Title
Worlds of Dairy Farming in Northeastern Turkey: Making Boundaries, Cheeses, Communities, and Technosciences

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Publication Date
2022

Peer reviewed|Thesis/dissertation

Worlds of Dairy Farming in Northeastern Turkey:
Making Boundaries, Cheeses, Communities, and Technosciences

By

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DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Anthropology

in the

OFFICE OF GRADUATE STUDIES

of the

UNIVERSITY OF CALIFORNIA

DAVIS

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2022

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Abstract

This dissertation is an ethnographic study of pasture-cheesemaking in Kars, Northeastern Turkey, amid politicized boundaries and transnational connections. It investigates cheesemaking within the larger agro-pastoral worlds molded by the everyday practices of animal care, dairy crafts, and technosciences, and regulated by the nation-state politics of food safety and national security. Focusing on a farmers' association in a village in Kars, I question the ways in which pasture-cheesemaking enabled farmers to organize for "a better life" for their more-than-human community. Cheesemaking is not a mere economic opportunity or a milestone industry; it is also a process through which local communities can reimagine places to make a better life in a depopulated village in rural Turkey.

Throughout the dissertation, I explore how cheese has become an unexpected agent to remember the shared violent past and circumvent the spatiality of state and ethnopolitical boundaries, while it also makes new places, communities, and technosciences through material practices of composing archives, doing scientific research and sustaining dairy production in Northeastern Turkey. I approach cheesemaking from practices that precede and remain as the underpinning of the dairy craft, namely *mera hayvancılığı* (agro-pastoralism) and processes of arranging pastures for dairy production. I focus on two kinds of trademark cheeses of Kars: *gravyer* and *kaşar*. I argue that appropriating the Swiss cheesemaking heritage of the early 20th century as *Boğatepe Gravyer* cheese and composing the archive of cheesemaking in the village ecomuseum entailed place-making through reconfiguration of dairy arrangements in the everyday practices of agro-pastoral livelihoods in Boğatepe pastures. By analyzing a nascent collaboration between small farmers, cheesemakers, and a group of dairy scientists engaged in the Geographical Indication certification process of *Kars Kaşar* cheese, I argue that the collaborative efforts have been challenging the Pasteurization procedures imposed by the industrial dairy standards, and "pasturing" the dairy arrangements

of *kaşar* cheesemaking in the last fifteen years. Lastly, I investigate the dynamics of the collaboration between cheesemakers and scientists. I suggest that this collaboration entailed pasture-cheese diplomacy, which not only obliged scientists to question the conventional approaches in dairy science research on traditional cheeses but also paved the way for new technoscientific interventions that would ensure crafting pastures into cheeses.

Acknowledgements

Completing this dissertation has been a long and challenging journey. I could not have endured without the support of many people along the way.

At the University of California Davis, my advisor Marisol de la Cadena has been incredibly supportive throughout my PhD studies. She has kept me grounded while introducing new ways of thinking; always provided helpful and critical advice; never hesitated to share her profound reflections on my work and her stimulating ideas; and given me the time and space to share, discuss, experiment and develop my ideas. I learned a lot through thinking with her.

I am indebted to my other dissertation committee members, who shaped my thinking in crucial ways. Tim Choy has always encouraged my creativity and offered me surprising comments that pushed my thinking beyond conventions. Cristiana Giordano has shared much wisdom, provided helpful mentorship, and contributed to my understanding of ethnographic methods and writing.

I am especially grateful to Suad Joseph for her time, wise advice on academic life, and sound scholarly feedback, especially during my first three years in the PhD program. Her informal seminar group that met every week offered constructive intellectual feedback but also a warm social environment full of emotional support that every graduate student needed. I want to thank Yael Navaro, who generously offered her time and feedback that became crucial for the PhD candidacy process and for my project.

In addition to my committee members, other faculty members at UC Davis have played essential roles in my intellectual development, including Suzana Sawyer, Alan Klima, Joseph Dumit, Li Zhang, Tarek Elhaik, Baki Tezcan, and Ian Campbell. I would like to mention Paul here, whom I worked together in UCD dairy, and who taught me milking cows in Davis!

Before my arrival at UC Davis, I was also inspired by many great mentors in Turkey. Ceren Özselçuk, Nükhet Sirman, Şemsa Özar, Yahya Madra, and Zafer Yenal at Boğaziçi University provided particularly invaluable encouragement and guidance in my graduate life. I am also greatly indebted to Aydın Uğur whom I met at İstanbul Bilgi University, and will always remember his mentorship beyond academia.

The graduate student community of which I have been a part at UCD have provided great friendships and support from the beginning till the (remote) end of my PhD life: Robert Deakin, Teresa Gil Lopez, Caroline McCusick, Ishani Saraf, Jorge Nunez, Adam Liebman,

Jake Culbertson, Kristina Lyons, Tanzeen Doha, Muneeza Rizvi, Morganne Blais-Mcpherson, Melissa Salm, Diana Pardo, Esra Köse, Onur Arslan, Mehmet Ali Çelik, Ali Danış, Taylor Bell, Justin Malachowski, Justin Haruyama, Annie O'Connor, Xinho Renan Martins Pereira have been present at different stages of this journey. Tory Webster has been there to bounce ideas throughout the whole journey. And my special thanks go to Aida Sofia Rivera, Kristi Onzik, Mariel Garcia Llorens, and Marie MacDonald who have always offered encouragement, new ideas, sincere friendship, and inspirational writing company – I would not be able to finish writing this dissertation without the committed writing group this group we initiated with Marisol.

I owe special thanks to Derya Nizam who have been a very dear friend to me and simultaneously a mentor, co-author, co-editor, and collaborator in different exciting projects. Similarly, Mehmet Ekinci deserves a very special mention since he has been a wonderful editor for my various publications, and a permanent thinking, reading, and writing company. He offered an incredible amount of labor in the formation of this dissertation. Over the years, I have benefitted greatly from other different publication projects that enabled me to collaborate with many friends and colleagues, including Ekin Kurtiç, Duygu Kaşdoğan, Kiraz Özdoğan, Ali Bilgin, Ebru Voyvoda, İhsan Karayazı, Armine Karayazı, Çare Olgun Çalışkan, and Sezai Ozan Zeybek. Last but not least, I learned a lot from Nilhan Aras as an editor, fieldworker, writer and friend; it was a pleasure to work and write with her on food!

I am grateful to Yerküre Research Cooperative, which has complemented my academic interests and motivations so beautifully – it quickly became both a vocational, intellectual, and collegial center of my life since 2019. Many thanks to all of my 'founding partners' and dear friends Ecehan Balta, Aylin Topal, Murat Bayramoğlu, Olcay Bingöl, Atakan Büke, Orkun Doğan, and Derya Nizam.

My dear friends, most of the time physically far in this journey but always emotionally close, have provided invaluable support in my life, and significant intellectual contributions to this research: Sidar Bayram, Orkun Doğan, Can Evren, Barış Özgen Şensoy, Zeynep Yeşim Gökçe, Bilgesu Şişman, Duygu Doğan, Kutlay Gürcihan, İlksen Mavituna, Goncagül Gümüş, Yusuf Kutlu, Utku Altunkaya, and Ali Yağız Şen.

This dissertation would not have been possible without the generous hospitality and cooperation of everyone I met in Kars, Ardahan, Iğdır, Van, and Adana during my fieldwork years. I am thankful to the professors and graduate students in the Veterinary Faculty at Kafkas University, Food Engineering Department at Çukurova University, and Food Engineering Department at Van Yüzüncüyıl University. I would especially like to thank

Mitat Şahin, Ufuk Kamber, Umut Çağın Arı, Çiğdem Sezer, Yavuz Öztürkler, Nuray Güzeler, Firuza Kaboyeva, Murat Kalender, Şehriban Oğuz, and Sipan Aslan. I am also very thankful to everyone who helped me reach the right contacts in Turkey and beyond its borders – including Erol Sağlam, Ceren Yazgan, Narek Sukiasyan, Armine and Alex Ter-Minasyan.

I am especially indebted to all the small farmers and cheesemakers of the two Boğatepe (Zavot) villages who welcomed me into their worlds. I am honored to be 'the son of the village' (*köyün oğlu*) after more than a dozen years of connection. Although I kept everyone anonymous in the dissertation, I have to thank some of them by their names here for making me feel at home in Boğatepe: Safiye, Turgut, Hüsniye, İlyas, Zümran, Celal, Gülcan, Şef, Nigar, Haydar, Solmaz, Deniz, Eco, Nurgül, Zakir, Ebru, Mehmet R., Eylem, Erkan, Nazım, Şemsi, Hayrettin, Sevdakar, Salatın, Tamaşa (Nanı), Soner, Kara, Ergüç, Emine, Çağdaş, Gamze, Uğur K, Sıla, Mete, Cihangir, Ali, Engin, Eren, Uğur A, Özkan, Hakan, İsa, Burak, Gürhan, Tayfun, and Emre.

I want to express extra gratitude to Kurban Olt and Güler Zerger who simultaneously have been fellow travellers, very close friends, trusted neighbors and housemates, and my chosen family members. Their presence in my life has become indispensable in the last six years.

And my most trusted advisor, İlhan Koçulu, not only introduced me to Kars and his village Boğatepe back in 2009 but has also been my best friend, father, teacher, student, and comrade since then. His partner Aynur became a second mother, his son Can Mithat became a brother to me throughout these years. He inevitably became a crucial character in my written narrative. It has always been my pleasure to travel, write, present, think, and simply converse with him. I cannot thank him enough.

I would also like to thank the institutions that financially supported my dissertation research and writing processes. The Wenner-Gren Foundation primarily provided funding for this dissertation fieldwork. I also received smaller grants from the American Research Institute in Turkey, UC Davis Anthropology Department, UC Davis Comparative Border Studies Mellon Initiative, UC Davis College of Letters and Science the Dean's Summer Graduate Fellowship, which were more than helpful for completing this dissertation. I thank all of these entities, and the people who generously read and commented on drafts of my funding applications.

My final word of gratitude goes to my family. I am so happy that my grandmother Yurdan Şalmanlı who has always been my biggest provider of love and care in this life, witnessed my graduation. My mother and father, Ferda and Ömer Tatari, my sister Fatma Nur Tatari, and my niece Ekin Nil who joined us in the middle of my Ph.D. life, have been beyond supportive and loving, and have always been there for me in times of need. My dear partner Esin Bozovalı has constantly been present with me through the challenge of writing up this dissertation. I am so lucky to be surrounded by her endless joy, love, and compassion.

Ankara, 04 December 2022.

Introduction

Studying the Worlds of Cheesemaking

This dissertation is an ethnographic study of pasture-cheesemaking in Northeastern Turkey, amid politicized boundaries and transnational connections. It investigates cheesemaking within the larger agro-pastoral worlds molded by the everyday practices of animal care, dairy crafts, and technosciences, and regulated by the nation-state politics of food safety and national security.

I started studying Kars cheesemaking in 2013 when a group of cheesemakers and dairy farmers were collaborating with development officials and experts, scientists, and activists in order to certify local cheeses that can be sold at an increased price, which would result in supporting dairy farming in the province's pastures. The two trademark kinds of cheese of Kars, namely *gravyer* and *kaşar*, became the entry points for my fieldwork research and further academic writing that follows this introduction chapter. As an outcome of a five-year-long process of farmers community organizing led by a small village association *Boğatepe Çevre ve Yaşam Derneği* (Boğatepe Environment and Life Association, BÇYD) in Kars, two cheese certifications were issued in 2015. The Turkish government issued a Geographical Indicator (GI) that recognized *Kars Kaşarı* as the local-artisanal cheese of the country's Northeastern border region, and the Slow Food Movement listed *Boğatepe Gravyeri* as a presidium product. BÇYD is constituted by small dairy farmers whose agro-pastoral livelihoods rely on animal husbandry[1] for cheesemaking in Boğatepe village. Both

[1] I use the English expression "animal husbandry" as the translation of "*hayvancılık*" in Turkish. This choice is inspired by the clarifications on the concept of "l'élevage" in French by Jocelyn Porcher (Porcher 2014; 2017) that highlights the contrast between industrial and small farmer methods of breeding animals. Yet the same

certificates are verified by a set of criteria to distinguish the production process of cheese and the final products of the respective process in a particular place. While *gravyer* cheese emerged as a specialty of Boğatepe village, *kaşar* cheese was associated with the administrative borders of Kars and Ardahan.

The geographical borders these farmers have been struggling to demarcate for the cheesemaking practices certified as 'local' are deeply entangled with other contentious political borders in the region. On the one hand, Kars is situated at the highly politicized nation-state border between Turkey and Armenia. Except a brief period between December 1991 and April 1993, the border remained firmly closed, mainly due to political disputes between the two countries over Armenia-Azerbaijan conflicts and the Armenian Genocide (1915) that is officially denied by the Turkish state. On the other hand, Kars constitutes the northern part of the predominantly Kurdish-populated region of Turkey, where the armed conflict between the Turkish army and Kurdistan Workers Party (PKK) has been ongoing for almost forty years. This conflict led to the militarization of the region, which consists of many unofficial, yet highly recognizable boundaries between the Turkish state and PKK, as well as between communities. These boundaries do not merely affect the spatiality of armed conflict; they also make possible the cohabitation of Turkish and Kurdish communities in lands once also inhabited by Armenians, Greeks, Molokans, Dukhobors, Swiss, Germans, Russians, and Georgians. This dissertation investigates an important assumption: the everyday life of animal husbandry that makes cheesemaking possible is a crucial space for negotiating the contours of boundary making and remaking practices between communities, scientists, cows, pastures, violent histories, and contested memories.

Turkish word will be translated differently in different expressions throughout the dissertation. I preferred to translate "*süt hayvancılığı*" as "dairy farming". As I explain in detail in Chapter 1, I choose to translate "*mera hayvancılığı*" – a central concept throughout the dissertation – as "agro-pastoralism".

Commercialization of milk and cheese and enclosures of common pastures as private farms commenced in the late 1800s when Russian, German and Swiss colonies were founded in Kars. A particular dairy farm system emerged during this period with new breeds of cows, types of alpine cheeses, and ways of collecting and processing milk. After significant demographic changes by the end of the World War I, the legacy of this colonial dairy farm system became an important determinant of the boundary making practices among different communities, and for the formation of the Turkish state borders in the region throughout the twentieth century. *Gravyer* and *kaşar* cheesemaking that relied on local forms of agro-pastoralism (*mera hayvancılığı*)[2] became the main revenue for most farmers, thanks to the Turkish state's developmentist politics before 1980, which included state-owned dairy enterprises, distribution of pastures to villages and/or families, and subsidies to rural dairies. With the escalation of the armed leftist struggle in 1970s rural Turkey and the armed conflict between the Turkish Army and the PKK after 1980, most of the dairy farm owners were attacked, permitting small farmers to occupy and turn some of these farms into common pastures. Together with the intensification of the armed struggle, the 12 September 1980 military coup and the following decades in Turkey were marked by the neoliberal policies in agriculture, which resulted in the dismantling of state-owned enterprises, import limitations, and price determination mechanisms. Movements of dairy farmers, shepherds, and dairy animals were affected not only by the security measures such as border security zones, counter-insurgency measures, re-distribution of abandoned lands, and guerilla activities, including the assassination of big landowners and the occupation of particular farmlands; but

[2] Throughout the dissertation, I use *mera hayvancılığı* and agro-pastoralism interchangeably. While the first one is locally used in Kars to describe everyday practices of animal husbandry in pastures, and nationally in Turkey to challenge intensive industrial animal farming; the latter seemed the translation that can capture best the embedded meanings of the term in Turkish. I rely on Nori and Farinella who define the term as follows: "Agro-pastoral systems are based on specific agricultural practice whereby ani- mals are mostly raised in open settings, mostly feeding on local natural grazing; several interactions and synergies characterise the combination of farming and livestock systems" (Nori and Farinella 2020, 105). See also Chapter 1 for the local version of this combination in Kars.

also by the transformation of agricultural policies that accelerated the decline of the local breeds (*yerli ırklar*) of dairy animals and the industrialization of dairy production processes from animal care to milk processing and dairy crafts.

In 2004, the Turkish government legalized new food safety reforms and regulations as part of the ongoing membership negotiations with the European Union. Hygiene and pasteurization was essential buzzwords of this reform. The new criteria made the production process more arduous than before and increased the fixed costs of the mobile dairies in pastures or small dairies in villages to obtain official production permits (*üretim izin belgesi*), yet more than half of the total milk production in Turkey still does not end up in the formal dairy industry. The Turkish state attempted to formalize commercial milk and dairy production by distributing milk subsidies to the farmers through a re-institutionalization of the dairy sector through local breeder unions.[3] This new institutionalization favored factories (located in the industrial zones close to urban centers and regularly inspected to enforce safety standards) over the rural dairies in pastures (where cheesemaking is assumed to be performed under unhygienic conditions with traditional techniques). By the mid-2000s, a significant portion of commercial dairy farming was pushed outside the formal dairy economy in Turkey.

While the flourishing supermarkets of the 1990s and 2000s did not accept most of the "traditional" cheeses due to food safety-related concerns, smaller grocery stores and local marketplaces (*yerel pazarlar*) dominated the dairy markets. As İlhan, a fourth-generation cheesemaker from Boğatepe, Kars, and an important figure in the artisanal cheese trade landscape in Turkey, expressed at the artisanal cheese symposium organized in Kars in 2016: "Dairy farmers and rural cheesemakers, although fewer in numbers than ever before in

[3] EU reforms favored the institutionalization of local breeder unions and an independent national dairy council where these unions, together with scientists and dairy industry representatives, form an advisory council that publishes reports, statistics, and yearly milk price recommendations.

Turkey, continued to make cheeses thanks to the people's eating habits." This situation, İlhan said, made possible the sustenance of pasture-cheesemaking in rural Kars, and by 2014, supermarket chains started to find ways to buy and sell dairy products from local cheesemakers. The persistence of informal dairy markets also obliged the authorities to partially revise food safety measures after 2016.[4]

Geographical Indications (GIs), which are supposed to support local products, were first legalized in Turkey in 1995 by a presidential decree, and they became part of Industrial Property Law later in 2016[5]. They became an almost essential component of a new model of "local" and "participatory" development projects, especially in the 2010s. GIs are meant to certify the authenticity of potential niche products like local artisan cheeses by identifying appropriate craftsmanship in a geographically bounded region. GI certification is only possible with a new set of tools and practices implemented, negotiated, and performed by scientists and small farmers, state officials, development experts, various nongovernmental institutions, and activist networks. Scientific research on the local cheeses aims to define the geographical borders in which the distinctive materiality of a particular GI food can be identified and reproduced. As it is the locality itself that defines the food, the products are usually named after these borders. This dissertation scrutinizes the process of localizing cheese as making new boundaries in a contentious region. I propose that these borders are enacted through new practices of dairy farming that have been shaped by the spatiality of the state, movements of herding cows in pastures, dairy crafts and techniques, and materialization of local/artisanal and scientific knowledge in cheeses.

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[4] See, for instance, the recent regulation by the Turkish state on "local, marginal, and limited operations in food enterprises" https://www.resmigazete.gov.tr/eskiler/2016/07/20160726-2.htm (accessed on 24 April 2021).

[5] These official documents can be accessed online through the following links: https://www.mevzuat.gov.tr/File/GeneratePdf?mevzuatNo=555&mevzuatTur=KHK&mevzuatTertip=5 (accessed on 01 June 2022), https://www.resmigazete.gov.tr/eskiler/2017/01/20170110-9.htm (accessed on 01 June 2022).

Agro-pastoralism (*mera hayvancılığı*) and cheesemaking practices make boundaries that differ from – and at times challenge – state-imposed borders. I approach these as daily practices that have important geo-political implications. Accordingly, this research interrogates the relationship – frictional or collaborative – between day-to-day pastoral practices and the way the nation-state exercises its sovereignty. How does the imposition of state borders impinge on animal husbandry practices, local life, and everyday relations between ethnic communities? Cheesemaking does not simply become an economic opportunity or a milestone in the regional development path; it also serves as a process through which local communities can reimagine places to make a better life in the depopulated villages of rural Turkey. My research is simultaneously concerned with the materiality of cheese, which farmers and scientists mobilize through GI processes that depend on defining the borders of a given region. As an integral entity in the rural livelihoods of agro-pastoralists and particular kinds of local food to be standardized by GI, cheese emerges as an important site of collaboration between scientists and local farmers. I look at the practices of local cheesemakers and microbiologists to observe how specific components from material elements (such as soil, water, grass, plants, cowsheds, milking and dairy equipment, and dairy cheese aging shelves) are chosen to make the cheese distinct and local to Kars. What kinds of new regional/geographical boundaries and biological, physical, chemical, and sensory entities are produced in this localization process, and how? My research thus approaches cheese as a vital agent in making different dairy arrangements by the nation-state and local communities on the one hand and by scientists, animal husbandry practitioners, and dairy producers on the other. Pastures, grass, cows, milk, curd, cheese, and many other entities are enfolded in this human endeavor of dairy crafts.

Formulating research questions on pasture-cheesemaking (*mera peynirciliği*)

This research builds on five main strands of literature: anthropology of borders and the state, anthropology of (agro-)pastoralism and rural studies, anthropology of place-making, anthropology of food, and science and technology studies. These five main pillars can also be articulated through the following keywords: state, pastoralism, place, food, and science and technology studies. In other words, this dissertation brings together political anthropology (with a particular emphasis on spatiality and national border-making), rural studies (with a particular emphasis on political ecology and economy of agriculture and food), human geography (with a particular emphasis on place-making through food), food studies (with a particular emphasis on memory and senses), and feminist science and technology studies (with a particular emphasis on methodologies and enactments of more-than-human entanglements).

Borders, nations, animals, and space

Borders have long constituted a significant subject of inquiry in the anthropology of the state. Scholars have challenged the assumption of an imaginary bounded space of the nation-state (T. Mitchell 1991; Trouillot 2001; Das and Poole 2004). Gupta and Ferguson (2002) argued that the spatialization of the state as a reified entity is produced through mundane, everyday routines. Borderlands have also been conceptualized as peripheral spaces where everyday life is not fully governed by the state (Scott 2009); as frontiers where state actions shape and transform identities (Wilson and Donnan 1998); as produced by a multiplicity of ways "that may contest, undermine or creatively appropriate statist projects" (Reeves 2011, 321; 2014), and as marginal spaces where borders produce ontological ambiguity in the regions that they are supposed to divide (Green 2005). Both Green's analysis of the Balkans (2005) and Grant and Yalcin-Heckmann's analysis of the Caucasus (2007) problematize popular discourses about the excessive diversity of these regions and their stigmatization as prone to violence and fragmentation. Instead, these authors draw

attention to the complexity of the connectedness of peoples and places that exceed the territorialized ethnic order of nation-states. I draw on these studies to unravel national and ethnoreligious boundaries in Northeastern Turkey, a highly militarized and controlled border with the "chaotic" Caucasus and the "rebellious" Kurdish region. My analyses in Chapters 1 and 2 shed light on the complexity of boundary-making in Kars pastures through the materialization of the nation-state, as well as everyday practices of agro-pastoralism and place-making of the Turkish nation-state.

My dissertation research combines the anthropological literature on place-making, environmental history, and animal husbandry to explore the relationships between dairy farming, colonization, violence, and the formations of the modern Turkish state in Kars. My historical research questions are inspired by studies that have explored various facets of the transition from empires and nation-states, especially through agriculture, livestock, and human-animal movements (Cronon 2003; Ingold 2000; Scott 1998). Building on the scholarly works that have conceptualized pastures and shepherding practices in relation to the dynamics between states, markets, and local communities (Agrawal 1999; Gray 2000; Dominy 2001), as well as environmental histories of colonialism through animal husbandry (Cronon 2003; V. D. Anderson 2006; Weisiger 2011; Smith 2014; Bruno 2016), this dissertation investigates pastures as they emerge and transform at different times under particular agro-pastoral arrangements.

Place-making through food

My research examines the production of boundaries through particular place-making practices of herding, pasturing, milking, and cheesemaking. I draw on the critical studies of space and place, which conceptualize space, not as a representation for power relations or a background for everyday practices but as an instrument of cultural power (Mitchell 1994; Lefebvre 1991) and as practiced place (De Certeau 1984; Massey 2005; Ingold 2011; Tuck

and McKenzie 2015). Ethnographic literature has also dealt with the senses of place (Feld and Basso 1996), place-making as making life (Escobar 2008), and place as they emerge from particular local relationalities (de la Cadena 2015). My dissertation relies on a relationship of co-construction between place and food, and analyzes both the making of food in a particular place and the making of place through food – which I conceptualize as "placing *gravyer*" in Chapter 1, making spatial boundaries through pasture-cheesemaking in Chapter 2, "pasturing" *kaşar* cheese and technosciences in Chapters 3 and 4. Rather than conceptualizing food and place as separate entities that enter into a relationship, I am interested in analyzing their emergence through complex, more-than-human entanglements of the dairy arrangements that result in practices of making place and food simultaneously.

Scholars in the social sciences have long been interested in studying peasant movements, agrarian change, global food regimes, and commodity chains, alternative food justice movements, and politics of local food (Mintz 1986; McMichael 1995; DuPuis 2002; Bowen and Zapata 2009; Grasseni 2013; Heller 2013; Cameron, Gibson, and Hill 2014). The connection between food and place has also been widely discussed in food studies, especially with the concepts of "*terroir"* - which can be translated as the taste of place from its linguistic origins in French (Trubek 2008) – and of "local food" (DuPuis and Goodman 2005; Fonte 2008; Grasseni 2009; Bowen 2011; Guthman 2014; Grasseni et al. 2014; Weiss 2016; Z. Yenal 2017; Nizam 2019). Anthropological and sociological studies on *terroir* highlight the material, sensory, and historical connections between food production and geography (Bowen and Zapata 2009; Paxson 2010; Besky 2014b; West 2022). My analysis of the everyday life of dairy farming and agro-pastoralism (*mera hayvancılığı*) in the making of place and taste is accompanied by a special attunement to the relationship between place and memory in pasture-cheesemaking.

I am indebted to the interdisciplinary scholarship that investigate the relationship between food, senses and memory (Sutton 2001; 2010) in the formation of my research questions concerning remembering pasture-cheesemaking. Through investigating the inextricable link between place and food, this dissertation also contributes to the recent discussions on senses, and memory in food studies. This dissertation problematizes how a Swiss cheesemaking tradition has not only been placed in South Caucasus and Northeastern Anatolia since the late 1800s, but has also been re-invented as *Boğatepe Gravyeri* in the 2010s. Remembering Swiss cheesemaking as a "culture that came with migration (*göçle gelen kültür*)", farmers enact a particular process of "appropriation" of Swiss cheese as *Boğatepe Gravyeri*. I borrow anthropologist Leyla Neyzi's (2002) concept, "remembering to forget", to elaborate on how the violent years of war, clashes and, atrocities fueled by the politicization of ethnoreligious and national difference have been cast as *migration* in the archival documentation of the *Ekomüze Zavot* in Boğatepe village, Kars. Yet different layers of this migration illuminate the presence of the past in the present. Following the formation of an archive in the village, my analysis explores the relations between the ways in which farmers remember cheese, and enact the contemporary "dairy arrangements"[6] that make the milk flow convenient for dairy processing, which includes pasture-cheesemaking.

At the interface between science and technology studies and ethnography

I am very much inspired by the studies that have explored the material transformations produced by the 're-invention' of particular foods and places, such as artisanal cheese in the United States (Paxson 2013) and the Italian Alps (Grasseni 2016), heritage pigs in North Carolina (Weiss 2016), tequila and mescal in Mexico (Bowen 2015), raw milk in Lithuania (Mincyte 2014), microbrewed beer in Palestine (Meneley 2014), and Darjeeling tea in India (Besky 2014a). Most of these scholars rely on the social studies of

[6] I have also called these arrangements "dairy infrastructures" (Tatari forthcoming)

science to analyze collaborations between scientific and non-scientific practitioners, and conceptualize nonhuman actors' participation in the making and 're-invention' of food and places. This literature, situated at the intersection of the anthropology of food and science and technology studies (STS), enabled me to ask new questions and incorporate new methodological challenges. Accordingly, in Chapter 3, I problematize the ways in which the practices of "pasturing" dairy arrangements can be traced in the making of dairy technosciences. And Interlude 3 provides a juxtaposition of the practices in the dairy and in the laboratory in order to explore more-than-human agencies in both settings.

Social studies of science have long revealed that the material practices of knowledge production, or simply the practices of making-doing science, enact particular realities; and that these multiple realities do not necessarily cohere (Mol 2002; Law 2004). In a similar vein, scholar argued that (expert) knowledge is always "situated" (Haraway 1999), and that the articulation between the so-called universality of science and the particularity of local knowledge should itself be seen as an enactment (Choy 2005). My project draws on this discussion to explore the collaborations between scientists and cheesemakers, microbiologists and farmers, and how these collaborations may produce, invent, and remake material entities and boundaries – political, spatial, sensory, and otherwise. In Chapter 4, I explore the ways in which a concept suggested by a cheesemaker in Kars ("carved reason") could reveal the limits of expert knowledge in the situated practice that combines traditional cheesemaking techniques with technosciences.

STS scholars have also drawn attention to scientific practices as constituting a contested field in which a multiplicity of human and nonhuman actors participate in making scientific realities (Latour 1993; Callon 1999). Studies of the interfaces between scientific and nonscientific practices have taken the agency of naturecultures (Heath and Meneley 2010), multispecies entanglements (Kirksey and Helmreich 2010; Tsing 2015), human and

nonhuman relationalities (Lyons 2016), and of animals in particular (Haraway 2008; Despret 2016; Despret and Meuret 2016b) seriously. I worked on being attuned to the entanglements between plants, cows, milk, and microbial cultures through dairy arrangements as boundaries are made, crossed, and re-made through pasture-cheesemaking in Kars. While Chapter 4 hints at this entanglement in collaboratively making cheese and dairy technosciences by scientists and cheesemakers, Interlude 4 narrates the invisible and more-than-human agencies that affect everyday practices in the transition from an old dairy to a new one.

Situating this research in social sciences on Turkey

This dissertation proposes a new approach for understanding the relationship between the spatiality of the state in its borderlands and everyday practices of dairy farming and cheesemaking. It contributes to a growing body of ethnographic and historical studies on the borderlands of Turkey (Migdal 2004; Ozgen 2005; Cora, Derderian, and Sipahi 2016; Pelkmans 2006; Bacas 2005; Ateş 2013; Akyüz 2018; Bozçalı 2019; 2020; Tejel and Öztan 2022). My dissertation treats state borders as territorial boundaries that circumvent agro-pastoralist movements of local communities. I investigate dairy arrangements of agro-pastoralism (*mera hayvancılığı*) which also involve various territorial boundaries that circumvent the border-making of the Turkish state. I am interested in the militarization of space through ethno-religious, national, and species differences. Recently, historical studies that draw attention to the agricultural underpinnings of national struggles (Aytekın 2012; Meier and Aytekin 2019; Aytekin 2022) have been illuminating in formulating my research questions on borders and boundaries made by the state and pastoralism.

The increasing number of studies with a particular focus on the methods and questions that reveal the environmental and ecological histories of Ottoman Empire, especially in Eastern Anatolia and Mesopotamia inspired my research (Tabak 2008; Mikhail 2011; White 2011; Cora, Derderian, and Sipahi 2016; Duffy 2019; İnal and Köse 2019;

Gratien 2022; Dolbee 2022). Research on the history of dairy farming, pastoralism, and cheesemaking requires delving into the well-established fields of studies in the social sciences of Turkey on agriculture. Recent work on the little Ice Age in the 1700s that affected the movement of pastoralists and the patterns of farming (Pehlivan 2020) has particularly inspired me to take into account the environmental history of Eastern Anatolia and South Caucasus in the formation and transformation of agro-pastoralism and dairy arrangements. By focusing on pastures and dairy animal farming, my research aims to bring together an attunement to the environment, physical geography, and animal-human relations in studying the long-discussed questions on agricultural politics and relatively much less explored questions on pastoralism in the last 150 years in Northeast Anatolia.

The northeastern border of the Turkish Republic provides an intriguing case in the country for these research questions since the transition from empire to nation-state involved Tsarist Russia, the Soviet Republics of Armenia, and Georgia. The transformation of rural life with nation-state borders has been entangled with the meshwork of agro-pastoral movements of humans, animals, grass, and milk. Since Northeastern Anatolia have been a heated zone of war between Tsarist Russia and the Ottoman Empire, especially in the 18th and 19th century, the agro-pastoral movements were deeply affected and shaped by violence, dispossession, deportation, and the change in human and animal populations. *Çiftlik* (farm) debate in the historiography of the late Ottoman Empire illuminated multiple crucial aspects of the agricultural and rural lives in the late 19th century, such as land ownership, sizes of agrarian production units, ethno-religious conflicts and the ways in which family farmers persisted until the 20th century (Keyder and Tabak 1991; Quataert 2008; Aytekin 2008).

This dissertation engages with the vast 20th century literature on rural studies in social sciences in Turkey through three key concepts it develops: pasture-farms, agro-pastoralism (*mera hayvancılığı*), and pasture-cheese as a peculiar form of local food in Kars. By

analyzing pasture-farms as vital dairy production units in Kars until 1980, my research contributes to the empirical studies on farms (*çiftlik*), and reveals complex arrangements of agro-pastoralism that involves pastures, fields, animals, milk, farmers, and cheesemakers. It aims to open up space for discussion and scientific investigations that consider animal care as central to the practices of agriculture and cheesemaking. Agro-pastoralism (*mera hayvancılığı*), in this picture, becomes the starting point of both the dairy arrangements and other infrastructures of food and agriculture. Hence, it contributes to the recent studies on agriculture and rural studies, as well as to the political ecology and animal studies in Turkey. My focus on artisanal cheese provides me the means to engage with the discussions in the growing literature on local food in Turkey (Nizam 2019; Kocagöz 2018; Soysal Al and Küçük 2019; Atalan-Helicke 2018; 2019; Nizam and Yenal 2020). Since Boğatepe cheeses have been part of many community-supported agriculture networks in Turkey since 2005, my research on Kars pasture-cheeses contributes to this literature. Moreover, my dissertation also contributes to the recently growing scholarly work on political ecology (Erensü 2018; İnal and Turhan 2020; Scaramelli 2019; 2021), critical human-animal studies (Zeybek 2020; Özdoğan, Tatari, and Bilgin 2021), and science and technology studies in Turkey (Ansal, Ekinci, and Kaşdoğan 2018; Kayaalp and Arslan 2022) through its focus on the ways in which agro-pastoralism and dairy crafts make animals and pastures present in pasture-cheese sensorium, and on the collaboration between farmers, cheesemakers, and scientists in designing dairy science research and making technosciences.

Ethnographic concepts and methodology

This dissertation is a pasture-cheesemaking ethnography. My research mainly consisted of observing and participating in the practices in animal sheds, villages, pastures, dairies, and laboratories. My 18-month fieldwork between September 2017 and February 2019 followed my eight years of voluntary engagements with Boğatepe village, its village

association BÇYD, and dairy farmers in Kars. In 2013, I was involved in an oral history research project on Kars *kaşar* and *gravyer* cheeses which fueled my interest in studying pasture-cheesemaking. During this research, the details of which I discuss in Chapter 1, I spent two months traveling in the villages of Kars (Turkey), Ardahan (Turkey), Tbilisi (Georgia), and Dmanisi (Georgia), and our research team interviewed more than thirty elderly farmers. This research focused on the early 1900s, and it enabled me to familiarize myself with the regional history of dairy farming, and to ask questions about how violent histories are present today in the everyday life of animal care and cheesemaking. Since then, I had an ongoing archival interest in local forms of agro-pastoralism (*mera hayvancılığı*) and dairy production in Kars and Turkey. During my dissertation research, I conducted archival research in Turkish state archives in order to access the documents on pastures, animals, dairy production, and cheesemaking in Kars in the early 20th century. I also benefited a lot from the publications by the agricultural faculties of Ankara University and Erzurum Atatürk University on Kars dairy farming and cheesemaking, which were important sources for the development politics of the state until the early 1980s.

In 2015, I was involved in BÇYD's subcommittee that worked on the Geographical Indication of Kars *kaşar* and Slow Food Presidium of Boğatepe *gravyer* cheeses. In 2016, I took part in the organization of an International Symposium in Kars called "Local Artisanal Cheeses in Turkey and the World: The Use of Geographical Indication for *Kars Kaşarı*" (Nizam and Tatari 2018). This symposium introduced me to a network of scientists (veterinarians, microbiologists, and food engineers) whose scientific work on cheese in Turkey deepened my understanding of the technoscientific worlds that connect these scientists to the cheesemakers and dairy production. Between 2017 and 2019, I conducted a series of in-depth and semi-structured interviews with 50 dairy owners, 80 cheesemakers, 20

state officials, and 13 food scientists on dairy farming and *kaşar* cheesemaking in Kars.[7] I visited all the registered dairy facilities in the province, accompanied dairy farmers in their everyday life, traveled in the many milk transportation vehicles of different dairies across pastures and villages, regularly worked in three different rural dairies for more than two months, and observed crafting pasture-milk into *kaşar* cheese for innumerable hours.

In addition to my research in the pastures, villages, and dairies of Kars, I visited veterinarians, microbiologists, and food engineers who study Kars *kaşar* cheeses in three universities in Turkey. I audited two classes on dairy farming and technologies and observed scientists in their labs when they analyzed whey or cheese samples shipped from dairies in Kars. I had the opportunity to closely observe two PhD dissertation research on Kars *kaşar* cheeses in two universities in Van and Adana where scientists analyzed whey or cheese samples shipped from dairies in Kars in the laboratories. This laboratory experience enabled me to grasp how cheeses become local through different scientific practices and the various ways these scientific practices interact with the practices of small farmers and cheesemakers. Knowing milk and cheese, techniques and technologies of dairy crafts emerged as a field of controversies and collaborations between different groups of experts.

My involvement in several local, national and international organizations around dairy farming, pastures, and cheesemaking, and the ethnographic methods I used at different sites, among different actors enabled me to follow the ongoing legal, scientific, commercial, and practical controversies. Following all these controversies as an ethnographer closely, I was inspired to conceptualize ethnographically - the concepts I chose to think with and write in this dissertation had to be situated. In other words, all the concepts I develop in this dissertation, such as agro-pastoralism (*mera hayvancılığı*) or pasturing, are not only strongly attached to Kars pastures and the empirical realities I encountered, they have also been

[7] I conducted all interviews in Turkish, which is my native language.

carved by me and my various human and nonhuman collaborators in the course of producing this ethnography.

Dissertation outline

All through the dissertation, I analyze the making of artisanal cheese and various other dairy products in the everyday worlds of pasture-dairying. I approach cheesemaking as a part of animal care practices in *mera hayvancılığı* (agro-pastoralism) in which cheese has always been an important food product with other dairies, including yoghurt, butter and ghee. Accordingly, Chapter 1 and 2 (and Interlude 1 and 2 that follow them) focus more on the practices that precede and remain as the underpinning of the dairy craft, namely *mera hayvancılığı* and processes of arranging pastures for dairy production. These processes of infrastructuring pastures consisted of complex dairy arrangements through political and geological boundaries, movements of herds and milk, practicing dairy crafts and technosciences, as well as remembering the past to enact the present. The remaining two chapters and interludes of the dissertation focus on the practices of dairy sciences and artisanal cheesemaking from obtaining the (pasture-)milk to crafting and scientifically analyzing it. Hence, this dissertation investigates the worlds of pasture-cheesemaking – it starts with *mera hayvancılığı* in villages and pastures, continues with transporting the milk of these animals to *zavot*s (dairies) and crafting it into cheeses, and ends with carving the practitioners' knowledge on cheesemaking after making the cheese itself – in *zavot*s, laboratories and *badval*s (aging rooms).

An interlude follows each chapter. As the outline below elucidates, each chapter aims to discuss four distinct conceptualizations that this dissertation puts forward, namely placing and re-membering *gravyer* cheesemaking, dairy arrangements and pasture-farms, pasturing *kaşar* cheesemaking and technosciences, and carving diplomacy in the scientist-cheesemaker

collaborations. The interludes are meant to provide primarily empirical descriptions or stories, to supplement the conceptual frameworks of each chapter with a particular thick description of pasture-cheesemaking in Kars. They link one chapter to the next by extending some of the issues introduced in the previous one and articulating them to the central questions of the following chapter.

Chapter 1 focuses on the Boğatepe Gravyer cheese as it emerges from the web of dairy arrangements in the everyday life of agro-pastoralism in rural Kars. In the first part of this chapter, I situate the recent organization of farmers and cheesemakers in Boğatepe to "make life better" in their village. Because *gravyer* cheese is a trademark of Kars province and specifically of Boğatepe village, its story has attracted public attention and funding opportunities from different parts of Turkey within the last decade. In 2010, BÇYD members founded a living museum of local-traditional cheeses, *Ekomüze Zavot*, in the village. *Ekomüze Zavot* gathered many stories, artifacts, and documents that belong to the past of cheesemaking in Kars, specifically in Boğatepe. By attending the practices that aimed to compose both the museum archive and *gravyer* cheesemaking as part of my ethnographic research, I unpack the trajectory of inheriting *Swiss cheese* as *Boğatepe Gravyeri*. I engage with farmers' acts of remembering *gravyer* cheese not only in the narratives of migration but also in material enactments of Boğatepe in the present through dairy farming in high-altitude pastures.

Farmer narratives on cheesemaking as "a culture that came with migration" that simultaneously reveals and obscures the violent years of colonialism, wars, exiles, genocides, Turkification, and modernization policies of the nation-state play a crucial role in demonstrating the multifaceted nature of cheesemaking in Kars in this dissertation. These phenomena affected the processes of appropriation of villages, fields, houses, dairies, and pastures, as well as the demarcation of spatial boundaries of pasture-cheesemaking. On the

one hand, I analyze the processes of dispossession and appropriation, which structure the movements of people and animals that have constituted agro-pastoral lifeworlds in Kars in the early twentieth century. On the other hand, I explore specific dairy arrangements for forming the local trademark product, *gravyer* cheese, since 2005. I argue that Boğatepe Gravyer emerges from the meshwork of pasture-cheesemaking that entails a reconfiguration of dairy arrangements in the everyday practices of agro-pastoral livelihoods in Boğatepe.

Interlude 1 continues to trace the legacy of Swiss cheese beyond the nation-state borders of Turkey. Inspired by a *maya* (yeast/rennet) sample that traveled from Kars, Turkey, to Gymri, Armenia, I narrate my visits to the abandoned Swiss cheese dairies and schools in Georgia and Armenia. By highlighting the few remaining masters of Swiss cheese, I question how *terroir* is made across borders and boundaries.

Chapter 2 focuses on the forms of agro-pastoralism (*mera hayvancılığı)* in İsaçayırı pasture-farm (*mera-çiftlik*) and how these farms led to the conflicts over the ownership conditions of the pastures. I highlight the comprehensive meaning of *pasture* (*mera*), which entails the movement of animals and humans, and encompasses the (material-semiotic) boundaries between *mera, çayır, yayla*, and *tarla* in Turkish. This chapter unpacks the dairy arrangements of *mera hayvancılığı* in Kars province before the massive depopulation in the 1980s. Building on the historical accounts of *mera hayvancılığı* in Kars, I analyze the formation of the dairy arrangements between 1920 and 1980. I suggest that the cooperatives or partnerships of dairies in the 1930s and 1940s were replaced by a few large pasture-farms in the 1950s, which not only bought milk from peasants but also rented animals and employed many workers. In the intriguing case of the İsaçayırı pasture-farm, local peasants, backed by an organized revolutionary armed group, attacked and burnt down the houses, dairies, and other establishments in late 1979, almost 50 years after the pasture-farm's

establishment. I focus on the culmination of events that led to this "occupation" or "commoning" of the pasture-farm.

Interlude 2 continues describing the transformation of Kars cheesemaking between 1980 and 2005. Through the story of a well-known industrial processed cheese *Karper*, I trace how Kars cheeses have been subject to industrialization, first in Istanbul, then in the industrial dairies in Kars city center.

Chapter 3 investigates how pastures become integral to a particular pasture-cheese sensorium of Kars Kaşar cheese. Dairy farmers put significant effort into inscribing this sensorium as the desirable taste of *kaşar* cheese in the official GI legislation. In line with the industrialization of dairy production in the country, the decline in the rural population, and armed conflict in Kars, rural dairy production has declined sharply between 1980 and 2015. Rural dairies (*zavot*s) were not economically competitive with the increasing number of (semi-)industrial urban dairies. Artisanal cheesemakers in *zavot*s relied on pasture-dairy farming and *mera hayvancılığı* (agro-pastoralism) as a necessary infrastructure for artisanal *kaşar* cheese. I joined several meetings primarily organized by the local small farmers association (BÇYD) to design the official legislation. These meetings gathered dairy farmers and owners, cheesemakers, and shopkeepers (*esnaf*), academics, state officials, and development experts. These gatherings effectively shaped the official legislation that recognized pasture-milk and traditional techniques of cheesemaking as the main factors that make *kaşar* cheese distinctively local. The sensorium of the Kars Kaşar cheese that dairy farmers and cheesemakers enunciated in these meetings consisted of the smell and taste of pastures crafted into the cheese. This sensorium can only be sustained by the particular everyday practices of dairy farming and artisanal cheesemaking, which I investigate closely in this chapter. And I argue that these practices attempt to *pasture* the dairy arrangements of *kaşar* cheese, including its technosciences.

Interlude 3 expands the role of hands and touch in the pasture-cheese sensorium by looking closely at the dairy craft in the dairy and scientific research in laboratories. The juxtaposition of the use of hands in artisanal cheesemaking and scientific practice aims to elaborate on the entanglements of humans, milk, curd, and cheese, and on the sensory communication between humans and nonhumans while dairying and performing scientific research.

Chapter 4 focuses on the collaboration between artisanal cheesemakers and scientists as they engage with "local" cheese and its dairy technosciences in Kars. Artisanal cheesemaking emerged as a crucial site for small farmers in their attempts to sustain rural livelihoods by certifying local cheeses as authentic products whose distinctiveness needs to be scientifically proven to the official food safety authorities. While providing the necessary scientific analyses for certifications such as the Geographical Indication of Kars *kaşar* cheese, studies I discuss in this chapter also reveal the limits of the cautious approach in the conventional dairy science research towards the effects of pasture-cheeses on human health. Focusing on the recent collaborative processes that made new connections and boundaries between pastures, dairies, laboratories, scientists, and cheesemakers, I analyze how these processes have altered dairy scientists' research agenda on artisanal cheesemaking and also destabilized the epistemic boundaries between scientific and traditional knowledge. I argue that "pasture-cheeses diplomacy" leads (and *obliges*) scientists to question the conventional approaches in dairy science research on traditional cheeses. Building on this, I further claim that the recent attempts of situating microorganisms in Kars cheeses – which follow the trends in global microbial research while restrained by the structural limitations the scientists face in designing and practicing research in between rural Kars and universities in Turkey – point to the new aspirations that emerge from the diplomatic collaborative processes prioritizing research on the presence of pastures in cheeses.

Interlude 4 discusses the local innovations that make traditional knowledge appear under new guise in cheesemaking. I introduce the story of a new dairy in the village, which enables me to focus on the use of copper vats 'undercover' and the practices of the dairy crew in making the new dairy suitable to the production through cultivating an environment suitable for the cheeses that age. By introducing technical solutions of cheesemakers in the new dairy as local innovations, this interlude complements my investigation on technoscientific interventions that emerge from the cheesemaker-scientist collaborations.

The conclusion wraps up the dissertation by summarizing the achievements of the BÇYD by 2022 and presenting the recent immigration decisions by the youth. The dissertation ends by questioning what "a better life" means for the women (and their children) 15 years after they founded their association, despite all the transformations throughout the years.

Chapter 1

From Swiss Cheese to Boğatepe Gravyeri: Remembering Pasture-Cheesemaking

Encountering pastures

Upon their arrival at Boğatepe[8], visitors of *Ekomüze Zavot* are accompanied by a woman member of *Boğatepe Çevre ve Yaşam Derneği* most of the time. *Boğatepe Çevre ve Yaşam Derneği* (Boğatepe Environment and Life Association, BÇYD) members founded this cheese ecomuseum located in rural Kars and they are in charge of it in many aspects including administrative duties, tourism guideship and architectural restoration. One of association's members, Zümran has turned into a famous local guide[9] for narrating the history of Swiss-cheesemaking in Boğatepe since I met her and other residents of the village in 2009. Zümran is also the co-president of the BÇYD and her house is located right next to the permanent exhibition room of the museum building. According to her version of the story, a Swiss cheesemaker named David Moser travelled across South Caucasus in the late 1890s.[10] Moser, one of many foreign entrepreneurs at the time (there were others coming from Switzerland, Germany, and Russia), also a cheesemaker, is known for constructing and running many dairies in the region[11]. The story goes like this: One day, Moser arrives to an area nearby where the two Boğatepe villages are located today, the marvelous pastures amaze him, which, at the time, were used by animals and farmers of six different Molokan villages

[8] As it will become clear throughout this dissertation, Boğatepe as a place refers to the two villages and their pastures around the village center.

