Title

Improving Dairy Organizational Communication from the Veterinarian's Perspective: Results of a Continuing Veterinary Medical Education Pilot Program

Journal

Journal of Veterinary Medical Education, 43(1)

ISSN

0748-321X

Authors

Moore, Dale A
Sischo, William M
Kurtz, Suzanne
et al.

Publication Date

2016

DOI

10.3138/jvme.0215-028r

Peer reviewed

HHS Public Access

Author manuscript

J Vet Med Educ. Author manuscript; available in PMC 2016 April 06.

Published in final edited form as:

J Vet Med Educ. 2016 ; 43(1): 33–40. doi:10.3138/jvme.0215-028R.

Improving Dairy Organizational Communication from the Veterinarian's Perspective: Results of a Continuing Veterinary Medical Education Pilot Program

Dale A. Moore, DVM, MPVM, PhD, Dipl. ACVPM [Clinical Professor and Director of Veterinary Medicine Extension and Continuing Veterinary Medical Education],
Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Washington State University, P.O. Box 646610, Pullman, WA 99164–6610 USA. Her research interests are in needs assessment and evaluation of outreach education and food animal population health

William M. Sischo, DVM, MPVM, PhD [Professor],
Food and Waterborne Disease, Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Washington State University, P.O. Box 646610, Pullman, WA 99164–6610 USA. His research interests are in antimicrobial resistance and foodborne pathogens; the ecology of zoonotic and food-borne pathogens in animal production units, with a particular emphasis on the transmission dynamics of Salmonella across rural and urban interfaces; and the impact of communication and management on complex agricultural production systems on the use of antibiotics

Suzanne Kurtz, PhD [Director of Clinical Communication],
Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Washington State University, P.O. Box 646610, Pullman, WA 99164–6610 USA. Her research and teaching interests are in effective medical communication with clients

Julie D. Siler, MS [Research Technician],
Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY 14853-3565 USA. Her focus is on research and outreach for the dairy industry

Richard V. Pereira, DVM [doctoral student],
Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY 14853-3565 USA. His research is focused on contributing to a deeper understanding of the emergence, persistence, and transmission of antimicrobial resistant and zoonotic bacteria in cattle, and on the implementation of interventions to reduce and control this problem in animal and human health

Lorin D. Warnick, DVM, PhD [Associate Dean], and
College of Veterinary Medicine, Cornell University, Ithaca, NY 14853-3565 USA. His research has focused on the epidemiology of Salmonella in dairy cattle and risks for antimicrobial resistance

Margaret A. Davis, DVM, PhD [Associate Professor]
Paul G. Allen School for Global Animal Health, College of Veterinary Medicine, Washington State University, P.O. Box 647090, Pullman, WA 99164-7090 USA. Her research has focused on the molecular epidemiology of zoonotic foodborne pathogens including non-Typhoid Salmonella, E.

coli O157:H7 and other STEC, Campylobacter spp. and multi-drug antimicrobial resistance in Salmonella and other Gram-negative bacteria

Dale A. Moore: damoore@vetmed.wsu.edu; William M. Sischo: wmsischo@vetmed.wsu.edu; Suzanne Kurtz: smkurtz@vetemed.wsu.edu; Julie D. Siler: jds88@cornell.edu; Richard V. Pereira: rvp25@cornell.edu; Lorin D. Warnick: ldw3@cornell.edu; Margaret A. Davis: madavis@vetmed.wsu.edu

Abstract

The increasing size and complexity of US dairy farms could make it more difficult for a veterinary practitioner to effectively communicate protocol recommendations for prevention or treatment on the farm. A continuing education workshop was set up based on the results of research on dairy organizational communication on dairy farms, which resulted in a tool to assess dairy communication structure and flow. The workshop specifically focused on communication structure and whom to talk to when implementing health care changes in calf rearing. In addition, modern methods of veterinary–client communication knowledge and skills were provided. Primary outcomes of the workshops were to obtain feedback from participants about research findings and the communication model, to improve awareness about the complexity of communication structures on dairy farms, and to change participants' knowledge and skills associated with on-farm communication by providing communication theory and skills and an approach to evaluate and improve dairy organizational communication. Of the 37 participants completing the pre-program assessment, most recognized a need for themselves or their practice to improve communication with clients and farm employees. After the program, most participants were confident in their new communication skills and would consider using them. They highlighted specific new ideas they could apply in practice, such as conducting a “communication audit”. The results from the assessment of this communication workshop, focused on dairy veterinarians, highlighted the need for communication training in this sector of the profession and practitioners' desire to engage in this type of training.

