DIET IN MESOPOTAMIA: THE EVIDENCE OF THE BARLEY RATION TEXTS (*c.* 3000–1400 B.C.)*

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In order to live one must eat and if one is to live a full and active life the food that is eaten must supply all the nutrients required to maintain the body in a healthy state. An appreciation of the importance of diet has led to many modern studies in this field. The methods used include an examination of the environment of the country concerned; of its economic basis—for example whether it is mainly an agricultural or an industrial country, what food is available and whether such food is locally grown or imported; dietary surveys, usually at family level, of the food intake of the population and clinical studies to assess the health of the individual. The information gained in these surveys is used to assess the adequacy of the nutritional intake of the population. It has proved difficult to set up an accepted standard by which to judge adequacy of diet, but the Food and Agricultural Organisation (FAO) of the United Nations has produced tables of recommended daily intakes of nutrients which can be taken as a practical guide.

Some of these methods can be applied to ancient Mesopotamia in order to see whether the diet there can be considered adequate. Examination of the palaeo-ethnobotanical and palaeozoological evidence from excavated sites, together with references in cuneiform texts and representations of plants and animals on cylinder seals and reliefs, give information about the environment and the economic base. This was agriculture with cereals such as barley and wheat as the main crops and sheep, goats, cattle and pigs the main domesticated animals. Clinical studies of individual people are not possible: obviously no one is available for measuring and weighing or to supply blood and urine samples for tests! It may be, however, that the study of skeletal material will in future enable the likely height and weight of a population to be calculated and provide some information about calcium and Vitamin D deficiencies. It is impossible also to carry out the kind of dietary survey in which families are studied and their food weighed before eating so that exact food intake can be calculated. But by studying the botanical and faunal remains, cylinder seals and reliefs, and the cuneiform texts, it is possible to get some idea of the range of food which was available, which foodstuffs were utilized and how, and to a certain extent who ate what.

Cuneiform texts show that the cereal crops were prepared as breads (*CAD: akalu, aklu*), gruels (Hrozny, 1939: 100 ff.), roasted barley (*CAD: laptu*) and malted grains (Hartman and Oppenheim, 1950), and that meat from cattle, sheep, goats, game animals such as deer and hare, fish and birds was eaten. This latter evidence is reinforced by the faunal remains from a number of sites (e.g. Hilzheimer, 1941). A wide variety of vegetables was available, including onions, chick-peas, lentils, turnips and cress. Although onions, turnips and cress appear only in the textual records (e.g. Bauer, 1972: no. 4, no. 69; Thompson, 1949: 56), chick-peas and lentils are found also among the palaeobotanical samples (e.g. Waines, 1973;

* Article based on part of an unpublished Ph.D. thesis, *A Study in Diet in Mesopotamia (c. 3000–600* B.C.*) and associated agricultural techniques and methods of food production* (University of London, 1978).

Helbaek, 1963; Helbaek, 1966). Cucumber is mentioned in mid-third millennium (Early Dynastic III) texts at Lagash (Deimel, 1931: 7–8) and was found among the first-millennium plant remains at Nimrud (Helbaek, 1966). Thus it is likely to have been available throughout the period we are considering. Other vegetables which appear in the botanical samples are the grass and field pea, bitter vetch and the broad bean (Waines, 1973; Ellison *et al.*, 1978; Helbaek, 1960; Helbaek, 1966). It is possible that these can be equated with some of the terms for vegetables found in the texts, and as yet unidentified.

Many fruits were also available. The date (which has a particularly high energy content when dried) was common, and was indeed perhaps first domesticated in this area (Zohary and Spiegel-Roy, 1975); in southern Mesopotamia dates are mentioned in texts from the mid-third millennium (Deimel, 1925: 46–8) and the date palm appears on cylinder seals, plaques and paintings. References to dates in texts at Nuzi in the mid-second millennium (Lacheman, 1950: no. 215, lines 9, 11, 13–16; 1939: 535) and a date-bearing palm on a Neo-Assyrian relief depicting a garden at Nineveh (Barnett and Forman: plate 105) show that the date was known, and perhaps even grown, in Northern Iraq, though today dates fail to ripen in this area. Pomegranates were available from the late third millennium (Ur III) and possibly earlier, while figs, apples and probably grapes were grown locally at least as early as Early Dynastic III (Deimel, 1925: 46–8; de Genouillac, 1909: nos. 42 and 43). Pears, plums and apricots are mentioned at Mari in the Old Babylonian period (Dossin, 1951: no. 42; Birot, 1960: no. 240; 1964: no. 201) and at Nuzi (Lacheman, 1939: 535). These second-millennium references and the later depictions of fig and pomegranate trees on Neo-Assyrian reliefs (Layard, 1853: plate 14) suggest that fruit was plentiful, especially in northern Mesopotamia.

