Household food storage in Ancient Israel and Judah

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Archaeopress Publishing Ltd
Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978-1-78491-980-1
ISBN 978-1-78491-981-8 (e-Pdf)

Cover photography: Paul Jacobs, Lahav Research Project.

Printed in England by Oxuniprint, Oxford

This book is available direct from Archaeopress or from our website www.archaeopress.com

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Introduction

Ever since the archaeological discoveries from the 17th century onwards shone a new light on the world of the Ancient Near East, scholars and the public alike have been fascinated by new insights that excavation in the Holy Land could open up on the world of the Bible. In due course, the multilayered tells were surveyed and excavated, sometimes hastily, sometimes with more care. On the basis of archaeology our knowledge of that world has indeed increased, and sometimes also challenged, long-held notions about the Biblical accounts. While excavators initially focused on the more grandiose remains, no doubt inspired by the monumental ancient architecture of Egypt and Mesopotamia, Biblical accounts of kings and the tendency of history to focus on matters of state, over time, smaller sites and the more ordinary houses also received the attention of archaeologists. While up to the end of the 20th century archaeologists continued to focus on dating and the testing of sweeping theories, there has long been a strand in archaeological thought that considered the plight of ordinary people. Through this effort, usually in combination with Biblical interpretation, we have come to know more about the lives in the many small homes of Ancient Israel and Judah (see, for example, de Vaux 1961).

In excavations throughout the Levant, in the remains of houses big and small, the potsherds of many storage jars have been found. Often they were hardly noted, and used only for dating. If storage jars had an inscription or an unusual decoration they were given due attention. Archaeologists knew that people stored food in their houses; there was nothing new in that. If archaeologists discovered a large number of storage jars, they did note them as evidence of state organization and dedicated some discussion and space in reports to their presence.

And yet, these storage jars, together with other archaeological evidence of food storage, such as storage pits and possible storage bins, can help us to gain insights into the very essence of household organization and the lifeways of the people who once lived here. If we want to know more about the world of Ancient Israel and Judah, particularly life in households, this is evidence that we need to take into account. That can be said of many artefacts. But a comprehensive study of all artefacts would not go into the required detail and would probably be far too diffuse to add meaningful information to the scholarly discourse. There are several overviews, but they are often aimed more at the popular market and lack in-depth case studies and detailed comparisons between houses (King and Stager 2001; Borowski 1987; Borowski 2003). I am, instead, focusing on one particular aspect of household life and trying to look at it in detail. The choice of household food storage is not random. The sheer number of storage jars and storage pits indicates that they were important in household life. Storage jars are present in small houses and large. The use of storage equipment has been debated, but little detailed analysis of its use in households has been done. The archaeological evidence is there and this is an opportunity to use it to get to know the people of Ancient Israel and Judah better.

The Bible as a whole and the Old Testament in particular also give us evidence of food storage practices and the context in which it took place. This complements the archaeological evidence to build a more coherent picture. I also consider other ancient texts and art as part of this context. But the focus is on the Old Testament, not just because it is the literature most closely associated with Ancient Israel and Judah, but also because I can contribute to a better understanding of the perception of food storage in the Old Testament.[1]

I focus strongly on the household and consider food storage primarily in a household setting. In my discussion of food storage I also have to look at food storage beyond the household level. Large-scale food storage also affected household food storage and interacted with it. Further, some practices in larger storage facilities were similar to those at the household level, but have been better documented. My investigation of storage practices beyond the household is not thorough and comprehensive, but informs primarily our understanding of household food storage.

The study also touches on and affects concepts of larger societal and economic organization and systems. But it does so from a specific household perspective. In that sense it is a 'bottom-up' rather than a 'top-down' approach. The issue of household food storage is a small window on the bigger picture of Ancient Israel and Judah. But from that window we have a particular perspective and cannot see a complete overview.

[1] I use the terms Old Testament and New Testament here not as a theological statement, but simply because they are familiar terms, and also to acknowledge the research tradition out of which I write. Other terms, such as First Testament, Hebrew Bible and Tanakh have their validity and their specific contexts. I hope that my study can also speak into those contexts and be valuable for research. I also acknowledge that these are collections of texts, that were written and edited over a long period, so that there is not necessarily one homogenous view in all texts.

