

# The social Archaeology of Food in Ancient Egypt: Multidisciplinary lenses to Paleoethnobotany of Cereal-based Diet

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## Introduction

*Wheat and barley were used to making bread and beer, the main staple in Egyptian diet.* This typical interpretation of cereal based diet in Egypt implicitly homogenizes the culture. Variation within the culture are often interpreted as a temporal difference, ignoring the inter-regional cultural variation. Different names of bread encountered in ancient texts are often interpreted by using approximate Western terms (e.g., biscuits, cake) which distances us more from the ancient concepts of a meal. This presentation introduces a multidisciplinary paleoethnobotanical approach of the Egyptian cereal based diet including molecular and nano-archaeological methods and imaging applied to archaeobotanical remains of wheat from Egypt, with the goal of understanding the contribution of cereals on the chaîne opératoire of producing a meal. These methods provide a lens onto the regional cultural variation in the ways that cereals have intersected with other food items such as fruits and dairy when integrated into what constitutes the concept of a meal at a regional level. Ethnoarchaeological data enrich the understanding of the textual and archaeological materials by revealing the diversity of ways by which a cereal based meal has served as a social agent in the formation of society, economy, culture and identity in a regionally distinct way (Hastorf 2016). A key conclusion is that the use of interdisciplinary methods and technology is not only a source for expanding data, but also poses ontological questions to rethink the theoretical paradigm in Egyptology that has produced homogenizing terms for describing Egyptian society.