Keywords

communication; dairy; continuing education

Introduction

Veterinarians are responsible for oversight of antibiotic use on dairy farms and have a responsibility to promote judicious and prudent use of these drugs in an effort to prevent residues in meat and milk and to reduce the potential for antimicrobial resistant pathogens. This is particularly true for calf rearing, where numerous surveys in different states have highlighted widespread use of antimicrobials for calf diarrhea and, in some cases, an imprudent use of these drugs.[1–4] An estimated 25% of dairy calves in the United States develop diarrhea and about 18% are treated with antibiotics for diarrhea.[5] Because there are few labeled antibiotics for this condition in calves, most of the antibiotics used are extra-label and require a veterinarian's prescription. While developing treatment protocols and providing training are ways that veterinarians communicate the appropriate use of these drugs, effectiveness of these tools may be compromised if veterinarians do not know with

whom they should discuss developing calf health goals and designing work to meet these goals, and if they lack the skills to effectively communicate the messages.

While dairy veterinarians are key members of the dairy team, antibiotic use, particularly in calf rearing, remains difficult to monitor. Raymond and others[3] surveyed antibiotic use and disease in calves on Washington State dairy farms. Although the investigators found that calf diarrhea rates on farms could reach 60%, only 21% of respondents had protocols for diagnosing illness and only 27% had written treatment protocols. Over 80% treated most of their calf scours with an antibiotic and many used antibiotics in an extra-label manner. Despite the fact that 37% of producers believed that antibiotics that worked well in the past were no longer effective, the proportion of producers with treatment protocols only rose from 27% to 30% after educational interventions. About one fourth of producers reported using a drug in an extra-label manner, but only half routinely consulted their veterinarian for this use. This implies that the veterinarian may not be aware of or involved in the decision process regarding disease management and treatment, or may not understand where decisions are being made within the calf care system.

Treatment records could help a veterinarian to evaluate implementation of treatment or calf care recommendations and to provide feedback on the effectiveness of the programs. However, surveys suggest that only 35% of dairy farms[1] and 79% of dedicated calf rearing operations keep treatment records.[6] In the dairy organizational communication structure research, about 29% of the dairy farm owners reported having no written treatment records for calves.[a] In the absence of records, the importance of being able to describe the communication network on farms and having effective communication strategies are key skills for the veterinarian. An opportunity exists for the veterinarian to play a larger role on the dairy farm through development and communication of protocols for animal care.

Antibiotic use in calf rearing can be reduced without negative health and production outcomes. Furthermore, such reductions can result in benefits, such as reduced cost and a lower risk for antibiotic-associated diarrheas.[7] Despite the available evidence, many producers continue to use antibiotics for illnesses such as uncomplicated diarrhea because they perceive it to be an insurance policy. There is also evidence to suggest that caregivers view antibiotics as important tools for them to effectively fulfill their job responsibilities.[a] These beliefs are significant barriers to change and emphasize how important it is for veterinarians to have both knowledge to share and effective communication strategies. To address antibiotic use on farms, effective communication includes knowing who to target for delivering information and actively engaging producers and calf caretakers on effective strategies for using antibiotics. This has been noted by others looking to change practices on dairy farms around udder health. Lam et al. (2011) noted that “Technical knowledge on the issues involved remains the first and most important skill of the practicing dairy cattle veterinarian. However, to be able to transfer that knowledge and to actually improve udder health, communication skills and knowledge are also indispensable”.[8(p.14)] The changing demographics of the dairy industry of larger farms, an increasing number of employees, and

[a]Personal communication between Dale A. Moore and William M. Sischo

more complex management structures create particular challenges for dairy veterinarians in the United States wishing to introduce and implement new ideas on client farms.[9]

Communication research in health care settings has focused on preventing medical errors, but an extensive body of knowledge has accrued that describes structures that enhance communication between doctors, patients, and the entire healthcare team.[10–13] These structures, when applied and practiced, improve medical outcomes and patient and doctor satisfaction. Numerous papers have described the need for similar communication training for veterinary students.[14–16] While several veterinary schools have adapted curricula from medical colleges and now provide clinical communication training to veterinary students,[17,18] it is not universal, which leaves both new graduates and many practicing veterinarians without this training or an awareness of its importance to their practice.

