# Curbing waste improves global food security but has limited environmental benefits

UC Irvine, CU Boulder researchers find that better efficiency leads to more consumption

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Steven Davis, UCI professor of Earth system science, says: “There is a tension between the two objectives of eliminating food waste and increasing food security. Improving supply chain efficiency and thereby lowering food costs could help make food more affordable in less-advantaged countries. But, especially in those places, we may need to adjust our expectations about the environmental benefits of

avoiding waste and loss.”

Picture Credit:
Steven Davis / UCI

**Irvine, Calif., July 24, 2023** – Reducing waste is one way to help combat hunger around the world, but stricter control over food loss and waste does not lead to better environmental outcomes, according to researchers at the University of California, Irvine and the University of Colorado Boulder.

In a paper published recently in *Nature Food*, the scientists stress that curbing food spoilage increases the amount of produce in markets, which leads to lower costs. Cheaper food encourages people to buy and eat more, offsetting the lowering of greenhouse gas emissions when more goods reach tables.

“Let’s say the price of cereals goes down because of improvements in food system efficiency; now you can afford to eat the same amount more often,” said lead author Margaret Hegwood, a Ph.D. candidate in the Cooperative Institute for Research in Environmental Sciences at CU Boulder. “Consumers respond to these price decreases, purchasing more than they had before, which offsets some of the benefits of reducing the food loss and waste.”

Co-author Steven Davis, UCI professor of Earth system science, said, “The elimination of food loss and food waste has been promoted by scientists and advocates as a way to reduce adverse environmental impacts of food production. There is a sound basis for this reasoning: Loss and waste along the supply chain accounts for as much as a quarter of global food system greenhouse gas emissions and 6 percent of total emissions worldwide.”

But Davis said he and his fellow researchers found in their modeling a “rebound effect” whereby efficiency improvements cause price decreases and consumption increases. They suggest that this outcome could offset up to 71 percent of the benefits of cutting down on food loss and waste.

“Our model basically formalized Econ 101: Reducing food loss and waste shifts the supply and demand curves, respectively. How sensitive supply and demand are to prices – which we get from previous research – then determines how much we project food prices and consumption will change,” said co-author Matt Burgess, assistant professor at the CU Boulder institute.

“There is a tension between the two objectives of eliminating food waste and increasing food security,” Davis said. “Improving supply chain efficiency and thereby lowering food costs could help make food more affordable in less-advantaged countries. But, especially

in those places, we may need to adjust our expectations about the environmental benefits of avoiding waste and loss."

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