FOOD SYSTEMS
COLORADO STATE UNIVERSITY EXTENSION

THE COLLEGE *of* AGRICULTURAL SCIENCES

Food Consumer Response and Supply Chain Dynamics during COVID-19

Keynote to the Asian Pacific Economic Cooperation Member Economies

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Acknowledgements: Collaborations with a USDA AMS team from CSU (B. Jablonski, H. Edmondson, M. Gill), U of Kentucky and Penn State

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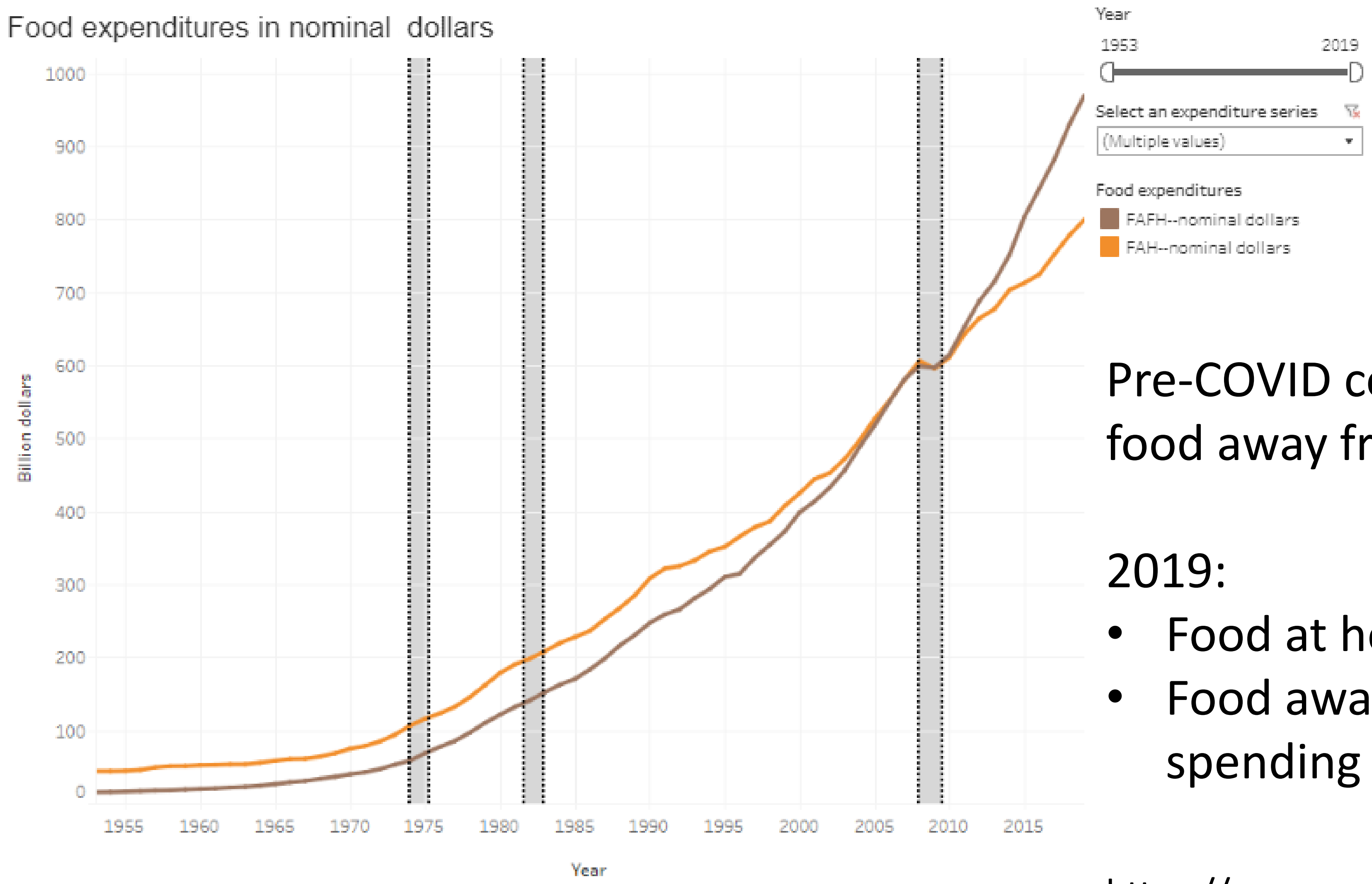
Overview

- The Covid-19 pandemic has changed how and where consumers purchase food, and using some global trends, we explore the most prominent changes
  - Decrease in food away from Home (likely temporary)
  - Increase in online food purchases (which will likely remain as shopping habits change)
- Using a US survey, beginning to explore how consumer purchasing behavior shifted during the pandemic, and consider how it may change markets
- Using examples from the US and global food markets, a discussion of how food supply chains have been impacted, perhaps indefinitely, will also be considered.



Notes: Estimates are in nominal and constant dollars, as noted.
FAH is food at home. FAFH is food away from home.
The base year for the constant dollar series is 1988=100.
Recessions lasting more than 1 year are denoted as gray bands in the chart. Recessions are defined by the National Bureau of Economic Research.
These estimates are for all purchasers.
The Food Expenditure Series has been comprehensively revised, resulting in a break in the series beginning in 1997. Data from 1950 to 1996 are extrapolated using the percentage change in the previously established estimates to pull 1997 levels back to 1950.
Sources: USDA, Economic Research Service, Food Expenditure Series and the National Bureau of Economic Research.

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Pre-COVID consumers purchased more food away from home

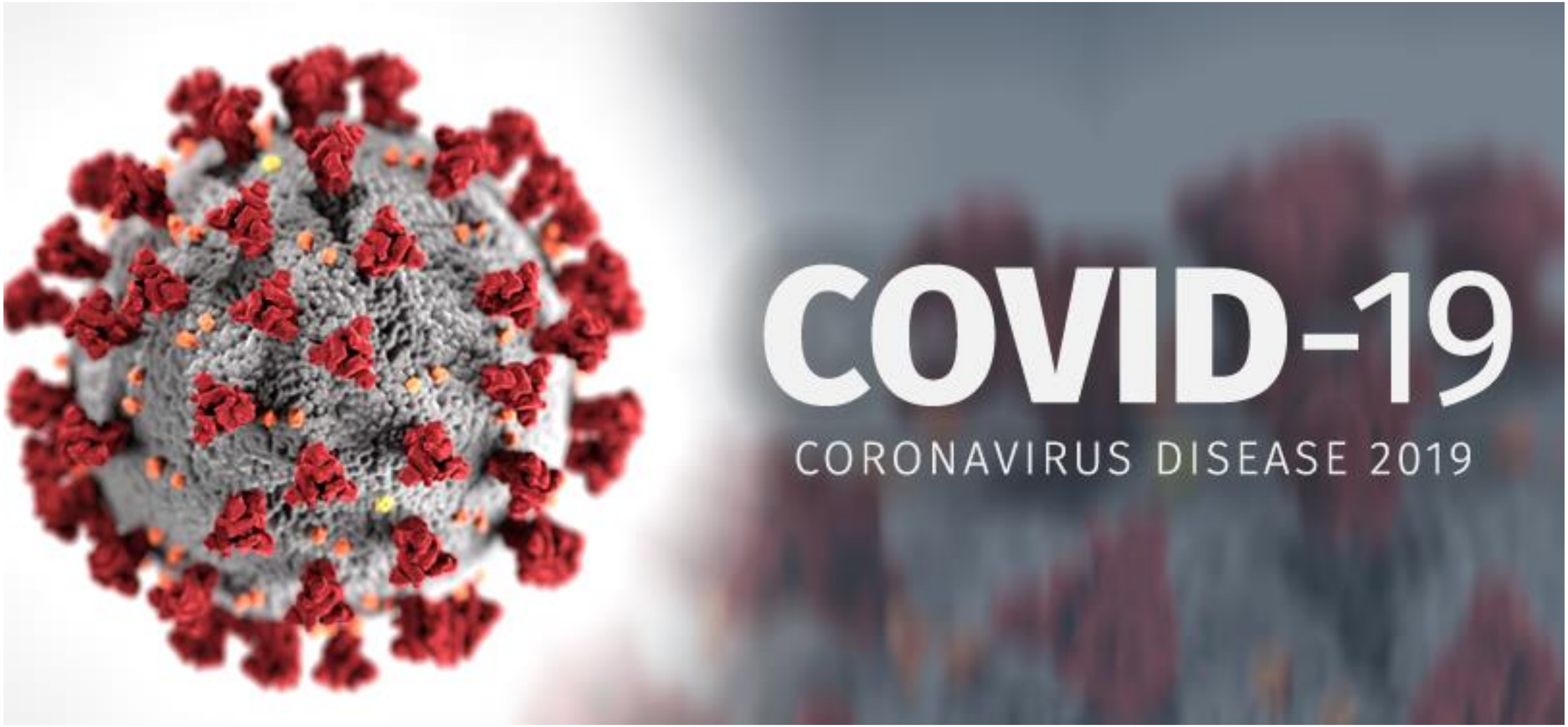
2019:

- Food at home (FAH) spending ~$800B
- Food away from home (FAFH) spending ~$970B

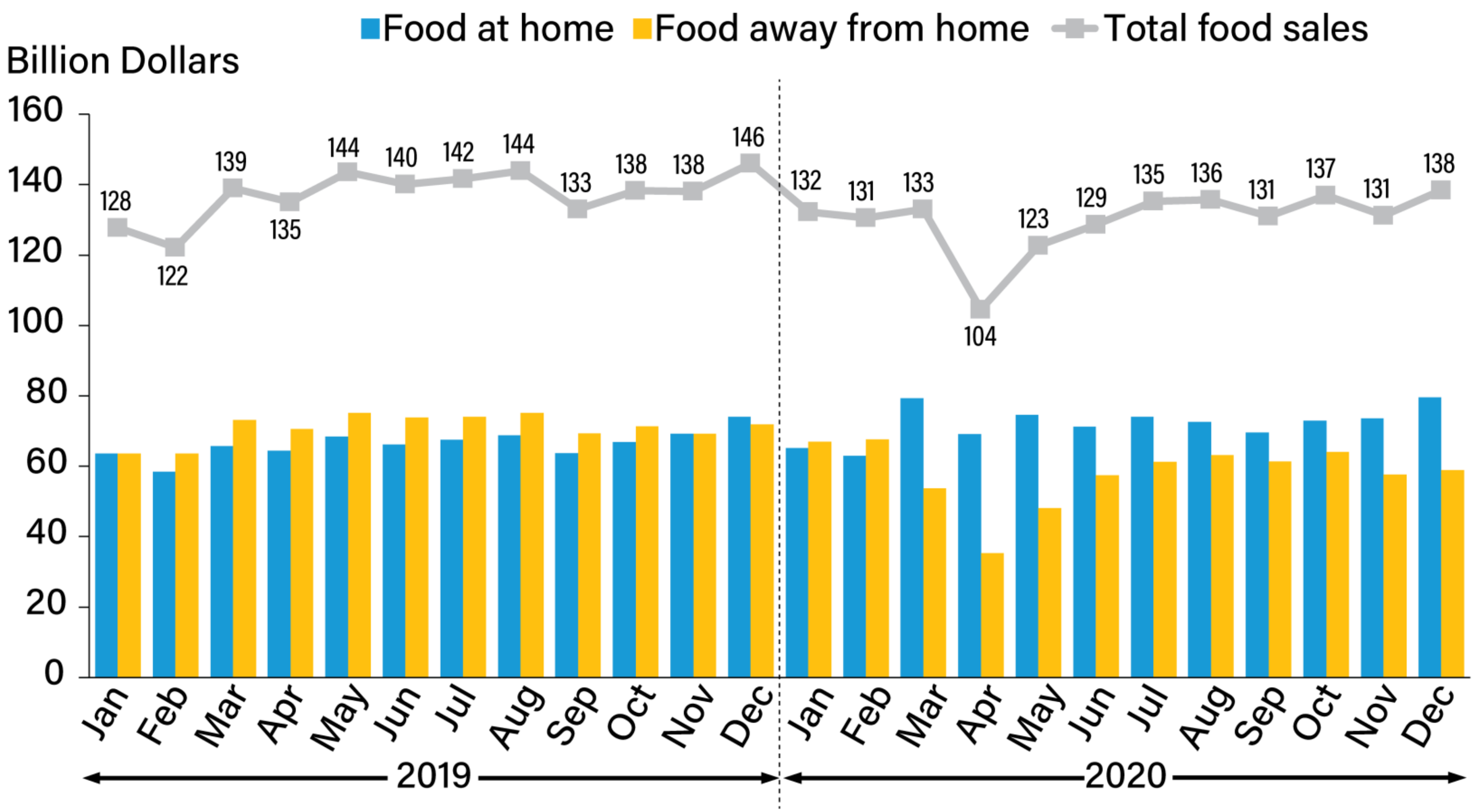
https://www.ers.usda.gov/data-products/food-expenditure-series/interactive-charts-food-expenditures/

Where the consumer dollars go: farm vs. post-farmgate food value chain

Post-farmgate food value chains make up most of consumer food expenditures globally, **Nature Food**
Yi , Meemken, Mazariegos-Anastassiou, Liu, Kim, Gómez, Canning and Barrett


COVID-19
CORONAVIRUS DISEASE 2019

Since pandemic began, U.S. spending on food-at-home increased, while food-away-from-home expenditures dropped, resulting in an overall reduction in total food spending in 2020



Notes: The monthly total food sales values may not equal the sum of the values for food at home and food away from home because of rounding. Expenditures are in nominal dollars.

Source: USDA, Economic Research Service, using data from the Food Expenditure Series.

