

Ancient faeces show Iron Age miners ate blue cheese and drank beer

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Ancient faeces found in salt mines in Hallstatt, Austria

Anwora/NHMMW

Fungi found in faeces from Iron Age people who worked in salt mines in what is now Austria suggest that people were eating blue cheese and beer at least 2700 years ago.

There is earlier evidence for ancient cheese, found in Early Bronze Age tombs in Western China from nearly 4000 years ago, but these fossilised [faeces](#) provide the earliest evidence that “people produced cheese with even a flavour that is found in blue cheese”, says [Frank Maixner](#) at Eurac Research in Italy.

The ancient faeces have “entrapped information like a time-capsule”, he says. “This is a fascinating thing.”

Maixner and his colleagues discovered four samples of ancient faeces in the salt mines in Hallstatt, Austria. They sequenced the preserved genomes of the microbes in them. One sample contained the mould species *Penicillium roqueforti*, which is used to create blue [cheese](#) today.

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Although Maixner says environmental contamination is possible, all faeces were found in a similar location within the salt mine but only one of the samples contained *P. roqueforti*, which makes the team confident that the blue cheese was consumed.

“For blue cheeses, you need high salt concentrations, which fits quite nicely in this site,” says Maixner. The team found wooden containers in the mines, which may have been used as cheese strainers, although further analysis of any fat molecules in the strainers is needed to confirm this.

The genetic analysis also revealed the genome of a domesticated strain of the yeast *Saccharomyces cerevisiae*, which is used to make [beer](#), but not other yeast species, which suggests the beer was “probably more like craft beers which are more turbid. It would be more of a pale ale,” says Maixner.

He adds that the constant temperature of 8°C in the salt mines would have provided ideal conditions for beer production.

“It is surprising that salt miners would have such a gourmet appreciation for blue cheeses and fermented beverages. But then blue cheeses are a natural accompaniment to strongly flavoured beers,” says [Patrick McGovern](#) at the Penn Museum in Pennsylvania.

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