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## RATION SYSTEM

## نظام الجراية (المؤن)

*Hana Vymazalová*

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## RATION SYSTEM

## نظام الجراية (المؤن)

Hana Vymazalová

Das Zuteilungssystem  
Le système des rations

*The distribution of rations can be found in documents from different periods of Egyptian history, yet the general features of the ration system are not easy to trace. Most of our sources comprise more or less fragmentary lists of wages/payments that reflect, but do not make explicit, various conditions, such as the status of the recipients, the period to which the payment corresponds, etc. Other documents provide us with categories of allowances. A few traces of a systematic approach can be recognized in the evidence—for instance, value-units and day's-work units, but many details remain unclear. Bread, beer, and grain represented the basic components of rations in all periods. Bread and beer were often allocated daily, while grain was provided during some periods as a monthly payment. Meat was considered an extra ration. Linen and other valuable provisions could be distributed at longer intervals, such as once a year. Rations were distributed to the attendants of projects organized by the state, but similar payments in the form of commodities occurred in exchange for a hired service in the private sphere.*

يمكننا تتبع نظام الجراية (توزيع المؤن) في مصر القديمة من خلال العديد من الوثائق المكتوبة والتي تؤرخ بفترات مختلفة من التاريخ المصري القديم، وذلك على الرغم من أنه ليس من السهل تتبع الملامح العامة لنظام الجراية. فمعظم المصادر التي وصلت إلينا تتحدث عن قوائم أجور ، أو إذا أردنا القول مدفوعات، وعلى الرغم من وجود تلك القوائم، إلا أننا لا نستطيع تشكيل فكرة واضحة عن نظام الجراية. وتعكس تلك القوائم ظروف مختلفة، مثل حالة المتلقين، وكذلك الفترة التي دُفع من شأنها المقابل .. الخ، والتي في كثير من الأحيان ما تكون المعلومة غير مكتملة. وهناك وثائق أخرى تدلنا على المركز الإجماعي لفئة من الفئات ، وكذلك مستوى جرايتهم. ومن خلال ما لدينا من أدلة يمكننا التعرف على آثار قليلة لبعض الأساليب التي تعتمد على نظام محدد، علي سبيل المثال يمكننا التعرف بوضوح على قيمة الوحدات ، وكذلك وحدات العمل اليومية، إلا أنه وعلى الرغم من ذلك لا تزال الكثير من الأمور غير واضحة. الخبز والبيرة والحبوب مثلوا المكون الرئيسي في نظام الجراية (المؤن) علي مر العصور التاريخية، فكان يتم توزيع الخبز والبيرة بشكل يومي، أما الحبوب فكانت توزع في بعض الفترات بإعتبارها أجر شهري. وكان ينظر إلى اللحوم علي اعتبار أنها حصص إضافية، أما الكتان فكان يوزع على فترات متباعدة بالإضافة إلى منتجات قيمة أخرى، علي سبيل المثال مرة كل عام. وكان يتم توزيع الجراية على الأشخاص المشاركين في مشاريع تخضع لإشراف الدولة. وتم التعرف أيضاً على أجور متشابهة كانت تُدفع في هيئة منتجات عند الحصول على خدمات أحد ما ، وذلك في الحياة العامة بعيداً عن مشاريع الدولة.

**R**ations (compensation in the form of food or provisions) constituted the basis of the redistribution economy of the ancient Egyptian state and are usually understood as payment given in return for work. The Egyptian evidence shows no clear difference between the rations of laborers and the wages of personnel hired to perform services for projects organized by, or connected to, the state. It has therefore been suggested that rations and wages occasionally merged (Mueller 1975: 262-263). Rations were a component of royal projects of all kinds, including, for example, the construction of funerary complexes, the maintenance of the cults of deceased rulers, the perpetuation of the cults of temple deities, military expeditions, expeditions to quarries, and agricultural work. They were also employed in the private sphere as payment for those who worked, for instance, on an estate or on projects organized by non-royal individuals. Rations were applied to both the work force of laborers and to the officials who supervised them.

The basic rations in all periods included bread and beer, often supplemented by grain (mostly barley [jṯ] and wheat [bdt]). Additionally, meat, vegetables, cloth, oil, and other commodities were distributed to the workers on a less frequent basis. Evidence for rations is found in administrative and economic documents from various periods, though rations also figure among the subjects of calculations presented in mathematical texts. The major aim of these calculations was to demonstrate methods of solving mathematical problems (for instance, arithmetical progressions), but we can also detect in them some reflections of the principles by which rations were graded. The mathematical texts attest to the practice of bureaucrats of controlling the quality of bread and beer made from a given quantity of grain/flour (*psw*-problems) and of comparing the value of bread and beer of differing qualities (*dbꜣw*-problems)(on the making of bread and beer, see e.g., Helck 1971).