- U.S. food spending in December 2020 was $8 billion less than in December 2019
  - Narrowed from $40 billion drop in April
- FAFH spending rebounded July-October 2020
  - Declined again in Nov/Dec

Australia Food Security and Market Perceptions

	Spend preference *during* COVID-19 vs. before,[1] Net behavior[3]	Spend preference *after* COVID-19 vs. during,[2] Net intent[3]
Dine in restaurant	-39%	-7%
Take out food from restaurants	-10%	0%
Ready to eat food from restaurant delivered to home	-3%	3%
Ready made food purchased from grocery stores	16%	9%
Groceries purchased from grocery stores	20%	11%

Restaurants closed in NSW and ACT on March 22

Consumers have increased spending on food products from grocery stores

Post COVID-19, consumers may continue this trend

1.Q: How has your spending per month changed during the COVID-19 outbreak compared to before the COVID-19 outbreak for each of the below items?
2.Q: For each of the following meal options, how do you expect your spending per month to change after the COVID-19 outbreak compared to now (during the COVID-19 outbreak)?
3.Net intent is calculated by subtracting the percent of respondents stating they expect to decrease spend from the % of respondents stating they expect to increase spend.

Source: McKinsey & Company COVID-19 mobile survey, 3/21-3/24/2020, N = 631. Sampled and balanced to match Australia's general population, 18-65 years old.

McKinsey & Company 3

COVID-19 and the U.S. Dairy Supply Chain

CHOICES

Christopher A. Wolf, Andrew M. Novakovic, and Mark W. Stephenson

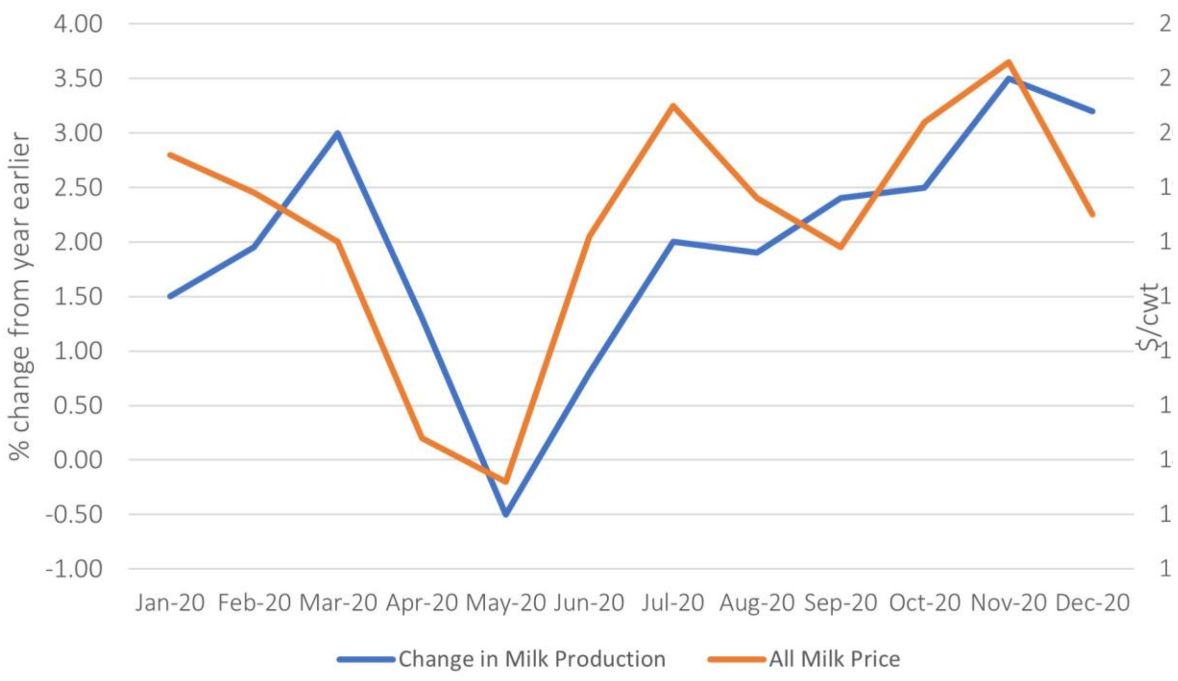


Table 1. 2020 Monthly Food Expenditures Percentage Change Year-over-Year, Leap Year Adjusted, Includes Taxes and Tips (relative to 2019)

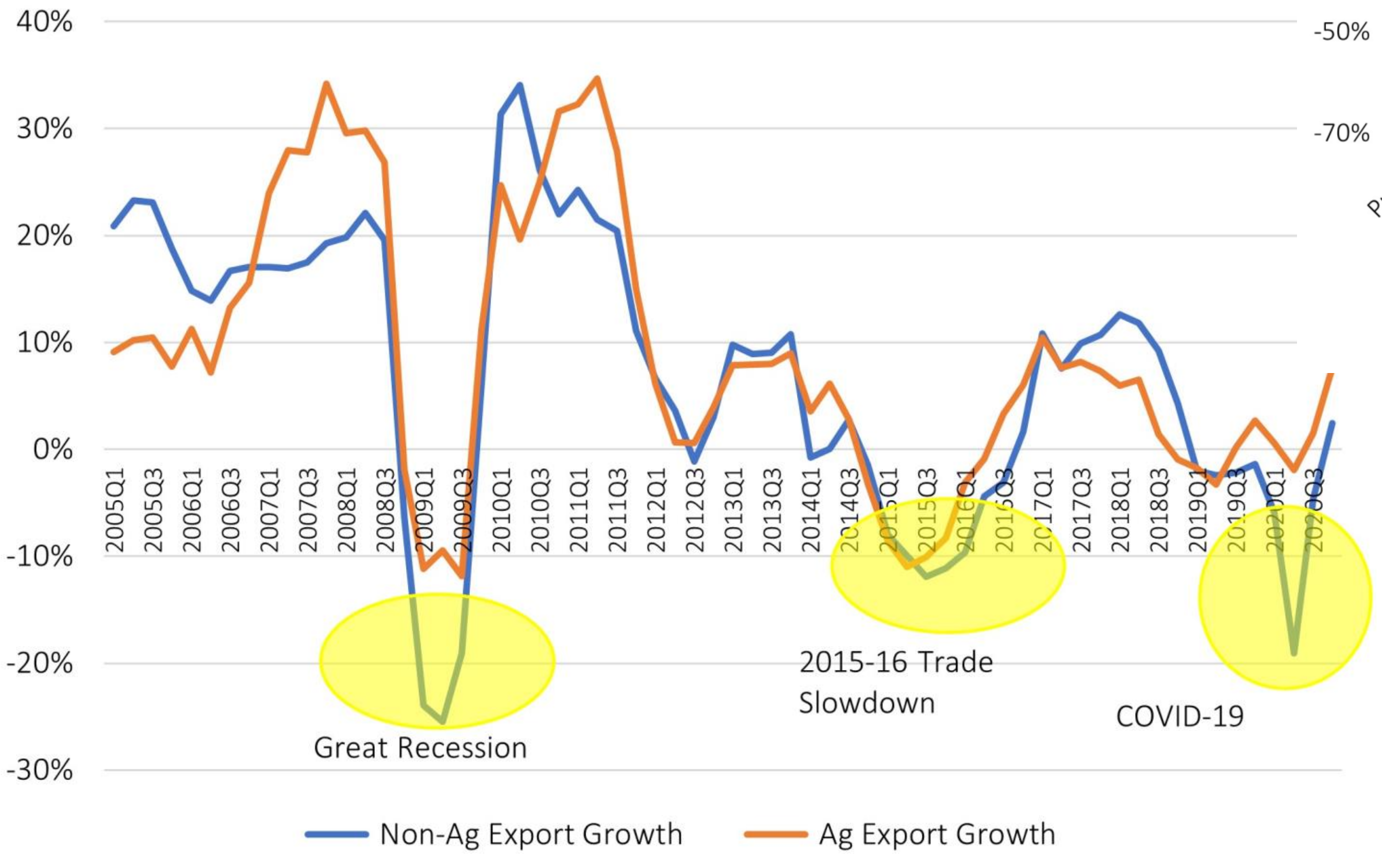
Month	Food at Home	Food Away from Home	Total Food Sales
January	2.5	4.5	3.5
February	3.9	2.6	3.2
March	20.6	-26.2	-4.0
April	7.3	-49.4	-22.4
May	9.0	-35.6	-14.3
June	7.0	-22.2	-8.4
July	9.6	-17.3	-4.5
August	5.6	-16.0	-5.7
September	9.3	-11.5	-1.5
October	9.0	-10.2	-0.9
November	6.2	-16.2	-5.0
December	7.5	-18.2	-5.2

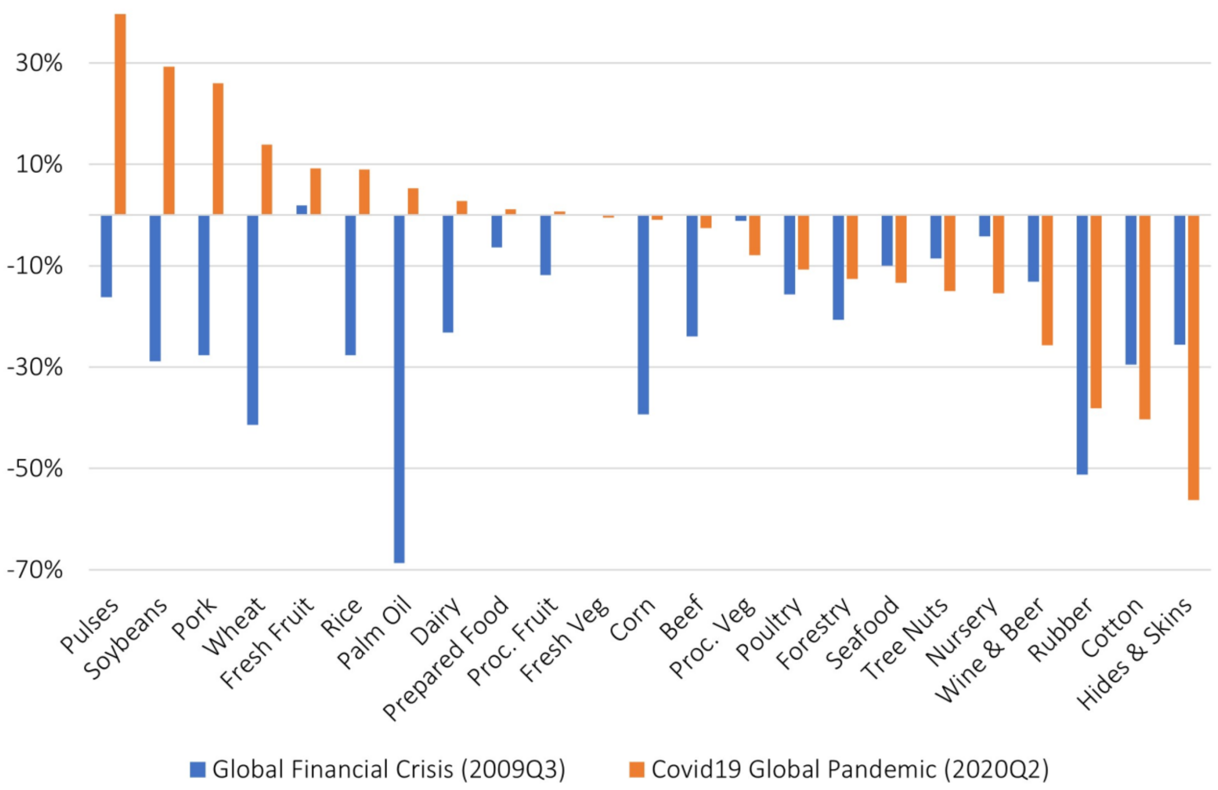
Source: U.S. Department of Agriculture (2020c).

https://www.choicesmagazine.org/

Has COVID-19 Caused a Great Trade Collapse? An Initial Ex Post Assessment

Shawn Arita, Jason Grant, and Sharon Sydow





Through August 2020, they estimated that COVID-19 may have reduced agricultural trade by 4.2% in the second and third quarters of 2020 while nonag trade was reduced by 18.7%.