## 1-Regional diversity in the wheat

### A. Text: Upper Egyptian grain & Lower Egyptian grain



### B. Morphology analysis by Nano-archaeology method on ancient and ethnographic samples of wheat

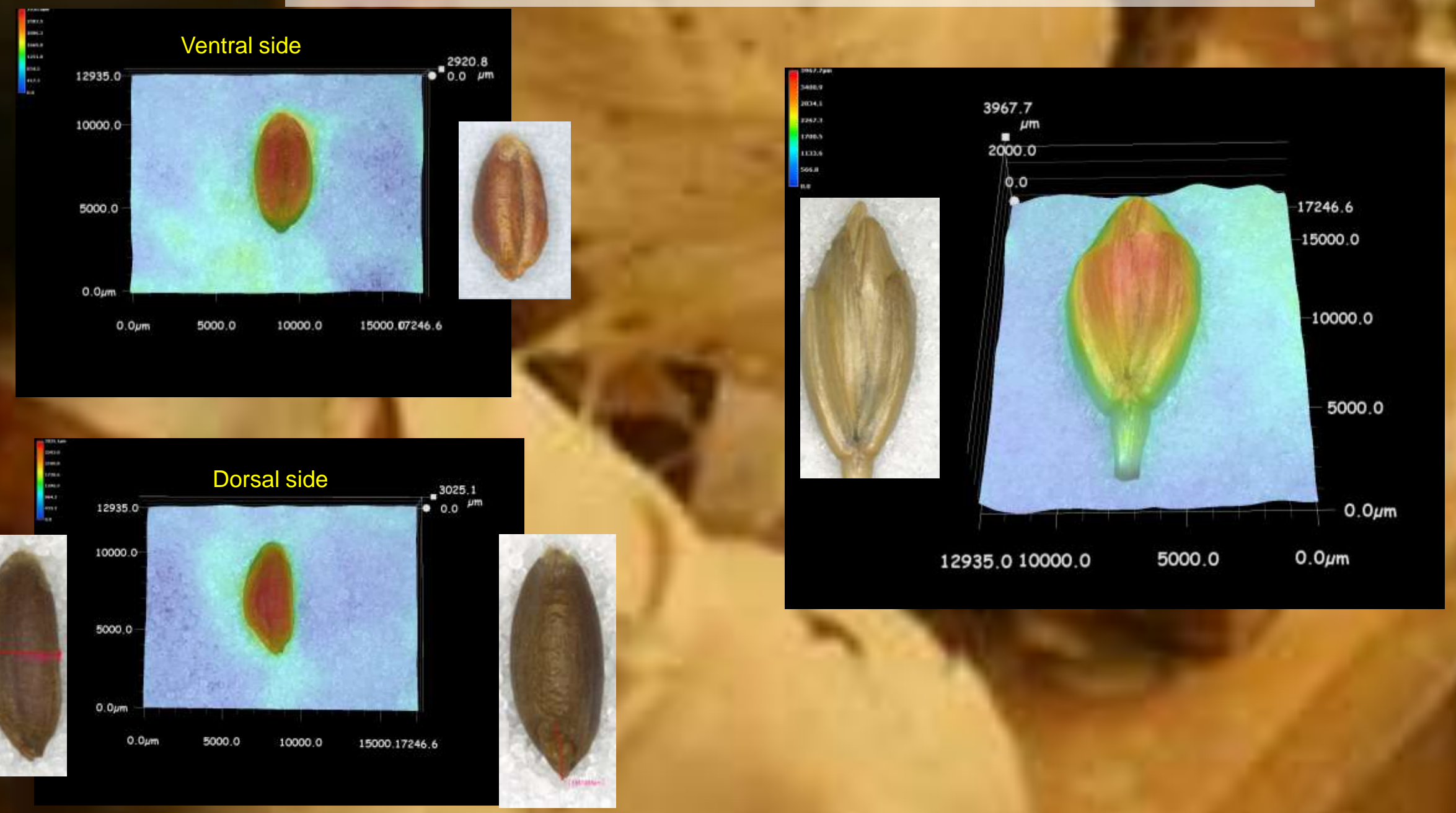


Wheat sample: Priestesses Cache, at Bab el Gasus, Atkinson Museum, UK.

Right: Wheat spikelet, Charleston Museum, SC



Imaging using Keyence VHX-1000 digital microscope, Nano-Archaeology Laboratory at UCLA.



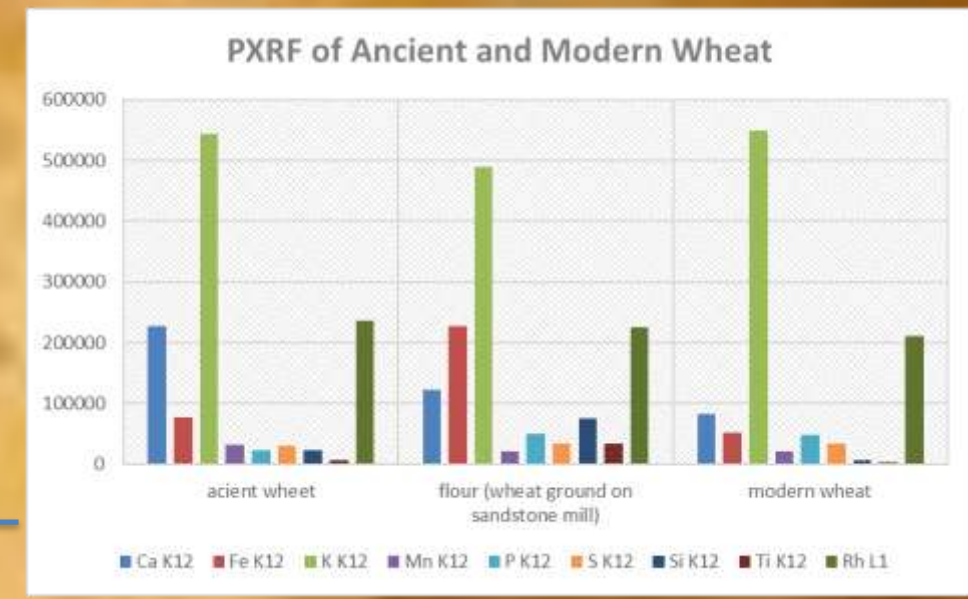
**Analysis and Results:**  
Archaeobotanical collections from Egypt are dominated by wheat and barley (ankhet, i.e. life sustenance) we may assume that ancient Egyptian diet was regionally homogenous and similar. During a given time period. However critical look into texts, grain morphology, and ecology, as well as ethnoarchaeology. We see that wheat itself showed variation among the same species between Upper and Lower Egypt.  
**A- Text:** Ancient Egyptian texts "tj-Sm" and "tj-mH" for Upper and Lower Egyptian grain respectively.  
**B- Nano-archaeology:** To compare upper and lower Egyptian wheat morphologically. We developed a method of taking the measurement of diagnostic features of wheat and mapping of the grain morphology using Keyence VHX-1000 digital microscope at the nano-archaeology Laboratory at UCLA. Samples from Upper Egypt found in the Bab el Gasus priestesses Cache, 21st dynasty; and wheat samples from ethnographic reference collections at the Charleston Museum (S.C) presumably excavated materials, collecting ethnographic data from Mishet el Amar (Lower Egypt) and Luxor (Upper Egypt), confirmed farmer's awareness of these ecological differences of Upper and lower Egyptian grain. Farmers explained underpinnings consequences in regard to value as thinner and darker grain of Upper Egypt is ascribed to be of lesser quality and hence cheaper. This example invited Egyptologists interested in the economy question to consider this regionality aspect of value.