[9] Her visitors shared many short videos of Zümran in 2018 in social media platforms, which attracted the attention of more tourists, gastronomy related journalists and TV shows to her house. See (Öç 2018)

[10] Moser is among the most well known Swiss cheesemakers who lived in Tsarist Russia territories in South Caucasus. He used the horsecars on railroads that Tsarist Russia constructed to deliver supplies to the troops during the long wars of 19th century against Ottoman Empire.

[11] For more on David Moser and Swiss cheesemaking in Kars, see (Badem 2010; 2014; D. Ünsal 2014; Nesipoğlu 2012; Atlagan, Gökmen, and Ryser 2018).

located at lower altitudes. He decides to construct a *zavot* (dairy)[12] in these pasturelands, rents a portion of land from the villagers, buys the milk the villagers get from their cows during the pasture season, and constructs the two-floor building which is located at the center of contemporary Büyük (Big) Boğatepe village, next to the mosque[13]. Zümran reminds the museum visitors that the dairy building they are at was renovated in 2010 for walling in the *Ekomüze Zavot* permanent exhibition room, Boğatepe cultural center, a small grocery store, and a small souvenir shop run by the women of the village.

David Moser's *zavot* was the first and the biggest in the entire Kars Oblast at the time and the pastures located on this region were also named after it. *Zavot* is the old name for Boğatepe that was officially changed in 1936 as part of the Turkification of place names policies in early Republication era. But many still call Boğatepe Zavot. By 1910, there were two dairies in Zavot, which eventually became two permanent villages, each formed around a dairy. Moser kept on producing Swiss cheese until he had to return to Switzerland at the start of the First World War. "Then, after the Independence War, our ancestors came here from Borçalı region in Georgia. There, they used to make the same cheese, so they continued to make *gravyer* in these dairies" concludes Zümran. She does not dig into the details of the years of war, violence, massacres, and exiles between 1914 and 1924, recalled as *kaçkaç zamanları* (runaway times) by local people, until someone asks. Zümran emphasizes the uniqueness of her village as a site of origin for *gravyer* cheesemaking, where immigrant cheesemaker families from the other side of the current Turkish-Georgian and -Armenian borders settled in after the 1920s, and have continued to make *gravyer* ever since.

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[12] *Завод* (*zavod*) is a Russian word that is still used in Kars, Turkey. In Russian, it means factory or workshop. In Kars and many other places inherting Tsarist Russian rule in South Caucasus, dairies are also called *zavot*. While in Georgian and Armenian territories, the Russian word is used for production sites in other sectors, in Kars *zavot* explicitly refers to the dairies.

[13] In the same place with this mosque, there used to be a church before the 1920s. The current minaret of the mosque that needed to be repaired in the 1990s carries the stones from the walls of the second floor of the abandoned Swiss cheese dairy or *gravyer zavotu*.

This chapter focuses on the Boğatepe Gravyer cheese as it emerges from the web of dairy arrangements in the everyday life of agro-pastoralism in rural Kars. In the first part of this chapter, I situate the recent organization of farmers and cheesemakers in Boğatepe to make life better in their village. Because *gravyer* cheese is a trademark of Kars province and specifically of Boğatepe village, its story attracted public attention and funding opportunities coming from different parts of Turkey. In 2010, BÇYD members founded a living museum of local-traditional cheeses, *Ekomüze Zavot* in the village[14]. *Ekomüze Zavot* gathered many stories, artifacts, and documents that belong to the past of cheesemaking in Kars, specifically in Boğatepe. By attending the practices that aimed to compose both the museum archive and *gravyer* cheesemaking as part of my ethnographic research, I investigate the trajectory of *Swiss cheese* and its successor *Boğatepe Gravyeri*. I engage with farmers' acts of remembering *gravyer* cheese not only in the narratives of their movements in the region, but also in material enactments of Boğatepe in the present through dairy farming in high-altitude pastures.

I analyze agro-pastoral worlds in Kars in the early twentieth century through movements of people and animals, and the processes of dispossession and appropriation these movements entailed. I focus on farmer narratives on cheesemaking as "a culture that came with migration" (*"göçle gelen kültür"*) that simultaneously reveals and obscures the violent years of colonialism, wars, exiles, genocides, Turkification and modernization policies of the nation-state in the region. These events affected the processes of appropriation of villages, fields, houses, dairies, temples, and pastures, as well as demarcation of spatial boundaries of pasture-cheesemaking. On the other hand, I investigate specific dairy arrangements for forming the local trademark product, *gravyer* cheese since 2000. I argue that *Boğatepe*

[14] The renovation of the old dairy as the permanent building of the ecomuseum, its permanent exhibition room, its mobile exhibition have been realized between 2010-2014, with the financial support of UNDP MDG, the state local development agency SERKA, and some dairy owners, and with the work by many villagers, activists, researchers, and artists.

Gravyeri emerges from the meshwork of pasture-cheesemaking that entails a reconfiguration of dairy arrangements in the everyday practices of agro-pastoral livelihoods in Boğatepe.

Organizing for a better life in rural Kars

When I was an undergraduate student in economics at Boğaziçi University, I was involved in a student work group that collaborated with the emerging farmers union of Turkey, Çiftçi-Sen.[15] In 2009, as a group of students and academics, we organized a panel in the university where a few farmers explained the ongoing grassroots mobilization among certain farmers in Turkey. I met İlhan Koçulu in this panel, who participated in it as a farmer and cheesemaker from Kars. İlhan has been active in Çiftçi-Sen and other farmer organizing networks in Turkey since its early formation stages. He was the president of BÇYD, which consisted mostly of women in the village worried about village's future, especially of their children who did not want to stay but migrate to other parts of the country. İlhan stressed that association members wished for a better life in rural Kars and to stop emigration and depopulation. They were involved in different projects to make small changes in their everyday lives but definitely not involved in projects that would solely increase the economic revenues of farmers. İlhan emphasized that farmers were concerned with learning new things, establishing new connections to other places, and enjoying life in their communities. He underlined the importance of national and international solidarity against the global food politics that aims to decrease the number of farmers in all countries, to modernize and industrialize food production at the expense of the wisdom of farmers and their life-worlds in everyday sense. According to İlhan local, national and international networks were equally crucial in the farmers' struggle. Like most of the audience, I was impressed by İlhan's talk, his vision, and the grassroots organization in Kars, of which he was one of the leaders. When

[15] *Çiftçi Sendikaları Konfederasyonu* (Çiftçi-Sen, Confederation of Farmer Unions) was founded in 2008, and officially accepted by the Turkish State after years long legal processes. In 2020, Çiftçi-Sen became a union itself by abolishing its member unions and merging all in one large union.

he invited me to his village later in the summer to help them as a translator from French[16], I did not hesitate to go and meet farmers in Kars.

I visited Kars and Boğatepe that summer, in July 2009. I met most of the women İlhan told us about at the university in İstanbul. They were excited about being part of a recently founded association in their village. In 2001, a tragic traffic accident killed more than 20 people who resided in one of the two settlements in Boğatepe area. Many farmers remember this accident today as the event that deepened the depopulation in the village. The only active *gravyer* dairy at the time had to be closed due to the death of the cheese master. The number of cows and sheep had decreased sharply in the village; the small rural dairies that used to be part of many households were shut down. İlhan narrates this accident as an essential turning point for himself. He had lost his brother, who was working as an *usta* (cheesemaster) in the only active *gravyer* dairy of the village. After his brother's loss, İlhan decided to move back to Kars. He had already been trained as a *gravyer ustası* (gravyer cheesemaster) in this dairy until he left the village for studying in the university[17]. The accident marked a tragic event for other villagers as well. "People had been emigrating already, each year some would leave. But the accident all of a sudden became a peak point in this. We were left very few houses; mourning stayed in the air for many years in the village. So many houses were closed…", told Safiye, mother of three sons who resides in one of the old Molokan houses at the center of the village. While intensifying the ongoing depopulation, this accident later became a starting point for the remaining villagers to do something. This chapter, as well as the whole dissertation, is very much inspired by the practices of the

[16] In summer 2009, I accompanied a group of travellers from Belgium and France in Boğatepe and Kars for two weeks. This trip was organized by "solidary tourism" (*tourism solidaire*) association, Tamadi, founded in Nantes, France. İlhan met them in a meeting organized by La Via Campesina in Brussels.

[17] After years of being involved in a leftist revolutionary group of the late 1970s in Turkey, İlhan was taken under custody for many years after the military coup in 1980. Then he worked in İstanbul in different jobs, including marketing local-traditional cheeses from Boğatepe as well as from various parts of Turkey.

Boğatepe villagers to make a change in rural Kars – to generate and live a better life, and to do so with dairy farming and cheesemaking.

The circumstances in which Boğatepe farmers, and an extended network located in Kars, started to organize meetings that were historically shaped by the aftermath of two decades that followed the 12 September 1980 coup in Turkey. Growing works of literature on the transformation of the food regimes (Keyder and Yenal 2011; Keyder 1981; M. Öztürk, Jongerden, and Hilton 2018; Aydın 2010), energy infrastructures (from mines and dams to pipelines and other enclosures of commons (Kurtiç 2019; Erensü 2018; Adaman, Akbulut, and Arsel 2017; Scaramelli 2019); and the armed conflict in the Kurdish region (Gambetti and Jongerden 2015) provide key insights to examine the circumstances in the early 2000s, in Northeastern Turkey. On the one hand, privatization targeted the state-owned enterprises, which also included the food industry that supported farmers by setting a minimum price for their products and ensuring the sale of their harvest to the state monopolies. On the other hand, Turkey's high percentage of rural population was identified as a major drawback for the country's growth. According to the neoclassical economics underlying the new food regime, agricultural production should be carried out 'effectively' with fewer people farming and living in the countryside. These people should instead become laborers in cities, in the growing service industry in Turkey. The transition from a closed and planned economy of the 1960s and 1970s to a neoliberal economy started right after 1980, but the implementation speed and intensity of many policies increased in the 2000s, especially with the uninterrupted AKP rule in the last 20 years. Plans based on the support of the International Monetary Fund Early were put into practice in the early years of the millennium. Growing food imports and the deficits of small farming in Turkey deepened the accelerated rural-urban migration in the country.

In line with the privatization of the state-owned enterprises in Turkey (D. Yenal and Yenal 1993), the government privatized the *Kars Süt Fabrikası* (Kars Milk Factory) owned by the Turkey Dairy Industry Institution and sold it to a private company in 1984. This factory, originally established in 1964 by the *Devlet Planlama Teşkilatı* (State Planning Agency), used to have the largest capacity among the state inventory (Saltık 2003). Due to its vast pastures and substantial amount of dairy animals, Kars province has been listed as a pivotal place for the state to invest in the dairy industry (Üresin 1936; Aras 1954; Kurt 1968; Saltık 2003). Yet the eventual investment in this dairy factory resulted in a big disappointment. The factory never used more than 10% of its capacity. The seasonal fluctuations of the milk supply by peasant farmers did not allow a steady and profitable production all year long. The seasonal increase in the milk yield was connected to agro-pastoralism (*mera hayvancılığı*)[18]; farmers overwhelmingly fed their animals in pastures – either by open-air grazing during the April to October period annually, or grass they mow and stock for the winter. Pasture's summer months provided more milk for the cows, who usually give birth between December and March. Since the cows can't produce the same amount of milk during most of the year (except the last couple of months of pregnancy) without industrial feedstock and other particular biomedical treatments, the industrial dairy factory in Kars did not become an essential center for the milk provision of the agro-pastoral worlds of traditional dairy farming[19].

[18] I translate "*mera hayvancılığı*" into English as "agro-pastoralism" in this dissertation. I use this concept to describe the totality of the everyday practices of taking care of cows, milking, and farming their feedstock in Northeastern Turkey. Pastures and pasturing constitute a crucial part in the everyday life of cows and humans. Movements of animals and people are shaped depending on the distance between pastures and villages. In higher altitudes like Boğatepe, only grains and other plants that cows can consume are cultivated in fields which cover a much smaller area than meadows and pastures where animals feed in open-air during pasture season (April-October) and where particular areas (in a certain rotation) are mowed to provide feedstock during the winter.

[19] Saltık's detailed report on Kars Dairy Factory and its dismantling after the privatization states that the seasonal agro-pastoral movements and the *avans* (credit) system between dairy owners and peasant farmers caused a major problem for this high capacity factory (See Chapter 2 for the *avans* system).

Agro-pastoralism and dairy production in the east of the country was affected by the dismantling of state-owned enterprises and the new national economic policies and the armed conflict between the Turkish Army and Kurdistan Workers' Party after 1984. The intensification of the conflict in the rural areas populated by the Kurdish people led the repressive apparatus of the Turkish state to damage everyday life in villages and pastures palpably. Thousands of Kurdish people were forced to leave their villages, most of which the soldiers burned down to cut the social support of the armed struggle. While "OHAL"[20] became the rule for many provinces, it demarcated different security zones in the rural parts of the region. Scholars have documented that the violence during the 1990s targeted animals in various ways during the conflict (Ortadoğu Tarih Akademisi Kolektifi 2006). Sociologist Ozan Zeybek demonstrates the decrease in the number of cows, sheep, and goats during the 1990s (Zeybek 2020; 2016). Local breeds of these animals have been shrinking in Turkey ever since. Together with the annihilation of animals, reconfiguring agro-pastoral pathways through pasture bans constituted a significant part of counter-insurgency measures of the Turkish state.

Kars province constituted the northern frontier of the armed conflict of the 1990s. The province included many villages of Kurdish people who have different immigration stories that date back to the 19th century or before[21]. In 1992, the Turkish state decided to divide Kars province into three separate provinces: Kars, Ardahan, and Iğdır. The administrative reordering of provinces located in Eastern and Southeastern Turkey throughout 1990s continued in tandem with the armed conflict and institutionalization of counter-insurgency measures by the Turkish army. In Kars, the formation of post-Soviet nation-states (Georgia, Azerbaijan, and Armenia) has also been an significant factor for the Turkish state to reorder

[20] "Extraordinary state rule of emergency" or *sıkıyönetim* became the rule in the 1990s in more 10 provinces in Southeastern Turkey. The implementation lasted until 2002. Similar decrees have been implemented since 2015, pasture-bans continue to accompany the armed conflict that have been more urbanized in the last decade.

[21] See also (Alakom 2009)

its Northeastern frontiers in governmental terms. Iğdır was mostly confined to the plains and northern half of the Ararat Mountain. The Turkish army had banned the access of farmers and their herds to the foothills of Ararat, which have always been crucial for pasturing animals (primarily cows, sheep, and goats) who live in the plain during the cold winter months. Ardahan is in north of Kars, neighboring the Northeastern Black-Sea province Artvin and Georgian border with Samtskhe-Javaheti (including Akhaltsikhe and Ninotsminda provinces) region of Georgia. All three provinces have witnessed various implementations of security zones since 1992. Seasonal agro-pastoral movements between villages and pastures have been reconfigured if not rendered impossible.

Asking for a better life in Boğatepe village then has to be understood along with the transformations of everyday life in Northeastern Turkey. Both the armed conflict and the neoliberal policies undermined the existing forms of agro-pastoralism in Turkey's predominantly Kurdish populated Eastern and Southeastern provinces. The high rates of depopulation (Khalaf 2019) and persistence of agro-pastoralism in its reconfigured forms and movements in the late 20th century marginalized the villages where dairy farming and cheesemaking have been a major craft for centuries. Social scientists studying food regimes and alternative networks of "local food" have highlighted that being left outside the capitalization of agricultural relations can become a trait favored by the emerging networks (Fonte 2008; Grasseni 2009). Maria Fonte argues that the persistence of traditional agricultural production in remote locations that limit industrialization enabled the formation of "local food" networks to be easier in these places where food traditions have been relatively less affected (Fonte 2008). Kars cheeses have also been an indispensable food product in Turkey's emerging consumer cooperatives and local food networks. Sociologists Zafer Yenal and Derya Nizam (2020), who study the re-invention of local wheat varieties and seed politics in Turkey, call these networks part of "silent activism" in the 2000s. The peasant

farmer mobilization, urban consumer initiatives, and various municipal or NGO-led projects established numerous networks of "local food" in the country (Özatağan and Karakaya Ayalp 2021; Atalan-Helicke and Abiral 2021; Atalan-Helicke 2018). Therefore, the farmer-organization in Kars, the networks between small farmers, scientists, state officials, development experts, and activists have been crucial in the localization[22] of *Boğatepe Gravyeri* and its underlying institutional and agro-pastoral relations in the 2010s.

Ekomüze Zavot: A living museum of local-traditional cheeses

Since the early 2000s, farmers, activists, development officials, and scientists across a dozen of villages in Kars have been forming a particular network of collaboration and solidarity. This group is interested in some common problems of sustaining rural livelihoods in villages, such as small farmers's access to locally adapted seeds, breeds of animals and safe and healthy veterinary practices. An environmentalist initiative focused on protecting biodiversity, wildlife, and its relationship to the existing agro-pastoralism. Before BÇYD was officially founded in 2007, Boğatepe farmers were in touch with a group of veterinarians, ecologists, and activists who aimed to implement several projects in a web of ten villages in Kars. Relying on vast pastures to feed their (mainly dairy) animals[23], historically famous for its commercial cheesemaking, small farmers of Boğatepe became interested in re-arranging practices of dairy farming in their village. Women constitute the majority of the association members. As the primary caretakers of the animals and the milk artisans, their involvement in the association is motivated both by increasing the value of their pasture-milk production, and by reaching out new people and aspiring for a more vibrant social life in the village.

[22] I draw on the recent literature on reinvention, which suggests that each such (re-)localization entails a reinvention of locality and food simultaneously – or a reinvention of *terroir* (Grasseni 2011; Grasseni et al. 2014)

[23] While all farmers have cows, other animals that live off the pastures include sheep, horses, donkeys, dogs, chicken, and geese.

When I visited Kars for the first time in 2009, Ilhan explained that the farmers organized in the village association wanted to repair the old, abandoned dairy building of the village to use it as a cultural center. "Wouldn't it be nice if we made it into a museum?" he added with clearly devised plans for future. In the following five years, the villagers cleaned gradually cleaned this old dairy building, then renovated and turned it into an 'ecomuseum.' The basement level that used to be the *badval*s (cold and hot aging rooms) of the dairy was reorganized as the permanent exhibition of the museum that exhibits migration stories of the cheesemaker families who arrived at Kars in the early 20th century and documentation of the local fauna and flora that are considered crucial for the taste of local cheeses. Kamil, whose house is next to the old dairy building, told me that when the dairy was abandoned in the 1970s, this basement level gradually became a shed for stray animals until the renovation started in 2010. It was also used as a dumping site, occupied by waste and weedy herbs. However, the villagers continued to use the upper floor of the museum building even after the dairy stopped producing cheese. Salman Emmi, for instance, who passed away in 2015, used to run a small grocery store on the side facing the village mosque. The spacious room behind its store, which used to be the production site with three large cauldrons when the dairy was active, was almost demolished. The ecomuseum project included the renovation of this room that was going to be called "the cultural center." Many villagers explained to me that they were interested in forming a commonplace in the village for farmers' use. They were very excited about renovating this room – perhaps even more than the basement/permanent exhibition level – mainly because this place would enable them to gather farmers from villages within the vicinity of Boğatepe. These gatherings were planned to be meetings for discussing political or dairy farming related issues but also organizing workshops, hosting people for wedding celebrations or funeral ceremonies, and other social activities.

Villagers quickly embraced the project of turning the abandoned dairy into an ecomuseum that would allow them to use the upper floor for social events, as well as to unite with other farmers and cheesemakers who are also invested in reorganizing practices of animal husbandry for cheesemaking as a way to sustain their livelihood in rural Kars. In the meantime, BÇYD prepared development projects for the United Nations Development Program (UNDP) and Serhad Kalkınma Ajansı (SERKA, Regional State Development Agency) to fund their new initiative. For the UNDP, the Cheese Ecomuseum was a development project that would allow Turkey to follow European examples of cheesemaking centers where local craftsmanship is the source of all economic activities. For SERKA, it was an opportunity to develop the local cheese production that has always been crucial for rural livelihood in Kars and make it a new tourism strategy for the region. Hence local cheese turned into a crucial tool for development projects when it emerged as an interface for farmers to sustain their livelihoods to be able to stay in Kars.

Ekomüze Zavot was designed as a farmer-run institution that supports artisanal[24] cheesemaking in Boğatepe, its neighboring villages, and beyond. Association members promoted the making of cheese varieties that have not been produced in recent years due to the changes in the dairy life of agro-pastoralism in Northeastern Turkey. In 2015, BÇYD became a partner in the European Union-funded research project of Ardahan University on farmstead cheese. This research project identified 32 local varieties of traditional cheeses (Koçulu and Aras 2016). Since then, the ecomuseum projects contributed various ways for re-making six different varieties[25]. Many festivals, workshops, visits, and audiovisual materials on different cheeses of the region have been organized in Kars, Ardahan, and Iğdır.

[24] "Artisanal" and "local-traditional" are used interchangeably in this dissertation. See (Nizam and Tatari 2018) for the underlying discussion on Turkish-English translation.

[25] Some of these varieties include: *gravyer*, *kaşar*, *Malakan*, *Türkmen çeçil*/*tel*, *çanak*, *motal*, *tuluk*, *karın yağlı peyniri*. More cheeses have recently emerged in the "heritage arena" of Turkey (Grasseni 2016).

Gravyer cheese, the most important source of revenue for the village, was always primarily a commercial cheese. Much different than other cheeses farmers make in their houses and small dairies, *gravyer* requires large quantities of milk to be collected from cows (and farmers) and crafted in a fairly large, well-organized dairy with talented workers, apprentices, and masters. The patterns of milk collection that provide at least 4000 liters of milk every day, are embedded in agro-pastoral life in Northeastern Anatolia and South Caucasus. As it will become clear later in this chapter, making *gravyer* involves a particular technique and infrastructure of agro-pastoralism (*mera hayvancılığı*), which I call pasture-cheesemaking (*mera peynirciliği*[26]) that materializes dairy arrangements as a spatial web of milk flow from pastures to dairies. Commercialization of dairy farming in Kars involves predominantly *gravyer* and *kaşar* cheeses along with *tereyağ* (butter) and *sarıyağ* (ghee) – other traditional cheeses are confined to the local marketplaces (*peynirciler çarşısı*) and networks of acquitances[27] (family, neighbors, friends…). Since *gravyer* is not produced elsewhere in Turkey, it stands out as a famous and intriguing cheese to food consumers. That being the case, a cheeseshop owner in Kars once told me: *Gravyer bu işin vitrinidir* (*Gravyer* is the display in this business).

The Swiss cheese as a Kars tradition in Turkey

In the permanent exhibition room of the Ekomüze Zavot, stories of the families known to be Swiss cheese masters and commercial cheesemakers in Boğatepe village are depicted on the information boards. The description of cheese as a "culture that came with migration" ("*göçle gelen kültür*") became the catchphrase for narrativizng cheese in *Ekomüze Zavot*. In my subsequent visits to the village between 2009 and 2013, I heard İlhan, Zümran,

[26] Pasture-cheesemaking or *mera peynirciliği* explicitely refers to the cheesemaking that rely on agro-pastoralism (*mera hayvancılığına dayalı peynircilik*).
[27] Local-traditional cheeses like *taze peynir*, *çakmak*, *yağlı* and *yağsız çeçil*, *motal*, *tuluk*... have been part of informal dairy trade and networks of consumption.

Safiye, and other villagers describing Gravyer cheesemaking by using this expression to different audiences. When İlhan first told me that "cheese carries culture, gravyer cheese for instance, it is a culture that came here with migration" (*peynir kültürel bir taşıyıcıdır, yani nasıl desem, gravyer peyniri mesela buraya göçle gelen bir kültürdür*) in 2009, I thought that he referred to the farmers' stories of parents and grandparents who migrated to Kars from South Caucasian territories of Tsarist Russia in the late 1920s like the ones who brought cheesemaking knowledge and practice to Kars. However, for İlhan, and other farmers I spend time with in the village, the expression referred to much more than I initially thought. Yet, this misunderstanding of mine was also at the heart of state institutions' funding decisions of the ecomuseum project. Let me explain how different layers of meaning are embedded in İlhan's particular statement I quoted above.

Cheesemaking as "a culture that came with migration" appealed to the officers from SERKA because it was understood in line with the official historiography of the region by the Turkish state. According to the official historical narrative, Turkish migrants from Southern Caucasus who came to the 'motherland' in the 1920s brought their cheesemaking culture that was a crucial aspect of their national identity. Cheese has already been investigated as a regional product that expresses national belonging and identity (Boisard 2003). SERKA officials approved funding of an oral history research project of BÇYD since the story of cheesemaking that came with migration would provide an engaging story of Turkish Kars for tourists. It would contribute to the region's tourism potential since the narratives of villagers were going to be part of the first "ecomuseum" of the country.

For villagers, this narrative emphasizes the migrating populations coming into Kars contrary to the groups who migrated out, one of the provinces with highest out-migration rates in Turkey especially after 1980 (Khalaf 2019, 247). When I asked BÇYD members why they wanted to have a cheese ecomuseum in the village, their answers always included a

concern about the ongoing emigration of the youth. One critical aim of this project, for them, was to stop the emigration from Kars, from the villages where the young population doesn't want to stay. Most of the time, they cannot stay because they have to go to the city to work. By emphasizing that their grandparents migrated to Kars and that they established a new life based on dairy farming and cheesemaking, the association members depicted Kars as a place of immigration rather than out-migration, i.e. emigration. They suggested that a living museum of cheese could help them forge new relationships between different villagers, organizing to promote local cheesemaking not only to become economically sufficient but also to inhabit a place they wouldn't have to leave.

When I took part in an oral history research project on Kars cheesemaking with BÇYD members[28], they were interested in finding out how and when cheesemaker families learned this craft. They had already listened to many stories from the elderly villagers about the violent years of the 1910s and 1920s. The exhibitions of the museum and its living character involved composing an archive of Kars cheesemaking where diverse tools used in the dairies, and objects like account records, pictures, letters collected from different people accompany several life stories and migration narratives. This composition also includes the practices of making traditional cheeses in various houses and dairies, as well as conducting research, holding workshops or other events to promote animal husbandry (*hayvancılık*), dairy farming (*sütçülük*), cheesemaking (*peynircilik*), and a vibrant social life in the village. These practices constitute what the composed archive enacts in the present.

During the oral history interviews in 2013 and 2014, I noticed that the people migrating to the region mentioned in the interviewees' accounts also included Swiss

[28] The oral history interviews and archival research that were coordinated by BÇYD and funded by Serhat Development Agency, led to the formation of a mobile exhibition on history of commercial cheesemaking in Kars (displayed in İstanbul, Kars and Tbilisi in 5 years). See the book that resulted from this project (Torun 2014).

cheesemakers arriving Russian territories in South Caucasus after the 1850s. BÇYD members, as well as the villagers we interviewed during the project, all emphasized that Gravyer cheese was a particular kind of craft their parents and/or grandparents learned from Swiss, German or Russian settler-colonizers in Borçalı region, located around the contemporary Georgian-Armenian borderlands.

Throughout the 19th century, the peoples of the South Caucasus struggled with the long-lasting wars between Tsarist Russia, the Ottoman Empire, and the Persian Empire, whose shifting imperial borders paved the way for the nation-state borders that were established later in the 1920s. Most of the local population was forced to fight during this century, if not massacred or forced to migrate. Settler-colonialism in the 19th century South Caucasus was shaped by Tsarist Russia which exiled many heterodox communities like Molokans, Dukhobors, and Circassians to the newly conquered borderlands and this situation provided incentives to the businesses that were owned by Russian, German, and Swiss entrepreneurs and merchants who occasionally established partnerships with important local farming families[29]. The latter enterprises, like the Swiss cheese dairies, became crucial both for the new order that the settlers desired to implement in the Russian Empire and for the livelihoods of local peoples.

Dairy farming, and more specifically, the organization of animal husbandry practices for cheesemaking in pastures and private farms -which I call *dairy arrangements*- constituted an essential portion of the settler-colonial projects throughout the Caucasus region.[30] Several German Colonies were founded in the early 1800s, and later Swiss colonizers started to form their settlements in these territories that were administratively reorganized by Russian

[29] (Badem 2010) See (Breyfogle 2005) for the Russian settler-colonialism in the South Caucasus, in the 19th and early 20th century. See also (Aytekin 2008; 2006; 2022) for an overview of the discussion on *çiftlik* (farm) and peasantry in the late Ottoman Empire.

[30] For detailed descriptions of the dairy arrangements of Swiss entrepreneurs and commercial cheesemaking in Kars, see (Badem 2010; Üresin 1936; Aras 1954; D. Ünsal 2014; Tatari 2018a; Badem 2014).

imperial politics. These new settlements, together with older rural and urban centers of the region, included a diversity of ethnic and religious communities that were resettled according to Russian Empire demographic politics. Malakans and Dukhobors, who have permanently been exiled to the newly obtained territories by the Russian authorities, became the prominent heterodox Christians in South Caucasus (Breyfogle 2005). Orthodox Greeks and Armenians, who constituted most of the local Christian communities, were resettled by the Russian authorities, especially in areas where there used to be an Ottoman and Muslim presence (Badem 2010; 2014).

The frontier province of Kars was a battleground between the Russian and Ottoman Empires throughout the 19th century until 1878, when almost 40 years of uninterrupted Russian rule was established[31]. Greek and Armenian inhabitants of Kars outnumbered the city's Muslim population by then. Russian, German, and Swiss colonizers established settlements in the province during these years. During the First World War, Kars was again a major front between the Russian and Ottoman armies. When the Armenian Genocide took place in 1915 in Ottoman territories, the city was still under Russian rule. It eventually became a refuge for many Armenians and other non-Muslim peoples who managed to flee the ongoing massacres at the time. However, especially after the Bolshevik Revolution in 1917, the Russian army left the city. Clashes between local Armenian and Turkish armed forces lasted for many years. The Ottoman-Russian borders in this part of the world after the 18th century had formed patterns of border-making and spatial boundaries between various communities. In addition to the changing power dynamic for controlling people's movements in the region, pathways of agro-pastoral communities and livelihoods were also reconfigured by armed conflicts. By 1921, the Ankara Government of the Turkish

[31] Throughout long decades of war, millions of refugees from both sides have migrated within and located by both Empires; see also (Kasaba 1988; 2009a; Tejel and Öztan 2022) for similar patterns of relocation and their effects in the late Ottoman territories.

Independence Movement and the Soviet Socialist Republic of Russia agreed on a state border demarcation in Northeastern Anatolia, where many communities had already been displaced if not annihilated[32]. According to the agreement, the Muslim population on the Russian side and the non-Muslim population on the Turkish side of the border were allowed to cross-migrate the borders and settle. While the states on both sides of the border guaranteed land entitlements for the incoming migrants, crossing the border usually was a deadly journey between 1921 and 1930, as was the case before. Yet for many Muslims (Terekeme, Kurd, or Circassian) in Soviet Georgia and Armenia, and for most non-Muslims, Jews or Christians - Greeks, Armenians or Malakans- in Turkey, sustaining life in their *yurt*s place had become unendurable and deadly. People in Kars call these years "*kaç kaç zamanı* (time of runaways)". While an overwhelming majority of the non-Muslim population left Kars in these years, the majority of the Kars population consisted of resettled Muslims: Turkic (Terekeme, Ahıska, or Azeri) communities from South Caucasus, Kurdish communities from South Caucasus, and further southern parts of Armenia, Azerbajcan, Iran, and Southeast Anatolia.[33] The newly arrived communities settled in the villages abandoned by the previous Swiss, Russian, Armenian and Greek inhabitants. As I learned in my conversations with different farmers in rural Kars and from the archival research on the early Turkish Republic relocation politics[34], families that crossed the borders searched for an appropriate village to settle in, and their occupied lands became subject to private property in the course of a dozen years.

[32] After the years of dispersed armed conflict between 1917 and 1921, and a very short lived socialist republic, many abandoned settlements in Kars became refuge for many agro-pastoralist communities, which arrived and occupied villages and pastures.

[33] For more on the Eastern borders of the Ottoman Empire, see also (Cora, Derderian, and Sipahi 2016; Kasaba 1988; Ateş 2013; Kasaba 2009b; Bruinessen 1992).

[34] More details on the experiences of particular families and communities in Kars and the relocation politics of the Turkish state can be found in (Badem 2014; Yazıcı 2014; Jongerden 2009; 2007; Balistreri 2022)

Terekeme families from different villages of the Borçalı region (located in the mountainous plateaus in the southeast Tbilisi and Northwest Gyumri), who used to be either a partner of the Swiss cheese dairies (*zavot*s) or dairy farmers selling milk to the *zavot* in their pastures, settled in Swiss cheesemaking centers like Zavot (Boğatepe), Vladikars (Kümbetli), Dikme, Nebiyurdu, and Harziyan. These *Terekeme* immigrant families started to produce Swiss cheese (or *gravyer*) in the dairies (*zavot*s) they found abandoned in these villages and pastures. As they were familiar with the complicated production and sale processes of this commercial variety, milk and Swiss cheese trade have become a major revenue for many *Terekeme* peasant family farmers. When farmers (more than 65 years old) remembered their parents' life, their descriptions of the *gravyer* cheesemaking in the past explores the underpinnings of the narrative of "culture that came with migration" I introduced above. The stories of immigration and working in dairy arrangements of *gravyer* cheese have been constitutive of the contemporary *gravyer* cheese as a traditional craft and historical trademark of Kars.

Remembering migration, appropriation and *terroir of gravyer*

The narrative of "culture that came with migration" offers a particular account of the past that expresses what it simultaneously aims to hide. In line with the public performance of a singular identity of imagined Turkishness of the migrants who came to the newly founded Turkish state after the independence war, remembering Swiss cheese in Kars was shaped by the silence about the alternative histories that are supposed to be hidden from the public sphere. Since 2000 there has been a proliferation of memory studies in Turkey, especially on how 'alternative histories' omitted from national historiography are constitutive in the formation of fractured subjectivities (Neyzi 2010; Darici 2011; Neyzi and Darıcı 2015; Navaro-Yashin 2012; Navaro et al. 2021; Velioğlu 2021; Sağlam 2020; 2022). Leyla Neyzi, a pioneer oral historian in Turkey, argues that people whose memories don't fit in the singular

identity of being Turkish "remember to forget" their past of being excluded (2002). She argues that the fear of being treated as an outsider in their society makes people reluctant to face their past (2002,147). Through her analysis of Fatma Arig, a Sabbatean[35] woman who agreed to share her life history, Neyzi highlights the contradictory narrative of Arig, who challenges her family's accounts of denial of their past to align with the Turkish state historiography, and simultaneously positions Sabbatean heritage in the past to demonstrate that her own identity was shaped by being Turkish rather than being a member of the remaining Sabbatean community in Turkey.[36] Hence, Neyzi's conceptualization of "remembering to forget" denotes a form of remembering that does not deny the 'inappropriate' past but a particular state of recollection that fixates certain events in time so that the present will not be affected by remembering (to forget) it.

When I interviewed farmers in Kars and listened to their migration stories, I came upon narratives on how particular lands, pastures, dairies, and dairy equipment were acquired by their immigrant parents or grandparents. The state's redistribution of the abandoned land is evident in state archives. Still, significant private family farm owners described the settlement of their families not only as if they bought the land from its previous owners but also as if they completely reconstructed everything on the land they settled. (It is worth noting that these were the biggest *gravyer* dairies in the region between the 1930s and 1970s.) In Boğatepe, farmers told that their families happened on abandoned dairies when

[35] "Sabbateanism, known in Turkish as dönme ("convert") or Selanikli ("being from Salonica"), refers to the followers of Sabbatai Sevi, a Jewish rabbi from Izmir (Smyrna) who declared himself the messiah in the seventeenth century, initiating a messianic movement that divided the Jewish community. The forced conversion of Sevi to Islam under Ottoman rule resulted in the emergence of a double identity based on dissimulation. Of Jewish origin, Sevi's followers maintained a Muslim identity in public and a Sabbatean identity in private in their base in Salonica. Descendants of the Sabbatean community of Ottoman Salonica now live mostly in Turkey, in the city of Istanbul. Officially Muslim Turkish citizens, they have been ardent supporters of the Turkish modernity project. Yet the question of origins continues to rankle, even as the community has largely assimilated" (Neyzi 2002, 137).

[36] This apparent contradiction is also in line with the recent analyses of "nostalgia" towards Ottoman multiethnic and multireligious everyday life in contemporary Turkey – see (Özyürek 2006; 2007) for discussions of 'imperialist nostalgia' in Turkish context.

they settled in the villages and pastures the state allocated them. As part of this narrative, my interviewees referred to the heterodox Russians (Malakans and Dukhobors) or Swiss settlers as the previous owners of pastures their families occupied after the 1920s. Such descriptions are key components of the official narrative of the making of the Turkish State in Kars where the Armenian and Greek remnants from the past are publicly repressed; rendered invisible, if not eradicated. Yet cheesemaking contains the material traces of the past in various ways: abandoned built environments of *zavot*s (dairies) and equipment, the know-how of women in the households and the masteries of cheese producers active in the commercial markets, techniques inherited from earlier generations, and patterns of dairy arrangements in everyday life of agro-pastoralism. The deliberate effort to 'remember to forget' non-Muslim communities (predominantly Armenian and Greek inhabitants and owners of the land, pastures, houses, and dairies) haunts the formation of the *Ekomüze Zavot* archives and practices in distinct ways. I engage with such ethnographic material in Interlude 1 that follows this chapter.

This selective narrative of farmers on the history of *gravyer* cheese, while concealing the dispossession of the non-Muslim communities, also describes the material conditions of survival for the new immigrants who arrived Kars area in the early 20th century. They reveal the Terekeme families' particular understanding of what a 'place' is -based on the principle of 'continuity' from South Caucasus to Kars. This continuity is understood in terms of climate, altitude, grass and flowers, animals, and built environment, which are similar across a region divided by territorial state borders. The continuity also denotes know-how about Swiss cheesemaking which was shaped during the social interactions between settler-colonizers and local communities. The homeland that farmers "imagined" (B. R. O. Anderson 2006) was part of the same territories in Kars, not in terms of nation-state borders but with respect to the cultural characteristics of dairy products like *gravyer* cheesemaking.

Hence, intriguingly, the 1920s migration waves were conceived as sensual movements within the *terroir* of Gravyer cheese[37] that associated dairy farming and agro-pastoralism (*mera hayvancılığı*) practices with commercial dairy production in South Caucasus and Kars, Turkey.

Terroir is a French word commonly translated to English as 'taste of a place' (Trubek 2008). It offers a perspective for understanding food as a produced entity that emerges from local conditions, environmental and cultural. Many scholars discussed this notable term thinking with the certification mechanisms of local food (Trubek 2008; West and Domingos 2012; Besky 2014a; Bowen and Zapata 2009; Paxson 2010; Grasseni et al. 2014; Bowen 2010; Guthman 2007; Grasseni 2011). Proliferating discourses on "local food" in the last twenty years have led many scholars to interrogate and discuss the conceptual and material relations between food, tradition, invention and place (Grasseni et al. 2014; Hetherington 2013; Fonte 2008; Besky 2014b; Nizam 2019; Nizam and Yenal 2020; Nizam and Tatari 2020). Harry West (2022) recently researched the underpinnings of the *terroir* perspective of linking more-than-human worlds of food to particular places. West argues that *terroir* is "a product reflecting the natural and social environments into which it has expanded and in which it is (re)produced" (2022, 2). He challenges the widespread understandings of *terroir* as belonging to a demarcated (almost isolated or static) place; he suggests conceptualizing *terroir* as a "moveable feast"; emerging from the movements that make (and transform) places, memories, and traditions. As briefly discussed by West, the narratives built around *gravyer* cheese (and the particular ways in which it has been marketed) in Kars and Turkey reveal intriguing stories that help us to conceptualize its *terroir* and place it as a site of localization for Swiss cheese – a *terroir* that emerges from the movement of another one, a

[37] Harry West conceptualizes "terroir" in its movement (West 2022). I am inspired by his work to suggest in this dissertation that Boğatepe Gravyeri also reveals the sensual movements that underlie the historical patterns of human and animal movements in a particular place.

re-placement. In the next section, I will describe how movements of people and animals reconfigured pastures and villages in rural Kars in the early 1900s – while the Swiss cheese as a settler-colonial dairy craft appeared in the first years of the century, it became a commercial trademark of Kars in the 1920s, the northeastern border province of Turkish state with extensive pastures and high amount of cows and milk. This reconfiguration, which may also be called "placing" Swiss cheese, consists of particular dairy arrangements in everyday life that assemble pastures, cows, farmers, milk, and cheesemakers. Then in the last section, as I focus on the recommence of *gravyer* cheesemaking in Boğatepe village after 2000 (almost a century later), I will revisit the movement of Swiss cheese and its *terroir* in Kars.

The dairy arrangements of *gravyer* in Kars

Swiss cheese's arrival caused a reconfiguration of dairy farming and commercial cheesemaking in the South Caucasus. Swiss cheese is produced in a dairy (*zavot*) through a web of material relations between pastures, farmers, animals, and milk which I call *dairy arrangements*. Swiss cheesemaking requires a particular infrastructuring of dairy arrangements (Tatari forthcoming). Since one Swiss cheese wheel requires around one thousand liters of milk, the dairies in question here attracted a significant portion of the milk produced in the region. Everyday life of agro-pastoralism in Kars and South Caucasus is shaped by transhumance between winter settlements *köy* (village) and summer pastures (*yayla*). Milk is abundantly available since dairy animals (including cows, buffaloes, sheep and goats) graze on pastures from mid-April until late September or October.

Kars province is located in between the Taurus Mountains of Northeastern Anatolia and the South Caucasus Mountains. Its plateaus are composed of pastures, grazing lands for herbivore animals, including 'domesticated' ones that are part of the dairy arrangements, abundant with nutritional grass and flowers for cows, buffaloes, sheep, goats, horses, and

donkeys. The seasonal movements of peasants with animals and modes of sheltering follow particular patterns between different altitudes. These patterns can vary, be ruptured or be in flux, yet they resemble the prominent patterns in the "Mediterranean" (Braudel 2012; Kasaba 1988; 2009b; Horden and Purcell 2000; Tabak 2008; Pehlivan 2020; Gratien 2022; Dolbee 2022). They move back and forth between plains and mountains. In Kars, villages and pastures are located at relatively high altitudes - above 1700 meters. On the other hand, pastures have been crucial in sustaining agro-pastoralism since they are usually situated at higher altitudes - around 2000-2600 meters. Peasants have relied on feeding dairy animals in pastures during the spring and summer when the weather allows humans and nonhuman animals to move and graze. The seasonal movements are accompanied by a milk production cycle throughout the year. When the animals are kept inside the sheds from fall until spring, they give much less milk; they calve and feed their offspring. Milk production in pastures not only provides a significant food stock of peasant diet throughout the year in various forms of dairy products but also involves commerce as a potential source of revenue or exchange for the dairy farmers.

The increasing relations with large cities in the Russian Empire, some of which were also newly constructed in the South Caucasus, made longer distances of trade possible in the late 19th century.[38] The commercial batch of goods traded included dairy products, in which Swiss cheese, together with butter and ghee consisted of the largest share. Hence the milk production in pastures was the crucial starting point for Swiss cheese, which became an important commercial product by the early 20th century. Candan Badem, a renowned historian of the region, suggests that the first wave of Swiss cheese dairies in Kars started in pastures where settler-colonizers made various agreements with local people and authorities (Badem 2014). His research shows that many court records dating back to the 1900s include

[38] Katherinafeld, Alexandropol and Tsalka can be cited among these settlements that have enlarged in the late 1800s and early 1900s.

cases of legal disputes between the peasants and entrepreneurs who wanted to rent pastures, buy milk from peasants, bring their dairy herds, and new construct dairies (2014, 59). German historian Gisela Tschudin states that there were 73 registered dairies in total in South Caucasus by 1910 (Tschudin 1990, 154), before the First World War started in the Transcaucasian fronts of the Russian Empire. According to Ali Aras who wrote about the dairy production activities in Kars as part of his extensive study published in 1954, there existed 32 dairies in Kars Oblast before the 1917 Bolshevik Revolution (Aras 1954, 152). The detailed maps included in the appendices of this study reveal that 19 of these dairies were located within the administrative borders Kars and Ardahan as of today.

Varieties of Swiss cheeses entered the diet of a small minority in the region. At the same time, an overwhelming majority of the population got involved in this craftsmanship as milk producers, dairy workers or *peynir ustaları* (cheese masters). Badem's research in Russian, Turkish, and Armenian state archives reveals that Swiss cheesemaking economy consisted of diverse dairy owners in Kars. These records indicate that in the Russian Military Administration compiled a list of the big dairies in Kars Oblast in 1910 (2014, 56). This document includes the owners' names, locations of the dairies, and breeds of animals that produced milk for these facilities. The names listed – all written in Russian – verify that people who owned the largest dairies in Kars spoke different languages, including Armenian, Russian, German and Turkish/Azeri. Breeds of cows were classified as "local" or "crossbreed" for most of the dairies. In five out of 24 dairies on the list, Malakan, Dukhobor, Swiss, and Simmental were the names given to respective groups of cow breeds. Almost half of the dairies in the list were either owned by heterodox Christians in exile (Malakans or Doukhobors) or local families. Many of these businesses were forms of partnership between settlers and locals, and a few dairies were owned explicitly by the Russian, German or Swiss colonizers. These Swiss cheese dairies were designed to collect and process large quantities

of milk produced in the pastures – *yayla*s and *mera*s.[39] The cheese production operations started in the pasture-dairies turned into an effective means for supplying goods to the markets of expanding urban areas and colonial settlements in the region, which included Alexandershilf, Tbilisi, Katharinenfeld, Elisabethpol, and Yerevan. Bigger and distant markets like Moscow and Istanbul were also part of this commercial network.

Dairy and farm construction projects were crucial for the transformation of cheese making in pastures and the Russian Empire countryside's modernization (Badem 2014, 64). The organization of dairy production by the settler-colonizers made the seasonal practice of grazing in pastures economically profitable, and paved the way for the later dairy arrangements be formed between 1914 and 1921, throughout the wars, genocides, skirmishes and forced displacements that caused a violent rupture in rural livelihoods and worlds of dairy farming in South Caucasus and Eastern Anatolia. The movement of people across the borders, settlements in different villages, and patterns of agro-pastoralism connecting pastures and villages created new dairy arrangements in the northeastern borderlands of the Turkish Republic[40].

During the early years of the Republican, state officials conducted a series of studies on agro-pastoralism and commercial diary production (*sütçülük*, *süt mamüleciliği*) in Kars. Ekrem Rüştü Üresin, a veterinarian based in Ankara Yüksek Ziraat Enstitüsü, prepared a detailed report on Kars focusing on his findings during his visit to the province in 1931 as part of a Ministry of Agriculture assignment. In 1954, Ali Aras, another veterinarian in Ankara, published a study titled, *Kars Süt Mamüleciliğinin Ekonomik Yapısı* (Economic Structures of Kars Dairy Production Firms). These two manuscripts provide detailed

[39] Both words are translated as "pastures" in this dissertation, see also Introduction for a larger discussion on this choice.

[40] The existing movements of agro-pastoralism have been limited with new borders, and Swiss cheesemaking continued its trajectory that differed on different sides of the borders – see also Interlude 1.

portrayals of dairy production and agro-pastoralism in Kars. Both of them define the existing dairy production units in Kars back then under the categories of peasant production or commercial diaries (*zavot*)[41]. While peasant production was common in all villages, its percentage of the dairy products (mostly butter/ghee and cheese) sold in the markets amounts to a small portion. Üresin and Aras' studies (Üresin 1936; Aras 1954) highlight the high number of dairy animals, especially cows, and extensive grazing pastures of Kars compared to the rest of the country. These figures were at their peak point throughout the first four decades of the Republic until the 1980s[42]. This situation made Kars an important economic region for further investment and encouraged the expansion of dairy production in the state rural development policies. As both studies describe with a 20 years interval, the particular modes of production utilized in a typical *zavot* (dairy) incorporated more advanced techniques and technologies than widespread peasant dairy production in other parts of the country. Yet they were not as efficient, technologically advanced, and hygienic as industrial factories. Both studies highlight that the need for the foundation of an industrial dairy factory supplied with steadily produced, standard quality milk in Kars since it was the most prominent province in Turkey with respect to dairy production. Due to the ample volume of milk supply and significant commercial production in *zavot*s, Kars was in a distinctively advantageous position comparing with other provinces. However, the existing agro-pastoral practices were identified as significant obstacles for the establishment of a modern dairy industry (Aras 1954). Peasants moved to the pastures (*yayla*s) with their dairy herds for at least five months each year (roughly between May and October). Yet these movements complicated the data keeping practices for the state officials, and a considerable amount of

[41] Aras (1954) indicates the third category as the industrial production, which consisted of one milk powder factory that was founded in 1934 thanks to a joint investment of Swiss and Turkish states.