Change in Exports under COVID-19,

Change in Q2 2020 Exporters Relative to Previous Quarter

Exporter	Pulses	Soybean	Pork	Wheat	Fresh Fruit	Rice	Palm Oil	Dairy	Prep Food	Proc Fruit	Fresh Veg	Corn	Beef	Proc Veg	Poultry	Forestry	Seafood	Tree nuts	Nursery	Wine & Beef	Rubber	Cotton	Hides & Skins
Brazil	14%	48%	45%		-20%	171%	51%	16%	-1%	-9%	180%	-87%	30%	15%	-21%	-9%	-6%	-5%	12%	-28%	-35%	-12%	
Russia	-12%	46%	173%	30%	-35%	-73%	9%	10%	1%	50%	41%	54%	65%	13%	92%	-10%	-12%	72%	-50%	-16%			-97%
Kenya	374%				27%		95%	-57%	34%	74%	-6%		-14%	17%		-34%	-51%	-46%	-30%	-53%	10%		
Turkey	94%	624%			23%	44%		-14%	17%	5%	8%	69%	-18%	-1%	-15%	-12%	-13%	18%	-13%	-26%		-3%	
Argentina	109%	62%	258%	-35%	9%	6%		28%	1%	-64%	37%	16%	-4%	-44%	-23%	-4%	10%	-42%		-14%	-93%	-63%	8%
Mexico	16%		36%	226%	10%	63%	-11%	7%	15%	-6%	2%	66%	42%	10%	60%	-2%	-21%	-17%	-17%	-29%		-31%	
Japan			29%		7%	9%		26%	27%	-2%	171%		-20%	-5%	27%	-4%	-16%	-1%	13%	-38%			14%
Thailand	11%		112%		57%	0%	-75%	29%	6%	0%	-20%	15%		-4%	1%	-13%	6%	-48%	-53%	-55%	-41%		21%
Indonesia					88%		9%	34%	32%	16%	-26%			43%		-2%	5%	7%	0%	-25%	-41%		
Canada	60%	-6%	14%	11%	-37%	25%		17%	-4%	7%	22%	-49%	-5%	-15%	0%	-16%	-23%	-6%	-8%	-15%	-71%		-69%
China	11%	-25%	-13%		52%	-15%	31%	-40%	9%	-3%	5%	-97%	-34%	-7%	-17%	-5%	-15%	8%	-3%	-28%	-8%	-70%	-34%
Colombia					-16%		27%	50%	23%	-18%	-21%		49%	-25%		-46%	-4%		-16%		-58%		-66%
South Africa	48%		-41%	187%	16%	14%	-19%	-19%	-15%	5%	-26%	193%	61%	-24%	-32%	-49%	-26%	16%	-42%	-51%		-44%	-33%
Switzerland			40%			19%		-6%	-3%	-15%	0%		-12%	2%	-50%	0%	-76%	-37%	-7%	-44%			-37%
Ukraine	-15%	-69%	5%	21%	-66%			-25%	10%	-3%	-36%	-24%	-14%	-8%	-16%	-13%	11%	-37%	-5%	-7%			-14%
New Zealand	33%		-50%		2%			4%	-13%	20%	-13%		-5%	1%	-61%	-31%	-33%		-24%	-5%			-15%
EU	4%	-65%	34%	55%	-9%	0%	-16%	8%	3%	0%	7%	-20%	-3%	-13%	-9%	-5%	-12%	-27%	-19%	-27%	-27%	-62%	-72%
Chile	0%		42%		-11%			13%	1%	9%	-4%		38%	-3%	-5%	-15%	-7%	-22%	-9%	-17%			-38%
USA	27%	-27%	11%	-9%	-1%	3%	-12%	12%	-6%	-7%	-15%	11%	-26%	-16%	-7%	-18%	-10%	-17%	-17%	-21%	-29%	-35%	-35%
Uruguay		-5%		63%	36%	132%		-4%	54%				-23%			-2%	-25%			-37%			48%
Singapore			111%		-15%	50%	11%	20%	-3%	-24%	78%		-18%	15%	53%	-63%	-26%	31%	-44%	-49%	-46%		-85%
Malaysia			-18%		-16%	-12%	1%	-28%	-18%	54%	1%		-42%	-17%	-27%	-39%	-6%	-4%	-51%	-56%	-39%	-89%	-93%
Hong Kong			49%		35%	-6%		-50%	51%	-46%	-54%		-65%	-33%	-3%	-38%	-46%	-69%		-28%	-85%		0%
Cote d'Ivoire					-10%	148%	-21%		15%					-40%		-23%	-9%	-16%			-10%	-73%	
Morocco					1%			-34%	-21%	-10%	-23%			-33%		-37%	-18%	47%	-24%	-55%			
Australia	26%		37%	3%	-2%	-47%		-12%	1%	-20%	-12%	5%	-5%	21%	17%	-29%	-20%	-38%	-41%	-11%		-76%	-36%
Taiwan			96%		-7%	216%		66%	-8%	-29%	-13%		-37%	5%		-24%	-30%	-6%	-23%	-33%			
Peru	-31%				1%	8%	-39%	-73%	-14%	-2%	-13%	3%		-5%		-58%	-53%	-25%	6%	-80%			
Senegal					-11%	-89%			15%		43%					-10%	-20%	-78%				-10%	
Mozambique	-60%	82%			5%		-29%									-91%	-18%	-15%				-85%	
Zambia								-34%	-36%			-29%			-13%	11%			-20%			-75%	-95%

- Global agricultural trade ended calendar year 2020 up 3.5% compared to global trade in all products which fell 8%
  - BUT the level of disruption is very sectoral in nature—nonfood trade products and food products consumed more intensely away from home have slowed or contracted more significantly than food products consumed at home.

Note: Selected Agricultural & Related Sectors. Data from Trade Data Monitor.

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Local Food Systems Response to COVID

Building Better Beyond

Find Resources Our Partners

https://lfscovid.localfoodeconomics.com/

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ABOUT THE PROJECT

Enrich & expand existing efforts across LRFS responding to COVID

Document and disseminate innovations and adaptations

Cross-sector collaboration and learning

Strategize for long term resilience of LRFS

ABOUT THE TEAM

Multi-agency, multi-sector collaborative initiative

Cooperative Agreement with USDA AMS

3 University Partners

17 Community of Practice Coordinating Organizations

Engaging Local and Regional Food Systems as a Whole

Survey Overview

Mission: Explore COVID-19 impacts and their unique resonance in LRFS food markets

Through the eyes of consumers, this survey found 3 overarching themes:

1. The shift to **more at home eating** as restaurants closed reverberated through a variety of food market channels

2. The stark **increase in online food purchasing** presented opportunities for targeted sales by food businesses.....along with significant challenges

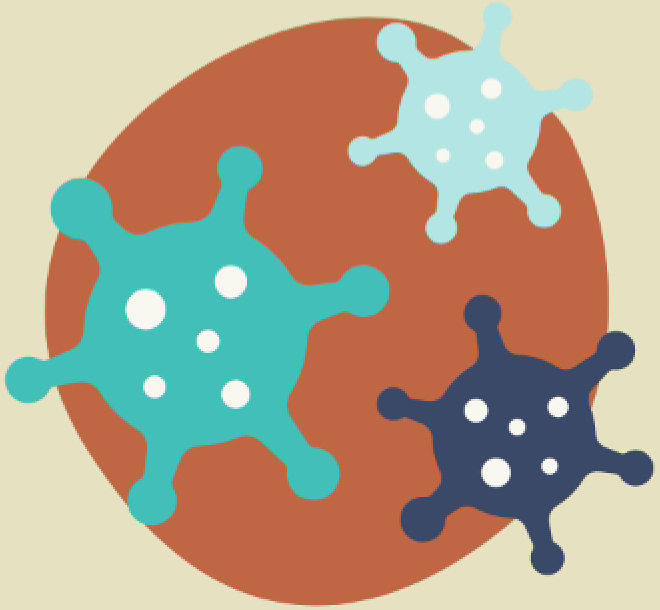
3. **Heightened levels of food insecurity** may influence market access as well as monetary and time limitations

All of these changes can be framed as opportunities for market growth and impact in LRFS.