Dairy produce, including ghee, sour milk and cheese, occurs in offering lists (e.g. Figulla, 1953) and representations of dairy scenes and of herds of sheep, goats and cattle are common (e.g. Hall and Woolley, 1927: plate XXXI). Vegetable oils and animal fats are also mentioned in the texts. This variety of foodstuffs provides some clues to the qualitative value of the Mesopotamian diet. Sources for all the essential nutrients were available: for example, cereals, pulses and meat supply nicotinic acid and thiamin (vitamin B_1); green vegetables, milk, liver and eggs are good sources of riboflavin (B_2); whole grain cereals, green vegetables and many fruits are good sources for iron; calcium is present in most foods; and meat, cereals and many of the pulses are good protein sources. Vitamin A (retinol) is available in milk, ghee, cheese and liver, while carotenes (retinol equivalents) are found in green vegetables and yellow and orange fruits and vegetables. The main sources for vitamin C (ascorbic acid) are citrus fruits, cress, the leaves of coriander and other fully grown green vegetables, fresh liver, kidneys and some wild plants such as purslane. There is no vitamin C in dried cereals or dried pulses, but they form the vitamin on germination so that sprouted grains and pulses are a valuable source of ascorbic acid.

With the possible exception of citrus fruits, all these foodstuffs were available in Mesopotamia, and if eaten in sufficient quantities would have provided an adequate diet. Unfortunately it is extremely difficult to make a quantitative assessment of the diet. If we assume that the food considered suitable for the gods can be taken as a

pattern of the food considered suitable for man, offering lists (e.g. Figulla, 1953; Thureau-Dangin, 1921a) and texts giving details of food provided for the king (such as the Old Babylonian *naptan šarrim* texts from Mari, published in Botterro, 1957; Birot, 1960; 1964; Burke, 1963) give an idea of the food eaten by the richer sections of the population. No estimate can be made of how much each individual ate, however, since even when the total quantity of food provided is known, the number of people sitting down to a meal is not. In many cases, foodstuffs are listed as so many sheep and cattle, so many loaves of bread, so many measures of beer, etc., so that it is impossible to calculate the individual amounts provided. It is reasonable to assume that the richer members of society took advantage of the variety of foodstuffs available and ate them in sufficient quantities to provide all the necessary nutrients and energy.

The best evidence for the diet of the ordinary members of society are the ration lists. These record issues of barley and other cereals by religious and secular employers to those working for them. Such ration lists are common: they come for example from Lagash in the Early Dynastic III period, *c.* 2500–2400 B.C. (e.g. Deimel, 1931), from Nippur, Tell Asmar and GA.SUR (Nuzi) in the Agade period (Westenholz, 1975; Gelb, 1961; Meek, 1935), from Lagash, Umma, Nippur and Ur in the Ur III period, *c.* 2000 B.C. (Pinches, 1908; Oppenheim, 1948; Myhrman, 1910; Kang, 1973; Legrain, 1947), from Larsa, Lagaba, Mari, Chagar Bazar, and Rimah in the Isin/Larsa-Old Babylonian period (Leemans, 1954; Leemans, 1960; Birot, 1960; Loretz, 1969; Dalley *et al.*, 1976), and from Nippur and Nuzi in the mid-second millennium (Clay, 1906; Pfeiffer and Lacheman, 1942). They cover a wide range of professions from shepherds to weavers, from agricultural workers to brewers, and they include men, women, young men and women, and children. The rations are recorded either as monthly or as daily issues, although they can also be provided for a particular job such as harvesting, and there are variations according to age and status.

