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News

Earliest cheese-making in central Europe revealed

13 December 2012, by Tamera Jones

Scientists have unearthed the earliest evidence yet of cheese-making. It seems people in Europe have been making the stuff for more than 7000 years.

Selection of cheese.

A UK-led team of researchers found traces of milk fats on sieve-like vessels excavated from Poland dating back to between 5200 and 4800 BC.

The fats, which are strikingly similar to those found on modern cheese strainers, suggest the ancient receptacles were used to separate fat-rich milk curds from liquid whey while making cheese.

The team's findings are published in *Nature*.

Our ancestors probably used pottery to process dairy products like cheese, yoghurt and butter in order to make milk more digestible. Before dairy farming took off, no-one could drink milk. Cow's milk would've given our ancestors stomach pains similar to those experienced by lactose-intolerance people today. This is because milk contains a sugar called lactose, which needs a specific type of enzyme to break it down.

'Neolithic people's guts hadn't yet evolved the enzyme needed to digest lactose. Today, most people in north-western Europe have evolved this enzyme, called lactase, so most of us can drink raw milk,' says Dr Mélanie Salque from the University of Bristol, lead author of the study.

Processing milk was a critical breakthrough for our early ancestors. Yoghurt, cheese and butter all contain much lower levels of lactose than milk, so they're much more digestible. Not just that, but turning milk into butter, cheese or yoghurt would've let them make use of an otherwise indigestible product. The resulting products could be transported easily, and would've lasted much longer than unprocessed milk.

'Ancient dairy farmers' diets would have been enhanced by these dairy products. They're complete - they contain sugar, fat and protein. And you don't need to kill the animal,' says Salque.

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> **Dr Mélanie Salque, University of Bristol**

Previous work by members of the Bristol team suggested that milk was being processed as far back as 8000 years ago in the near East, and nearly 7000 years ago in North Africa. But even though fragments of broken pottery with small holes that looked like cheese strainers start appearing in Europe 7000 years ago, the researchers couldn't be absolutely sure this pottery was used to make cheese products.

'Co-author Peter Bogucki excavated some of the potsherds from sites in Poland in the 1980s. The presence of rare fragments of sieves, and cattle bones - more than 90 per cent of bones were from cattle – at sites made him come up with the theory of cheese strainers,' say Salque.

'But no-one could prove this. Besides, these sieves could have been used to strain all sorts of things such as curds from whey, meat from stock, or honeycombs from honey, or they could have been flame cover.'

'Up until now, evidence of cheese making this far back was merely iconographic, that is to say murals showing milk processing,' she adds.

Murals on cave walls in North Africa show people next to pots, dairy cattle with full udders and even milking scenes, while friezes in Mesopotamia show milking and milk processing scenes.

Now, after analysing organic residues found on the sieve-like vessels, researchers from Bristol, Princeton, Gdánsk, ¿ód¿, and Pozna¿ show that the strainers had indeed been used to process dairy products. The team examined fatty acids trapped in the fabric of the pottery using lipid biomarkers and stable isotope analysis.

'The isotope analysis facility at the University of Bristol was absolutely central to our finding. Determining that the fats were from beeswax, vegetable oil, or animal fats was done by conventional techniques. But it was the isotopic analysis that showed that the animal fats were from milk,' says Salque.

The team even found milk residues in non-perforated bowls, which may have been used alongside the sieves.

But when the researchers analysed cooking pots and bottles that didn't have any tiny holes in them, they found no evidence of milk processing. Instead, the chemicals found in these receptacles suggest they were used to cook meat and store water.

The findings also provide a context for understanding how the lactase gene evolved. It seems it started to evolve right when prehistoric people started eating processed milk products.

The team's work was funded by a Marie Curie Initial Training Network, but analysis

relied heavily on the Natural Environment Research Council's Life Sciences Mass Spectrometry Facility at the University of Bristol.

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