September 2019

The Before Times

April 2020

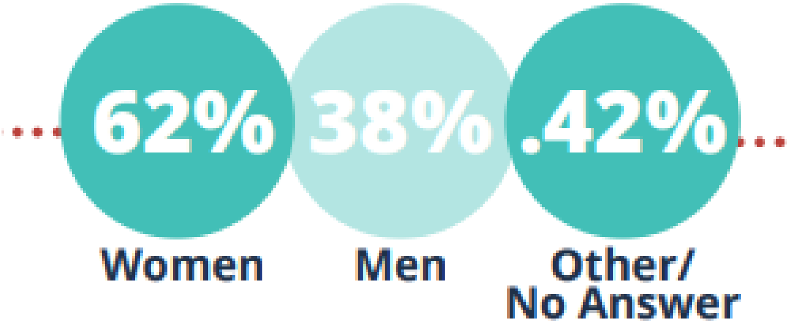


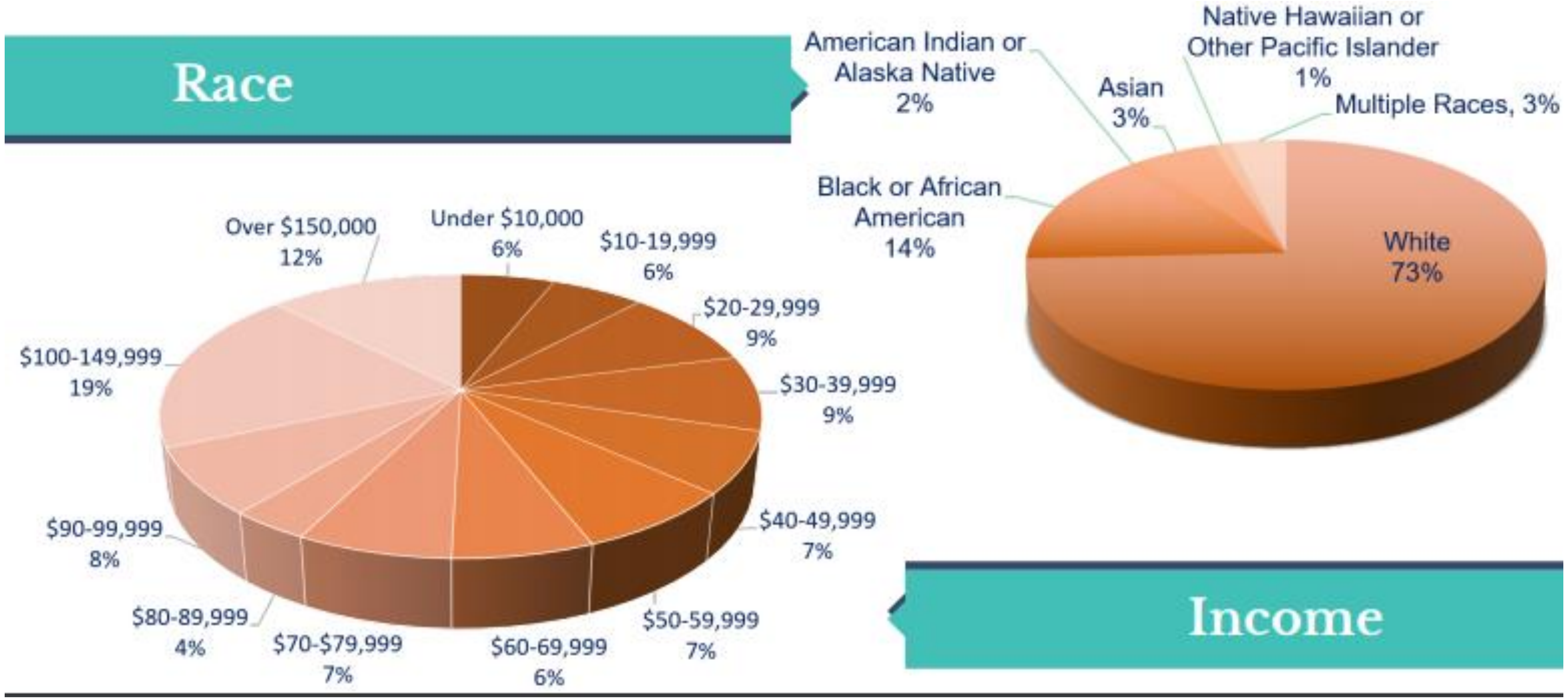
Pandemic Begins

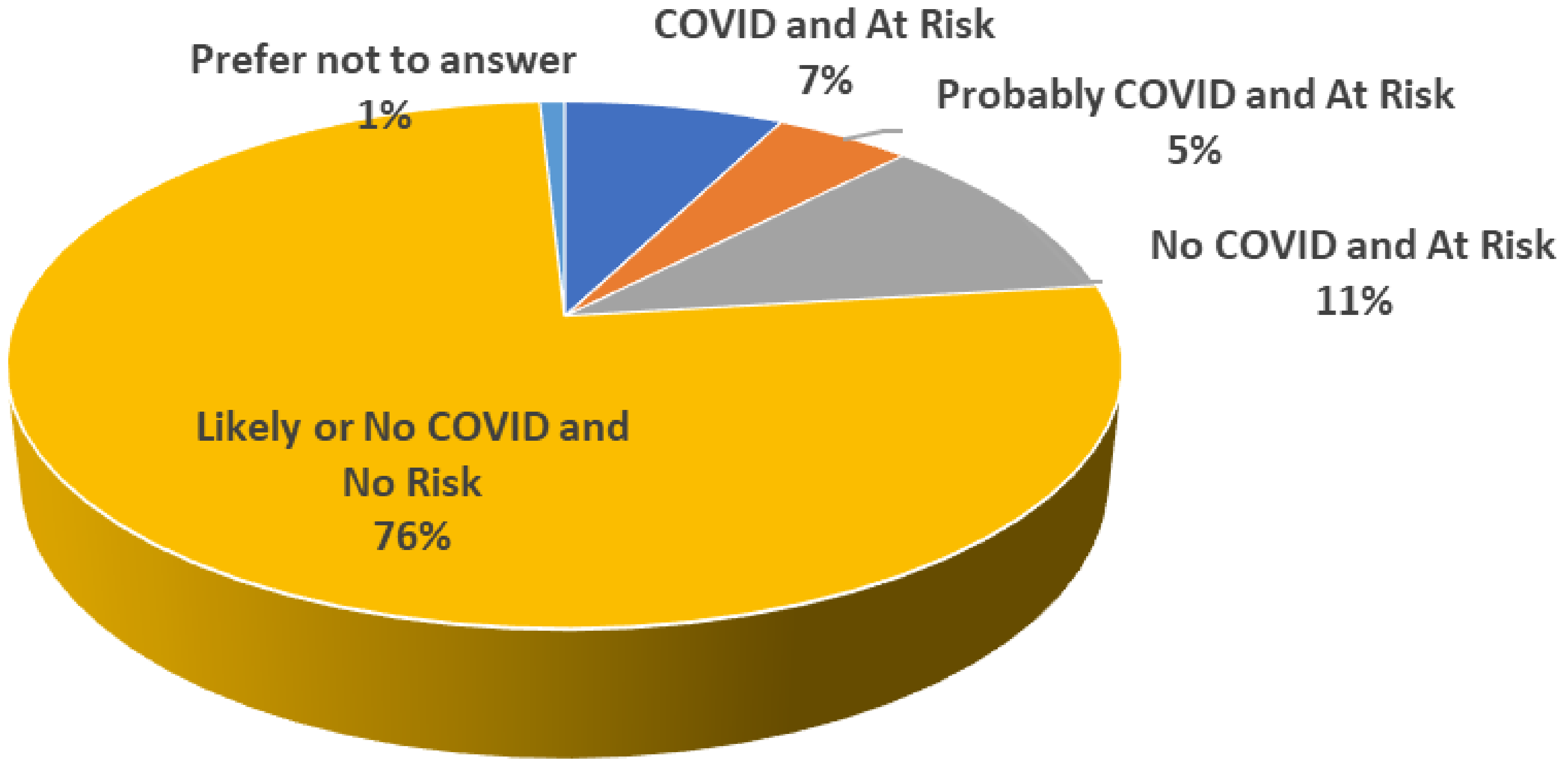
September 2020

The New Normal

National Survey including 5,000 households

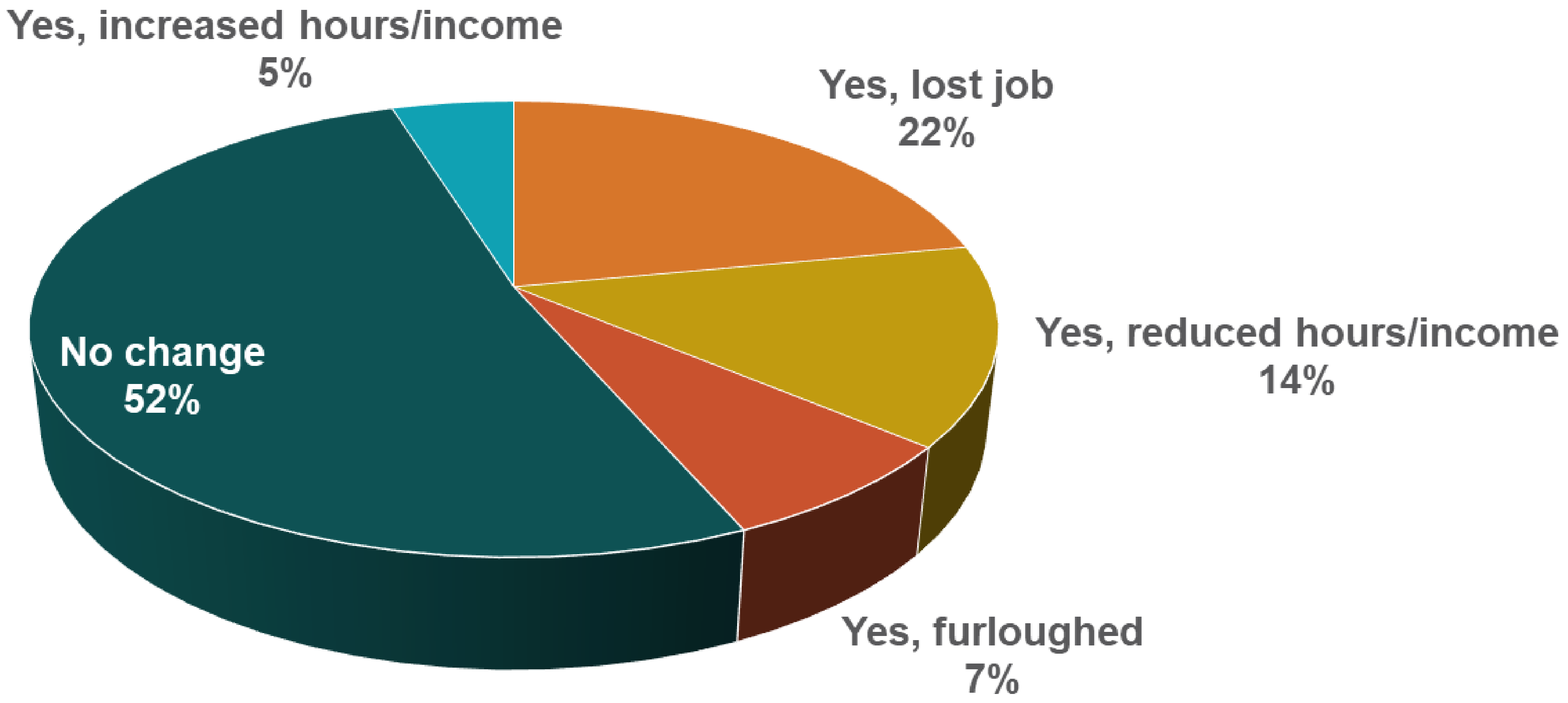






Household Experience and Perceived Risk with COVID
Household COVID status based on Whether Tested (Probable is Not),
At Risk Based on Any Household Member with Potential Complications

Have you or anyone in your household experienced a change in income or job since the COVID-19 outbreak (April 2020)?

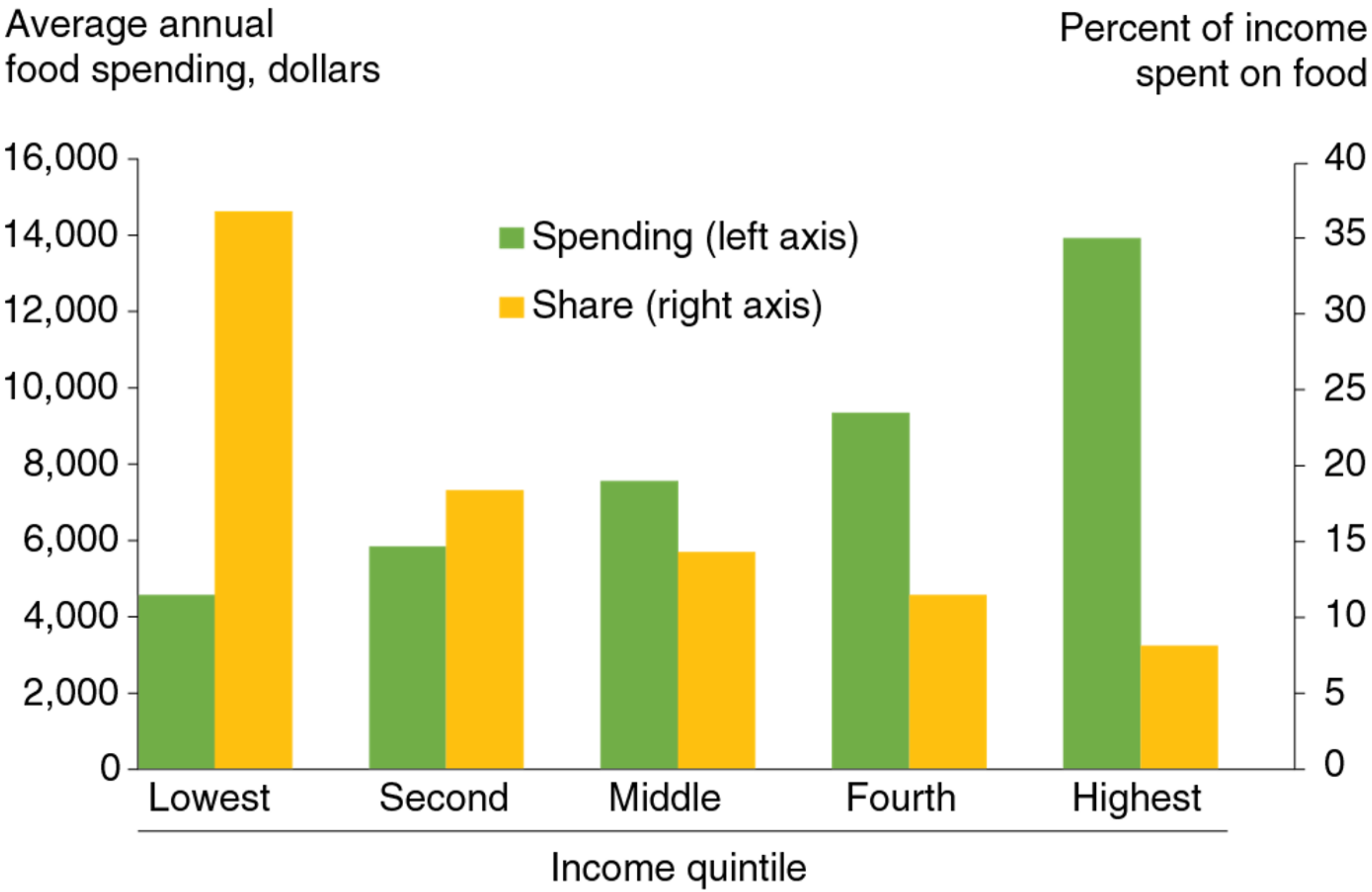


The impact of income on food spending is very income dependent.

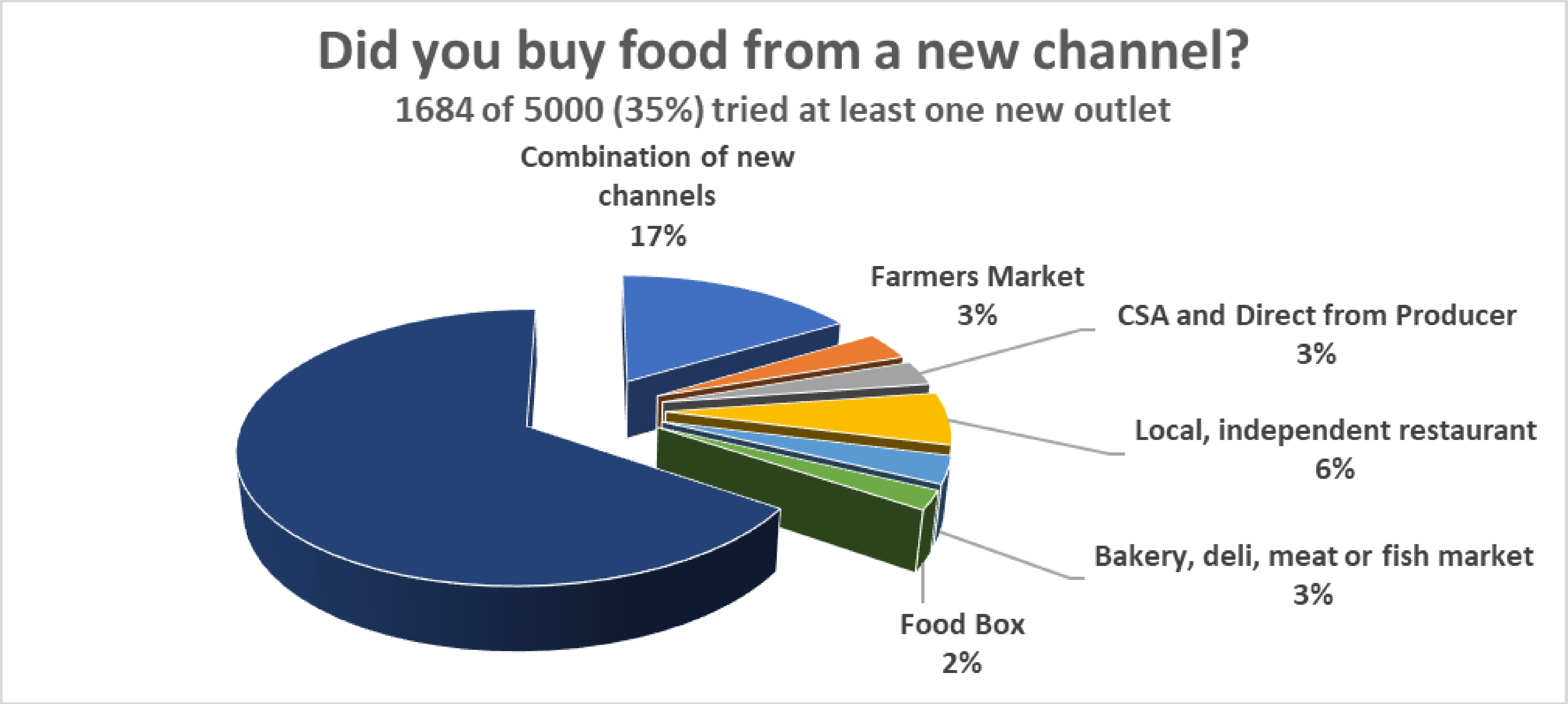
Also confirms our sample's validity:

$7800 Median
$9620 Mean

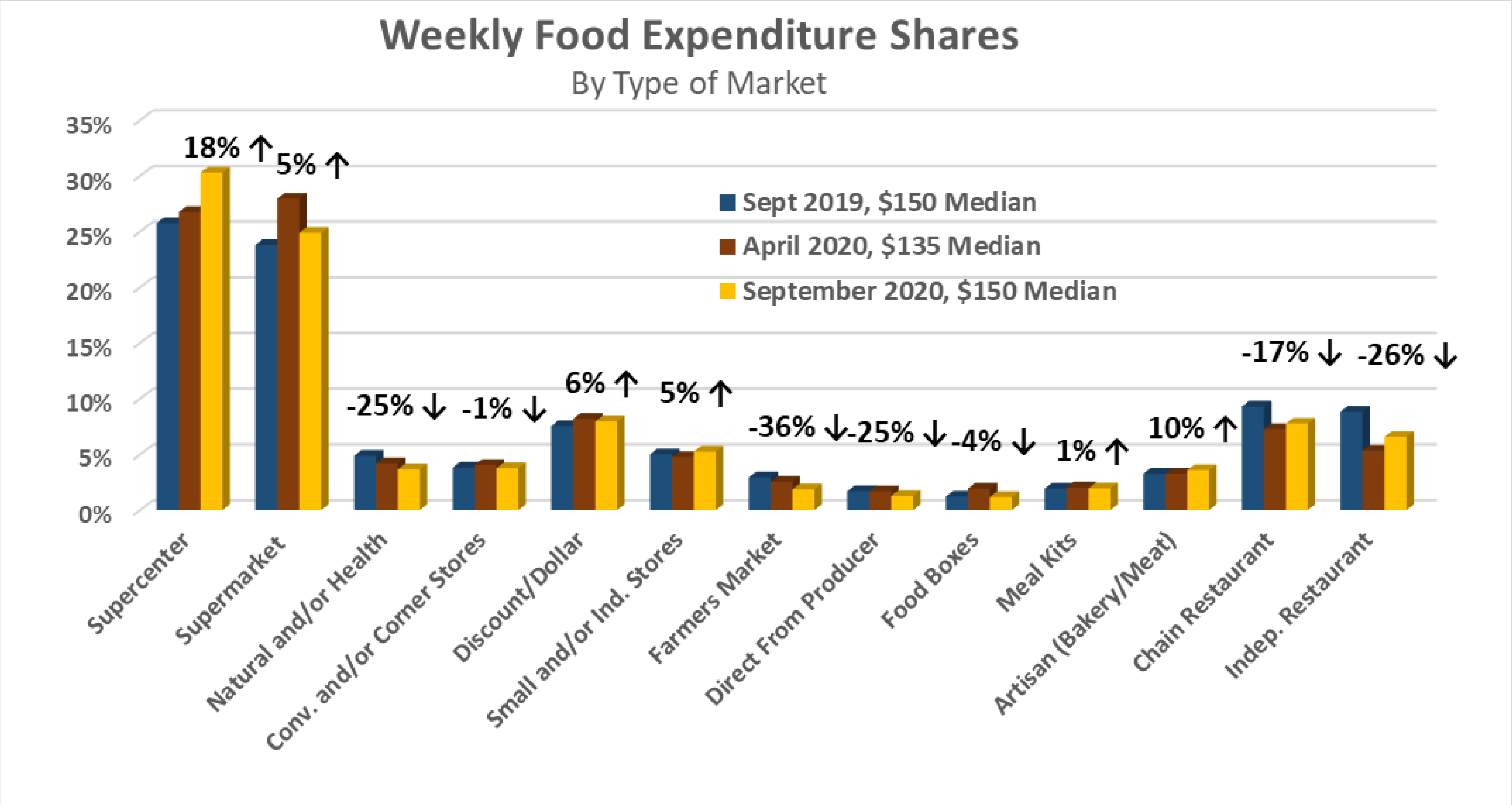
Food spending and share of disposable income spent on food across U.S. households, 2019



Source: USDA, Economic Research Service using data from U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2019.



