

PREHISTORIC CHEESE TECHNOLOGY: EXPERIMENTAL ARCHAEOLOGY WITH REPLICA VESSELS

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Annotation. Ceramic “sieves” are a characteristic pottery form in European prehistory, found from the early Neolithic onwards. Typologically defined as possible “cheese strainers”, this interpretation has been confirmed through the detection of dairy lipids in organic residues from perforated sieve sherds. To explore the feasibility of cheese making in such vessels, we manufactured two replica of Chalcolithic Age ceramic vessels and used them to strain rennet-coagulated cheese. We then utilised these vessels for a public event, providing a tangible way to discuss the cultural origins and biological impact of prehistoric diet.

Key words: Chalcolithic Age, cheese strainers, experimental archaeology.

Introduction

Ceramic “sieves” are a characteristic pottery form in European prehistory, found from the early Neolithic onwards. Typologically defined as possible “cheese strainers”, this interpretation has been confirmed in a 2013 Nature article by Melanie Salque and a team of researchers from the University of Bristol through the detection of dairy lipids in organic residues from perforated sieve sherds from the Linearbandkeramik (5500–5000 BC).¹ In Bulgarian archeology the function of the prehistory ceramic “sieves” is still point of controversy. Some authors considered these vessels as sieves for fruit pulp or honey combs,² or

¹ M. SALQUE, BOGUCKI, P. I., PYZEL, J., SOBKOWIAK-TABAKA, I., GRYGIEL, R., SZMYT, M. AND EVERSHERD, R. P. Earliest evidence for cheese making in the sixth millennium BC in northern Europe, *Nature*, (2013), 493, 522 – 525.

² П. ДЕТЕВ, Праисторическите селища в басейна на р. Мечка, *Годишник на музеите в Пловдив*, 3 (1960), 49.

even proposed function as a fume diffuser against insects.³ The authors of this study vindicate the hypothesis for “cheese strainers”. In order to explore the feasibility of cheese making in such vessels, we manufactured two replica ceramic vessels and used them to strain rennet-coagulated cheese.

Vessel manufacturing

Two replicas were made by Daniela Goralova, based on fragments of pierced pottery recovered from the chalcolithic tell near Iskra, Plovdiv Province, Bulgaria.⁴ (Fig. 1. A1, A2) The vessels

³ В. НИКОЛОВ, *Проучвания върху неолитната керамика в Тракия*. София 1998, 32.

⁴ Р. ИВАНОВ, Р. ИВАНОВ, Керамиката от селищната могила Чамурлу дере при село Искра, община Първомай. – В: *Национални научни студентски четения. Historia est Magistra Vitae. 10 години историко-археологически клуб „Проф. Велизар Велков“*, Пловдив 2009, 30.

were constructed with large hole in the base, similar to the vessels found at prehistoric sites such as Dalbok izvor, Asenovgrad Province, Bulgaria.⁵ Holes (0,3 cm in diameter) were pierced into the vessels by inserting pieces of dry straw from the outside to the inside of the pot once it was formed. (**Fig. 1. B**) The vessels were allowed to dry and then fired. (**Fig. 1. C1, C2**)

Cheese making

In the University Of Food Technology – Plovdiv (Department of Microbiology laboratory) we made soft cheese from unpasteurised organic milk from pasture-fed Bulgarian goats.⁶ The milk was coagulated using commercially available rennet. First, the milk was warmed to 32°C in stainless steel pan, and the rennet added. After coagulation and warming, the curds were cut into pieces to enable further separation of the whey and curds. The curd pieces were then transferred to the ceramic vessels for straining. We found that our replica vessels were able to effectively drain the whey from the curds. (**Fig. 2**) Surprisingly the small holes were not clogged, possibly because of the way that the rennet-coagulated curds “clumped” together.

We also made a number of additional observations which led us to think about the contextual use of these vessels. Firstly, we had to place the sieves within a larger bowl to prevent the whey from flowing everywhere and the sieves from falling over. (**Fig. 3**)

Where the whey would have drained to, was it held in another vessel and was the whey utilized? Unfortunately we cannot answer these questions. Secondly, although we found that the large hole in the base did eventually become clogged with coagulated cheese, it would have been more efficient not to have such a large hole. Was there some kind of plug made from ceramic or organic material, which was then removed

when the cheese had formed a solid mass to enable further drainage? In contemporary cheese making, a fine fabric mesh is often placed within the sieve. Was there a prehistoric equivalent of this, which was placed within vessels?

