

Identifying poverty levels requires accurate measurements

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When food prices spiked in 2008, the number of households that moved into poverty was overestimated by about 60 percent, according to a recent University of Illinois study. In middle-income countries such as Mexico that have more diversity in their diets, households are able to substitute other foods and cope with the change in prices.

"In 2008, there was a lot of quick-response research trying to measure the poverty effect across the world from the food price increase," said U of I [agricultural economist](#) Carl Nelson.

"They adopted an older research method and looked at what the household consumption bundle was, multiplied by the price increase to determine how much income they lost. The [World Bank](#) Studies reported that 13 million households were moved into poverty, but that number was overestimated by about 6 million households because it didn't take into account the ability for households to substitute foods in their diet."

In the study, Nelson and his colleagues argue that the simplified equation to calculate income loss fails to recognize that when a household has variety in their diet, and one food item becomes more expensive, they have the ability to switch to other items that have become relatively less expensive.

"If you measure the income loss assuming no change in quantity, no ability to substitute, you get a much bigger income loss than if you

measure it correctly accounting for the change," Nelson said. "The method we used is based on the [economic theory](#) of household consumption, but it takes the budget constraint seriously and accounts for both the reduction in consumption of more expensive goods as well as the increase in expenditures on relatively less expensive goods."

Mexico is a good example, Nelson said, because although tortillas are a staple, [Mexicans](#) also have access to [dairy products](#), meat, [fruits and vegetables](#), and beans. He explained that, if in 2008 corn became much more expensive and corn is the primary feed for chicken in Mexico, then chicken would become more expensive because of the higher cost of the feed.

"If you assume that the household is consuming the same amount of chicken that they consumed before the price increase, you get a much larger income loss for that household," he said. "But if you recognize that a household could substitute beans and cheese for the chicken, and include that in the equation, the measure of income loss from a price change accounts for the full range of household adjustment in consumption."

Nelson said that when this new statistical model meets the data, it accounts for the behavioral theory of household consumption, such as the ability to switch to a lower-priced protein. The older studies fail to do that, producing a significant misinterpretation of the data.

Other methods to measure income changes due to food spikes have underestimated the poverty effect, Nelson said. The problem arises by not recognizing the entire household budget.

"When the price of chicken goes up, households face a budget constraint," Nelson said. "When they reduce the amount of chicken they buy, they don't save that, they use that money to increase their

consumption of beans, and so by only measuring the reduction, they're actually underestimating the income loss because they're not accounting for the increase in expenditure on the goods that they are substituting for the relatively more expensive good."

Understanding a food price spike requires accurate estimation, Nelson said, because the information about that effect is needed to accurately determine the need and the level of policy response. He cited Mexico's successful conditional cash transfer program for poor households called Oportunidades in which a household must satisfy a condition, such as accessing health care, in order to qualify for the cash transfer.

"In response to food price shock, one of the Mexican policy responses was to increase Oportunidades payments to households," Nelson said.

"Correctly identifying income loss is important when governments need to adopt policies that involve giving back some of the loss," Nelson said. "You need an accurate measure of the monetary loss in order to not over- or underpay."

Poverty effects of food price escalation: The importance of substitution effects in Mexican [households](#) was coauthored by U of I economist Lia Nogueira and U of I Ph.D. candidate Benjamin Wood and was published in *Food Policy*.

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