PURDUE UNIVERSITY®

College of Agriculture

A Year in Review:
Center for Food Demand Analysis & Sustainability *(CFDAS)*

2023

A Year in Review:

Center for Food Demand Analysis & Sustainability *(CFDAS)*

Overview

The **Center for Food Demand Analysis and Sustainability (CFDAS)** at Purdue creates, interprets and communicates data-driven insights into consumer preferences and behavior in food markets.

The CFDAS is housed in the Department of Agricultural Economics – home to 41 faculty and 51 staff and ranked 4th in the world by the Center for World University Rankings. We leverage multidisciplinary expertise from across Purdue's College of Agriculture to advance understanding of food demand and the food system.

The Center produces timely analyses and insights on emerging trends across four primary categories:

- Food prices
- Food production and supply
- Consumer food spending
- Consumer preferences, attitudes, knowledge and beliefs

The Center conducts and supports research at the cutting-edge of consumer behavior in food markets and funds food demand research by faculty affiliates across the University. We publish our research in the top academic journals, and communicate our findings to a broader audience through our website and news media. We also tailor custom analyses and reports for industry partners. Since January 2022, the Center has conducted its monthly Consumer Food Insights survey to track trends and changes in consumer food purchasing and preferences across the U.S. The CFDAS also produces a variety of data dashboards to make the food system more understandable for consumers, policy makers and the farms and firms working throughout the food system.

Shifting consumer preferences and growing focus on food sustainability will continue to profoundly impact food processing and farming in the future. The ability of agribusinesses and farmers to design, produce and deliver crops with specific attributes for consumer segments is evolving at a rapid pace. Data-driven insights from the CFDAS will help researchers, growers and businesses assess the challenges facing these innovations and conceive potential solutions.

Our Team

Joseph Balagtas
Interim Director of the Center for Food Demand Analysis and Sustainability, Professor of Agricultural Economics
Provides strategic direction and cultivates internal and external relationships.

Jinho Jung
Postdoc
Provides data analytic support for research projects, writes grants, research reports and journal articles.

Rick Evans
Senior Manager
Leads day-to-day operations, manages staff, coordinates activities, manages and executes sponsored program projects, ensures timely execution of deliverables, manages budget and expands resources.

Ashvini Malshe
Communication Specialist
Writes and edits news releases, reports and promotional content and creates social media and web content.

Elijah Bryant
Survey Research Analyst
Responsible for achieving research objectives through the creation, administration, dissemination, analysis and communication of surveys.

Caitlinn Hubbell
Market Research Analyst
Conducts market research and writes reports on market trends and competitive analysis.

Annapurni Subramaniam
Research Data Analyst and Visualization Specialist
Designs, develops and maintains online dashboards.

Gustavo Valencia
Lead Research Data Analyst
Leads data initiatives to support research that seeks to increase and promote the Center's ability to steward, integrate and analyze data in repeatable ways that lead to reproducible research results.

Ahmad Zia Wahdat
Lead Research Economist
Leads research projects, contribute to research grants, surveys and data analytics.

Miyeon Son
Postdoc
Constructs mathematical and economic models for research projects, write grants, research reports and journal articles.

Leadership News: In Fall 2023, Jayson Lusk departed Purdue and the Center to take on a new role as Vice President and Dean of the Division of Agricultural Sciences and Natural Resources at Oklahoma State University. We thank Professor Lusk for his vision in establishing the CFDAS, and we wish him the best in his new role.

Institutional Collaborators

We partner with key players in the agricultural and food industries and across the Purdue campus to produce and disseminate research and related content about the economic dynamics of the food supply chain.

Organizations & Centers

- Foundation for Food & Agriculture Research
- United States Department of Agriculture
- United Soybean Board
- Food Entrepreneurship and Manufacturing Institute
- Digital Innovation in Agri-food Systems Laboratory (DIAL)
- Plant Sciences 2.0
- Purdue University Agricultural Economics
- Purdue University Center for Food and Agricultural Business
- Mission: Ingredients
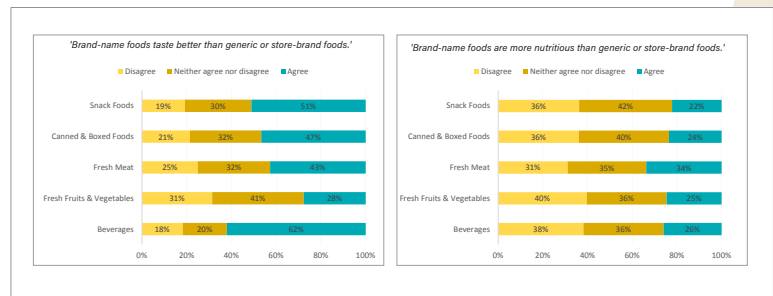
Faculty Affiliates