[42] Kars province cow milk production rose from 66.000 tons in 1937 (T.C. Ziraat Vekaleti 1938, 29), to 190.339 tons in 1948 (Aras 1954, 165), to163.000 ton in 1969 (Öztek 1983, 1), to 272.800 ton in 1978 (Gelegen 2017, 51). All these sources state that Kars is the province with the highest milk production in the country.

the dairy production was seasonally confined to the pastures are located in remote mountainous areas, where most of the abandoned Swiss-cheese dairies were located.

Both Üresin and Aras clearly state that the forms of agro-pastoralism and practices of animal husbandry play foundational role for the establishment and sustainability of commercial cheesemaking. Aras provides a list of important *yetiştirici*s (breeders) in the province (Aras 1954, 143) which evidently show that almost all the breeders were also the owners of the *gravyer* dairies. According to Aras, these breeders owned more cows than an average peasant family, and more importantly, their cows were considered better dairy breeds (1954, 141). Furthermore, Malakon or Dukhobor cows, the particular breeds enlisted by the Russian authorities in 1910, are not included Aras' records. Together with the locally adapted generations of the Simmental and Brown Swiss cows, which are called *Montofon inekleri* in Turkey, *Zavot* cows are considered to be one of the most important kinds of dairy breeds. These cows were descendants of the selective breeding held between Grey Swiss breeds and the local ones such as Eastern Anatolian Red. As the name suggests, the milk produced from this breed is considered the best for dairy production, especially for Swiss cheesemaking. The selective breeding process is estimated to have started in the early 20th century in the pastures. In addition to the abandoned Zavot cows in rural Kars during *kaçkaç zamanı* (time of runaway), some of the Terekeme immigrants managed to bring their herds when they immigrated to Kars, too. Swiss cheese dairy owners were the pioneer breeders (unsurprisingly) who provided Zavot bulls to the ordinary dairy farmers which they made milk agreements with[43]. Boğatepe village, in line with its old name Zavot, was listed among the province's largest Zavot cow-holding villages.

[43] The same breeding practices also continued in the 20th century when pasture-farm owner families provided Zavot bulls selectively to their milk providing families (see Chapter 2).

The number of *gravyer* cheese dairies was four in 1923, six in 1924, seven in 1935, and eight in 1938 (Aras 1954, 154). All of these *zavot*s were abandoned during the *kaçkaç zamanı*. Terekeme families, who migrated from Borçalı region and were relocated by the Turkish state (primarily due to their demands for settling in the villages and pastures nearby the Swiss cheese dairies), had re-activated these pasture-dairies. Üresin and Aras highlight that most of the dairies were operated as cooperatives or business partnerships among a small group of families (two to twelve in number) in the 1920s and 30s. However starting with the 1940s, Aras observed that these partnerships dissolved and families took over all *gravyer* dairies privately in Kars, except Boğatepe. One of the *gravyer* dairies in Small Boğatepe village (founded in the 1920s) stopped producing gravyer in the 1940s but the other ones in Big Boğatepe village kept operating as a cooperative until the mid 1970s. Between 1970 and 1990, three or four privately owned *gravyer* dairies processed milk in the village. After 1990 *gravyer* cheesemaking capacity decreased exponentially in Boğatepe and was halted between 2000 and 2004.

As the farmer organizations and the BÇYD members started seeking a better life in the village, *gravyer* cheesemaking emerged as a crucial craft embedded in the dairy arrangements of agro-pastoralism in the 2000s. The nostalgia for the good old days of the village and its crowded and vibrant life was associated with the *gravyer* cheese. *Ekomüze Zavot*, and the archival research conducted as part of the museum project, was part of this re-membering process in which farmers and cheesemakers innovated new material arrangements of the agro-pastoral worlds and dairy farming. In the next and last section of this chapter, I will follow how making gravyer cheese is embedded in the productive power of remembering and composing pasture-cheesemaking over the previous 10-15 years. The inheritance of Swiss cheese as *Boğatepe Gravyeri* in this process reveals the contemporary dairy arrangements that involve more-than-human movement through pastures. Accordingly,

I argue that making *gravyer* cheese reveals how the cross-generational adaptation of pasture-cheesemaking and agro-pastoralism by the current inhabitants of Boğatepe has transformed their ways of living distinctively.

Making *Boğatepe Gravyeri*: Inhabiting Boğatepe through pasture-cheesemaking

Composing archive

The documents of the *Ekomüze Zavot* archive include animal husbandry practices for cheesemaking in Kars, and despite their main focus on cheese, they inescapably reveal stories of land appropriation, redistribution, war and forced migration, and power relations in the use of pastures by different communities, including traces of Russian settler-colonialism but also the Turkish state's counterinsurgency operations and security measures. In other words, the ongoing effort for forming the *Ekomüze Zavot* archive reveal a collection of artifacts and stories that inevitably include the ones that were rendered invisible in the process of making Kars a Turkish border province in the 20th century. My research emerges from and contributes to this archive.

I conceptualize the archive not as an unchanging stock of material entities or storage of knowledge but as a dynamic site of production that is generative of knowledge and practices. The extensive critical literature on how archives are expressions of empires and states, how they contribute to the persistence of an existing organization of power relations shapes my conceptual framework in that regard (Foucault 1982; Derrida 1996; Stoler 1995; Trouillot 1995). The productive power of archives can also challenge the power structures that hegemonically define what History is (Chakrabarty 2000). As Elizabeth Povinelli argues, the "postcolonial archive" cannot be considered merely as a collection of things:

> …. the task of the postcolonial archivist is not merely to collect subaltern histories. It is also to investigate the compositional logics of the archive as such: the material conditions that allow something to be archived and archivable; the compulsions and

> desires that conjure the appearance and disappearance of objects, knowledges, and socialities within an archive; the cultures of circulation, manipulation, and management that allow an object to enter the archive and thus contribute to the endurance of specific social formations. (Povinelli 2011, 152)

Povinelli explores how Indigenous virtual archive projects "create new forms of storage, and preservation and new archival spaces and time, in which social otherwise can endure and thus change existing social formations of power" (Povinelli 2011, 153). In line with Povinelli's emphasis on "the otherwise", Marisol de la Cadena suggests "an alter-notion of archive" that "would house a vocation for partial connection with that which it cannot incorporate, but also makes it possible" (de la Cadena 2015, 149). De la Cadena acknowledges the postcolonial project's achievement of exposing the heterogeneous nature of local histories, rendering the marginalized humans visible as subjects of these histories, of extending Western concept of history to the "people without" it (Wolf 1982). Still, she also argues that the division between nature and humanity was mostly conserved in postcolonial understanding of history rather than being critically examined. De la Cadena's encounter with Mariano Turpo, and his archive of the land struggle led by the Indigenous community and a leftist alliance in the 1960s against the big landowners and the Peruvian state, paved the way for her realization of the colonial attributions of (postcolonial) history as rooted in the nature-humanity divide. Mariano's stories revealed that the archive as a historical object (and the agrarian reform as a momentous historical process) was made possible by a set of ahistorical actors and practices (including other-than-human beings). De la Cadena's conceptualization of Mariano's archive rests on opening "the historical archive to the otherwise; that is, to the ahistorical in-ayllu practices that contributed to the making of this archive" (de la Cadena 2015, 150). In-ayllu practices refers to the relationality through which humans (Runakuna speaking Quechua people), other-than-humans or earthbeings (the Tirakuna) emerge simultaneously with the

place (Ayllu). De la Cadena puts it as follows: “Runakuna and Tirakuna emerge within Ayllu as relationship, and from this condition they, literally take-place” (de la Cadena 2015, 102).

Following Povinelli and de la Cadena, I am interested in exploring the power of the archive as a “generative matrix” in the dairy arrangements of pasture-cheesemaking in which place emerges as a collectivity of farmers, pastures, herds, milk, dairies, and cheeses. Remembering the Swiss cheese of Kars corresponds to re-assembling the dairy production of Boğatepe pastures into *Gravyer* dairies. Collecting oral histories from elderly farmers, using memories in particular ways, and making a collective archive in *Ekomüze Zavot* have been generative of the new arrangements of making *Boğatepe Gravyeri*.

Philosopher Vinciane Despret and sociologist Michel Meuret who analyze how semi-transhumant pasture practices are re-membered in Southern France, define “re-membering” as “composing with” (Despret and Meuret 2016b, 28; 2016a). After the modernization and industrialization of animal husbandry started in the 1960s, breeders began to use industrial feedstock, stables or small fenced areas for more efficient production, and they stopped shepherding and grazing animals in pastures. However, in the late 1990s, with the increase in input prices and the decrease in meat and dairy products, industrial breeding reached its limits. When breeders decided to go back to the practices of herding, previous cosmoecologies had already “slipped out of existence” (Despret and Meuret 2016b, 29). Both the sheep and breeders had to (re)learn techniques of transhumance. The authors argue that this learning entails inhabiting another time and space – or “composing with a place, a space in time” (Despret and Meuret 2016b, 32). Through herding practices, the shepherds and the sheep form a flock, and this flock could be imagined as an embodied, collective memory: “By the concrete memory in the mouths, the eyes, the guts, the bodies, the legs, and the feet, the flock multiplies the ways lands, paths, bushes, springs, and rocks exist” (Despret and Meuret 2016b, 33). They emphasize that the lands not used for grazing since the 1960s were

not simply transformed or stayed idle, but they lost some of their ways of being, their modes of existence – where 'to exist' means 'to be associated with a world'. The embodied, collective memory of the flock gives back some of its existence to the land. In other words, techniques of semi-transhumance are re-membered in this movement of 'composing with,' of inhabiting place and time of herding.

Inhabiting Boğatepe also implies a cosmoecological relationship through which humans, animals, and pastures collectively compose the place. I think of remembering Swiss cheese generative concerning the particular definition of "re-membering" as a continuous process of place-making through everyday practices of *mera hayvancılığı* (agro-pastoralism) and, more specifically, pasture-cheesemaking. I argue that the Swiss cheese of the early 20th century was 're-membered' as *Boğatepe Gravyeri* cheese in the early 21st century in Boğatepe/Zavot. In the next section, I will describe how this process relied on configuring dairy arrangements of agro-pastoralism in Boğatepe.

The flow of pasture-milk and the dairy arrangements of gravyer cheese

The *gravyer* production in Kars was almost non-existing in 2001; the only dairy at the time was in (Big) Boğatepe village. The two partners of the only *gravyer* zavot in the village had passed away in 1999 and 2000. One of the partners was İlhan's elder brother who died in a traffic accident while travelling with a minibus from the village. The other was his uncle (also father-in-law), the legal owner of the *zavot* property. Both were experienced *usta*s whose dexterity was rooted in cross-generational *gravyer* making practice. When İlhan came back to the village in 2000 and decided to make *gravyer* like his brother, father, and grandfather, the existing dairy arrangements were not suitable for *gravyer* cheesemaking. The produced milk available on a daily basis between May and August (barely enough for one zavot in the late 1990s) did not suffice the practical needs for making Gravyer cheese during the pasture season. The increasing number of deceased or out-migrated peasant farmers in the

village, which reached a peak after the traffic accident in 2000, affected the practices of agro-pastoralism (*mera hayvancılığı*) as well. The number of total animals had decreased to 700 in the village.[44] The dairy arrangements of *gravyer* cheese requires around a minimum of 350-400 cows, and these animals pasture in high altitudes between May and August, and they are regularly milked twice every day during this seasonal period. In the 1950s, which can be called 'the golden age of *Boğatepe Gravyeri*', the largest number of animals that were owned by five to six wealthy farmers amounted to 600-700 cows. The rest of the farmers (around 100 people) owned the same number of animals in total. These 1500-2000 cows formed at least 10 herds; each herd had one head shepherd, two or three shepherds, and a few dogs. By 2000, since the number of animals shrank with the human population, both the herds and shepherds also decreased. This situation led villagers to form larger herds with two shepherds[45].

While the same cycle of pasturing cows continued in the village, the small volume of milk obtained from them was only enough for products other than *gravyer* in the early 2000s. Farmers mainly transformed milk into yoghurt, butter, and ghee. In terms of cheesemaking, a dozen *kaşar peyniri* zavots collected most of the available milk until they were closed after the new food codex of 2004. (I delve into this particular re-institutionalization process in Chapter 3). In 2005 when İlhan decided to restart *gravyer* production in his family dairy, previously run by his brother and uncle, he needed to find larger volume of milk. The limited supply and the previously established agreements between dairy owners and farmers posed a

[44] My own interviews revealed this number. During this period, from 1980 until the early years of the 2000s, the number of cows and sheep have decreased in Kars (Demir 2016, 56). After 1990 a similar decline can be observed for the overall milk production in the whole country until 2003 (Akman 2019, 18), for the overall animal count in the whole country until 2003 – since the irregular fluctuations that can be detected in the official statistics do not allow to grasp the real changes (Akman 2013, 13–14). Yet the statistics suggests that while the number of 'more efficient' culture and hybrid breed cows have exponentially increased since the 2009, the number of local breeds keeps decreasing, especially in the Eastern Anatolia (TÜİK 2020; Zeybek 2016; Tatari 2020; Akman 2013; 2019).

[45] The pattern of making larger herds among villagers is called *nahır yapmak* in Kars; *nahır* is also used in many places in Turkey to refer any herd (*sürü*) in general.

challenge for him. These agreements are renewed on a yearly basis in Kars during which payments are done in bulk amounts at the time of agreement, usually in August or September for the following year. Rather than the conventional transaction schemes, mostly common in the western parts of Turkey, based on monthly payments, the agreement system in question in Kars system *avans* ensured the steady milk supply to the dairies together with cash provision for the farmers who need to harvest their fields and grass as animal feedstock. With the help of this downpayment, the farmers invest for the harsh winter conditions when agricultural production was confined to the small amount of milk obtained from cows. *Avans* system also causes the price of milk to be decided in September for the following year; hence ensures the steady supply of milk to the dairy though this particular system protects the dairy owner against fluctuations of the milk price.

The practice also reveals certain socioeconomic inequalities and circuits of cash flow within the dairy arrangements. Dairy owners need to be able to invest a large sum of money in their business each year. This vital need led the dairy owners to establish cooperatives or business partnerships, too. When I started to interview cheesemakers in Kars, I quickly noticed that most *gravyer usta*s (gravyer masters) come from relatively wealthy families in their villages. The ones who are part of other kinship relations are either partners with or employed by a dairy owner who is wealthy enough to make bulk payments to the farmers in September every year. Farmers I spoke with in 2014-20 told me that the system can be beneficial when a dairy farmer needs cash to make preparations (basically to buy food, harvest fields, mow grass from pastures, buy more feedstock for animal or sell grass in the market) for the winter. Another case in which this payment scheme is beneficial for the farmer is when the milk prices decrease for any reason – yet this was never the case during my fieldwork. According to the yearly budget calculations, if a dairy farmer obtains around 40-50% percent of the total price of their expected milk yield for a whole year, they will be

able to get the rest of their milk revenues during the next pasture season after April, when a new and usually higher price is set. During my fieldwork between 2015 and 2020, I followed the payment schemes, meetings in which farmers and dairy owners agreed on price and payments, and innumerous encounters between farmers and cheesemakers about calculations of their milk and cash transactions in three villages, including Boğatepe. The dairy owners usually paid each farmer more than 60% percent of their expected milk revenue in August or September.[46] Then around a third of the farmers gave the milk that corresponds to this initial bulk payment until June or July. Dairy owners negotiate with the farmers about the new price and bi-weekly or monthly payments for the rest of the pasture season which lasts until the new production cycle in October. In Kars, almost all dairies stop production during September; farmers use the milk in the house during this month as they prepare dairy products to be consumed in their households in the winter or their sale in the market.

İlhan, who comes from a prominent wealthy Terekeme family in Boğatepe, wanted to work with dairy farmers in 2005. But the limited number of farmers who owned cows had already promised other *kaşar* cheesemakers in the village to sell their milk in exchange for cash installment they had received beforehand. Since *gravyer* cheese is made only for 90-100 days between May and mid-August, he was also unable to buy all the year's milk from farmers.[47] Hence he negotiated with one of the *kaşar* cheesemakers in his village, Metin, who agreed to sell him most of the milk he was going to receive from his *sütçü*s[48] in June and July. İlhan then made a deal with another friend, Namık, who is also a third-generation *gravyer ustası* like him, coming from another Terekeme family.[49] Namık and his two brothers

[46] This variable amount paid in advance depends on the particular relations between the dairy owners and family farmers.

[47] As I will elaborate more in Chapter 2, the best strategy for dairies in Kars have been combining *kaşar* and *gravyer* cheesemaking so that they could process milk all year long.

[48] *Sütçü* is the colloquial word for the official definition of *süt üreticisi* (milk producer).

[49] The Terekeme families involved in making *gravyer* cheese in the villages of subprefectures of Göle, Ardahan Merkez , Kars Merkez, Selim and Kağızman contributed to the cheesemaking in the whole provinces of

owned a *gravyer zavot* founded in the 1980s by their father, who had previously worked as a master in the village cooperative between the 1950s and 1970s. Namık agreed to provide the milk his family would obtain from their cows and work at İlhan's family dairy to make cheese. During one of our long conversations with him, İlhan told me that that first year in 2006, he and Namık produced around 25 tons of gravyer cheese in his brother's dairy, the cheesemaking space that İlhan continued to use actively until 2019 (see Interlude 4). He made a significant effort to sell the small amount of cheese he produced that year at a reasonably high price that enabled him rebuy milk in the following year. Since the cheese needs to age for at least three months, he started to sell his products right in the beginning of August. (At other times, six month-ageing is preferred in the market, and some buyers age the cheeses after they buy.) Both İlhan and Niyazi highlighted that their biggest buyer (of *gravyer* cheese) has been a trader and dairy factory owner in İstanbul since the early 1970s.[50] The wholesale deals made with this person, albeit with a lower price, has been the easiest and guaranteed supplier of cashflow for many years to *gravyer* producers in Boğatepe and other villages in Kars. Once his business picked up, İlhan started looking for new buyers, especially retail dealers like grocery stores, charcuteries, and local cheese traders. His primary aim was not to sell *gravyer* cheese for high prices to provide a larger share of surplus value to the village because his work was a matter of struggle against industrialization and capitalization of agriculture in Turkey from his personal and political standpoint. In relation to this stance, he has been active in Çiftçi-Sen (the flagship national organized farmers union in Turkey), Slow Food Movement and La Via Campesina (international networks). Hence within a few years, İlhan succeeded in selling his *gravyer* cheese to various small grocery

Ardahan and Kars. All these families had been involved in making *gravyer* cheese for many decades by 1980. These two particular families have settled in Boğatepe after leaving their villages and pastures that are located in Georgian-Armenaian borderlands where they used to work in or owned Swiss cheese dairies.

[50] See Interlude 2 for the long-standing commercial connection between him and Kars cheesemakers.

stores around the country, together with an increasing number of consumers' cooperatives or other community supported agriculture networks.[51]

İlhan and Niyazi's successful production and sale numbers in 2006 helped them to convince their families to keep more dairy cows. One kilogram of *gravyer* cheese was priced almost eighth times one kilogram of milk. According to their calculations, one kilogram of *gravyer* corresponded to 14-17 kilograms of milk according to the length of the aging period of the cheese (the longer it aged, the more it loses weight and hence costs more milk). The dairy operation of two months amounted to almost two thirds of the revenue of their production. The main expense items were: salaries of two cheese masters and two wage laborers (*çıraklar*, apprentices), equipment repurposed from old family dairies, energy costs for heating the large cauldrons with gas and the stove in the hot ageing room with coal, electricity bills and other expenses. Cheese commerce was profitable for both partners, and they decided to continue producing cheese in separate zavots in 2007. Niyazi, with his elder brother Namaz, renovated their father's old zavot, bought more dairy cows for the family. İlhan, in the meantime, convinced his younger brother to keep more dairy cows, too. But he needed more milk, so he agreed with five dairy farmers, who owned 10 to 20 cows each, to use their milk for making the *gravyer*.

He proposed them to organize payments based on the value of their milk after the sale of the *gravyer* cheese from the average milk-cheese ratio. Instead of being paid the unit price of the milk, this agreement enabled farmers to have revenues from the profit in the unit price of cheese after *zavot* expenses – this latter unit price was more than twice as much as the first

[51] Cheeses from Kars have been present in almost all of the consumer cooperatives, ecological or farmers markets (*pazar*) or consumer groups in İstanbul, Ankara and İzmir since the second half of the 2000s. The large supermarket chains in Turkey used not to buy from small cheesemakers, especially between 20015 and 2015. (Also see Interlude 2 and Chapter 3 on the trade of Kars cheeses)

one.[52] Yet this required farmers to wait until *gravyer* cheese was sold by İlhan during the Fall. Or they could also take their share of cheese and sell themselves. In all cases, they needed to sustain themselves on a daily basis on other resources, especially during the harvest time and preparation for winter. One crucial cash flow for these farmers stemmed from three other *kaşar* cheesemakers in the village, whose dairies operated all year long. The *kaşar zavot*s made *avans* payments in September for the milk to be received in the following year. Another resource of these farmer families was coming from selling newborn male bovines. Finally, the farmers who owned sizable lands could sell some of the grass or crops they harvested. In short, pasture-milk that *gravyer* cheesemaking required has quickly become an essential source of revenue in the village. This joint mode of production never acquired a legal identity in the last 15 years (until today), but as the price of *gravyer* cheese increased, its revenue for dairy farmers became significantly advantageous over selling milk to the *zavot* in an *avans* system. The number of farmers joining this collective accounting increased to 11 in 2011, 14 in 2018, and 19 in 2021.[53] This could be considered a significant growth rate, especially given that the *gravyer* cheese is made from the milk collected from only a small group of farmers, namely 30 to 32.

When *gravyer* cheese production resumed in Boğatepe village in the second half of the 2000s, many small artisanal *zavot*s were pushed out of the dairy economy due to the new set of food safety regulations that were legally put in place in 2004. İlhan and Niyazi, and many other cheesemakers in Kars, accommodated state inspectors in their production sites. A separate *zavot* building and specialized equipment distinguished *gravyer zavot*s from more

[52] The partners of this business agreement made calculations based on the prices of milk, *gravyer*, and the production costs spent by the dairy owners and farmers.

[53] Not only that a limited number of dairy farmer families that can afford the harvest and winter stock purchases without taking credit (*avans*) dairy owners, drought years and sudden precipitations especially after 2018 caused fluctuations in the number of farmers involved in the collective production with different payment schemes. İlhan's *gravyer zavot* partners were rarely involved in wholesale agreements in the sale of the cheese until 2019 when cheese trade enlarged with the rise of Kars as a touristic destination. This enabled rural cheesemakers to make new selling agreements, and secure regular payments starting in September.

basic production sites of *kaşar* cheesemaking, usually located indoors in village houses. Yet the official production permits (*üretim izin belgesi*) required the producers to comply with new criteria put in place that framed "traditional" *gravyer* cheesemaking craft" as insufficient.[54] İlhan and Niyazi, as new generation *gravyer ustaları* (masters), negotiated with the inspectors, met state officials in local branches of different ministries, agreed to pay fines, and explored ways for sustaining the production process during the summer months. Their persistent attitude was also supported by the farmers, who were able to increase their revenues thanks to the higher price of *gravyer* cheese compared to the other dairy products.

Increasing *gravyer* cheese production in the village had a significant impact on the local milk price fluctuations.[55] The most expensive milk in Kars was in Boğatepe. Farmers and cheesemakers in the village told me that the milk price increase rate between 2008 and 2018 was much more than they had anticipated. İlhan and Niyazi's *gravyer zavot*s, and the cooperative structure that İlhan's *zavot* supported to a major degree, had an encouraging effect on farmers for keeping more cows and selling more milk. Small dairy farmers always care about the reliability of a dairy owner in the village for investing in keeping more cows. Such investment corresponds to taking care of more grass, feedstock, sheds, grazing, and milking labor. Embedded in a daily routine with cows (and other animals, including horses, dogs, sheep, geese, chickens, foxes, bears, wolfs, etc.) in Kars pastures and the dairy worlds of agro-pastoralism in Boğatepe, milk provision from pasturing-cows required a particular mode of management of herds and pastures. In the remaining pages of this chapter, I will

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54 These criteria are discussed in detail in Chapter 3 and Interlude 4.

55 Milk price for *gravyer* cheese and the particular case of Boğatepe diverge from the overall patterns of the milk price determination in Turkey. State agricultural politics in the 2000s promoted a new institutionalization in Turkey through Animal Breeders Unions (*Yetiştirici Birlikleri*) that allow access to the state subsidies. National Milk Council (*Ulusal Süt Konseyi*) that was founded in 2008 announces the suggested milk prices in Turkey every year. This council has representatives of state officials, academics, breeders unions, milk unions, and industrial producers. Milk prices in Boğatepe are usually the same or very close to this suggestion. But it is hard to observe the implementation of fixed milk prices in Kars as well as in the country. Starting in 2019, despite an exponentially raising inflation, the milk prices were increased at such a low rate that in 2022 it is not possible to generate revenue by keeping dairy cows.

focus on the dairy arrangements that enable pasture-milk provision to the *gravyer zavot*s through local patterns of pasturing cows.

Inheriting pasture-cheesemaking

Gravyer cheese is associated explicitly with pasture-milk. In *Ekomüze Zavot*'s exhibitions or other information sources, it is underlined that the cheese could be produced only for a 100 days or three months long period. Cows pasture in high altitudes only throughout May, June and July and their milk makes *Boğatepe Gravyeri* distinctive from other cheese types. From the early years of farmer community organizing activities in BÇYD onwards, research projects that focus on biodiversity, edible and medicinal plants in Kars pastures have turned into a motivation factor for women of the village for organizing workshops and trainings collectively. These projects[56] not only provided sustenance to women by drying numerous for use or sale but they also unraveled the relations between women and the grass, flowers and other plant life in their surroundings. The 'traditional knowledge' possessed by the Boğatepe women was composed of agro-pastoralism practices where both humans and animals find food and cure in the pastures. In 2015, when Slow Food Movement defined the presidium of Kars gravyer cheese[57], the pasture season, its biodiversity and, particular dairy arrangements were highlighted as crucial components that shaped the authenticity of this gravyer cheese. In April 2018, when the women members of BÇYD started selling cheese to the tourists visiting the village (the number of daily visitors had been on the rise), whether preparing *gravyer* by using the nonpasture-milk (since these cows could not be taken to the high altitude pastures due to harsh weather in April) provoked

[56] BÇYD run many projects in the village (on ethnobotany, plant drying, oral history of cheese, ecomuseum and cheesemaking, animal health, communication, tourism for solidarity, felt and woolcrafts, cuisine etc.), funded by institutions like United Nations Development Program, by the companies of the two pipelines that cross Kars and Ardahan (BTC and TANAP), or local development agency SERKA.

[57] ESSEDRA project supported by Slow Food Biodiversity Foundation, European Union, Gastronomi Dostları Derneği in Turkey. İlhan Koçulu, as the leader of Kars Convivium has been an active participant of the biannual meetings of Terra Madre and Slow Cheese in Italy since 2004. He received Slow Cheese Award in Bra in 2017.

a heated discussion among farmers, shepherds, and cheesemakers. These stakeholders eventually agreed that proper *Boğatepe Gravyeri* could only be made with the pasture milk obtained starting with May.[58]

The pasture management organization between April and October required a particular order to be put into practice based on the decisions made by the village council[59] and the *mera korukçusu* (the pasturewatch), who is also the head shepherd in charge of others. Zakir, who worked as the *korukçu* of Boğatepe for 20 years, explained to me that the pastures of each village are demarcated and their borders are recognized by the state, too. *Korukçu*'s duties primarily consisted of guarding the boundaries of the pastures against intrusions by herds or flocks from neighboring villages or different agro-pastoralist communities. And secondly, a *korukçu* is expected to ensure that animals of the village occupy pastures in the order designated by the village council each year. According to the grass available for distribution among the farmers over the pasture season, the orderly rotation of animals across different portions of the pastures and fields for 4-5 months of open-air grazing is a significant component of this order.

The village council (constituted mainly by the elderly farmers) relies on the traditional grazing practices and patterns that have been cultivated across generations to designate a new grass distribution and pasturing order each year. The space-time allocations detailed by the council and the climate indicators, including the rainfall, temperature cycles, and the physical conditions of grass and flower affect the council's trajectories for each

[58] The discussion among farmers on when it is right time to make and sell *gravyer* cheese has always been ongoing. In 2018, when Boğatepe women sold cheese in the small shop in the second floor of the Ekomüze Zavot, they reached an agreement that, although a few *gravyer usta* (masters) can make cheese in March, the right time to start the production would be May and the earliest sale should happen after three months. Yet, by 2022, in more and more small dairies in rural Kars and Ardahan, cheesemakers start making *gravyer* in March and April, some aiming to make *gravyer* all year around.

[59] The council is officially made up of the elected major and his appointed council (*ihtiyar heyeti)*. In Boğatepe I observed that many prominent characters in the village were part of the council, and anyone in the village could communicate their opinion to the mayor and people in the council.

pasture season. The dairy cow herds are systematically grazed in the pastures, starting from the fields nearby the village (before these fields are sowed) and meadows in April, moving further away in May and June to the pastures where the ice and snow layers on grass disappear (usually due to increased sun exposure in the southern slopes after winter), then to the higher elevation pastures in July and August, and finally to back in the nearby pastures and fields (after these are harvested) during September and October. Each cow herd walks between the pastures and the village twice daily; they arrive at the village early in the morning and later in the afternoon to be milked in the sheds, where they spend most of the winter months.

The collective management of Boğatepe's vast pastures consists of the administration of commons and payment schemes annually.[60] *Gravyer* cheesemaking requires milk to be collected from several dozens of dairy farmers. I conceptualize this 'pasture-milk' collection process as *assembling pastures*. Dairy arrangements that materially assemble milk to transubstantiate it later into *gravyer* cheese are part of the everyday practices of pasture-cheesemaking.

Gravyer cheese is a notably representative case for unpacking the complicated world of dairy farming and the unique arrangements that shape artisanal cheesemaking. Further on, Tim Ingold's distinction between transport and wayfaring (Ingold 2011) is helpful for conceptualizing the two different ways of assembling milk from cows followed by the dairy arrangements that structure pastures into cheese wheels. For Ingold, wayfaring refers to "lineal movement along paths of travel" (Ingold 2011, 149), whereas transport as a unique

[60] Most of the pastures are dedicated to the animals of the village and no one pays for it. The remaining portion is usually divided between rental pastures for the meat calves (*dana*) of the villagers, rental pastures to the other villagers who search pastures for their animals. The rent of these pastures subsidizes mowing the grass and making hay in other portions of pastures that are used in an organized manner by shepherds. The sale of the hay contributes to the village budget, which allows a payment of the *korukçu* (pasturewatch). The farmers pay the other shepherds per their animal in the composed herd.

concept is about "lateral movement across a surface." Transportation of milk from villages to a *zavot* requires it to be moved across rural Kars, whereas the grazing practices imply the herds to be mobilized along specific paths and meadows in the pastures. Ingold also distinguishes "the network of transport" and "the meshwork of wayfaring" (Ingold 2011, 151). Based on my fieldwork observations, I conceptualize diary arrangements as particular network formations for milk transport made possible by a meshwork of wayfaring practices for herds, shepherds, and farmers in seasonal practices of agro-pastoralism. According to Ingold, what the meshwork is to the wayfarer can be thought of as what the web is to a spider: "It is not an object that I [the spider] interact with, but the ground upon which the possibility of interaction is based. The web, in short, is the very condition of my agency. But it is not, in itself, an agent" (Ingold 2011, 93). He argues that conceptualizing place as a meshwork would allow us to understand the agency of the environment not only as one of the entities of a network but rather as a dynamic component that is made along movement paths. Thus, in addition to establishing networks between villages, pastures, and dairies via the movements of farmers, herds, and milk, thinking of pasture-cheesemaking as meshwork formations led me to conceptualize the movement of pastures and milk continuously. As part of this particular meshwork, not only milk coalesces in cheesemaking, but it also makes the place it moves through otherwise.

Boğatepe Gravyeri is a unique food culture component in Northeastern Turkey. It incorporates particular material processes in the *zavot*s to reinvent the historic Swiss cheese of this region using new techniques and technologies, food sample analysis laboratories and their technosciences, and commercial or alternative "local food" networks. In addition, this unique cheese comes into being via the practices of dairy farming and agro-pastoralism that configure dairy arrangements of pasture-cheesemaking.

Conclusion

In this chapter, I explored how Swiss cheese was reinvented as *Boğatepe Gravyeri* via farmer community-organizing activities in Boğatepe village, Kars. That being so, I argue that this reinvention enabled Swiss cheese to be understood as a food culture product to be inherited and new arrangements to inhabit Boğatepe. The *gravyer* production growth after 2010 has been synchronous with the emergence of new approaches for managing pastures and herds, milking and collecting milk, and developing community organization projects by the BÇYD to improve the living conditions in the village. These improvement efforts include the reproduction of ancestral seeds, investigation of biodiversity in pastures, exploration of edible and medicinal plants, restoration of an old *zavot* into a museum, compilation of an archive and composition of material sites for "artisanal" [61] cheesemaking, and the organization of several training programs and workshops on topics like communication, reproductive health, animal breeding, and tourism. Therefore, in the first part of this chapter I situated the gravyer cheesemaking process within this wide range of practices. In conjunction with the establishment of the ecomuseum and the projects springing out of it, the growing interest for local food in Turkey, and the tourism-boosted demand for Kars cheeses, *Boğatepe gravyeri* have turned into a nodal point within the worlds of pasture-cheesemaking. (I continue to explore its other aspects in the rest of this dissertation).

The violent historical events that contoured the current nation-state borders of Turkey, Georgia and Armenia that surround Kars have been included in the archives of *Ekomüze Zavot*. Yet the movement of peoples and animals and the appropriation of abandoned places have been left to oblivion. In comparison, Boğatepe farmers remember the deadly dangerous

[61] The translation of artisanal in Turkish is a bit tricky. In 2016, in our conversations along the organization of an international conference on Artisanal Cheeses in Kars, İlhan Koçulu, Derya Nizam, and I agreed on using "yere*l-geleneksel*" (local-traditional) in Turkish to refer to the widespread use of the adjective "artisanal" in English, French, and Italian.

journeys of their grandparents who settled in this village. Elaborating on the oral history research I participated in 2013-14, in this chapter, I argued that farmers narrate not the violent *kaçkaç yılları* (1914-21) but years before and after them. Boğatepe residents re-member *gravyer* cheese as a craft that moved from Switzerland to Georgian-Armenian-Turkish borderlands, and they conceive Kars as the final destination of their families' migration route where previous generations' cheesemaking craft could be transposed and re-assembled.

Their narratives revolving around and the archival research findings concerning Swiss cheese in South Caucasus lead us to conceptualize *terroir* in intriguing ways: How can the geographical and social, physical and cultural, sensory, and ephemeral characteristics of a Swiss cheese be associated with a specific place outside Switzerland but in South Caucasus, Kars or Boğatepe? Focusing on dairy arrangements that provide the necessary milk flow to the *zavot*s where pasture-milk is crafted, I discuss the historical (trans)formations of the environmental and social practices (*terroir*) that result in *gravyer* cheese. My analysis of the movements of farmers, cows, herders, and milk as part of a larger world of dairy farming and agro-pastoralism (*mera hayvancılığı*) enabled me to approach the heritage of Swiss cheese as a form of pasture-cheesemaking. This form was by the farmers and the more-than-human collectivities of *mera hayvancılığı*/agro-pastoralism in Boğatepe with a new fashion after the 2010s to make life better in their village.

Interlude 1

On the *maya* (yeast) of *terroir*: Making Swiss cheese in South Caucasus

Maya, yeast is the name given to the material that activates fermentation in Turkish. The word is used in Kars (and in Turkey) to refer to any "starter culture" or "rennet" that initiates or assists the fermentation process – that of milk, vinegar, wine, or pastries. The Turkish word has its roots in the Persian word "maye", that denotes "essence, raw material, yeast, capital"[62]. This substance in colloquial Turkish is understood in a larger world of invisible agencies in beings or becomings: a person's *maya* may not be good (*bozuk*) if they tend to (always) cheat, lie or do evil. The same expression (*mayası bozuk*) or a similar one (*mayası tutmamış*) can also be used for nonhuman entities, usually food like a piece of bread or cheese that is not fermented well enough. *Maya* usually encapsulates an invisible agency that mysteriously works without being much noticed while making an entity. In addition to the materials like a piece of dough, of a ruminant's fourth stomach, or a liquid produced from microorganisms – lactic acid bacteria or particular enzymes –, *maya* figuratively signifies a substance that triggers or makes possible a transformation. It relates to the outcome of a process by taking part in the transformation. While it is usually an added substance (like adding yoghurt to the milk or a piece of formerly fermented dough to the newly formed one), it is also the same word that signifies the process of fermentation *mayalanmak*. I am amazed by the power of fermentation and the multiple meanings it contributes to the semiotic worlds of cheesemaking.

Coagulating milk is said to be sleeping in Turkish. It wakes up in the form of separated whey and curd, as the necessary process of making cheese. *Mayalamak* (adding

[62] I rely on Nişanyan etymological dictionary, see https://www.nisanyansozluk.com

rennet) is expressed as *sütü uyutmak* (putting the milk to sleep). The curd and potentialities of cheeses emerge from this silent, warm sleep. Since I started my research on Swiss cheese in Kars, and learned that it was a particular craft that traveled from Switzerland to South Caucasus in the late nineteenth century, I have been interested in understanding how this "Swiss tradition" has taken root in this place. Throughout the years, I have encountered various ways in which it affected and was affected by the existing "traditional" cheeses, other dairy entrepreneurs, and different dairy arrangements of agro-pastoralism. This situation made me investigate not only the composition of place, as I elaborated in Chapter 1, but also the decomposition of its dairy arrangements, the ruins of the Swiss cheesemaking. This interlude sheds light on my trajectory from 2013 to 2019 in the search for the Swiss cheese and its remnants in parts of Northeastern Turkey, Southern Georgia, and Northern Armenia. I approach Swiss cheese as a particular kind of *maya* that contributes to the fermentation of dairy crafts in this part of the world. It is one among many other *maya*-like entities (other cheeses, animal breeds, particular techniques or technologies etc.). In places where I encountered a specific variety of Swiss cheese like Gravyer or Emmental, I noticed the phenomenon of *maya tuttu* (the yeast holds). I have also encountered forms of its disappearance, maybe existing in memory but also in abandoned built environments or pastures devoid of dairy animals.

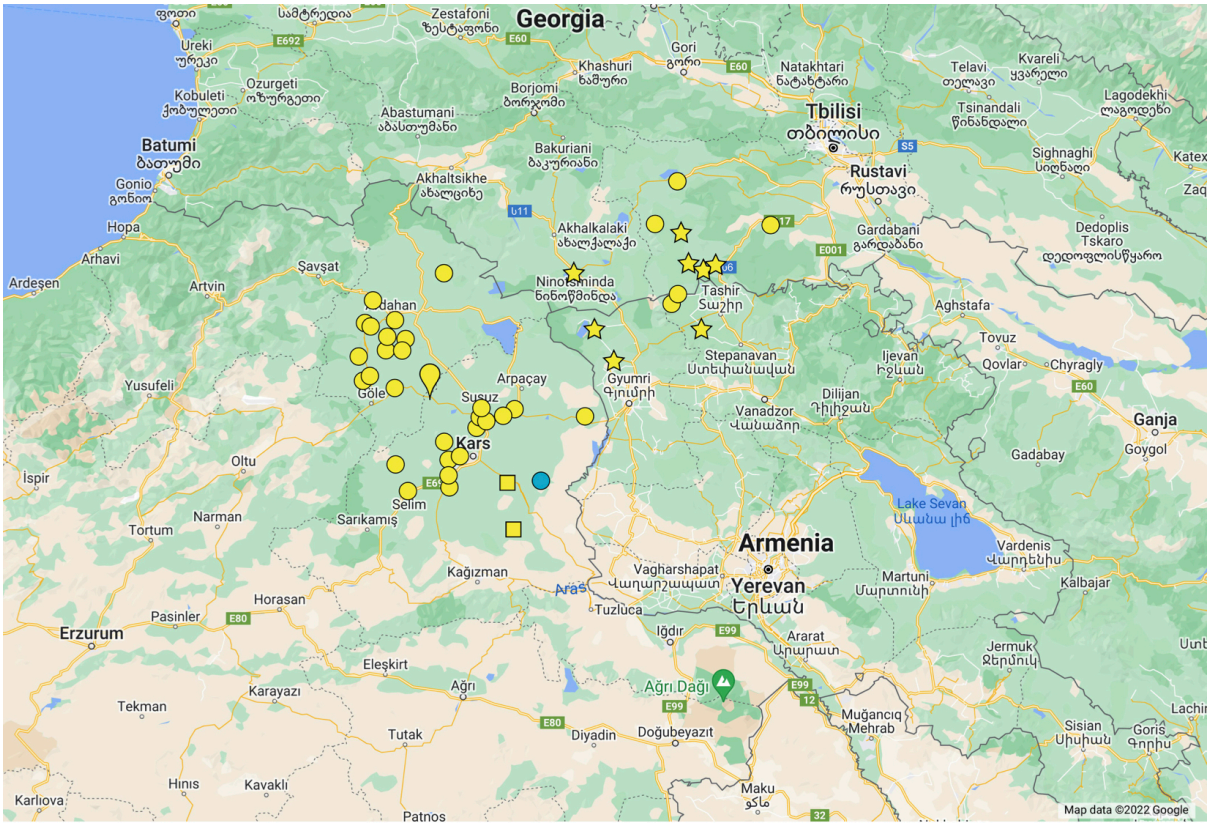


Image 1: Map of the research area indicating the Swiss cheese *zavot*s that existed before 1914. Map data: © 2022 Google. The author prepared this map in Google MyMaps, with the icons Google allowed him to use online. All the yellow icons indicate places where Swiss cheese dairies existed before 1914. The star shaped icons indicate places that are introduced in this Interlude. The pin shaped one indicates Boğatepe. The blue icon indicates İsaçayırı pasture-farm, where I did not encounter any record of a Swiss cheese *zavot* before 1930. The two rectangular icons indicate the two Swiss cheese *zavot*s that later became pasture-farms (See Chapter 2 for the stories of making Swiss cheese in Kars after 1921). I have benefited from my interviews and relevant sources (Aras 1954; Kobro 1989; Tschudin 1990; Badem 2014; Tatari 2018a) to demarcate these places. Since my research focused on Turkey, many Swiss cheese *zavot*s that existed before 1921 in today's Armenian and Georgian terriories are likely to be missing from this map.

Maya across borders

When I encountered a particular story of *maya* between İlhan and Ani in 2015, I was curious to follow the itinerary from Kars, Turkey, to Gyumri, Armenia. Boğatepe villagers, like many other Caucasian immigrants in the province, have been interested in keeping their family relations beyond nation-state borders. My involvement in BÇYD research on Boğatepe cheesemaking, and my research on Swiss cheese had already led me to encounter many intriguing ways in which nation-state borders and other territorial boundaries between multi-ethno-religious communities and villages in Northeastern Turkey (Kars, Ardahan,

Artvin, Iğdır), and South Georgia (Ninotsminda, Dmanisi, Bolnisi, Tsalka) have been drawn as well as transgressed. İhsan and Armine, two independent researchers from Turkey and Armenia, have been involved in different projects that contributed to the collaborative practices between actors like women, small farmers, cheesemakers from both countries. In the course of a project realized in 2015 by these two researchers in collaboration with (food) writer Takuhi Tovmasyan, several women from Gymri, Armenia, and Kars, Turkey shared traditional food recipes, prepared a recipe book, and cooked for and hosted each other (Erdoğan and Karakılıç 2017). In July 2015, when a group of Armenian women from Gyumri came to Kars, where another group of women from Kars cooked a selection of the recipes that were collected during this research, I witnessed the conversation on *maya* between İlhan and Ani.

After the dinner, I accompanied the research team and a group of participant women in the lobby for a brief conversation. Ani, a village mayor from rural Gyumri, told us that they restarted cheesemaking in an old, abandoned *zavot* (dairy) nearby their village a year ago. She said that their region is famous for dairy farming in Armenia; they have a handful *zavot*s functioning today, but used to have more than a few dozen 40-50 years earlier. They recently opened a *zavot* near the pastures of Ani's village in an old dairy-producing town, Hartashen. Ani told that her friends, the cheese masters of the dairy, were not able to find the appropriate *maya* (yeast/rennet) for their craft. They had said to her that the most widespread variety in rural Armenia was microbiological rennet, which was cheaper than animal rennet. They would prefer the rennet derived from animal stomach. Yet the more expensive animal rennet options available in the market would not give the desired results, according to the masters in Gyumri. After a brief discussion on different sorts of yeast/rennet, İlhan suggested sharing a sample of what he uses in his dairy in Kars. He stated that he worked hard to find the best yeast in the market. He remembers that some *gravyer* masters in Kars used to import

yeast from Switzerland since it has always been a sensitive substance in cheesemaking. While traditionally, villagers use the fourth stomach of a young ruminant animal (*abomasum*/*şirden*), more technological interventions have shaped commercial cheesemaking for a long time. İlhan had visited many yeast-producing factories where the enzyme within the animal stomach, namely *chymosin*, is extracted and used in the making of commercial yeast, or animal rennet as it is usually called in English. After many trials, İlhan found the brand he thought produced the best result in his dairy. Therefore, he was happy to share some of his yeast with Ani.

The following day, before leaving Kars to return to their hometowns, Ani and her friends stopped by Boğatepe village. They visited the Ekomüze Zavot, İlhan's dairies, and several women from the association. The small portion of rennet, packed carefully for their long trip between Kars and Gyumri inspired me to think of the entanglements of people, animals, and microorganisms *in-place* as (literally) material-semiotic compositions of spatial boundaries across and around the territorial nation-state and different ethno-religious borders. Pathways of agro-pastoralism, permanent or seasonal settlements in all sides of the Turkey-Georgia-Armenia-Azerbaijan borders have been affected by militarist, post-developmentalist, and post-Soviet politics of all nation-states. I approach pasture-cheesemaking practices as being shaped by the implementation of these politics across -and beyond- borders; these practices localize various implementations of national or global politics while creating new spatial arrangements in settlements, more urbanized centers, villages, and pastures. I am convinced that dairy farming and agro-pastoralism oblige spatial arrangements in particular ways that do not always coincide with state politics, and developmentalist or nationalist desires.

Encountering the travel of the yeast in the ridiculously long route between Kars and Gyumri, like any travel from Northeastern Turkey to Armenia, made me think of the history

of complex movements across and within nation-state borders. The distance between the two cities is approximately 60 kilometers. They used to have an important railway connection that is closed since 1993. Reaching Gyumri could last maximum an hour if the closed territorial border between Armenia and Turkey did not oblige travelers to use Georgian territories as a transit. This distance corresponds to at least a 6 hours long drive, without any railway option[63]. The travel of the yeast had inspired me to think of not only movements that cross territorial borders between states (Turkey, Georgia, and Armenia) but also the yeast of the border-making as being the practices of pasture-cheesemaking with new spatial arrangements and boundaries within and across state borders. My interest in the remnants of the Swiss-cheese (*Gravyer* or *Şvetzar*) in Turkey, Georgia, and Armenia paved the way for my subsequent plans and observations of the transformations of dairy farming and agro-pastoralism (*mera hayvancılığı*) in these three countries. This interlude offers a bunch of interrelated stories on my encounters with the ruins and remnants of Swiss cheese production, its particular moments of revitalization across national borders, and the worlds of cheesemaking practices that configure ethno-religious boundaries in various intriguing ways.

Making Swiss cheese in Georgia

I met İhsan and Armine in 2013 when I was involved in a research project on the history of Kars cheesemaking. They designed a pioneering project on cheesemaking in 2006. They organized a brief trip between Yerevan and Kars, during which Armenian, Turkish, and Kurdish cheesemakers met each other. Thanks to this project, İlhan met Vahe, an Armenian cheesemaker in Ninotsminda (Georgia) who used to make Swiss cheeses in the 2000s. Vahe and İlhan visited each other a couple of times after this project. When I was interested in

[63] Recent railway construction to Tbilisi and Baku has still not finalized and put into operation. See also the social media post by Hrant Dink Foundation for the possible travel options between the two cities: https://www.instagram.com/tv/CYRcB1qq2xq/?utm_source=ig_(accessed on 10 June 2021).

tracing the remnants of Swiss cheese in Georgia and Armenia, İlhan gave me the approximate address of Vahe as he remembered it.