## 2-Regional diversity in the chaîne opératoire of wheat processing

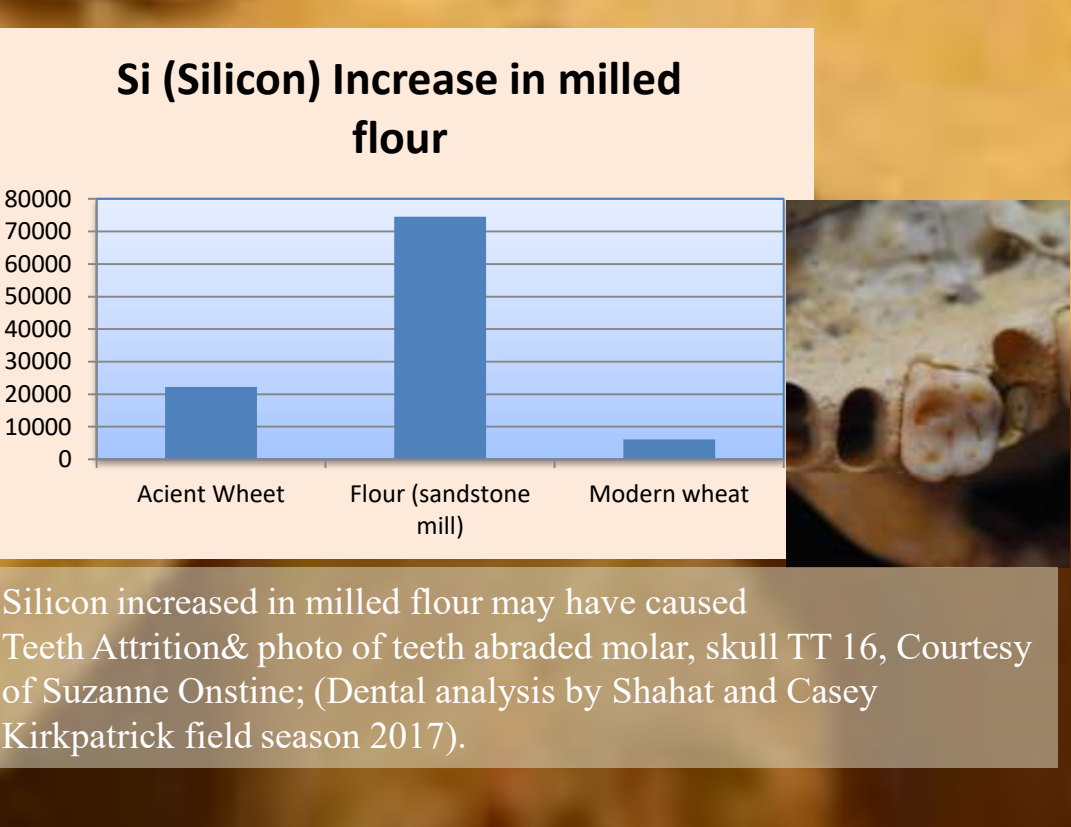
### A- Quern making and Grinding Experiment



