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A taste for milk shows evolution in action

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MOST mammals grow out of drinking milk when they are weaned. Northern European humans don't - and the gene that allows them to digest milk may turn out to provide the first direct example of natural selection at work in modern humans.

Today more than 90 per cent of Europeans can digest milk, but Mark Thomas of University College London has found evidence that this capability only developed during the past 7000 years. For Europeans to have undergone such a rapid change, the ability to digest milk must have held a big evolutionary advantage, Thomas argues.

For the majority of people around the world, the ability to digest a sugar in milk called lactose disappears before they reach adulthood. This happens when a gene for the enzyme lactase, which breaks down the sugar, gets switched off. For people without lactase, consuming milk or milk products leads to symptoms such as bloating and diarrhoea.

To determine when northern Europeans acquired a version of the lactase gene that remains active for life, Thomas's team analysed the DNA from 55 bone samples belonging to eight Neolithic Europeans dated to between 5840 BC and 5000 BC. After extracting the DNA from the fossils, the researchers determined the sequence of the lactase gene for each of the Neolithic individuals. Surprisingly, none of them had the gene variant associated with the ability to deal with lactose that modern-day Europeans have.

Thomas concludes that the mutation for lactose tolerance arose spontaneously in Europe within the past 7000 years and that natural selection quickly ensured its spread (*Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.0607187104). He points out that the ability to digest milk would have given a massive survival advantage to people living a few thousand years ago. Milk from cows is uncontaminated by parasites, making it safer to drink than stream water. It is also available year-round, unlike most crops, and provides

both calcium and some vitamin D, which may be in short supply during the sunlight-starved winters of northern Europe.

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The study offers a window onto past human genetic variation, says bioarchaeologist Clark Larsen of Ohio State University, Columbus.