A number of problems are met in attempting to interpret these ration lists: it cannot be certain whether the rations were the only source of food for the employee, whether the ration was intended for one day only and for one person only, whether all the ration was eaten or whether part of it was used to purchase other necessities. These problems can only be examined briefly here. Ration lists at Lagash in the Early Dynastic III period were divided into two main groups: those for personnel who received rations from month 8/9 to the end of the year and were also allotted some land, and personnel receiving rations for every month in the year (Maekawa, 1973–4: 88–98). Ration lists for the second group continued over a number of years with little variation in the amounts issued. Also at Lagash, in the slightly later Ur III period, rations were issued to women, with smaller amounts indicated for their daughters (Reisner, 1901: no. 155). A similar situation occurs at Rimah (Dalley *et al.*, 1976: nos. 206 and 207), and at Chagar Bazar a family consisting of a farmer, his wife and two children, received amounts specifically for each of them as individuals (Loretz, 1969: no. 34). Such evidence suggests that the rations issued were intended for one person only. At Lagaba, believed to be near Sippar, texts record both daily and monthly issues of barley and dates: an individual who received 30 *silà* each of barley and dates in the monthly record, was given 1 *silà* of each in the

daily list, suggesting that the ration was measured and issued on a daily basis (Leemans 1960: nos. 88 and 90). Whether all the ration was eaten or whether part was used to purchase other goods must have depended on how large it was and whether there was enough left over after dietary needs had been satisfied.

If the ration lists are assumed to be the main food source of the employee, an attempt can be made at a quantitative as well as a qualitative assessment of the diet. A problem which arises immediately is that the ration lists were issued in the Sumerian capacity measure of the *silà* (Babylonian *qû/qa*) and nutritional values are calculated in grams so that the ancient measure has to be converted into a modern equivalent before any assessment can be made. The exact size of the *silà/qa* remains uncertain—indeed it probably varied from one period or area to another (see Postgate, 1978), but it is generally held to be roughly equal to a litre. There is some evidence suggesting an increase in the size of the *silà* after the Early Dynastic III period. Estimates for this period are based partly on the measurements of an inscribed vase of Entemena, which suggests a *silà* of 0·83 or 0·88 litres, depending on whether or not the jar was filled to the brim (Thureau-Dangin, 1921b: 127 ff.). In the Early Dynastic period at Lagash the most common barley rations were 72, 48, 36 and 24 *silà* a month. At Kish, Nippur, Nuzi and Tell Asmar in the Agade period and at Lagash itself in the Ur III period, the most common amounts of rations were 90, 60, 40 and 30 and 20 *silà*. These latter figures continue into the second millennium. (It is not suggested that these are the only ration quantities—simply the most common.) If these amounts are compared, it can be seen that 60 is $\frac{5}{6}$ of 72, 40 $\frac{5}{6}$ of 48, 30 $\frac{5}{6}$ of 36 and 20 $\frac{5}{6}$ of 24. There are two possibilities: (1) the rations may have been reduced by one-sixth after the Early Dynastic period; or (2) the size of the *silà* was increased, the actual rations thus staying the same.

Assuming that (2) is more likely:

72 *silà* at 0·83 litres a *silà* = 59·76 litres (60)
48 *silà* at 0·83 litres a *silà* = 39·74 litres (40)
36 *silà* at 0·83 litres a *silà* = 29·88 litres (30)
24 *silà* at 0·83 litres a *silà* = 19·92 litres (20)

and 60 *silà* at 1·0 litres a *silà* = 60·0 litres, and so on. Therefore, when quantitative nutritive value is assessed for ED III, the *silà* is taken to be equal to 0·83 litre. For the Agade and later periods, the *silà* is assumed to equal 1 litre. The weight of a litre of threshed barley was established to be 0·765 kg. From these figures, the energy and nutritional value of the barley ration was calculated, on the assumption that all the barley rations were consumed and that there was no loss in cooking.

Table 1 (Pellett and Shadarevian, 1970) gives the nutritional value of barley; Table 2, the FAO nutritional intakes recommended for an adequate diet for adult men, women and for children of certain ages (Passmore, Rao and Nicol, 1974): Table 1); Table 3, sample issues of rations from different periods; and Table 4 lists the nutritional value of selected barley rations.

If Tables 2 and 4 are compared, it can be seen that any male receiving more than 1·33 litres per day, and any female with more than 1 litre per day, had an energy intake as high or higher than that recommended by FAO (3,000 calories for males and 2,200 calories for females). Men with 1 litre (2,700 calories) and women with

0·83 litre (2,160 calories) probably have a sufficient energy intake, especially if allowances are made for smaller size and hotter climate. The FAO recommended intake figures were based on a male Western worker weighing 65 kg, in fairly active employment. Adjustments are made for different types of community according to body weight and temperature, for instance under African conditions the FAO requirement is 2,707 calories per day. However, the more active the work, the higher the energy intake required (Clark and Haswell, 1970: 12, note 3).