In recognition of the importance of understanding how dairy management structure and size influence communication strategies, a study of dairy farm communication networks that surveyed owners, veterinarians, managers, calf feeders, and calf treaters was developed collaboratively by Washington State University (WSU) and Cornell University researchers. This study used a variety of tools and was able to identify farm-specific complex and diverse communication structures, but it also identified common themes that universally applied across large dairy farms. There was also evidence indicating that decision making for neonatal calf care was commonly in the hands of middle management and calf care workers, and often with relatively little input from veterinarians.[19] An outcome of this work was the development of a tool that could be used in practice to identify people critical to decision making and implementation of policies for antimicrobial use on the farm. The research also led to a set of learning points for veterinarians that would help them use the tool and develop communication strategies to improve implementation and oversight of calf health care.[20]

The purposes of this article are twofold: (1) to describe a short continuing veterinary medical education (CVME) workshop on using a tool to define dairy organizational communication in the context of neonatal calf care, and on effective communication skills, and (2) to describe changes in participant perceptions of their communication skills following the workshop.

Methods

The Curriculum

The curriculum was presented at two separate, 4-hour workshops and consisted of three parts: (1) a presentation of research data from the WSU–Cornell Dairy Organizational Communications research project describing communication structures for calf care on large dairy farms, (2) introduction of a model and tool for assessing those structures in the field by a veterinarian, and (3) presentation of client communication concepts and skills. Primary outcomes of the workshops were to obtain feedback from participants about research findings and the communication model, to improve awareness about the complexity of communication structures on dairy farms, and to change participants' attitudes and knowledge associated with on-farm communication by providing the communication skills

needed to evaluate and improve dairy organizational communication. The long-term project goal was to improve animal health care and team effectiveness.

The workshop attendees included members of the Academy of Dairy Veterinary Consultants, a primarily western United States organization that includes practitioners with a wide range of practice experience (workshop 1), and dairy veterinary practitioners, early career academic veterinarians, state program veterinarians, and food animal clinicians based at Cornell University College of Veterinary Medicine (workshop 2). Workshop 1 was offered as a stand-alone CVME program and workshop 2 was a CVME program offered the afternoon before the New York State Veterinary Conference. The workshop learning objectives were consistent at both workshops and reflected the need to create awareness and understanding among participants of the ideas and concepts that emerged from the dairy organizational communication research. It was assumed that these concepts were new for most of the participants. The learning objectives included

- recognizing that communication is an essential clinical skill that can be learned and applied on farms;
- listing examples of effective and ineffective communication;
- describing a framework for understanding communication structure on individual client farms;
- introducing a tool and its use to identify communication flow and networks to identify key personnel involved in calf care;
- describing a conceptual framework for effective communication;
- listing barriers to effective communication;
- creating a message on introducing dairy communication to clients; and
- listing ways to motivate change on the farm.

The workshops were a combination of didactic and interactive discussions using newer ideas on adult learning theory and incorporating participants' own experiences to ground the discussions.[21] Aside from discussions describing the communication network research, guidelines for teaching communication skills were incorporated into the workshop.[22] Components of the course included (1) a pre-program self-assessment of attitudes and beliefs about communication skills; (2) participant-led discussion on successful and unsuccessful implementation of recommendations on a dairy farm (including reasons for the success/failure); (3) objectives and rationale for developing communication skills; (4) a participant-led discussion of barriers to effective communication with a subsequent discussion of barriers identified in the literature; (5) results of the WSU–Cornell Dairy Organizational Communications research project; (6) description of a tool to assess communication flow on a dairy and to identify key personnel to target when making specific recommendations (http://vetextension.wsu.edu/research-projects/mart/outreach/); (7) explanation of a conceptual framework for communication[22]; (8) the first principles of effective communication[22,23] and approaches to communication[24]; (9) the Calgary–Cambridge guide to evaluating effective communication skills[13,23]; (10) a discussion on

motivating and evaluating changes, dealing with defensiveness and conflict or opposition to change, and making a plan for change on a client farm; and (11) a post-program assessment and a course evaluation. The post-program assessment included questions from the pre-assessment and also included questions about interest in additional in-depth communication workshops and participants' likelihood of using the model and tool to evaluate communication structures on their client dairy farms. The Institutional Review Board at WSU reviewed this work and gave it exempt status.

