

# Researcher finds link between diet, surviving childhood in medieval Italy

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Laurie Reitsema is a bioarchaeologist and assistant professor of anthropology in the UGA Franklin College of Arts and Sciences. She also directs the Bioarchaeology and Biochemistry Laboratory at UGA.

For the past five years, the University of Georgia's Laurie Reitsema has been researching how early childhood living conditions affect individuals' health outcomes as adults.

As a bioarchaeologist and assistant professor of anthropology in the Franklin College of Arts and Sciences, Reitsema studies human remains as a "record from the past."

She recently set out to discover whether medieval Italian children's diets affected their ability to reach adulthood in a study published in the *American Journal of Physical Anthropology*. She was also curious about whether class influenced what foods people ate. The bottom line, she found, was children who did not have much [animal protein](#) and were not breast-fed had a lower chance of survival into adulthood.

"The [medieval period](#) was a really interesting time for people's diets because society was so stratified," said Reitsema, who directs the Bioarchaeology and Biochemistry Laboratory at UGA. "When it came to a person's nutrition, there were really sharp divisions in class; there were sharp divisions between the sexes."

A previous study Reitsema conducted in Trino Vercellese, a small town in Italy's piedmont region about 30 miles from Turin, investigated the link between status and diet during both childhood and adulthood, finding that the majority of people who lived to adulthood ate roughly the same things as children and differentiations between diets of different class members really only appeared when looking at low-status adult males.

Trino Vercellese, a location where many studies have been conducted and much is already known about people's diets and the plants and animals they could have consumed, was a "regular old agrarian village" that typified regular life in the medieval period, Reitsema said. There

were clear status differences between church elites and the general populace in Trino, making it an ideal site to analyze class differences in diet.

For Reitsema, these findings raised the question of whether one's childhood diet ultimately influenced survival to adulthood.

She found that high- and low-status children ate essentially the same diet, with an emphasis on animal-based protein. As the children matured, however, their diets diverged some, with low-status men no longer eating as much protein.

"That wasn't unexpected. We expect low-status individuals to have kind of a pauper's diet—millet, gruels, porridges—but it was strange that the low-status females were still eating the same things as the high-status individuals," she said.

For her new research, Reitsema went back to Trino Vercellese but switched the focus from people who reached adulthood to people who died as children to see if their diets differed as shown by ratios of different isotopes in their teeth and bones.

Bones provide a good idea of what people ate in [adulthood](#) because they continually remodel and are "updated," she said. Teeth, on the other hand, only form once and don't grow and change throughout life the way bones do; they serve as a record of what people ate during their childhood.

"Your weight is actually reducible to the amounts of different elements in your body," Reitsema said. "The carbon in your tissues comes from the foods that you eat."

Different foods have different atomic makeups, and those "signature"

makeups are incorporated into people's own tissues, making it possible to essentially tell what someone's diet was by what's present in their bones, she explained. And that is done through studying isotopic levels.

An isotope is a variant of an atom with the same number of electrons and protons as other atoms of their particular element but a different number of neutrons. Because of that difference, isotopes' weights vary.

She believed non-survivors of childhood would have lower nitrogen isotope ratios, indicating that they ate less animal protein. Her analysis confirmed this suspicion. The role that animal protein plays in supporting childhood growth and development is nothing new, but she wondered if this had always been the case. The ability to study human nutrition in the past using [isotope ratios](#) enables Reitsema to track how food relationships have evolved and changed.

She also found a connection between not being breast-fed as infants and dying young. Some of the children showed no breast-feeding signal, meaning their mothers didn't breast-feed them at all.

"From a health perspective, people made all kinds of bad decisions about child care in the medieval period," Reitsema said. "The reasoning behind abstaining from breast-feeding isn't completely clear, but there is an unusually high incidence of lactose intolerance in Italians, including in infants, that may explain the decision."

**More information:** Laurie J. Reitsema et al. Subadult dietary variation at Trino Vercellese, Italy, and its relationship to adult diet and mortality, *American Journal of Physical Anthropology* (2016). [DOI: 10.1002/ajpa.22995](#)

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