- Jonathan Bauchet
- Maksym Chepeliev
- Heather Eicher-Miller
- Brenna Ellison
- Kajal Gulati
- Thomas Hertel
- Bhagyashree Katare
- Valerie Kilders
- Meilin Ma
- Maria Marshall
- Jacob Ricker-Gilbert
- Juan Sesmero
- Tor Tolhurst
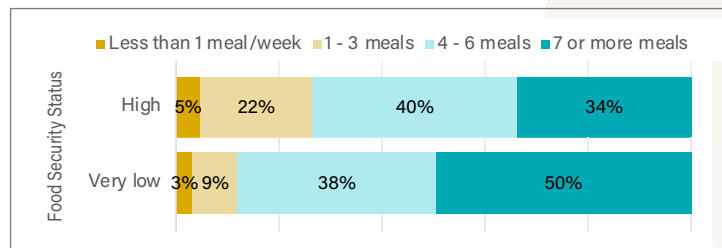- Nicole Widmar

CONSUMER FOOD INSIGHTS (CFI)

In February 2022, the CFDAS introduced the first of its Consumer Food Insights (CFI) Report, tracking trends in food demand, satisfaction, food security and other food sustainability behaviors. Each month, the CFDAS surveys 1,200 households from across the U.S., taking a pulse on what consumers are thinking, what they can afford and what food attributes are most important to them to produce a report that helps to guide farmers and retailers along the supply chain.

A Consumer Food Insights dashboard provides access to data on shopping and eating habits, which can be filtered by specific time frame, region and demographic. The monthly reports also utilize specific demographic measures that during the past year have included personal political beliefs, age, race and ethnicity and household size, among others. The Center highlights and analyzes key findings, which leads to a broader understanding of national trends in food insecurity, spending and satisfaction.

- **Volume 2, Issue 12: December 2023**
  The twenty-fourth Consumer Food Insights Report from Purdue University highlights consumer behaviors related to food safety, age and out-of-stock trends.

- **Volume 2, Issue 11: November 2023**
  The twenty-third Consumer Food Insights Report from Purdue University analyzes consumer behaviors related to food labels and food safety.

- **Volume 2, Issue 10: October 2023**
  The twenty-second Consumer Food Insights Report from Purdue University explores consumer food behaviors related to Thanksgiving across U.S. regions.

- **Volume 2, Issue 9: September 2023**
  The twenty-first Consumer Food Insights Report from Purdue University explores consumer beliefs about brand-name vs. generic or store-brand foods.

- **Volume 2, Issue 8: August 2023**
  The twentieth Consumer Food Insights Report from Purdue University looks closer at consumer food beliefs according to political ideology, revisiting the August 2022 focus.

Brand Beliefs by Food Category, Sept. 2023

- **Volume 2, Issue 7: July 2023**
  The nineteenth Consumer Food Insights Report from Purdue University looks closer at different levels of food satisfaction using the conceptual labels of suffering, struggling and thriving.

- **Volume 2, Issue 6: June 2023**
  The eighteenth Consumer Food Insights Report from Purdue University looks closer at different annual household income categories and related consumer behaviors.

- **Volume 2, Issue 5: May 2023**
  The seventeenth Consumer Food Insights Report from Purdue University looks closer at consumer spending according to food spending per person, per week.

- **Volume 2, Issue 4: April 2023**
  The sixteenth Consumer Food Insights Report from Purdue University looks closer at consumer preferences related to differences in food behaviors by food security instead of demographics. It also explores the role of dollar stores in the food landscape.

Rate of Households Eating Home-Cooked Meals Per Week by Food Security Status, May 2022 - Apr. 2023

- **Volume 2, Issue 3: March 2023**
  The fifteenth Consumer Food Insights Report from Purdue University looks closer at consumer preferences related to employment status and new data reveals consumers' experiences with food labels.

- **Volume 2, Issue 2: February 2023**
  The fourteenth Consumer Food Insights Report from Purdue University looks closer at the religious demographics of consumers and includes new data on frozen food preferences.

- **Volume 2, Issue 1: January 2023**
  The thirteenth Consumer Food Insights Report from Purdue University delves into potential changes to consumer eating behaviors related to New Year's resolutions, among other key findings.

