

Pizza, a nascent dairy industry, and infant health in the Peruvian highlands

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What does pizza have to do with infant health in the Peruvian highlands? According to research published in the *American Journal of Human Biology* from Penn anthropologist Morgan Hoke, a whole lot—but it goes beyond the pizza itself.

When families produce the dairy at home to make the cheese that tops that pizza, or when they have chickens to lay eggs or other crops to generate food, infants in those households have better growth rates. "Producing food in the home dramatically increases women's autonomy and economic control," Hoke says. "There's a great amount of literature showing that when women have control of economic resources, more food goes to the children who, in turn, have better health." Hoke's most recent findings add to this body of literature by looking at the relationship between home-produced foods and infant growth.

Her work at this field site in rural Nuñoa, Peru, began in 2012. Nuñoa, with its extreme climate and at elevations 3,850 to 5,500 meters above sea level, sits about 150 miles southeast of Cusco, a frequent starting point for tourists before they climb

Machu Picchu. Twenty-five years ago, Cusco had few pizzerias, and those that were around catered solely to visitors. "As tourism around the region continued to grow, pizzerias started popping up all over," Hoke says.

With an increased demand for pizza came an increased demand for cheese, spurring a nascent dairy industry where one hadn't before existed. "Local governments, NGOs, and communities started pushing dairying as a rural-development strategy," Hoke says. "Farmers there produce cheese and yogurt. All of this [economic change](#) was sparked by pizza."

Yet such change doesn't affect every family the same way. Cows don't produce as much milk in the higher, drier areas, for example, making dairying there less lucrative. Hoke wanted to understand more broadly whether the economic transition simply reproduced known inequalities or lessened them, so she focused on the health and well-being of infants.

During 18 months of fieldwork, the research team enrolled 86 mother-infant pairs that included healthy moms and children younger than 2. Participants answered a survey that asked for basic demographic information about each household, plus about subjects like infant and maternal diet, [water access](#), and food security. The researchers also measured each infant's height, weight, and skin behind the upper arm, which provides data about the body's fat reserves.

"Then we waited six months and did the same survey and took the same measurements again," Hoke says. The results were clear: "Kids whose families produced more food at home at the first time point had better growth at the second time point. Interestingly, you can't see the benefit in the moment, though. You have to wait until the second set of measurements to see it."

Though the finding itself was not unexpected, Hoke says she may not have thought to pursue this line of research had she not conducted a dozen-plus ethnographic interviews with mothers there. "They would tell me that dairying has been so helpful because it provides a reliable source of [food](#) and income that comes directly to them rather than through their husband," she says. "It got me thinking."

Hoke has other ongoing research in Nuñoa. She is currently studying the relationship between maternal and infant gut microbiomes, as well as seeking out blood-based markers for intestinal permeability, a condition that occurs when [infants](#) are chronically exposed to pathogenic gut bacteria and subsequently have difficulty processing carbohydrates.

In the future, she plans to examine climate change and water vulnerability there. "We think the water table is going to be empty in 20 years or so. It's totally unsustainable," she says. "The amount of water that the alfalfa and the cows take is draining the water rapidly." That project, originally slated to begin this past summer, is on hold until after the pandemic.

For now, Hoke is focusing in on what she's learned so far about the implications of a young dairy industry in the Peruvian highlands. Her hope is that it will continue to shed light on [infant health](#), one cheese-topped pizza slice at a time.

More information: Morgan K. Hoke. A biocultural examination of home food production and child growth in highland Peru, *American Journal of Human Biology* (2020). [DOI: 10.1002/ajhb.23438](https://doi.org/10.1002/ajhb.23438)

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