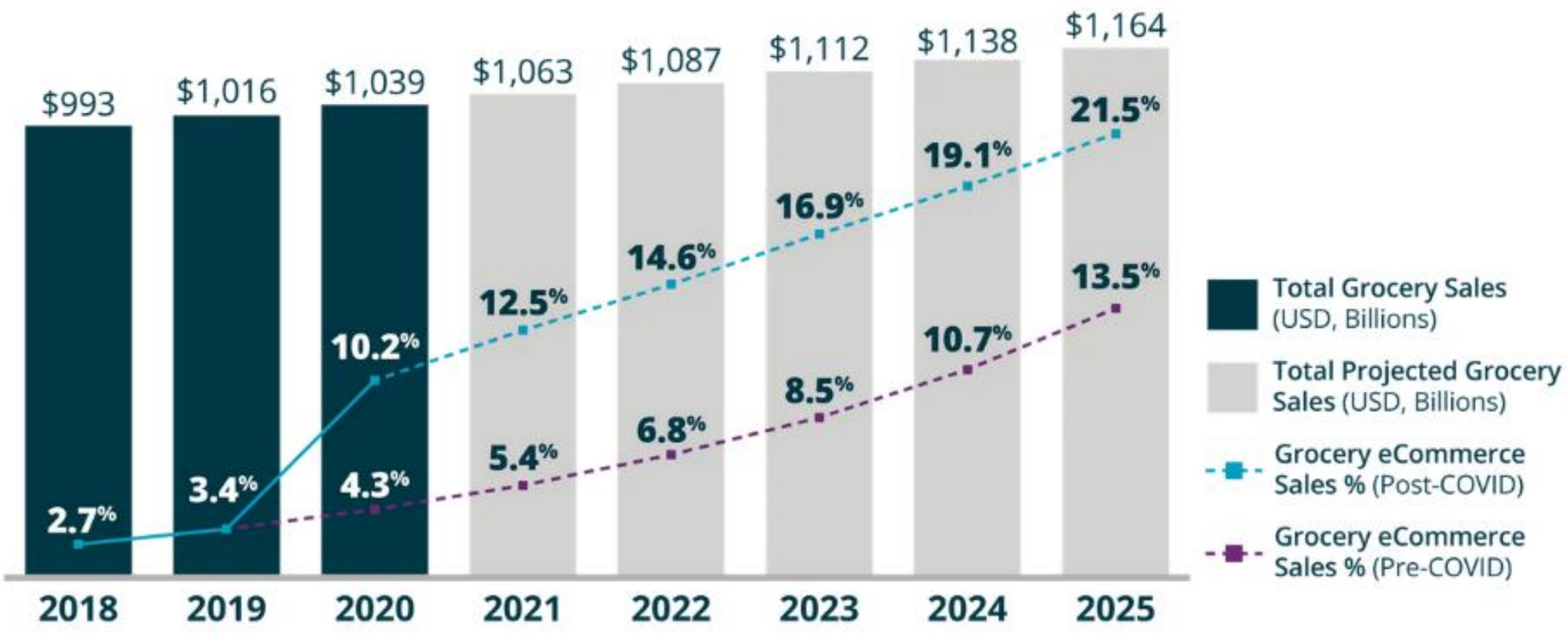
Note: Shoppers may have already been buying in this channel but started visiting a new business in that same channel as well.



Food Dollar Expenditures Hit but Recovered

Who Gained?
Who Lost?

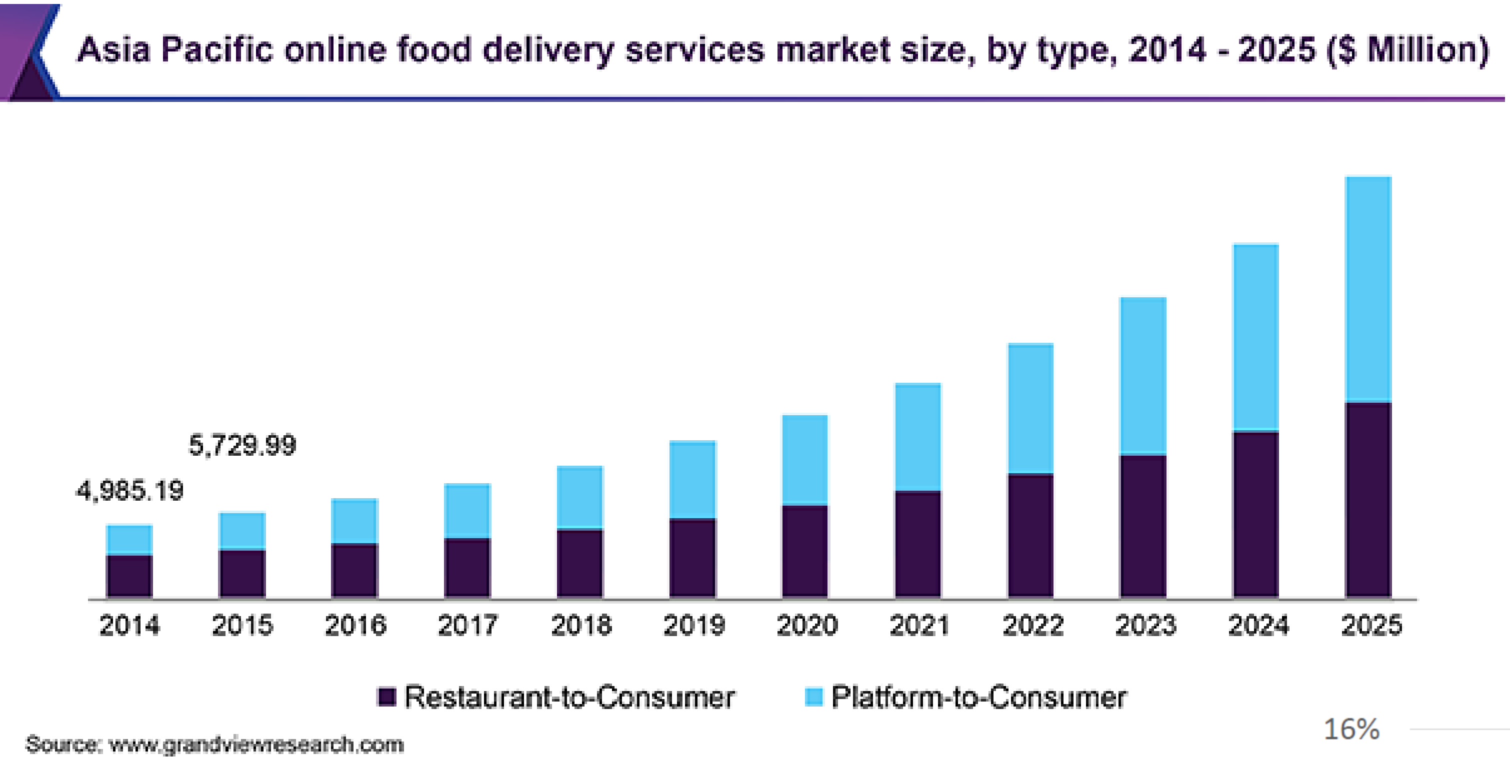
Online Grocery to Account for 21.5 Percent of Total Grocery Sales, Accelerating eCommerce Trends



- 2020 saw COVID-related restrictions "kink" the adoption of eCommerce, with a doubling of volume through online
- We explored this in a bit further detail
  - More channels
  - Differentiating delivery and curbside pick up

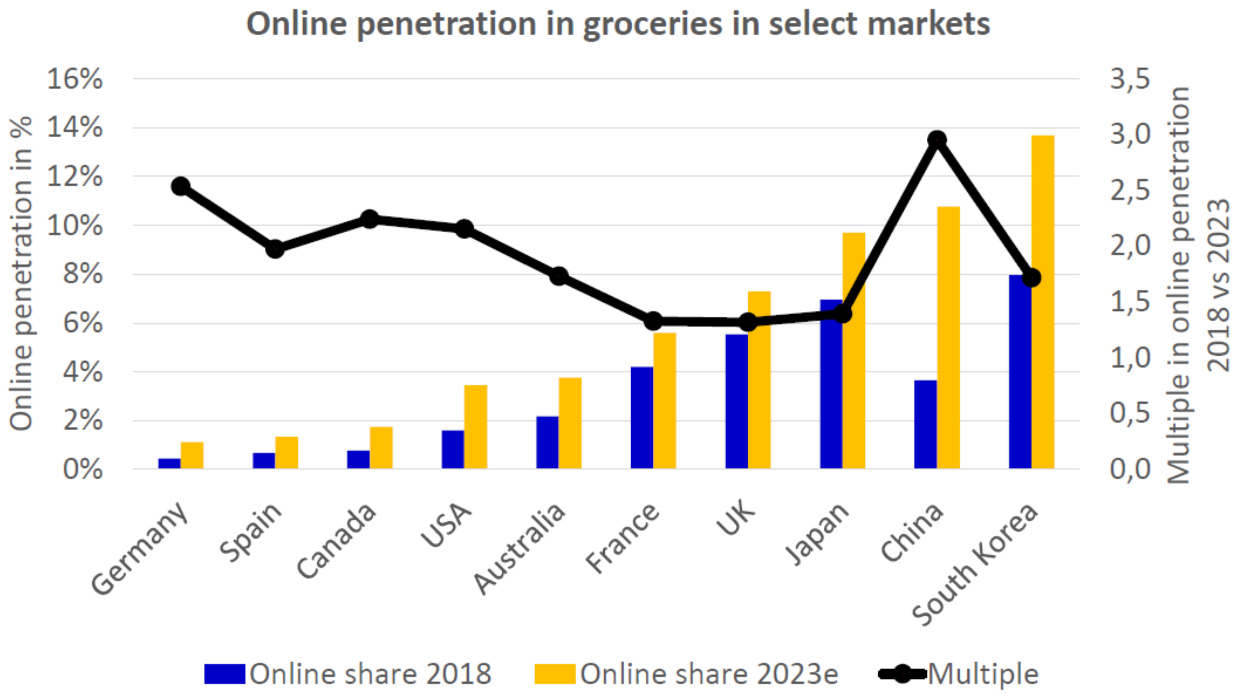
"eGrocery's New Reality: The Pandemic's Lasting Impact on U.S. Grocery Shopping Behavior," Mercatus and Incisiv, https://info.mercatus.com/egrocery-shopper-behavior-report?utm_source=ketner&utm_medium=media&utm_campaign=fy21-q3-shopper-survey-report-ketner-press-release

A Broader look at a few APEC Member Economies



Restaurant to consumer has led the growth

Australia growth in online share mimics USA, but Asia markets are moving more quickly