# DATA & RESOURCES

Data Dashboards

PRICE

- **Egg Prices**, since September 27, 2023
  - This dashboard tracks daily prices and trends across the U.S. for different types of eggs, including Cage-Free, Conventional, Free-Range, Organic and Pasture-Raised.

- **The Cost of a Thanksgiving Meal**, since November 18, 2022
  - This dashboard provides the National Average Price, Price per Meal item, Price Point and Price Ranking by State for a 12-person Thanksgiving meal.

- **The Cost of a Cheeseburger**, since October 13, 2022
  - This dashboard provides the average cost of a cheeseburger by U.S. state over time across different categories. It also provides the cost for each item of the cheeseburger by U.S. state over time and ranks prices by state.

- **Average Food Prices**, since February 7, 2022
  - This dashboard reports average food prices and their trends over time for various food items across three perspectives.

- **Changes in U.S. Food Prices**, since December 10, 2021
  - This dashboard shows price changes and trends (since 2010) of various food items. The dashboard also shows changes for 'All Items,' which represents all goods and services purchased for U.S. consumption.
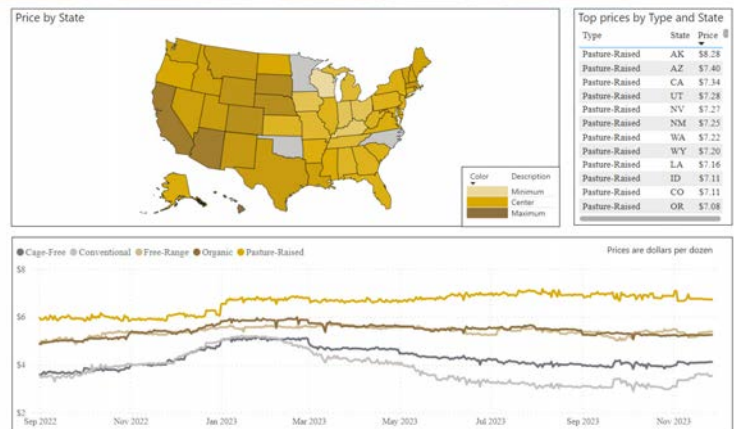
Egg Prices - Inflation adjusted

SUPPLY & PRODUCTION

- **Changes in Food Sector Wages and Hours Worked**, since April 4, 2023
  - This dashboard tracks trends in percentage changes from January 2006 to the latest CPI publish date. Featured sectors include food wholesalers and food processing, among others.

- **Food Sector Wages and Hours Worked**, since March 17, 2023
  - This dashboard tracks trends from January 2006 to the latest CPI publish date. Featured sectors include food wholesalers, food processing, grocery and other food retailers.
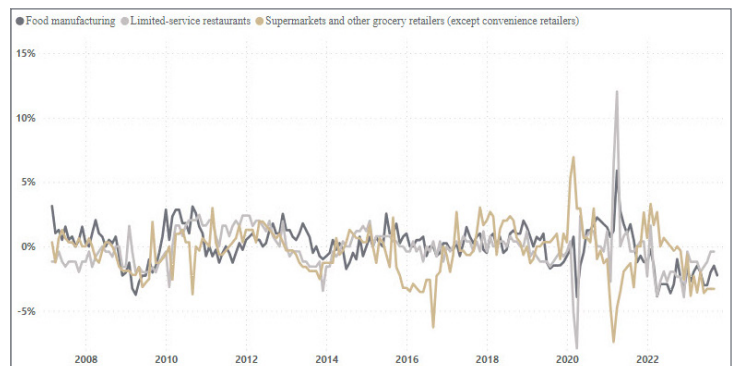

Changes in Food Sector Wages and Hours Worked

- **Economic Profile of Food Service Industries**, since March 31, 2022
  - This dashboard explores the economic profile of all U.S. states for three selected food service industries – "Restaurants and Other Food Industry", "Food Services Industry" and "Drinking Places Industry."
- **Food Industries' Vulnerable Input Purchases via Exposure to Upstream Industries and Labor Occupations,** since November 30, 2021
  - This dashboard characterizes the vulnerability of input purchases for each food industry within each U.S. state.
- **Food and Beverage Industries' Value Added by U.S. State,** since October 22, 2021
  - This dashboard provides information on the food and beverage industries' production value, revenue, costs, and employment.
- **Food and Beverage Industries' COVID-19 Vulnerability Index by U.S. State and Counties,** since October 22, 2021
  - This dashboard presents the estimated production value that could be lost due to COVID-19 illness among industry workers.
- **Food and Agriculture Vulnerability Index**, since March 20, 2020
  - This dashboard shows the estimated number of agricultural workers with COVID-19. The map and table show the total number of COVID cases in each state.