Those people, male or female, with 0·66 litres or less would not receive an adequate energy intake (unless they were children below six years of age). Many children received 10 litres a month (0·33 a day) which would provide around 900 calories a day, only adequate for a child in its first year. The exact age of the children is difficult to establish, and it is probable that, except for those specifically referred to as breast-fed, most were weaned and past their first year.

Of the essential nutrients, the barley rations would supply adequate intakes of thiamin and niacin. The iron content is low for girls and women, but adequate for men. The most serious deficiencies are of vitamin A and vitamin C, and these *must* be made up elsewhere. The only source of vitamin C within the barley ration would result from the preparation of a green malt from barley sprouts (Davidson, Passmore and Brock, 1972: 280). Other sources of vitamin C may have been wild plants and some of the fruits and vegetables known to have been grown, including chick-peas, cress and coriander leaves. The FAO recommended intake of vitamin C is 30 micrograms a day. This figure is about three times the minimal requirement; this wide margin of safety was set because much ascorbic acid is lost in cooking and fruits and vegetables can vary greatly in their vitamin C content (Passmore, Rao and Nicol, 1974: 35). Experiments have shown that an intake of 10 micrograms a day will provide protection against scurvy and is sufficient to cure the disease. No real conclusion can be drawn about the incidence of scurvy in Mesopotamia. Possible descriptions of scurvy have been found in a number of medical texts (Kinnier Wilson, 1966: 53; 1967: 193) with the medicine $^{(ú)}$*būšānu*, "wild grapes", suggested as a treatment. However, the translation of this disease (also *būšānu*) as scurvy is far from certain—for instance *būšānu* would appear also to have symptoms similar to diphtheria. There may have been some seasonality in scurvy: it is known to develop if a diet is devoid of ascorbic acid for a period of 30–70 days and, as has been remarked, it can be cured by doses of about 10 micrograms. Thus scurvy which developed during the winter months might be cleared up when the green vegetables appeared.

The lack of vitamin A in the barley rations is also serious. Vitamin A is stored in the liver of the human body so that deficiency diseases associated with its lack do not appear quickly. Most children start life with an adequate store of vitamin A in their livers, but unless they receive an adequate intake this store will become depleted and never returns to the proper level unless increased intakes are available. Such deficiency of vitamin A is the main cause of xerophthalmia and keratamalacia—conditions which, if not halted, produce permanent blindness. This deficiency may have been a major problem. It is possible that the frequent use of the phrase *igi.nu.du*$_8$, "blind", (see e.g. Bauer, 1972: nos 44, 47, 48; Deimel, 1928: 55; Loretz, 1969: no. 42) usually taken to refer to prisoners of war who had been

TABLE 1: *Nutritional value of barley*

	Calories	*Protein grams*	*Calcium mg*	*Iron mg*	*Retinol Equivalents micrograms*	*Thiamin mg*	*Riboflavin mg*	*Niacin mg*	*Vit. C. mg*
100 grams barley	360	9·4	50	4	∅	0·38	0·20	7·2	∅

TABLE 2: *Recommended nutritional daily intakes*

	Calories	*Protein grams*	*Calcium mg*	*Iron mg*	*Retinol Equivalents micrograms*	*Thiamin mg*	*Riboflavin mg*	*Niacin mg*	*Vit. C. mg*
Adult man	3,000	37	400–500	5–9	750	1·2	1·8	19·8	30
Adult female	2,200	29	400–500	14–28	750	0·9	1·3	14·5	30
Children									
under 1	820	14	500–600	5–10	300	0·3	0·5	5·4	20
4–6	1,830	20	400–500	5–10	300	0·7	1·1	12	20
Male adolescents									
10–12	2,600	30	600–700	5–10	575	1·0	1·6	17·2	20
16–19	3,070	38	500–600	5–9	750	1·2	1·8	20·3	30
Female adolescents									
10–12	2,350	29	600–700	5–10	575	0·9	1·4	15·5	20
16–19	2,310	30	500–600	14–28	750	0·9	1·4	15·2	30

∅ Not present or value less than 0·1 per cent.