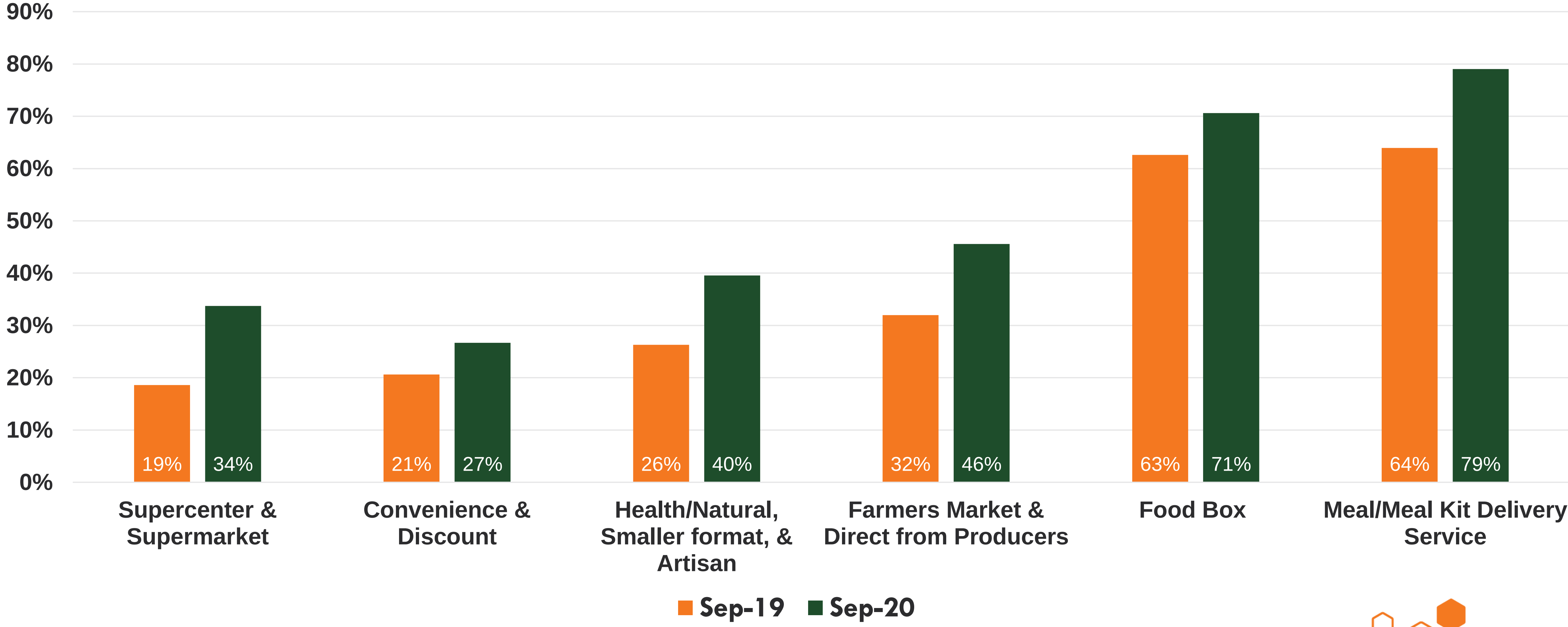


Source: own illustration based on IGD data.

https://seekingalpha.com/article/4344200-deep-dive-ocado-is-long-term-growth-bet-in-e-commerce-niche

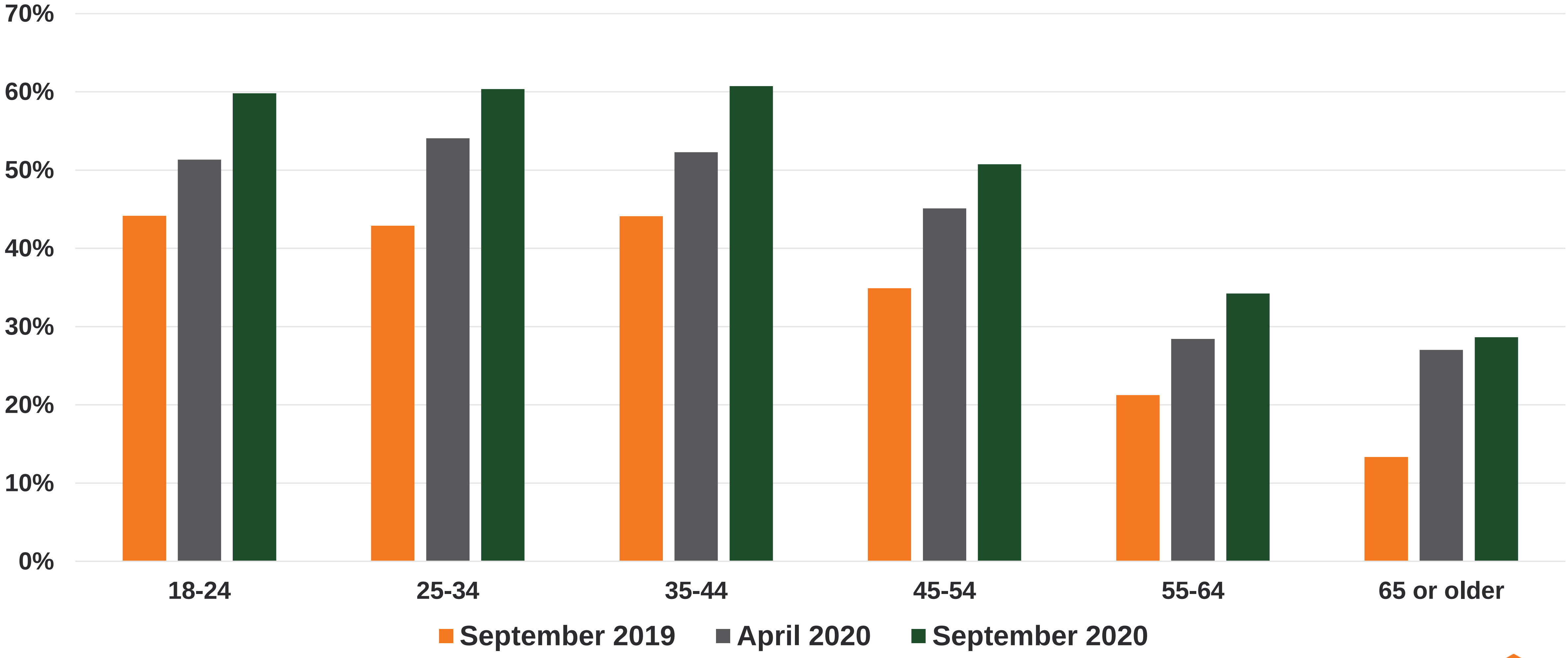
Online Shopping across Market Channels

U.S. sample, n=5000



Source: https://lfscovid.localfoodeconomics.com/

Percent of Consumers Using Online Shopping,
by Age Group (n=5000)



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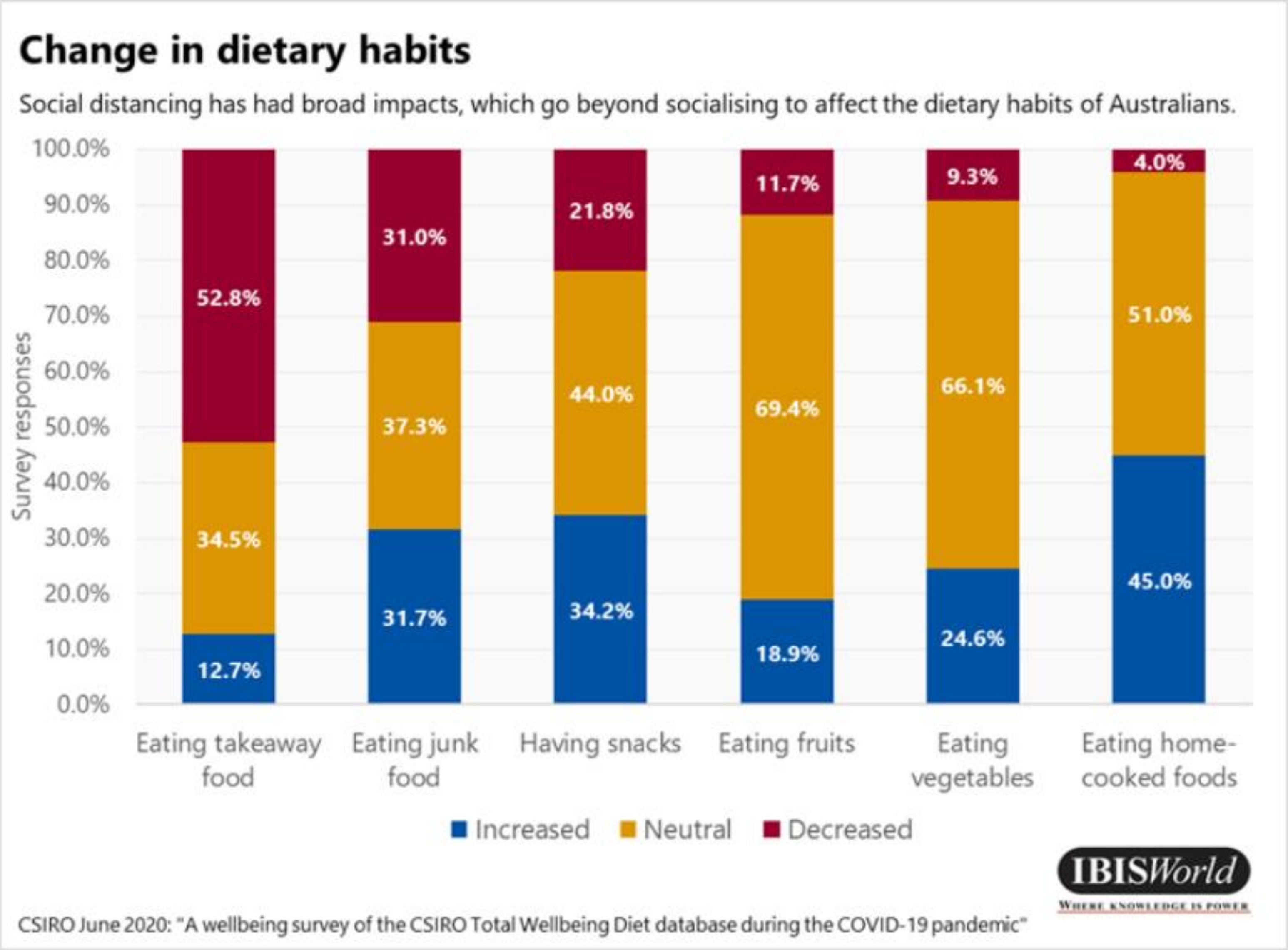

Australians Noted Changes in Behavior

- The shift to home cooking significantly boosted revenue for the Supermarkets and Grocery Stores industry, which grew by 4.6% in 2019-20 to $113.3 billion,
  - Expected to grow by a further 0.5% in 2020-21.
- In contrast, revenue for the Restaurants industry declined by 25.1% in 2019-20.

Unbalanced: COVID-19 Shifting Australian Dietary Habits, Liam Harrison, Jul 27 2020
https://www.ibisworld.com/industry-insider/press-releases/unbalanced-covid-19-shifting-australian-dietary-habits/

Takeaways

- COVID brought about the biggest shifts in sales patterns that have been seen in many years
  - Food away from home vs food at home (and a blurring of those lines)
  - Online/eCommerce food shopping accelerated from more modest growth
- The future trends require insights into consumers' new habits, persistence/continued growth of online and "new models" of food shopping
  - Will supply chain infrastructure require more regional nodes and hubs if "last mile" delivery is rethought?
- Food values were already driving some changes to market channels and structure, but economies of scale maintained a small number of players, particularly in retail
  - Will online purchasing change the "math" of optimal number of food businesses?

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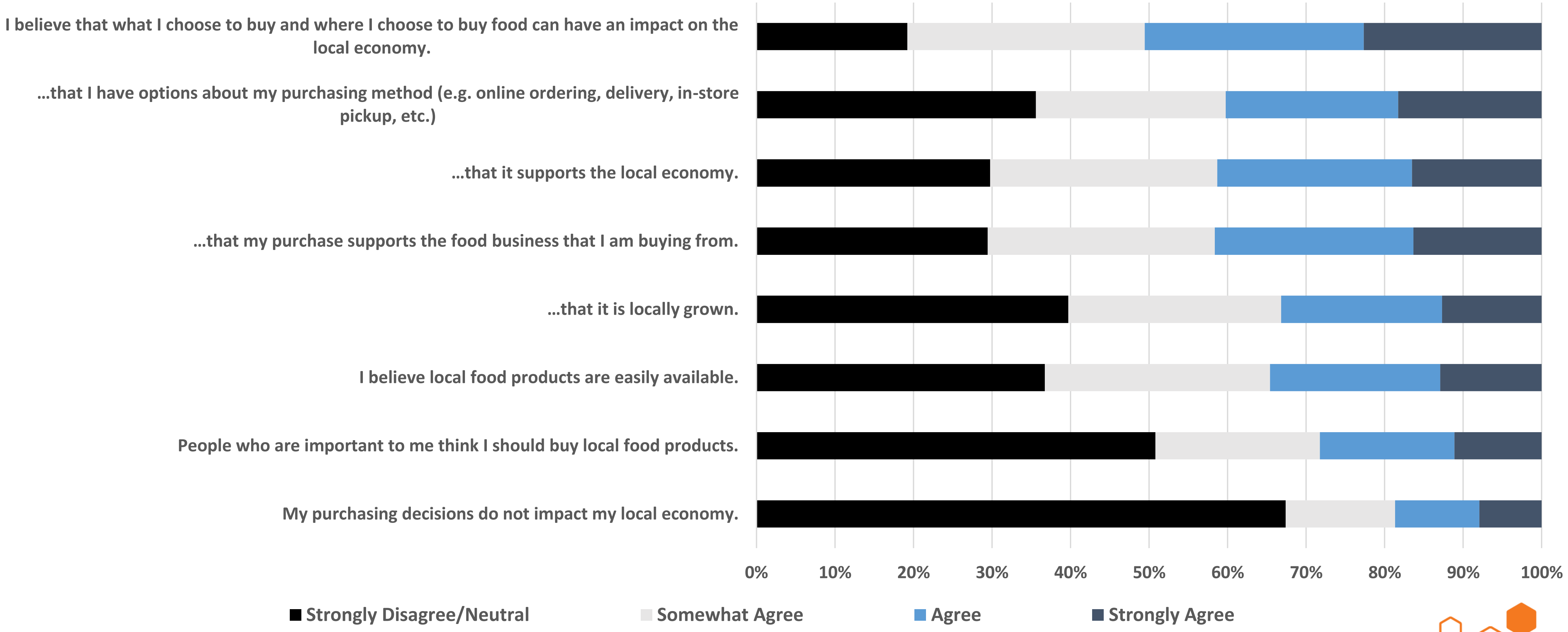
Localfoodeconomics.com