Nevertheless, this perspective can contribute to a more general understanding of society in Ancient Israel and Judah.

To interpret artefacts and say something about household interaction and organization beyond a simple description, household archaeology tends to rely heavily on ethnographic analogy. That such analogy can be quite straightforward and that practices continued in the Near East for thousands of years is shown by the example of the beehives found at Tel Rehov (Mazar and Panitz-Cohen 2007). Over 20 beehives were excavated in a stratum related to the Iron Age IIA. They were first identified as beehives based on their similarity with current beehives still used in traditional communities in the area. This was confirmed by chemical tests. The similarity between modern and ancient is such that the material, shape and dimensions are exactly the same, right down to the shape of the handle on the lids. The ancient beehives were slightly deformed and deteriorated, but they had been preserved quite well because they had been hardened by a fire raging in the area at the time of the town's destruction.

While evidence from geographically close ethnographic analogies is usually given preference, household archaeology takes interpretive stimuli from a wide range of contexts. It thereby enlarges the 'methodically schooled imagination' (Weber 1904: 54) to understand the significance of artefacts to lifeways far removed from our own (see Hardin and Holt 2017 on imagination and archaeology). As such, not only are the artefacts compared to ethnographic analogies to specify possible uses, but the setting in the household is also considered. This then allows archaeologists to not only see houses as expressions of abstract systems, but rather as the location of homes, where people lived in intimate closeness and interacted with the community around them. With a focus on the home, household archaeology tends to eschew grand models of society and societal change, and rather considers wider societal patterns through the detailed analysis of a few houses and their histories.

A further feature of this study is the use of computer-generated visualization, not only to aid in the interpretation of space and to illustrate the integration of food storage into the household, but also to convert the descriptions of physical remains into numerical data. The conversion to such numerical data is not always straightforward, but allows a more uniform description of the houses and statistical comparisons between households. This enables a detailed analysis of the differences between houses and recurring patterns. Such patterns allow me to draw inferences about food storage in Ancient Israel and Judah more generally, based on the assumption that the investigated excavated houses are in some way representative of the many thousands of houses that existed during that time.

Numerical data of food storage capacity in and around houses is compared to human food requirements to understand how, in the particular context of Ancient Israel and Judah, these requirements might have been supplied. Such data also are more easily transferable to other studies, even though they cannot claim full accuracy.

A particular problem in archaeological interpretation and data calculation is the distinction between long-term storage and short-term storage. Some products would have been stored in the house for consumption within days or weeks. Other products were stored for a year or even longer. But the distinction is fluid. While wheat, as the most important staple food, was normally stored for availability during the entire year, other products were stored for a limited time, but in some cases still for months. Products may also move from long-term storage to short-term storage. The seasonality of agriculture in Ancient Israel and Judah not only meant that food had to be stored for later, but also that new food sources became available throughout the year. Even though the wheat harvest was particularly important, food became available over a period of at least six months. The harvest was not just a one-time event until exactly the same time the next year when storage equipment would be filled again. Nevertheless, due to our insufficient knowledge of what products were stored exactly in which containers, and how different containers might have been re-used, total storage capacity has to be used for most calculations. As some short-term storage would not have taken place in easily distinguishable storage equipment, I also have to limit my research to those vessels and installations that were particularly identifiable as storage equipment and provided sufficient storage capacity to make a difference in the overall organisation of the household.

Many food items were regularly turned into products that allowed preservation over long time periods: fruit was dried, wine was fermented, vegetables and fish were probably pickled, and milk was converted into preservable products. For many products this process of preservation is a necessary pre-condition for storage. This study does not focus on the process of food preservation, but rather on food storage, an activity that is more visible in the archaeological record. Not all preserved food would have been stored, particularly not in the household. Rather, it might have been used for trade or for imminent consumption.

