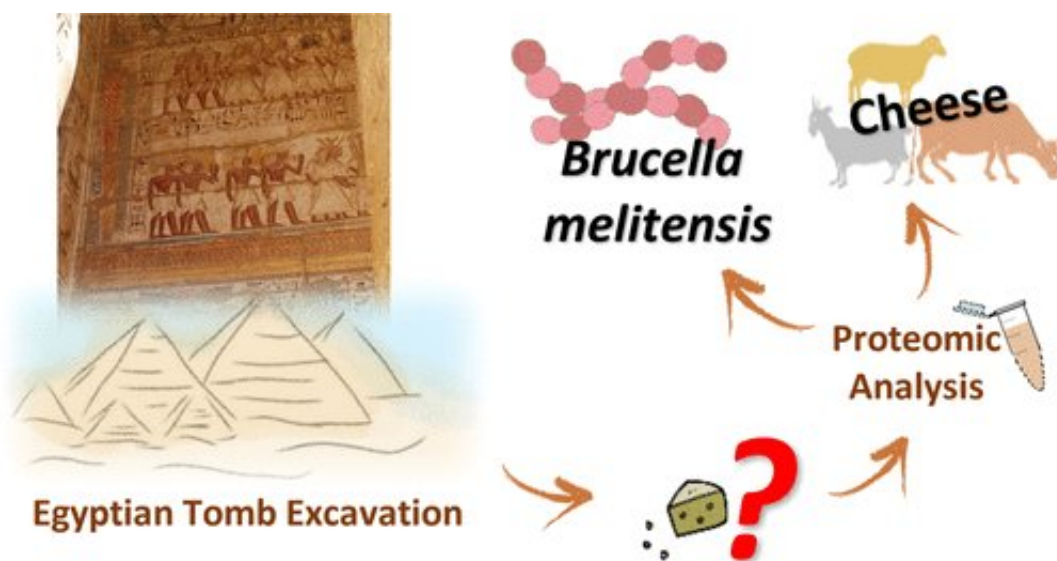


World's oldest cheese found in Egyptian tomb

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Credit: American Chemical Society

Aging usually improves the flavor of cheese, but that's not why some very old cheese discovered in an Egyptian tomb is drawing attention. Instead, it's thought to be the most ancient solid cheese ever found, according to a study published in ACS' journal *Analytical Chemistry*.

The tomb of Ptahmes, mayor of Memphis in Egypt during the 13th century BC, was initially unearthed in 1885. After being lost under drifting sands, it was rediscovered in 2010, and archeologists found broken jars at the site a few years later. One jar contained a solidified

whitish mass, as well as canvas fabric that might have covered the jar or been used to preserve its contents. Enrico Greco and colleagues wanted to analyze the whitish substance to determine its identity.

After dissolving the sample, the researchers purified its protein constituents and analyzed them with [liquid chromatography](#) and mass spectrometry. The peptides detected by these techniques show the sample was a dairy product made from [cow milk](#) and sheep or goat milk.

The characteristics of the canvas fabric, which indicate it was suitable for containing a solid rather than a liquid, and the absence of other specific markers, support the conclusion that the dairy product was a solid [cheese](#). Other peptides in the food sample suggest it was contaminated with *Brucella melitensis*, a bacterium that causes brucellosis.

This potentially deadly disease spreads from animals to people, typically from eating unpasteurized [dairy](#) products. If the team's preliminary analysis is confirmed, the sample would represent the earliest reported biomolecular evidence of the disease.

More information: Enrico Greco et al. Proteomic Analyses on an Ancient Egyptian Cheese and Biomolecular Evidence of Brucellosis, *Analytical Chemistry* (2018). [DOI: 10.1021/acs.analchem.8b02535](https://doi.org/10.1021/acs.analchem.8b02535)

Abstract

The material analyzed in this study is probably the most ancient archeological solid residue of cheese ever found to date. The sample was collected during the Saqqara Cairo University excavations in the tomb of Ptahmes dated to XIX dynasty (El-Aguizy, O. Bulletin de l'Institut Française d'Archéologie Orientale (BIFAO) 2010, 110, 13–34 (ref (1)); Staring, N. Bulletin de Institut Français d'Archéologie Orientale (BIFAO) 2015, 114, 455–518 (ref (2))). Our biomolecular proteomic

characterization of this archeological sample shows that the constituting material was a dairy product obtained by mixing sheep/goat and cow milk. The interactions for thousands of years with the strong alkaline environment of the incorporating soil rich in sodium carbonate and the desertic conditions did not prevent the identification of specific peptide markers which showed high stability under these stressing conditions. Moreover, the presence of *Brucella melitensis* has been attested by specific peptide providing a reasonable direct biomolecular evidence of the presence of this infection in the Ramesside period for which only indirect paleopathological evidence has been so far provided (Pappas, G.; Papadimitriou P. *Int. J. Antimicrob. Agents* 2007, 30, 29–31 (ref (3))); Bourke, J. B. *Medical History* 1971, 15 (4), 363–375 (ref (4))). Finally, it is worth noting that, although proteomic approaches are successfully and regularly used to characterize modern biological samples (D'Ambrosio, C.; Arena, S.; Salzano, A. M.; Renzone, G.; Ledda, L.; and Scaloni, A. *Proteomics* 2008 8, 3657–3666 (ref (5))), their application in ancient materials is still at an early stage of progress, only few results being reported about ancient food samples (Yang, Y.; Shevchenko, A.; Knaust, A.; Abuduresule, I.; Li, W.; Hu, X.; Wang, C.; Shevchenko, A. J. *Archaeol. Sci.* 2014, 45, 178–186 (ref (6))). In the absence of previous relevant evidence of cheese production and/or use, this study, undoubtedly has a clear added value in different fields of knowledge ranging from archaeometry, anthropology, archeology, medicine history to the forensic sciences.

Provided by American Chemical Society

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