The ration or payment lists that have survived tend not to specify the quality of the bread and beer, and this indicates that some sort of standard norm existed in the system. Bread molds and beer jars, abundantly attested in the archaeological record, indicate that each site and period operated with more or less standardized forms and sizes. Such standardization is today a helpful tool in archaeological context dating (Aston et al., eds. 2011; Rzeuska and Wodzińska, eds. 2009; Rzeuska 2008; on pottery production, see Nicholson 2009).

#### *Archaic Period and Old Kingdom*

The early Egyptian state made use of the ration system to sustain the elite, the numerous officials, and the army in a redistribution-based economy. Written evidence on labels and stone vessels from the Archaic Period indicates that a network of administrative centers existed that controlled the produce of local agricultural estates and distributed products from different parts of the country to the royal residence or the royal tomb. The agricultural domains (*njwṯ*) and administrative centers (*hwt*), with appointed officials holding the title of *ḥqꜣ-hwt*, constituted the basis of the taxation system and of the conscription of village inhabitants for service on the king's projects (Moreno García 2008, 2013).

At the royal residence, the title *ḥrj-wdb* was associated with those who were in charge of the distribution of rations. Evidence indicates that from as early as the 2<sup>nd</sup> Dynasty domains had been established to support the system of direct supplying (Helck 1986), and from the early Old Kingdom attestations have survived of agricultural domains established by rulers in order to guarantee economic support for royal projects and the administration. Kings enumerated long lists of funerary domains on the walls of their pyramid complexes (Jacquet-Gordon 1962; Khaled 2008); the logistical details of the transmission of agricultural products between the estates, administration, and workers, however, remain unclear.

The organization required for massive royal projects, such as the construction of pyramid complexes, undoubtedly represented a major challenge for the Egyptian administration and economy in the Old Kingdom (Vymazalová 2015). A large number of officials and a huge workforce participated in these projects, while the royal agricultural domains produced the quantity of rations required to support them. No direct evidence has survived of the system of ration-distribution at the construction sites, but some information can be traced in archaeology. Areas for brewing and bread baking were discovered at the 4<sup>th</sup> Dynasty settlement of Heit el-Ghurab at Giza (Lehner et al. 2009: 44-49). Fish bones found on the site testify to the regular protein intake of the laborers (Lehner and Wetterstrom eds. 2007: 25-28). Officials supervising the labor would most likely have received more than the basic daily food rations, perhaps receiving grain, meat, and cloth as additional wages in accordance with their status.

The funerary cults of deceased rulers were supplied from the domains associated with these cults, and the residence of the ruling king controlled the redistribution process. The attendants of the funerary complexes who fulfilled various cultic and bureaucratic tasks were rewarded daily through the process of the reversion of offerings. Records of distributions that survived in the Abusir archives from the late 5<sup>th</sup> and early 6<sup>th</sup> dynasties (Posener-Kriéger 1976; Posener-Kriéger et al. 2006) show daily rations written down in table-accounts, as well as distributions on a less frequent or irregular basis (fig. 1). The accounts comprise the individual rations but do not reflect the patterns according to which the system of distribution worked.

The daily rations of bread and beer were recorded for the period of one month, during which each *phyle* (work team) served in a ten-month rotation. Half-month tables are also attested. The basic rations of the attendants of funerary temples consisted of two kinds of bread (*ht* and *pzn*) and *ds*-jugs of beer. These probably represented food redistributed from the temple's offerings. The rank of the

individuals and/or the level of importance of their service for the funerary temple are reflected in the allotment of rations: the daily rations of persons with higher status could, together with bread and beer, also include meat, birds, and "good things" (*ht nfrt*). Indications of the quantity of the daily allowances of high-ranking officials associated with these royal cults vary in the preserved documents. Up to 35 loaves of bread and one jug of beer could be allotted to a single man, but this occurred only irregularly on several days in a month (Posener-Kriéger and de Cenival 1968: pl. 40a). On the other hand, in a regular distribution, a holder of the title *jmj-ht hmw-ntr* was allotted only two loaves of bread and one jug of beer per day (Posener-Kriéger et al. 2006: pl. 54, Sekhemra). Taking into consideration the size of the bread molds and beer jars found on Old Kingdom sites, this amount of food, while seemingly sufficient for a day's work, would probably not constitute the entire wage of the official.