Chapter 2

Foodways in Ancient Israel and Judah

Diet in Ancient Israel

Examination of the diet in Ancient Israel and Judah has largely relied on a combination of evidence from the Bible, ethnographic descriptions and archaeology. I propose to use the results of these studies. Rather than considering the evidence anew, the following overview reviews the literature on diet in Ancient Israel and Judah, and therefore the food that was probably stored.

The Mediterranean triad of bread, wine and olive oil also formed the basis of the diet in Ancient Israel (MacDonald 2008: 19). Grain-based food, such as bread and porridge, probably provided at least half of the caloric intake (MacDonald 2008: 19). Estimates range from 53 to 75 percent. The main cereals (*dagan*) grown in Ancient Israel were wheat (*hitta/hittim*) and barley (*se'ora/se'orim*), with emmer (*kussemet*) and millet (*dohan* and *pannag* [Ezek 27: 17]) also known. The wheat grown in Ancient Israel was probably durum wheat. It was used for bread and other baked goods, for porridge, and was eaten parched (Borowski 1987: 89). Barley can be grown on soils derived from chalk and limestone. It was also used for bread and other baked goods and eaten parched. Barley may have also formed the basis of beer production (Borowski 1987: 91; Homan 2004: 91), though wheat may also have been used for that function. Other cereals were not as important in Ancient Israel. Emmer is hardly found in Iron Age contexts. Millet was seen as a food used in hard times (Borowski 1987: 93). Legumes archaeologically attested were broad beans (*pol),* lentils (*'adasim),* bitter vetch, chickpea (*hamis),* and pea (Borowski 1987: 94–97). The identification of *hamis* as chickpea in Isaiah 30: 24 is based on an interpretation of the verse as describing a time of plenty when animals will eat crops usually reserved for human consumption (Borowski 1987: 96). Spices known in Ancient Israel were black cumin (*qesah),* cumin (*kammon),* and coriander (*gad*). Other field crops were flax *pista* and sesame for their seeds and oil (Borowski 1987: 98–99).

Borowski suggests that horticulture was an important element of the agricultural economy of Ancient Israel. Grapes were mainly grown to make wine, but were also eaten fresh, dried to make raisins, used to make vinegar and probably boiled down to make syrup (Borowski 1987: 110–113). Olives were extensively grown and seem to have been used mainly to make oil (Borowski 1987: 116–126). Oil was not used only for culinary purposes, but also for hygiene and for lighting. Following Dalman, Borowski suggests that the pickling of olives was only introduced in the Hellenistic or Roman period (Dalman 1935: 198; Borowski 1987: 123–124). The fig was a staple food item in Ancient Israel. A fig tree yields two crops each summer. The first crop was usually eaten fresh, the second crop was dried. They could be dried individually, dried on a string or mashed into a cake (Borowski 1987: 115). The date (*tamar)* was cultivated especially in the Jordan valley. Dates were eaten fresh and dried. Date honey was a sweetener (Borowski 1987: 126–127). Other fruit trees were the pomegranate (*rimmon)* (Borowski 1987: 116–117), the sycamore (*sikmim),* and a tree which Borowski suggests was the apricot (*tappuah)* (Borowski 1987: 128–130). Almonds (*saqed),* pistacchio nuts (*botnim)* and walnuts (*'egoz)* were also cultivated.

Borowski thinks that the small number of references to vegetables in the Bible and the low regard in which vegetables were held suggests very strongly that vegetables were not considered very nutritious and did not constitute an important part of the Iron Age diet. He also suggests that quite a few vegetables and leaves were collected in the wild and not grown in gardens. He identifies the vegetables mentioned in Numbers 11:5 as cucumber (*qissu'im),* melons (*'abattihim),* leek or a green leafy vegetable (*hazir),* onions (*besalim),* and garlic (*samim).* (Borowski 1978: 135–139).