CONSUMER SPENDING

- **Trends in Grocery Delivery Sales**, since May 8, 2023
  - This dashboard tracks sales for grocery delivery based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.
- **Trends in Food and Beverage Sales**, since May 8, 2023
  - This dashboard tracks sales for food and beverages based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.
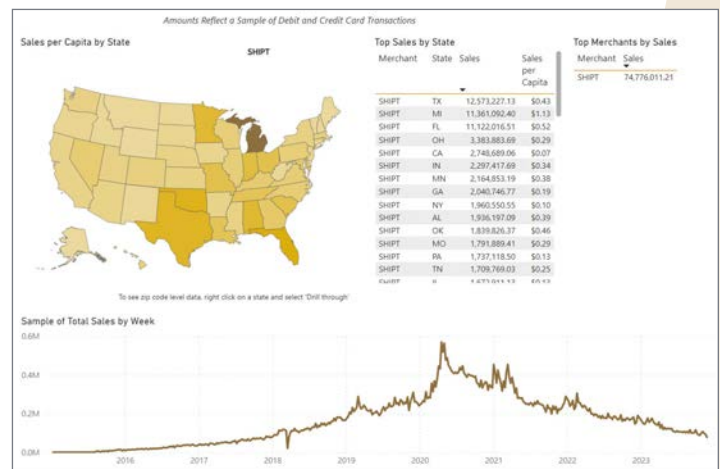

Trends in Grocery Delivery Sales

- **Trends in Convenience Stores Sales**, since May 4, 2023
  - This dashboard tracks sales at convenience stores based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.
- **Trends in Food Services Sales**, since May 4, 2023
  - The Trends in Food Services Sales dashboard tracks sales for food services based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.
- **Trends in Dollar Stores Sales,** since April 25, 2023
  - This dashboard tracks sales at dollar stores based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.
- **Trends in General Retail Sales**, since April 19, 2023
  - This dashboard tracks retails sales based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.
- **Trends in Grocery Sales**, since April 7, 2023
  - This dashboard tracks grocery sales based on a sample of debit and credit card transactions. The location of the debit/credit cardholder is based on the cardholder's address in the financial institution's records.

- **Food Delivery Sales,** since January 17, 2023
  - This dashboard tracks trends in dining sales based on sample debit and credit card transactions.
- **Consumer Food Expenditures,** since May 23, 2022
  - The Consumer Food Expenditures dashboard provides insight into consumer spending by year and by household income.
- **Casual Dining Sales,** since January 12, 2022

CONSUMER PREFERENCES AND FOOD MARKET PERFORMANCE

- **U.S. Food Insecurity**, since December 12, 2022
  - This dashboard tracks the national rate of food insecurity by aggregating academic, governmental and nonprofit survey data.
- **#Meat**, since July 25, 2022
  - This dashboard explores the sentiment and volume of #Meat mentions on social media and through the news.
- **Consumer Food Insights Dashboard**, since May 5, 2022
  - This dashboard describes behavioral data compiled monthly from a national survey of 1,200 Americans called Consumer Food Insights and run by the CFDAS.
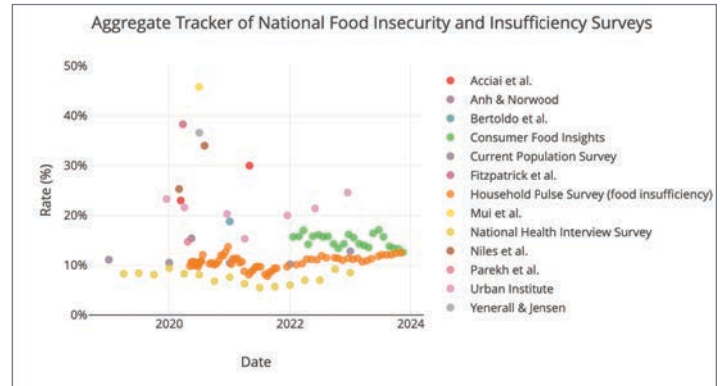

U.S. Food Insecurity

*INFO*GRAPHICS

The Center produces timely and data-driven infographics that give a snapshot of the nuances of food items and prices across the country. The data featured in each infographic underlines the food price and budgeting realities that consumers may face in their day-to-day lives, given national holidays, inflation trends and other events that affect the national food supply-chain.

