



## Short communication

## Coping with the 2022 infant formula shortage

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## ABSTRACT

To estimate the proportion of US consumers who sought formula during the shortage, what coping mechanisms they used, and public support for formula policies, we conducted an online survey of approximately 1,000 US consumers in August 2022 via Qualtrics. Approximately 35% of consumers attempted to purchase formula during the shortage, for their own household or on behalf of someone else, and the most common coping mechanisms were focused on searching different outlets (e.g., multiple stores, online). During the shortage public health agencies published recommendations for consumers – some were highly utilized (e.g., searching multiple stores), however, some were utilized less frequently (e.g., brand switching, breastfeeding). Additionally, despite warnings, some consumers still attempted to make their own formula. Understanding what coping mechanisms were and were not utilized, and their related risks has important implications for improving public health outreach in the future. Finally, we find considerable public support for regulation to ensure adequate supply of formula in the future, in particular regulation allowing imported formula and increased government involvement in the number of firms producing formula.

## 1. Introduction

Over half of infants in the United States depend on infant formula (formula for infants under one year; CDC, 2020). In late 2021, pandemic-related supply chain issues brought initial formula access issues, and reports of initial shortages began appearing (Maloney and Terlep, 2022). In February 2022, the shortage was worsened when, after an investigation of foodborne illness by the FDA, Abbott Nutrition engaged in a voluntary recall and temporarily ceased production at a plant in Michigan (Abrams and Duggan, 2022; FDA, 2022). As shelves emptied, concerned consumers stockpiled, which exacerbated the shortage. By May 2022, reports indicated stock out rates were 74 % nationally and over 90 % in some states (Paris, 2022). Although access has improved drastically since May, recent news reports indicate consumers continue to have difficulty locating and affording infant formula (Han, 2023).

Product shortages have been commonplace during the pandemic; however, attributes of the infant formula market made it especially vulnerable to damaging shortages. Most importantly, unlike most other products, formula has virtually no close substitutes beyond breast milk, which although preferable is not always feasible (Sriraman and Kellams, 2016; Schulze and Carlisle, 2010; Dennis, 2006). Additionally, formula

imports have been previously restricted or faced high tariffs, and the market is highly affected by the involvement of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC has historically limited each state to one manufacturer of WIC-approved formula, and as WIC-purchases account for about half of formula purchases overall, their impact on brand market dominance is large (Davis, 2012).

During the shortage, many recommendations were made by health agencies on how consumers should cope short term (AAP, 2022; HHS, 2022) and began working on policy changes to increase supply and access. The American Academy of Pediatrics (AAP), for example, released recommendations, noting consumers should check multiple stores, purchase from reputable online distributors, switch brands, and check at doctors' offices (AAP, 2022). They indicated babies older than 6 months could temporarily use alternatives (e.g., cow's milk) if formula was unavailable and highlighted consumers should not make their own formula or water down formula. Governmental agencies made changes to increase supply and access to formula, including: approval for WIC to cover the cost of alternative formulas, allowance of imported formula without tariffs, and mandating increased production (USDA, 2022; WH, 2022). A recent paper utilized social media listening during the formula shortage (Jung, et al., 2023). They find that mentions peaked in May

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2022 and then disappeared quickly, despite continued shortages.

While recommendations were available on how to cope with the formula shortage, less is known about how households actually responded. Here, we investigate what coping mechanisms consumers engaged in (and may continue to engage in) and how consumers felt about formula policies.

## 2. Methods

We conducted an online survey of 1,070 US consumers in August 2022 about their experiences and policy preferences related to the formula shortage. We worked with Qualtrics to recruit respondents from an existing consumer panel; respondents were recruited to match the US population in terms of gender, age, income, and census region. Subject recruitment and compensation were managed by Qualtrics. Sample characteristics are presented in Table 1. This study was approved by the University of Illinois at Urbana-Champaign Institutional Review Board (IRB #22965). Respondents provided written consent by answering affirmatively that they would like to participate in the study in the first question of the online survey.

We first asked participants if they had tried to purchase formula during the shortage, either for their household’s use or on behalf of someone else. We refer to these participants as formula seekers. Formula seekers were asked about their use of different coping mechanisms such as switching formula brands, purchased formula online, received donor breastmilk, etc. All survey participants were asked about how they felt about two major formula policies – importing formula and government involvement in the number of formula producers.

## 3. Results & discussion

We find that over one-third of participants (35.1 %; n = 376) had tried to purchase formula during the shortage. Similar to previous findings on formula use (CDC, 2020), formula seekers were more likely to be non-white (31.1 % of formula seekers vs 24.2 % of all participants), Hispanic/Latino (24.2 % of formula seekers vs 14.7 % of all participants), and use nutrition assistance programs (45.4 % of formula seekers vs 28.4 % of all participants).

