Northeast Regional Center for Rural Development
COVID-19 Issues Brief

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Google Searches Reveal Changing Consumer Food Sourcing in the COVID-19 Pandemic

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Claudia Schmidt, Stephan J. Goetz, Sarah J. Rocker, Zheng Tian, NERCRD, Penn State University

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Consumers are dramatically changing their food purchasing habits in response to the evolving COVID-19 pandemic (Kolodinsky, 2020; Schmidt, et al., 2020; Worstell, 2020). In part this is due to growing public awareness that food supply chains, which normally operate largely unnoticed and with great efficiency, are in fact fragile and vulnerable. With supply chain interruptions and mandates in several states for social distancing and fewer grocery shop trips, consumers are compelled to think about food storability as well different food sourcing options. In this commentary we examine how consumer interest has changed since the advent of the pandemic, by observing Google Search Trends. Google Trends analysis has been widely used to study health-related aspects of COVID-19 and earlier pandemics (Carneiro & Mylonakis, 2009; Ginsberg et al., 2009; Nuti et al., 2014; Mavragani, Ochoa, & Tsagarakis, 2018; Mavragani & Ochoa, 2019; Arora, McKee, & Stuckler., 2019), but to our knowledge not to track changing consumer behavior with respect to food sourcing in real time.[1] We offer these comments both as potential real-time tracking of consumer preferences, as well as working hypotheses for future more vigorous investigations.

Google Search Trends[2] data can reveal not only what is preoccupying the public at a point in time, but also how that compares with preoccupations over the course of a year (i.e., year to year comparisons), as well as to other topics.[3] In the case of the pandemic, the State of Washington was the first to declare a COVID-19-related emergency, on February 29, 2020, while California was the first to issue a Stay-at-Home order, on March 19 (it declared an emergency on March 4) (Kelleher, 2020; Mervosh *et al.* 2020). In terms of national consumer interest or preoccupations, we are able to observe three more or less distinct periods in terms of food-related searches. *First*, a concern with food storage, starting the week of February 16-22 and continuing until mid-April, coupled with some evidence about concerns over food shortages (starting March 1-7). *Second*, starting the week of March 1-7, a growing interest in more local, direct options for acquiring food emerges, which continues to this day. *Third*, starting the week of March 8-14, and spiking a few weeks later (except for Grubhub), growing interest

[1] These searches are not without potential problems; for a summary discussion see: https://medium.com/@pewresearch/using-google-trends-data-for-research-here-are-6-questions-to-ask-a7097f5fb526

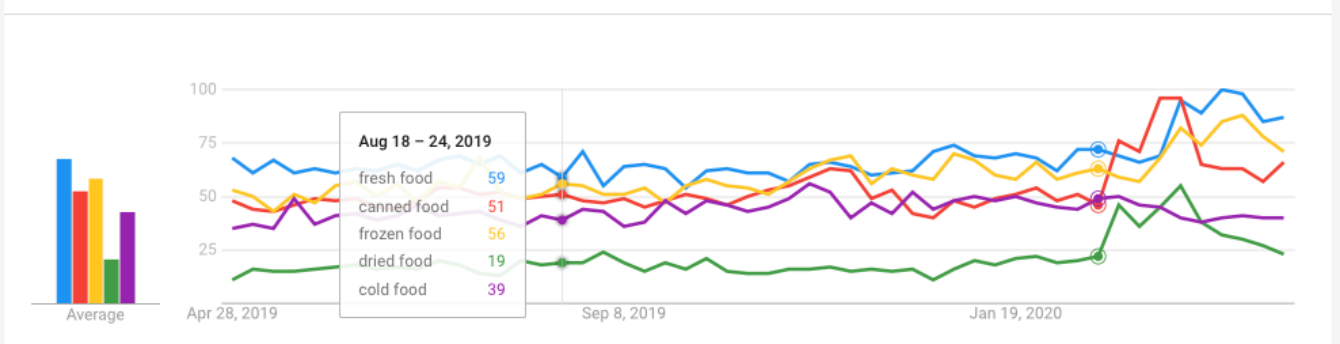
[2] "Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough data for this term" (google.com)

[3] Except where noted, the search is for the entire U.S. and for the last 12 months.

in take-out food and home delivery, as the stay at home orders became more widespread. This was also the week in which searches for food banks and pantries started to take off, just preceding the week of March 22, which saw record increases in initial jobless claims (3.3 million) (Trading Economics, 2020).