- **Dine In and Dash! Casual Dining & Food Delivery Trends in the U.S.**
  - Consumer spending at casual dining restaurant chains and food delivery companies experienced a dramatic rise during the COVID-19 pandemic. Using credit and debit card transaction data from the firm Facteus, we've got the numbers on how consumers across the U.S. have dined in and dashed food from various merchants over the past three years.
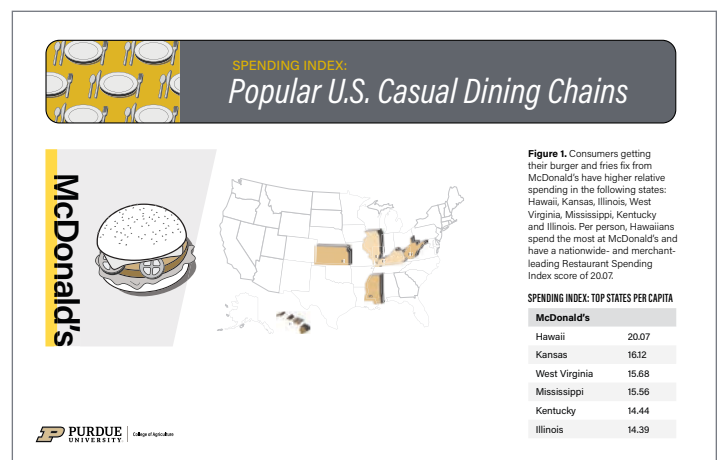
Casual Dining & Food Delivery Trends in the U.S.

CHEW ON THIS!

In Fall 2023, the Center created a new blog series serving up timely consumer insights with a side of impact. With the series, the Center aims to unpack timely trends and topics related to their consumer food insights products. This includes interactive data dashboards, infographics, research projects and collaborations with internal and external partners.

- **Looking backward to look forward: Food prices in 2024**
  - Joseph Balagtas and Caitlinn Hubbell revisit last month's topic of economic gloom and predict food prices over the next year, and the potential impact on American wallets.
- **Economic Gloom: Making sense of the confusion over the state of the economy**
  - Joseph Balagtas discusses food inflation trends and resulting consumer sentiments.
- **Egg prices: The data tell the story**
  - The CFDAS has built a new data dashboard that will help consumers, the egg and food industries and policy makers track the performance of the egg market.

RESEARCH PUBLICATIONS

- Bir, C., **Jung, J.**, Tao, J., Widmar, N. O. 2023. Online Grocery Shopping Practices and Intentions Shaped by Pandemic-Era Experiences. Journal of Food Distribution Research. In Press.
- Dong, X., **Balagtas, J.**, & Byrne, A. T. (2023). A closer look at the relationship between concentration, prices, and market power in food retail—A monopolistic competition and differentiated products approach. Agricultural & Applied Economics Association, 45(4), 2161-2182. https://doi.org/10.1002/aepp.13344
- Ellman, B., Bir, **C., Jung, J.**, Widmar, N. O., Foster, K. 2023. # Buzz: Exploring Public Interest in Pollinators, Bees, and Honey Using Online Media Data. Telematics and Informatics. 102000. https://doi.org/10.1016/j.tele.2023.102000
- **Jung, J.**, Widmar, N. O., Ellison, B. 2023. The curious case of Baby Formula in the United States in 2022: cries for urgent action months after silence in the midst of Alarm Bells. Food Ethics. 8(1), 4. https://doi.org/10.1007/s41055-022-00115-1
- Nuño-Ledesma, J. G., Wu, S. Y., & **Balagtas, J.** (2023). Taxing sugar-sweetened beverages: A nonlinear pricing approach. American Journal of Agricultural Economics. https://doi.org/10.1111/ajae.12416
- Samuel S. Polzin, Jayson L. Lusk, **Ahmad Zia Wahdat**, "Measuring sustainable consumer food purchasing and behavior", Appetite, Volume 180, 2023.

UNDER REVISION OR REVIEW

- **Jung, J.**, Widmar, N. O., Lusk, J. 2023. Societal Implications of Personalized Pricing in Online Grocery Shopping. Food Ethics. Revised and Resubmitted.

- Kim, Y., **Jung, J.**, Yu, K., Kim, S., Widmar, N. O. 2023. Spatial Differentiation in Food Service Pricing: An Explorative Study with Web-Scraped Data. International Food and Agribusiness Management Review. Under Review.

- **Wahdat, Ahmad Z.**, and Jayson L. Lusk. "Extreme Weather Events and Consumers' Dynamic Food Shopping Behavior." (*Was presented at the Italian Agricultural and Applied Economic Association in Milan, Italy in June 2023).