Market Channels

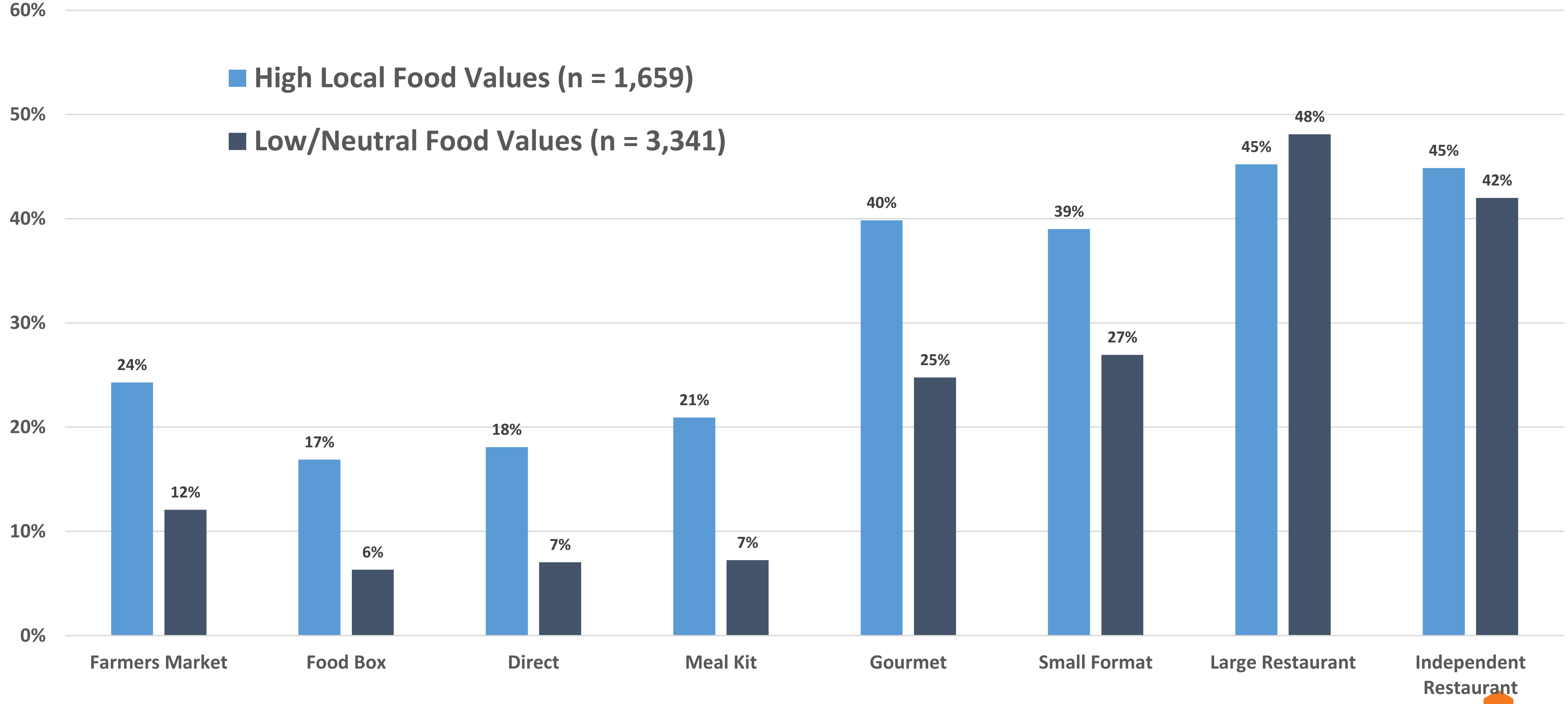
- “Supercenter and wholesale (e.g. Walmart, Costco)”
- “Supermarket and grocery (e.g. Safeway, City Market, Albertsons)”
- “Health/natural supermarket (e.g. Whole Foods, Natural Grocers)”
- “Convenience store/corner store (smaller stores with limited selection, e.g. 7-Eleven)”
- “Discount store (e.g. Dollar Store; Aldi)”
- “Smaller format grocery store (e.g. independent grocery store, food co-op, Trader Joe's)
- “Farmers market”
- “Direct from producer (other than farmers markets; e.g. CSA, farm stand, ordering online from a producer)”
- “Food box (e.g. sourced from many farms/producers; picked up at food hub or delivered to home)”
- “Meal/Meal Kit Delivery Service (e.g. Blue Apron, Schwan's, etc.)”
- “Bakery, deli, meal or fish market (gourmet or ethnic)”
- “Large, national restaurant chains (e.g. Wendy's, Applebees, etc.)”
- “Local Independent restaurant”

Food Values
(Local Food & Local Economy)



Market Channel Use and Local Food Values (Sept. 2020)

(Percent of Shoppers with High vs. Low/Neutral Local Food Values Using Market Channels)



Examples of US trends in intermediated markets

In 2014, Wal-Mart sold **$749.6 million** in **local foods**

-Fortune Magazine 2015

Walmart

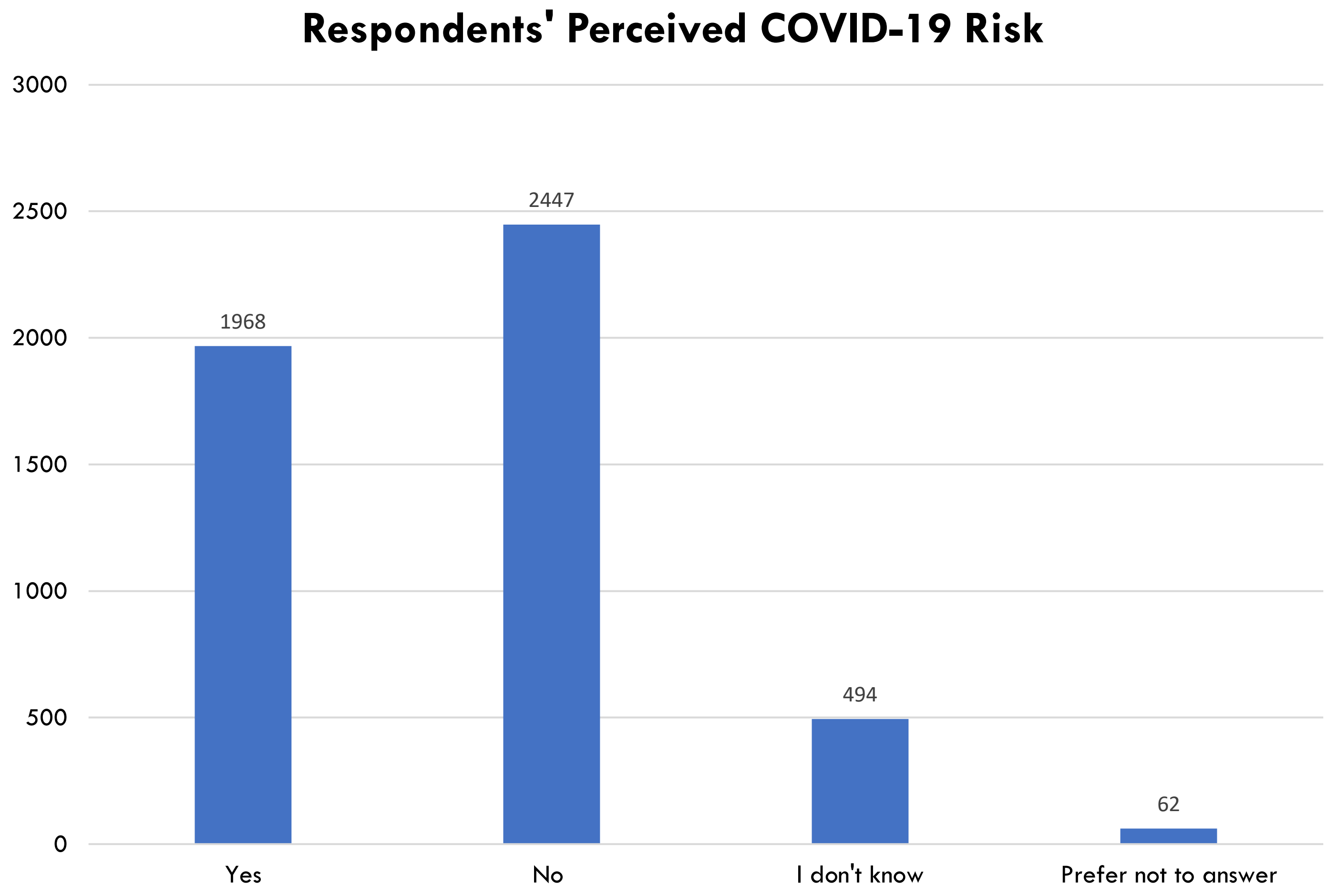
Bringing the farm to school

4,322	40,328	23,513,237
districts	schools	children

USDA distributed the Farm to School Census (the Census) to **13,133** public school districts in the United States, **9,887** of which completed the Census. **4,322** districts operating approximately **40,328** schools with **23,513,237** students in attendance are bringing the farm to school.

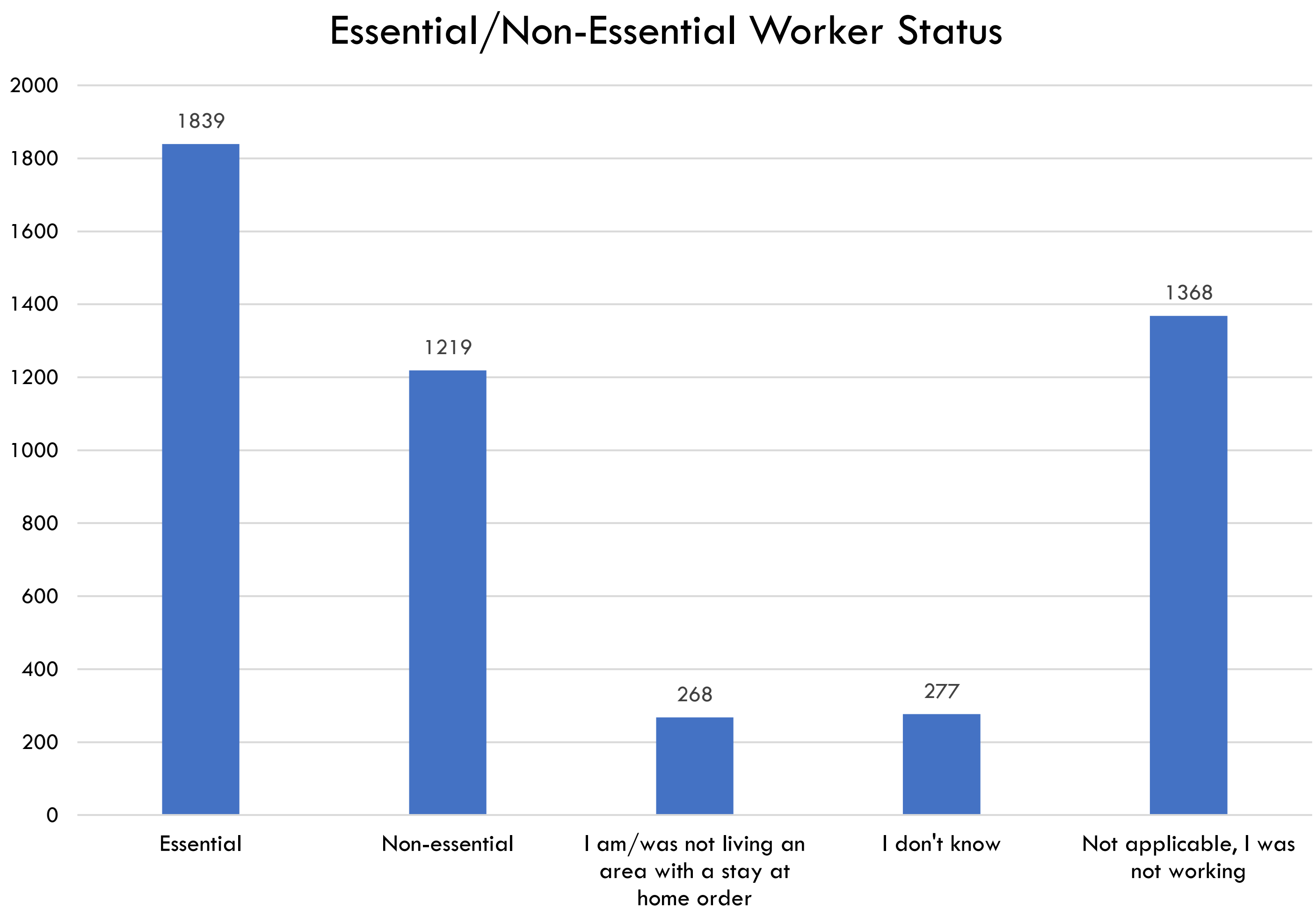
Chains Seek Out Ways to Showcase Local Ingredients

Consumer Survey: COVID-19



Respondents were asked "Are you, someone you live with, or someone you are in close physical contact with, at high risk for developing complications related to COVID-19?" 39.6% of respondents (1,968) responded "Yes," that they or someone they are in close physical contact with are at high risk for developing complications related to COVID-19. A large portion of respondents (2,447; 49.2%) answered "No." Another 9.9% (494) responded "I don't know," and the remaining 1.2% selected "Prefer not to answer."