In February 2019, I planned a short trip to Georgia and Armenia to visit Vahe, the mayor Ani, and search for Swiss cheese producers in Armenia. I was accompanied by a well-known food writer Nilhan Aras with whom I had travelled to many places of Turkey in the search for local-traditional cheese and other food recipes. Areg, a friend of a friend from Armenia, accepted to work with us as our local coordinator and translator. He contacted a taxi driver he knew, and they came to pick us up from the border gate between Turkey and Georgia. Before driving to Gyumri, Armenia, to meet Ani, we stopped at Ninotsminda and started asking the residents about the cheesemaker Vahe. Shortly we were told about the location of a house where Vahe used to live until he passed away one year before our trip. We encountered Vahe's son Armen and his family when we arrived at the house. I explained my research to him and told him that İlhan from Kars directed me to visit his old friend Vahe. Armen was very touched when he heard of İlhan and Kars. He told me that Vahe was very fond of this friendship. Armen has worked with his father to adapt their Swiss cheese production to market conditions. He said that his father used to make huge wheels of Emmentaler-like Swiss cheese. The size of these cheeses became a problem in the sale since the 70-100 kg wheels cannot be preserved without any contamination issues once they were cut into small pieces in retail markets. Due to the low demand, the markets were not interested in buying large wheels. Hence Vahe and Armen worked on a cheese they called 'Caucasian cheese'.

Armen explained that the project that brought together Vahe and İlhan was an important starting point for Vahe to change his Swiss cheese production. The main difference was the size of the cheese. The workshop during this project revealed that the smaller cheese molds could be a remedy for the marketing problems of the Swiss cheese producers. Armen

took us to his *badval* where we saw the cheeses that have been aging for months. He made most of the cheese during the pasture season between April and September, he told me. The Caucasian cheese was made from mid-May until August, and sold completely before winter. It was February 2019, and he had other aged varieties occupying his shelves: Holland/Gouda, Sulguni, and Chanakh.

Armen told me that as far as he knew, he was the only Swiss cheese producer in Georgia. During my several visits to the old Swiss cheese production sites in the country in 2014 and 2018, I had not met any Swiss cheese producer in that region, too. In January 2014, İlhan and I traveled to Georgia, and visited many villages that Terekeme families in Kars talk about as their homelands[64]. There were still many extended family members of Kars villagers in these towns and villages in Georgia.

In addition to the oral history interviews and İlhan's knowledge, Samettin Nesipoğlu's book on his family history became an essential source in designing our voyage (Nesipoğlu 2012). Nesipoğlu's grandfather Hacı İdris, who had immigrated from Borçalı region in the 1920s, was a renowned Gravyer master in Boğatepe village. He had been among the wealthiest farmers in Kars. According to the family stories he told his children, he was also one of Georgias's few Terekeme Gravyer *zavot* owners. He was from Armutlu/Armutly village, Tbilisi, where he used to make Gravyer cheese in a *zavot* owned by Swiss settlers. Later he established another *zavot* himself. İlhan and I went to Armutly in January 2014. Tahmaz, who lives in Dmanisi, accompanied us as a local guide. He used to be a history teacher and was pretty knowledgeable about the region.

The similarity of Boğatepe pastures to the mountainous slopes near Armutlu, Hamamlı, and Bezekli was astonishing. We stopped at the building that villagers (and

[64] This trip was part of our research on Kars cheesemaking (Tatari 2014). The oral history interviews on Swiss cheesemaking in Southwestern rural Georgia, which later influenced the questions of my dissertation research, guided our trip.

Nesipoğlu) described as Hacı İdris' zavot before 1920. The couple who owned and used it as a *kiler* (depot) had an old padlock on the large doors of the entrance at the side of the building. The old couple told us they bought the building together with their house behind it in the 1990s. There was nothing left from the dairy inside. İlhan insisted and asked if they heard anything about Hacı İdris and his cheesemaking in the village, but the couple told him that they only knew his name as an ancient Terekeme villager everyone knows in the village. Then İlhan realized that the padlock looked quite old, turned around and asked: "Can we take the padlock to our cheese museum in Kars?" This question was quite unexpected, she could not answer immediately. After a short pause, she said İlhan would need to leave something to get the padlock. When her husband started to unlock the door, İlhan and I moved to our car to get some cheese for them. Together with some cash, we offered them lots of cheese. The women gave us the padlock, stated that she did not know where the padlock came from and thanked us for the money and cheese.

After we secured the new padlock of the museum building in Boğatepe, our local guide Tahmaz told us that the larger dairy operated by Hacı İdris is located in the nearby higher altitude pastures. This *zavot* was located in Dağ Bezekli (Mountain Bezekli) and could not be accessed with the car we were driving. The *zavot* was known to be owned by Swiss cheesemakers before Soviet times. Tahmaz introduced us to the family who bought the dairy after the dissolution of the Soviet Socialist Republic of Georgia. They partly renovated and operated a small portion of the dairy for a few years in the pastures. However, due to economic crises and the decline of dairy farming in the region in the late 1990s, cheesemaking did not continue.

Photograph 1: The abandoned dairy in Dağ Bezekli pastures (2014**).**

Photograph 2: An abandoned cauldron inside the dairy in Dağbezekli pastures (2014).

Another abandoned *zavot* we encountered was in Mahmutly village. Baron von Kutzschenbach, a settler from Prussia, established this dairy in 1862. It was one of the biggest Swiss cheese production sites in the South Caucasus in the late 19th and early 20th centuries. Many swiss cheese masters were employed here until 1914 (D. Ünsal 2014). In 2014, when we visited Mahmutlu/Mamutly, we encountered a village populated with Terekeme, Azeri and a few Armenian farmers. The villagers told us that an Armenian cheese master, Aram, made Swiss cheese and other dairy products in the dairy until 1969. Then the dairy was abandoned. The villagers did not tell us what happened in detail, maybe they did

not know or there were other reasons. One thing was sure, Aram and his family left the village in the 1970s. Some said Aram had another dairy in the south; others said they emigrated to a village in Armenian territories. They said that some German families (*nemets* – in Russian) used to live in a nearby settlement during the Soviet times until the Second World War. A quick internet search revealed that family members of von Kutzschenbach were listed among the prisoners in 1944 in South Caucasus[65].

Photograph 3: The abandoned dairy in Mahmutlu village (2014).

While most German and Swiss settlers left South Caucasus in the 1910s, many families stayed in the region. Yet the colonial ethno-religious order of the early 20th century has gone through different transformations on the two sides of the border between the Turkish nation-state and Soviet Socialist Republics of Georgia and Armenia. Collectivization of property and the establishments of Kolkhozes and Solkhozes paved the way for larger *zavot*s in rural South Caucasus[66]. Throughout my four visits to Georgia and Armenia in 2014,

[65] http://www.kaukasusdeutsche.de/en/geschichte/1941-1955.html (accessed on 11 June 2022).

[66] The word *zavot*, different than its meaning as artisanal dairy processing sites in Kars, also acquired the meaning of dairy factory in Georgia – in line with the meaning of "factory" in Russian.

2017, 2018, and 2019, I also encountered large *zavot*s, some of which included cheesemaking technical schools, all of which were abandoned.

In addition to the abandoned, almost demolished *zavot*s, İlhan and I unexpectedly encountered an abandoned building of a dairy school and a large dairy factory in Karabulakh, Georgia. When we asked the villagers about Swiss cheese and the presence of Germans and Swiss colonizers, they called an old villager who used to be a chief cheese master until the late 1980s. He took us to an abandoned 4-floor building and explained that this building was a significant dairy institute in the Soviet times. He was trained in this school, and later became an instructor and master in the dairy that was also located in this building. He said that for many years this institute cultivated important cheese masters like Aram in Mahmutlu. It also produced different types of Swiss cheeses. The master looked at the picture of Boğatepe Gravyeri we showed him and told us that he used to make similar cheeses together with other Swiss (*Şvetzar*) ones like the one with holes (a more Emmentaler type) and a cubic-shaped smaller cheese that is still found in the Georgian market. The production of more than one type of Swiss cheese appeared to be the case in several Soviet collective production centers, according to the farmers who remember various kinds of cheeses that were made in the *zavot*s.

Photograph 4: The abandoned dairy school in Karabulakh village (2014).

Photograph 5: Inside the dairy in Karabulakh village (2014).

Hence Armen who continue making Swiss cheese in Ninotsminda had the only remaining active *zavot* in Georgia. He knew that there was one more producer in Armenia, in the Amasia region, rural Gyumri. The geography is very similar, he added. The pastures of Ninotsminda (Bogdanovka) were located southwest of the center, on the slopes of the higher-altitude mountains that continue in the Armenian territories in the south. He stated that his

father Vahe was trained in Armenia, more in the east, and then worked in the Amasia region before moving to Ninotsminda/Bogdanovka. When I encountered Vahe's old friend Husik, in Gyumri (Leninakan), I learned that Vahe was trained in an important dairy school near Tashir (Kalinino). Two large Swiss cheese production sites during Soviet rule were located at Tashir and Amasia – none of them survived in the late 20th century.

Making Swiss cheese in Armenia

After we visited Armen in Ninotsminda, we crossed the Armenian border and reached Gyumri at night. We were surprised and happy that obtaining a visa and entering Armenia happened smoothly for me and my friend Nilhan as two Turkish citizens. The following day, I was traveling in the Amasia region with Ani, who used to be the mayor of Aregnadem village. I was lucky to visit different places in the region (like Amasia, Bertashen, Zorakert, Ardenis, Hertashen, Musayelyan), famous for its Swiss cheese production centers before and during the Soviet Socialist times. The large Swiss cheese dairy was located in Shurabat, by lake Arpi, according to a few villagers we encountered in Bertashen. The next day when we went to Hartashen, we learned about Khosrov, who owned a small *zavot* in Ahotsk. We met Khosrov in Gyumri, he explained that his father was a Swiss cheese master who worked in several dairies, including the one in Musayelyan where his father and another master, Husik worked together in the 1970s. Then his father and Khosrov established a dairy in Amasia, which operated from 1989 until 2013. In 2019, he continued his cheesemaking in Ahotsk where he no longer made Swiss cheese. He explained to us that he could not sell this cheese anymore. His production included local varieties like sulguni, çanak (chanakh), or çeçil (checil or civil) and a small amount of cheddar and mozzarella-type cheeses. When we reached Husik the same day, we learned that he was the only remaining Swiss cheese producer in the Amasia region.

Husik used to work in Musayelyan *zavot* under the Soviet regime in 1977. He told us that Musayelyan *zavot* was established in 1973. They used to make large wheels of Swiss cheese, which (together with differently cultured, shaped, and aged varieties) amounted to 300-350 tons yearly. When we spoke that day in 2019, he told me that he made only around 20-25 tons of "Emmental" each year between May and August. Rather than large wheels, this cheese has a cubic or rather rectangular shape. Husik told us that the use of paraffin or similar materials to cover the aged cheese while storage became widespread in the 1970s and onwards. In some places, like Ninotsminda, these hard cheeses with a crust, which are covered with usually yellow paraffin, could also be called Holland or Gouda. Husik explains that these rectangular prism shaped Emmantaler-like cheeses of 5-kilogram weight are more easily sold in the dairy market in Armenia and Georgia. The former production of Swiss cheese in the form of large wheels is not profitable anymore for dairy owners because the markets have shrunk for them: together with the decline of the German and Swiss population locally and the demise of the particular connections with Soviet cities like Leningrad (St. Petersburg) and Moscow made impossible for the dairy owners to produce large cheeses in big amounts.

The next day we went to Tashir. We looked for the address Husik gave us to visit the dairy that is owned by a Swiss cheese master, Razmik. Husik had told us that Amasia used to be the second most important Swiss cheese production center in Armenia after Tashir, which was also an educational center until the late 1980s. Razmik's father was the director of the cheesemaking school. The big Kalinino *zavot* was demolished in 1988, said Razmik, and some remnants could be seen at the village Katnarat. After our interview, we drove to Katnarat and encountered the abandoned *zavot*. Razmik does not produce Swiss cheese (*şvetzar*) anymore. For a few years, he made wheels of 65-70 kg cheeses in the late 1990s. Later he switched this production into smaller forms of European cheeses like paraffined

Gouda-type (also called Holland) or cubic Emmental-type. In the meantime, he increased his production of more local varieties like sulguni, canakh etc., and secured a consistent share in the local and national markets.

Photograph 6: The abandoned dairy school in Katnarat (2019).

Photograph 7: The abandoned brine pools of the dairy in Katnarat (2019).

Razmik told us that in the north of Katnarat and Tashir, many villages were located around the border between Armenia and Georgia. Milk production in agro-pastoral livelihoods and dairy production in *zavot*s were crucial for these villages' everyday life. When the national borders between Georgia and Armenia were settled after the consecutive independence declarations of the former Soviet republics in the early 1990s, many families

and communities moved within the nation-states. As Razmik explained, Azeri families used to be part of dairy arrangements in Tashir. After 1991, while most Azeris in Armenia left their villages to move to Azerbaijan, Georgia, or Turkey, most Greek left their villages to move to Greece, and many Armenians from different parts of South Caucasus (former Soviet territories) moved to rural Armenia. All the cheesemakers I encountered in rural Georgia and Armenia (as well as in Turkey) narrated the last 30 years as a continuous dispossession for dairy farmers. The movement of human communities and dairy animals – cows, sheep, and goats –not only resulted in depopulation but also dissolved dairy arrangements that, albeit marginally, were re-configured in different nation-state territories.

Making *terroir* across boundaries

I have been following the adventures of Swiss cheese in Kars for almost ten years. This unique 'food heritage' is inherited very differently, across pastures and villages alongside Turkish-Georgian-Armenian nation-state territorial borders under various circumstances. The knowledge I brought together in this dissertation about how Swiss cheese is remembered and its variations are recomposed can fuel further ethnographic research. Following my analysis of the terroir of Boğatepe Gravyeri in Chapter 1, this interlude aimed to show the traces of the terroir of this cheese in its movements across nation-state borders. In other words, it was not only people, animals, cheesemaking techniques and technologies but also the *terroir* itself which moved across borders. Yet it also pointed to the upcoming interrogations of this dissertation. The boundaries between nation-states as territorial borders were not considered when cheesemakers or dairy farmers talked about the shared heritage of Swiss cheesemaking in the South Caucasus. Anthropologist Cristina Grasseni conceptualizes the competition of local cheese varieties in Northern Italian Alps as the "heritage arena" (Grasseni 2016). The heritage arena of Swiss cheese, as it emerges from beyond (and through) nation-state borders in South Caucasus paved the way in the 20th century to make

gravyer in Kars, *şvetzar* or *emmental* in Georgia and Armenia. Does this imply that the terroir of Swiss cheese in South Caucasus became a terroir of three slightly different kinds of cheese?

In line with my analysis in Chapter 1, I find the concept of "terroir" provocative since it brings together place and taste, both of which keep transforming in time and space. Worlds of dairy production and cheesemaking, as naturalcultural becomings of grass, cows, sheep, goats, farmers, milk, and dairy crafts are shaped by and challenge clear-cut national or ethno-religious boundaries that support territorial state borders. In other words, the territoriality of cheesemaking and the terroir of *gravyer* can only be understood as a multispecies or more-than-human and vibrant place-making process across boundaries. Terroir is a becoming, a particular process of combining place and products in practice and markets (West 2022). Inspired by the word *maya* and its multiple meanings, I approach terroir as a fermentation process. When Swiss cheese was added to the existing dairy arrangements within the agro-pastoralism of local communities, it transformed (and was also transformed by) milk production and processing in pastures to sell.

As the stories I shared in this interlude reveal, the making of terroir of Swiss cheese in the South Caucasus includes the remnants of countless migration and displacement stories constituting the place-making processes. Seasonal agro-pastoralist pathways, and everyday practices of dairy farming, and cheesemaking have been configured in many different ways in the last 150 years in Northeastern Turkey and South Caucasus. I listened to Ashot, whose maternal family fled from genocide in 1915 to Northwestern Armenia, and whose paternal family had to settle in their summer pastures after 1921 since their winter village settlement stayed on the Turkish side of the border. Ashot told us he grew up in Azeri, Greek, and Ezidi villages, who are not as much part of everyday life in this part of Armenia. In many

cheesemaking stories he shared with us, particular differences in techniques or ingredients between the communities that shape the resulting cheese in specific ways.

Apart from *gravyer* and *kaşar* cheeses – the two most common commercial cheese kinds that are also the main foci of this dissertation research – other local-traditional cheeses like *checil*, *chanakh*, and *motal*/*tuluk* are made in almost all the villages and compose the majority of the cheeses in people's homes and local dairy markets. I have listened to countless similar stories about how some particular cheese varieties or particularities are associated with different ethno-religious identities: Armenians use the hairy part of the animal skinbag when they make *motal* cheese, Greeks age the white cheese differently than other locals, Alevis make *checil* cheese much thinner than others, Terekemes and Armenians make very good *chanakh* in Turkish-Georgian-Armenian borderlands, Armenians and Kurdish use different plants to mix with the cheese. Almost everyone loves allowing mold to make its way into the *motal* and *tulum* (skinbag) cheeses during the ageing period towards the winter. This list can also be multiplied in many different ways. For instance some Kurdish families age white cheese very similar to Greek traditions in villages where there is apparently no more Greek inhabitants. Some Terekeme families can make *checil* as thin as Alevis. Also, many families are mixed. Ashot told us about his grandmother who is from a Muslim family in Kars. Similarly, İlhan answered BBC Radio editor Dan Saladino when asked about how he sees the cheesemaking heritage:

> Cheeses are cultural carriers (*kültürel taşıyıcı*). I believe that cultures are alive, they are formed within everyday life. As someone who is a child of a family in which many different national, ethnic, and religious belongings come together, I live in Kars. I look at my family and my village: Turkish, German, Kurdish, probably Armenian, Greek, Molokan… they all have blood in this large family. They also exist in the cheeses we make. All the different communities have come together in various ways to produce food, to make cheese here. And they left many traces even if they are absent today. *Gravyer* has knowledge from Switzerland, its production culture is formed in the Caucasus, and it lives in Kars. Who produces milk? Who works here?

> We are all together making this cheese that emerged as and carries a common culture around food.

İlhan's emphasis on the "common culture" of the various ethno-religious cultural communities made me question how various processes of violence, displacement, and dispossession are parts of the formation of cheesemaking practices. As I outlined in Chapter 1, the production of Swiss cheese in the 1920s Turkey involved the settlement of *Terekeme* families in abandoned villages, pastures and *zavot*s. In the next chapter, I will analyze the (re)configurations of the dairy arrangements in Kars pastures until 1980. I will focus on the patterns of movements by animals, humans, and milk in the spatial arrangements of pasture-cheesemaking. Deciphering the forms of agro-pastoralism in the 20th century, Kars will allow me to explore processes of commoning and uncommoning in the making of not only pasture-cheeses but also place through movements across boundaries.

Chapter 2

Dairy Arrangements of *Mera Hayvancılığı*: Pasture-Cheesemaking in Kars

Visiting the ruins of a pasture-farm

I visited the remnants of the demolished buildings in İsaçayırı pastures with Erol who spent his childhood and early adult years in this large farm until it was attacked by an armed group in 1979. Efkan owned a *hamam* when I met him in 2010; I frequently visited him since then, especially when I lived in Kars during my fieldwork in 2017-2019. İsaçayırı was one of the three largest dairy farms that used to be located in the southeast of city center. As we drove on that sunny July afternoon, Efkan told me and Erol about the harsh living conditions in the farm during the long winters of Kars back in the day; there was no electricity, the roads would be inaccessible due to blizzards, and they had to monitor the borders of the farm regularly which meant long hours of horse riding. When I asked him why, he said that just like the pastures of a village, his family did not want anyone to trespass the farm's borders without their notice. When many herds lived in the pastures during summer, things were easier to monitor and control since several shepherds would be in touch with Erol's uncle and report back to him about land use. Moreover, his family owned a lot of animals in İsaçayırı farm and since theft used to be a major concern, it required the owners to patrol the fields with a rifle as a precaution. Such measures were also vital for keeping the farm secure against wolves who would chase and hunt cows and sheep on a regular basis. Also, the residents of the mostly Kurdish villages that surrounded the pastures were discontent about İsaçayırı pasture-farm since they couldn't access this large grazing area due to its private property status. As I elaborate more in detail in this chapter, this latter factor cause the private dairy farm of İsaçayırı to be torn down.

In order to reach the ruins, we turned left from the main road between Kars city center and Digor (a district nearby) that was located a couple of kilometers further from an army barracks (Dağpınar Jandarma Başkomutanlığı) in the region. On our right handside was Dağpınar, another town that had become an important center in the local organization of the Kurdish movement and the Turkish state's counterinsurgency measures since the 1990s. After a left turn, we started driving towards Dumanlı Dağ (Dumanlı Mountain) where the farm used to be in its foothills. Soon, Erol told us we just had just passed beyond the farm borders and added that those wore the original borders later redrawn by the Turkish state in 1960, when about a third of the land was redistributed to the villages in the vicinity as pastures. After a few kilometers, we encountered a large state building, constructed in the 1980s but never officially operated. Erol told us that after his family farm was attacked, access to the pastures was banned by the state for a few years, and following that the construction project started and lasted for multiple years.

İsaçayırı pasture-farm, patterns of agro-pastoralism (*mera hayvancılığı)* and cheesemaking (*peynircilik*) it entailed, provides an intriguing case to explore dairy arrangements of commercial cheesemaking in Kars in the 20th century. This chapter focuses on the dairy arrangements of *mera hayvancılığı* in Kars province before the massive depopulation started in the 1980s. By "dairy arrangements", I refer to the material web of sociotechnical practices of obtaining milk in pastures and crafting it into cheeses in dairies. *Mera* in Turkish implies both a legal status of being common pastures of villages – usually containing summer settlements (*yayla*) – and a colloquial understanding of meadows (*otlak* or *çayır*) for pasturing animals that may also contain fields (*tarla*). *Hayvancılık* can be translated as animal farming[67]. *Mera hayvancılığı* entails a movement of animals and humans, as well as of the boundaries between *mera, çayır, yayla*, and *tarla*. This movement

[67] I use animal farming, as well as cow and sheep farming in this dissertation in parallel to the English translation of Jocelyn Porcher's definition of animal husbandry (*élevage*) (Porcher 2017).

has complex patterns, which includes rotational grazing and shepherding, mowing grass for the winter, cultivating food in fields, rental agreements, protecting boundaries of the village pastures and fields. Throughout this dissertation, the more-than-human entanglements in this movement are analyzed through pasture-cheesemaking. Let me continue to describe my encounter with the remnants of the İsaçayırı pasture-farm (*çiftlik*), and the conflicts over the ownership (or use) of its pastures before elaborating on the dairy arrangements of pasture-farms in Kars between 1930 and 1960, and their dissolution by 1980 in the rest of this chapter.

We kept driving for a few more kilometers after the abandoned building and then started walking because the paved road was over. Erol first took us to the nearby spring where a stone canal used for providing the animals with fresh water existed, even though partly destroyed. We approached the spring to fill our water bottles where a couple of kids were filling their large plastic bins to carry water to their pasture settlements (*yayla*). We continued our walk through the strikingly green grass colored with yellow flowers. It did not take long to reach the ruins of the farm, which I could not notice until Erol stopped and stared at the grey stones that were hardly distinguishable from the rocks in the terrain.

When Erol started to describe the burnt down İsaçayırı farm as we walked the ruins, the scale of the dairy arrangements in this remote pastureland struck me profoundly. Erol first showed us the remnants of the main house where his family used to live all year long. Then he walked over the grasses that used to host huge sheds and barns that accommodated hundreds of cows and oxen, thousands of sheep, and dozens of horses. What struck me was not only struck by this large, wealthy family farm's built structures but also other buildings that were reserved for the villagers who came with their herds during the summer months.

Erol showed us an area approximately 250 meters away from their own house, where he told us that there were 30-40 tiny stone houses, each with one or two rooms. I asked the names of the villages which used to come here for the pasture. That day Erol remembered 13 villages and added there were more villages he could not remember the names of. Lastly, he took us to the place of the old dairy. It was located in between pasture houses and the sheds of the family. Erol explained to us that it was a two-floor building. Similar to the other *gravyer* dairies, the basement was composed of hot and cold aging rooms (*badvals*), and the upstairs was the production site. They used to have two large cauldrons for making *gravyer*, and a small vat for making *kaşar*. During the pasture season, when the animals produced the most milk, they used to produce two wheels of *gravyer* in the morning and two wheels in the evening - each production starting right after the women milked the cows twice every day. İsaçayırı farm, the largest private farm in Kars between 1930 and 1980, hosted thousands of cows and sheep during the pasture season each year. It was also very close to the Mişko Gölü (Mişko Lake) pasture-farm, which was owned by Erol's aunt (*hala*) and uncles (*enişte*). The big *kaşar* dairies that were established in *Mişko Gölü* pastures collected some milk from nearby villages and pastures.

According to the official records, the milk production in Kars amounted to 170905 tons in 1941 and 244013 tons in 1948 (Aras 1954, 163–65). The existing 32 dairies processed 5466 tons of milk in 1948 (Aras 1954, 156, 169), and produced 500 tons of *kaşar* and 100 tons of *gravyer* cheese in 1968 (Kurt 1968, 27)[68]. In addition to the 196 Zavot cows that are listed among the "*damızlık materyelleri*" (breeding materials) (Aras 1954, 141), Ali Güngören (Tarçınlı Ali) owned, hundreds of more cows and around a thousand sheep who used to live in the pasture-farm. During the pasture season, farmers and animals from a few nearby lower-altitude villages use İsaçayırı pastures. Tarçınlı family also made milk or

[68] Kurt also indicates 600 tons of butter, 100 tons of white cheese (*beyaz peynir*), and 200 tons of casein production in Kars in 1968.

animal contracts with a dozen of villages, most of which were located further in the North and Northeast. These contracts mostly entailed renting dairy herds for the pasture season from peasants. Some families who would come and live in the farm with their animals were paid for their labor, similar to the workers in the farm and dairy. Tarçınlı family bought all the milk produced by the cows and milked by peasants on the pastures[69].

The complicated form of *mera hayvancılığı* in İsaçayırı pasture-farm (*çiftlik*) led to conflicts over the conditions of ownership of the pastures. The commercial agreements that manage the flow of milk in İsaçayırı pasture-farm reveal the transformation of the dairy arrangements between 1930 and 1980 in Kars and in Turkey. In the next section, I focus on the formation of the dairy arrangements in Kars province in the early years of the Turkish Republic (late 1920s). I suggest that the cooperatives or partnerships of dairies in the 1930s and 1940s were replaced by a few large pasture-farms, which not only bought milk from small peasant farmer families, but also rented animals and employed many workers. These infrastructures (Tatari forthcoming) of commercial dairy production in pastures – or *pasture-cheesemaking arrangements* – lasted until the late 1970s and early 1980s, when the pasture-farms and most large dairies were attacked and stopped their operation. In the last section of this chapter, I revisit the intriguing case of İsaçayırı pasture-farm. The local peasants, backed by an organized revolutionary armed group, attacked and burnt down the houses, dairies, and other establishments in late 1979, almost 50 years after its establishment. I focus on the culmination of events that led to this "occupation" or "commoning" of the pasture-farm.

[69] The details of caring for the newborns, other cows, and animals in general in the everyday life of agro-pastoralism will be discussed throughout this dissertation. Here, it is important to note that not all the milk of the cows is sold to the dairy owners; the milk of the cows belong to their calves entirely in the first 3 months (if not longer) after birth, and partially during the whole lactation cycle.

Mera hayvancılığı and dairy arrangements in Kars between 1920 and 1980

When I started my research on the history of commercial cheesemaking in Kars, I quickly realized that *mera hayvacılığı* (agro-pastoralism) constituted the underlying dairy arrangements of milk collection. I use "dairy arrangements" to refer the material web of relations that makes dairy production possible through sociotechnical practices of obtaining milk in pastures and crafting it into cheeses in dairies[70]. Pastures, which are crucial sites of the dairy production in Kars, are materially connected to the dairies through the flow of milk. The pastures in the broadest sense of the word (including *mera*, *yayla*, *çayır*) feed the animals with green, fresh grass approximately for five months from late April until late September. For the remaining seven months, the animals are mostly kept inside the sheds due to the cold weather. Grass cut in pastures in August and September still constitute the main feedstock of the animals during the winter months – it is usually supported with grains that are cultivated in the fields. This yearly agro-pastoral cycle has immediate effects on milk yields, especially for cows. While most milk is produced during the pasture season, the percentage of fat in milk decreases. As the milk is directly related to the pregnancy of animals, the farmers traditionally control the reproduction of cows according to the yearly pastoral cycle. The bulls are taken inside the herds of cows during the pasture season by taking into account the pregnancy period of cows, which lasts around nine months. The desired birth date of calves is winter months, January or February if possible. This way the newborns can milk their mothers for a couple of months, which make them physically strong enough by May for the upcoming open-air pasture conditions until the Fall.

Mera hayvancılığı is the term that is mostly used by farmers, cheesemakers, development experts like government officials and scientists throughout the 20th century to

[70] I conceptualized these arrangements as "dairy infrastructures" (Tatari forthcoming) in order to analyze everyday practices that make pastures into an infrastructure for dairy production.

describe the characteristics of peasantry, dairy industry and cheesemaking in Kars. Veterinarian Ali Aras who conducted a study on the Economic Structures of Dairy Production Enterprises in 1948 describes *mera hayvancılığı* both as an important strength thanks to the vast and fertile pastures available for animals, and as the major obstacle to the development of dairy industry in Kars (Aras 1954). *Mera hayvancılığı* involves a range of different movement patterns of farmers and animals across "pastures" of Kars. Aras states that these movements not only increase the contagion of the existing animal diseases but also implies seasonal fluctuations in milk yields, and complicated patterns of movement by herds, flocks, shepherds, and families (Aras 1954, 180). The seasonal movements across private fields (*tarla*), common and private meadows (*çayır*), and common or rental[71] pastures (*mera*, *yayla*) complicated the production and circulation networks of milk flow to the dairies. Aras underlines that dairy industry requires high yields of milk from cows (particular breeds), and a sustained regular milk provision to the high capacity industrial enterprises (*endüstriyel işletme*). The seasonal movements of agro-pastoral communities in Kars made this industrial organization almost impossible.

Kars is well known for its high-altitude pastures (*mera, yayla, çayır*) on a vast plateau. Unlike most of the Eastern Anatolia, the terrain in Kars is not that rough (*engebeli*), making it more suitable for farmers to herd cows. The sheep have also always been part of the *mera hayvancılığı* in Kars, as in most central and eastern Anatolia as well as in South Caucasus. Yet cow milk always outnumbered sheep milk in Kars in the 20th century (Aras 1954, 166). Except for a few villages in Kars, sheep farming (*koyunculuk*) has been limited to Iğdır, the province in the southeast of Kars, which used to be a subprefecture of Kars until 1993. Iğdır is situated in a lower altitude plain surrounded by the high plateaus of Kars in the north and west, and mountainous Ağrı province in the west and south. The pastures at the

[71] Pastures that are commons of a particular village, can be rented by the mayor (*muhtar*). Renting pastures is common among the farmers to care for the male calves most of which are sold by the fall, primarily to butchers.

northern foothills of Ağrı (Ararat) Mountain have been crucial for sheep herding in Iğdır province, the northeastern administrative borders of which form the nation-state borders between Turkey and Armenia. Since these pastures are not enough for all the flocks, many villages seasonally migrated to the pastures in the neighboring Kars and Ağrı provinces.

Patterns of transhumance have been re-invented[72] in Kars agro-pastoralism since almost all the inhabitants settled in the province after 1920. Access to pastures after the spring has always been crucial for the subsistence economy of peasants, a great majority of whom resided in abandoned settlements in the 1920s. The drastic demographic change in Kars between 1910 and 1930 and the settlement policies issued by the Turkish state have been part of the patterns of movements in everyday life of agro-pastoralism. The multiplicity of ethnoreligious communities and traditions regarding transhumance paved the way for new pathways for agro-pastoralism. These pathways have also shaped the possible dairy arrangements. Kars province was at the emerging nation-state borders between the Turkish Republic, and the Soviet Socialist Republics of Armenia and Georgia by 1921. This territorial border enabled significant trade until the years of the Cold War. Yet it also contributed to the militarization of the province with border checkpoints and preparation against possible military attacks. As the pastures have been crucial for agro-pastoralism, the distribution of land (in the forms of abandoned village and pasture settlements, dairies, fields or meadows and pastures) among the new settlers, mostly immigrant Turkish (Sunni or Shia Turkic communities) and Kurdish communities (mostly Sunni) led to new arrangements. As I describe more in detail below, the emergence of pasture-farms in the 1940s and 1950s implied particular arrangements of agro-pastoral pathways and spatial boundaries between pastures, villages, and families of diverse communities.

[72] I extend the use of "re-invention" in the food studies literature, especially for "local cheese" (Grasseni et al. 2014; Grasseni 2011; 2016; Percival and Percival 2017) to the patterns of movement in agro-pastoral life.

These arrangements in the form of a farm (*çiftlik*) were parallel to the policies that aimed to keep rural inequalities untouched (Pamuk and Toprak 1988). They also involved more "advanced dairy production" than subsistent peasants (Aras 1954, 172). Yet they rely on seasonal movements of herds, flocks, and humans, which makes milk production insufficient for industrial factories. These movements, which were governed by more-than-human farming practices, were also circumvented by landholding and management practices of the Turkish state.

Three relatively wealthy Terekeme families privately owned three large pasture-farms that used to be important centers of *kaşar* and *gravyer* production. They were dismantled by 1980, after the attacks by peasants and armed revolutionary groups on the large dairy owners in Turkey's political climate of revolutionary struggle.[73] After the military coup of 12 September in 1980 with its violent military junta and the following critical decisions on the liberalization of the national economy, agro-pastoralism in Kars was deeply affected by the political turmoil and armed conflict between the Turkish Army and Kurdistan Workers' Party (PKK) which launched a guerilla war in the rural North Kurdistan (a large part of Eastern Anatolia) in 1984. Counter-insurgency measures created a massive displacement, the army burned down hundreds of villages, and countless animals were also killed in this process[74]. Kars province has constituted the northern boundaries of the region that was declared as *olağanüstü hal* (state of emergency) by the state during the long years of the conflict.

In 1993, Kars province was divided into three separate provinces: Ardahan, Kars, and Iğdır. Iğdır, with the highest Kurdish population percentage among the three, also became the most militarized. Yet, particular places in Ardahan and Kars have also been subject to many counter-insurgency measures in the 1990s and 2000s. The bans on pasture access profoundly

[73] The armed revolutionary movements have been widespread in rural Turkey the 1970s.

[74] The forced displacement of Kurdish people, among other implications, also corresponds to a violent process of annihilation of agro-pastoral lives in rural Turkey.

affected everyday practices of agro-pastoralism, and pasture cheesemaking. The foothills of Ararat Mountain have been banned to the villages for pasturing activities since the 1980s.[75] This obliged peasants to use pastures in Ağrı, Kars, and Ardahan even more during the pasture season between May and October when the lower altitude Iğdır meadows are too hot for the flocks of sheep to be protected from contagious diseases and other health problems.

Together with the armed conflict, the economic liberalization policies in Turkey also made subsistence livelihoods of *mera hayvancılığı* more and more difficult after 1980. The state subsidies and price determination mechanisms were gradually dismantled. The state-owned dairy enterprises, mainly founded within the developmentalist policies of the 1960s and 1970s, were either privatized or stopped functioning to support dairy farming households. The number of domestic small and large ruminant animals (i.e. cows, sheep, and goats) in Kars has significantly dropped from 1985 to 2003 (Demir 2016, 56). The population of the provinces also shrunk in this period. With the dissolution of *gravyer* dairies, whose owners also controlled a significant portion of the dairy cows who pasture and give milk each year in Kars, commercial dairy production became confined to small *kaşar* dairies after the 1980s. In Interlude 2, I discuss the transformation of *kaşar* cheesemaking arrangements between 1980-2010. In the remaining part of this chapter, I focus on dairy arrangements of pasture-cheesemaking in Kars between 1930 and 1980.

Dairy arrangements of pasture-cheesemaking in Kars

Kars has been the largest milk producer province in Turkey until the late 1980s. In the reports and scientific studies on animal husbandry and dairy production, Kars was cited among the places where developmentalist state investments should be made (Üresin 1936; Aras 1954; Kendir 1966; Kurt 1968; Erkun 1977; Öztek 1983). Between 1921 and 1960, it

[75] My interviews with various farmers from Iğdır revealed that pastures in the Northeastern foothills of the Ararat (Ağrı) Mountain have been inaccessible due to security reasons for more than forty years.

was the center of most *kaşar* production in the country[76]. According to Aras' calculation, the subsistence agro-pastoralism in Kars permits only a maximum of 25% of produced milk to be sold or crafted into commercial dairy products in 1948. He expected that only 5-10% of the total milk produced in Kars was processed in the dairy enterprises (*süt mamuleciliği işletmeleri*)[77]: "*zavot*s" (dairies) and Kars Milk Powder Company (Aras 1954, 170). The latter was a joint investment of the Turkish and Swiss states. Aras argues that the capacity of this only industrial dairy enterprise was barely used in 1950 due to the lack of a steady milk supply that stems from the regular seasonal fluctuations of milk in agro-pastoralism (Aras 1954, 164). The movements across pastures complicated the movement of milk to commercial dairy production.

The available pastures per animal, number of animal holdings per house, breeds of animals, and relations with the state mattered for the patterns of dairying in Kars. In addition to subsistence dairy farming, which involves dairy-crafts in the house to obtain various food that can also be saved for the difficult and harsh winter months – different types of yogurt and butter and various kinds of local cheeses. Commercial cheesemaking was limited to the local cheese varieties; mostly *çeçil* and *tulum* could be found in the small dairy stores. Yet *kaşar* and *gravyer* cheeses had become essential sources of revenue for many farmers. Establishing a small *kaşar zavot* was possible by buying milk from a few neighboring families. Since *kaşar* does not require the same process and scale of production as *gravyer*,

[76] Many small seasonal *zavots* in pastures dominated the small scale *kaşar* production by peasant families as petty commodity production units. Kars *kaşar* cheese was known as a lower quality version of Trace (Trakya) *kaşar* cheese due to the less amount of sheep milk that goes into making a batch of cheese in Kars. Although sheep farming used to be very common (not only for meat but more) for milk production in Kars, and sheep have always been part of most peasant life across the mountains of Northeastern Black Sea and South Caucasus, Kars province is very special in providing large, convenient plateaus for raising larger ruminants like cows, cattle, buffaloes which cannot live well in rugged geographies, such as Northeastern Black Sea, Eastern Anatolia or Thrace. Since *kaşar* cheese is traditionally produced in the Balkans, the Trace region, and parts of Marmara and Aegean costs; it originally contains sheep and goat milk much more than cows who have been a smaller minority until the second half of the 20th century in most places of Turkey, except Kars and very few other Anatolian provinces. In the interlude I will describe the relationship between the industrialization of cheesemaking in Turkey and the low quality kaşar cheesemaking in Kars.

[77] This number rose to 45-50% in 2020.

daily milk processed in the dairy can be lower. At the same time, a crucial difference in the process of making *kaşar* and *gravyer* also affected how *kaşar* dairies aimed to govern the milk flow in pastures. Making *gravyer* requires at least 900-1000 kg of fresh milk to be processed within a few hours into a large wheel of cheese. On the other hand, the process to make *kaşar* cheese has two intervals: obtaining the curd and boiling the curd. Until 2004, *kaşar* dairies were allowed to obtain the curd of the fresh milk they collected in pastures (*baskı*), and later transport these curds to their principal dairy to mix and boil them to make *kaşar* cheeses. I will explain this technique (*baskı*) more in Chapter 3, here I would like to highlight that the first step in *kaşar* cheesemaking could be realized in pastures by cheesemakers or their workers (master, apprentice or a family member) during the pasture-season. A mobile dairy-tent or a pasture settlement (*yayla evi*) serving as a dairy to make curds (*baskı*), was very widespread in rural Kars until the 2000s.

Aras emphasizes that *kaşar* and *gravyer zavot*s always involved a dairy owner (or partners) that would buy large quantities of milk from peasants – the number of farmers who can make cheese exclusively from their milk has always been minimal. Buying milk was mainly realized through a contract between peasants and dairy owners on a price (usually settled first in the Fall and then revised in Spring each year). Another major solution to the need for fresh milk in proximity to the dairies was that dairy owners, who have access to large pastures, rented dairy animals from peasants during the pasture season. The latter, a rental agreement for animals, was primarily performed by wealthy families who owned dairies or had access to the pastures where they could sell milk to a dairy.[78] Hence, dairy owners and milk production units (peasant households) had two different arrangements, each favoring the dairy owner in revenue, as I explain in the next section.

[78] Ali Aras discusses the patterns of this dairy production in detail (Aras 1954, 133–50).

Ali Aras provides two overlapping pictures. On the one hand, he mentions the existing numbers of the *kaşar* and *gravyer* dairies in the province, and he describes some of them in detail. On the other hand, he shares the list of the leading "breeders" (*yetiştirici*) who owned *damızlık* cows. These breeders who owned around 100 or more cows also composed the majority of the *gravyer* dairy owners in the province, and a significant portion of *kaşar* dairies. In other words, the dairy arrangements of *kaşar* and *gravyer* cheesemaking, while they are embedded in everyday life of agro-pastoralism, also affect the routes of communities during the pasture-season. Ali Aras describes three levels for the dairy production in Kars: peasant production to zavot production (*kaşar* or *gravyer)* and the industrial enterprise as the most 'advanced' (*ileri*) (Aras 1954, 172).

The higher altitude *gravyer* production sites are cited as the most critical commercial dairy production centers in Kars. An important reason is that *gravyer* cheese, which necessitates milk from high altitude pastures, requires more complicated technologies and techniques than other cheeses; hence it is considered a more 'advanced' dairy industry by scientists and development experts. Another significant reason is that *gravyer* cheesemaking requires large amounts of milk to be available or carried over to where the dairy is located. Although *kaşar* cheese can be made from the curd (*teleme*) that is obtained in the pasture and carried over to the dairy, *gravyer* cheese needs the raw milk to be quickly transferred to the dairy, where all the production process has to take place. This technical aspect is closely connected with the feedback loop that can be observed between 1920 and 1980. Since more good quality milk was available in particular pastures, *gravyer* dairies were founded in these places. Once the latter paved the way for the institutionalization of milk commercialization and collection mechanisms between farmers and dairy owners, dairy farming, milk production and selling milk to the dairy has increasingly become part of the agro-pastoral livelihoods. Since larger volumes of milk became available, and running a dairy

(*mandıracılık*) became more familiar, new *kaşar* dairies were also started on or nearby these pastures. In other words, milk-fed dairies, which in turn provided more milk and paved the way for new dairies.

Aras' extensive study offers many other details on *mera hayvancılığı*, milk production, and dairy production in Kars. He also calls for more state investment in animal care, milk production, and cheesemaking. In less than 10 years, after the 1960 military coup, the new development paradigm of the Turkish State paved the way for new institutions like *Türkiye Süt Endüstrisi Kurumu Kars Fabrikası* (TSEK), *Göle İnekhanesi*, and *Iğdır Devlet Üretme Çiftliği*. The latter did not produce *kaşar* or *gravyer* cheese but only butter. Göle İnekhanesi had a small dairy site that produced butter and cheese for some years. It was more of a site of breeding special cows with high milk or meat yields in Kars. Many farmers would buy animals of Göle İnekhanesi. Lastly, the dairy factory in Kars by TSEK has operated by using a very small percentage of the established capacity due to the seasonal milk supply, which is embedded in the movements of animals during the pasture season, and the *avans* system which the state bureaucracy could not successfully establish (Saltık 2003).

Let me now turn to the question of how *kaşar* and *gravyer zavot*s (dairies) in Kars were established in villages and pastures after 1920 to describe the emergence of pastures as commons of villages that supply dairies with milk and as pasture-farms where the milk agreement is tied to another agreement on the pastures and animals.

Pastures and dairies: From cooperatives to the pasture-farms

According to the historian Candan Badem, the Tsarist Russia archive listed 24 *gravyer* dairies in 1910 in Kars province (Badem 2014, 57). According to the veterinarian Ali Aras who studied the dairy production in Kars in the late 1940s, this number amounted to 32 before the First World War (Aras 1954, 152). Alagöz was the only village where a German

gravyer cheesemaker family decided to stay at during the war. Alexander Kaiser, who used to be business partners with David Moser (see Chapter 1), continued cheesemaking in Alagöz village. Kaiser and Moser's was the only active *gravyer* dairy after the war until the Terekeme families settled in villages where the other *gravyer* dairies were abandoned since most non-Muslims who lived in these places and operated the dairies had left with the war.[79]

When Terekeme migrants from South Caucasus started to settle in Kars, Alagöz and its nearby villages such as Harziyan (Sütlüce) were suitable places for them due to Kaiser's *gravyer* production in Alagöz and the abandoned dairies in Harziyan villages. One Terekeme family who managed to cross the border with their herds was the Koçulu family. They had previously owned a *gravyer* dairy on the other side of the border, where they had partnerships with Swiss cheesemakers. Once they arrived in Harziyan, they started to collaborate with the Kaiser family in making *gravyer*. Koçulu family first supplied milk, convinced the other dairy farmers to sell their milk to the dairy, and later with the help of Alexander Kaiser, they renovated the old dairy in Büyük Harziyan and made *gravyer* here until 1933 (Aras 1954:154, 178). Koçulu family migrated once again in those years to Boğatepe village, which has already been an essential *gravyer* production center.

By 1924, there used to be two *gravyer* dairies in Büyük Zavot (Boğatepe) and two in the Küçük Zavot villages. Two of these four were abandoned by Swiss cheesemakers and renovated by the Terekeme families who settled in the village. Üresin (1936) indicates that there were two dairies in each village by 1931. All four dairies in Boğatepe villages were operated like cooperatives in these years, each composed of a handful of dairy farmers representing the family who owned the largest herds in the villages. As Üresin makes clear in

[79] The First World War ended with more ethnoreligious clashes in Northeastern Turkey and South Caucasus. Especially in Kars region, the national borders of the states were redrawn after violent years between Turkish and Armenian troops in 1917-1921. By 1917, when the Russian Army withdrew from occupied territories of Tsarist Russia including Kars, many non-Muslims (Swiss Germans, Russians, Malakans, and Greeks) started to leave their homes. When the Turkish rule ended the violent *kaçkaç* years in Kars, most Armenians and remaining non-Muslims also left the villages and pastures of Kars (see Chapter 1 for details).

his study in 1931, most of these dairies were not officially registered companies and in the case of a registration not in a partnership configuration (Üresin 1936, 38). The partners had agreed to obtain the resulting cheese and butter according to the amount of milk they brought to the dairy. Yet the farmers in the two villages have always been more than the sum of the partners of these four dairies. While a dozen *kaşar* dairies started to function in the villages, especially after 1930, the partners of the *gravyer* dairy were involved in making contracts with farmers in the village to buy their milk. Hence each partner, who usually owned dozens of cows that provided milk to the dairy, also had separate contracts with dairy farmers of the village through which they provided more milk to the cooperative dairy.

Alagöz and Boğatepe were the pioneer *gravyer* production sites that relied on milk collection from the dairy farmers whose animals graze on common pastures of the village. Besides these two centers, there were other villages and pastures like Harziyan, Türkeşen, Cicor, Çamçavuş, and Yaycı where some *gravyer* dairies operated intermittently following the same system of milk collection from the farmers who have their animals on common pastures. The only German *gravyer* producer family in Alagöz did not own dairy animals. This was the only dairy where the cheesemaker bought all the crafted milk from the village. When the production ceased in Alagöz, in line with the migration of the family members to Germany, Boğatepe remained the only *gravyer* production village in this geographical triangle of Boğatepe, Göle, and Ardahan for many years after 1980.

Besides Boğatepe, Alagöz, and other rural *gravyer* dairies located in villages or common pastures, another dairy arrangement made *gravyer* cheesemaking possible in rural Kars. This arrangement was centered on the privately owned dairy farms that collected the milk of the dairy farmers, who were also charged for using the pastures, unlike the villagers who are entitled to access the common pastures of their village. Such a pioneering dairy farm of *gravyer* cheesemaking was Nebiyurdu.

Nebiyurdu used to be common pastures of the Dikme village, located a dozen kilometers south of Kars city center. According to the villagers, Abdullah Usta (Master Abdullah) renovated this pastureland's abandoned Swiss-cheese dairy. Abdullah was one of the Terekeme Swiss-cheese masters who migrated to Kars from Georgia. He was famous for his education in Switzerland and certificate of being a cheese master. He worked in Small Boğatepe village dairy before establishing his own in Nebiyurdu.