Milk could be processed and stored for later consumption, especially by processing it into what we might today call yoghurt, butter and cheese (Borowski 2003: 66). Due to the heat, milk gets sour quickly in the Mediterranean. In Palestine, milk was often processed into *leben,* a soured, thick milk similar to yoghurt (see Dalman 1939: 293–296). At times, this was mixed with bulgur wheat and dried, so that it could be stored long-term (Dalman 1939: 296). The product was then used in cooking. The making of butter seems to have changed little in this area since the Chalcolithic Period. After shaking the milk in a churn, the butter was separated from the butter milk. Normal salted butter lasted up to 15 days. Cooking butter could be stored for longer periods. It was won by heating the butter twice, adding wheat grouts to soak up the water and removing the wheat grouts again (Dalman 1939: 302). The buttermilk, a byproduct of butter, was often further processed after the remaining water was removed. Thickened, it was formed into small balls, which were then dried. They were often stored in olive oil and used for cooking (Dalman 1939: 302). A soft cheese similar to that produced in Palestine was probably also known in Ancient Israel (Dalman 1939: 312–313). It was made with rennet and salt, and could be stored (Dalman 1939: 303–304).

While meat was regularly consumed in Ancient Israel, it was certainly not daily fare for the average Israelite, and was more likely consumed at special occasions (Borowski 2003: 67). Some hunted animals were consumed, but the majority of meat was supplied by domesticated animals from local herds. Biblical references to meat preparation relate to immediate consumption (Borowski 2003: 67). Fowl were also eaten. It is likely that pigeons were kept under controlled conditions. Bones of chickens, geese and ducks have also been found at several Iron Age sites, though the introduction of chicken seems to have occurred late in the Iron Age. Until the introduction of chicken, eggs were probably available only in limited quantity (Borowski 2003: 69–70). Zooarchaeological evidence indicates that a variety of fish was consumed in Ancient Israel, even in settlements distant from lakes or the sea. A lively trade in fish is therefore likely (Borowski 2003: 68-69).

Assuming that the diet in Palestine was relatively stable over centuries, the Mishnaic description of a food basket that has to be given to an estranged wife is often used as a guide (MacDonald 2008: 43–44; Broshi 2001: 121–123):

> *He who maintains his wife by a third party may not provide for her less than two qabs of wheat or four qabs of barley [per week]. [...] And one pays to her a half-qab of [legumes], a half-log of oil, and a qab of dried figs or a maneh of fig cake. And if he does not have it, he instead provides some food of another type. (Ketubot 5: 8)*

The food basket may also give us an indication of the overall quantities of food considered to be minimal provisions for one woman. The double portion of barley is disputed within the Mishnah and probably reflects the fact that barley was considered a less desirable and cheaper grain, rather than the difference in nutritional value between barley and wheat.[2]

Broshi discusses the various methods for converting the Mishnaic measurements to modern measurements, and the calculation of daily requirements. He provides Table 1 as the more likely calculation.

As the Mishnah later specifies that the estranged wife should eat with the husband on the Sabbath evening, Broshi thinks that the food basket was supposed to supply sufficient for only six days (Broshi 2001: 123). Then the daily caloric intake would be 1874 calories. But if the reference to the Sabbath meal is a euphemism for spending the night together or is to be regarded as a separate passage to that mentioning the food basket, the amount would be for seven days. Then the daily caloric intake would be 1606 calories. According to Broshi, the FAO recommends a daily intake of 1540-1980 calories for a woman beyond child-bearing age. The food basket would provide for that amount, whether for the full seven days or just six days of the week.

Broshi highlights the importance of the various food items in the diet of Roman Palestine. In particular, he notes that fruit, specifically dried fruit, would have been regularly consumed (Broshi 2001: 127–129). Wine was also a significant part of the diet, but probably more so for men than for women (Broshi 2001: 129). Fish was very important for the Jewish population, and fish sauce a regular part of the diet (Broshi 2001: 134–135).

Nathan MacDonald emphasises the variability of the diet in Ancient Israel, primarily along geographical, temporal and social lines (MacDonald 2008: 92). The temporal dimension here not only encompasses changes from the early to the late Iron Age, but also seasonal changes. At different times of the year, different food would have been eaten, as it became available, even though some of the basic foodstuffs would have been consumed throughout the year. It also includes the variability from year to year. In some years the harvest would have been good, in others there was crop failure resulting in famine. But not only drought or pests could cause famine; at times social and political factors, such as warfare, would have diminished the food supply (MacDonald 2008: 57). Strategies like storage, mixed farming and the foraging of substitute food would have allowed many people to survive food shortages and famines (MacDonald 2008: 59).