We asked formula seekers to select all the coping mechanisms they used during their experience with the formula shortage (see Table 2). The most common were purchasing formula from multiple stores,

**Table 2**  
Coping mechanisms used by formula seekers (n = 376)<sup>a</sup>.

Coping Mechanism	Proportion of formula seekers that used the coping mechanism (n)
Purchased formula at multiple stores	30.1 % (n = 113)
Purchased formula online	29.5 % (n = 111)
Had someone else purchase formula for you from stores near them	28.2 % (n = 106)
Sent or received formula in the mail	25.3 % (n = 95)
Received formula from a doctors’ office	24.4 % (n = 92)
Received formula from a community event or group (for example, a community formula drive or a Facebook group)	23.9 % (n = 90)
Received formula from a food bank or food pantry	14.4 % (n = 54)
Switched to a substitute brand of formula	13.6 % (n = 51)
Began breastfeeding, restarted breastfeeding, or breastfed for longer than you intended	13.3 % (n = 50)
Substituted with a product other than formula or breast milk (for example, cow’s milk)	13.3 % (n = 50)
Received donor breast milk	8.2 % (n = 31)
Attempted to make formula at home	5.6 % (n = 21)

<sup>a</sup>Individuals could select more than one coping strategy; as such, percentages will not add up to 100 %.

purchasing formula online, and having someone else purchase formula for you from stores near them.

During the formula shortage, recommendations were made by health agencies to help consumers cope temporarily. We find that some of these recommendations were highly utilized (e.g., searching multiple stores), however, some common suggestions like brand switching and breastfeeding were used at lower rates. These coping mechanisms may have been more difficult, costly, or less preferable. For example, lack of brand switching may have been due to higher costs of alternative brands, complications with government assistance (e.g., WIC), or concern about potential consequences of switching (e.g., suitability of another brand for infant). Similarly, starting, restarting, or extending breastfeeding can be difficult or not possible depending on the age of the infant or the length of time since breastfeeding was last attempted. Few recommendations discussed the use of donor breast milk, however a recent study recruited from parenting/breastfeeding/lactating Facebook groups found that over 70 % thought “donor milk from the milk bank could be a viable alternative to address the baby formula shortage” (Jackson and Obeng, 2022). Here, we find that use of donor milk was not a commonly utilized coping mechanism during the formula shortage. This highlights that despite support for the coping mechanism amongst many parents, in practice the use of donor milk was limited. These differences may be due to access of donor milk, infant needs (e.g., specialty formulas), or consumer preferences. Recommendations also noted consumers could temporarily switch to non-formula products such as cow’s milk for older infants, although we find this was not a highly utilized coping mechanism. Additionally, despite strong recommendations against the practice, some consumers still attempted to make their own formula.

Some coping strategies introduce additional risk to infants. For example, homemade formulas are unregulated and pose serious health risks to infants. In addition, accessing formula or donor milk through more informal sources like a Facebook group may introduce risk. Consumers may be offered unsafe formula (e.g., previously opened products, expired or recalled products) or unsafe donor milk (e.g., infectious disease, contaminates). Finally, shipping formula through the mail service can expose the product to unsuitable storage temperatures. Our results highlight the need for additional research to understand the health impacts of the formula shortage and underscore the importance of preventing future shortages.

Finally, we asked all participants (n=1,070) how they felt about two major formula policies aimed at addressing the formula shortage and preventing future shortages. We find that 86.6 % of participants thought the government should allow imported formula that meets US health

**Table 1**  
Sample Characteristics (n = 1,070).

Characteristic	Proportion of Sample
<i>Gender</i>	
Male	46.9 %
Female	51.5 %
Non-binary/third gender	1.7 %
<i>Age</i>	
18–24 years	12.4 %
25–34 years	18.2 %
35–44 years	17.2 %
45–54 years	17.6 %
55–64 years	15.8 %
65 years or more	18.8 %
<i>Annual Household Income</i>	
Less than \$25,000	18.1 %
\$25,000–\$49,999	22.2 %
\$50,000–\$74,999	19.1 %
\$75,000–\$99,999	14.0 %
\$100,000–\$149,999	14.9 %
\$150,000–\$199,999	5.9 %
\$200,000 or more	5.8 %
<i>Census Region</i>	
Northeast	21.7 %
South	40.6 %
Midwest	20.4 %
West	17.4 %

and safety standards and that 74.0 % of participants thought the government should be involved in increasing the number of formula producers in the US.

#### 4. Conclusions

We surveyed approximately 1,000 consumers to estimate the proportion of consumers affected by the formula shortage, to understand what coping mechanisms consumers used, and to gauge public support for two large formula policy initiatives. Our results indicate that over one-third of consumers surveyed had attempted to find formula during the shortage either for their own household or on behalf of someone else, highlighting the extent to which this shortage has affected US households. We also find that this shortage disproportionately affected non-white and Hispanic/Latino consumers and consumers that use nutrition assistance programs. Additional research is needed to understand the impact of the shortage on the health of infants and mental health of caregivers. We also show what coping mechanisms were and were not utilized during the shortage and how these differed from health agency recommendations. These results have important implications for improving future public health outreach. Our results suggest that during similar crises public health outreach should highlight low cost strategies (like searching multiple locations and online). Similarly, our results suggest that outreach efforts must understand the roles that consumers' networks play in coping. Here, we find that consumers depended heavily on others, including sending or receiving formula through the mail, receiving from doctors' offices, and receiving from community events and groups. Our results also show that in addition to discouraging high risk coping strategies like making formula at home, recommendations should include details on how consumers might mitigate risks for common coping mechanisms (for example, how to safely share and accept formula with and from others). Finally, our findings highlight considerable public support for both allowing imported formula and additional regulation ensuring adequate suppliers of formula in the future.

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#### CRediT authorship contribution statement

**Maria Kalaitzandonakes:** Conceptualization, Data curation, Formal analysis, Writing – original draft. **Brenna Ellison:** Conceptualization, Writing – review & editing, Supervision. **Jonathan Coppess:** Writing – review & editing, Supervision.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Data availability

Data will be made available on request.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2023.102123>.

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