Evaluation

Three data collection forms were used for program evaluation (see Appendices 1–3, available online at http://dx.doi.org/10.3138/jvme/0215-028R): (1) pre-program assessment (Appendix 1); (2) post-program assessment (Appendix 2); and (3) a course evaluation (Appendix 3). Pre- and post-program assessments were designed to assess participants' confidence of communication skills, attitudes about the importance of the new knowledge, and intent to apply that knowledge. A decision was made to keep the participant self-assessments anonymous. The pre- and post-assessments were compared as ecological data and reflected change in the group rather than individual change. To evaluate change with regards to learning about client communication, the prevalence of each of four stages were evaluated using the structure described by Kurtz et al. (2005): Stage 1—consideration (I am aware of and willing to consider change); Stage 2—attitudes (I have a positive attitude toward the change); Stage 3— beliefs and values (I believe change is the best approach); and Stage 4—action/behavior (I change the way I act or behave in real life).[25] Data were entered into and summarized using a spreadsheet program,[b] and a Chi-square test for trend was used to evaluate changes in group stage of learning for communication skills based on pre-and post-program assessments.[c]

Results

Two workshops were held, one in Seattle, Washington, with 31 attendees and one in Ithaca, New York, with 15 attendees. A total of 37 participants completed the pre-assessment (Table 1), 43 completed the post-program assessment (Table 2), and 26 completed the course evaluation (Table 3). In the Washington program, there were 29 veterinarians (83% male) and 5 veterinary students (80% female). The range of practice experience was 0 to 35+ years and the participants came from Arizona, California, Colorado, Idaho, and Washington state. In the New York program, there were four veterinary practitioners (75% male), one regulatory veterinarian, eight early career academic veterinarians (50% female), and two research technicians (100% female). The range of experience was 0 to 30+ years. All of these participants were from the state of New York.

In the assessment conducted before the program (Table 1), for which participants rated themselves on developing personal and working relationships with clients, 70% of attendees rated themselves “average” to needing “a lot more work.” About 66% rated themselves “average” to needing “a lot more work” with regards to determining the needs of clients by

[b]Excel 2013, Microsoft Corp, Redmond, WA
[c]EpiInfo, V 7, US Centers for Disease Control and Prevention, Atlanta, GA

asking the right questions, listening, and confirming before acting, and 62% were “average” to “needing more work” on reporting to clients on a timely basis, both in writing and orally, on issues relating to herd health or progress. Half of the attendees rated themselves very high on being able to identify potential problem areas and recommend alternative actions to meet farm goals, but only 30% rated themselves very high on their understanding of the organizational structure of their clients' dairy business. Most of the attendees (86%) thought that information on improving communication was important to them or their practice. To measure their stage of learning before the program, participants were asked to identify where they were with regards to communication strategies; most were “considering” making a change (27%) or “felt positive” (35%) about making a change in their communication strategy (Figure 1).

Within the workshop, participants were asked to list and discuss barriers to communication. The most common theme was “language,” indicating that without a common language among workers and veterinarians, communication was difficult. However, when the speakers put up a list of potential barriers including filtering, selective perception, information overload, emotions of the receiver, communication apprehension, lack of feedback, gender differences, and cultural differences, participants acknowledged their broadened view of potential barriers.

After the workshops, there was a trend towards an increasing interest in applying communication skills in practice (Chi-square for trend = 4.9; $p = .03$); the proportion of participants intending to “try” new communication skills increased from 35% before to 62% after. Corroborating this finding, after the workshop, 62% of attendees were very committed to using the information they had just learned (Table 2). There was no difference between before or after program responses on how important they thought communication was to them or their practice ($p = .34$). There was no significant difference before and after the program in the percentage of attendees that answered “Very” to the question “How confident are you that you have the skills/know-how to implement an animal health care change on the dairy?”

To assess whether participants would use the communication network tools presented during the workshop, they were asked, “How likely are you to evaluate communication flow on a dairy or calf rearing operation?” Program participants responded “maybe” (21.1%) or “very likely” (42.1%) (Table 2). Similarly, in response to the workshop, almost half of the participants (46%) indicated that they were very likely to attend a more in-depth continuing education program on communication, complete with practice cases and coaching, and another 44% would consider attending such a course (Table 2).

Twenty-six individuals provided feedback on the course through a paper evaluation (Table 3). The course was rated mostly “excellent” to “good” with regards to the objectives and relevance to practice. For 83% of the respondents, 50% or more of the content was new to them and 83% would recommend the course (with 5 non-responders). Just over 85% felt that the program delivered what they came to learn. There were 20 written comments to the request, “List an example of something new that you learned.” There were two major themes that emerged with regards to communication. One was “communication barriers” and the

second focused on using the dairy communication flow assessment tool, “mapping communication lines between owners and personnel.” Twelve participants provided a response to the request, “List an example of something you learned that you can apply in your practice.” There was more diversity in the responses to this request and they included the following (in their words):

- Acknowledge, then pause for 3 seconds;
- Approach to clients to talk about changes;
- Be sure to evaluate communication and organizational structure at any operation I work in;
- Becoming a conduit for communication between upper and lower management;
- Better understanding of farm communication structure to try to improve my interventions with all personnel;
- Communication audit;
- Communication by using acknowledging and silence;
- Communication skills;
- Communication awareness;
- I can use the chart of motivation for opportunities of change among our clients by perceived/real confidence and conviction;
- Listening skills, repeating what you think you heard and then waiting; and
- Take conflict to positive common ground.