Shorter accounts that were not displayed in the form of tables concern the daily distributions of bread (Posener-Kriéger and de Cenival 1968: pls. 44A, 45, 57), the monthly sums of the rations (Posener-Kriéger et al. 2006: pl. 68B), and the monthly income of the funerary temples (Posener-Kriéger and de Cenival 1968: pl. 95 B4 and B5; Posener-Kriéger et al. 2006: pl. 68 A, section c). The more than 3,000 loaves of bread (and possibly jugs of beer) mentioned in one of these monthly sums (Posener-Kriéger et al. 2006: pl. 64A) would have comfortably sustained the members of the phyles, as well as the additional staff and various officials associated with these royal cults.

Meat seems not to have been a regular part of the diet of the attendants of the funerary temples, but cattle and poultry were slaughtered during festivals, which were relatively numerous. The accounts of meat distribution show that various butchery cuts (hind, foreleg, ribs, etc.) were given to individuals after an animal was slaughtered (Posener-Kriéger et al. 2006: pls. 53B, 65B).

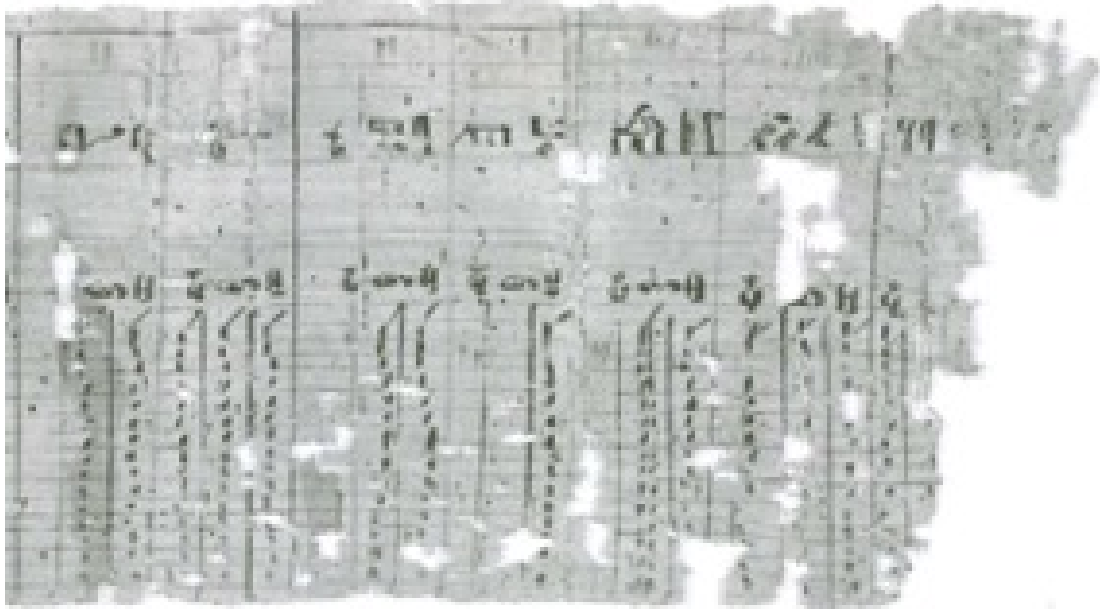
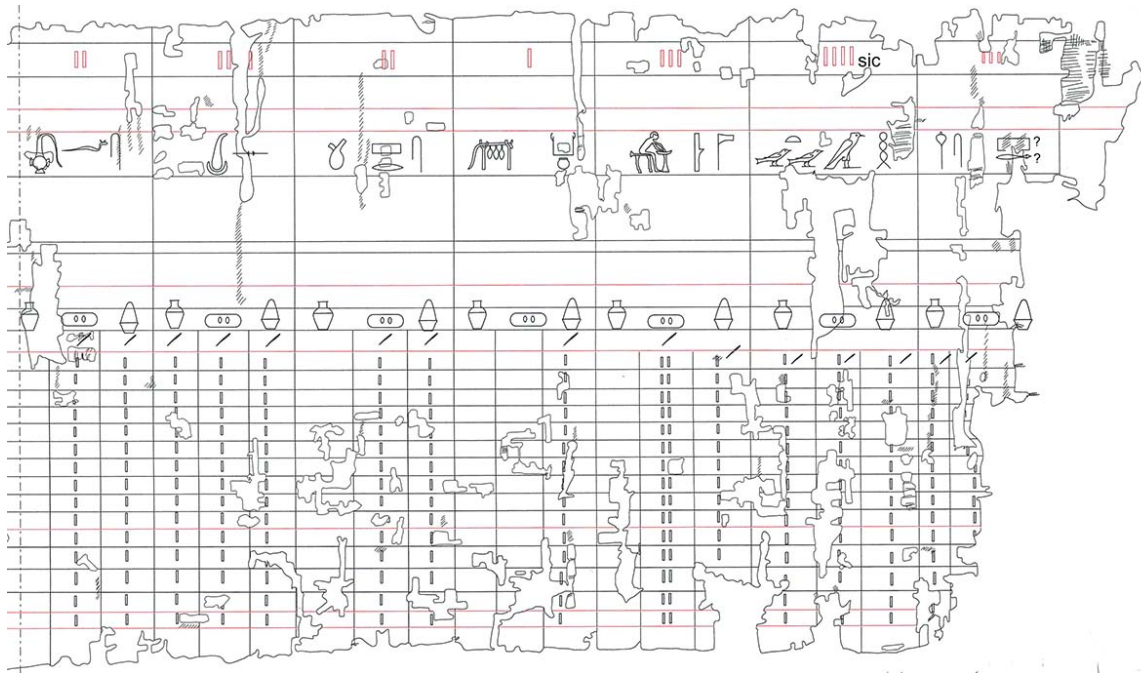


