

Reducing food waste: A smaller environmental win than expected?

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A new CU Boulder study suggests that eliminating food loss and waste would not fully eliminate the environmental cost of that waste; it would, however, improve food security, globally. Credit: Wikimedia, Creative Commons CC0 1.0

Decreasing food loss and food waste may not have the environmental benefits researchers, advocates, and policymakers expect, but it could increase access to more affordable food for people worldwide, a new University of Colorado Boulder study suggests.

For years, eliminating food loss and food waste has been promoted as one of the most important actions humans can take to reduce the environmental impacts of the food system. And not without reason: food loss and waste along the supply chain account for as much as 24% of global food system GHG emissions and 6% of [total emissions](#) worldwide. The total loss and waste worldwide amount to an average of 527 calories per person per day.

The paper, published in *Nature Food*, suggests decreasing food loss and waste will have less of an environmental benefit than previously thought. Instead, [food prices](#) will go down, and people will eat more.

For the new work, a CIRES-led team considered the full impacts of reducing food loss and food waste, using guidelines set by the [United Nations Sustainable Development Goals](#) in 2021.

The study looked at food loss (damaged or spoiled before reaching retailers) with waste (spoiled or thrown away by consumers or retailers). Using these definitions, loss occurs on the supply side, while waste takes place on the demand side.

Margaret Hegwood, lead author of the study, and a CIRES/CU Boulder Ph.D. candidate, explained to understand the environmental benefits of reducing food waste and food loss, one must also consider the full picture of reducing waste: More food available would lead to lower prices, and that would create predictable changes in people's behavior.

"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 Hegwood. "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."

The authors used a simple model that looked at supply and demand responses to reducing food waste and food loss.

"Our model basically formalized ECON 101: reducing food loss and waste shifts the supply and demand curves, respectively," says Matt Burgess, co-author of the study and CIRES/CU assistant professor. "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"

The offset is significant, and the authors found that reducing food loss and waste by 100%, decreases 1/2 to 2/3 of the predicted environmental benefits.

While the study modeled what might happen if food waste and loss are reduced, the authors don't make assumptions about how both will be reduced. There are various solutions, and they all depend on food type, region, consumption habits, access to technology, politics, and dietary needs.

Similar studies have looked at the impacts of decreasing food loss and food waste at the regional or country scale, but Hegwood and Burgess say it's the first study they know of that looks at the global level.

Overall, Hegwood hopes this study can shift the conversation from its focus on the environmental benefits of reducing [food waste](#) and loss to recognizing the food security benefits.

"And I think likely, at least to some extent, that this could mean that our efforts to reduce food loss and [waste](#) could actually not be as beneficial for the environment as we think they could be, but it's super beneficial in terms of food security," said Hegwood. "And I think that is very important for people to think about."

More information: Rebound effects could offset more than half of avoided food loss and waste, *Nature Food* (2023). [DOI: 10.1038/s43016-023-00792-z](#)

Provided by University of Colorado at Boulder

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