### B- p-XRF analysis on the milled flour

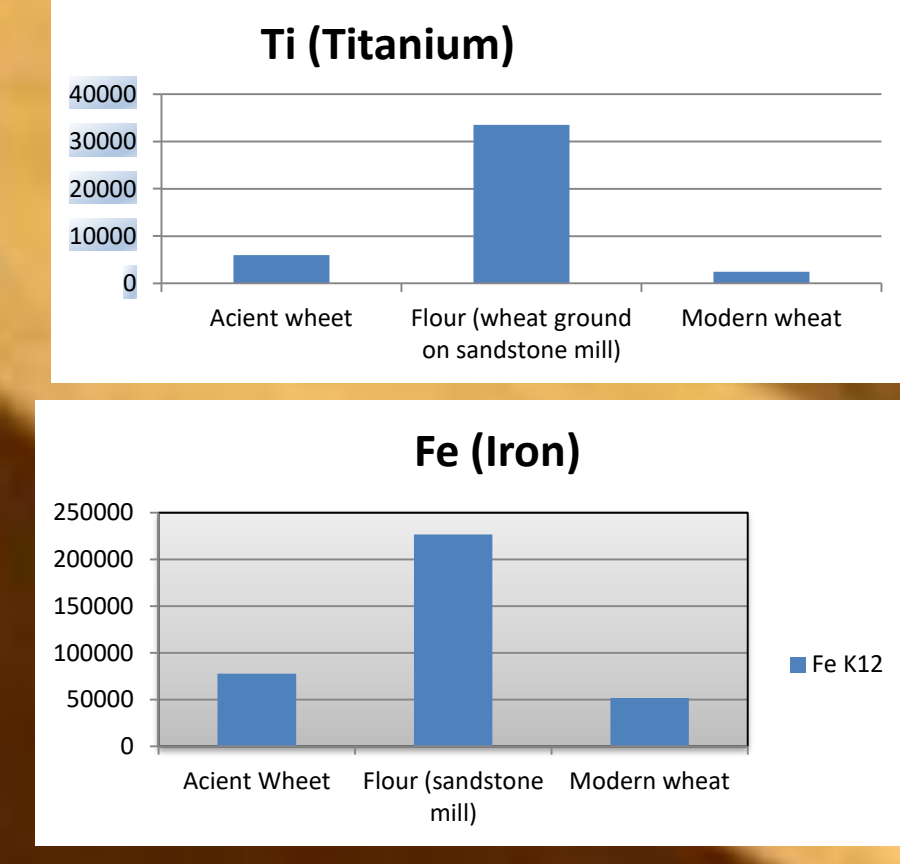


### Negative health impact



Silicon increased in milled flour may have caused Teeth Attrition & photo of teeth abraded molar, skull TT 16, Courtesy of Suzanne Onstine; (Dental analysis by Shahat and Casey Kirkpatrick field season 2017).

### Positive: Milling as nutrition enhancer



**Experiment:**  
Replication of a predynastic quern was made based on UCLA excavation database. In order to evaluate the impact of grinding process, comparative analysis of the inorganic components in ancient Wheat (T. dicoccum) from the priestesses cache of Bab el Gasus; modern bread wheat from Egypt (T. aestivum) and the milled flour of the modern wheat. Although the comparison was done between two different types of ancient versus modern wheat, their inorganic component did not show a significant difference in the p-XRF results.  
Two readings of the samples were taken with adjusting the p-XRF into 15 height voltage; current 35; and assay time 120 with no filter and (one time with helium and the 2nd with no helium). Measurement of the minerals of the sandstone quern was also taken.  
**Results and interpretation:**  
Building on earlier studies by Delven Samuel (Samuel, 2010) on grinding and Filce Leek (Leek 1972) x-Ray analysis of Egyptian bread. Although the results of the p-XRF showing increase in silicon (Si) on milled flour agrees with Leek's finding of grit in Egyptian bread which may have caused teeth attrition, it is remarkable to notice that the milling process of what has enriched its nutritional value evident in the increase of iron value as well as Ti (Titanium), a mineral useful in the gut and helps resist gastrointestinal degradation (Achtschin, 2017). People chose their processing technologies based on the concept meal in mind (Hastorf 2016). Analysis of grain processing in ancient Egypt reveals overlapping temporal and regional variation. Analysis of both continuity and change in food processing technologies may help Egyptologists unpack regional histories and interactions with different identities through food practices (Hastorf 2016; Ann Austin 2014).