When asked about the likelihood that they would apply their “new” knowledge to their practice, 32% of respondents were 100% confident and 36% were 75% confident. When asked to provide an example of something we did not teach that they thought should be included, four individuals indicated the following: “communication discussion far too superficial,” “more on communication strategies with Hispanic workers,” “use a different vernacular to effect change,” and “work using the Calgary–Cambridge Guide skills.” All of the respondents agreed or strongly agreed with the statement “I better understand barriers to effective communication on the farm” and 89% felt confident that they could evaluate dairy business communication structure.

Discussion

The workshop described in this article took new information from research on dairy organizational communication structures and lines of communication and combined it with known, tested medical communications instruction with the long-term goal to improve the delivery of messages to on-farm personnel regarding antibiotic use. The goal was, in effect, translational research. Translational research is that which can be turned into practice, from the laboratory to the patient or to systems of care.[26] While translational research is considered primarily for laboratory-based research, results from communication or behavioral science studies based in community or ambulatory care settings are more often

directly applicable to practice. The research that informed this workshop's curriculum for dairy veterinarians was focused on models for structures and flow of communication on dairy farms and on the potential barriers to communication determined in farm-based studies in communities relevant to the workshop participants.

The strength of this workshop was that it blended the theory of effective client communication with information about the importance of understanding the communication networks on farms to help define how and to whom communication should be directed. Veterinarians are seen as the most important advisors on many dairies. To implement effective positive changes in animal health and well being, it is imperative that they have excellent communication and client motivation skills.[8] Although there are several veterinary college programs devoted to teaching communication to veterinary students, there are few continuing education programs on this topic and none have been devoted to the dairy practitioner. These workshops focused on dairy organizational communication from the veterinarian's perspective and outlined some communication skills using tested methods and combined these with a tool to target messages.[23] By using a communication skills framework, even with a short, didactic, and discussion-based program, we were able to increase participants' level of stated engagement in applying their new knowledge.

Because the workshops were designed to actively involve participants, an expected outcome was that participants would be engaged to both fulfill a perceived learning need and bring context to solve a “problem” they had recently encountered. From Slotnick's four-stage theory of physician learning, participants may have enrolled in the workshop with the objective of solving a “general problem”—a gap in knowledge or skills—but active participation likely moved them to also address a very specific problem.[27] The question, “Which of the following best describes you right now?” identified participants' learning stage before and after the workshops. The four discriminators or choices in this question were: Stage 1. Considering the use of new information on communication; Stage 2. Feeling positive about making a change; Stage 3. Believing that a change was the right approach; and Stage 4. Intention to try new skills. The first response would be for practitioners that were still deciding whether to take on a problem. The second response indicates a transformation in attitude toward making the change, while the third response indicates a decision to change. The fourth response category was used to identify those with intent to change or use the information. Comparing those responses to Prochaska's stages of change, we have pre-contemplation, contemplation, preparation, and action (a decision to use).[28] For learning how to solve clinical problems and for modeling behavior change, both models fit with attempting to change something as fundamental as how individuals communicate with and motivate clients. We found a strong trend within each of the workshop groups toward action or intention to use the new skills following the workshop.

The interpretation of the pre- and post-program assessments are ecological in that they are group-based outcomes and not linked to individual change (i.e., individual participant change was not evaluated). While the change in learning stage was strong, the response membership of the pre- and post-evaluation was different as the Cornell workshop participants did not complete the pre-assessment before the workshop and not all participants arrived in time to complete the survey on the day of the workshop. It is possible

that the group only completing the post-evaluation was different, but the strength of the observed change suggests that the change was real. This mode of evaluation is limited, however, as it is better to be able to identify an individual's change in learning stage. In future programs, use of an audience response system with specific response-card identification could serve as an alternative method that identifies individuals throughout the program but maintains confidentiality.

This pilot project to provide an introduction to dairy organizational communication, to the use of a tool to assess communication flow on a diary, and to communication theory and client motivation helped move many participants to another stage of learning in their use of these skills. The next step will be to provide them with a more skills-based program, allowing them to learn and practice with coaching.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This project was supported by the US Department of Agriculture National Institute of Food and Agriculture (Grant Number 2010–01412). The authors thank and acknowledge the workshop participants.