Figure 1. Fragment of a ration list from the papyrus archive found in Neferefra's pyramid complex at Abusir, 5th Dynasty.

Other commodities, such as vegetables, were probably distributed to the attendants of funerary temples on a less frequent basis. A certain quantity of fine linen was allotted to them after having been offered to the deceased king (Posener-Kriéger and de Cenival 1968: pl. 53A), and different sizes and qualities of cloth

were divided among members of temple phyles on the occasion of festivals, either for use in their service or for their own personal use (Posener-Kriéger et al. 2006: pls. 11-13). Some of the cloth allotments were assigned to the temple statues and to the lector priests who performed recitations upon them and



supervised rituals associated with them (Vymazalová and Coppens 2013).

The rations of grain attested in the short accounts from Abusir varied considerably, from ½ to 8 *ḥqꜣt* per person (Posener-Kriéger and de Cenival 1968: pls. 41C, 57, 97C; Posener-Kriéger et al. 2006: pls. 63g, 66A, 70D, 74B, 82K). The differences reflect the rank of the recipients, but absence from work and the type of work may also have been taken into consideration. The frequency of these distributions is not made explicit; monthly or weekly payments seem possible and the allotment of grain that occurs in the archives could constitute wages additional to the daily basic rations of bread and beer (e.g., Vymazalová 2015: 323).

Of a slightly earlier date are large and more complete table-accounts of the distribution of grain rations on papyri from Gebelein in Upper Egypt (Posener-Kriéger 2004). The tables comprise long lists of the names and rations of those who served on a construction project that was part of the provincial administration. The rations consisted of four kinds of grain: *bšꜣ*, *bšꜣ-nfr*, *ḏḏw*, and *ḏḏw-nfr*. The totals for each of the allotments over a period of 15 days show us that the highest rations of the officials reached up to four sacks and 6 ¼ *ḥqꜣt*, while the ration of an ordinary project attendant was 5 *ḥqꜣt* (ibid.: pls. 10-14). In another example, the distribution of grain to the selected group of people occurred every other day or every third day during a given period, and consisted of quantities from 1 to 8 *ḥqꜣt* (ibid.: pls. 24-25, 27).

The evidence suggests that a large part of the population was in one way or another sustained from the surplus collected by the central administration and redistributed by the royal residence together with the provincial administration centers. Though undoubtedly an exaggeration, the 500 loaves of bread, 100 jugs of beer, and half an ox, consumed daily by the magician Djedi according to the *Tales of Wonder* (Lichtheim 1975: 218), reflect the burden that the system was apparently expected to manage. Towards the end of the Old Kingdom, the lists of both royal and private funerary domains appeared on a larger

scale in the tombs of officials and testify to an increasing control over the country's agricultural produce through private ownership. The private provisioning of families and estates appears to be associated with the First Intermediate Period, when the central administration of a strong economically and politically unified state was no longer in operation.