- **Wahdat, Ahmad Z.**, and Jayson L. Lusk. "Stockpiling, Grocery Shortages, and Consumer Shopping Behavior."

- **Wahdat, Ahmad Z.**, Yuansen Li, and Jayson L. Lusk. "Spatial Vulnerability of the U.S. Meatpacking Industry." (Submitted to a field journal)

IN PROGRESS

- **Jung, J.**, Sesmero, J., Siebert, R. 2023. Using Pre- and Post-Entry Data to Identify the Effect of Ethanol Expansion on the Spatial Pattern of Corn Prices: A Study in Indiana. To be submitted to American Journal of Agricultural Economics.

- **Jung, J.**, Barrett, L., Widmar, N., Ortez, M. 2023. Perceptions of Universities as Public Entities: Comparing Purdue University and Indiana University during the COVID-19 Pandemic Era. To be submitted to Journal of Marketing for Higher Education.

- **Jung, J.**, Widmar, N. O., Quagrainie, K. 2023. Quantifying Online and Social Media About Fish and Shellfish in the United States.

- **Jung, J.**, Kim, Y., Siebert, R., Lusk, J., Nicole, N. W., **Balagtas, J.** Spatial Pricing Differentiation of Fast-Food Restaurant; A Study with Web-Scraped Data.

- **Jung, J.**, Lusk, J., Balagtas, J. Food prices and its dispersion using Web-Scraped data.

- **Wahdat, Ahmad Z.**, **Caitlinn B. Hubbell, Elijah H. Bryant, Joseph V. Balagtas**, and Jayson L. Lusk. "Risk Preference, Risk Perceptions, and Risky Food Behavior."

CONFERENCE PRESENTATIONS

- Jo, J., Lusk, J., Adjemian, M. K., Widmar, N. O., **Jung, J.** 2023. Predicting Food Prices Using Data from Consumer Surveys and Consumer Behaviors in Online Spaces. Conference Presentation at AAEA 2023, Washington, D.C.

- Kim, Y., **Jung, J.**, Yu, K., Kim, S., Widmar, N. O. 2023. Spatial Differentiation in Pricing Strategy of Restaurant Business: An Explorative Study with Network Analysis based on Web-Scraped Data from a Delivery Application. Conference Presentation at AAEA 2023, Washington, D.C.

- **Wahdat, Ahmad Z.**, and Sam Polzin. "From Disasters to Hunger: Investigating the Causal Effect of Natural Disasters on Household Food Insufficiency in the U.S."

NEWS & STORIES

- **Year-end survey spotlights food safety, age-related consumer behavior, out-of-stock trends**
  - Building off the previous month's survey, the December 2023 Consumer Food Insights Report digs deeper into the relationships between food date labels and the decision to discard food.

- **Consumers grapple with confusion over food-date labels**
  - The use of food-date labels such as "use-by" and "best if used by" causes consumer confusion that results in many Americans discarding food that is safe to eat or donate, according to the November 2023 Consumer Food Insights Report.

- **October Consumer Food Insights Report highlights Thanksgiving meal plans**
  - Nearly eight in 10 Americans will celebrate the upcoming Thanksgiving holiday with a special meal, according to the October 2023 Consumer Food Insights Report.

- **Purdue survey delves into brand-name food and beverage preferences of consumers**
  - Most consumers would choose brand-name beverages over generic or store-brand beverages, according to the September 2023 Consumer Food Insights Report.

- **Survey reveals influences of political ideology on consumer food perceptions**
  - Consumers generally remain more optimistic about food prices compared to a year ago.

- **Majority of Americans report high rate of food satisfaction**
  - Consumers who report they are most satisfied with their food consumption also spend the lowest share of their incomes on food, according to the July 2023 Consumer Food Insights Report.

- **Food insecurity rate hits 17% for the second time in 18 months**
  - Reported food insecurity has reached 17%, matching the rate last reached in March 2022, according to the June Consumer Food Insights Report.

- **Climb in consumer food spending signals continued inflationary pressure**
  - Reported food spending has increased to its highest level since the Consumer Food Insights Report began surveying in January 2022, possibly leaving consumers feeling little relief from inflation.

- **Purdue April Consumer Food Insights report explores role of dollar stores in food landscape**
  - A market for an expanded grocery selection at dollar stores potentially exists, especially with consumers who live less than 10 minutes away, according to data reported in the April Consumer Food Insights report.

- **Food survey: Consumers trust and value product labels**
  - Americans tend to trust food labels, especially the ingredient list, expiration date and nutrition fact label, according to the March Consumer Food Insights Report.