References

1. Zwald AG, Ruegg PL, Kaneene JB, et al. Management practices and reported antimicrobial usage on conventional and organic dairy farms. J Dairy Sci. 2004; 87(1):191–201. http://dx.doi.org/10.3168/jds.S0022-0302(04)73158-6. Medline:14765827. [PubMed: 14765827]
2. Sawant AA, Sordillo LM, Jayarao BM. A survey on antibiotic usage in dairy herds in Pennsylvania. J Dairy Sci. 2005; 88(8):2991–9. http://dx.doi.org/10.3168/jds.S0022-0302(05)72979-9. Medline: 16027213. [PubMed: 16027213]
3. Raymond MJ, Wohrle RD, Call DR. Assessment and promotion of judicious antibiotic use on dairy farms in Washington State. J Dairy Sci. 2006; 89(8):3228–40. http://dx.doi.org/10.3168/jds.S0022-0302(06)72598-X. Medline:16840641. [PubMed: 16840641]
4. Friedman DB, Kanwat CP, Headrick ML, et al. Importance of prudent antibiotic use on dairy farms in South Carolina: a pilot project on farmers' knowledge, attitudes and practices. Zoonoses Public Health. 2007; 54(9-10):366–75. http://dx.doi.org/10.1111/j.1863-2378.2007.01077.x. Medline: 18035975. [PubMed: 18035975]
5. United States Department of Agriculture (USDA). Fort Collins, CO: USDA:APHIS:VS:CEAH; 2010. Dairy 2007: heifer calf health and management practices on U.S. dairy operations, 2007 [Internet]. Available from: http://www.aphis.usda.gov/animal_health/nahms/dairy/downloads/dairy07/Dairy07_ir_CalfHealth.pdf [cited 2015 Oct 25]
6. Walker WL, Epperson WB, Wittum TE, et al. Characteristics of dairy calf ranches: morbidity, mortality, antibiotic use practices, and biosecurity and biocontainment practices. J Dairy Sci. 2012; 95(4):2204–14. http://dx.doi.org/10.3168/jds.2011-4727. Medline:22459866. [PubMed: 22459866]
7. Berge AC, Moore DA, Besser TE, et al. Targeting therapy to minimize antimicrobial use in preweaned calves: effects on health, growth, and treatment costs. J Dairy Sci. 2009; 92(9):4707–14. http://dx.doi.org/10.3168/jds.2009-2199. Medline:19700735. [PubMed: 19700735]
8. Lam TJGM, Jansen J, van den Borne BHP, et al. What veterinarians need to know about communication to optimise their role as advisors on udder health in dairy herds. N Z Vet J. 2011; 59(1):8–15. http://dx.doi.org/10.1080/00480169.2011.547163. Medline:21328152. [PubMed: 21328152]