Food items in the Old Testament

According to Deuteronomy 8: 8, Israel was a land with wheat and barley, vines and fig trees, pomegranates, olive oil and honey. Its trade commodities are described as wheat and confections, honey, oil and balm (Ezekiel 27: 17). The frequencies with which different food is mentioned in the Bible may also be an indication of the importance of the food in daily life during the time of Ancient Israel and the Persian Period (Table 2). I do not include references to various animals, as each individual case must be weighed to assess whether it refers to food. The frequencies given here are taken from Strong's Exhaustive Concordance (Lexiconcordance 2014).

The times of harvest

Crucial to any consideration of food storage is not just what food was available and how much, but also at what time it became available and was consumed. The seasonality of food sources is one of the reasons

[2] The Food and Agriculture Organization of the United Nations (FAO) gives a slightly higher energy (1630 kJ/100g) for barley than for wheat (1570 kJ/100g), but the digestible energy for barley (81%) is lower than for wheat (86.4%) so that, overall, wheat provides a slightly higher digestible energy per weight (Food and Agriculture Organization of the United Nations 1999:Nutritional Quality of Cereals).

Table 1. The Mishnaic food basket. Broshi 2001: 123.

Product	Mishnaic measure	Volume (litres)	Weight (kg)	Caloric Value
Wheat	2 qab	2.854	2.037	6111
Legumes	½ qab	0.713	0.597	2035
Oil	½ log	0.178	0.162	1458
Dried figs	1 qab	1.427	0.713	2992
Total		5.172		11,244

Table 2. Frequencies of words denoting food in the Old Testament.

Word	Word	Translation	Occurence
לֶחֶם	leḥem	bread, food	297
שֶׁמֶן	šemen	oil	193
יַיִן	yayin	wine	140
גֶּפֶן	gepen	grapevine	55
דְּבַשׁ	děbaš	honey, syrup	54
חָלָב	ḥālāb	milk	44
דָּגָן	dāgān	cereal	40
תְּאֵנָה	tĕʾēnâ	fig	39
תִּירוֹשׁ	tîroš	wine	38
זַיִת	zayit	olive (tree)	37
שְׂעֹרָה	śĕʿōrâ	barley	34
רִמּוֹן	rimmōn	pomegranate	32
חִטָּה	ḥiṭṭâ	wheat	30
יִצְהָר	yiṣhār	fresh oil	23
שֵׁכָר	šēkār	strong drink	23
תָּמָר	tāmār	date palm	12
חֶמְאָה	ḥemʾâ	butter / cheese	10
עֻגָּה	ʿuggâ	cake	7
שִׁקְמָה	šiqmâ	sycamore fig	7
תַּפּוּחַ	tappūaḥ	apricot / apple	6
חֶמֶר	ḥămar	wine	6
חֹמֶץ	ḥōmeṣ	vinegar	6
יָרָק	yārāq	vegetable	5
עֲדָשָׁה	ʿădāšâ	lentils	4
שָׁקֵד	šāqēd	almond	4
אֲשִׁישָׁה	ʾăšîšâ	raisin cake	4
צִמּוּק	ṣimūq	bunch of raisins	4
כֻּסֶּמֶת	kussemet	emmer	3
כַּמֹּן	kammōn	cumin	3
פּוֹל	pōl	beans	2
גַּד	gad	coriander	2
מִמְסָךְ	mimsāk	mixed wine	2
חָצִיר	ḥāṣîr	leek	1 (food), 20 (grass)
דֹּחַן	dōḥan	millet	1
פַּנַּג	pannag	millet	1
חָמִיץ	ḥāmîṣ	chickpea	1
אֱגוֹז	ʾĕgōz	nuts	1
שׂוּם	šūm	garlic	1
קִשֻּׁאָה	qiššuʾâ	cucumber	1
אֲבַטִּיחַ	ʾăbaṭṭîḥ	melon	1
בָּצָל	bāṣāl	onion	1

food was stored. If it could be harvested at any time and immediately consumed, little storage would be required, except for risk management and feasting. The availability of food in Ancient Israel was largely seasonally determined, even more so than today. Nevertheless, our best indication of the seasonal

Table 3. Harvest times of the most common crops in Palestine and modern Israel (Borowski 1978: 37; Dalman 1933: 4–6; Dalman 1935).