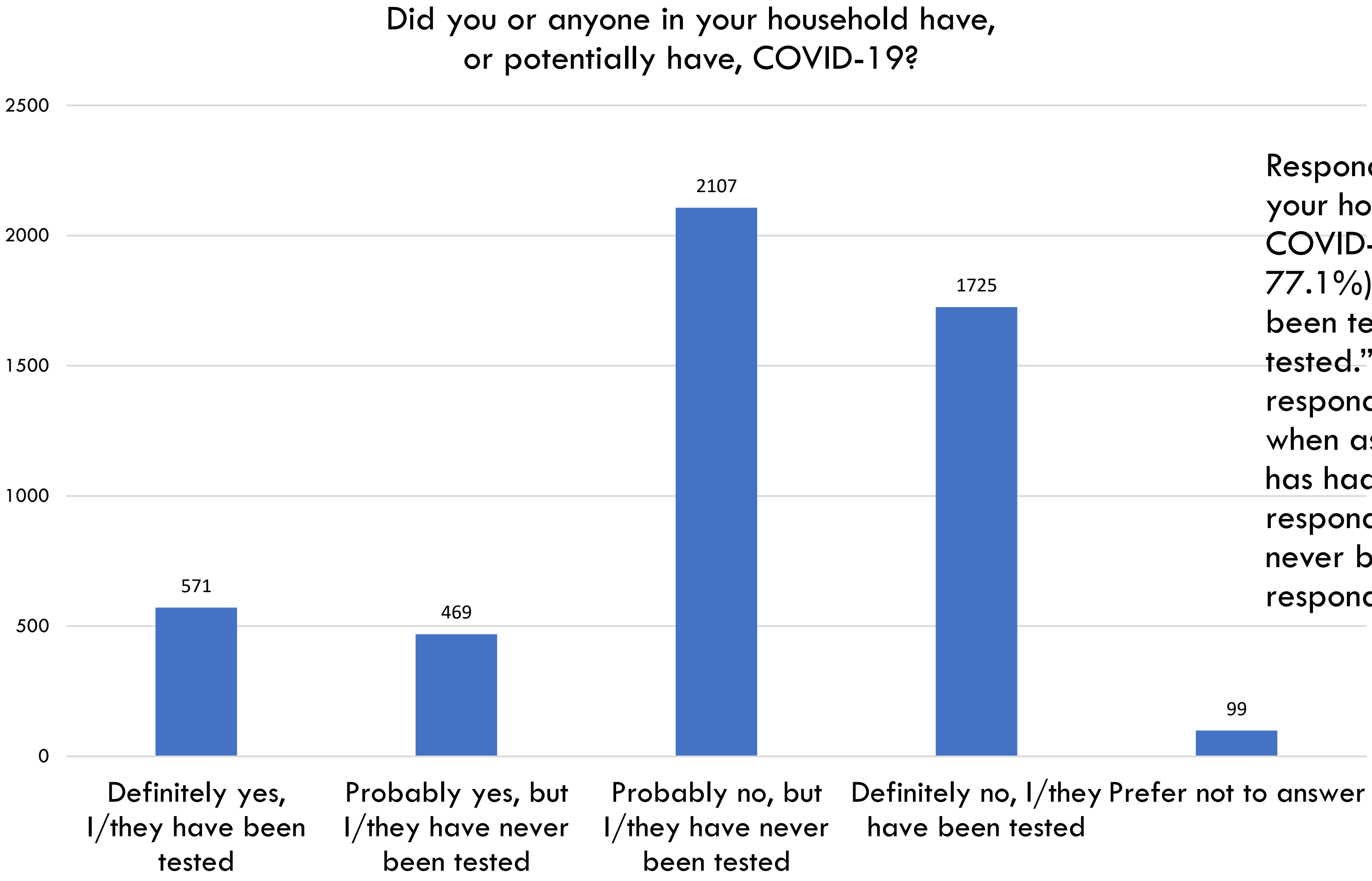
Consumer Survey: COVID-19



Respondents were asked "If you are living in an area that is/was under a stay at home order and were working, is/was your job or business considered "essential" or "non-essential"?" 37% (1,839) of respondents selected that they were designated "Essential" and 24.5% (1,219) responded that they were "Non-Essential."

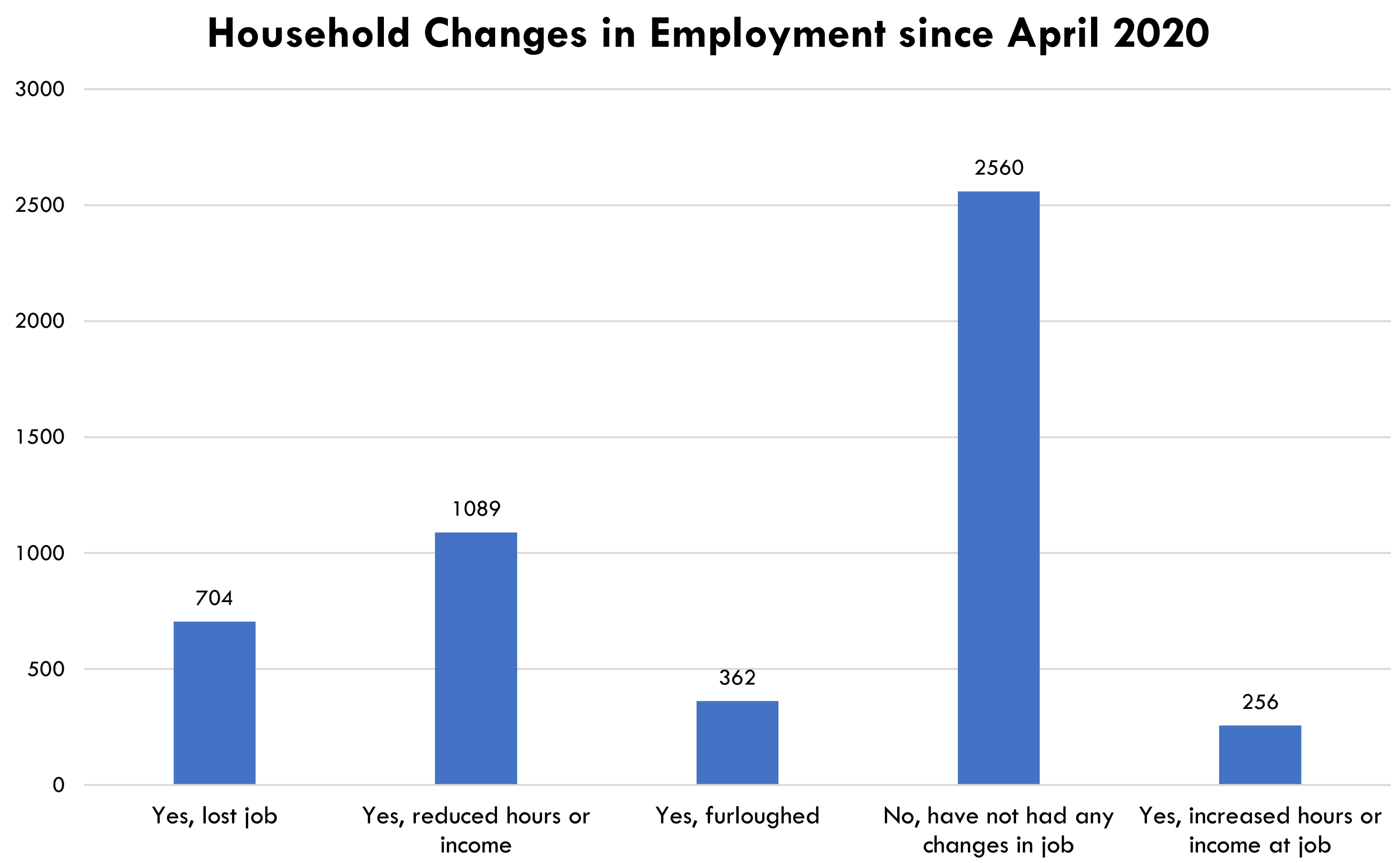
27.5% (1,368) of respondents selected "Not applicable, I was not working." The remaining portion of respondents selected that they were not living in an area with a stay at home order (5.4%; 268) or selected "I don't know" (5.6%; 277).

Consumer Survey: COVID-19

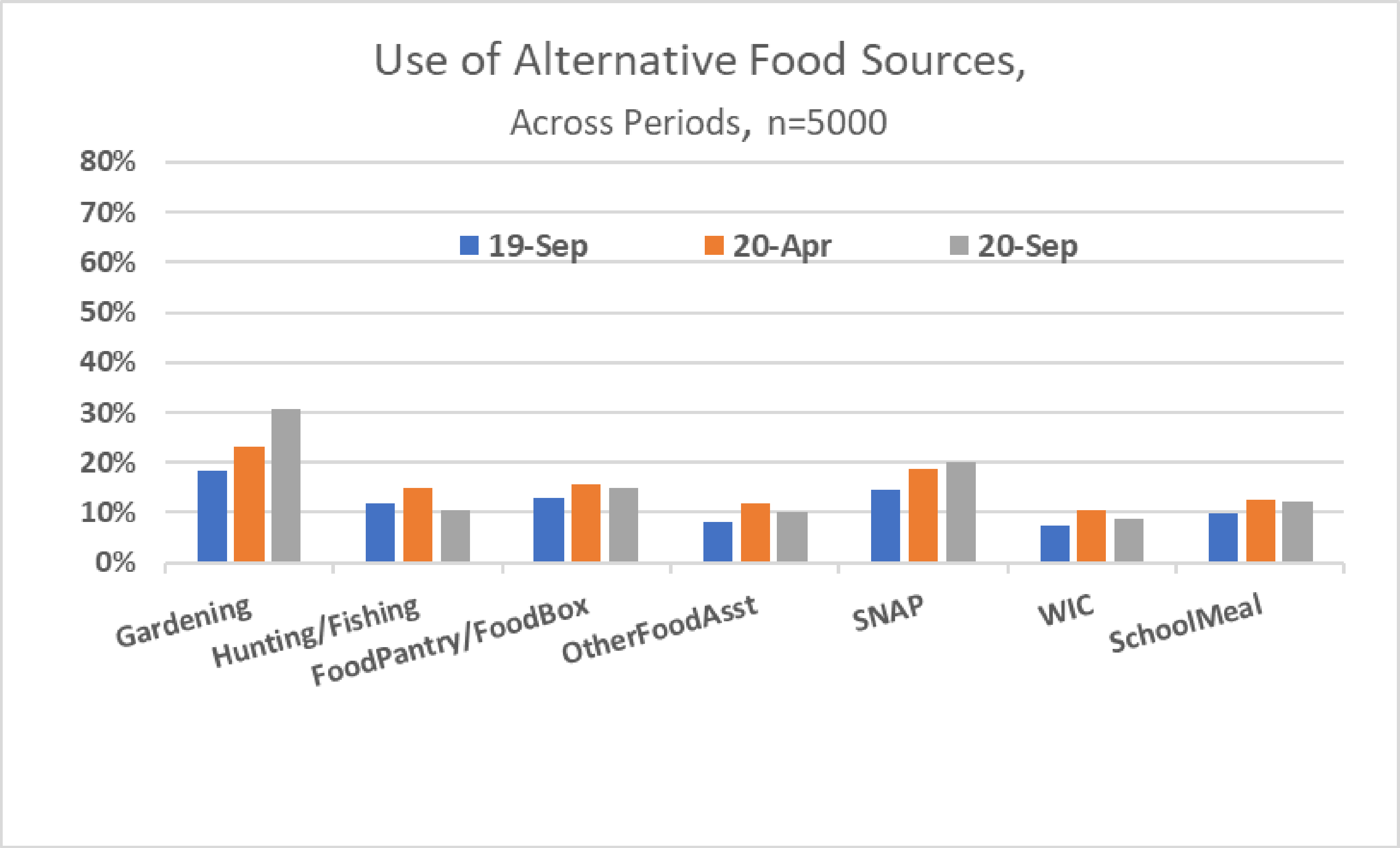


Respondents were asked "Did you or anyone in your household have, or potentially have, COVID-19?" A majority of respondents (3,832; 77.1%) stated either "Probably no, but never been tested" or "Definitely no, have been tested." 11.5% of the respondents (571) responded "Definitely yes, have been tested" when asked if they or anyone in their household has had COVID-19. Another 9.4% of respondents (469) selected "Probably yes, but never been tested." The remaining 2% of respondents selected "Prefer not to answer."

Consumer Survey: COVID-19

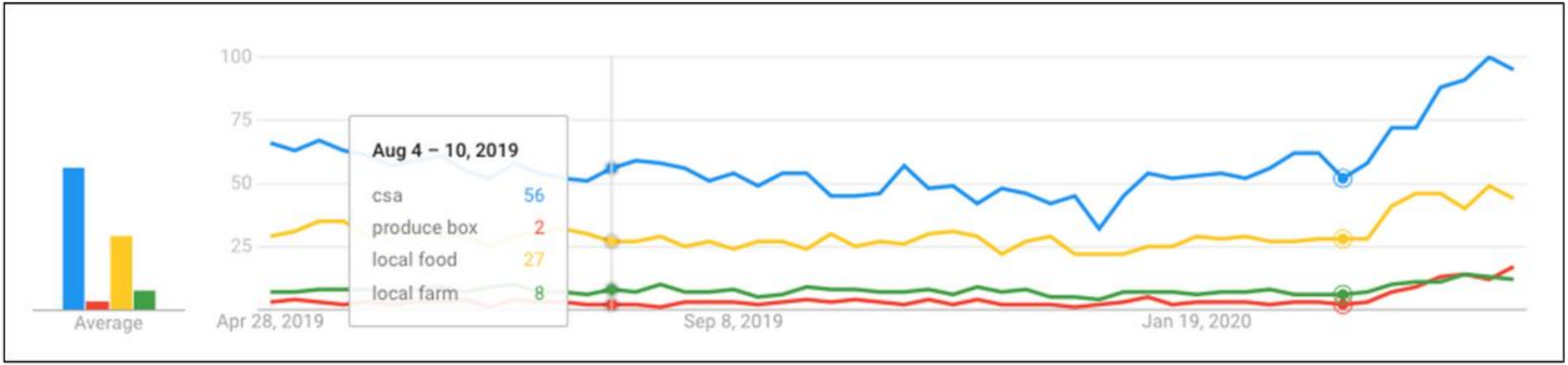


Respondents were asked "Have you or anyone in your household experienced a change in income or job since the COVID-19 outbreak (April 2020)?" A majority of respondents (2,560; 51.5%) answered that they/their household did not experience any changes in income or employment since April 2020. 2,155 respondents



Linkages to broader changes in food behavior may also provide some insights

Google Trends



Source: Google Trends, April 27, 2020; circles to the right show week of March 1–7, 2020.

Schmidt, C., S.J. Goetz, S.J. Rocker, and Z. Tian. 2020. Google searches reveal changing consumer food sourcing in the COVID-19 pandemic. *Journal of Agriculture, Food Systems and Community Development.* 9(3), 9-16.