9. Rosson, P.; Adcock, F.; Susanto, D., et al. Arlington, VA: National Milk Producers Federation; 2009. The economic impacts of immigration on US dairy farms [Internet]. Available from: http://www.nmpf.org/files/file/NMPF%20Immigration%20Survey%20Web.pdf [cited 2015 Oct 25]
10. Sutcliffe KM, Lewton E, Rosenthal MM. Communication failures: an insidious contributor to medical mishaps. Acad Med. 2004; 79(2):186–94. http://dx.doi.org/10.1097/00001888-200402000-00019. Medline:14744724. [PubMed: 14744724]
11. Lingard L, Espin S, Rubin B, et al. Getting teams to talk: development and pilot implementation of a checklist to promote interprofessional communication in the OR. Qual Saf Health Care. 2005; 14(5):340–6. http://dx.doi.org/10.1136/qshc.2004.012377. Medline:16195567. [PubMed: 16195567]
12. Silverman J. Teaching clinical communication: a mainstream activity or just a minority sport? Patient Educ Couns. 2009; 76(3):361–7. http://dx.doi.org/10.1016/j.pec.2009.06.011. Medline: 19647971. [PubMed: 19647971]
13. Silverman, J.; Kurtz, S.; Draper, J. Skills for communicating with patients. London, UK: Radcliffe Publishing Ltd; 2013.
14. Kurtz S. Teaching and learning communication in veterinary medicine. J Vet Med Educ. 2006; 33(1):11–9. http://dx.doi.org/10.3138/jvme.33.1.11. Medline:16767633. [PubMed: 16767633]
15. Adams CL, Kurtz SM. Building on existing models from human medical education to develop a communication curriculum in veterinary medicine. J Vet Med Educ. 2006; 33(1):28–37. http://dx.doi.org/10.3138/jvme.33.1.28. Medline:16767635. [PubMed: 16767635]
16. Gray CA, Blaxter AC, Johnston PA, et al. Communication education in veterinary education in the United Kingdom and Ireland: the NUVACS project coupled to progressive individual school endeavors. J Vet Med Educ. 2006; 33(1):85–92. http://dx.doi.org/10.3138/jvme.33.1.85. Medline: 16767644. [PubMed: 16767644]
17. Harris DL, Lloyd JW. Changes in teaching of nontechnical skills, knowledge, aptitudes, and attitudes at US colleges and schools of veterinary medicine between 1999 and 2009. J Am Vet Med Assoc. 2011; 239(6):762–6. http://dx.doi.org/10.2460/javma.239.6.762. Medline:21916757. [PubMed: 21916757]
18. Hafen M Jr, Drake AA, Rush BR, et al. Using authentic client interactions in communication skills training: predictors of proficiency. J Vet Med Educ. 2013; 40(4):318–26. http://dx.doi.org/10.3138/jvme.0113-019R. Medline:24113724. [PubMed: 24113724]
19. Sischo, WM.; Moore, DA.; Davis, MA., et al. Intra-farm communication on dairy calf health. 2014 Northeast Dairy Producers Association (NEDPA) Conference; 2014 Mar 19-20; Syracuse, NY. Available from: http://prodairy.cals.cornell.edu/sites/prodairy.cals.cornell.edu/files/shared/documents/NEDPA2014_Pereira.pdf
20. Sischo, WM.; Crudo, C.; Moore, DA. Pullman, WA: Veterinary Medicine Extension, Washington State University; 2015. Dairy organizational communication: assessing the structure [Internet]. Available from: http://vetextension.wsu.edu/wp-content/uploads/sites/8/2015/06/Dairy-Organizational-Communication-Assessment_Finalv3.pdf [cited 2015 Oct 28]
21. Lawler PA, King KP. Changes, challenges, and the future. New Dir Adult Contin Educ. 2003; 98:83–92. http://dx.doi.org/10.1002/ace.103.
22. Kurtz, S.; Silverman, J.; Draper, J. Teaching and learning communication skills in medicine. San Francisco, CA: Radcliffe Publishing; 2005.
23. Kurtz, SM. Curriculum structuring to enhance communication skills development. In: Stewart, MA.; Roter, D., editors. Communicating with medical patients. Newbury Park, CA: Sage Publications; 1989. p. 153-166.
24. Barbour, A. Humanities Institute 1999-2000 Lecture Series. Denver, CO: 1999 Nov 11. Making contact or making sense: functional and dysfunctional ways of relating. Available from: http://files.eric.ed.gov/fulltext/ED436011.pdf
25. Kurtz, S.; Silverman, J.; Draper, J. Teaching and learning communication skills in medicine. Oxon, UK: Radcliffe Publ Ltd; 2005.
26. Woolf SH. The meaning of translational research and why it matters. JAMA. 2008; 299(2):211–3. http://dx.doi.org/10.1001/jama.2007.26. Medline:18182604. [PubMed: 18182604]

27. Slotnick HB. How doctors learn: physicians' self-directed learning episodes. Acad Med. 1999; 74(10):1106–17. http://dx.doi.org/10.1097/00001888-199910000-00014. Medline:10536633. [PubMed: 10536633]

28. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. Am Psychol. 1992; 47(9):1102–14. http://dx.doi.org/10.1037/0003-066X.47.9.1102. Medline:1329589. [PubMed: 1329589]