- **Americans planning frugal uses for their 2023 tax refunds**
  - Americans likely are receiving smaller tax refunds than they have in recent years, and most people will not be going out to spend this money, according to the February 2023 Consumer Food Insights Report.

- **Food survey queries consumers about New Year's resolutions, risk tolerance**
  - Eating more fruits and vegetables and less sugar ranked highly as potential changes to eating behaviors related to New Year's resolutions, according to the January Consumer Food Insights Report.

- **December Consumer Food Insights Report reveals steady food behaviors through economic change**
  - Data trends that emerged in 2022 help demonstrate that most people are slow to start spending differently when it comes to their favorite foods, despite an economic environment much different than when the year began.

- **November Consumer Food Insights Report examines regional attitudes**
  - Fairly stark regional differences about food spending emerged last month among surveyed U.S. consumers. However, similarities in food values also appear at the regional level, both according to the newly released Consumer Food Insights Report.

MEDIA METRICS

CONSUMER FOOD INSIGHTS REPORT
- Report Downloads: 3118
- Total Media Placements (approximate): 726

INFOGRAPHICS
- Downloads: 319

RESEARCH PAPERS
- Downloads: 2147

ASSOCIATED PRESS (AP) VIDEOS
- Total Media Placements (approximate): 822

Note: These data were collected in December 2023.

FUNDING SOURCES

GRANTS AND AWARDS RECEIVED
- "Plant Sciences 2.0," Purdue University, $1,200,000
- "Alternative Data to Measure Food-Away-From-Home Markets and Their Resiliency," U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), $91,369
- "Processer-Retailer Relationship in the U.S. Beef Supply Chain," Office of the Chief Economist (OCE), $100,094
- "Structure of Food Insecurity Document for AgriNovus Indiana," Central Indiana Corporate Partnership, $10,000

STRATEGIC INVESTMENTS IN CONSUMER FOOD RESEARCH
- In 2023, the CFDAS invested $150,000 to advance Purdue faculty-lead research related to food demand and consumer behavior
  - Jonathan Bauchet, PI, Jacob Ricker-Gilbert, co-PI, "Consumer demand for nutrition: Information and willingness to pay for biofortified sweet potato bread," $31,000
  - Maksym Chepeliev, PI, Thomas Hertel, co-PI, "Policy solutions for transitioning to healthier and sustainable diets in the United States and worldwide," $50,601
  - Valerie Kilders, PI, "Repeat purchases in the face of drip pricing: consumer adaptation in online food delivery," $43,647
  - Jacob Ricker-Gilbert, PI, Jonathan Bauchet and Kajal Gulati, co-PIs, Consumer demand for improved safety in informal milk markets in Senegal," $25,000

WHAT'S NEXT?

The Center for Food Demand Analysis and Sustainability continues to generate vital consumer food insights, produce CFI reports on trends and emerging topics, data dashboards and infographics.

Currently, the CFDAS team has several major projects on the horizon. These include developing real-time food price indices that vary by product characteristics and geography, forecasting and "now-casting" up-to-date food price changes and economic modeling of impact of supply chain factors on retail food prices. This modeling will help estimate impacts of the food system or policy changes on farm and retail prices and consumer spending and profitability.

Moving forward, the Center will continue its collaboration with DIAL to explore engagement with stakeholders in the agricultural and food industry. In addition, the CFDAS will provide timely research funding and support to faculty affiliates through the first round of its seed grant program.