Nebiyurdu constituted important and fertile pastures for dairy farmers who resided in Dikme. According to Russian records, Andrey Jukov owned a dairy in Nebiyurdu in 1910 (Badem 2014, 56). One can easily speculate that the families who moved to Nebiyurdu must have repaired this old dairy where some equipment and microorganisms resided. [80]

The Nebiyurdu *gravyer* dairy started to be operated in 1926, according to Üresin's research findings (Üresin 1936, 38). The dairy and the pastureland were owned by a cooperative composed of approximately 15 Terekeme families who all migrated to Dikme village in the 1920s. Mehmet Ergüner, who spent most of his childhood here, recalls that 10-15 houses were belonging to five to six different immigrant families. Ali Aras states that the cooperative started with 14 partners officially in 1930. By the time he conducted research in 1948, this number had decreased to nine. Aras explains this with the capital accumulation that enables cooperative partners to invest in their dairy arrangements (Aras 1954, 175). According to my interviews, all the families who composed the cooperative of Nebiyurdu sold their shares to Himmet Ağa between 1940 and 1960, who eventually became the only owner of the farm. First, Tarçınlı Yasin and Ali Güngören brothers moved to İsaçayırı in the early 1940s. Later, Ali Köseoğlu to Mişko Lake, Süleyman Ağa (Köseli) went to Hamamlı,

[80] According to Mehmet Ergüner, the nephew of Abdullah Usta, his uncle was "*kirve*" with the previous owners, and this was the reason why they bought Nebiyurdu for "very little money." Yet I cannot reach the official records of its last owner, nor any traces of the sale contract. [*Kirve* is usually the man who helps a boy during the circumcision ceremony, and who is considered very close in position to the boy, similar to the latter's father.]

Abdullah Usta (Ergüner) to Karanlıkdere, Mustul Usta (Mustafa Ergüner) to Yaycı. Among these places, only İsaçayırı became an important center of cheesemaking, including *gravyer* cheese. It was a privately owned dairy farm like Nebiyurdu, where large herds of around a couple of thousand cows can pasture and give milk to the dairy. The dairy in these farms processed 2002 liters on average daily (Aras 1954, 177). Borluk is a similar family farm. Borluk, a bit smaller than these two, is located closest to the Kars center. A few households from the Türkyılmaz family who had settled in Boğatepe bought large pastures at the foothills of Borluk Mountain in the late 1940s. All these three pasture-farms – Nebiyurdu, İsaçayırı, and Borluk – used to be important dairy production centers of Kars. According to the official number in 1968, they produced 75 tons of a total of 117 tons of *gravyer* cheese in Kars (Kurt 1968, 27). The large dairies on each farm processed thousands of liters of milk every day during the pasture season. The farms consisted of pastures where large herds could pasture nearby a dairy (*mandıra* or *zavot*).[81]

Yaycı was a temporary *gravyer* production site for a few years in the 1930s and 1940s (Aras 1954, 154). It was a small settlement composed of 5-6 households. Not only a few Terekeme families who had first settled in Dikme and used Yaycı as pastures (*yayla*), but also another family known as Halim Petan's family moved to Yaycı in the 1940s. Petan was a pioneer figure in making *kaşar* cheese in Kars, remembered together with another Balkan migrant, Filibeli Fehmi, who arrived in Kars a few years earlier than him. (See also Interlude 2)

In the 1920s, the first kaşar dairies were started with a particular migration pattern from the Balkans, especially Filibe and Tselloniki. Thanks to the initiatives that also involved Turkish state actors like public officials, many *usta*s (masters) of this cheese lived in Kars for

[81] Along with the *kaşar* and *gravyer* cheeses, butter (*yağ*), whey, and other dairy products like *lor* or *Tulum* cheese were also produced in these dairies.

a few years in the 1920s and 1930s until they raised new masters from the local apprentices they worked with and/or earned enough to go back to their larger families who, in most cases, had migrated to İstanbul or western Black Sea. *Kaşar* cheese, smaller than *gravyer*, is a cheddar-like cheese that has been a well-known commercial dairy product in Balkans and Aegean region for centuries[82]. The number of *kaşar zavot*s in Kars increased exponentially after 1928. This increase can be followed in subsequent publications on dairy production in Kars: According to the dairy scientist Ekrem Rüştü Üresin[83] there were ten *kaşar* dairies in 1931 (Üresin 1936, 20). His follower Ali Aras recorded 41 in 1948 (Aras 1954, 156). Dairy scientist Ahmet Kurt listed 77 in 1968 (Kurt 1968, 27). (The number I collected from the Kars and Ardahan directorates of Agriculture and Forestry Ministry was 128 in 2018.) As all these sources state, *kaşar* cheesemaking required a simpler production setting, less complicated mastership, and less milk than *gravyer*, which made it easier to quickly become a widespread commercial cheese variety in Kars (also see Interlude 2). *Kaşar* cheesemaking started to be produced in a few villages like Dikme and Vladikars (Kümbetli) and pastures close to the Kars city center. The dairy farmers who could afford to process or buy a few hundreds of kilograms of milk every day quickly embraced *kaşar* cheesemaking. Given that making one-wheel *gravyer* cheese, as the trademark and most profitable advanced dairying (*zavotçuluk*) in Kars by the 1920s, required a daily amount of 1000 kilograms (around at least 100-200 cows), *kaşar* dairies can be as small as processing only 100 kilograms of milk every day. While the large *kaşar* dairies processed around 2500 kilograms of milk in 1948, gathering the milk from a few households in the village or pastures was basic enough for a large number of *kaşar* producers.

82 It was also called as *kashkaval,* see (West 2022) on a brief history of this cheese.

83 As I mentioned in Chapter 1, Üresin's research was a result of a particular demand of the Turkish Agricultural Minister (T.C. Ziraat Bakanı) Muhlis Erkmen.

Hence by 1950, there were six important *gravyer* production sites in Kars: Nebiyurdu, İsaçayırı, Borluk, Boğatepe (Zavot), Alagöz (and Harziyan), and Yaycı (Aras 1954, 154). According to the official records of 1968, *gravyer* production ceased in Yaycı, and the remaining five important *gravyer* production sites in Kars produced 117 tons of *gravyer* cheese. The *kaşar* cheeses produced either by the same dairy owners, or in the other kaşar dairies in the villages that use these sites as their pastures, amounted to 208 tons of kaşar out of a total of 383 tons in Kars (Kurt 1968, 25–27). These five sites have also been the most important centers for dairy farming, pasture-milk production, and cheesemaking in Kars.

While *gravyer* production was limited to the five to six dairies, the number of *kaşar* dairies kept increasing in Kars throughout the 20th century. Throughout the years, making *kaşar* cheese became an important subsistence strategy for many families who chose to make (usually low quality) *kaşar* cheese instead of selling their milk to other dairies.[84] The already established network of *gravyer* production, which is a more profitable dairy craft (*mamuleciliği*), facilitated the local re-invention of *kaşar* cheese in Kars. Most *gravyer* dairies or pastures around which they are located became simultaneously important *kaşar* cheese production centers.

While some villages had the right to rent portions of their unused pastures in a particular year, only in İsaçayırı, Nebiyurdu, and Borluk particular families can provide pastures (that privately owned by the dairy owner families) to the farmers from other villages. These large farms used to host thousands of cows and sheep. I call these three "pasture-farms" since they were owned by a family (in the form of private property) who would make milk, land, and animal contracts with hundreds of peasants. Boğatepe and Alagöz villages, as the two other important *gravyer* production sites, are located in vast Göle and Ardahan pastures that are mostly owned by the state and used by peasants as commons apart from the

[84] See Interlude 2 for a more extensive discussion on *kaşar* cheesemaking in Kars.

designated private fields (*tarla*) and meadows (*çayır*). All these dairies are cooperatives because they are all businesses founded by a large family or by a partnership between a few prominent families. They employed one to three people, masters and apprentices, who would receive a monthly or seasonal wage, sometimes also sharing the profit with the dairy owners. The milk of the large and small dairy farming households was collected and processed in the dairies. Swiss-cheesemaking, *gravyer* cheese as it is called in Kars, which requires pasture-milk that does not travel more than a few kilometers to reach the dairy, has been the pivotal commercial cheese variety that shaped the dairy arrangements of local forms of agro-pastoralism. Kaşar dairies usually consisted of one or multiple mobile pasture-dairies where fresh milk was transformed into curd and the main dairy building where this curd is crafted into *kaşar* cheese. Hence pastures, where *gravyer* cheese has historically been made, were productive of large amounts of pasture-milk, which also provided curds for the *kaşar zavot*s in the region.

Intriguing case of "commoning" the İsaçayırı pasture-farm

Güngören family was among the Terekeme immigrants who settled in Dikme village, which is close to the Kars city center, that later became a prominent cheesemaking center. They were known as Tarçınlı family. Tarçınlı brothers joined the cooperative in Nebiyurdu when it was founded in 1925. Although they were relatively less wealthy than the other families in the cooperative, Yasin was well known for his fearless border crossing experiences, and his brother Ali was a good merchant. They were involved in international animal trade with the Soviet republics, which helped them to buy more animals and invest in the cooperative. In Nebiyurdu, they learned cheesemaking – both *kaşar* and *gravyer*. Families who formed the Nebiyurdu cooperative resided in this place, which was turned into a small village. The farmers remember the master of the dairy, Abdullah Usta, as the pioneer in founding this cooperative pasture-farm. One of the descendants of the partners told me that

there used to be at least 15 households. Tarçınlı family members lived in two of these houses: Ali and Yasin together with their mother and wives and their two sisters with their husbands and children in another house. In the early years of the 1940s, the Tarçınlı family had a dispute with some of the cooperative members, which was due to the competition among members to buy milk from dairy farmers, according to the eldest son of Tarçınlı Ali.

According to their children, Tarçınlı Ali and Yasin brothers bought İsaçayırı pastures sometime between 1940 and 1945. The two brothers acted together to establish the pasture-farm. Ali's three sons I interviewed told me that their father and uncle bought the land from the inheritors of a famous pasha who acquired this place after serving the Ottoman army. According to what they had told their children, it took them a few years to buy all the separate shares of a dozen inheritors of this pasha. The details of this trade are unfortunately not accessible. Whether this pasture was privately owned in partial terms is not clear and the de facto ownership of land might not coincide with the state's official records – as these records were a matter of dispute in the following years.

İsaçayırı farm encompassed a vast area of summer pastures for many villages. While the nephew of Abdullah usta told me that 36 villages used İsaçayırı as summer pastures, Tarçınlı Ali's eldest son told me that there were more than 60 villages that claimed the right to use İsaçayırı pastures. This issue was at the heart of the unfolding conflicts after the establishment of the farm by the Tarçınlı brothers. Access to the enclosed pastures was governed by the ethnopolitical boundaries which were spatially demarcated between villages and communities, contradictory state interventions, and local-traditional dairy arrangements of pasture-cheesemaking.

Most of the villages surrounding İsaçayırı were Kurdish villages, and they were organized under a family structure called *aşiret*[85]. These *aşiret*s owned local breeds of dairy cows and large flocks of sheep, and the villages they lived in had little or no established practice of selling milk to a dairy. Tarçınlı family needed thousands of cow milk for making *gravyer* cheese at that time since the limited number of cows in the surrounding villages gave less milk than the cows Terekeme families brought from South Caucasus. The latter's breed was called Zavot. They also did not want to work with the Kurdish peasants since they thought these farmers would not comply with the order they wanted to have on the farm. Hence they agreed with many Azeri farmers who were further in the North to come with their herds or to rent their cows to the İsaçayırı pasture-farm. This agreement led to severe clashes between local dairy farmers and the Tarçınlı family throughout the 1950s.

Many local farmers stressed upon the fact that they could not access to the pastures that were close to their villages. The *aşiret* leaders contacted the governors of the Turkish state, and after some point they even travelled to Ankara the capital to visit influential political figures in the government. Since the Tarçınlı family was a well-known supporter of the Republican Party (CHP), the Kurdish villagers contacted the competing party (AP) representatives in order to access pastures in the wake of the first few elections of the Turkish Republic after 1945. These attempts were eventually resolved in the late 1950s. The last governor of Kars before the 1960 coup ordered a decree for dividing İsaçayırı into smaller parcels. 20 parcels in various sizes were distributed to the residents of the surrounding Kurdish villages. This new situation caused the Tarçınlı family to have limited access to the pastures they thought they had bought, and brought up a set of new obligations such as making payments to the mayors of these villages, who had obtained the right to use different portions of pastures. While they made payments to some villages to rent a particular path for

[85] See also (Bruinessen 1992; Yalçın-Heckmann 2002) on Kurdish family and *aşiret* structures.

their herds, they also managed to make other contracts with others - like buying milk, making *baskı*, renting cows, and employing peasants.

Numerous middle-aged local farmers that I talked to during my fieldwork, who used the old settlements around the farm, recalled that the owners obliged the peasants to cooperate with them in many ways. A few dairy farmers described how they were humiliated while interacting with the farm people. Some were employed on the farm to milk the cows rented from further away villages. Many also remembered the difference between their herds: "They had lovely animals," "Their cows were Zavot or Montafon, each giving almost twice as much milk as our cows gave," "We were not allowed to mix our cows with the breeds they have, which gave more milk." Tarçınlı family members also remembered the significant differences between the milk production process from their cows and the cows of other local peasants. Their father and uncle used to be in touch with the state officials and local branches of the government, which allowed them to access the breeds imported by the Turkish state and reproduced in state-owned institutions[86]. Their trade with Georgia and Armenia until the Second World War also provided them cows, mostly Zavot, with high milk yields. For many herds they rented each year from the same Azeri families, the Tarçınlı brothers had more systematic breeding attempts. An old Azeri woman who used to work in İsaçayırı pastures told me that their herd was 'improved' throughout the years working in İsaçayırı since their local cows – some of which were also mixed breeds – reproduced with the bulls on the farm. This particular story also reveals that the class formation and terms of exchanges in pasture-cheesemaking involve not only milking but also landholding and animal holding.

After the partial distribution of İsaçayırı, the Tarçınlı family made many attempts to undo the distribution of their lands. They negotiated with some of the leaders from the

[86] The most important of which was located in Karacabey, Bursa. Göle İnekhanesi was a smaller hub for breeding activities by the state.

surrounding villages to rent some pastures. When the older brother, Tarçınlı Yasin, passed away a few years later, Ali, his wife, and his three sons took control of the farm. The surrounding pastures used by other villages gave way to the occupation of more and more plots of pastures from their previous borders. The minor disputes turned into heated fights or threats between the pasture-farm owners and peasants from a dozen villages. In the 1970s, there were numerous leftist revolutionary movements organized in Kars. Some of them also were armed forces. In the late 1970s, the pasture seasons witnessed many fights between the peasants and farm owners in İsaçayırı. In 1979 fall, when Ali's wife was alone on the farm with a few workers, a group of farmers and revolutionary militants attacked the farm. They started to burn the dairy and parts of the house. They released all the animals from the sheds. Ali's three children remembered that day with tears, saying that their mother was tied and her eyes were closed. She used her rifle to scare the group, but it was not a successful attempt. When Ali and his sons heard about the attack, the dairy, the compact pasture houses built for peasants and workers, sheds, and main house were all plundered and partly burnt.

Many peasants who remember İsaçayırı farm also remember the clashes between farm owners and peasants around the pastures. The inequality between dairy owners and peasants with differing sizes of animal and land holdings were considered to be the main cause of the disputes. Many stated to me that the enclosure of such a large pasture that can benefit the lower altitude villages around İsaçayırı evoked discontent and an unfair situation. This particular agro-pastoral conflict could also be articulated with the ethnoreligious boundaries between Turkish (Terekeme or Azeri) and Kurdish communities. Most armed actors of the İsaçayırı attack later became part of the Kurdistan Workers' Party. Yet, this occupation of the pastures by 1980 did not last very long. Most of the pastures were closed to outside access for multiple years during the second half of the 1980s and all of the 1990s due to counterinsurgency measures of the Turkish state. Villages on the boundaries of the İsaçayırı

pastures at the foothills of Dumanlı Dağ lost most of their inhabitants who migrated to the larger cities due to the economic and political conditions. Dağpınar (Pazarcık) as the closest semi-urban town to İsaçayırı enlarged with the immigration. It also became a critical headquarters for the Turkish state army.

This attack that demolished the İsaçayırı pasture-farm started a wave of similar destruction attempts in different parts of Kars. Almost all *gravyer* dairy owners were assaulted and one of them was killed in 1981. The production stopped at all five *gravyer* production centers. The three pasture-farms, Nebiyurdu, İsaçayırı, Borluk, were dismantled. Nebiyurdu became pastures for smaller herds, meadows that could be mown and sold, and the family turned more plots into cereal fields. İsaçayırı pastures became partially occupied by the peasants and their herds, partly appropriated by the state for a project of prison, and later partly involved in the counter-insurgency actions by the state like pasture-bans and armed operation to the guerilla groups. Borluk was the only farm that restarted cheese production later in the 1980s. While the farm owner was shot dead in 1980, his sons continued to make *gravyer* in Borluk until the late 2000s by transforming the farm into a small dairy production site with fewer animals. And one dairy in Boğatepe[87] restarted production within a few years after 1980 and did not halt its cheese making operations until today. In Interlude 2, I will be reflecting more on the aftermath of İsaçayırı and pasture-farms in Kars by pointing at the connections between *mera hayvancılığı* and the industrialization of *kaşar* cheesemaking.

[87] A dairy owner's house was also attacked in Boğatepe in 1980. Four dairy owners in total were attacked by 1980, which scared the owners of large dairies, most of whom stopped commercial cheesemaking.

Interlude 2

On the processed Kars cheese: Industrialization of pasture-cheesemaking

Cheese is an essential component of a typical breakfast in Turkey. One would always find a few different cheese varieties on a well-prepared breakfast table. When it comes to more economical or faster solutions, a piece of white cheese or a tiny package of triangular-shaped industrial cheese usually accompanies a cup of tea and a piece of *simit* (a particular kind of bagel with sesame seeds). White cheese, the most widespread variety produced and consumed in the country, is the usual choice. Yet an industrial type of cheese, Karper has been widely known as a cheap alternative since the 1970s. Especially in Istanbul, Karper in standard small triangular packages has become widely available in grocery stores and small peddlers, which consisted most of *simit* sales in the city. %51 of Karper shares were sold to the global Swiss dairy company Bel group, in 2006. Bel group still keeps Karper as the brand on the packages since *karper* had long become a common name for the triangle processed cheese in urban Turkey.

Hayk Arslanyan and his brother-in-law Kevork Santalu found Karper in 1966. He emphasized that especially due to the *Varlık Vergisi* in 1945, a tax implementation mostly against non-Muslim minorities in Turkey, he was not able to continue his studies and start working with his father in 1946 (Türk 2004). His father was an experienced Armenian merchant of İstanbul, who was involved in trading charcuterie. When he left the business to Hayk, the latter started to sell cheeses made by a Greek man called Hristo. When Hristo immigrated to Greece, Hayk took over his Kars Peyniri (Cheese of Kars) factory (Kütnaroğlu 2016). Hayk became business partners with his brother-in-law Kevork Santalu in 1961, and they slowly modernized the production by important machinery, and later changed the name

of the company into Karper. All the *gravyer* cheesemakers I encountered in Kars knew of the Arslanyan family as the most important buyer of Kars *gravyer* and *kaşar* cheeses. An Armenian merchant who buys large amounts of cheese from Kars has been a well-known story, even in remote villages among dairy farmers. Veterinarian Ahmet Kurt in his study on dairy production of Kars and Erzurum also talked probably about the same person as the most important buyer of Kars cheeses, especially skim-milk *kaşar* cheeses (Kurt 1968, 29). Especially after the start of the Second World War that had impacted the trade with Soviet republics, the market for the Kars dairy products was confined to Istanbul. *Gravyer* cheesemakers told me that Ankara, the second largest city in Turkey, has always been a minimal market for them. Almost all of the *gravyer* produced in Kars was sold in Istanbul. Arslanyan family was the biggest buyer of Kars cheese in Istanbul.

Hayk Arslanyan started producing "processed cheese" (*eritme peynir*) in full scale operation in Istanbul in the late 1960s. The market of processed cheese was expanding in those years in Europe and the US, especially after the invention of 'emulsifying salt'. For the Arslanyan family, processing cheese was not only a key solution to the shelf life of the cheeses they had bought, but it also allowed them to get rid of the low-quality cheese they bought – it is always risky to buy cheese in bulk since the color or shape does not always indicate the percentage of fat or water, hence its quality. Cheese processors allow making cheese from cheese, i.e., 'processing' (*eritmek*) cheeses into a uniform substance that can be re-molded as a new cheese. Emulsifiers (*eritme tuzu*) contribute to this process by standardizing different melted cheeses.

Karper was among the pioneer industrial dairy factories in Turkey during the 1970s which was the decade during which industrial dairy production increased significantly in the country. After the establishment of State Planning Agency (*Devlet Planlama Teşkilatı*) in 1960, new state-owned dairy factories also started to produce dairy products. Dairies

(*mandıra*, *zavot*) have long been widespread in Anatolia. While some larger dairies in the country, like *gravyer* and *kaşar zavot*s in Kars, emerged as important centers, only a handful of industrial dairy enterprises existed by the late 1970s. Karper quickly became a very successful cheese brand in Turkey. The company won several awards from European cheese competitions (*Milliyet* 1973), which increased its reputation. In the press releases and interviews, the owner Hayk Arslanyan emphasized the high quality of their raw material, namely Kars *kaşar* and *gravyer* cheeses, as the primary reason behind the consumer choice (Türk 2004).

Karper's success had serious implications for Kars cheesemaking. First of all, the company became the most important buyer of *kaşar* and *gravyer* cheeses in the 1970s. This suddenly increasing demand triggered a certain mode of upscaling especially in *kaşar* cheese the production. Since industrial processing also involved low-quality *kaşar* cheeses without fat, skim milk *kaşar* cheeses became widespread among small farmers and cheesemakers. Producers did not prefer skim milk cheeses in *kaşar* cheesemaking due to the low amount of fat that shortens the shelf life. Moreover, skim milk is mostly considered as a dishonest production phase trick. Farmers call this kind of milk and cheese as "*imansız*" (unbeliever). This also means that farmers separate the fat before processing the milk, hence they can obtain more butter than they would normally do by using the whey of whole milk *kaşar* cheese. In other words, the lower quality *kaşar* cheesemaking increased the revenues of dairy farmers, small cheesemakers, and the Karper company.

The increasing use of Kars *kaşar* cheese in processed cheese in the 1970s had a significant impact on its fame and popularity in national dairy markets and its average price. Kars was the largest producer of *kaşar* cheese in Turkey at the time, but the *kaşar* producers in the Thrace region has been more preferred and their cheese was more expensive due to the region's long lasting tradition of cheesemaking. It is also worth noting that sheep milk

dominates cheesemaking in the Thrace whereas cow milk in Kars. Kars *kaşar* cheese was cheaper than Trace (*Trakya*) *kaşar* due to the less amount of sheep milk that goes into making a batch of cheese. Sheep husbandry (*koyunculuk*) was very common in Eastern Anatolia, and sheep have always been part of most peasant life across the mountains of Northeastern Black Sea and South Caucasus. Yet, as I elaborated on agro-pastoralism in Kars in Chapter 2, Kars province is particularly exceptional in providing extensive, convenient plateaus for raising larger mammals like cows, cattle, and buffaloes that cannot live well as large herds in rugged geographies of Northeastern Black Sea and Eastern Anatolia. This is why Kars has historically been used by agro-pastoralists with their herds of cattle. *Kaşar* cheese is traditionally produced in the Balkans, Greece, and Trace region, together with parts of Marmara and Aegean coasts where sheep milk and goat milk is more common than cow milk. Cows have been a smaller minority until the second half of the 20th century in most places of Turkey, except Kars and a dozen other provinces in Anatolia. Kars province lost its exceptional position starting in the 1980s, due to the industrialization of dairy farming in Turkey through subsidizing the ownership of large cow herds which increased the absolute cow milk. In addition, the end of developmentalist schemes such as price control or subsidies to small dairy farmers in the 1990s and massive depopulation of the Kars border province due to the economic and political conditions heavily impacted dairy production in villages and pastures played crucial role in this process.

From 1975 to 2000, one of the highest out-migration statistics in Turkey belonged to Kars province (Khalaf 2019).[88] Since almost all *gravyer* dairies were shut down, more kaşar dairies dominated the pastures. As Öztek (1983) states, most small *kaşar* dairies processed the milk from a few families during the pasture season. He highlights that in almost all villages of the 9 out of 14 prefectures (*ilçe*) of Kars, there were one or more *kaşar* dairies

[88] This human depopulation was also paralleled with the decreasing number of sheep and cows until the mid-2000s (See also Chapters 1 and 2).

(Öztek 1983, 27). The *Türkiye Süt Endüstrisi Kurumu* (TSEK, Turkish Milk Industry Institution) dairy factory was privatized in 1986, then worked only for a brief period before it was declared bankrupt in 1994 (Saltık 2003). After this economically stagnating event, a new organized industrial zone was founded in the province (Kars OIZ). The state favored large-scale milk and dairy production through subsidizing investments for dairy factories in this zone, close to the urbanized center. By 2005, only a handful of dairy factories were started in the zone – all of them used to be dairies in the villages close to the center. In 2004, during European Union negotiations, the Turkish state obliged small dairy producers to obtain permits not only from the Ministry of Agriculture as agricultural producers but also from the Ministry of Health to ensure food safety. The new requirements included using stainless steel and chrome instead of wood or copper materials or having the dairies' cement walls covered with easily 'cleanable' tiles instead of stone walls that risk contamination (see more in Chapter 3). These new requirements were costly expensive, and were almost impossible to put into practice in the given dairy work space of most peasants. By the time more and more (semi-industrial) dairy factories were established in the Kars OIZ at the turn of the last century, dairy farming and commercial pasture-cheesemaking in Kars consisted of *kaşar* dairies. Most of these small to middle scale dairy facilities in pastures were either producing interim goods for processed Karper cheese, or were confined to a particular informal economy circuits.

How did Kars cheese become Karper?

Karper's founder Arslanyan named the brand after Kars, and the syllables of the brand name correspond to *Kars Peyniri – Kar* of Kars and *Per* of Peynir (*peynir* meaning cheese in Turkish). On the commercial product packages and the advertisement campaigns of Karper, this etymological root was indicated clearly. Not only *kaşar* but *gravyer* cheese contributed to the taste of Karper. Namık, one of the sons of Paşa who was one of the first

gravyer masters of Boğatepe village, once told me that Karper was successful because it was partially composed of very good Kars cheeses and this mixed compositing made its taste much better than other processed industrial cheese varieties. When I asked Namık why every *gravyer* producer sold their cheese to the Arslanyan family, he said that "a guaranteed buyer is always the best (*garanti alıcı her zaman en iyisidir*)" with a smile on his face. Then he shared a memory that made him believe that this transaction was the best way to reach the market:

> One year, Hayk came to the village again, collecting cheeses, it was barely spring, we are about to start making cheese. He negotiated with us to buy cheese in advance. We could not settle the price, after long conversations, he already got some with other cheesemakers, made his deals, at the end we did not agree. My brother told me that we could sell the cheese with a better price, we do not have to give it to the same Armenian every year. That year, we decided to take our cheese ourselves to sell it in Istanbul. We were again in touch with Hayk a few times before the fall, we told him that we don't sell it to him. He said it is our decision. We knew the market in Istanbul to a limited extent. We put some cheese at back of the truck and went to Istanbul. We were so confident at the beginning. We went to Hayk and gave a quite expensive price; we told him that we had customers interested in our product. Of course, he did not buy the cheese, he knew that we could not sell it easily, maybe he did not believe in us, I don't know. We left his office, then we started go around to door to door among the acquaintances… then also to some random grocery stores for days. Probably it took us more than a week. The ones who had told us they would buy, said they had bought from some others beforehand. We knew that many buy from Hayk, they don't want to overstep him. We made discounts, offered better price than him. No, nobody bought it. We barely sold a few wheels to some small groceries. After a while, we started to worry about the cheese in the truck, they were not fresh anymore. We had to find a cold storage because if we cannot sell later, it would become a huge deficit. At the end we went to Hayk's office, our tail between our legs. It was nice of him that he did not throw our wrongdoing to our face. We sold him at a lower price. We also made a deal for the rest of our cheese in the village. We came back here [Boğatepe, Kars]. But we understood that making cheese is one thing, selling it is another… Besides selling though, Hayk used to buy all that cheese to also melt and process it. I was surprised when we talked about the cheese storage unit we brought in the truck for those days in Istanbul. I guess he had recently started Karper at the time. His cheese was also a way of putting our defective cheeses or the ones reaching the end of their shelf lives in good use. He also collected cheap kaşar from Kars in advance. When he added a bit of good *kaşar* and *gravyer*, Karper was already delicious! His business was not only profitable but also saved many cheeses before

they went bad and improved Kars' public reputation since it was tastier than other industrial cheeses.

Karper and its cheese processing technology have been widespread in many different forms around the world. The small triangular yellow cheese relied on a cheese processing technology that mixes and transforms different cheeses into a new variety. Emulsifiers were also part of this processing since they enable the cheeses dissolve better in the dough that the processor will form. Among the cheesemakers in Kars, the processor is called "*eritme makinesi*" (melting machine) or *robot*. As I will describe in Chapter 3, I have encountered a few *robot*s in the Organized Industrial Zone in Kars in the last ten years. Karper's industrialization technology of Kars cheese was later followed by the semi-industrial dairies (*zavot*s) in Kars in the 1990s and the 2000s. Especially when the mobile system of producing curds (*teleme*) with the *baskı* system was banned in mid-2004, cheesemakers mostly used *robots* to process curds and defective *kaşar* cheeses in some dairies. Dairy farmers and cheesemakers I met in Kars since 2010 explained that this technology produces a lower quality *kaşar* cheese. Their problem was not about the very production of this cheese, but the additives being used and unfair market conditions where the difference between this cheese and Kars *kaşar* cheese is not acknowledged. This lack of acknowledgement was also another reason for the cheesemakers to remember or talk about Aslanyan family as "decent people and merchants". They knew the difference between a good *kaşar* cheese and a defective one. They had essential customers who would only buy good *kaşar* and *gravyer* from them. They also made another cheese, *Karper*, by processing Kars cheeses. The problem for Kars cheesemakers in the late 1990s and the 2000s was that many processed cheeses were sold as Kars *kaşar* cheese at a lower price than the *kaşar* made by small farmers and cheesemakers.

Kaşar has long been one of the most produced cheeses in Turkey. In addition to a dozen of state-owned or private dairy factories, hundreds of small to middle scale dairies

(*mandıra* or *zavot*) dominated the dairy industry in Turkey by 1980. A large portion of dairy products was produced and consumed locally, either in largely subsistence agro-pastoralism or informal markets. Industrial dairy production primarily consisted of butter and milk powder, and a very limited range of cheese varieties given the country's large worlds of dairy farming. According to the Turkish state's official statistics, the formal dairy industry processes only 45% of the milk that is crafted around the country in 2019 (USK 2020, 45)[89]. The dairy industry enlarged in the last 25 years in Turkey mainly by the establishment of new dairy farms which consisted of large herds of imported special breed cows. These breeds are enlisted as "*kültür"* (culture) breed next to local (*yerli*) and hybrid (*melez*) by the *Türkiye İstatistik Kurumu* (Turkish State Statistics Institution, TÜİK). The intensive dairy production by culture breeds for industrial ends relied on a stable provision of feedstock rather than a pasture season as it was the case in Kars. During my fieldwork I visited more than a dozen large dairy farms which were mostly supported (subsidized) by the Turkish state through EU programs. These farms had large sheds that could accommodate at least 75-80 and usually around 100-150 cows.[90] These projects aimed to provide large amounts of milk to the dairy industry on an everyday basis, which was (historically and socially) shaped by the pasture-season dynamics that determined the cycles and places of milk and cheese production. As I will explain in Chapters 3 and 4, the collaborations between cheesemakers, scientists, development experts, activists, and state officials paved the way for the official legislation of the Kars Kaşar Geographical Indication in 2015 and the geographical indicator in question emphasized the pasture-milk and human craft as defining characteristics of this cheese.

[89] Ali Aras expected the same proportion in Kars as 5-10% in 1948 (Aras 1954, 160). See also Chapter 2.

[90] Yet a significant amount of these sheds were empty since the owners could not afford to buy animals (and feedstock) after finishing the construction work with the development project. The ones who had cows usually had one or two families taking care of the everyday work with a couple of workers. They said that they have been keeping animals but cannot make any profits to sustain the ongoing production. It is also important to note here that the average herd size per household is 8 in Kars.

Let me conclude this interlude by pointing at two argument axes that you will read about in further details in the following chapters of this dissertation. Firstly, seasonal movements and milk fluctuations of agro-pastoralism have always defined the dairy arrangements in Kars. In this interlude, I shared several stories on the relationship between Kars *kaşar* dairies, cheese-processing technology in *Karper* and other industrial dairy factories. These stories provide sharp insights on some of the tensions between pasture-milk and dairy production as it will be discussed in Chapter 3 and 4. The second axis I would like to point out is the unvarying evaluations of all the scientists who studied Kars cheesemaking since 1926. According to this evaluation, many cheesemakers must sell their cheese earlier than the ideal ageing period of 2-3 months. The shape, taste as well as shelf life of the cheese depends heavily on the appropriate craft and aging protocols named as *affinage* (*olgunlaştırma* or *eskitme*, in Turkish).

The cheeses that are not considered the first-quality good *kaşar* cheese do not have to be produced erroneously, but they might not be '*aged*' enough. Since many small dairies operating in the villages did not have available space to keep – at least for a few months – all the cheese they could make in a pasture-season, they sold their not-aged-enough *kaşar* cheeses to the larger intermediaries. Similar to the sources on Kars cheesemaking in the 20th century (Aras 1954; Kurt 1968; Öztek 1983), sociologist Derya Nizam's 2015 report on Kars *kaşar* cheese making industry also indicates that small cheesemakers who don't have enough space or those who need cash to secure the milk for the following year usually sell their cheeses in July. This particular time of the year is when a significant portion of the pasture-milk *kaşar* cheese they make is not ready to be packaged and put in cold storage.

According to the current reports that a few existing market research companies share with industrial dairy companies, the *kaşar* cheese constitutes 29% percent of the cheeses sold

at the supermarkets according to the yearly reports of market research.[91] Three large dairy companies in Turkey carry out almost half of this industrial production. One was officially founded in Bursa in 1974, one in İzmir in 1973, and another in 1996 in Sakarya.[92] The market shares are measured through the sales of supermarkets. Hence "the market" measures exclude a wide range of more localized dairy production networks. Apart from the products that local producers can package or products that can be packaged by supermarkets, most of cheeses (and other dairy products) in Turkey are stored or put on sale in various fronts without any proper packaging. While the local dairy markets and networks constitute around the same size as the formal and big scale industrial ones, people I interviewed during my dissertation research who work in industrial dairy producers or big supermarket chains expressed the regional differences in Turkey in terms of market shares and brand reputations of dairy products. Kars cheesemaking, which used to be popularized and strongly advised by well-acclaimed scientists (Üresin 1936; Aras 1954; Kurt 1968; Öztek 1983) concerning the state and private sector investment plans until the 1960s, lost its production quality and scale in the 1980s and onward. It became attached to the industrialized *kaşar* production sites located more than 1000 km away near Istanbul. Yet the emerging networks between semi-industrial and artisanal *kaşar* dairies in Kars between 2005 and 2015 paved the way for a shift in the dairy arrangements. In parallel to the "reinvention" of *Boğatepe Gravyeri* (Chapter 1), *kaşar* cheese is now associated with the province of Kars thanks to the Geographical Indication (GI) acquired in 2015. In Chapter 3, I narrate the attempts by small farmers and cheesemakers to make pasture-milk part of the Kars *Kaşar* GI legislation. Accordingly, I

[91] Some reports also indicate that white cheese (*beyaz peynir*) constitutes more than half of the available cheese basket per household and that *kaşar* cheese comes the second. These reports were confidentially shared with me during my interviews with a few marketing managers of industrial dairy companies and sales managers of two large supermarkets..

[92] Their commercial networks span across the country, with particular regional clusters due to the number of their factories. They have lower number of factories in the East, Southeast and Black Sea regions of Turkey.

argue that the presence of pastures in the cheese implied particular practices of "*pasturing*" with respect to dairy farming and cheesemaking.

Chapter 3

Pasturing Kars Kaşar Cheese: Sensorium, Techniques, and Technosciences

Discerning the 'animal-like' smell

Tasting pasture-cheese is also learning the language that allows one to put their sensorial experience put into personal and particular words. In Kars, tasting workshops have been crucial for forming this language that would express the distinctive sensorium of Kaşar cheese, which was certified with a Geographical Indication (GI) in 2015 by the Turkish Patent Institute[93]. Tasting workshops and the formation of a tasting panel aimed to evaluate the sensory characteristics of cheeses based on the distinctive properties identified in the official legislation. These workshops defined the sensorium of Kars Kaşar cheese while they revealed how what I call "pasturing the cheese" can be sensorily recognized.

Prof. Fügen Durlu Özkaya is a food engineer working in a well-known public university in Ankara, and she has been directing cheese-tasting workshops on Kars Kaşar cheese since 2016. Özkaya had initially developed a list of criteria, primarily based on international examples of sensory evaluations (also referred to as 'organoleptic analyses') of cheeses. She and her team met with a dozen of cheesemakers in Kars to prepare a form that later became a standard that a particular panel composed of farmers, academics, state

[93] Geographical indications (GIs) are place-based denominations that define a collective right of people who live in a particular place (boundaries of which are determined in the GI legislation) and produce goods that have a distinctive cultural and territorial quality (that is scientifically 'proved' in the legislation). While GIs used to be seen as important mechanisms in creating alternative food solidarity networks, there is a growing critical literature on their design and implementation processes around the world (Besky 2014b; Bowen and Zapata 2009; Bowen 2010; Fonte 2008; Nizam 2019). In recent years, GIs have become a key tool for Turkish state development politics. In Turkey, GI protection was first legalized in 1995 with a decree-law and then the new industrial property law in 2016. While the number of GIs registered increased slowly until 2016, since then their numbers skyrocketed: from 2016 to 2020, the number of certified GI products increased from 196 to 475, while pending GI applications rose from 80 to 474. The proportion of GI products registered by producer cooperatives and associations remained very limited (around 3 percent) (Nizam 2017; Nizam and Tatari 2020).

officials, and consumers has been revising each year after tasting *kaşar* cheese samples in Kars.

During one of the first meetings in 2016[94], an interesting conversation occurred about the "animal-like smell" that the professor listed as an undesired smell in cheese. According to the cheesemakers, 'animal-like smell' can name both a desired and undesired smell for *kaşar* cheese —these two different smells cannot be labeled as one. Özkaya had not experienced this distinction and wanted to learn how to distinguish between the good and the appalling animal odors. She asked cheesemakers to describe both smells so that she could mark them with particular names on the form.

Cheesemakers explained that the desired animal-like smell would correspond to a "nice smell of a cow" in the milk, which later appears in the cheese. One cheesemaker described this smell as almost the same smell one gets while milking a cow: "When you sit on that small stool to milk the cow, your head is almost at the same height with her udder, while the milk fills in the bucket, you usually smell a nice animal odor, maybe coming from the teat of the animal." This particular description and others cheesemakers provided in that meeting drew attention to the act of milking cows as a crucial instance where the farmers smell 'the cow' in the 'pasture-milk' that GI legislation requires. In contrast, cheesemakers learned to identify what the scientists called the animal-like smell that they did not like as one that came from 'barns and cowsheds'. Cheesemakers explained that the undesired "animal-like smell" emerges when the cheese is made with milk that is produced by cows who are fed with corn silage and other industrial feedstock, milked in a closed barn. Especially the large and unclean barns where the milk absorbs the smell of the environment that later appears as an undesired "animal-like" smell in the cheese. Cheesemakers and scientists as two

[94] This meeting was realized in the course of the organization of the International Symposium of Local Artisanal Cheeses in Turkey and the World: The Use of Geographical Indication for "Kars Kaşarı" Cheese on 15-17 July 2016. See (Nizam and Tatari 2018) for the proceedings of the symposium.

communities of practice constructed "animal-like smell" differently, which in this sense became a "boundary sense" (Star and Griesemer 1999) [95]. An olfactory sense, which emerges from the cheese in the local situation of cheese tasting, holds together divergent senses of the desired smell of cows and pasture-milk.

After this discussion, the "animal-like smell" changed from the initial bad smell, as it bifurcated into two smells. The desired smell was called "animal-like smell" (*hayvansı koku*), and the undesired smell was called "cowshed smell" (*ahır kokusu*). According to the cheesemakers who contributed to the tasting panel of Kars *kaşar* cheese, discerning this nuance between the two quite similar odors was crucial. Their bodily experience favored the smell of a connection between cow, milk, and pastures that enables an "animal-like smell" in kaşar cheese. In other words, they were able to calibrate their sensory perception to discern the smell that emerges from pasture-in-the-cheese.

This chapter investigates the ways in which pastures are integral to a particular cheese sensorium for dairy farmers who put significant effort to inscribe this sensorium as the desirable taste of the Kars *kaşar* cheese in the official GI legislation. In line with the industrialization of dairy production in the country and affected by the conditions of depopulation and armed conflict in Kars, rural dairy production has declined sharply in the last twenty years. Cheesemakers remember the 2000s as the worst years of their business. Rural dairies were not economically competitive with the increasing number of semi-industrial urban dairies due to the latter's advantage of economies of scale and low cost of

[95] Discerning the desired smell of cow that originated from the pasture-milk is crucial to make the tasting experience of kaşar cheese "coherent" across scientists and cheesemakers' different "visions" in Susan Leigh Star and James R Griesemer's words. They argue: "boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They have different meanings in different social worlds, but their structure is common enough to more than one world to make them recognizable, a means of translation. Creating and managing boundary objects is a key process in developing and maintaining coherence across intersecting social worlds." (Star and Griesemer 1999, 509).

labor[96]. Rural dairies and artisanal cheesemakers relied on agro-pastoralism (*mera hayvancılığı*)[97] and pasture-cheesemaking (*mera peynirciliği*) as a necessary infrastructure for artisanal kaşar cheese. I joined several meetings primarily organized by the local small farmers association (BÇYD) to design the official legislation. These meetings gathered dairy farmers, cheesemakers and dairy owners, shopkeepers (*esnaf*), academics, state officials, and development experts. These gatherings effectively shaped the official legislation that recognizes pasture-milk and traditional techniques of cheese-making as the main factors that make Kars Kaşar cheese distinctively local. The sensorium of the Kars Kaşar cheese that dairy farmers and cheesemakers enunciated in these meetings consisted of the smell and taste of pastures preserved or instead crafted into the cheese. This sensorium can only be sustained by the particular everyday practices of dairy farming and artisanal cheesemaking, which I investigate closely in this chapter. And I argue that these practices attempt to *pasture* cheeses and dairy technosciences – although these attempts do not always result in pasture-cheeses.

Technoscientific expropriation of pastures from milk

During my fieldwork, I learned that the initial criteria listed by the professor as an undesired quality of animal-like smell was in line with the industrial dairy technologies that aim to eliminate this odor in the production process. The questions I put forward to the food scientists were attuned to matter of pasture-milk that cheesemakers' sensorium and the answers I received revealed that most of the scientists associated the desired smell of pastures only with flowers and grass. For them, the smell of the animal is an undesired side-effect of agro-pastoralism (*mera hayvancılığı*), which involves pasture-dairy farming in Kars. They indicated that the possible animal-like smell is formed by the milking conditions in pastures

[96] Yet, the business was not profitable for the latter either since the dairy infrastructures of Kars lacked a year around milk production that is crucial for industrial dairy production. This unprofitability was seen due to two main factors: 1) climate conditions that allow pasturage for a maximum of 5 months where the animals were lactating the most, and 2) most of the milked cows were local or mixed breeds, unlike the industrialized dairy infrastructures which rely on processing milk of the 'efficient' breeds like Holstein, Symmental or Jersey cows.

[97] See Chapters and Interludes 1 and 2 on *mera hayvancılığı* and its intricate connection with dairy production.

where a lack of hygiene causes contamination from udder, hands, or buckets that brings the unpleasant animal odor. The latter should be eliminated with a deodorization machine so that the flora dominates the sensory experience when one eats the cheese. The expropriation of animal odor from milk leaves milk devoid of pastures (and the reducing pastures to the grass and flowers as if the latter do not contain animals); hence pasture-milk becomes deodorized milk[98].

In Kars, the only university in the town (Kafkas University) established a modern dairy in 2005. The first director of this 'dairy factory' explained to me that the deodorization machine they purchased became a very good example for privately owned dairies in Kars; some of which followed the university and bought the same machine. She emphasized that the odors from the environment can be eliminated with this machine that cancels all 'foreign' odors of milk. She argued that this process purified the milk; enabled to keep its original, authentic smell that was a product of the flora of pastures. Therefore, deodorization is a process that prevents the animal-like smell in milk since pastures do not encompass animals. The resulting olfactory sensorium of cheese includes pastures but not animals that are not conceived as part of the pastures. The same reasoning was also formative for the initial set of criteria that Prof. Ozkaya formulated in the panel form.

Yet, for cheesemakers, the deodorization process takes away the pastures that also include the smell of animals. Cows are not only machine-like transmitters between the pastures and milk they produce. They are rather inseparable entities of the pastures. The animal-like smell of the milk and cheese that the cheesemakers look for in pastured dairy products corresponds to the olfactory expression of this symbiotic relationship. Pasture-milk, is both pasture and animal; the animal-like smell is a sensory property of this entanglement.

[98] Inspired by Donna Haraway's conceptualizations of naturecultures and technoscientific objects like onco-mouse (Haraway 2018; 2003; 2008), I approach the deodorized milk as a machine-animal substance.

Cheesemakers also emphasize that the machine eliminates animal-like smell and other unpleasant odors that may result from industrial dairy farming practices (feedstock like corn silage or large and 'unclean' cowsheds). Once the milk is 'purified' and made odorless, hence pastures-as-animals are expropriated, then the dairy production becomes independent from the environmental conditions of the milk production. Whether the cows are milked in pastures or sheds becomes irrelevant for the cheesemaking process since deodorization nullifies this distinction. In this sense, deodorization can be seen as a technological fix that allows dairy producers not to worry about the olfactory sensorium that raw milk embodies. This separation of dairy production from milk production obscures the different practices of herding and milking cows when it comes to smell, but also significantly affects cheesemakers' practices. The local-traditional know-how of cheesemakers includes techniques for making this animal-like smell and pasture-milk present in the cheese. While the presence of animal smell (along with other odors) in the raw milk is crucial, production techniques are equally essential to preserve it to be sensed in the resulting cheese. In other words, the techniques of cheesemaking that enable the 'desired' smell and other senses of kaşar cheese are part of what cheesemakers aimed to include in the legislation as they emphasize the sensorium of 'pasture-milk'.

For small-scale cheesemakers who have their dairies in rural Kars (in pastures or villages), industrial dairy farming threatens the peasant livelihoods in pastures and alters the existing dairy techniques due to the changing materiality of milk that originates in these practices. In the panel form meeting, when cheesemakers described the animal-like smell, they also stated that the milk from industrial farms usually doesn't smell in any particular way.

> They usually use a milking machine when the milk comes from a farm. If the machine is clean, the milk would not go bad. But the milk is not good in the first place. The

> milk does not taste like pastures since they feed the animals with corn silage or other industrial feed. By the time milk arrives in the dairy, it does not smell.

While many cheesemakers in that meeting agreed on the quality of the 'farm milk' as inherently deprived of the pasture due to the simple fact that animals do not graze on pastures; they have also stressed that in Kars, there wasn't more than a few large, industrial dairy farms. By positing pasture-milk as a necessary ingredient, cheesemakers enforce the seasonal production of Kars Kaşarı as a pasture-cheese that starts when herds are taken to the pastures around late April/early May, and ends in late September/early October when animals are taken back to the sheds. Smelling the cheese, then is also smelling the seasons.

The owners of a few more industrialized dairies in the Organized Industrial Zone of Kars that collect milk from a handful of modernized large cowsheds were not happy about this requirement at the beginning. Yet, they quickly adapted to a new marketing strategy that underlines how cows in these farms also graze in pastures during the season mentioned above[99]. According to the rural dairy owners in the workshop, who are also small dairy farmers, this milk does not convey the pastures in cheese since cows are fed with industrial feedstock the whole year around – grass in pastures is not enough for these cows' metabolisms to stay healthy and productive. More importantly, pasture-milk is not simply the milk that is obtained from grazing cows. It relies on farmer-cow-pastures-milking relations that constitute the sensory world of pasture-milk, and shape what this 'pasture-milk' can later become in the dairy with the cheesemaking techniques and technosciences.

[99] Most small farmers who are employed on these large farms used to take the herds to the pastures each spring, primarily because of saving the cost of feedstock. Since these cows mostly consisted of imported Brown Swiss or Holstein cows, their bodies were not suitable for pasture conditions, and especially their feet and hooves, caused them serious trouble.