Crop / Location	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Barley / Lahav		x							
Barley / *el-Ruwer*		x	x	x					
Barley / Bethlehem			x	x					
Barley / Jesreel				x					
Barley / *el-kubebe*				x					
Vetch / Lahav		x							
Vetch / *el-Ruwer*		x							
Vetch / Bethlehem			x						
Vetch / *el-kubebe*				x					
Lentils / Lahav		x							
Lentils / *el-Ruwer*		x							
Lentils / Bethlehem			x						
Lentils / *el-kubebe*				x					
Peas / Lahav		x	x						
Broad beans / *el-Ruwer*		x							
Broad beans / *el-kubebe*				x					
Wheat / Lahav			x						
Wheat / *el-Ruwer*			x	x	x				
Wheat / Bethlehem				x					
Wheat / Jesreel				x	x				
Wheat / *el-kubebe*					x				
Chickpeas / Lahav				x					
Chickpeas / Jesreel					x				
Sesame / Lahav					x				
Sesame / Bethlehem						x			
Sesame / Jesreel							x		
Millet / Lahav					x	x			
Millet / *el-Ruwer*						x			
Millet / Bethlehem						x			
Millet / Jesreel						x			
Flax / Lahav					x				
Figs / Lahav				x		x	x		
Grapes / Lahav				x	x	x			
Grapes / *'auga*					x	x	x		
Grapes / Bethlehem						x	x		
Pomegranates / Lahav						x	x		
Olives / Lahav							x	x	x
Olives / Jerusalem							x	x	x
Crop / Location	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov

availability of food is based on relatively modern observations on the assumption that seasonal patterns in the Eastern Mediterranean have changed little over the millenia.

The harvest season for different crops depends on the location. Gustaf Dalman lists those for several locations in the high country (Dalman 1935: 4–6). Oded Borowski's times are usually somewhat earlier (Borowski 1987: 37).

He probably used his own experience as a kibbutz farmer in the Shephelah/Negev area, and from his continued involvement with the agricultural community in that region, to arrive at an indicative calendar. Most of the field and orchard crops were harvested once per year in a relatively short time-span. Vegetables are available over most of the summer (Dalman 1935: 4–6). Barley and wheat are winter crops and mature in early summer. Other field crops such as beans and lentils are also sown in winter and harvested in summer. Sesame, chickpeas and millet are summer crops and are ready for harvest in late summer. Table 3 gives an indication of harvest times of the main crops in Palestine and Israel. I denote the times given by Oded Borowski with 'Lahav'; the others, given by Gustaf Dalman, are according to the mentioned location.

Not all of the crops were placed immediately into storage after harvest. Processing was often required to make crops more durable or to remove non-nutritious parts. In this way, only the useable parts of plants were kept and stored for later use. For example, wheat and barley were not only harvested, but later threshed, winnowed and sieved, before they were stored. For crops such as sesame, the process was very similar but different tools were used. Fruit such as grapes and figs were further processed, for example, by drying. Most of the grapes were pressed for wine production. Olives were mainly cultivated for olive oil production.

Storage was required to make the food available throughout the year. A portion of the harvest had to be kept as seed stock. Wheat, for example, was harvested in May or June; the seed was sown in November and December, while the part kept for food had to last at least until the new harvest in May. In November, just before sowing the crops again, the maximum amount of food would have been stored. Part of the grain would have already been consumed by the time the olive oil was stored. The stored food changed in a household through the year. It would have also changed from year to year. Bumper harvests would have required greater storage capacity, while at times of crop failure the harvest would have been small.