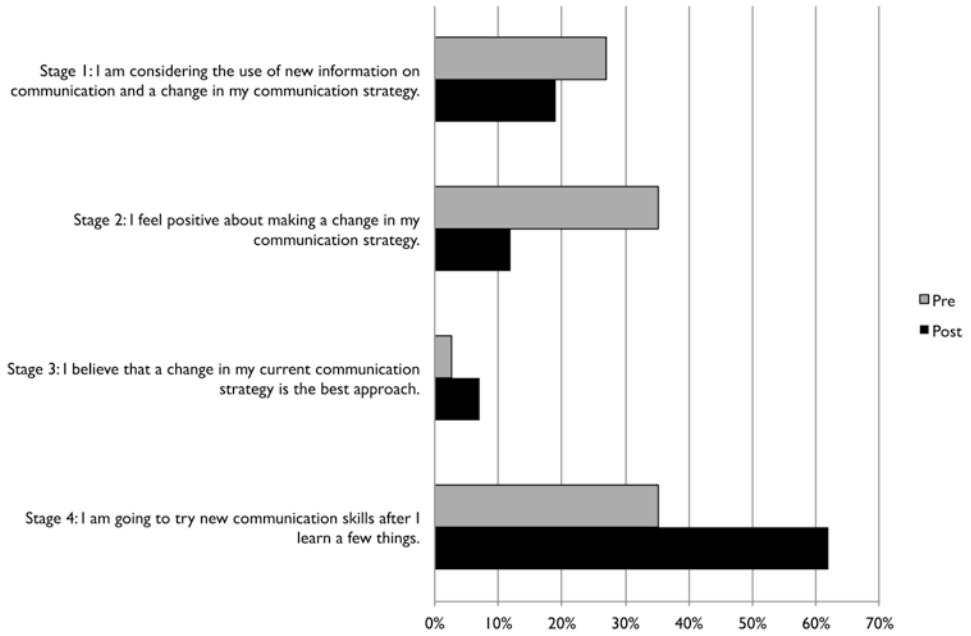

Figure 1. Proportion of participants at each stage of change[22] with regards to communication strategy before (pre) and after (post) a dairy communications workshop (*N* = 43)

Table 1

Responses to pre-program assessment questions with regards to self-rating professional communication competence, view of the importance of professional communication, and confidence on implementing changes on the farm

Question	1	2	3	4	5
Developing personal and working relationships with clients	2 (5.4%)	9 (24.3%)	15 (40.5%)	10 (27.0%)	1 (2.7%)
Determining the needs of clients by asking the right questions, listening, and confirming before acting	0	12 (32.4%)	18 (48.6%)	6 (16.2%)	1 (2.7%)
Reporting to clients on a timely basis, both in writing and orally, on issues relating to herd health/progress	4 (10.8%)	10 (27.0%)	13 (35.4%)	9 (24.3%)	1 (2.7%)
Identifying potential problem areas and recommending alternative actions to meet farm goals	2 (5.6%)	16 (44.4%)	10 (27.8%)	6 (16.7%)	2 (5.6%)
Understanding the organizational structure of the dairy business	1 (2.8%)	10 (27.8%)	20 (55.6%)	4 (11.1%)	1 (2.8%)
	Not	Somewhat	Very		
How important is information on improving communication to you and your practice?	0 (0%)	5 (13.5%)	32 (86.5%)		
How confident are you that you have the skills/know-how to implement an animal health care program on the dairy?	1 (2.7%)	25 (67.6%)	11 (29.7%)		

1 = the best; 3 = average; 5 = need a lot more work on this

Table 2

Responses to a post-program assessment by participants of a dairy communications workshop

Question	Not	Somewhat	Very
How important is information on improving communication to you and your practice?	0 (0%)	8 (19.1%)	33 (80%)
How committed are you, at this point, to using the information you just learned?	1 (2%)	15 (36%)	26 (62%)
How confident are you that you have the skills/know-how to implement an animal health care change on the dairy?	0 (0%)	28 (67%)	14 (33%)
	Not	Maybe	Very likely
How likely are you to evaluate communication flow on a dairy or calf-rearing operations?	7 (36.8%)	4 (21.1%)	8 (42.1%)
	No interest	Might consider it	Very likely to attend
Please rate your level of interest in a more in-depth CE program on communication, complete with practice cases and coaching.	4 (9.8%)	18 (43.9%)	19 (46.3%)

Table 3

Responses to a course evaluation by participants of a dairy communications workshop

How did we do overall?	Excellent	Good	Fair	Poor
Course educational objectives	18 (64%)	9 (32%)	1 (4%)	0 (0%)
Relevant to my practice	16 (57%)	12 (43%)	0 (0%)	0 (0%)
Opportunity to ask questions	21 (75%)	7 (25%)	0 (0%)	0 (0%)
Course notebook	15 (54%)	10 (36%)	3 (11%)	0 (0%)
Lighting, seating, and environment	13 (46%)	13 (46%)	2 (7%)	0 (0%)
Course length	14 (50%)	13 (46%)	1 (4%)	0 (0%)
Refreshment breaks, food, etc.	11 (39%)	10 (36%)	7 (25%)	0 (0%)
Overall course rating	16 (57%)	11 (39%)	1 (4%)	0 (0%)
	Almost all	About 75%	About 50%	About 25%
How much of the content was new to you?	1 (4%)	10 (36%)	12 (43%)	5 (18%)