Image 2: "Kars Kaşarı [with] Geographical Indication". (Poster distributed during Boğatepe Cheese Festival in 2019). Six fundamental characteristics are listed at the bottom as follows: 1) Administrative Borders of Kars and Ardahan, 2) April-September Pasture-Milk, 3) Wet Boiling, 4) Hand Belly Tying, 5) Aging for 30-40 days ("naked fermentation'", 6) Aging for 90 days ("fermentation in the sack")

Sensing pastures in milking

If discerning the animal-like smell in Kars kaşar cheese implies tasting pastures in the cheese, this sensory experience that needs to be cultivated in tasting practices also emerges from the materiality of the formation of this odor in the cheese. The material presence or absence of pastures in Kars Kaşar cheeses depends on the techniques of dairy farming that combine practices of producing 'pasture-milk' in farmer-cow-pastures-milking relations and of crafting dairy products with the available milk depending on the season and possible means of transportation and production. Rather than taking for granted the 'pasture' in

pasture-milk, I am concerned with "pasturing the cheese" as a process that makes it possible to create a cheese sensorium in which 'pastures' can emerge as smell.

In 2018, when I attended the third yearly tasting workshop of Kars Kaşarı, I recognized that the good animal-like smell became one of the crucial markers in the taste of kaşar cheeses, especially for women in the village attending the tasting panel meetings each year. Hayriye, who was taking care of a dozen cows and calves in Boğatepe village, told me that she enjoys smelling milk when eating the cheese in these workshops.

> They say that we need to recognize different smells, colors, and texture … I can understand different smells very easily because I live in pastures, and I know how my animals (mallarım) smell. They are my daughters! I also know how they make the shed smell, especially in spring… you came to my place in April, don't you remember? …. Of course, I know how milk in that dirt (*o bokun içinde*) can smell! But it was very strange to me when I first smell it in a good-looking kaşar cheese. I immediately said this milk got some odor from the shed.

I remembered. I visited Hayriye many times in April 2018. Here is what I wrote in my notebook:

> *I visited Hayriye a few times in these past couple of days. She wants to renovate the small cowshed she has. Her eight cows and growing four calves (*düves*) require a larger space than the old building made of rocks, a wooden ceiling and a traditional roof with grass. Her place was smaller than 8 meters long and 'it isn't wide enough' she said to take care of all the animals. Hayriye's husband, İlker, has a chronic problem in his nervous system due to which he needs care. Two of their three sons live in the village. One of them, Görkem came back more than a year ago. He is the middle brother. The youngest came this winter when he was fired from his job. The eldest still lives in Kars Center, where he can barely earn a living wage. Hayriye and the two sons explained that working together encouraged them to invest in a new cowshed. They want to take care of the animals and have a better life in the village. Görkem told me that they need to provide the conditions for getting married and that this implies having a decent life, some saving for the future, and a stable livelihood – a decent job in the city, which doesn't seem possible anymore, or animal husbandry in the village. When I joined them to clean the cowshed after the animals left in the morning, the most challenging part was the bitterness of smell. As many other women in the village told me in the past weeks, this smell is particularly sharp this month*

*when animals start to spend the whole day outside after months of winter. Hayriye explained that the weather is still cold, and the soil and grass are also cold and frosty. The grass is also very young (*körpe*), there is not that much to eat, and no flowers are out yet. When they come in the evening, they eat some dry hay that they have been eating since the winter started back in October. Then in the morning, their shit is always very stinky. Like when you get cold, and it smells terrible. This is why, Hayriye said, this month is the hardest for farmers to clean their sheds, keep animals healthy, and milk clean.*

Hayriye's taste of pastures in cheese and her experience of milking cows in the shed are related. This relationship informs her discernment of the animal-like and cowshed-like smell, and her sensorium of pasture cheeses —which is not only about smell. In April[100], as Hayriye and other women's daily practices of taking care of animals and sheds make clear, animal bodies produce manure since they start eating fresh grass for the first time after five or six months of harsh winter conditions. While it takes some time for cows' metabolisms to digest fresh grass properly, it also takes time for the grass to grow after months of snow; the flowers start to appear usually almost a month after the end of the yearly snowfall. This transition period also affects cows' milk.

Some cheesemakers told me that the milk from April grass (or in the first few weeks after animals start grazing outside) makes *kaşar* cheese bitter. They refer to this cheese as *nisan kaşarı* (kaşar of April). İlhan, a cheesemaker in Boğatepe village proudly, showed me the special molds he invented to age *nisan kaşarı.* "I made the molds (*kalıp*) narrower than the usual *kaşar* molds so that the cheese kicks out the remaining water more easily," he said. His experience tells him that the bigger molds cause the bitter taste in *nisan kaşarı*. As I heard from a few other cheesemakers, it is vital to help the cheese kick out all the excess

[100] When farmers in the village uttered the word "*nisan*", I realized that they do not necessarily refer to the month of April (*Nisan*) in technical terms. On the one hand, there is a vernacular usage of nisan, that is also called avril in Kars, which refers to a traditional calendar slightly different from the modern one. On the other hand, similar to this vernacular calendar, farmers used the names of the months with the particular changes in nature. For instance, April practically ends for them when the grass is not that frosty, the cows don't have diarrhea, and they can spend the night outside in pastures.

water by forming smaller wheels during this month. But, he adds, it is very unusual that you end up not smelling the cowshed, that bitter-ish smell. This smell was acknowledged as a sign of the first weeks that cows spend their days outside. Accordingly, Kars Kaşarı G.I. legislation certifies cheeses produced between May and September – to guarantee that the undesired shed-like smell and bitter taste disappear.

Hayriye or other women in Boğatepe village don't spend the summer in pastures, since their village is located at a very high altitude that doesn't require their herds to travel long distances to get to the pastures. Cows walk approximately 10-15 kilometers a day, including their trip between pastures and sheds twice a day.[101] This also means that the cows go to their sheds where they have a spot they spent the whole winter. When herds arrive from the pastures, women, young children, and some men, all outside their cowsheds, wait for their animals. Men and women usually have a clear division of labor – if there are no special conditions like Hayriye and his husband's. While men take the animals inside the shed, and count them to make sure no one is missing, the women are occupied with milking. The calves arrive first; they go to their place at the back of the shed. Then the cows come, and they each take their spots. Humans who recognize all their animals "take attendance" and ensure that everyone is well placed in the shed. Each time I participated in these instances, I was exposed to various sounds including conversations between shepherds, farmers, calves, bulls, and cows. Hayriye ties some cows to the iron rounds (*demir halka*) on the walls. Then she opens the door of the small part at the back where the calves excitedly wait for their turn to get milk. She lets a few calves pass, then close the door again. Görkem helps the calves find their mothers whose udder they suck for a few minutes. Then Hayriye starts milking. I am surprised that the calf stands next to Hayriye, who is almost underneath the cow on a small stool. After her bucket fills, she goes and pours the milk into the larger bucket (*güğüm*)

[101] Unlike most villages, this also means a milking system in which women don't go to pastures and milk the cows in the village.

placed right at the entrance, next to the large doors of the shed that are wide open. Hayriye drew my attention to this detail in particular: Boğatepe women put their buckets at the door and go from their stool to the door each time their small milking bucket is full. The big bucket is almost in the open air and it does not necessarily absorb the smell of the cowshed. I witnessed this practice in all the sheds in Boğatepe, where I attended milking. Apart from occasionally milking the cows, my job would usually be helping women by taking the small bucket, pouring it into the bigger one, and giving it back to them. According to Hayriye, in April, not even this practice cancels the smell of the shed. She says: "When you spare some milk for yourself to make some butter or fresh cheese, this month is easily distinguishable. Especially if you don't finish eating those in a week or so, I think the smell becomes even worse." This is how Hayriye recognizes the cowshed-like smell in the cheese without a doubt. These everyday experiences of the farmers maintains the relations between the cheese and its makers. I ask Hayriye if she can distinguish this smell and the smell of a cheese made with milk from animals fed with corn silage or other feedstock. She said that a few such cheese samples she ate in the workshops did not smell at all; they didn't taste *(hiç tatmıyordu)*[102], she said.

Transfer from pastures to dairies

Discerning smell and tasting cheese involved the farmers' sensory experiences of milk and milking. Hayriye's account exemplifies how women might discern the smell of pasture milk in cheese using her own experiences of smelling "pasture" when milking her cows. For cheesemakers, tasting cheese is linked to their sensory know-how, especially their experiences of touching the curd when they knead curd and make forms of kaşar cheese.

[102] Smell and taste cannot be separated easily; the intricate relationship between sensing smell through internal nostrils and tasting inside the mouth makes the taste a significantly different experience without smell (Ozan 2019).

Throughout my fieldwork, the cheesemakers in Kars told me that kaşar cheese no longer tastes like it used to. Beyond romanticizing some good old times, they specifically refer to the techniques and technologies that allowed them to carry the smell of pasture to the taste of cheese before the late 2000s. The critical aspect back then was transforming the milk in the pastures immediately after milking. As expressed by an old cheesemaker in one of the meetings: "The cheese is not like when we were making *baskı* (the pressed curd)[103] in the pastures, and then bringing it to the dairy in the village to turn it into kaşar cheese".

When farmers and their herds move to the higher altitude pastures, cheesemakers used to have a mobile dairy station (usually a tent) where the milk from pasturing cows could be collected and processed. Making *baskı* is still the first step in making many local-traditional cheeses in Turkey, especially in mountainous Eastern Anatolia. It refers to the practice of making a round shaped and pressed fresh curd from raw milk. Today, many pastoral communities produce fresh cheese in pastures and sell them to the merchants in cities who transform them in various ways before obtaining an end product. Hence *baskı* constitutes a crucial sociotechnical process that connects pastures and artisanal cheesemaking in making pasture cheeses. The system of mobile dairies used to be essential for *kaşar* cheesemaking before the new food safety regulations were legalized in Turkey in 2004. This technique produced the curd-like fresh cheese that the cheesemakers processed at their main dairy as a *kaşar* cheese. This process was declared dangerous to human health in 2004, and state inspectors strictly banned the technique almost explicitly for kaşar cheesemaking in Kars.

Raw milk was the main problem. While providing a crucial microbial diversity for making different cheeses, raw milk has always been considered dangerous for human consumption. Because of this risk assumption, cheesemakers try to turn the milk into cheese

[103] *Baskı* means pressure in Turkish. In Kars, it refers to adding the rennet and draining the whey for obtaining a curd. This fresh cheese can also be called *baskı*, or can have different names like *baş peynir*, or *kelle peyniri*.

as soon as it is obtained from the animals in pastures. In Turkey, while the milk was first pasteurized milk in 1927, raw milk circulation and especially making raw-milk cheese continued to be a significant part of dairy infrastructures. A sweeping transformation in formal use of raw milk happened in 2004 when the Turkish government legalized new food safety reforms and regulations in EU membership negotiations. Hygiene was a crucial keyword of this reform, together with pasteurization. All food production sites, including rural dairies, had to adjust to the new European standards. Dairies that did satisfy the requirements were not issued permits for production by the Ministry of Agriculture and Forestry. Consequently, a significant portion of commercial dairy farming was pushed outside the formal dairy economy. Yet, like in Lithuania (Blumberg and Mincyte 2019), the persistence of informal dairy markets not only obliged the authorities to revise food safety measures in recent years but also sustained an "infrastructure of taste" (Blumberg and Mincyte 2019) of raw-milk pasture cheeses.

In Kars, the new food safety regulations caused strict supervision of small, rural dairies, most of which were seasonally operating to make *kaşar* cheese. Accordingly, the environment of these mobile or traditional dairies is unsuitable for dairy production, and the technique of *baskı* is designed to process raw, 'unpasteurized' milk is dangerous. Ministry officials, food inspectors, and dairy scientists I interviewed all explained that the *baskı*s coming from different pastures into the same dairy increase the risk of contamination. Their reasoning relies primarily on the unhygienic conditions of the dairy tent, where different materials like wood and plastic were used instead of stainless steel and chrome, and no regular cleaning was performed. Yet, beyond all the hygienic problems that can be fixed (at least this was their claim), the major concern would still be the raw milk that cheesemakers use for dairy production in pastures.

A consequential infrastructural transformation happened in Kars when mobile dairies were no longer allowed to make *kaşar* cheese. The dairy tents continue to exist in some pastures, but their number decreased sharply, and no one can use them to make *kaşar* cheese anymore. After 2004, state subsidies for new investments in the Organized Industrial Zone (OIZ) and new machinery used in these semi-industrial dairies altered dairy infrastructures in Kars. When I talked to the cheesemakers in the OIZ, they told me that they prefer not to pasteurize milk in these modernized dairies either. Since cheesemakers are used to working with raw milk and their traditional recipe doesn't include pasteurization, they prefer making cheese out of raw milk. They also claim that pasteurization changes the taste significantly. The dairy tents in the pastures had ensured the short distance and time interval between milking the animals and the initial process of making the *baskı*. From the perspective of the food safety measures and dairy sciences, or what Paxson calls Pasteurian microbiopolitics (Paxson 2008), the bacterial communities in the milk don't have enough time to reproduce before coagulation. However, the milk that travels from pastures to the modernized dairy in the industrial zone right outside the city center risks carrying more pathogens because of the proliferation of bacteria that exists in the raw milk.

This infrastructural change of the connection between pastures and *kaşar* cheese led to new sociotechnical processes where the cheesemakers had to work with the materiality of the milk (rather than the curd) that had traveled. The "microbial abundance" (Paxson and Helmreich 2014) was seen as a problem not only by Pasteurian microbiopolitics of the food safety regime but also by the cheesemaker who cannot craft the right texture of *kaşar* cheese if the curd is obtained from milk that waited for a long time before coagulation – the cheesemakers referred to it with another description: milk that was shaken longtime (*çalkalanmış süt*). Due to the persistence of this problem a new technology was introduced in the production of semi-industrial *kaşar* cheese in the 2000s. Some dairies bought new

machines that cheesemakers called "*robots*"[104] by the cheesemakers. This technology involves *kuru haşlama* (dry-boiling)[105] the pressed curd to obtain a texture close to the traditional *kaşar* cheese. By calling this a *robot*, cheesemakers stress that the technology did not require any involvement of the human hand, which is crucial in the conventional techniques of *sulu haşlama* (wet boiling) and *göbek bağlama* (tying the belly)[106]. The *robots* with similar technology to the widespread industrial cheese processors allowed the processing of almost any type of curd, including old and defective cheeses, into a brand new *kaşar* cheese.

Rural cheesemakers challenged the use of *robots* in the processes mentioned above, during the GI legislation meetings. They emphasized that the craft of making kaşar cheese resides in the traditional technique of *sulu haşlama* (wet boiling). This technique involved using a vat filled with hot brine (usually between 67-72 degrees °C) in which a large strainer (called *sepet*-a basket) is used to consolidate the small pieces of curds that are dried and pressed for approximately 12 hours. The cheesemakers use a wooden stick in this process. When they make sure that the curd holds together, the next step is to put it on the wooden counter to knead and make small forms. The kneading technique is called "*göbek bağlama"* (tying the belly). The real craft is to decide how much to boil, how much to knead, and tie the belly properly. And during this process, the cheesemakers sense the cheese, or rather what the cheese can become when it starts to be aged. The texture they sense when kneading tells them what kind of texture to expect after a few months of ripening. Their artisanal techniques enact

[104] *Robot*, along with its meaning shared with English, is used widely in Turkish to refer to different kinds of machinery like the kitchen appliance *mutfak robotu* (food processor). The word itself highlights the automation technology of, in this case, cheese processing.

[105] Dry-boiling of the curd is a mechanized procedure that heats the curd at a high temperature, usually using steam, to soften it and shape it into a desired form of cheese. This technology also allows re-using cheeses and produces processed cheese that is not made of fresh curd.

[106] See Interlude 3 for the details of these techniques.

the pastures in the milk, curd, and cheese; they bring the pastures back in, or better put, pasture dairy infrastructures through sensory and technoscientific practices.

Sensing pastures in crafting

It was one of the days I accompanied İlhan on his visit to Kars city center from the village to do some errands. We were on our way back to the village when he received a phone call. It was clear that he was talking to another cheesemaker about some possible causes of a problem in the cheese. I figured that the cheesemaker on the phone was calling from Koçköyü, a village in the east where pastures harbor the national border between Turkey and Armenia. If he needed to visit the dairy in Koçküyü, we needed to take the exit from the main road and drive the East rather than the Northwest. By the time his conversation was over, he had already taken the exit. When he called his nephew, he turned to me and said: "Now I will have to take you to another small rural dairy, and we will be late because the road is in very bad shape." While İlhan spoke to his nephew and ensured that the latter would take care of the cheesemaking in the village that evening, I started to look for my notes from a meeting in previous months. A few months before, I had met Cemal, the cheesemaker who was calling, when I accompanied İlhan and his friend Kamil on their trip to Koçköyü.

İlhan and Kamil were two farmers from Boğatepe village interested in launching a production site in a pasture where they could find good quality milk. Since they were also involved in cheesemaking in their village, they agreed with Musa, another cheesemaker experienced in making kaşar in pastures before the ban, who was going to work as the master cheesemaker in this new dairy. While they failed to find a suitable place where they could get the necessary permissions from the state and convince farmers to sell milk to them, they encountered Cemal, who renovated his family production site in Koçköyü few years ago. Cemal obtained production permission by satisfying food safety requirements in 2015. In my

fieldwork, I listened to many stories from small dairy farmers who attempted to renovate their old dairies by conforming to the criteria in food safety laws and keeping their 'inappropriate' traditional aging sites or tools out of the inspector's sight. This process requires an investment that is impossible for most small dairy farmer families in rural Kars. Cemal's family, like İlhan's, Kamil's and Musa's, was known as talented cheesemakers, whose number has declined in Kars especially after 2005. In three years, Cemal and his brothers managed to continue their production, and in 2018 they decided to scale up when the second dairy in the village went bankrupt in 2017. They told me that there were more than half a dozen dairies and much more crowded herds in the village before the 2000s. Their building was suitable to accommodate a second tank and larger *badval*s (aging rooms or cellars). Musa, who has worked in different villages and pastures as a cheesemaker his whole life, accepted to work in Koçköyü during the pasture season. İlhan also visited the dairy and realized that the renovated building was on top of an old stone structure that could be turned into proper *badval*s (that would not satisfy food safety requirements but make possible 'real' Kars Kaşar cheese ripening). Hence these four cheesemakers decided to manage the production in the Koçköyü village together. That day, it was Musa who called İlhan. Apparently, he told him new details about the problem with the *kaşar* production that had been going on for 10 days and asked him to visit the dairy.

İlhan and Musa had several ideas about what caused the problem in the texture of the cheese. Including Musa, there were three cheesemakers in the dairy. They all told me that the texture of the curd when they boil, knead, and form the cheese feels like 'it doesn't hold together' (*tutmuyor*). They describe their sense of feeling the curd as not strong enough. It is not a familiar sense they feel when they knead the curd. They know different curd-feelings when the substance they shape lacks the necessary amount of fat or salt, or when it is more

acidic than it should have been while waiting to be boiled. Yet the feeling they had in the last ten days was unfamiliar.

They started to follow the cheeses closely. When the cheeses were taken out of the forms after one day of resting, they didn't show any physical signs of 'not holding together.' Only after four to five days in the cellar some of the 15-20 kg wheels of *kaşar* cheeses start to crack. Realizing that cheeses risk getting wasted before they age for three months, they became more concerned and started to try different techniques to form the 'right' texture. When we got to the village, I talked to Musa while waiting for the milk to arrive at the dairy. He tells me that some of the equipment in the dairy is new and that it takes time for cheesemakers to find the optimum techniques calibrated to the properties of the milk. Cheesemakers, according to him, learn to *hissetmek* (feel) the particular properties of different kinds of milk. These differential properties include place, weather, breeds, feed, or transportation techniques. He adds that he has a few *çubuk*s (wooden sticks) that he has been using in different dairies. The *çubuk* – which should not be wood according to food safety regulations – is used in the boiling technique of the curd that forms a dough-like substance to be kneaded. Musa says that it helps him to get the right texture. He even thought that the cheeses showing signs of cracks but did not end up having real cracks might have been saved by the old wooden çubuk that brought the taste from the previous dairy sites he had worked. But it is not enough, he added. They needed to solve the underlying cause.

Cheesemakers considered different possibilities. Since they felt the problem while kneading, the issue couldn't be about the ripening process. They ended up having two theories. The first one was about the condition of the milk by the time it arrived at the dairy. The road to the village took very long for any car due to the large holes in the asphalt. Maybe more important than the time (since the pastures were not that far away and the maximum time it takes from the pastures was about 30 mins to an hour for the milk tractor), the

movement of milk (*çalkanlanması*) in the tank might cause the coagulation process not to happen correctly. To make the resulting curd take the right texture while kneading, they were going to increase the amount the rennet used. The second possibility was the timing of the cheesemakers when to start the process of wet boiling. İlhan suggested starting a couple of hours earlier than they do. In this way, the curd would be less acidified when boiling starts. I had learned in dairy technology classes that the curd should have a ph of around 5 at this point. In some dairies, I had encountered the practice of putting water on the curd that was pressed. This step lengthens the time needed by the curd to reach the desired level of acidity and allows the cheesemaker not to be late by the time he comes back to the dairy in 6 to 8 hours.

All this investigation clearly demonstrated that artisanal cheesemaking in rural dairies relies on constant learning about the milk of different pastures and modifying their techniques to make good quality pasture cheeses. In contrast to pasteurization and *robot*s that ensure a tasteless but holding together texture of kaşar in industrial dairies, wet boiling requires adjustments and calibration of techniques. Sensorium of cheesemakers gets formed during this process which intricately ties their know-how to materiality of milk and curd.

During one of my visits to the OIZ in Kars where most dairies in the province are located, I saw a dairy truck transferring milk to the dairy with the owner I had an appointment with. I introduced myself to the driver who was standing by the truck. He had attached the tank with a hose to the stainless steel pipe that carried the milk inside the dairy, where the milk is filtered and then poured into an eight-tons vat. I asked him the source of the milk he uses. “This is the milk from a pasture of the Dikme village. But I arrived early. The other truck is going to be late. This milk might wait for a long time, and this is not good,” the driver answered me. He seemed to be proud of collecting the milk fast, yet he didn’t think this would cause a problem. The dairy owner Kemal was complaining about this problem

when I saw him a bit later in the kitchen of the dairy: "Today he came early. … They don't let us press the curd and then bring it to the dairy." He referred to the banned practice of processing *baskı* in the dairy.

I sat with Kemal in the kitchen of his dairy factory in Kars for more than an hour that day. While I was happy to have an opportunity to interview him, I was also worried that by the time the second truck of milk arrived at the dairy, the chances of making a good kaşar cheese might have already become very low. Kemal told me the famous phrase I kept hearing in dairy worlds of Kars: "*Cenaze bekler, süt beklemez* (A funeral can wait but never can the milk)". After he had waited for about half an hour (checking the milk a few times with a Ph meter), he called the second truck's driver once again. When he learned that the remaining milk would not arrive soon, he decided to put the rennet and coagulate the first batch of milk. He explained to me that the real *kaşar* cheese needs to be made from (raw) pasture-milk. However, when it takes a long time for the milk to arrive at the dairy, it becomes impossible for the cheesemakers to craft it as they wish. Kemal tells me that before the *robot*s were introduced, this kind of milk was not used for kaşar cheese, simply because it was impossible to craft the texture that would hold together. On that day, the milk from the first truck turned into kaşar cheese with traditional methods – from raw milk to wet boiling and tying the belly. The second batch, that was late due to a time lapse between milking in two villages the truck was supposed to collect, was put in the pasteurization machine first, and then the *robot* was used to make kaşar cheese. The second batch did not turn into proper kaşar cheese that would satisfy GI requirements, yet it was still more profitable than making other traditional cheeses for the dairy owner. This choice also implied that the know-how of urban cheesemakers has increasingly become devoid of the techniques that can be adjusted to accommodate different materialities of pastures in the milk and the cheese.

Pasturing dairy technosciences

After 2010, small cheesemakers in rural Kars started to cooperate while bargaining with the inspectors, convincing state officials and technocrats, and applying the development aid programs to renovate their dairies. They had the support of a larger organization of small farmers, veterinarians, and environmentalists in Kars, and various alternative food networks in Turkey. *Ekomüze Zavot*, a cheese ecomuseum that was founded in a village famous for cheesemaking in Kars (also introduced in Chapter 1), aimed to foster local-traditional forms of *mera hayvancılığı* and *mera peynirciliği* (agro-pastoralism and pasture-cheesemaking), and it became an important node in the organization of dairy farmers and cheesemakers. The latter sought to find ways of convincing the state authorities, starting from the local inspectors and bureaucrats, about the aspects of illegal artisanal cheesemaking according to the food safety regulations. Cheesemakers managed to create new connections; ecomuseum activities and GI legislation recognizing pasture milk helped them maintain their rural dairies. In various negotiations, encounters, workshops, and projects, cheesemakers started collaborating with a small group of dairy scientists who formed a minority in their disciplines (veterinarians, food engineers, or microbiologists). They considered artisanal raw milk cheeses almost safe for humans and also investigated biological and microbiological diversity that exists in pasture milk and traditional dairy products in Turkey.

The collaboration between dairy farmers, cheesemakers, and scientists in Kars aimed at identifying distinctive characteristics of the *kaşar* cheesemaking to enable crafting practices that ensure the safety and taste of this pasture-cheese. Hence, making pastures present in the *kaşar* cheese requires scientific knowledge production and technologies of pasturing cheese. Veterinarian and microbiology professor Mitat Şahin, who directed microbiological analyses of Kars Kaşar cheese in 2014 for the GI legislation, had told me that the analyses aimed to unravel "the fingerprint" of the cheese. The unique fingerprint would

scientifically describe distinctive microorganisms and aroma of *kaşar* cheese, which necessarily includes properties of pasture-milk, according to Şahin. While he was disappointed when no significantly local (or 'indigenous') microorganism was found in the PCR results of *kaşar* samples he collected, he remains committed to studying the microbial diversity of artisanal cheeses to create regional and national databases of locally found microorganisms in traditional dairy products.

Although not institutionally supported by the public university in Kars, Şahin's approach was influenced by a handful of food engineers in Turkey, who persisted in doing research on local dairy products when the majority in their disciplines worked on issues related to industrial food processing. These studies revealed not only the entanglement of physical, chemical, and (micro)biological transformations of milk in the course of its transubstantiation into cheese but also how techniques and traditional methods were intrinsic in the governing microorganisms that make the cheese (Kamber 2005; 2015; Güzeler and Koboyeva 2020). These efforts enabled them to collaborate with rural cheesemakers, especially in discussing the logic behind food safety measurements and formulating plausible claims to the state authorities, especially in terms of public health concerns.

These kinds of collaborations are akin to what anthropologist Heather Paxson calls "Post-Pasteurianism" (Paxson 2008; 2013). As opposed to the Pasteurian microbiopolitics which involves making microscopic agents visible through technosciences, and perceive the microbial abundance in milk and other dairy products as dangerous for humans, post-Pasteurian microbiopolitics approach the microbial abundance as offering many possibilities for humans in their relation to microorganisms (Paxson and Helmreich 2014). This view highlights that humans work with the microbiological communities in milk while crafting cheese. The Pasteurian approach isolates microorganisms in milk and ensures the elimination of the harmful ones before dairy production. This approach aims to kill the possible

pathogens[107] by standardized procedures to replace 'raw' milk with pasteurized milk. Whereas a post-Pasteurian view seeks ways to work with the dynamics of microbial communities that can inhibit microorganisms humans know as pathogens and that enable distinctive smell and taste of pastures. The latter approach requires conducting thorough research by following the milk production from farms, sheds, pastures, and cows at each step as the cheese is crafted and aged in the dairy; and this enables scientists to reveal the dynamics of microbial community formations in cheesemaking while also (partly) satisfying food safety concerns. As I elaborate in Chapter 4, the collaboration between scientists and farmers in Kars involved collecting samples at different stages of pasture-milk and analyzing physical, chemical, microbiological, and sensory compositions (and decompositions) of pasture-cheeses. Recent dairy science research addresses safety concerns that are unfairly associated with pasture-cheeses and depicts how certain characteristics of *kaşar* cheese originate from pastures, from the proximity between pastures and dairies, and from particular techniques of dairy craft. In the remaining part of this chapter, I will focus on the co-construction of this craft with technosciences.

Once the milk reaches the dairy, most common technoscientific practices include analyzing the samples collected from farmers when they pour their milk to the common tank at the back of the trucks. Small machines called "milk analyzers" are commonly used in rural dairies to identify the percentages of the components in milk, like fat and dry matter. In my visits to the diaries in Kars and Ardahan, I also encountered antibiotic kits and small incubators in some dairies to make more detailed microbiological analyses of pasture-milk. These technologies increasingly become more and more important in the relationships

[107] 'Raw' (*çiğ*) milk became defined in opposition to the Pasteurization in the dairy industry since the early 20th century. (Raw) milk is assumed to be risky of carrying microorganisms that can harm human health. Pasteurization is considered to be a fundamental technology to ensure that pathogens like e. coli, brucella, tuberculosis do not survive in milk and dairy products. See chapter 4 for a more extended discussion of the health concerns and scientific research related to the use of raw milk in dairy production. For recent publications on the "raw-milk cheese" debates, see (Donnelly 2019; Percival and Percival 2017; Richez-Lerouge 2017).

between dairy farmers and cheesemakers, because everyday encounters between the two have decreased due to the change in the dairy infrastructures of collecting milk in particular. It is not surprising that these technologies shape the kind of trust in their relationship. When I started my fieldwork, I expected to observe how the use of new dairy technologies reduces the relationship of trust between farmer and cheesemaker to the 'technical' matter of analyzing milk. A technical expression of the composition of milk becomes part of a commercial agreement and a new space of negotiation between farmers and cheesemakers on the determination of milk prices, effects of the weather conditions on milk quality, or how the dairy can collect milk better. In other words, the technical evaluation of the milk by the machines does not necessarily imply that the relationship of trust between the farmer and cheesemaker, whose interactions are shaped by everyday life in the village, would result in the transformation from personal trust to be mediated by a technical process or to the composition of the milk as it is revealed by dairy technosciences. Collecting samples, analyzing milk, discussing the analyses, and crafting techniques are always subject to the everyday conditions in pastures where sociotechnical arrangements are constantly calibrated to the necessities of the particular pasture-milk collected twice every day. For instance, when farmers skim the milk before selling it to the dairy to make butter for their guests, or when it rains too heavily in a pasture, the percentage of fat in the milk can decrease significantly. However, cheesemakers usually learn this from farmers or shepherds in the village. Hence their milk analysis in the dairy usually takes these conditions into account for adjusting expectations on technical results and balancing these problems with other farmers' milk as much as possible[108].

[108] In a recent publication (Tatari 2020), I discuss the reasons why the use of dairy technosciences that I encountered in my fieldwork, cannot be considered as a form of 'techno-politics' where power relations are reduced to the technical problems. The case of pasture-cheeses points to particular sociotechnical arrangements that somewhat complicate the 'technicality' of technosciences with artisanal dairy craft and everyday practices of agro-pastoralism.

Photograph 8: A milk analyzer machine in a small dairy in Boğatepe village (2018).

The collaboration also made cheesemakers committed to the scientific understanding of pasture-milk and cheesemaking. They work with food engineers to design scientific studies that aim to identify distinctive properties of pasture-cheeses. For instance, in a study conducted in 2016 and 2017, samples of cheeses were collected and identified with their production places as 'mountains' or 'plains' of Kars, which, according to scientists and cheesemakers involved in the study, could partly correspond to the crucial distinction between cheesemaking in pastures and organized industrial zone. Similarly, another researcher collaborated with cheesemakers in Kars dairies to collect whey samples from different batches of coagulated milk by categorizing them according to the pastures' altitude. These artisanal studies –which are discussed in detail in Chapter 4 – have also affected cheesemaking craft in rural dairies where the masters embraced the idea that the microbial abundance in pasture-milk is not a danger but the site of many opportunities. As İlhan puts it:

"Our job is to provide the conditions for the living beings in the milk, to help friendly bacteria win the war against those harmful to people who will eat this cheese". He emphasizes that pasteurizing milk is to kill harmful bacteria without enabling other potentialities of the microbial diversity in milk. In his view, traditional crafting methods involve working with the milk, including its microbial abundance. Hence, İlhan's perspective and sensory know-how of the invisible agents involved in substantiating milk in different forms combine what anthropologist Christina Grasseni calls post- and pre-Pasteurian attitudes (Grasseni 2016). While artisanal *kaşar* cheesemaking has always been attuned to the presence of pastures while crafting milk, practices of scientific knowledge production link the cheese's materiality to the pasture-milk in new ways, crafting involved pasturing technosciences. This convergence has been characterizing the attempts of pasturing dairy infrastructures in rural Kars.

Conclusion

Industrial dairy production relies on the milk standardization by expropriating the traces of its place-based characteristics, such as the entanglements of pastures, cows, milk, and farmers in rural Kars. As I discussed in this chapter, Pasteurian technosciences like deodorization and dry-boiling expropriate pastures from milk. Pasteurizing dairy infrastructures not only marginalizes pasture-milk but also make invisible the everyday life of *mera hayvancılığı* that is crucial for the dairy craft. The geographical indication of Kars Kaşar cheese emerged in this context for dairy farmers and rural cheesemakers as a means of infrastructuring pastures differently for dairy craft, i.e., of pasturing dairy infrastructures.

The collaboration between cheesemakers and dairy scientists that made possible the design of the GI legislation highlighted pasture-milk and craft practices calibrated to the everyday conditions. Pasturing kaşar cheese in rural Kars involves practices that ensure the

presence of pastures in the cheese. While scientific knowledge on pasture-cheeses addresses food safety concerns, especially around the raw-milk controversy, it also transforms everyday practices of pasture-cheesemaking through artisanal techniques and technosciences. The transfer of milk from pastures to dairies becomes pivotal in forming a pasture-cheese sensorium in Kars Kaşar cheese. Practices of sensing pastures in the milk, curd, and cheese enable dairy crafts to be calibrated to the everyday conditions of pastures.

Pasturing, I argued in this chapter, is a particular mode of dairy infrastructuring in rural Kars. It involves the collaboration of dairy farmers, rural cheesemakers and a group of scientists, and more-than-human communities that include cows, grass, milk, and various technosciences making possible the emerging pasture-cheesemaking sensorium of Kars Kaşar cheese. Challenging the practices that pasteurize dairy infrastructures involves sociotechnical arrangements attuned to how pastures are present throughout cheesemaking. The synesthetic experiences of crafting pasture-milk, in which smell, taste, touch, and vision are simultaneously implicated, shape the sensorial know-how of farmers and cheesemakers. The interlude that follows this chapter offers more stories on the sensory labor in crafting cheese and show that artisanal techniques and scientific experiments are both *handcrafts*. Then, the next chapter delves into the recent dairy scientific research on Kars *kaşar* cheese to analyze the recent scientist-cheesemaker collaborations in relation to making pasture-cheeses as scientific entities, living substances, and commercial food.

Interlude 3

On techniques, hands, and contamination

The skillful practice of craft incorporates the practitioner's body each time it is enacted. Touch and movement with hands play a crucial role in the process. All crafts are, first and foremost, hand-made endeavors. Crafting human bodies use their hands to communicate with the material substance they work on. Cheesemakers I met during my fieldwork touch the milk, the curd and the cheese repeatedly throughout the crafting process. Touching allows them to sense what matters in the curd (and the cheese) primarily through their hands. This interlude sheds light on the hand-made processes of *kaşar* and *gravyer* cheesemaking as I participated in and observed this craft in different rural dairies of Kars. The involvement of hands also easily provokes the anxiety of 'contamination' for the visitors of the dairy, inspectors of food safety requirements, and dairy scientists. Hands and arms covered with latex gloves seems to be the simplest precaution cheesemakers can take to satisfy the tourist and inspector gaze; as it will become clear below, this precaution impairs the craft of cheesemakers. Meanwhile scientists who also use their hands in dexterous ways in the laboratory are very cautious about preventing any microbiological contamination from their hands. Intriguingly, what is perceived as contamination by scientists is part of the microbiome of the cheese, according to the cheesemakers.

The number of tourists visiting Boğatepe village has exponentially increased between 2018 and 2020 until the COVID-19 pandemic. As more people visited the dairies, the production process often became a public spectacle. The largest dairy in the village, where I spent most of my time observing and participating in the production process, and the encounters of the visitors and cheesemakers, included a spacious hall on its second floor,

with large windows that overlook the production process happening on the first floor. Touristic visits were usually considered similar to the inspections by the dairy staff since the latter needed to showcase an exemplary production while being watched. Tourists could take pictures and videos later circulated digitally, mainly on social media and news websites. I encountered many tourists expressing their concerns and anxieties about people working with their bare hands in the dairy. The involvement of hands during local food and artisanal production is acceptable for some people because they trust the practitioners. Also, many expressed that the artisanal cheese should be hand-made anyways. Yet for some others, each and every type of food production process should be run without using any human hands. These people were interested in looking for ways that prevent the possibility of contamination by practitioners' hair, if not the microorganisms on the skin. They constantly questioned the lack of gloves and other equipment covering the head or arm of the practitioners. Once the main master, Çetin, answered a question posed by an anxious tourist regarding the use of gloves by stating that the practitioners take care of the cheeses at every step with their bare hands. "We often wash our hands, and they are crucial for giving the taste to the cheese you eat." Çetin's dairy was famous not only for its *kaşar* cheese but also for its *gravyer*, which requires a longer and more tedious production process than *kaşar*, and requires closer attention at every step. For Çetin, taking care of the cheese they produce is an everyday routine for most of the year in a particular pattern.

Making *gravyer* with hands

The routine of *gravyer* cheese involves touching not only the milk and the curd for the first 3 hours during the production production, but also large wheels of cheeses (50-120 kg each) for the following 6 months in the resting area, brine, and aging rooms. I watched Çetin and Ahmet, the two *gravyer* masters in the dairy, working in all these stages between 2015 and 2019. Hands and fingers of the *gravyer* master touch the substance while crafting. When

the milk arrives and fills the two large copper vats (1 ton each), Ahmetadds approximately 15 mililiters of rennet with one hand and stirs the milk with his other arm. Then the curdling-milk sits for about 45 minutes, at the end of which one of the masters sinks one finger slowly to assess if the coagulation formed the desired texture of the curd. Throughout the various cooking processes during which the curd is heated, stirred, and cut into small pieces within the same vat for at least 90 minutes, the master often puts his hand into the coagulated milk to check the size and texture of these pieces. He decides the time to take the particles out to form a young *gravyer* wheel. Çetin has a small steel sieve that he sinks into the vat and collects curd particles into his hand. Then he has a series of movements he performs with this piece of curd. He uses his fingers and palms to form one solid chunk of curd from these particles. He plays with this curd, lengthens, squeezes, shakes, and breaks. Lastly, when he finishes his assessment, he powders it into small particles by almost grinding it with his two palms to put it back into the vat. Çetin repeats this many times in the last 15-30 minutes of cooking until he decides that his hands feel the desired texture.

When the master calls the time to take the *gravyer* out of the vat, all the staff in this small dairy take a position. While the master goes towards the bucket of cold water to soak his arms before touching the hot substance in the vat, an apprentice prepares the long flat wooden stick on which the master would lean with his pelvis. Then he covers a long and thin elastic steel stick with one end of the large rectangular cheesecloth. The master takes this end and stretches out along the round vat's imagined diameter. When he starts to sink the cheesecloth along the vat's surface, all the other four apprentices/workers should be positioned around the vat, holding a piece of the cloth that travels all around the bottom of the vat. Once the master takes the cloth out of the vat near his own body, he takes off the steel stick while the others bring the edges of the same fabric together to make a bundle. This bundle is hung to a hook that is part of a mobile system that can be placed on top of the

gravyer molds called *kasnak*. But before this collective step in the process, the staff squeezes the bundle with their hands and helps the whey strain from the cloth back to the vat. Lastly, two people move the hook to land the bundle into the *kasnak*. Two people release the tie of the bundle, squeeze and flatten the cheesecloth on top with their hands, and put the wheel of cheese under pressure.

Hands and fingers are intensely involved throughout this cooking process. Yet they continue to be the main tools after the cooking as well. The wheel stays under pressure for around 24 hours. To change the wet cheesecloth with a dry one and turn the wheel upside down, the pressure is released 4 times during this interval. This repeated operation is called "*çit açmak*" (opening the cloth), and it is a critical level in *gravyer* apprenticeship. After my first week in the dairy, I started to help the person who performed it. *Çit açmak*'s timing is crucial since the cloth should not stay wet. Otherwise, it causes the young cheese to keep more water inside and not to ferment at the desired pace. Once the pressure is released, and the cheesecloth is unraveled, the wheel in the mold is found stuck to the cloth. With the help of a steel spoon, one needs to clean the particles of the young cheese from the fabric. This is a slow process that requires particular hand coordination to be paid attention to by the apprentice; one hand holding the spoon and scratching from outside the cloth, the other stretching the cloth each time the movement of the spoon releases a tiny bit of the cloth from the young wheel of the cheese. These particles collected from outside the cloth form a pile at the end distributed on top of the mold. Both Ahmet and Çetin taught me that this distribution, which seems to be an insignificant detail at the end of a laborious process, is the most important moment of this procedure. They both emphasized that I needed to consider the respective pressure's physical impact on these tiny particles. These particles easily sink into the wheel because of this pressure, but if they are too much gathered in the center, later they cause the hard wheels to crack from the center. To prevent this, the apprentice should use

their hands and spread these small particles around the wheel's surface. Ahmetonce showed me a five-month-old *gravyer* cheese that had cracked from its center. While I was analyzing the deep cracks I encountered on the wheel, he told me that the particles the apprentice did not distribute well on the surface caused the cracks. This was a particular moment of visual recognition for me, months after I learned to open the cheesecloth and used my hands to distribute the curd particles before wrapping the wheel with a dry one and putting it under pressure. When the pressure gets released for the fifth time, the wheel is taken out of the production area to the resting room, and put on a wooden shelf for 1 or 2 days until it joins the other wheels in the brine pool.

Most visitors watch a portion of these long processes if they visit a *gravyer* dairy during its cheese production phase. Ahmet used to make fun of the romantic comments of the tourists:

> They see us here for a couple of hours, sometimes even less. And they think that they got the gist of it. But how can they? These wheels need constant care like a baby; we have to be on top of them at each step. They cannot imagine the labor we put in these wheels every day for months!

Ahmet was responsible for the aging process. While Çetin is the cheese master who usually cooks the cheese, Ahmettakes care of the daily routine labor in the aging rooms. He numbers all the cheeses before they go in the brine, then notes down the storage timing of each cheese stored in the brine, in the hot and cold ageing rooms. After the cheese production, he goes to the aging rooms every morning and evening. Emre, one of the apprentices, accompanies him to help carry the cheese when necessary. The main job is to wipe off all the wheels in the hot room and sprinkle some rock salt on their surfaces. Ahmet says that the cheeses sweat in this room and that he needs to clean their sweat by wiping them twice every day. The hot aging room is heated with an old stove that needs to be filled with coal three times every day. The cheeses are on the wooden shelves in the room.

After the steps detailed above, an important task is to turn the wheels around or upside down. By closely observing the shape of the wheels, which start to swell from their center, Ahmet turns them around one axis or the other. He slaps the wheels using his hands while gazing at them and listens to the sound that comes from the inside of a large wheel. He explained that the ones nearer to the stove 'work' (*çalışıyor*) more, and they look more swollen. To ensure an even distribution of heat (and its effects on the cheese), he needs to move the wheels: the ones occupying the nearest spots should not stay there for more than a few days. They need to be turned around every day so that each part gets exposed to the similar heat. When he takes the wheels into the hot room, Ahmetprefers to place them on the shelves further away from the stove. Hence throughout the 28-30 days storage period ahead, each wheel in the hot room is constantly moved, turned, wiped, and salted. When Ahmetdecides that a particular cheese has swollen enough and that the sound of his slaps fits his expectation, he calls Çetin to the hot aging room. Çetin confirms - by looking, slapping, and listening - the ones that will be transferred to the cold aging room where they stay for at least 3 more months. Ahmetcontinues to check the wheels in the cold room as well. He continues to wipe them every day, sprinkles a bit of salt on top, and moves them when necessary.

Artisanal *gravyer* cheesemaking in rural Kars requires a long period of care labor to be enacted by the cheesemakers. After the transubstantiation of milk into cheese, the aging period continues to beg for everyday activities like wiping, turning around, and keeping them at the right temperature, humidity, and salt level. All the cheesemakers I encountered consider themselves managers of an almost natural process in the milk. As Çetin once put it:

> We enable the milk to be coagulated and preserved in particular forms, as we learned from our grandparents. The main job is performed by the milk itself, or rather by the bacteria and other microorganisms already inside the milk.

While Çetin is the only local cheese master I met who studied milk technologies at the university, most cheesemakers expressed that providing the appropriate environment for the

milk is a crucial part of their craft. To do this, they need to evaluate the milk, curd, and cheese. This is first and foremost a sensory evaluation that involves touching and feeling the cheese sample with bare hands, a tacit knowledge of cheesemakers that relies on practice. Yet the food engineers and inspectors consider this handling very risky. While most would accept that washing hands often would minimize potential risk of contamination, the use of gloves is a key criterion during the inspections.

Hands in the laboratory

During my fieldwork, the food engineers I was in touch with emphasized that cheesemaking is basically about cultivating an environment for certain desired microorganisms. Hence, they usually compared the cheesemakers to a microbiologist carefully working in the laboratory. Once I asked my *gravyer* master friend İlhan what he thinks about not touching and handling the cheese with his bare hands, he told me that the food engineers do not take into account how their hands can also be part of the microflora they would detect and identify on the cheese he produces.

The microbiological research I followed closely in a research lab at the Food Engineering Department, Van Yüzüncü Yıl University, shed light on the fact that the craft of microbiological science has a lot in common with cheesemaking, especially when it comes to the use of hands during the artisanal production process. Throughout the time I spent in the lab with Şehnaz (a Ph.D. student whose research I discuss more in detail in Chapter 4), I was instructed on various techniques that were assumed to prevent any possible contamination of the samples. Like the cheesemakers, she was interested in setting up the right environment for the microbes present in the samples she analyzed. Yet she never considered the microbiome of her own hands as part of the microbial communities she was researching; she instead considered her hands as possible sources of contamination that needed to be isolated from her research material as much as possible.

To keep everything sterile and prevent any possible contamination, Şehnaz used an autoclave machine as the first step that sterilized the equipment before she used them. She mixed agar and water to prepare the 'feeding lots' of the microorganisms. This mixture provided the nutritious layer of the petri dishes in which the bacteria that Şehnaz later transferred consumed for further reproduction. My primary responsibility in the lab was to write down the appropriate codes on the petri dishes. These codes usually consisted of the number of the transferred dilution, the characteristic of the agar used in the mixture, and whether the bacterial communities were kept under anaerobic conditions or not.

Once the petri dishes and the microbe culture mixture were sterilized with the help of the autoclave machine, Şehnaz transferred the microdoses of the diluted samples into the petri dishes. For this process, she used disposable straws in which she filled 0,1 milliliters from the sample and then injected this liquid on top of the feeding lot in the petri dish. She used a glass spatula that helped her to distribute the liquid dilution inside the plate. She used alcohol and a Bunsen burner to keep her equipment sterile throughout this process. She used hands during each movement she repetitively performed. She used the straw in her right hand throughout the process. Her left hand first held the tube which contained the dilution. Her right little finger had a crucial role in opening and closing the tube's lid, which she moved towards the flame each time she opened and closed it. After she got 0,1 ml of the straw from the tube by using her left hand and right little finger, she put the tube away and switched to the petri dish. Her left thumb and point finger lifted the lid of a petri dish while her right hand held the straw and injected it immediately when the lid was lifted for a few centimeters, which allowed the head of the straw to sneak inside. Once the liquid dilution was inside the petri dish, she closed the lid with a quick hand movement. Simultaneously she discarded the straw and held the glass spatula with her right hand. Her left hand reopened the petri dish, while her right hand sank the spatula into the alcohol and kept it on the flame for a brief

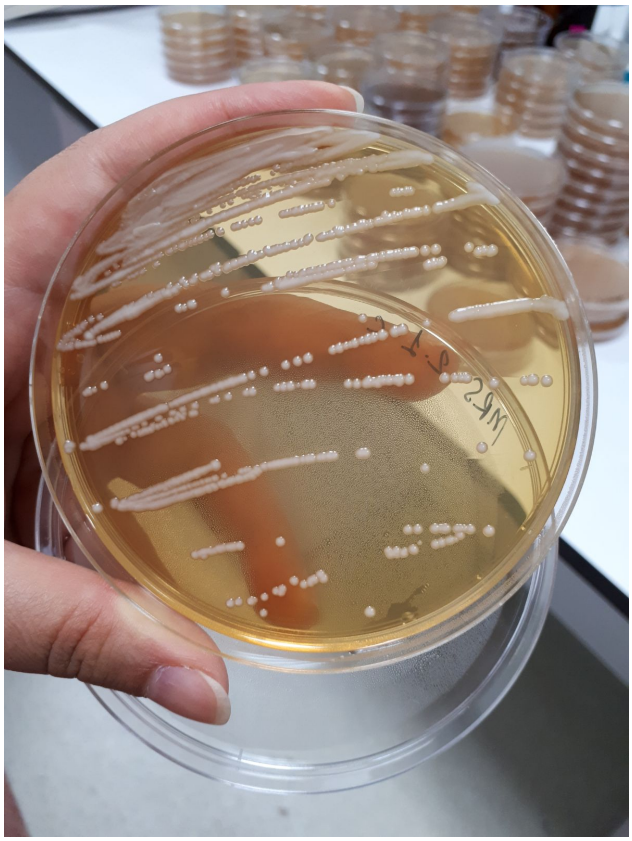
second afterward. Then she quickly used the spatula (after briefly touching the petri dish's surface to cool it down) and spread the liquid on the brownish-looking agar base inside the plate. This hand movement did not seem to leave any traces until the next day, when she took the petri dish out of the incubator. When I saw the colonies of microorganisms inside the petri dishes, I recognized the patterns of the spatula from the previous day. This visual recognition of an earlier hand movement reminded me of Ali's demonstration of the deep crack at the center of a five-month-old *gravyer* wheel earlier at the dairy.