### *Middle Kingdom*

Evidence from the Middle Kingdom presents general features similar to those of the Old Kingdom papyrus archives, though luckily some of the documents provide us with more particulars on the ration system. In the literary text *The Eloquent Peasant*, ten loaves of bread, together with two jugs of beer, were assigned to the “peasant” every day when he presented his complaints, and his wife and children received 3 *ḥqꜣt* of grain daily during that period (Lichtheim 1975: 173). Thus we can surmise that these rations represented the quantity of food considered sufficient for a man and his family during the Middle Kingdom.

Inscriptions left by expedition leaders in the deserts and wadis tend to present a system of equal rations for all, such as, for instance, the daily ten loaves of bread mentioned in inscription 137 at Serabit el-Khadim (Gardiner et al. 1952: pl. 50; 1955: 137-138; also see Goyon 1957: no. 89, though from the New Kingdom). Other documents, above all the wage-list in the inscription of Ameni in the Wadi Hammamat (Goyon 1957: no. 61), clearly indicate that rations varied considerably in relation to the status, function, and skills of the recipients, who were arranged in categories. The above-mentioned ten loaves of bread with a certain amount of beer represented the basic wage of an unskilled worker, from which the other salaries were calculated as multiples (Mueller 1975: 257). The large allowances ascribed to the supervisors—reaching up to 200 loaves—may indicate that salaries were given partly in commodities other than bread and beer, within a given equivalence of compensation (Mueller 1975: 259), or that perhaps a suit of personal servants accompanied some officials, by whom they

were provisioned from the given rations. Meat occurred in the diet of expedition members, but it seems to have been an irregular addition to the rations, possibly reserved for specific days such as festivals, or perhaps “paid for” from (part of) the bread and beer allowances (Mueller 1975: 260-261). Vegetables were also sent to the expeditions but no details about their distribution have survived in the evidence.

In documents from the early Middle Kingdom, an elaborate system of units was used in calculating rewards for work. A “man-day” and *trzzt*-portions enabled an easy organization of the accounts and also the comparison of the value of different products. The basic ration seems to have been 8 *trzzt* for one man’s workday, and a single *trzzt*-portion was estimated to equal slightly over 100 grams (Menu 1982: 129). The Reisner papyri record the use of man-days and the *trzzt*-compensation-units system (Simpson 1963: 35; Simpson 1969: 13-15). It is not quite clear from these documents whether the *trzzt* payments covered only the basic rations or also included extra salary-allowances, since the remains of an account of cloth (written as an overview table) and a small account of grain also partly survived on the papyri (Simpson 1986: 12-13, pls. 22-24). A group of soldiers mentioned in the Harhotep documents (James 1962: 71-74) received large amounts of dates in addition to their regular daily rations of grain (*bs̄z*, wheat, barley, and emmer). The rations of priests and officials associated with the funerary complex at el-Lahun (P. Berlin 10005) included bread and beer calculated in a 2:1 ratio. Less than one loaf was the smallest ration for a temple attendant, while the *jnj-r hwt-ntr* was supplied with 16  $\frac{2}{3}$  loaves and half that amount of beer in *sd̄z*-jugs daily (Borchardt 1902: 113-117; Gardiner 1956: 119).

Late Middle Kingdom documents associated with the administration of a royal household (Papyrus Boulaq 18) show the daily allowances of the members of the royal family and high officials associated with the court (Scharff 1922; Spalinger 2015a). The rations included bread, beer, and various cakes. Unlike the rest of the Egyptian population, however,

these elite individuals also received regular allotments of meat and vegetables. Specific quantities of provisions were given to them each day in proportion to their status. The allotments included five loaves for mid-ranking officials, ten loaves for high-ranking officials and for each of the king’s children, and 20-30 loaves for the king’s wife (Scharff 1922: pls. 4, 11). In addition, one to two jugs of beer, together with five portions of meat, were allotted to the court attendants. Regular rations from the palace are also mentioned in the narrative of Sinuhe, who was brought food three or four times a day after he returned to Egypt and was pardoned by the king (Lichtheim 1975: 233). The smallest ration mentioned in P. Boulaq 18 appears to have been three bakery products daily (Scharff 1922; Spalinger 2015a). According to the *Satire of the Trades*, a similar quantity of three loaves of bread and two jugs of beer seems to have been insufficient to satisfy the young student-scribe (Lichtheim 1975: 191).

