

# Researchers illuminate resilience of U.S. food supply chains

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Structural chokepoints correspond to the freight transit hubs within the United States in 2017. a, Structural chokepoints for the FAF-scale aggregated agri-food network. b, Structural chokepoints for the county-scale aggregated agri-food network. c, Logistics sector revenue (in US\$) computed with the data in Supplementary Table 2 at the county scale. Darker red indicates higher logistics sector revenue—the freight transit hubs within the United States. The logistics sector data to identify transit hubs are directly adopted from the literature. Credit: *Nature Food* (2023). DOI: 10.1038/s43016-023-00793-y

Researchers have identified a number of chokepoints in U.S. agricultural and food supply chains through a study that improves our understanding of agri-food supply chain security and may aid policies aimed at enhancing its resilience. The work is presented in a paper published in the July 20, 2023, issue of the journal *Nature Food*, "Structural chokepoints determine the resilience of agri-food supply chains in the United States," by authors including CEE Associate Professor Megan Konar and CEE Ph.D. student Deniz Berfin Karakoc.

The agricultural and food systems of the United States are critical for ensuring the stability of both domestic and global food systems, so it is essential to understand the structural resilience of the country's agri-[food supply](#) chains to threats, researchers write. Because the United States plays a key role in a highly integrated global food system, the resilience and security of the U.S. food supply chain has implications for global food security. Additionally, agricultural and food system security and resilience is increasingly recognized as a non-traditional defense objective in the [national security](#) community and is critical to the mission of U.S. national defense agencies.

"We were inspired to perform this research due to the supply chain disruptions during the pandemic and in response to the Executive Order on America's Supply Chains, which highlights the importance of supply chains for national security," Konar says. "We hope this research can contribute to more resilient and secure food supply chains."

Chokepoints are locations that are critical for distributing agri-food commodities throughout the country. While much research on agri-food supply chains has been from the perspective of industrial firms with a focus on logistics, cost-savings and resilience, the researchers took a national and global security perspective due to growing threats such as pandemics, [extreme weather events](#), climate shocks, and cyber and terrorist attacks. The researchers employed a complex network approach to determine the chokepoints within the agri-[food](#) supply chains in the continental U.S. for the years 2007, 2012 and 2017. They found that chokepoints were generally consistent over time.

Co-authors also include Michael J. Puma of the Center for Climate Systems Research at Columbia University and Lav R. Varshney of the Department of Electrical and Computer Engineering at the University of Illinois Urbana-Champaign.

**More information:** Deniz Berfin Karakoc et al, Structural chokepoints determine the resilience of agri-food supply chains in the United States, *Nature Food* (2023). [DOI: 10.1038/s43016-023-00793-y](https://doi.org/10.1038/s43016-023-00793-y)

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