Photograph 9: Şehnaz using the spatula in the laboratory (Van, 2018)**.**

Şehnaz repeated this brief procedure in the lab endlessly for her dissertation research. During the two weeks I accompanied her in the lab while she was trying to isolate mesophilic

bacteria from the wheel samples, she prepared four diluted solutions (experimental samples) from all the ten samples I brought to her, and two petri dishes for each diluted solution. After she took the dishes out from the incubator, where they stayed for between 24-72 hours, she analyzed the proliferated bacteria in the dishes, ran some tests, and then selected some of them (not all were useful for her research aims) for which she prepared another set of petri dishes with new feeding lots. This was a long process during which Şehnaz's fingers and the microbes that proliferated inside tubes and petri dishes collaborated with the facilitation of her sterile equipment. Yet numerous petri dishes did not contain any bacteria when taken out of the incubator. So the collaboration was not always a matter of success.

Şehnaz's research samples taken out from the whey of the coagulated milk were later transformed into *kaşar* cheeses in different dairies. Her research aimed to reproduce the lactobacillus bacteria in the curd that can resist the boiling temperature when the *kaşar* cheese is crafted (see below). She argues that some of the crucial bacteria that give Kars *kaşar* cheese its distinctive taste proliferate in the petri dishes thanks to her laboratory practice. She uses microbiological techniques, research procedures, and her tacit knowledge in the lab to reproduce the same bacteria that populate Kars *kaşar* cheeses crafted with the artisanal methods of boiling the curd and kneading it with particular techniques in the rural dairies.



Photograph 10: The proliferation of microorganisms in a petri dish revealing the movement of the spatula (Van, 2018).

Making *kaşar* with hands

As I touched upon in Chapter 3, there are two crucial techniques of Kars *kaşar* cheesemaking: wet-boiling (*sulu haşlama*) and tying the belly (*göbek bağlama*). During the wet-boiling, the cheesemaker uses a wooden stick and their arm to make the dried small pieces of curd hold each other. This process involves handling the sieve-like steel basket that contains the curd inside a large vat filled with hot salty water (usually between 68-72 degrees C). In a few minutes, the curd starts to be formed as one piece with the help of the stick, but the cheesemaker needs to check the elasticity of this one-piece of curd to be able to knead and mold it with their hands. For achieving this step, the cheesemaker takes the basket out of the water swiftly and moves it almost upside down to watch how the curd slowly stretches towards the edge of the basket. Once the curd passes beyond the rims of the basket and starts

to hang down from it, the cheesemaker grasps it with one arm and applies pressure on it. The gesture allows them to sense the curd's texture through their arm. Then they fold the curd into two and press with their hand. After checking the elasticity with their arm and hand, they decide how much more the curd needs to be treated this way. They put the basket back into the water and usually repeat this process 2-4 times until they decide that the curd is boiled enough and ready to be kneaded.

When this curd is taken out of hot water, it is placed on a wooden desk to be kneaded. The master uses their hands, a bodily gesture that resembles kneading the dough to make bread. Each master has their way of performing this particular step. Sensory knowledge is crucial in this process; the texture they sense while kneading tells them when to stop. Usually within a few minutes of kneading, a more refined process starts. The curd needs to be folded in itself so that the curd itself looks like a rounded bundle (*bohça*). The master's fingers do the final work of 'tying the belly' by stretching the curd and sealing the bundle. There is usually a tiny extra dough that needs to be cut with fingers when the desired form is reached. This additional piece is called 'the belly' (*göbek*), and it is sold as a different kind of cheese. It is considered to be the softest part of the *kaşar* cheese since this part, according to the cheesemakers, is relatively less kneaded, and it is taken from the part that will form the very center of the wheel once it is aged. Tying the belly is a crucial technique through which the master feels the curd and its 'belly' through his fingers. Cheesemaker's dexterity and the performance of this tacit knowledge can significantly be impaired when the bare arms, hands, and fingers are not allowed to touch (and hence see and feel) the curd.

According to the food safety measures, all this process should be completed devoid of any wooden equipment that would be replaced with their stainless steel counterparts. Moreover the cheesemakers should use gloves to prevent any possible contamination from their bare hands and arms. None of the cheesemakers I met in Kars were happy about using

gloves, which became widespread in the last decade, especially during an inspection or a formal visit to any dairy. Mert, an experienced *kaşar* master in Boğatepe village, told me that some gloves warm up when he touches the curd, which is already very hot; that other kinds of gloves, on the contrary, do not allow his hands to feel the heat. He added that it is very bothersome to use gloves since they negatively affect the sensory communication between the master and the curd: "The master needs to feel the texture (*doku*) of the curd," he added. Because of the curd's high heat and moisturized texture, the long gloves easily slide down the arm that they are supposed to coat and the needed maneuvers can't be made with the same speed and dexterity while using bare hands. Many cheesemakers complained about using plastic surgical gloves that are not resistant to heat. They can shred, and the shredded pieces stay inside the curd. The cheesemakers I spent time with showed me large slices of *kaşar* cheeses with noticeable pieces of blue gloves inside them.

One such picture was sent by a supermarket chain's sales department, which was the biggest customer of a small rural dairy I visited. The owner, Osman, who showed me the picture when I asked about the gloves, told me that he used to work more frequently with small shopkeepers in Kars and middle-sized local supermarkets or intermediaries like merchants for larger marketplaces in Istanbul or other cities. In 2017, together with Çetin's dairy in Boğatepe village, he started to sell the bulk of his *kaşar* cheese to a German wholesale supermarket chain that operates in many cities in Turkey. He admits that he doesn't like limiting his final products to the supermarket shelves, but, he states, it is much easier for him to receive scheduled payments. This is impossible when I have many small buyers, he added. When I visited his dairy (March-August 2018), I noticed that Osman had reconsidered his business approach and shifted to a sales management model in which almost 70% of his production was bought by Çetin who sells it to the supermarket chain. This German company of wholesale supermarkets has also been a pioneer in advertising

Geographical Indication products in Turkey. When Kars *kaşar* cheese acquired a GI in 2015 (see Chapter 3), they sent out a food engineer to Kars to assess whether the existing dairies could meet the food safety criteria of certain international certification mechanisms[109]. I met the engineer, Kutay, in Kars during my preliminary fieldwork in 2015. He was employed in a Turkish audit firm to which this assessment study was outsourced. Kutay told me that they identified only one dairy in Kars (Çetin's dairy in Boğatepe), which could satisfy the appropriate criteria without compromising the traditional taste of the cheese. He worked as an advisor for this dairy for a daily audit rate paid by the supermarket chain to the subcontractor for months. In his words, Kutay "basically taught the dairy staff how to register particular variables and do the paperwork every day about the different phases of the production." The tutorial in question was necessary for future regular inspection visits by different certification mechanisms.

Various inspection visits I witnessed in the dairy consisted of going over this paperwork, which mainly concerned with tracking the safety measures of the food production environment and processes. Easily washable surfaces, stainless steel equipment, the specific molecular composition of the milk, and the temperature at which the rennet was added to; all of these details were registered on these forms that were ideally filled by the dairy workers on a daily basis for each batch. After assessing the paperwork, the inspection continued with a tour of the production facility. All the physical surfaces, equipment, and the crew inside the dairy look as tidy and orderly as possible in those days in particular. Everyone involved in the dairy production wore the necessary hygienic clothes like bonnets and gloves. Regular inspections were effective in making the craft practitioners follow specific hygiene-sensitive, micro-biopolitical codes of conduct. The dairy appeared to be more like a laboratory, and the

[109] In this particular advisory service, the supermarket prioritized International Featured Standards, Food (IFS), that is widely used in the UK and Germany. While the dairy met most of the criteria, the eventual certification failed due to the lack of a metal detector in the dairy, an unrealistic and costly requirement for a small rural dairy.

cheesemakers worked like food engineers or microbiologists especially during those days of inspection. Although they were fake instants, they also made me question what this similarity suggests. As much as the cheesemaking practice conforms to the safety norms by making food production resemble a scientific study in sterile conditions of a laboratory, the cheesemakers felt more and more detached from the cheese they make. The scientists' use of tools enables them not to involve their bare hands and to save the microbial communities in the dairy substances from any contamination. But for the cheesemakers, it is impossible to imagine artisanal cheesemaking without using their bare hands, arms and fingers since they would not be able to sense nor craft the milk, the curd, and the cheese.

Chapter 4

Carved Reason in the Dairy Technosciences: Knowledge, Expertise, and Collaboration

Disagreement between cheesemaker and scientist

It was a sunny Tuesday in the first week of July 2018, a few days before the "Anatolian Cheeses Meet in Kars Festival" in Boğatepe village. Villagers were preparing to host more than 30 artisanal cheesemakers from various parts of Turkey. I accompanied İlhan and Şehnaz during their visit to İlhan's recently constructed dairy Boğatepe. Şehnaz is a researcher and a Ph.D. student in food engineering and works on the microbiology of milk. As part of her dissertation research, she analyzes lactic acid bacteria in Kars *kaşar* cheese to develop a starter culture that can later be commercialized. Şehnaz had contacted İlhan and asked for his support in collecting whey samples from his dairy. İlhan had invited her first to visit the village, and then to the dairy during the festival. While we were walking in-between old copper vats covered with stainless steel façades, Şehnaz explained that her research aimed to analyze the *thermophilic lactic acid bacteria* in the whey. According to dairy scientists, these bacteria are among the microorganisms crucial for cultivating the taste and texture characteristic of Kars *kaşar* cheese. She stated that, as is the case in most food engineering departments, her research would hopefully result in meaningful contributions to large-scale *kaşar* production. Her main contribution to the invention of a starter culture would be to enable cheesemakers to have a standard *kaşar* cheese independent of seasons and microbial composition of raw milk. For *kaşar* cheesemakers in Kars pastures, the microbial diversity of raw milk that differs according to climate and pasture conditions constitutes the distinctive taste (and its variations) of the resulting cheese. But at the same time, the same diversity is considered to be the major obstacle to developing a standardized cheese production process in the dairy industry and also in the scientific research community that

works on dairy production. İlhan answered Şehnaz by stating that the traditional cheeses are artisanal products that reflect the conditions under which they are produced. In his words, the cheesemakers use techniques to "shape the natural world into a cultural product" called cheese; and this process cannot or should not be run without its daily circumstances. Then he added that he would be glad to contribute to Şehnaz's research and emphasized its importance for him and other cheesemakers who are eager to learn about the scientific definitions of the microbial world in pasture cheeses. However, the expected outcome of Şehnaz's dissertation research posited a threat to the small-scale cheesemakers in rural Kars, where cheesemaking is a craft that depends on a web of relations among pastures, cows, small farmers, milk, and cheesemakers. Similarly, the insistence of cheesemakers on the local character of their artisanal production that excludes the use of a standard starter culture challenged Şehnaz's arguments in her dissertation.

With the industrialization of cheesemaking, dairy factories rely on various technologies that aim to standardize milk and cheese by ignoring the cheesemakers' claims that the source of milk, craft processes and, daily conditions are all relevant to the production process. Starter culture is one of the fundamental commodities for the factories since it enables the pasteurization technologies deployed in the standard cheese production to be operationalized. Rather than using raw milk to obtain the curd, the industrial cheesemaking process starts by pasteurizing the milk. Pasteurization minimizes the risk according to food safety measures since it kills the pathogenic bacteria harmful for human health. Yet it kills most of the bacteria vital for the cheesemaking craft, too. Once the milk is pasteurized, the starter culture is added to the batch to provide the specific bacteria –only some selected safe ones!- that can work in the curd to make the cheese. Hence, with the use of starter culture, dairy factories depend much less on the daily conditions of dairy farming or place-based microbial flora of the milk that require particular craft processes. The starter cultures, which

are usually imported bacteria batches, ensure that the standard cheese making process no longer depends on the particular local conditions. They make milk and cheese *place-less*.

The disagreement between Şehnaz and İlhan epitomizes the main concern of this chapter, namely the collaboration between artisanal cheesemakers and scientists as they engage with "local" cheese and its dairy technosciences in Kars. Artisanal cheesemaking emerged as a crucial site for small farmers in their attempts to sustain rural livelihoods by certifying local cheeses as authentic products whose distinctiveness needs to be scientifically proven to the official food safety authorities. While providing the necessary scientific analyses for certifications such as the Geographical Indication of Kars *kaşar* cheese, studies I will introduce later in this chapter have also revealed the limits of the cautious approach in the conventional dairy science research towards the effects of pasture-cheeses on human health. Focusing on the recent collaborative processes that made new connections and boundaries between pastures, dairies, laboratories, scientists, and cheesemakers, I analyze how these processes have altered dairy scientists' research agenda on artisanal cheesemaking and also destabilized the epistemic boundaries between scientific and traditional knowledge. I argue that "pasture-cheese diplomacy" leads (and *obliges*) scientists to question the conventional approaches in dairy science research on traditional cheeses. Building on this, I further claim that the recent attempts of situating microorganisms in Kars cheeses, while following the trends in global microbial research, point to the new aspirations that emerge from the collaborative processes and the structural limitations the scientists face while designing and practicing research in between rural Kars and universities in Turkey.

This chapter proceeds in four parts. First, I conceptualize the collaborative processes between dairy scientists and artisanal cheesemakers as pasture-cheese diplomacy. Then I

provide an overview of the conventional dairy science research on traditional cheeses in Turkey and how it informs the current food safety regime that excludes small-scale rural dairies. I elaborate on the concept of "implanted reason" (*koyma akıl*) and "carved reason" (*oyma akıl*) by İlhan, an experienced artisanal cheesemaker introduced above, who referred to the modes of scientific research he encountered in his attempts to collaborate with dairy scientists and state inspectors. In the remaining part of the chapter, I focus on four dairy science researchers I worked closely with between 2015 and 2019 to discuss how scientific studies are conducted through what I call pasture-cheese diplomacy. In the third section, by contrasting the research designs of two scientists, I point to the two distinct ways in which the pastures can inform dairy science research and suggest that the concerns of distinguishing pasture-cheese from its industrialized versions through scientific analyses pave the way for pasture-cheese diplomacy. Then I situate this collaboration within the recent literature on the 'microbial turn' in life sciences concerning artisanal cheesemaking. Building on two examples from two different national contexts, the fourth section of this chapter concentrates on two studies on the microbial life in Kars *kaşar* cheese and analyzes how diplomatically formulated research questions on local cheese, and microbial ecology can *carve reason* in dairy technosciences. I explore the relationship between them. As part of my argument, I highlight that the collaborative research practices that feed the pasture-cheese diplomacy challenge the abstract microbiological knowledge defining conventional dairy science research and the institutional limits of designing and practicing research in rural Turkey. They hold together the divergent interests of scientists and cheesemakers, scientific and local concerns, institutions, and conventional knowledge production. At the same time, while they stay attuned to the microbiological life as it is made in laboratories and artisanal techniques of the 'local' cheese as they are practiced in Kars pasture-dairies. Rather than a clear-cut solution to the disagreements, I suggest that treating these practices as pasture-cheese

diplomacy implies slowing down scientific research design and collaborating to "carve reason".

Pasture cheesemakers as experts: A diplomatic proposal to Science

Scientific studies on concrete forms that the milk takes throughout its transubstantiation have long been shaping dairy production and practices of cheesemaking. With the industrialization of milk and dairy production in the late 19th century (DuPuis 2002; Smith-Howard 2014), technosciences have intervened in various aspects of the cheesemaking craft, especially in Europe and North America (P. Atkins 2010; 2007; 2000). Food scientists and cheesemakers, as different kinds of milk experts, have collaborated and disagreed on various dairy production processes. Pasteurization might be considered the most famous controversy enforced and formalized by many nation state regulations[110], and both supported and challenged by many cheesemakers and scientists. In other words, pasteurization is a field of expertise that can be endorsed or challenged by scientists, as well as adopted or rejected by cheesemakers. It is a prime example of abstract knowledge that is black-boxed (Sage 2007, 208; see also Nestle 2010) in such a way that it hides all the inherent disagreements and uncertainties within the process. Scholars have argued for situating knowledge to challenge the universality claims of objective scientific knowledge (Haraway 1999) and for articulated knowledges to evade a simple opposition between particularity and universality (Choy 2005). In this chapter, I am interested in the collaborative practices between dairy scientists and artisanal cheesemakers to elaborate how cheesemakers' concerns can sneak into the scientific research and become interwoven with the concerns of scientists, and challenge the conventional practices of knowledge production on Kars cheeses.

[110] While some states, such as France and Italy, have defined exceptional dairy processes to the mandatory pasteurization, others including the US and Turkey, lifted the requirement in case the raw-milk cheeses are aged for a certain period (60 days in the former, 90 days in the latter). For more on the recent discussions on pasteurization and raw-milk cheeses, see (Paxson 2008; Donnelly 2019; Percival and Percival 2017)

The more I worked with cheesemakers and scientists between 2013 and 2019, the more I became fascinated by the intermingled ways of knowing the milk. Rather than taking categories like 'scientific expertise' or 'local knowledge' as a binary confronting scientists and cheesemakers I followed during my research, I aim to approach what either group considers 'knowledge' through the practices it emerges from. Each has its ways of abstracting from concrete processes of milk transubstantiation as this happens in their respective practices. As each dairy product materializes particular processes of scientific research and cheesemaking craft, these 'knowledge' or rather thinking-making-doing processes culminate and become materialized in the cheese. Anthropologist Heather Paxson points to the synesthetic reason for cheesemaking, which relies on "subjective, sensory knowledge [that] is required to make objective knowledge work in practice" (Paxson 2013, 135). According to her artisanal cheesemaker informants, science stands for the objective knowledge that needs to be articulated with the tacit, sensory knowledge of the cheesemaker in their practices. Excellence in craft skill in this picture becomes "virtuosity rather than expertise" (ibid); following recipes (and tweaking them when necessary) is a craft that brings together art and science, according to these cheesemakers. While scientific expertise stands in opposition to the craft virtuosity in this narrative, I find it productive to think about the distinction Paxson's study reveals between the two: objectivity as expertise, subjectivity and sensorium as virtuosity. Instead of categorizing scientists and artisanal cheesemakers I worked with following this distinction, I conceptualize them as occupying interchangeable positions in the category of 'expertise' or the mode of abstraction that obtains knowledge. In other words, both can become an expert in different instances since they each refute the other's knowledge and practice by relying on how their (scientific or artisanal) knowledge enables what they assume is the truth about pasture-cheeses.

In her manifesto for slow science, Isabelle Stengers challenges "the sharp opposition between questions defined as scientific and those that should be left to politics, or rather to ethics" (Stengers 2018, 150). For scientists to reconsider the boundaries of their scientific research questions and expertise, Stengers' call to slow down science suggests the figure of a diplomat. Stengers stresses that the expert does not preempt what kind of destruction it can bring to the non-expert. In contrast, the diplomat is aware of the obligation of thinking with the other ways of knowing that can be undone due to expert knowledge.

> [The scientists] should cultivate an active, concrete awareness of the very special and demanding character of their knowledge, and the way its reliability depends on the distribution between what they define as mattering and what can be ignored. Acquiring and maintaining such a concrete awareness, as a condition for the capacity to enter into new relations, takes time, and this may be the true challenge here. For scientists educated in modern research institutions, whatever requires slowing down mobilisation amounts to a distraction, a diversion from the scientists' one true mission of advancing knowledge. We thus need the same kind of deep change that slow food movements propose. (Stengers 2018, 150)

Stengers' figure of the diplomat considers possible destructions expert knowledge may bring. This conceptualization has been inspiring me to think with the encounters between dairy scientists and artisanal cheesemakers in Kars. The latter's primary concern is that the conventional dairy science research neglects the expertise of rural cheesemakers and contributes to the destruction of the pastures as a necessary site of dairy farming and cheesemaking. Diplomacy, in Stengers' words, can enable dairy scientists in Kars to consider the destruction of pasture-cheesemaking and the everyday livelihoods of agro-pastoralism in rural Kars. In Chapter 3, I demonstrated the implications of the food safety regulations on pasture-cheesemaking, which cannot conform to the requirements for establishing and sustaining a healthy, standard dairy industry. In contrast to the Pasteurization[111] of rural Turkey, I argued that artisanal and technoscientific practices of milking and dairying made

[111] I borrow the term from the pioneering work by Bruno Latour (Latour 1993). I am also inspired by Atkins' use of the term to investigate milk processing in England (Atkins 2000).

pastures present in the cheese – they *pastured* the cheese. In this chapter, I delve into the details of *pasturing* dairy science research.

Stengers' conceptualization of slowing down science involves cultivating new relations in which different matters of concern also become part of the scientific inquiry – matters of concern considered to be non-scientific or located outside the scope of conventional scientific research agenda. Focusing on the practices of dairy science research on Kars *kaşar* cheese, this chapter analyzes how pastures become part of the scientific inquiry as a matter of concern that was not left outside the scope of conventional studies in Turkey. This process is not innocent or harmonious; not only because the scientists have not been traditional allies with artisanal cheesemakers, but also because place-based microbiological studies have challenged the conventional Pasteurian understandings of dairy production (see "Microbial turn in localizing cheese" section below). The process in question requires working with microbial communities both in laboratories and dairies. Stengers remarks that this would involve dangerous ways of "weaving relations" (Stengers 2018, 156). Remembering her previous work on "ecology of practices" (Stengers 2005a) is helpful in this regard. Rather than describing or recognizing practices "as they are" like physics, her concepts aim to constitute tools for thinking, hence practices "as they may become" (Stengers 2005a, 186). I approach scientist-cheesemaker collaborations with this speculative opening. The divergences between heterogeneous practices of artisanal cheesemakers and dairy scientists are what the pasture-cheese diplomacy holds together.

> Indeed diplomacy does not refer to good will, togetherness, a common language or an intersubjective understanding. It is not a matter of negotiation among free humans who must be ready to change as the situation changes, but of constructions among humans as constrained by diverging attachments, such as belonging. (Stengers 2005a, 193)

Artisanal cheesemakers and scientists collaborate in this ecology with a seemingly common interest (for example, making a good Kars *kaşar* cheese), yet they have divergent attachments, like dairy farming in pastures, crafting with traditional techniques in the dairy, isolating different strains from microbial communities in the laboratories, identifying pathogens, standardizing dairy production. Once they avoid confusing their attachments with universal obligations, they would be devoid of any general theory or conventional black-boxed truth that can lead them to the solutions without considering the situation at hand. This situation itself according to Stengers becomes a cause for thinking once there is room for "diplomacy" instead of "politics as usual" – it "transforms each protagonist's relations with his or her own knowledge, hopes, fears, and memories, and allows the whole to generate what each one would have been unable to produce separately" (Stengers 2005b, 1002). The disagreement between İlhan and Şehnaz inspired me and made me think that their collaboration threatens their ways of knowing milk and making cheese. Drawing on Stengers and conceptualizing pasture-cheese diplomacy enables me in this chapter to unravel how *pasture-cheeses* obliged scientists to think and do otherwise. Meanwhile, I am aware that the particular tools one uses to think with also co-produces the thinker as Stengers suggests (2005, 196): this dissertation is partly due to this diplomacy. What I had initially thought when I encountered this disagreement, namely cheesemakers should convince scientists that their artisanal dairy craft needs to be supported instead of starter cultures, has transformed from searching an agreement between the two to inhabiting both the craft and science in their divergent ways in the collaborative ecology of practices. To make the divergence between dairy craft and science in Kars clear to the reader, the next section introduces the conventional approach to dairy scientific expertise in Turkey.

Expertise in the conventional dairy science research: "*oyma akıl*" ("implanted reason")

According to the National Milk Council (*Ulusal Süt Konseyi*) of Turkey, only between 40-45% of the total raw milk production ends up in formal dairy processing, and 57% of this portion is processed by the *mandıra*s (small dairies) (Kırdar and Karaca 2017). These *mandıra*s are mostly seasonal production sites in rural areas of the country. They operate when the milk supply increases significantly in the spring and summer months since a significant portion of dairy farming in Turkey relies on extensive grazing on pastures, as a necessary characteristic of *mera hayvancılığı*. Dairy animals, farmers, and shepherds use highland pastures or settlements near the pastures especially during the pasture-season. The usual setting involves collecting milk produced by dairy farmers in one or a few villages around the *mandıra*. Most *mandıra*s process less than 10 tons of milk per day. Their overwhelming presence is considered to be a sign of 'backwardness' for the dairy industry in official reports and other publications in which dairy scientists have highlighted the lack of proper sanitary conditions, advanced technologies, and standardized dairy production in the *mandıra*s for many years (Üresin 1936; Çağlar 1947; Aygün 1951; Milli Prodüktivite Merkezi Tarım Şubesi 1969; Tekinşen and Tekinşen 2005).

Kars encompasses high altitude plateaus with a rich flora in the transition zone between Anatolia and South Caucasus. In addition to the closed land border between Armenia and Turkey for dozens of years, Kars is located at the northern frontier of the Kurdish region in Turkey, where an armed conflict between Turkish army and Kurdish Workers' Party (PKK) has been ongoing since 1984. Together with these conditions causing depopulation in this borderland, and in line with the neoliberalization of agriculture (Keyder and Yenal 2011; 2013; Aydın 2010; M. Öztürk, Jongerden, and Hilton 2018; Nizam and Yenal 2020; Atalan-Helicke 2018) and industrialization of dairy production in Turkey (Zeybek 2016; Tatari 2020), rural dairy production has declined sharply in Kars in the last 25

years. Pastures have always been fundamental for dairy farming in Kars, where farmers and their herds reside in these high-altitude grasslands (between 1700-2600 meters) covered with snow during the harsh winter conditions for 7 months each year. From April until October, animals are fed in these open-air pastures according to different management regimes in various villages (see also Chapters 1 and 2 on the dairy arrangements of *mera hayvancılığı* and pasture-cheesemaking). Like the rest of the country, dairy production in Kars is also dominated by the *mandıra*s. More than half of the registered production sites are located in villages and operate seasonally.

Despite the high percentage of dairy production in the *mandıra*s, legal regulations of food safety concerning dairy products do not distinguish them and factories in Turkey. When I met İlhan in 2009, he was already an active supporter of traditional cheese production and commerce across various regional, national and international networks. His struggle against the imposition of the industrial standards, he told me, emerged as a necessity, especially after 2004 when the Turkish state, as part of its European Union candidacy process, legalized the new food safety requirements that officially banned the dairy production in small rural dairies that did not satisfy Hazard Analysis and Critical Control Point (HACCP) requirements. Most dairies in rural Turkey were either shut down or confined to the informal markets in provincial marketplaces or small dairy shops in the last 20 years (see Chapter 3 for a more detailed discussion of this period). During my research I encountered many of these small local businesses and a dozen of dairy farmers in İlhan's village who had to shut down their *mandıra*s due to the inspections, fines, and high cost of the required renovation processes throughout the time I spent in the region. The state inspectors most of whom are graduates of food engineering and veterinary faculties referred to the conventional dairy science studies which informed the food safety regulations.

In most conventional dairy science publications, the traditional cheeses are considered risky, if not dangerous, for human health when produced in rural *mandıra*s devoid of necessary hygienic conditions like easily cleanable surfaces, stainless steel equipment, and technosciences like pasteurization machines or milk analyzers. The bulk of the conventional dairy science research on traditional cheeses in Turkey consists of laying down the physical, chemical, and microbiological properties of a particular type of cheese based on the analyses of the samples randomly collected from the local markets by the researchers. They evaluate the risk for human health posited by the pathogens identified in the studied samples. The proposed solutions are usually concerned with the amelioration of the conditions of dairy production in small *mandıra*s to ensure their conformity to the international industrial standards such as HACCP and with the standardization of the products that can be achieved by the use of pasteurization and homogenization of the milk, and use of starter cultures. When İlhan complained to me about the 'implanted reason' of the scientists, he specifically targeted these conventional interventions that he has encountered throughout these years as necessary outcomes of scientific facts.

Production permits issued by the state and different certification mechanisms consist of an organization of paperwork and an appropriate food production process. Inspectors of any such audit mechanisms work with particular checklists that are assumed to rely on scientific realities about food safety, health, and nutrition. Scientific knowledge is black-boxed in these lists, like forms that Pasteurization can take in the dairy craft procedures. When scientific expertise materialized in a technoscientific intervention is implanted in the dairy craft, it changes the resulting cheese and its variations and transforms labor processes and relations - both human and nonhuman. İlhan's search for collaboration with scientists, as well as inspectors, technicians, and engineers entails accommodating local dairy craft practices within dairy science research not simply as a place of origin or a craft to be

modernized but more as a necessary site of place-based practices that feed scientific abstractions while producing cheeses. Let me go back to the opening anecdote of this chapter to unpack his conceptualization of *implanted* and *carved* reason (*oyma ve koyma akıl*).

Carving (*oymak*) reason while studying pasture-cheeses

When Şehnaz explained to İlhan that using a starter culture would save him from worrying about the effects of the daily circumstances on the taste of each batch of production or food safety measures that favor pasteurization, İlhan's unwillingness to be part of her scientific study became clearer: He was not enthused about the scientific study on a starter culture of Kars *kaşar* cheese. He said:

> I always say that there are two types of scientists; the first type act as if they had been *koyma akıl* (implanted reason) and the second as if they *oyma akıl* (carved reason).

The first type thinks that what they learn at school is the universal truth that can be applied anywhere. In the case of milk and cheese, all the universities have been producing knowledge for industrial technologies and large-scale dairy factories. He emphasized that the *implanted reason* relies on this knowledge that considers small farmers as culturally backward, economically inefficient, procedurally unhygienic, and industrially incompetent for standardizing their production. This reasoning can only offer solutions that neglect the actual needs of small farmers, their families, their animals, pastures and immediate surroundings. Hence, this kind of knowledge production may lead to the disappearance of traditional techniques developed in particular places under specific circumstances. İlhan concludes:

> Your 'starter culture' can do the same to me, my people, my animals, my pastures… because it is not what we need to make life better here! We instead need to improve our understanding of how we produce this particular cheese that we already produce. I need you to tell me what else I can do to take care of pastures, cows, milk, or cheese

> so that the microbes you will see under your microscope will thrive in the way the cheese asks from them. And this is a job only the second type of scientist can do.

The second type of scientific practice with a *carved reason*, according to İlhan, makes use of the available scientific knowledge produced and circulated in academia but also takes the extra-scientific know-how such as tradition or artisanship seriously so that the actual problems of the practitioners could be addressed. *Carved reason* then implies attunement to the specific circumstances a scientist encounters. It allows the reconsideration of the existing abstract scientific knowledge that is supposed to be universally applicable and requires a practice-oriented knowledge production process, or to put it more clearly, making-and-thinking. It can only emerge from the very process of thinking and doing with the local practitioners. This practice-oriented approach implies that a local issue/problem could be solved with the participation of local actors whose extra-scientific knowledge should be taken seriously. It also points to the place-based characteristic of a particular making-and-thinking that should also consider seemingly unrelated concerns like the aim of sustaining livelihoods under the same daily conditions that characterize milk and cheese. In other words, *carved reason* cannot be detached from the local conditions, actors, practices. It must be *placed*.

İlhan's claim for a distinctive contrast between *implanted* and *carved* reason was helpful for me to avoid judging scientists according to their different ways of reasoning and observe the implications of how scientists engage with the local knowledge of pasture cheesemaking. On the one hand, cheesemakers like İlhan expect scientists to respect and be open to learning from the craft of cheesemaking and the 'traditional' methods of the cheese masters in pastures. Such respectful attitude requires, first and foremost, not imposing their scientific knowledge as the only bearer of the right way of milk processing that usually contradicts and frequently threatens the characteristics of small-scale pasture cheesemaking,

and the whole world it emerges from. Instead, it entails contingently combining artisanal and scientific knowledge to carve out a solution to the existing problems of the practitioners, i.e., cheesemakers who strive to sustain certain quality standards and a unique taste that distinguishes their cheese from others while satisfying food safety requirements. On the other hand, scientists I encountered during my fieldwork had diverse motivations for studying pasture cheesemaking: curiosity about the physical, chemical, and microbiological worlds they encounter in raw milk that make a variety of cheeses possible; peer pressure to build a professional career path that feeds off from mainstream publication strategies on pathogens that can be easily identified in pasture cheeses; developmentalist aspirations that mostly value 'progress' in the industrialization of dairy farming and cheesemaking. Yet, as I interviewed many scientists and spent time with them, attended their conferences, observed their research practices and participated in them, I realized that their concerns regarding pasture-cheesemaking were more complex than what I had initially thought İlhan's distinction suggests.

Expertise and diplomacy in studying pasture-cheesemaking in Kars

Scientific expertise against pasture-cheesemakers

Trained as a veterinarian, Canan is an associate professor in the Department of Food Hygiene and Technology, Caucasus University, Kars. In Fall 2017 and Spring 2018, she allowed me to attend the classes she teaches on dairy processing and technologies, and food safety and hygiene requirements in dairy production. During these classes, I got acquainted with the details of the HACCP plans for processing various dairy products. In her lectures and during our conversations outside the classroom, she never hesitated to state that a factory setting is always much better than small dairies in terms of hygiene, health, and efficiency. Yet when I asked her questions about the microbial world of raw milk and the microbial diversity of traditional dairy products, she did not hide her ambivalent feelings. While she

acknowledged that a well-made pasture cheese usually tastes better than the industrially produced ones (after all she is a cheese eater herself), she insisted that she would not consciously choose to eat pasture cheese as a food scientist. Even if her work in the laboratory demonstrated that the pasture cheeses are much richer in microbial composition and beneficial to humans, she argued that one couldn't trust them since they always risk containing pathogens.

As part of an unpublished research she conducted with her Ph.D. thesis advisor on traditional dairy products, Canan isolated more than 9000 colonies of microorganisms from the samples collected in Kars pastures. She stated her amazement at the microbial diversity she encountered in these traditional products. Yet she was much disappointed by the manufacturing conditions of these products and their sensorial effects: she finds them "too salty, stinky and ugly looking". Canan's laboratory analyses identified many strains of bacteria known to be pathogenic (such as *Escherichia coli* and *Brucella*) in these samples, which she associated with the "primitive" (*iptidai*) production conditions. Since her main research interest was probiotics in dairy products, specifically the bacteriocin capability of the lactic acid bacteria, she was interested in isolating the strains known to be beneficial to human health. When I asked if this study aimed to associate particular traditional dairy products with specific probiotics to promote local dairy products, her answer made clear that her research aimed to promote industrial uses of the bacterial cultures:

> I cannot promote primitive production conditions in pastures. My studies aim to identify the beneficial bacteria that exist in these products in order to be able to isolate and reproduce microbial cultures. The ultimate aim would be to make these microbial cultures available to factories that process milk according to modern hygiene standards and that can make use of these cultures to produce probiotic dairy products.

Hence the two major threads of her research can be summarized as 1) to identify the pathogens in pasture dairy products, demonstrate the risks involved in consuming them, and

suggest food safety measures to modernize traditional dairy production; 2) to identify the microbial diversity and probiotics in pasture dairy products to reproduce some of these microbial communities as novel biotechnologies to be used in modern, hygienic dairy production sites.

Canan's firm belief in the necessity of replacing small rural dairies with large-scale dairy factories does not leave any room for her collaboration with pasture-cheesemakers besides collecting samples for her research. As she also confirmed, her research does not result in any collaboration with rural cheesemakers unless they are willing to adopt industrial technologies and modern food safety standards. While her research focuses on pasture cheeses as the source of the microbial diversity, her way of abstracting the knowledge about this diversity in her experiments does not go back to the pastures: rather, it emerges from experiments in department labs, and is limited to the research at the dairy factory of the university, and destined to the development of new biotechnology products that can be sold to the companies. Scholars have already shown cases in which local knowledge of small farmers is appropriated by companies that industrialized small-scale artisanal production of local food (Fonte 2008, 214). Canan's research points to a similar risk of scientists and companies expropriation the cheesemakers' local knowledge. Her expertise does not consider the implications of her practices of knowledge production, which contributes to the destruction of the existing everyday worlds of cheesemaking in pastures. Such biotechnological innovations risk substituting rural dairies, artisanal cheesemaking, and small-scale cheesemakers with urban factories, industrial dairy production, and workers in large-scale production sites – a process I called "pasteurizing dairy infrastructures" (Tatari forthcoming).

When pastures matter in dairy science research

I would like to contrast Canan's expertise with another dairy science research design process I followed closely during my fieldwork that corresponded to a particular kind of pasture-cheese diplomacy. Firuza Koboyeva, whose research was supervised by Nuray Güzeler, a well-known food engineer who has been working on traditional Anatolian cheeses for many years in the field, prepared an MA thesis between 2016 and 2018 in Adana, Çukurova University. I met Güzeler for the first time in Kars when she attended the "International Symposium of Artisanal Cheeses in Turkey and in the World: Kars Kaşar Geographical Indication" in 2016. At a conference she had attended back in 2014, she told me, she was thrilled to meet İlhan, especially because as a small cheesemaker, he was interested in scientific knowledge not to scale up his production – which is rare, she said. Her remark revealed that not only the artisanal cheesemakers are looking for like-minded scientists to collaborate, but also careful dairy scientists are looking for "artisanal" cheesemakers to produce knowledge together. This mutual concern is crucial for a collaboration that can lead to *carved reason*.

Güzeler told me that she finds artisanal cheesemaker's concerns more genuine, intriguing, and informative for the scientists than those of the industrial producers. She stressed that their questions are not usually answered in the scientific literature because the latter is more concerned with the solutions for the large-scale production in the course of industrialization. In 2016 when Güzeler expressed her interest in conducting research on Kars *kaşar* cheese during a conversation with cheesemakers, she consulted them and listened to their concerns that could inform her work. The narratives of the cheesemakers who distinguished pasture-cheeses from the industrially produced ones highlighted the use of pasture-milk and artisanal techniques in rural dairies. Accordingly, Güzeler and her student Koboyeva developed a research project that would reveal the physical, chemical,

microbiological, and sensorial characteristics of cheeses that are produced at different altitudes in different seasons. Since pasture-milk is produced between May and August in Kars, the research was designed as a comparative study on the cheeses made in April and July – "spring cheeses" versus "summer cheeses". Moreover, cheesemakers explained that the production in a few larger dairies, which are located in the Organized Industrial Zone (OIZ), situated near the city center in Kars, may breach traditional methods used in smaller rural dairies. Güzeler and Koboyeva translated this into a comparison of the altitude: While the higher altitude samples of "mountain cheeses" were collected from small dairies in pastures, the lower altitude samples of "plain cheeses" were collected from relatively larger dairies in the OIZ. These translations and the resulting research design were carved out of a collaborative process that addressed the concerns of both the artisanal cheesemakers and scientists while also challenging conventional dairy science research that would not problematize the distinctiveness of pasture-cheeses among all Kars *kaşar* cheeses.

Once the research framework was decided, İlhan helped scientists to identify four dairies, two in Boğatepe village and two in the OIZ. The researchers wanted to collect samples from three different batches of cheeses produced in consecutive weeks per dairy and season, which amounted to six samples per dairy and twenty-four samples in total. Since the symposium was held in July 2016, she was able to collect half of the samples herself. For the remaining half, İlhan collected the samples in April 2017 and shipped them to Adana where Koboyeva conducted the research. The research yielded a few statistically significant results for the "scientific" distinction between mountain and plain cheeses. Unlike what the cheesemakers expected, the scientific analysis and various comparisons it relied on did not result in favoring pasture production. So, it did not become a benchmark for pasture cheesemakers that expected to claim the distinctiveness of their cheeses.

Yet the chemical, physical and microbiological analyses revealed that all the cheeses produced in July had distinctive properties, which can be explained by the use of pasture-milk after May. For instance, chemical analyses suggested that the dry matter and fat in both mountain and plain cheeses are significantly higher in July than in April (Koboyeva 2018, 47, 51). Another significant aspect is that mountain and plain cheeses were found less bright in texture and more yellowish in July than in April (Koboyeva 2018, 84, 95). Pasture-milk affected the chemical composition of the milk in all the production sites. It transferred a yellowish color from pasture flowers and grass, and the cheeses became more opaque with the lower humidity level during the summer months.

The research also identified some crucial differences between mountain and plain cheeses. For instance, pH levels that were close among April samples diverged significantly among the July ones: plain cheeses had a much higher pH level in July (Koboyeva 2018, 44). These differential pH levels could be explained by the fact that the milk travels much longer distance to reach the OIZ. The higher temperature in July causes a significant increase in the pH levels of milk and young cheeses. Another statistically significant result concerned the color of the cheese rind in July. While among the mountain cheeses, the greenness of the rind decreases from April to July, the opposite is observed among plain cheeses (Koboyeva 2018, 90). This color difference was due to the climate conditions in the higher altitude rural dairies near the pastures, where the cheese dries and reaches the desired opaque color much more quickly. The proximity of milking sites in pastures and crating dairies determines the conditions and duration of the milk transfer, which can be scientifically detected (see Chapter 3 for the connection between milk transfer and pasture-cheesemaking).

The microbiological analyses also identified some significant differences. Both “total aerobic mesophilic bacteria count” and “total lactic acid bacteria count” turned out to be higher in April and lower in July for the mountain cheeses, whereas lower in April and higher

in July for plain cheeses (Koboyeva 2018, 100–105). In other words, mountain cheese microbial count decreased when the pasture-milk was used, while it was the opposite for the plain cheeses. Since the analyses do not give any detailed information about the particular composition of the bacteria counted, it is impossible to reach any conclusions about the particulars of the relationship between pasture-milk and microbial communities in the cheeses. Yet these counts still supported the pasture-cheesemakers' arguments about the distinctiveness of their cheeses made between May and September. In April, the animals barely start to be on the pastures, and the grass they eat is very humid after months of winter and snow. This humidity, according to the farmers and cheesemakers, affects the cows' digestion and often gives them diarrhea, causing a bitter taste in the milk and making the kaşar cheese taste more bitter than it should be. This crucial aspect could now be related to the microbiological analyses identifying a higher April count.

The results and their explanations based on the characteristics of pasture-cheesemaking contributed to the artisanal cheesemakers' struggle in unraveling the distinctiveness of their *kaşar* cheeses. It also enabled the dairy scientists to offer a new approach to the traditional cheeses beyond focusing on pathogens or possible biotechnology products that can be developed from them. In July 2018, I went to Adana to listen to the master thesis defense of Firuza Koboyeva. İlhan and I prepared a nice package of various Kars cheeses in the village, which contributed to the feast after her defense. According to Güzeler and Koboyeva, this research offers clues for further future research on the divergences between altitudes and seasons in *kaşar* cheese, especially on the transformation of the microbiological ecologies in pasture-cheeses which begs for more detailed analysis over a longer time interval. The last chapter of her thesis and the conversations we had during the defense revealed that the major drawback, according to the researchers, was the distance between Kars and Adana (1000 km, at least 13 hours drive). They told me that such new

research would be realized more effectively in Kars by shortening the distance between pastures and laboratories and using technosciences like DNA sequencing that would enable working on more samples throughout the ageing period of the cheese.

Microbial turn in localizing cheese

Before elaborating on further research on the microbiology of Kars cheeses, I would like to situate my research and the collaborative processes I analyze in this chapter within a wider network of scientists and cheesemakers who have been collaborating for many years in diverse ways. Craft cheese – in many forms labeled as artisanal, local, traditional or alike – has been a prominent site for these collaborations, together with multiple other food kinds including gradpe/wine, olive/oil that are artisanally processed and produced vegetables or animals (their parts and fluids). Anthropologist Heather Paxson conceptualizes the sensibility that allows the collaboration between scientists and artisanal cheesemakers: "working in selective partnership with microscopic organisms, figured as agents of a nature that is not fully objectified and never fully separate from human enterprise" (Paxson 2013, 161). She calls this a Post-Pasteurian alternative to the Pasteurian microbiopolitics that informs the food safety regulations, which casts the raw milk as a potentially harmful substance humans must control.

Beyond dairy science, this shift can be treated as part of a more significant "microbial turn" in biology (Paxson and Helmreich 2014, 166). Scholars have argued that the representations of microbes have shifted from being sources of peril to promise, and scientific engagements with them started to consider them as "communities that matter in diverse ecosystems" instead of individual strains (Paxson and Helmreich 2014, 168). Similar shifts can be found in fields including epigenetics, where new concerns such as antibiotic resistance are grasped through recent theories of horizontal gene transfer instead of older

theories of gene mutation (Landecker 2016, 20). This shift led molecular biologists to be concerned with the trans-individual because the molecular organisms and their environments could not be studied independent from each other since they do not simply affect but literally and historically make each other up. The epistemology that allowed scientists to know microbes and engineer antibiotics has also been constitutive of the emergence of what is today known as the antimicrobial resistance. Building on these recent scientific theories and the crucial insight of the social studies of science, namely that the epistemic cultures through which materialities are known closely interact with those materialities, anthropologists revisited the older constructivist arguments in their fields, like that of "localized biologies" (Lock 2006). Niewöhner and Lock argued that "situating biologies" would allow the ethnographic practice to grasp "environment/human entanglement" as "a ceaseless process of relating … through which environment and human become defined as such" (Niewöhner and Lock 2018, 691). When it comes to the microbial life in cheese, the complicated processes of co-construction between microorganisms and their environments need to be thought of together with the practices that not only enable practitioners to know these processes but also to make sense of the "local" cheese within its environments, i.e., concerning where it is produced geographically.

Studying microbial diversity in cheeses while attempting to link particular microorganisms in some cheeses to particular geographical places has been a matter of vital controversy among scientists and advocacy groups. On the one hand, microbiologists refute the idea that microorganisms belong to a certain place. Rather than a connection that takes the place in question as the primary source, their approach highlights a relationship that focuses on the conditions that make particular bacteria manifest in particular places. In other words, the geographical place becomes irrelevant since the same bacteria can be encountered once there is an appropriate environment for its proliferation. While this undermines any

inherent connection between territory and bacteria, hence complicates the collaboration between artisanal cheesemakers and dairy scientists in defining the autochthonous microbial ecology of a particular local cheese; it simultaneously enables an unlimited potential of (re)invention (Grasseni et al. 2014), as Paxson observes in processes of "reverse-engineering" in the US (Paxson 2010). Hence, it is plausible that dairy scientists and cheesemakers continue to collaboratively decipher the *terroir*, or the taste of a place, in Amy Trubek's words (Trubek 2008), in terms of particular microbial ecologies. And this process inevitably entails the movement of the *terroir* itself (West 2022), which can also be traced in the formations of microbial ecologies.

Science of artisanal cheese or cheese of artisanal science

Cheese has become an interesting nodal object of analysis in this recent microbial turn. Dairy science studies on cheesemaking increasingly de-emphasize the isolation of particular bacteria to understand their effects and focus on analyzing the formation and transformation of microbial communities throughout particular cheesemaking practices (Donnelly 2014; 2019; Percival and Percival 2017). Many examples can be found to conform to Paxson's conceptualization of post-Pasteurian microbiopolitics, which relies on a grid of intelligibility for humans to understand the world of microorganisms as dynamic communities to collaborate with beyond a sum of particular isolated strains to be controlled (Paxson 2013, 161). For instance, Rachel Dutton, a microbiologist at UC San Diego, states that microbiologists cannot create the environments where complex microbial communities can live. Therefore laboratory research needs to rely on environments that are not completely controlled by the scientists, like the ocean, soil, or cheese. As such, Dutton and her team of laboratory researchers use cheese rinds to analyze a rich diversity of microbial

communities.[112] Dutton and other scientists working on/with cheese usually frame their research in terms of human health. For instance, Dutton and her colleagues envision developing a model for a complex microbial community by using different cheese rinds as a wide range of models to understand how microbial communities work and how their work can be reproduced in the laboratory environments for various health purposes for humans, such as research on cancer. Hence microbiologists like Dutton suggest that the microbial communities cannot be understood through a Pasteurian microbiological approach, isolating particular bacteria and analyzing them as individuals devoid of community. The microorganisms that grow on the surface of or inside the cheese create communities in which their interactions create emergent compounds that we come to recognize as particular tastes and scents.