CONNECT WITH US!
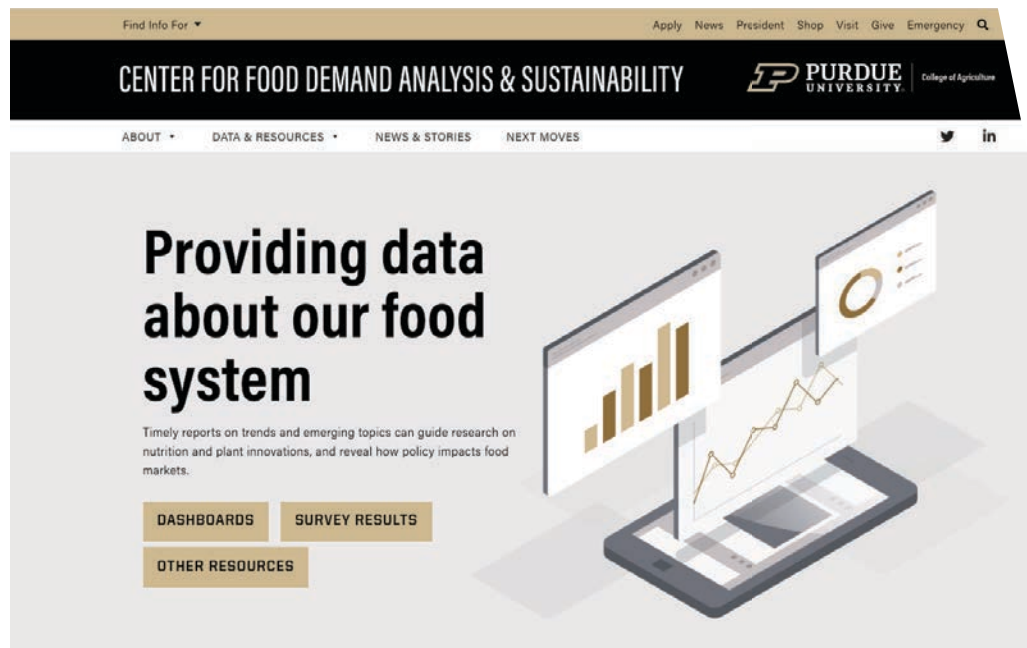
Subscribe to our Mailing List:
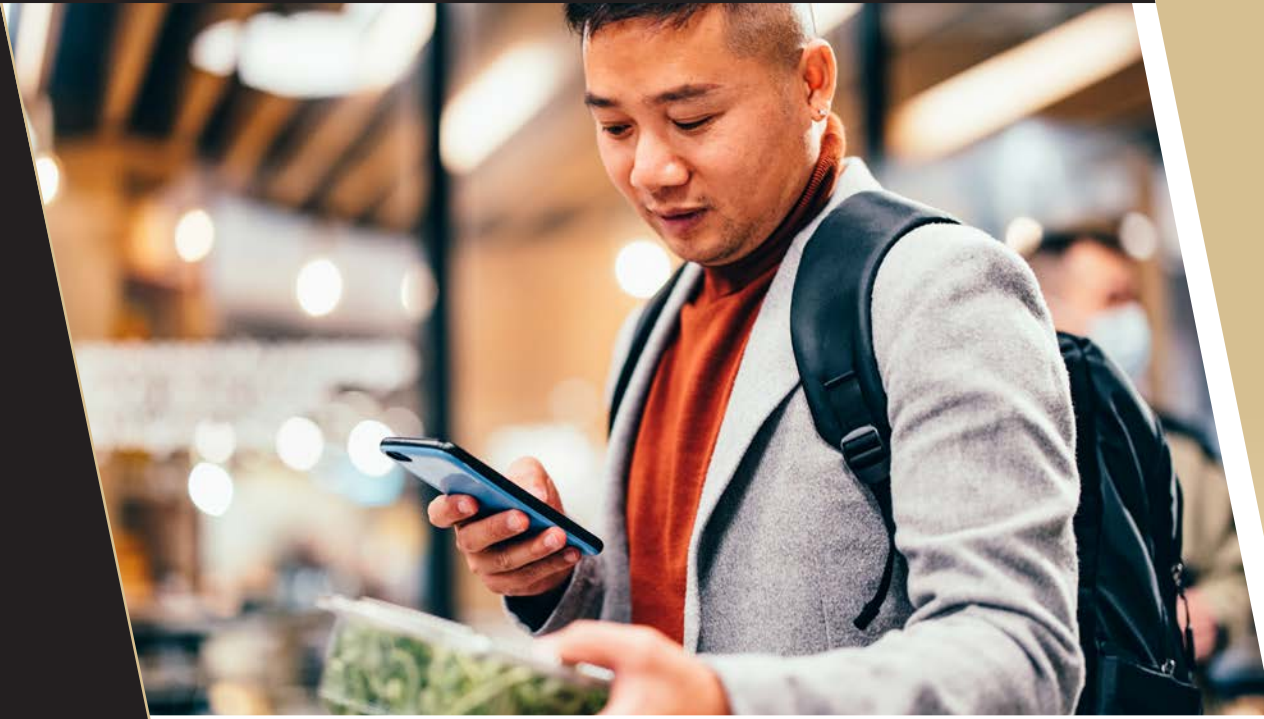
ag.purdue.edu/cfdas/

Follow us:

twitter.com/cfdas_purdue   linkedin.com/company/cfdas-purdue

A Year in Review:

Center for
Food Demand Analysis
& Sustainability *(CFDAS)*

PURDUE UNIVERSITY

College of Agriculture

2023