1. *Week of February 16-22: Consumers are concerned about storing food (and potentially hoarding)* With the looming pandemic, consumers became increasingly interested in storable basic food items, whether that food was fresh, canned, frozen, refrigerated or simply dried (Fig. 1). These searches started to rise during the week of February 16-22 in the cases of dried food and canned food, a period that also coincided with anecdotal evidence of empty shelves for certain food items, including beans, flour and pasta. Searches on fresh food were gradually rising even earlier but jumped March 8-14, while in the case of frozen food the increase occurred the week of March 1-7. Interest in frozen food was also the last to spike, during April 5-11.

Figure 1. Interest over Time – Food by Storage-Related Processing (last 12 months)*



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of Feb. 16-22, 2020

**Note for this and other Figures: We capture Google search results directly as screenshots. In order to keep the graphs small while adding a legend, we use the feature whereby hovering the cursor over the lines on a certain data also provides a legend for the lines; this date is reported but arbitrary for present purposes. The dates that are relevant are shown as dots with circles and are closer to the right sides of the graphs.*

In terms of the distribution across states (Fig. 1a), searches for fresh food tended to dominate in the eastern half of the U.S., except in West Virginia and Vermont, where canned food dominated, while frozen food was of greatest interest in Northern New England, Connecticut and Ohio and selected and inter-mountain west states as well as Iowa. Canned food searches showed similar dispersed pattern, with WA, OR, MT and a few other states standing out.

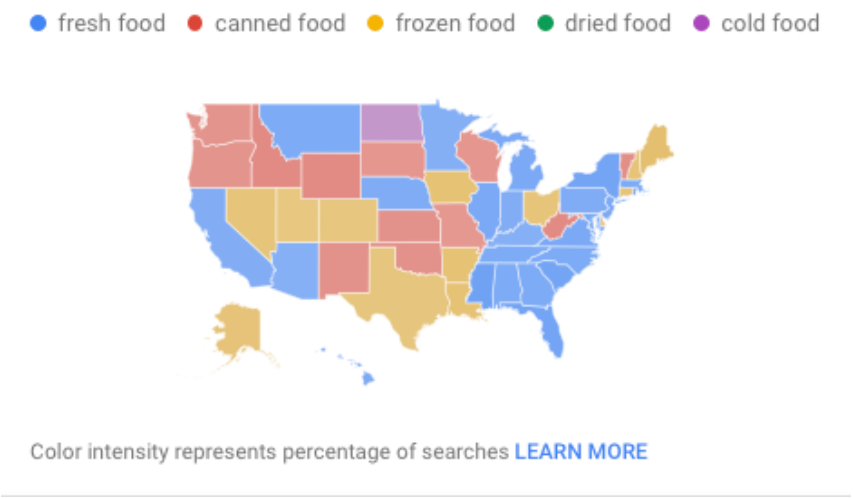
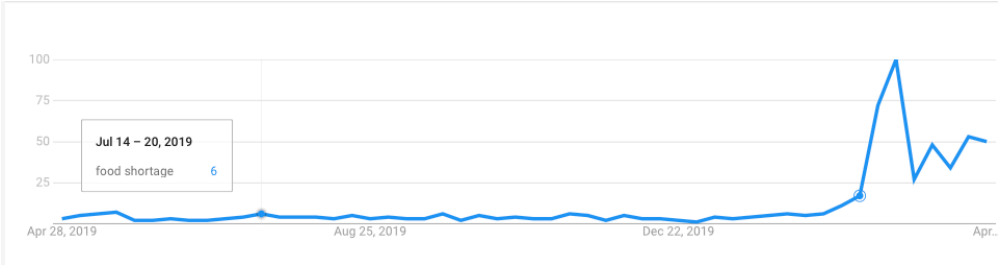