Let me refer to another well-known example among artisanal cheesemakers, Marie-Christine Montel, a microbiologist at the INRA Research Centre in Clermont-Ferrand, France. Montel works closely with dairy farmers to ensure their products's safety without losing the diversity of the microbial communities in the milk they process. She argues that the microbiological research should take into account the whole chain of cheesemaking to look for potential microbial transfers; not because some 'pathogens' can simply transfer from one environment to the other, but more importantly, transfers can enable the researcher to identify what microbial communities can be formed (and how they can also be transformed) throughout the whole process. Microbial biodiversity is not a list of species but a structured community that challenges the Pasteurian understandings, she states. Yet this diversity does not necessarily increase the quality of the milk or cheese. Cheese quality rather depends on the compatibility of the microbial communities with the desired outcome in the form of a particular cheese. Hence biodiversity management becomes crucial by collaborating with and

[112] For more information, please see http://www.theduttonlab.com/ also Paxson (2013).

promoting the microbial populations of interest. And this goal is mainly accomplished via artisanal techniques of the practitioners, sometimes with the help of biotechnologies and various other diary technosciences.[113] When Montel's research team analyzes "natural complex consortia" of bacteria in raw milk for "anti-listeria properties", they suggest that protecting microbial diversity that comes with raw milk can enable the inhibition of the growth of *listeria monocytogenes* in the cheese (Montel et al. 2014). Rather than identifying the presence of individual strains, the researchers are interested in studying the dynamics of microbial communities that would inhibit or let the strains grow. Hence the research on the complex relationship between food safety and milk biodiversity suggests that the safety measures in dairy production should take into account what kinds of microbes come to the dairy, what are the possible microbial transfers and formations of microbial communities that can be observed throughout the process of crafting different substances out of milk.

As Montel also clarifies, this kind of regulation would necessarily require much closer professional contact between cheesemakers and scientists since the milk that is not pasteurized before the production can host a wide range of bacteria that might have been transferred from pastures, utter, bedding, milking equipment, or human contact. Working with cheesemakers closely and listening to their concerns about food safety regulations, Montel designed a research agenda that rests on a particular type of diplomacy between scientific knowledge production and artisanal cheesemaking. In other words, the reasoning embedded in this study enables artisanal cheesemakers to claim the authenticity of microbial community formation in their local cheeses while simultaneously challenging conventional food safety criteria by scientific evaluations of pathogens in the cheese. In the remaining part of this chapter, I will focus on how scientific studies on Kars cheeses might similarly bring together the distinctiveness of pasture-milk, food safety concerns, and scientific knowledge.

[113] In this paragraph, I relied on Montel's presentation at the conference The Science of Artisan Cheese in 2012.

Placing bacteria of Kars *kaşar* cheese

Studying the microbial ecologies that make Kars *kaşar* cheese distinctive was an essential part of acquiring a Geographical Indicator in 2015[114]. Mitat Şahin is a veterinarian specializing in microbiology who led the scientific research in this process. When I met him in July 2013, he was supervising the initial phase of this research. He was excited about a potential database for the place-based denominations of cheeses: "We should identify the microorganisms that make our cheeses distinctive. Our aim should be to create a comprehensive database of the Turkish microorganisms of all of our local cheeses in this country." Although it is difficult for me to think of nationalism at the microbial scale, Şahin was not alone in casting microbiological dairy science research in nationalist terms. Artun Ünsal, a political scientist who also wrote extensively on the traditional dairy varieties in Turkey, criticizes the naming of one of the microorganisms, which is almost universally used in making industrial yogurt, namely *lactobacillus bulgaricus*. He states that it is a shame for the Turks, whose yogurt production dates much earlier, were not able to name this microorganism with their ethnicity (A. Ünsal 1997, 30; 2011, 28). Fungi like *penicillium camemberti* or *penicillium roqueforti* are named after the places in France that have been associated with their local cheeses – Camembert and Roquefort. But these examples of naming practices are limited in microbiology history; and all these microorganisms, far from being indigenous to certain places, are found in many other dairy products in different parts of the world[115].

[114] For a more detailed investigation of the GI of Kars *Kaşar* cheese, see (Tatari 2020)

[115] The starter cultures for Roquefort-like blue cheeses almost always contain strains of *penicilium roqueforti* fungus; or for Swiss cheese-like Emmentaler, strains of *Propionibacteria*. We had a remarkable encounter with İlhan after our presentation in Cheese 2019, organized by the Slow Food Movement in Bra, Italy. A young French microbiologist came to talk to us about his ongoing research on blue cheeses. He was part of a lab where they collected blue-cheese samples from various places in Europe and North America. He explained to us that all the cheese samples except one from Turkey contained some strains related to the commercialized starter culture populated with the 'domesticated' *roqueforti* strains, which were initially developed as biotechnologies from Roquefort cheese samples. The sample from Turkey contained what he called 'wild' *roqueforti* strains.

A small ratio of such microorganisms identified with particular dairy products is commercially produced by agrobiotechnology companies as 'starter cultures' to be utilized in the production of these dairy products. Studies on agricultural history show that starter cultures were a crucial step in standardizing commercial yoghurt production and making it suitable for industrial production (Stoilova 2013). Similarly, starter cultures of cheeses enable industrial dairy production where pasteurization kills most of the (both harmful and beneficial) microbial life in milk. These particular microbial cultures are added to the milk after pasteurization in order to ensure that particular microbial communities form in the cheese, and give the desired texture, scent, and taste to it. Yet this is a widespread practice in industrial dairy and artisanal cheesemaking, especially in Europe and in the United States where the pasteurization is not mandated and usually not implemented, and the microbial flora of 'raw' milk is preserved. This implies that the cheesemakers don't have complete control over the microbial communities that will emerge in cheesemaking; hence the resulting microbial life in the cheese then depends on the raw milk, the added starter cultures, and the conditions in which these microorganisms proliferate. The artisanal use of the strains of starter cultures is a topic beyond this chapter. Still, it's worth re-emphasizing that the artisanal cheesemakers may use these cultures to minimize the range of different characteristics of their cheeses that they label with the same name or to experiment with their craft. However, in Kars, none of the pasture-cheesemakers buy starter cultures to make standard cheeses. Some have their methods that can attract some Post-Pasteurian scientific interest in the future.[116]

This particular strain was why he was interested in conducting more research on the blue cheeses from Anatolia. This example, for me, pointed to the ongoing controversy in microbiology on the complicated relationship between place and microorganisms – even if the question is not about naming or locating origins, local cheeses can still enhance microbiological knowledge in unexpected ways.

[116] Standardization of cheesemaking is a complicated matter for artisanal cheesemakers. I encountered many cheesemakers in rural Kars who prepare their own starter cultures in traditional ways they learned from older masters. For instance, I witnessed some using a small amount of whey they saved from the previous batch of cheese and others adding a small amount of shredded cheese from the last pasture season.

When I interviewed Mitat Şahin in 2015, after he completed his project and the Turkish Patent Institute approved the GI of Kars *kaşar* cheese, he explained that his research findings did not provide any concrete identification marks regarding the specific microorganisms in the cheese. I encountered his disappointment on how "place" cannot be articulated with microbiology. Yet he told me that the distinctive microbial characteristics of *kaşar* cheese are produced thanks to the craft of the right environment by the cows on pastures, dairy farmers who milk them, and experienced artisanal cheesemakers; an environment that can cultivate the microbial communities that are desired for *kaşar* cheese, and that is simultaneously cultivated by these communities.

Şahin's experience of not being able to identify a strain of bacteria that could be considered autochthonous suggests that bacteria are place-less in an abstract microbiological sense. Yet they are placed in the very practices of cheesemaking craft even if the microbiological research would not be able to declare them as autochthonous. Then the question for a pasture-cheese diplomacy becomes: How to keep these two seemingly opposed suggestions together – namely microbes as local when they are placed as a cheese through particular craft processes, and microbes as abstractly place-less when they are reproduced in the laboratory? Let me return to the opening anecdote of this chapter. As I write this book chapter, Şehnaz's dissertation research project is still in progress. She collected whey samples after the (raw) milk was coagulated in the dairies.[117] Her research practices aimed to develop a starter culture for Kars *kaşar* cheese out of the thermophilic lactic acid bacteria she identified in these samples. She explained that after isolating different strains from the samples, she would select the more suitable ones to be reproduced as starter cultures. Once

[117] Since *kaşar* cheese is a type of 'pasta-filata' cheese that is obtained by boiling/cooking the curd around 60-70 C degrees, the lactic acid bacteria Şehnaz focuses on are thermophilic, which grows best in temperatures above 45 C, rather than mesophilic (which grows best at modest temperatures, between 20 and 45 C) or psychrophilic (which grows best at cold temperatures, between 0 and 20 C).

she decided possible samples, her starter cultures were expected to carry the distinctive taste of the Kars *kaşar* cheese to the cheese made from pasteurized milk.

Starter cultures and carving localization

Şehnaz argued that starter cultures would contribute to a generic, standardized 'local' kaşar cheese that would 'definitely' be a healthy dairy product thanks to the pasteurization before culturing the milk. İlhan objected to this affirmative contribution claim by suggesting that her method would only serve the industrial producers. He stated that the need to use starter cultures in pasteurized milk to achieve standardization is an implanted truth claim by conventional dairy science and industrial factories. Yet he agreed to provide samples to Şehnaz due to a few reasons. First and foremost, İlhan believed that a starter culture that would consist of a selection of thermophilic lactic acid bacteria could not substitute the microbial composition of Kars *kaşar* cheese made from raw milk. Secondly, he said that young scientists like Şehnaz, who are genuinely interested in understanding the microbiological composition of traditional cheeses, are crucial to collaborate with artisanal cheesemakers. He firmly believed that both sides could inform each other with insights that the other one lacked. Last but not least, he also thought that this collaboration could potentially affect Şehnaz's approach since she might realize some of the artisanal cheesemakers' concerns in her research. And more than three years after this encounter, İlhan turned out to be right; not only that Şehnaz's attempt to develop a starter culture almost failed, but she also modified her research agenda to include another variable, the altitude that she thought was irrelevant to her study before she visited the village.

Şehnaz had shipped small bottles for whey samples before she arrived at the village. I agreed to help her in collecting the samples. In return, she agreed to allow me to shadow her research in her lab in Van. It was a good deal for both of us. For my fieldwork, I was interested in participating in a dairy science research on the microbial composition of Kars

kaşar cheese. Şehnaz was also willing to collaborate with me since I had previously visited all the dairies in Kars during my fieldwork, and it would be easier for me to get the samples she needed. This collaboration also enabled me to be in touch with Şehnaz more often and hear about the institutional dynamics in which she functioned and the scientific concerns that guided her research.

We were in İlhan's dairy when she showed me how to take a sample from the whey: I needed to use gloves, preferably within a sterile disposable plastic laboratory coat. I had to wait until the milk was coagulated. The diaries usually have stainless steel vats that have a capacity of 4-20 tons of milk. These vats have automated systems of curd cutting with a set of turning steel grids inside them. Once the curd is formed, these grids start to function inside the vat, and they cut the curd into small pieces. Then the whole substance is taken to a deep, rectangular trough (*tekne*) in which large cheesecloths are installed. Through these clothes, the whey continues to drain and is collected in a separate vat so that it can later be turned into other dairy products like butter or different cheeses like *lor*. I was supposed to take the sample from the whey once the curd is cut and the two start to be separated. So I could either take the sample from the vat before the whey and curd were taken into the trough to be drained or while it was being drained before it was taken to another vat. We performed this together in İlhan's dairy. It was easy to sink the bottle inside the curdled milk and take it out quickly, filled with the whey and without any curdled particles. I stuck to the idea that the glove was crucial, despite İlhan's attempts to convince me otherwise[118]. After my first try was successful, we agreed that I would collect samples similarly from ten different dairies and indicate on each sample the altitude of the pasture the milk comes from.

[118] He insisted on the fact that the bare hands of the farmers and cheesemakers are always part of the microflora of the cheese. See Interlude 3 for further details.

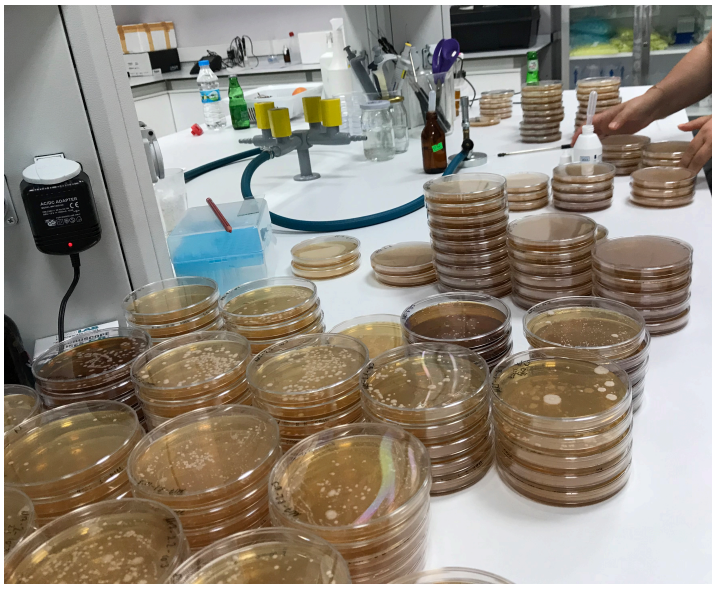
The events I described above all happened in the first week of July 2018. Şehnaz visited the village when the association had the yearly cheese festival. That year the festival was entitled 'Anatolian Cheeses Meet in Kars', and around 50 small cheesemakers from different cities in Turkey convened in Boğatepe village with their cheeses. The tasting workshops brought together wheels of Kars *kaşar* cheese from around 35 different producers in Kars. The five-day festival enabled Şehnaz to meet many artisanal cheesemakers with small dairies in rural Kars and different parts of rural Turkey. At the end of the festival, when we spoke about her research, she told me that while her academic interest has always been influenced by the rich microflora of raw milk and dairy products, initially, her main concern was to understand the particularities of food safety and standardization in Kars dairy production setting. "None of the starter cultures I can make by the end of this research can reflect the diversity in pasture-milk, which is constitutive of the cheeses," she said. Her conversations and encounters with cheesemakers in Kars, made her remember her childhood years when her parents have always consumed skinbag Tulum cheeses that are far from being safe from the conventional, Pasteurian scientific approach. While she hesitated to suspend her 'generic' knowledge of traditional cheeses as they are always risky for humans due to the pathogens they may contain[119], she felt the need to consider the effects of her knowledge on the practices of pasture-cheesemaking. Her conclusion was, in some sense, an obligation brought by the particular situation she found herself in after embarking on studying *thermophilic lactic acid bacteria* in *kaşar* cheese. She expressed that her scientific expertise (*uzmanlığım*) in revealing particularities of the biological diversity in artisanal dairy products

[119] Food safety concerns have always been present, especially during my fieldwork with academics. When I told them about the examples like Dutton or Montel, an immediate comparison they offered was the somatic cell counts in Turkey and Western countries like the US and France. They argued that the bulk of raw milk in Turkey consists much higher counts that would not even be acceptable for production in those countries. Moreover, bacteria that can be transferred from animals to humans through food and cause severe infections like *brucella* or *anthrax* are considered endemic, especially in eastern Turkey. Even if they are not always reported, they are known to exist widely in rural Kars (Tatari 2018b). This chapter does not aim to underestimate such public health concerns. Instead, it points to a particular type of diplomacy that can inhabit these concerns together with others that pasture-cheesemaking obliges its practitioners to consider.

could be brought together with the expertise of the cheesemakers, their traditional techniques and, knowledge. She cultivated this awareness, which led her to add new variables to her research after her trip: those variables would help connect her scientific expertise and the concerns she encountered in pasture-cheesemaking.

While the main focus of Şehnaz's research – commercial starter culture - did not change, she aspired to develop a spin-off project within the same research that investigates the differential origins of the samples she collected from Kars. We registered the altitudes of the pastures from which milk came, for each sample. Şehnaz hypothesized that this study, the collected whey samples might reveal possible nuances in the dominant lactic acid flora within the milk produced at different altitudes in the province. Close analysis of these samples would enable her to provide a list of thermophilic lactic acid bacteria she encountered in different samples according to their altitude, even if these would not possibly be reproduced in a starter culture trial. In other words, the database she has been creating in parallel is a more comprehensive set that would include the strains that are not considered suitable for being reproduced as starter cultures, but would also reflect the altitude from which the respective whey sample was collected.

İlhan and Şehnaz considered this component of Şehnaz's study a vital step toward future collaborations between scientists and artisanal cheesemakers in Kars. They imagined that this database would be helpful to differentiate pasture-cheeses first and foremost from large-scale industrial producers who are limited by the taste that starter cultures can provide them. I remember that three of us imagined how such a database could help create a research institution on traditional cheeses in Kars where scientists and pasture cheesemakers can collaborate in the future.



Photograph 11: Hundreds of petri dishes which Şehnaz used to isolate and reproduce thermophilic lactic acid bacteria from the whey samples (Van, 2018).

Photograph 12: A view of the cold storage unit after our work in the laboratory, with the strains Şehnaz isolated and preserved to identify them later (Van, 2018).

Conclusion

Collaborations between post-Pasteurian dairy sciences and artisanal cheesemaking have recently been more visible, especially in the local food production circles and their technosciences. Scientists like Dutton and Montel, and cheesemakers who are trained in dairy sciences, have been influential figures in many conferences and documentaries[120]. While recent scientific studies on artisanal cheeses target the controversies behind the black-boxes of the food safety regime (Donnelly 2019; 2014; Kindstedt 2012; Percival and Percival 2017)[121], various civil society organizations and artisanal cheesemakers associations have also been promoting new safety measures to protect traditional methods through different certification mechanisms[122]. In Turkey, especially since 2018, there has been an increasing public interest in traditional cheese production and consumption. Many festivals and non-scientific publications gave way to new collaborations between food engineers, microbiologists, development officials, and dairy farmers, and new cheesemaking facilities have been founded in several locations across the country[123]. These recent developments suggest that new forms of collaborations are being made, and further ones could be on the horizon; new diplomatic relations between different experts and new possibilities for carving knowledge in dairy technosciences.

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[120] See Bilger (2002) https://www.newyorker.com/magazine/2002/08/19/raw-faith, and the documentaries The Cheese Nun, PBS (2006) and Cooked (2016), episode 4: Earth. The biennial conference "Science of Artisan Cheese" can also be cited as a well-known prestigious example: https://scienceofartisancheese.com/. Slow Food Movement in Bra, Turin, Italy, also holds an prestigious international gathering called Cheese every two years since 2001.

[121] See also the works by several anthropologists including (Grasseni 2016; 2014; Paxson 2013; West and Domingos 2012; West 2020).

[122] Geographical indications are the most widespread certification mechanisms worldwide. Slow Food Movement established a certification system, called *Presidia*, to list and protect small-scale traditional food production.

[123] In addition to the traditional cheese festivals in Kars, a local version of the Slow Food Cheese Festival was organized in Bodrum in 2015, 2017, and 2019. Other similar events were also organized, such as a festival in Bitlis on Eastern Anatolian cheeses (2018) and on caves in central Anatolia used for cheese aging for centuries (2019). See (Bal Onur and Aksoy Biber 2016; 2019) for two recent popular publications on local cheeses in Turkey.

In my fieldwork, I mainly worked with women scientists who are researchers in public universities in Turkey. They were the ones who were researching Kars cheeses when I was doing my fieldwork, but this was no coincidence because most food scientists who study traditional dairy products in Turkey are women. A middle-aged women food engineer I interviewed explained: "until recently, it was considered pointless to study these products; the cutting edge work most men were interested in was related to the new technologies for large scale standardized food production." The existing institutional structures of academia heavily affect the possible paths that scientists can follow: All the food engineering departments and veterinary faculties of the universities where I conducted fieldwork (Kafkas, Kars; Yüzüncü Yıl, Van; Çukurova, Adana) can be considered as low-budget, provincial academic institutions where scientists don't work in their personal laboratories. They share one or two laboratories that belong to their departments for the collective use of designated academics and their students. This kind of research setting makes it difficult to dedicate a lab for a particular research that researchers themselves decide. They apply for funding several times for basic machinery or research activities; they usually have to travel to better-funded universities in bigger cities to use special equipment. They also share the pressure of a neoliberal university that forcefully suggests they collaborate with companies and produce knowledge that can be translated into a profitable strategy for the dairy industry. Hence given that working with small farmers on pasture cheeses is not part of conventional dairy science, these academics need to translate interests between academia, science, and craft so that their study allows them to keep their academic positions.

As the studies I discussed in this chapter have shown, expertise in dairy science posits new research agendas when it is open to the concerns of the artisanal cheesemakers and the everyday worlds of dairy farming in Kars pastures. Paying close attention to the ethical concerns embedded in the web of relations among pastures, animals, milk, curd, cheese, dairy

farmers, and cheesemakers makes diplomacy possible through pasture-cheeses. Yet this diplomacy is not only slow, but it also does not offer any guarantees for supporting pasture-cheesemaking through scientific analyses. As almost all the cases described in this chapter indicate, scientists also face many challenges in cultivating awareness about the possible implications their practices might bring on pasture-cheesemaking endeavors. In this academic context, one obvious fact is that conforming to conventional dairy science research is always safer than getting published and maintaining one's professional reputation and status. Whether the scientists in question can access and utilize the technological tools needed for conducting alternative microbiopolitics protocols (for example, protocols that progressive dairy scientists such as Montel put in practice) is another challenge that needs to be kept in mind. Not having an equipped laboratory in Kars dedicated to artisanal cheesemaking or the lack of DNA sequencing machines in many provincial universities also compound the strength of the persistence of Pasteurianism in dairy science research. Yet, the collaborative practices in rural Kars, and the pasture-cheese diplomacy they enact, carve out a place for the co-construction of scientific and local ways of knowing and dairying.

Interlude 4

On the local innovations of dairy craft: A new *Gravyer* dairy in Boğatepe

Cauldrons undercover

We were standing right at the entrance of İlhan's (old) dairy in Boğatepe, looking together at the construction of the new dairy building while waiting for the milk to fill the cauldrons inside. It was barely 9 am. The milk in the tank at the back of the minivan was transferred with a large and firm hose that passed through a hole in the window of the dairy's facade. İlhan answered his mobile phone and started to talk about the new dairy equipment to the person calling him. When was the new cauldron going to be ready? I was stunned to hear this! I knew that the cauldrons in İlhan's *gravyer* dairy were very special. And I had assumed that they would be simply transferred from the old dairy building to the new one once the building is constructed. I had listened to him many times when he explained how these cauldrons -made of copper and a small amount of gold- are crucial for making authentic, real *gravyer*. İlhan's family has been producing *gravyer* cheese in the same cauldrons since they migrated from Dmanisi (Georgia) to Kars (Turkey) in the 1920s. They have been carrying out this production following the violent years of World War I, Turkish-Armenian clashes, and new borders to be drawn between the two newly founded nation-states – Turkey and the Soviet Union. İlhan always mentions that his grandparents had brought one or two cauldrons with them, but nowadays, no one is sure which cauldrons are the ones they brought from the South Caucasus.

There has been an ongoing conflict over the cauldrons between İlhan and state officials who regularly inspect Kars dairies according to the food safety standards set by the Ministry of Agriculture and Forestry. In 2004, when the Turkish state changed its food safety

measures for dairy production in the course of EU membership negotiations (see Chapter 3), the use of any cauldron that is not made of chrome was strictly prohibited in cheesemaking in Turkey. Since then, every time an inspector shows up in the dairy, İlhan is busy explaining the stories about the copper cauldrons, emphasizing how they are indispensable for the *gravyer* cheese, offering various gifts to them and inviting them over for lunch or dinner. Still, he was subject to pay fines many times and he had to shut down the dairy several times. When I had asked İlhan if the family tradition was the only reason behind his insistence on these cauldrons, he was at first angry with me since according to him my question implied that I thought he might be lying to the inspectors. Then he told me that the other dairy in the village that accepted to comply with the rule of using chrome cauldrons could never produce the same *gravyer* again, even if the best cheese masters worked for them. He explained that the special cauldrons in his dairy balance the fluctuations of the milk, which depend on the grass and flowers the cows eat out in the pastures on a daily basis. The material interaction between the metal of the cauldron and the milk it contains was not as dangerous as the inspectors believed it to be. On the contrary, use of them was rather necessary if one wanted to produce real *gravyer*. "*Gravyer kromda olmaz!"* (One cannot make gravyer in chrome), he would say over and over again. When his phone conversation was over, I asked him if he bought a new chrome cauldron. His answer was negative; he was going to use the old copper cauldrons "undercover".

In 2013, two years before this conversation, when İlhan and I visited the grandchildren of Abdullah Usta in Dikme village (see Chapter 2), we encountered an old copper cauldron in their garden. I remember our thrill when we took pictures of it – posing as we sat inside this large, 1000 liters capacity cauldron. That day, the owner of the house promised İlhan that he would give him this cauldron if he needed a new one for his new dairy. With this anecdote in mind, I asked him if this new "undercover cauldron" was the one

we encountered together in 2013. I was right; he had taken that cauldron, and renovated it with the help of an old tinning master in Kars. Once the cauldron was ready to be used, he consulted his old friend Yaver who was a master in designing and repairing dairy equipment. Yaver is from Antakya, an Eastern Mediterranean port city in southern Turkey at the Syrian border. His job consisted of designing and producing dairy equipment for more than 40 years. Since Yaver repurposed old naval equipment and made machines to be used in dairies with low costs, his dairy equipment was cheaper than the new ones available in the market. I encountered him each summer in Kars. He told me that he drives with his minivan all around Eastern Anatolia every year, delivering new machines to the farmers and dairy owners, repairing some old ones or collecting/buying their old machines so that he could repair and sell them later. He had become very good friends with İlhan throughout the dozens of years he visited Kars. Yaver liked the idea of making a cauldron undercover! They had planned to insert this copper cauldron in the same external façade of new chrome cauldrons, which contains the heating water pipes between the cauldrons and the exterior planting.

Approximately a year after this phone conversation, when I visited İlhan in the village in July 2016, I saw the undercover cauldron with chrome exterior plating. It was placed under the stainless pipe that pours the milk that is transferred from the tank outside and it was connected to the heating system of the dairy that ensures the circulation of hot water through the pipes. That summer, the ministry officials visited the almost finished construction site of the dairy. While the production unit was ready, İlhan and his nephew Çetin wanted to add a two-floor building to their dairy to have new *badval*s (ageing rooms) in the basement. Once the officials confirmed that the production unit could get the necessary permit from the ministry if they had the required paperwork, İlhan was relieved to learn that the undercover cauldron would work to convince the inspectors to come. After that relief he immediately decided to cover one more copper cauldron for the new dairy.

The construction of İlhan's new dairy in Boğatepe started in 2015 and it took more than two years to complete the building, mainly due to the high cost of construction investments in a remote village. When the construction work ended in 2017 and the dairy was ready to use, it included two "undercover cauldrons". One of them was from Dikme and the other one was from his old dairy. İlhan left one copper cauldron in the old dairy and he explained his decision based on two reasons: First, he taught that the old dairy could be turned into a station of the Ekomüze Zavot, as the last dairy that can demonstrate the 20th-century gravyer cheesemaking technology in rural Kars. Therefore he wanted to leave one cauldron together with the press technology that can be occasionally used for special events. Secondly, he envisioned that this cauldron would be crucial in the transition period to the new dairy – not only sentimentally but also due to concrete reasons, the cheesemakers working for him needed the old dairy so that they could learn making similar quality *gravyer* cheeses in the new dairy.

Photograph 13: My first encounter with the cauldron undercover (Boğatepe, 2016)

Cooking in the new dairy

In June 2017, İlhan and his nephew Çetin started to make cheese in the new dairy for the first time. As İlhan had hinted, this was not planned as a straightforward, quick transition. They knew that it would take time for the crew, including the masters, apprentices, milk, and cheeses to get used to the new setting. They started *kaşar* cheesemaking more confidently than *gravyer*; but both were taken to the old *badval*s (aging rooms) for affinage. For *gravyer*, they used one cauldron in the new dairy and one cauldron in the old one. In addition to the new heating system that relied on the water running through the pipes under the chrome façade, the fact that this cauldron was put to use after dozens of years also affected the process. Çetin explained to me that he needed time to understand "the language the cauldron spoke".

Photograph 14: The milk, passing through the tubes, fills the cauldron undercover in the new zavot (Boğatepe, 2018).

In the old dairy, the cauldrons were embedded in a special place where it was surrounded with firebricks. To heat the cauldron when cooking the cheese, they used a machine locally called *patrofka* that produced strong flames of gas. When I worked in this old dairy in three consecutive summers until 2018, I was always amazed by how the staff was habituated to this seemingly dangerous technique. I was later surprised to learn that they considered it a much more controllable system compared to the new one. During the heating process, which happens in the last 30 to 45 minutes of cooking the curd, one person was responsible from bringing the *patrofka*, opening the safety lock of the large steel tubes filled with liquefied petroleum gas, and kindling the *patrofka*. Heating the bricks, raising the temperature of the cauldron, and heating the curdled milk inside it took considerable amount of time. When the master decides the time to take the cheese out, it was his same apprentice who stopped the flame, turned off the gas and carried the equipment to its first place in the dairy. In the new dairy, a simple movement of turning the yellow handle of the valve by 90 degrees was enough to make the hot water run through the pipes surrounding the cauldron. The heating happened much faster in this system, compared to the one with the firebricks in the old dairy, which need longer time to get warm. Similarly, when the *patrofka* was turned off, the cauldron kept the heat since the heated firebricks do not cool down quickly. In contrast, when the valve is closed and the hot water stops running, the cauldron would lose its heat much faster in the new dairy. Since timing mattered the most for the desired texture of the small curd particles, the master needed to find the right time of opening and closing the valve – and this required a particular habituation for working with a trial and error recursion.

Besides the working humans in the dairy, the invisible agents also needed time to get used to the production in the new dairy. İlhan and Çetin emphasized that the microorganisms that have been accumulated in the old dairy for more than 40 years were crucial in making *gravyer*; they considered them as contributing to the authentic taste of the cheeses they have

been producing. İlhan once stated that he was even able to guess the dairy in which a specific *gravyer* cheese was produced by looking at its shape and its holes' patterns. Since they don't use any commercial starter cultures in the production process, these microorganisms are transferred primarily from the surfaces the milk, curd and cheeses contact throughout the process. This makes the wooden equipment essential for the process since the wood keeps the traces of microorganisms and allows their transfer to every new batch of cheese. This is the main reason of prohibiting the use of wood in dairy production by the legislations because wooden equipment can enable the proliferation of pathogens when contacted with them or when they are not cleaned after being used. Yet the wood's bacteria containment capacity is an indispensable feature for the local-artisanal cheesemakers.

In 2017 and 2018, I was impressed by the work the İlhan's staff undertook to carry the invisible entities from the old dairy to the new one. Using the same wooden tools during the production was essential in the transition, including the wooden sword which was an essential tool when I worked in İlhan's *gravyer* dairy. Once the milk is curdled, around 30-40 minutes after adding the rennet to the (raw) milk, this sword was used to cut the curd for the first time. When the rennet is added and one waits for the curd to be formed, the milk is said to be "sleeping" (*süt uyudu*, in Turkish). İlhan once explained that the wooden tool traditionally used in the process enables them "to wake the milk up" softly – stainless steel materials would cause a sudden waking that leads to an undesirable pace for the separation of the whey from the curd. After awakened, the curd will be cut into small pieces and cooked up until 53 to 55 C degrees in order to be collected in a cloth and transferred to a mold to form 50 to 90 kilograms heavy large cheese wheels. *Poçka* and *harbi* (see photograph 15) are two primary tools being used during this phase of *gravyer* cheesemaking. Both tools are stainless steel or chrome in their bodies and have a small wooden piece that contacts the cauldron. *Poçka*, a stick that has four half-circle shaped metal bulges at the end, is used twice in the

process. First, shortly after the milk "awakened", *poçka* serves to stir the curdled milk and split the large pieces of curd into smaller pieces. Then once the pieces cannot get any smaller with *poçka*, it is *harbi*'s turn. *Harbi* looks like a metal grid consisting of 8 or 10 very thin and sharp metal cords of 60-80 centimeters each. Two masters or a master and an apprentice use the two *harbi*s in harmony impressively – each one bends over the cauldron, soaks the *harbi* down the curdled milk from the farthest point to their body and pulls it towards himself. One after the other, this movement is repeated for about 10-15 minutes. *Harbi* makes the curd pieces even smaller curd particles. Then the last stage *poçka* comes back into the process. The milk and its curd particles in the cauldron are stirred simultaneously while being heated. Stirring gets faster and faster as the cauldron's temperature rises. The master decides the right time to take the particles out and form the wheel inside a mold (see Interlude 3).

Photograph 15: From left to right: *poçka*, *harbi*, *kılıç* (wooden sword) (Boğatepe, 2019)

Both *poçka* and *harbi* are very stable tools, yet their wooden parts that constantly hit the cauldron can wear out after multiple production cycles. The new ones in the market have plastic parts instead of wooden ones (like the spare *harbi* in the dairy that can be seen in photograph 15). I once accompanied İlhan who took the small piece at the edge of the *poçka* to his carpenter friend in Kars. He told me that it was the second time in the last 15 years that he needed to do this. His friend looked at the piece, tried to understand its use and imagine its intact shape, and started to carve a piece of wood in a similar shape accordingly. We watched him working. At certain steps he stopped and asked İlhan for some tips: Should it be thicker? Should he make the edges curvier? Does it need to have a bump at the very top? İlhan gave him the tips he thought would work the best considering the heavy uses in the coming years. Once he finished carving out the small piece to be attached to the edge of a *poçka* at the end of a good 45 minutes or so, İlhan was happy with the result. He asked for two more identical pieces, explaining that they use three *poçka*s in the dairy regularly.

***Gravyer*s in between the two dairies back and forth**

When the *gravyer* cheese is taken out of the cauldron, the bag of the fresh cheese is put in a round mold (*kasnak*, in Turkish) placed on a round wooden piece. Another wooden piece is put on top of the mold before the fresh cheese is put under pressure. As I described in detail in Interlude 3, once a *gravyer* cheese wheel "is cooked", i.e., taken out of the cauldron in a large cloth that is placed in a round mold, another essential procedure called *çit açmak* (opening the cloth) enters the process. One wheel of cheese stays under pressure and gets rid of its extra water during the first 24 hours and the pressure is relieved four times to change the cloth enveloping the fresh cheese. The first three happens within the first hour and the fourth one usually happens five to seven hours later. After the fourth and last round, the cheese stays under pressure for another five to seven hours – special greaseproof cloths are used during this last stage. During the summer months of 2017 and 2018, each *gravyer* wheel

produced in the new dairy was transferred to the old dairy after the third or fourth time the cloth was changed. This ensured that these wheels stayed under pressure in the old dairy for eight to ten hours before the next step which is resting the cheese in salty water.

The basement level of the new dairy consisted of two pools of brine, a constantly refrigerated cold storage room, and two *badval*s - one hot, one cold (see Interlude 3 for the details of aging *gravyer* in *badval*s). This floor is under the soil for the most part of it. *Gravyer* masters consider this detail - the *badval*s where the cheese is aged to be situated underground - a crucial feature. The old dairy had a separate building that contained salty water pool and two *badval* rooms. This unit is situated right across the entrance of the old dairy. Once a wheel of *gravyer* stays under pressure for about 12-20 hours, it is taken to this unit. When one opens the main door of this unit, a small room appears. On the left, one could find shelves where the fresh cheeses rest, by the front, there is the brine pool, and on the right handside, there are two doors with a weight scale placed in between them. These two doors open to the hot and cold *badval*s. The hot *badval* is smaller and it hosts the cheeses for about 20-25 days after their five to seven days in the brine. This room is heated with the help of a stove that has a constant fire going on throughout the cheesemaking season. The next-door, cold *badval*, is the final stop of the *gravyer* wheels being made in Boğatepe before they are shipped to various markets for sales or taken to a cold storage facility in Kars or Istanbul. They stay in the cold storage room for at least two months. While most of the wheels stay no longer than three to four months, İlhan has special customers who ask for six or eight months old cheeses. İlhan and Çetin also save some cheeses as special products. For instance, I noticed them keeping one year or 18-months old wheels in their *badval*s multiple times during my fieldwork. Yet they prefer to keep the wheels in the cold storage facilities especially after one year.

During the transition from old dairy to the new one, İlhan, Çetin and Ahmet – the master of *badval*s ("*badvalcı*") – were very much concerned about the aging process. Although the new *badval*s were also located underground like the old one, there are significant differences between two buildings. First, the old *badval* unit is a stone building with a traditional roof that consists of two layers of wooden logs, large and flat stones (*lepik*), and around 30-40 centimeters of soil with grass on top. This structure enables the rooms to breath in the sense that it generates air circulation which is precious for the cheeses. The second and most important difference between these two dairies is that the temperature in the indoor space of the old unit is cooler than cement buildings, even if the latter is built underground. While this heat insulation detail is important for the *badval* given the cold climate in Kars, it can also be a disadvantage for hot *badval* since the stove needs to work harder to heat the room. In the new *badval* units, the unit is situated within a cement building. The temperature and humidity must be controlled with electronic air condition systems and therefore İlhan and Çetin needed to get used to the new air condition systems' functions. This new system meant an additional electricity cost to their production and things got even more complicated with the usual and frequently happening power outages in a remote mountain village like Boğatepe. They had to buy a diesel-generator against this risk since a long term power outage would easily spoil large amounts of cheese. Against the increasing costs and ecological implications of these electricity issues, İlhan and Çetin have been working on investing on solar energy panels to be used in the dairies. This investment plan is not only expensive but also risky given the limited access to maintenance services in Boğatepe village.

In 2017, when the new *badval* units of the new dairy were not ready to be used but the *gravyer* cheesemaking had started in the new dairy, each cheese that was carried to the old dairy for the last hours of pressure was transferred to the old *badval* unit with the others as usual. In 2018, the new *badval*s were ready but the three cheese masters were cautious. They

all told me that the cement structure of the building affected the aging process. Therefore they kept the hot *badval* running in the old dairy unit. Ali, as the *badval* master, warned İlhan and Çetin about the cheeses that may not be doing well in the new hot *badval*. Then these cheeses were carried to the old hot *badval*. When the cheeses were taken out of the hot *badval*, they were first taken to the cold *badval* in the old unit. After a week or so, when the cheeses seemed to be doing well, they were transferred to the new cold *badval*. Despite all these efforts, İlhan later told me that they lost a significant amount of *gravyer* wheels in 2018. By the time I finished writing this dissertation, İlhan, Çetin and Ahmet continued to experiment with the use of the old *zavot* and *badval* building. Each year they found a new way to create a balance between the new and old dairies – their complicated records of which cheeses stayed in which room for how long revealed the ways in which they attempted to cure the imperfections of the cheeses made in the new dairy by using the old dairy buildings, as well as to carry the invisible but necessary entities from the old dairy to the new one through cheeses (and various equipment, especially wooden ones) that travelled back and forth.

Conclusion

Postscript on Pasture-Cheesemaking in Northeastern Turkey

It has been a drought (*kıtlık*) year, said Hayriye in October 2021, while we were talking about her decision on how many of her cows to sell so that she could buy winter feedstock for the remaining ones in the stable. She had renovated her stable last year, which increased their debts. Living with her husband, İlker, and their eldest son in the village, the family did not own any fields or grasslands (*çayır*). The village pastures in commons status are crucial especially for the families who do not own land and use only the commons from April to October. These families usually own a house, animal shed, and a large garden (*halhal,* an essential piece of land where the dairy animals graze during early and late pasture season), occasionally small plots of grass. The snowfall was less than usual in 2021, and the summer months were unprecedently hot. The grass we walked on in July felt very dry as if it was already September. By October, most dairy farmers had already sold a few of their cows and were busy ensuring enough feedstock until the next pasture season.

Hayriye was concerned about her cows. Given the lack of fresh grass available in common pastures during the pasture season, cows started to return home hungry after August, with less milk than usual. Hayriye, İlker, and their son had to feed their cows with feedstock they have bought, which happens very rarely during the pasture season. Hayriye admitted that *hayvancılık* (animal husbandry) had become very difficult to be subsistent. In fall of 2021, she sold four of her cows. The following winter, İlker passed away. Hayriye and all her three sons were devastated by this unexpected loss. Although the climate conditions improved, her son who lived in the village told her that it would be difficult to take care of the cows by themselves. Her other two sons lived in Kars city center, where they work for low-wage jobs.

When I visited the village in July 2022, Hayriye decided to sell all of her cows and move to Kars with her sons. Her sons, who are in their 20s and early 30s, had expressed many times that they cannot get married if they stay in the village since most young women they meet prefer living in the city center. When İlker passed away, they decided to use the money from selling their animals to establish a life in the city. This is a very tough decision for them, according to Hayriye, who clearly stated that she has to do her best for her sons who desire to live in the city. She hoped that she would help her sons establish a good life in the city; after that, she could return to the village. Hayriye was planning to keep her house and the shed, which she would use except for a few months during the winter. Her life in the village was going to lose a crucial component of animal care and dairying. She felt ambivalent about not spending her daily work routine with her cows: "I will miss my cows, and the milk. But, at least, there won't be the job of waking up early, entering the shed. I cannot stand still (*boş durmak*) you know, I always wake up early and find lots of work to do".

I started this dissertation with the initial motivations and dreams of the women who founded the association BÇYD. As stated in Chapter 1, they aimed to make a better life in the village, better said, to make the village habitable again by themselves and especially by their children. In this conclusion, I would like to reflect on the current conditions in the village through the ethnographic concepts and stories I shared throughout the dissertation. Hayriye's recent decision to sell all of her cows is not a unique case in the village. While the economic reasons that underlie the unsustainability of dairy farming plays a major role for making such decisions, the desire of villagers to have an urban life is also very effective in the formation of livelihoods that combine village/rural and center/urban times and spaces. Since 2009, I have heard many members of the association in Boğatepe explaining that their association activities enhanced their everyday life with workshops and encounters beyond their village

life that was reduced to animal care, agriculture, and dairy production to make a living. İlhan once told me that during the first years of the 2000s, he was involved in the farmer organization networks in Kars, where they aimed to respond to the depopulation of villages. Throughout the years that led to the official foundation of the Boğatepe Environment and Life Association (BÇYD), a group of farmers, scientists, development officials, nongovernmental experts, and activists was formed. They aimed to sustain agro-pastoralism by coordinating various projects in a dozen of villages at different altitudes and with diverse vegetable and animal production. Yet, İlhan emphasized, these years clearly showed that a vibrant and decent life in villages, especially for women and youth, was at least equally as vital as subsistence and economy.

Boğatepe has become a source of attraction in the last ten years. In 2015, in addition to the publication of the official legislation of Kars Kaşar Geographical Indicator, and the registration of Boğatepe Gravyer as a presidium cheese by Slow Food Movement, İlhan Koçulu, a fourth-generation *gravyer* cheesemaker, became a known figure in the local food networks in Turkey. İlhan, who had been long involved in the cheese trade in Kars, İstanbul, and many other places in Turkey, has been a significant figure not only in cheesemaking or in recognizing local-and-traditional cheeses but also as a pioneer in the transformation of everyday life in the village thanks to his role as the president of BÇYD. Between 2017 and 2020, 5 short documentary film projects and a dozen of shorter video shootings took place in Boğatepe. In 2017, Turkey's Orient Express (*Doğu Ekspresi*) became more popular than ever for domestic tourism and travellers with social media sites. This popularity triggered an exponential increase in the number of visitors to Boğatepe villages. Zümran Ömür, who was presented as the co-president of the association, became a public figure among the visitors. In a short video recorded in her house in the village, Zümran spoke a few words of French when she told the visitors that she had learned basic French to be able to communicate better with

French-speaking people coming to her village. This video became viral with 5 million views in a couple of weeks. The same winter Turkish government awarded Zümran with Entrepreneur Women Prize. Until the pandemic, this increasing celebrity of the village resulted in more than 20.000 visitors to Boğatepe, where less than 500 people live in the winter.

Between 2007 and 2022, BÇYD became a long-standing and sustainable local association run by farmers. Hundreds of researchers, scientists, and experts visited the village, and many workshops, training seminars, tourism activities, and tasting events have taken place. In 2017, İlhan Koçulu was invited to a panel organized by the United Nations Development Program Global Environment Fund. After ten years of their first project funded by the program, İlhan was going to present BÇYD as a successful case in the panel. In the speech he prepared (which I had to deliver on behalf of him since he had a last minute family emergency), İlhan emphasized that the outmigration and depopulation had profound and long-standing effects in Boğatepe villages. Since several hundred households decreased to less than a hundred from 1975 to 2000, the stability of the population and even a slight increase in the 2010s was a hopeful revival for the two villages of Boğatepe. As the first and third chapters of this dissertation have highlighted, commercial cheesemaking enabled a flourishing everyday dairy farming life in rural Kars. Boğatepe, as an essential and historical center of *kaşar* and *gravyer* started to host more cows in the 2010s. İlhan stated that in 2017, the total number of cows in the two villages reached 4.000, a significant increase from 700 cows in 2000.

Many scholars of various disciplines have analyzed the shrinking rural population of Turkey. The sharply decreasing percentages of the rural population and employment in agriculture have played a major role in Turkish economy's structural transformation in the 21st century. Another decreasing trend concerned the pastures. Kars, which used to be the

province with a relatively large number of cows and available pastures, lost a significant amount of pastures as grazing and farming area for the villagers due to the spread of agriculture, security zones, pipelines, and dams. Boğatepe also lost a portion of its common village pastures to natural gas and oil pipelines construction projects.

Boğatepe farmers continue to work on animal care, dairy production, biodiversity in the pastures, and climate crisis. During the COVID-19 pandemic, when tourism was put on hold for long months, farmers continued to organize workshops on dairy farming, pasturage, cheesemaking, grass, and edible, aromatic and medicinal plants. The drought in 2021 created a big challenge for small farmers, a more significant challenge than the last drought in 2018. Climate crisis has been experienced in Kars pastures by the hunger of not only dairy cows or flocks of small ruminants but also of wild animals that used to interact less with humans – such as wolves and bears. The dam construction projects in Kars province and nearby places are also seen by farmers as effective in less precipitation and in the disappearance of known water sources in pastures.

As previous chapters and interludes of the dissertation have shown, studying local cheeses inevitably starts with agro-pastoralism (*mera hayvancılığı*). Animal care in pastures, practices of milking, and selling the milk precede cheesemaking, and constitute the starting point for any dairy product. This is the reason why I started my investigation of the *gravyer* cheese and the increasing number of *gravyer* dairies in Boğatepe in Chapter 1 by focusing on the dairy arrangements in pastures. Historical transformations from Swiss pasture-dairies and colonial farms to the cooperatives and pasture-farms throughout the 20th century are discussed in the first two chapters and interludes. By focusing on the specificities of pasture *kaşar* cheesemaking practices, Chapter 3 and Interlude 3 investigate how the design of the Kars Kaşar Cheese Geographical Indication involved the participation of small dairy farmers and rural cheesemakers, who emphasized the presence of pastures in the cheese. Since I

observed that crafting pasture-milk and recognizing pastures in the cheese have become more crucial than ever in the geographical indication meetings, tasting workshops, and in the resulting legislation, I conceptualize different layers of "pasturing" dairy arrangements – from milking to crafts and technosciences. Chapter 4 and Interlude 4 focus on the collaboration between cheesemakers and scientists. I narrate the ways in which İlhan's concept of "carved reason" could be understood as a proposal for what I call a "pasture-cheese diplomacy" in the design of scientific research and making of the dairy technosciences. The order of the chapters and interludes also provides a trajectory from animal care and dairy farming to dairy arrangements in pastures, to the practices that make artisanal cheese as a special craft of pasture-milk in Kars, to the collaborative spaces between farmers, cheesemakers, and scientists where knowledge sets and reasonings are questioned or articulated with each other. Yet, after all these hopeful (and to some extent speculative) material transformations (and their possibilities) I elaborate on throughout, I choose to finish this dissertation by hinting at the ongoing threat of depopulation in the village – despite all that was achieved in the last 20 years, there was of course no guarantees; maybe life did not get better enough…

To finish with Hayriye's story, I would like to go back to the motivations that lead farmers to prefer living in a city or an urbanized center. Education opportunities, medical services, everyday life without a stove and animal care responsibilities seem to be the main reasons people talk about when I ask them why they don't want to stay in the village. Young men also mentioned that they couldn't get married since young women do not prefer a life in the rural. Although Boğatepe can be considered as offering much more options than most villages around it, most young people still choose to leave the village for a life in the city. Like Hayriye, two other single women sold their animals after the death of their partners due to the lack of family labor to take care of the cows – their children chose to stay and work in

the city despite the fact that their revenues are lower than what they would most probably make in the village. In the meantime, a new generation of dairy farmers and cheesemakers have also emerged in the village in the last ten years. However their persistence is tied to the existence of dairy animals and milk in the village. Hence the same dynamic I focused at the beginning of this dissertation, namely the relationship between cheesemaking and *mera hayvancılığı* (agro-pastoralism) is likely to shape the future transformations of the contemporary dairy infrastructures in Boğatepe.

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