TABLE 3: *Sample barley rations* (given in *silà*)

Early Dynastic (3000–2400 B.C.) 1 *silà* = 0·83 litre

Reference	*Recipient*	*Monthly*	*Daily*	*Litres*
Deimel, 1928: 43	Men	96	3·2	2·66
	Men	72	2·4	2·00
	Men	48	1·6	1·33
	Men	36	1·2	1·00
	Men	24	0·8	0·66
	Women	36	1·2	1·00
	Women	24	0·8	0·66
	Women	18	0·6	0·50
	Children	12	0·4	0·33

Agade (2400–2200 B.C.) 1 *silà* = 1 litre

Reference	*Recipient*	*Monthly*	*Daily*
Westenholz, 1975: no. 29	Men	80	2·60
Ibid.: no. 34	Men	30	1·00
	Women	40	1·33
	Women	30	1·00
	Boys	20	0·66

Ur III (2100–2000 B.C.) 1 *silà* = 1 litre

Reference	*Recipient*	*Monthly*	*Daily*
Sollberger, 1966: no. 17	Men	40	1·30
	Men	30	1·00
	Women	30	1·00

TABLE 3 (continued) : *Sample barley rations* (given in *silà*)

Ur III (2100–2000 B.C.) 1 *silà* = 1 litre

Reference	*Recipient*	*Monthly*	*Daily*
Kang, 1973 : no. 21	Men	60	2·00
	Men	40	1·30
	Men	30	1·00
Reisner, 1901 : no. 158	Women	40	1·30 + wool
	Women	20	0·60 ,,
	Girl	15	0·50 ,,
	Girl	10	0·30 ,,

Old Babylonian (2000–1600 B.C.) 1 *silà* = 1 litre

Reference	*Recipient*	*Monthly*	*Daily*	*Reference*	*Recipient*	*Monthly*	*Daily*
Birot, 1960 : no. 25	Men	170	5·60	Leemans, 1960 : no. 86	Men	150	5·00
	Men	90	3·00		Men	100	3·30
	Men	60	2·00		Men	130	4·30
	Men	40	1·30		Men	60	2·00
	Women	120	4·00		Men	30	1·00
	Women	90	3·00		Men	20	0·66
	Women	60	2·00		Men	15	0·50
	Women	50	1·60		Men	10	0·30
	Women	40	1·30				
	Girls	60	2·00				
	Girls	40	1·30				
	Girls	30	1·00				
	Girls	20	0·60				
	Boys	40	1·30				
	Boys	30	1·00				
	Children	30	1·00				

Nippur (1600–1400 B.C.) 1 *silà* = 1 litre

Reference	*Recipient*	*Monthly*	*Daily*
Clay, 1906 : no. 58	Men	60	2·00
	Women	40	1·30
(This text is headed	Women	25	0·8
barley and dates but	Boys	30?	1·0
the issues are	Boys	20	0·6
expressed in barley)	Boys	15	0·5
	Girls	20	0·6
	Infants	10	0·3
	Infants	5	0·16

Nuzi (1600–1400 B.C.) 1 *silà* = 1 litre

Reference	*Recipient*	*Monthly*	*Daily*
Pfeiffer and	Men	100	3·3
Lacheman, 1942 :	Men	90	3
no. 19	Men	30	1
	Women	60	2
	Boys	60	2
Ibid : no. 113	Young men	20	0·6
	Young men	14	0·46
	Girls	14	0·46
	Girls	10	0·3
	Boys	10	0·3

TABLE 4 : *Nutritional value of selected barley rations*

Silà per day	*100 grams*	*Calories*	*Protein grams*	*Calcium mg*	*Iron mg*	*Vit. A*	*Thiamin mg*	*Riboflavin mg*	*Vit. C mg*	*Niacin mg*
2	15	5,400	145·5	750	60	∅	5·7	3	∅	108
1·33	10	3,600	97·0	500	40	∅	3·8	2	∅	72
1·00	7·5	2,700	72·75	375	30	∅	2·85	1·5	∅	54
0·66	5	1,800	48·5	250	20	∅	1·9	1	∅	36
0·33	2·5	900	24·25	125	10	∅	0·95	0·5	∅	18

∅ Not present or value less than 0·1 per cent.

deliberately blinded, may refer to people who have been blinded or partially blinded by vitamin A deficiency.