Figure 1a. Distribution of prominent search terms by State
Source: Google Trends, April 27, 2020

The notion that consumers were thinking about food shortages is confirmed by searches on this term, which dominated the individual food categories (Fig. 1b) and remains high at 50% after spiking early on. The states of North Dakota, New Mexico, Montana, Idaho, and Utah dominated in search interest over this period.

Figure 1b. Search Interest for Food Shortage Coincides with Beginning of Pandemic (12 months)



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of March 1-7, 2020

To put this one-year search pattern in perspective, Fig. 1c shows the data since 2004. Subject to the caveat that the collection method and search function have changed over time, this figure suggests a slightly greater concern about or preoccupation with food available in the current pandemic than was true in April 2008, the peak period of global food scarcity owing to production shortfalls around the world (over the overall period for which data are available).

Figure 1c. The Long View of Search Interest in Food Shortage (2004-2020)

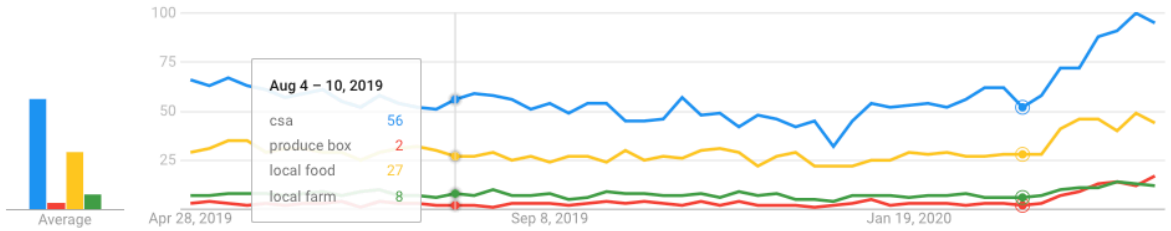
Source: Google Trends, April 27, 2020; the geography of search is the U.S.; The "note" labels mark when Google Trends made a change in the collection method.

2. Week of March 1-7: Consumers start to think about local options for sourcing food

Along with the concern about storability of different foods, consumers also started to look for other, more local sources of food around the first week of March. For CSA's, community-supported agricultural operations, the searches had already been gradually rising since the beginning of the year as consumers sought to connect with farmers who were making early planning decisions for what to grow, reflecting normal season search patterns. Interest in community-supported agriculture was the

highest in the states of Vermont, District of Columbia, Massachusetts and Oregon. The terms local farm and food also enjoyed moderate search interest in this period. Searches for these terms have only recently peaked, and they continue to rise in the case of produce box – mostly in North Carolina – as the harvest season accelerates.