Public presentation of prehistoric cheese making

After experimenting with cheese making, we demonstrated the use of the vessels during “Researchers’ Night” in the University of Food Technology – Plovdiv, as initiative to present university research to the public. We demonstrated our cheese-making experiment and discussed the biological and cultural origins of cheese making in Bulgaria with members of the public. There is growing public interest in the diets of past populations as a result of the prevailing popular idea that “ancient diet” may represent healthier food choices – a key example of this being the increasingly popular “Paleo Diet”, which excludes dairy products. Cheese making proved a very engaging route into discussing what constitutes a “natural” diet. We debated with visitors about the impact of domestication on our food cultures and health, as well as the impact of milk consumption on the genetics of present-day populations (i.e. the prevalence of lactase persistence). The audience was interested in the antiquity of dairy consumption, but also in how people may have made cheese in the past. The presence of the sieves provided a very tangible way for people to appreciate ancient food preparation technology, and the visual similarity of these vessels to contemporary strainers easily demonstrated the continuity of this dairy processing technique across millennia. Further experimentation may provide new insight into this matter.

Conclusion

We found that making cheese with replica vessels was an informative tool for exploring prehistoric cheese making, and an effective way to discuss prehistoric foodstuffs with the public. The replica vessels were certainly able to strain

⁵ П. ДЕТЕВ, Праисторическите селища, 50.

⁶ Credits to family dairy “Mlechna planeta”, Jelyazno village, Plovdiv Province.

cheese and remove the whey, although we also observed that some aspects of the technique were inefficient. Of course, it is easy for us to comment on the inefficiency of the method, since we have the insight from working with modern equipment which took millennia to develop. Our experiments also led us to consider other aspects of dairy pro-

cessing, in particular what other equipment may have been used alongside the sieves. In future work, we hope to experiment further with replica vessels in order to provide additional insights into prehistoric cheese making, as well as to utilize these replicas to explore lipid and protein preservation in archaeological ceramic vessels.

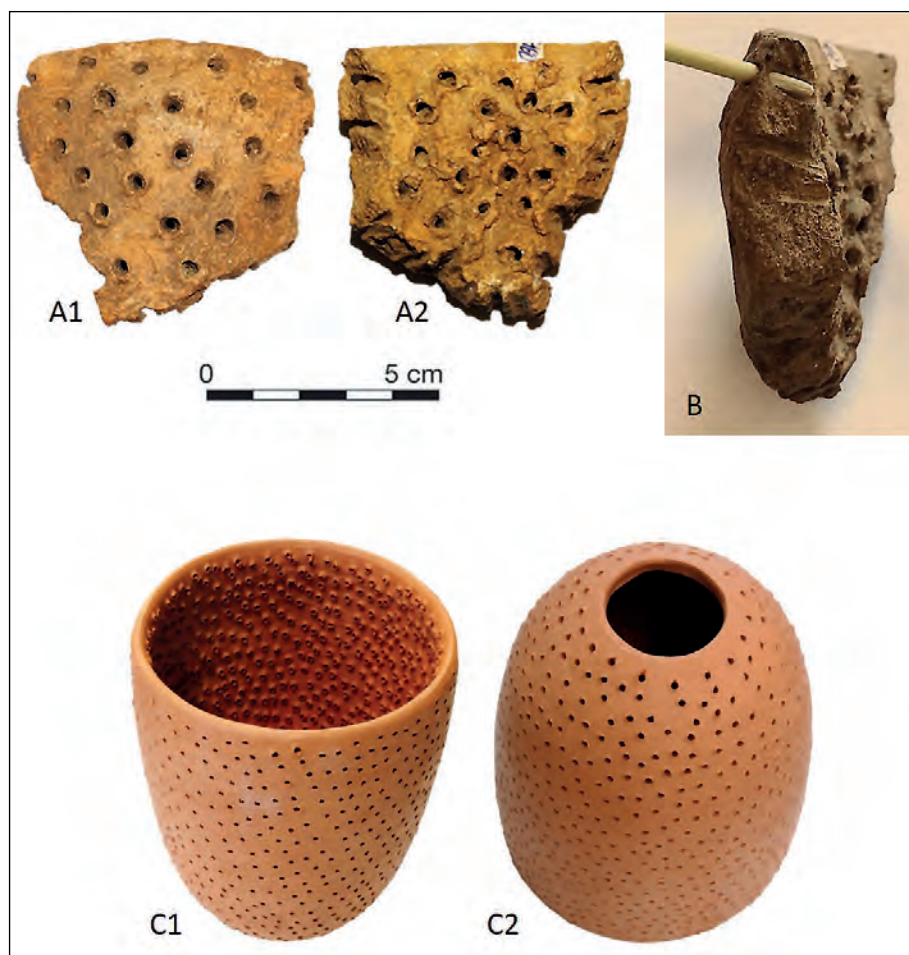


Fig. 1. Fragments of pierced pottery recovered from the chalcolithic tell near Iskra, Plovdiv Province (outside – A1, inside – A2); Holes peering approach by means of dry straw demonstrated on original pottery fragment (B); Replica ceramic sieve (C1, C2).