It might be expected that few of the people who existed on barley rations only would have reached adolescence, owing to the lack of vitamins A and C in their diets. However, the ration lists at Lagash, which date from the sixth year of the ruler Lugalanda to the first six years of Urukagina, reveal individuals who continued to receive rations throughout the period. (Deimel, 1928: for example, Gala-tur *nità* and Nin-bar-da-ri, 42, 45, 48, 49 ff.; and Lugalpae *sib.šah*, 2, 3, 5 ff). Such persons must have had other sources of these vitamins.

Barley rations were not the only food to be issued to employees. Mixed rations were occasionally given out. For example, at Lagash in the Early Dynastic III period, men of different professions received bread, beer-bread, beer and fish (Deimel, 1931: 8–10), and in another text men and women were recorded as receiving dates, ghee, apples and cheese (Deimel, 1931: 17). In the Ur III period, texts at Lagash and Umma record the foodstuffs issued to individuals travelling between one town and another—the so-called "Messenger Texts" (Jones and Snyder, 1961: 280). The food issued included beer, bread, onions, oil and a "salt substitute" (*naga*). Fish was occasionally added. In the Old Babylonian period at Lagaba, barley and dates were given as rations (Leemans, 1960: nos. 88 and 90). At Ur, workers building a temple (E-babbar) were given a daily ration of dates, cheese, bran from linseed (*gaba.še.giš.i*) and possibly meat (Sollberger, 1965: 15). At Nippur in the Kassite period, the headings on one text (Clay, 1906: no. 58) suggest that the monthly rations were issued in dates and barley, but the amounts are expressed as if one commodity so that the specific quantities of barley and dates remain uncertain.

Such mixed diets were nutritionally better than a diet consisting of only one type of food since the different types of protein would supplement one another. The amounts involved would have provided sufficient energy, the beer would supply the B vitamins, the onion, especially if eaten green, would supply a little vitamin C and the cheese and dates might provide some vitamin A. However there are no other good sources for the vitamins A and C, and the issues of onions and cheese cannot really be considered adequate. These people too must have had access to other sources.

It is possible to make a very rough comparison of the energy intake of the ancient Mesopotamian diet as provided by the barley rations, and modern diet in the same area. For the modern figures one can take the estimates of the United States Department of Agriculture (USDA 1961: Table 4) and for the ancient figures an average can be calculated from cuneiform data (see above, references given in Table 3).

The first impression given by Table 5 is that the energy intakes of ancient Mesopotamia were higher than the estimates of the average modern intake, and that they were in the region of the 3,000 calories per day recommended for an adult male by FAO. This apparently satisfactory state must not obscure the fact that a number of people in Mesopotamia receiving only barley rations had low energy intakes and must be considered undernourished. However, only those dependent solely on barley or other cereal rations were at risk from lack of vitamins A and C. The

energy intake of some of their children, moreover, was insufficient to provide fully for growth and development. Such children would have had inadequate diets when young, the time of greatest vulnerability, which would have lowered their standard of health and efficiency in later life. Under such conditions probably only the strongest and fittest children would have survived.

TABLE 5

USDA	*ED III*	*Agade*	*Ur III*	*Old Babylonian*	*Nippur*	*Nuzi*
2,255 calories	3,152 calories	4,320 calories	2,880 calories	Mari: 5,760 Lagaba: 2,520 Average: 4,140 calories	2,880 calories	3,600 calories

Mesopotamian average

3,495 calories

If these lowest levels of barley rations are set aside (that is 0·66 litres or less a day), the rest of the ration-recipients had a diet which contained adequate energy intakes and was also adequate in other essential nutrients with the exception of vitamins C and A, which were almost certainly available from other sources. It would seem that the nutritional health of most of the Mesopotamian population was good.

Conclusion

Knowledge of diet is important in assessing the health of a people. A study of the diet of ancient Mesopotamia shows that a wide range of foodstuffs, which could have supplied all essential nutrients, was available. Those members of society dependent solely on issues of barley, as recorded in the ration lists, would have had a diet deficient in vitamins A and C, and some would have had an inadequate energy intake. However, the average Mesopotamian energy intake, as calculated from selected cuneiform texts, compares well with modern figures and the intakes recommended by the Food and Agricultural Organisation of the United Nations. It seems likely that the major part of the population took advantage of the resources available, thereby obtaining an adequate diet.

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