Figure 2. Interest over Time – Switching to More Local Direct Options



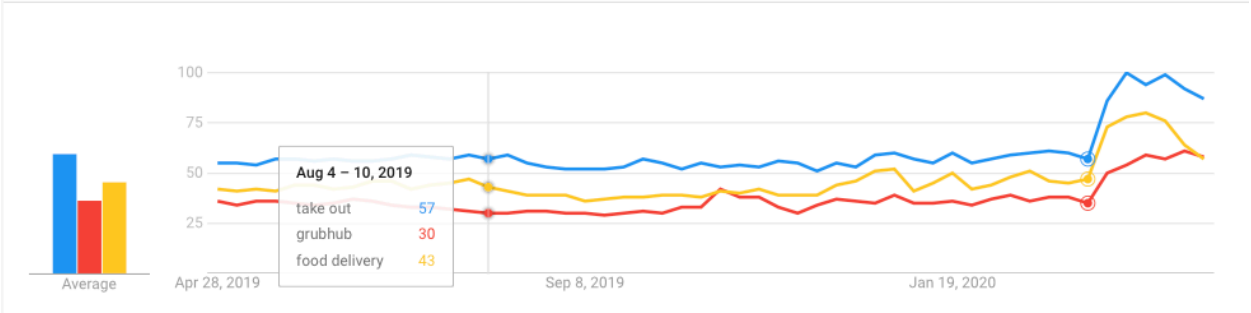
Source: Google Trends, April 27, 2020; circles to the right show week of March 1-7, 2020

3. *Week of March 8-14: With growing fears about the virus and shutdown orders, consumers look to takeout and delivery options.*

About a week later, as consumers could no longer go to restaurants and with social distancing and shut down orders in place, they turned to yet another food access option, with the terms takeout, Grubhub and food delivery each experiencing surging interest during the week of March 8-14. In these searches, food delivery could also be from grocery stores as well as restaurants.

The terms uber eats; peapod and instacart show similar trends (with the latter having twice the search volume of takeout). It is also noteworthy that Grubhub is enjoying sustained interest even as the other terms are falling off in terms of interest. North and South Dakota and Delaware dominated in food delivery searches, while Grubhub was most prominent in Oregon, Utah and Illinois.

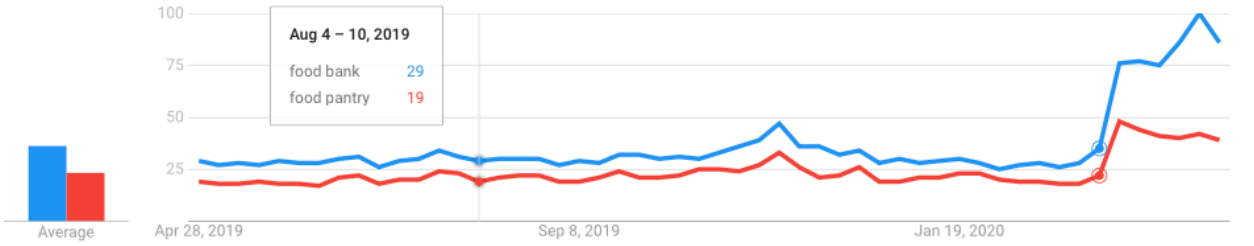
Figure 3a. Switching to Options Outside Restaurants (and Stores)



Source: Google Trends, April 27, 2020; circles to the right show week of March 8-14, 2020

During March 8-14, as the first waves of layoffs started to occur, searches for emergency food aid also started to rise. The term food bank dominated in WA, MT, AZ, AL and ID, all Western States which, unlike the U.S. South, may have individuals who are seeking food aid for the first time. In some states, including Washington, the National Guard has been called in to support Food Bank operations which are experiencing higher than ever client demand, on top of shortages of food supply and workers. (Kulish, 2020). For food pantry, WI, IL, SD, ND and MO dominated. Again, in these states residents may not have had much prior experience utilizing such emergency food outlets.

Figure 3b. Rising Demand for Food Aid



Source: Google Trends, April 27, 2020; circles to the right show week of March 8-14, 2020