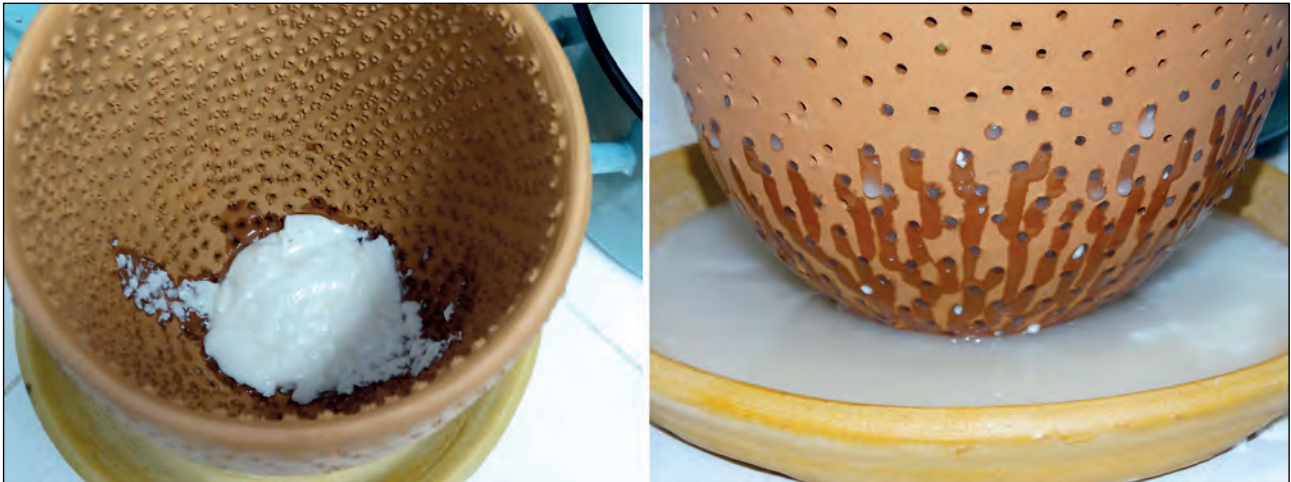


Fig. 2. The curd piece is transferred to the ceramic vessel for straining. The effectiveness of straining the whey from the rennet-coagulated curds in the ceramic sieve is confirmed.



Fig. 3. The sieve is placed within a larger bowl to prevent the whey from flowing everywhere and the sieve from falling over. The process of straining the whey from the rennet-coagulated curds in the ceramic sieve continues until cheese had formed a solid mass.

ТЕХНОЛОГИЯ НА ПРАИСТОРИЧЕСКОТО СИРЕНЕ: АРХЕОЛОГИЧЕСКИ ЕКСПЕРИМЕНТ СЪС СЪДОВЕ РЕПЛИКИ

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Резюме: Известните в праисторическата археология съдове „цедки“ имат конусовидна форма, с отвор на дъното и гъсто перфорирана повърхност. В българската специализирана литература тези съдове са определяни като цедилки (за отцеждане на плодове пулп или мед от восъчни пити) или като димарници (приспособления за прогонване на комари, чрез разпръскване на дим). Пръв тезата за възможното използване на тези „цедки“ като съдове за производство на сирене застъпва полският археолог Peter Boguski, но едва през 2013 г. M. Salque и съавт. публикуват проучване в сп. Nature, в което доказват чрез изотопен анализ наличието на мастни киселини, характерни за млякото, по фрагменти от такива съдове, заключавайки, че това са именно съдове за производство на сирене.

С цел да се провери достоверността на това заключение нашият екип извърши археологически експеримент със съдове реплики, изготвени по модел на намерени в с. Искра (Пловдивско) фрагменти от праисторически „цедки“, както и на един добре запазен съд от селищна могила „Драгинова могила“ при село Дълбок Извор, община Асеновград.

За целите на експеримента в лабораторията на катедра „Микробиология“ в Университета по хранителни технологии беше приготвена смес за сирене от непастъризирано козе мляко с температура 32°C и сирищна мая. Готовата сиренина беше прехвърлена в подготвените съдове-реплики, където беше оставена да отдели суроватката и да се самоотцеди до получаване на свежо сирене. Скоростта на подсирване, качеството на сиренината, рН и органолептичните качества на приготвеното сирене бяха оценени от специалист-технолог.

Експериментът доказва пригодността на използваните съдове-реплики за производство на сирене при условия близки до тези на праисторическия човек (липса на пастъризация, температура, близка до тази на прясно издоеното мляко, използване на естествен сирищен ензим). Отделянето на суроватката от сиренината беше успешно и бързо, а готовото сирене не полепва по стените на съдовете, което потвърждава тяхното функционално предназначение.

Технологията за производство на „праисторическо“ сирене беше демонстрирана успешно пред публика по време на „Ноц на учените“, издание 2018 г., в УХТ – Пловдив.

Ключови думи: халколит, цедки за сирене, експериментална археология.