In the private sphere rations were applied in much the same way as they were by the state. Inscriptions in the tombs of officials, and documents such as the papyri of Meketra (James 1962: 85-87), refer to private projects—the construction of tombs, the manufacture of tomb-equipment, and the like—the rations for which appear to have been considered as payment for work—that is, hired-service wages. In the Heqanakht papyri we find the term *qw* used with the meaning “ration” or “allowance” as the payment given to individuals in return for work (Allen 2002: 145-146). This term refers elsewhere to the revenues of institutions (Mueller 1975: 262). Documents show that the members of Heqanakht’s household and estate received wages in grain probably in addition to their daily food rations (Allen 2002: 147). The wages in grain were usually allocated monthly, on the first day of the lunar month (or sometimes mid-month), for the work of the preceding month. Payments in advance were rare. The largest salary mentioned in the documents consisted of 8 *hqst* of grain per month, the smallest being 2 *hqst* monthly.



### *New Kingdom*

The ration system in the New Kingdom was similar that of the Old and Middle Kingdoms. Officials were supplied from the fields assigned to their particular offices, from the taxes collected from (or offerings given by) their subjects, and from the produce of their own private fields, vineyards, and cattle-herds. The organization of royal projects in the Valley of the Kings is relatively well attested; especially numerous are documents referring to the rations distributed among the workmen's community of Deir el-Medina (Černý 1973). Here the rations for the workers were distributed at regular intervals. Every day the workmen received sandals; every week, oils; and once a year, cloth that came from the royal treasury. Monthly payments in the form of grain came from the royal granary. Special payments sometimes occurred as favors from the ruler or from a temple. The grain allotments reflect the status of the recipients: the basic ration for a worker included 4 sacks of emmer and 1 ½ sacks of barley, while an overseer received 5 ½ sacks of emmer and 2 sacks of barley. Vegetables, water, firewood, and fish were allotted regularly, while meat represented an extra commodity (Dowel 1999: 231-132). The smaller rations recorded for some of the men probably reflected wage categories or partial payments (Černý 1973: 112-113).

### *Summary*

Although our sources on rations in ancient Egypt are rather fragmentary and reflect varying projects and work conditions, features of the general development of the ration system can be traced. The royal residence played the main role in the Old Kingdom system, which was based on the redistribution of the surplus from agricultural domains associated with royal administration centers and projects. Little can be said about the principles or terminology of the allocations for this period. The possibility cannot be excluded that units of rations and units of work (the "man-day"), attested in later evidence, were already in use. Tables of the fulfillment of tasks of funerary temple attendants may have served

in the calculation of individual ration-allotments in a manner similar to that of the man-days. The relative value of rations was calculated as the *psw*-quality of bread and beer, and the units of daily bread were expressed in terms of *trzzt*-bread since at least the early Middle Kingdom. Bread-units were used to express the value of rations, which may in reality have been given in different commodities. In the New Kingdom, private property and fields assigned to offices replaced the centralized system of domains, and the granary and treasury were in charge of the distribution of rations related to state projects.

Rations were distributed as either daily allowances or wages/salaries; no distinction appears in the terminology in the preserved texts. Bread and beer were distributed regularly, mostly on a daily basis, often in association with work that required the recipients to spend time away from their homes—for instance, at the royal funerary complexes or during expeditions. Grain may have been considered as a wage additional to the bread and beer rations, or as the main commodity. Later evidence attests to the distribution of grain as a regular payment for a month's work. Individual rations varied between a few *hqst* and several sacks of grain. The monthly payments at the workmen's community of Deir el-Medina were apparently sufficient to sustain the workmen's households.

Meat was a regular component of rations only at the highest level of society, fish having been consumed instead as a regular part of the diet of workmen. Attendants of state projects received meat on an irregular basis, probably mainly in association with festivals. They were also provided infrequently with luxurious commodities such as oils and fine linen. The New Kingdom evidence indicates yearly rations of cloth, while the Old Kingdom texts suggest cloth distributions only on the occasion of festivals.

The food-energy value of ancient Egyptian rations has been calculated with estimated data (for instance Miller 1991; Allen 2002; Menu 1982; Kemp 1991: 127-128), but generalizations can hardly be made on the basis

of the preserved evidence. Rations varied in the course of time due to changes in the types of bakery products and their preparation,

reflected in the development of jug- and bread-mold shapes and sizes.

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- Figure 1. Fragment of a ration list from the papyrus archive found in Neferefra's pyramid complex at Abusir, 5<sup>th</sup> Dynasty (after Posener-Kriéger et al. 2006: 122-123, document 49A).