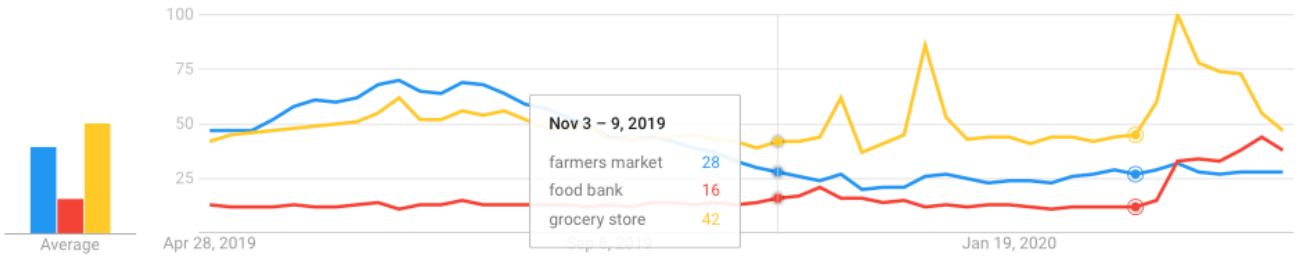
4. *The broader changing context of where food is sourced*

To place the above findings in context, we show search trends for grocery stores, farmers markets and food banks over the course of the last 12 months (Fig. 4). Even though consumers start to think about local options for sourcing food in the early spring, farmers market searches are lower (by about half) year over year, most likely because of social distancing concerns as well as non-essential orders prohibiting farmers market operations in some states. Based on the patterns last spring (and earlier years -- not shown) seasonal searches for farmers markets should be increasing at this time as consumers start to expect early spring harvests at least in some parts of the country. But this year, even as some farmers markets adapt (Schmidt et al. 2020) by using curbside delivery, etc., the searches remain low.

Grocery store searches are well above seasonal search patterns normally observed this time of the year, spiking noticeably on March 15, and slightly greater than searches around the end of year holidays of Thanksgiving and Christmas. This is likely because consumers are verifying store hours of operation (including special hours for senior citizens) or perhaps planning grocery trips in order to stock up on food. The latter would explain why the search intensity has declined recently to a level more similar to that of last years at this time.

As already noted, interest in information on food banks has increased sharply since the beginning of March in a relative sense. Normally such search demand rises only in the few weeks before Thanksgiving, but during the pandemic the volume is two to three times higher.

Figure 4. The Broader Context: Farmers Markets, Grocery Stores and Food Banks

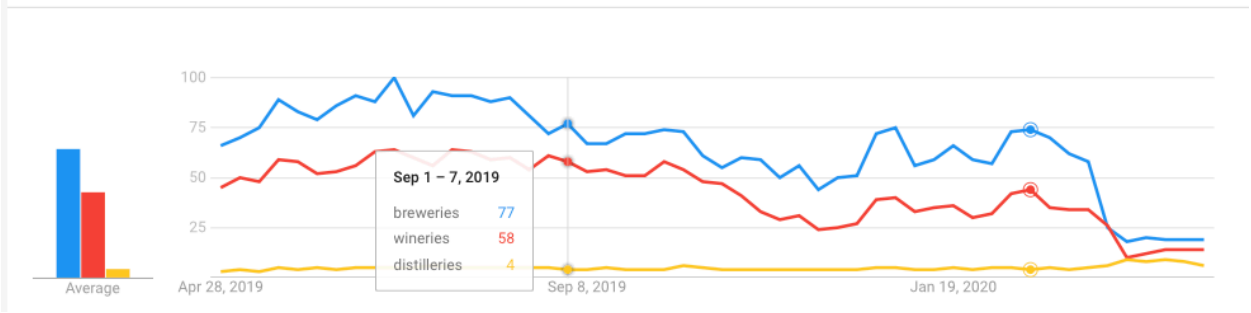


Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of March 1-7, 2020

5. *Despite growing interest in local, demand for breweries and wineries has dramatically dropped*