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**Online Source:** Archaeobotany database: University of Groningen, The Netherlands: <http://www.plantatlas.eu>

## 3-Regional variation in cereal based diet: Ingredient-based approach

**Future research:**  
Further step in this research aims at looking at regional variation in terms of recipe and ingredients This includes:  
1- **Contextualized paleoethnobotanical of macro-remains:** to answer question on regional variation and cultural interactions with Nubia (Shahat and Jenzen, *BIFAO* forthcoming).  
2- **Micro-remains of ingredients** by SEM imaging  
*Is every loaf a bread?*  
SEM imaging by Heiss, (2017) in Neolithic settlement in Switzerland and Catalhuyuk has revealed micro-ingredients of bread-like object and made him question the interpretation of any cereal based recipe as bread. Similar recipe was collected by the author from Egypt known as *Keshk*. The name of the recipe suggests origins from the levant, specifically Turkey.  
3- **Molecular method to ingredients: GS- mass spectrometry**  
Ethnographic materials of cereal based diet is collected by the author from different regions for analysis before application on archaeological samples. Different recipes included mixing of multiple kinds of flour or using crushed *doum* as sweetener. Some recipes such as keshk, and Mefatella or Beleyla include dairy for making a bread like recipe or a soup. (Research undergoing by Shahat and Hans Barnard). Though residue analyses in archaeology was not employed at his time, Saffirio in 1966 could identify cereal soup residues in ceramic vessels discovered at Badary in Upper Egypt dated to the Neolithic period (Saffirio, 1966).  
4- **Ethnoarchaeology:** The use of the ethnographic materials of food is not to draw on similarities or differences of traditions in Ancient and modern Egypt but to derive theatrical and methodological approach investigate regional cultural variation.

### Ethnographic collections Beni Swef, Upper Egypt

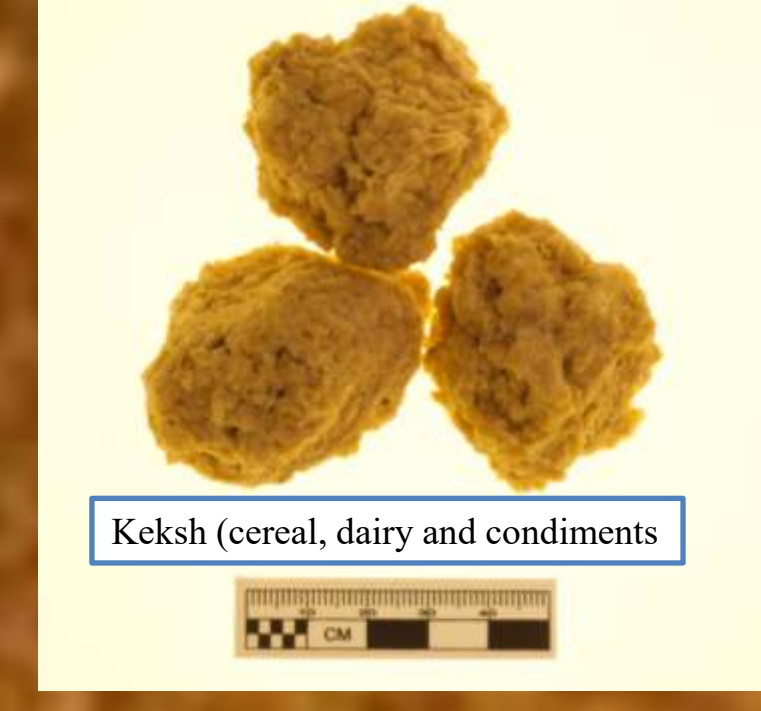


Fayesh (sliced bread)