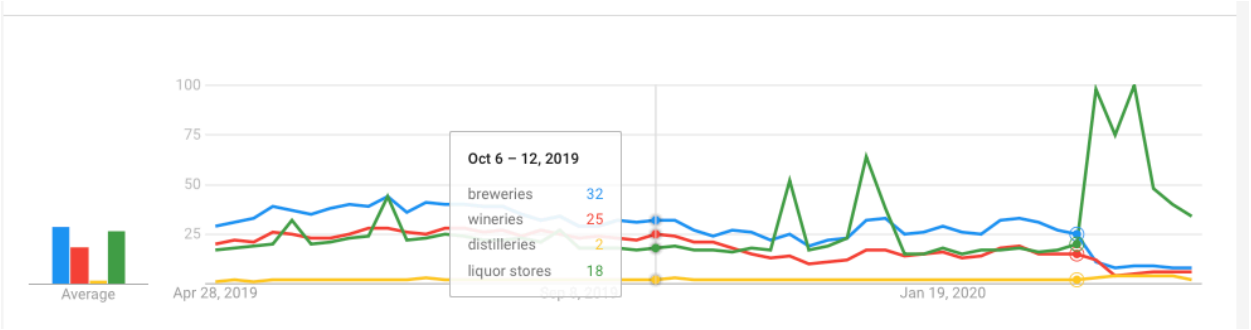
As a result of stay-at-home rules and social distancing relatively early in the pandemic, consumers ceased to look up much information on breweries and wineries, starting in mid-February (Fig 5a). At the same time, however at a considerably smaller search volume, interest in distilleries has risen in recent weeks, perhaps as consumers sought more potent forms of alcohol, as liqour stores shut their doors in some states under non-essential business closures, or as consumers were looking for local sources of hand sanitizer (Distilled Spirits Council, 2020). Interest in breweries and wineries, which tend to provide experiences rather than mere commodities, is greatest during the summer and again around the late-year holidays, and normally search volumes should be rising at this time rather than falling (Fig. 5a); both of these search terms are dominated by searches for liquor stores (Fig. 5b), perhaps reinforcing the idea that consumers are seeking a greater variety and perhaps more potent drinks[4] (a concern raised in PA after liquor stores were closed was that sudden withdrawal could be life threatening for alcoholic (Whelan, 2020); PA residents also started to drive into adjacent states to purchase liquor, contribution to concerns there that they would be bringing the virus with them (Ebrahimji, 2020).

Figure 5a. Search Intensity for Breweries, Wineries and Distilleries



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of February 16-22, 2020 as period of decline

Figure 5b. Search Intensity for Breweries, Wineries and Distilleries with Liquor Stores



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of March 8-14, 2020 as period of increase for liquor store searches, such as the decline for breweries/wineries accelerates (suggesting substitute stores/goods)

[4] The average consumer likely does not know the name of their local brewery or winery, and may just be looking for generic terms to find an alternative to what they know (which was perhaps their closest go-to state store).

For brewery searches, the greatest interest was in the northern New England states while for wineries it was along the western coastal U.S. and, somewhat surprisingly, Kentucky. Many breweries are now having to deal with kegs that will turn stale within a couple of months amounting to losses estimated at $1 billion (Chaudhuri, 2020). This has sparked innovative collaborations among brewers and distillers across the country, who are rescuing stale beer through distilling the kegs for the production of whiskey and hand sanitizer (Japhe, B., 2020).

Conclusion and Shortcomings

Even though demand in local food has increased over the past decade, only a small number of Americans buy regularly from local food outlets, such as farm stands, farmers markets, and community supported agriculture operations (Kolodinsky et. al, 2020). It is likely that interest in local products and markets has increased because of consumer demand for convenient and safe access during this time of sheltering, where distant travel is restricted. As restrictions loosen in the coming months, it remains to be seen whether consumer interest in local will persist, and how innovations in short supply chains during the peak of the pandemic will ultimately affect long-term profitability of local foods systems (e.g., Ahearn et al. 2018).

What we show in this commentary has shortcomings, including inherent noise in the data based on the search terms. Nevertheless, this relatively quick examination of Google searches shows how real-time data can be collected and interpreted to understand what is preoccupying consumers from week to week during a pandemic. More refined analyses could be carried out in the future, with rigorous hypothesis testing.

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