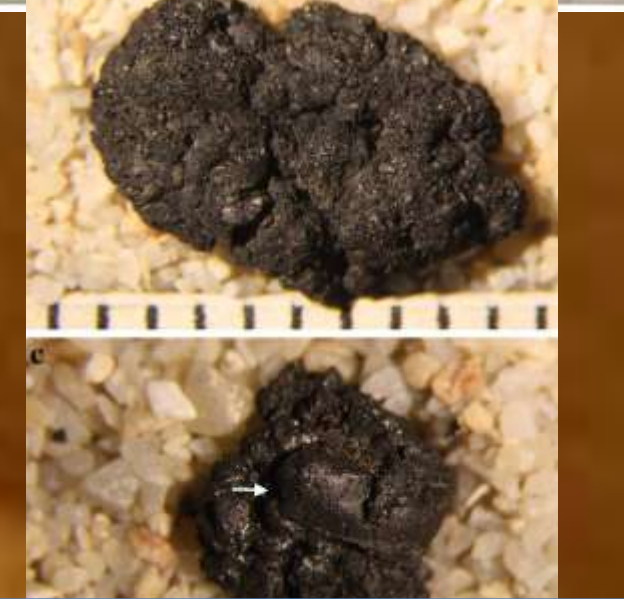
### Possible archaeological parallels?



Middle Kingdom Stela, Egyptian Museum Cairo



Keksh (cereal, dairy and condiments)



Bread like Object, Catalhuyuk & Neolithic site At Switzerland. SEM revealed condiments (Heiss et al, 2017).

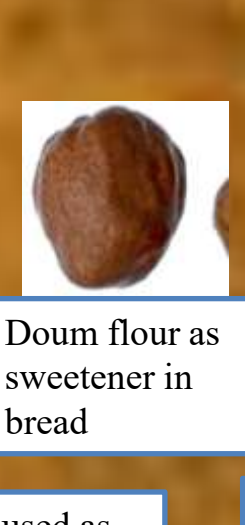
### Other recipes: cereal as condiments and soup



Freek: unripe wheat for stuffing pigeon



Burghul: Over-ripe wheat used as condiments



Doum flour as sweetener in bread



Mefatella: wheat wrapped with milled flour and dairy For cereal based soup

## Discussion and conclusion

Egyptology began within orientalist and colonialist paradigm (Said, 1993). One ongoing aspect of this paradigm is the periodization of Egyptian history (kingdoms and intermediate periods) by which variation within the culture as only seen from the lens of continuity and change measured on a temporal scale. Even though it is important to keep the dynastic system, we should not forget the fact that Manetho himself emphasized the regionality aspect of his system (Thinite, Theban, Memphite dynasties etc). In conclusion, looking so closely into regional variation within the Egyptian culture is not simply a research method to consider but it is an enabling theoretical lens to transcend the colonial history of Egyptology and its entailing homogenization of Egyptian culture.

## Acknowledgements:

My appreciation and gratitude for the lab help by Vanessa Munros (Nano-archaeology lab, UCLA); Alan Farahani (Paleoethnobotany and Ancient Agriculture Lab, UCLA); Atkinson Museum, UK and the spirit of collegiality by Cynthia Sheikholeslami and the coordination for the samples by Campbell Price, Manchester Museum, Helen and Nigel Strudwick, Fitzwilliam Museum, Cambridge and Kara Cooney, UCLA. I also extend my gratitude to Suzanne Onstine; Patricia Podzorski (U of Memphis for field data and sample from the University of Memphis Art Museum). Special thanks to Willeke Wendrich and my colleagues Casey Kirkpatrick and Carrie Arbuckle for their feedback on the grinding experiments. We also indebted with gratitude to Rene Cappers, University of Groningen, Netherlands; <http://www.plantatlas.eu/>