



# Tackling and Solving Food Insecurity with Private Sector Innovations

CENTER FOR FOOD DEMAND ANALYSIS AND SUSTAINABILITY

Department of Agricultural Economics  
Purdue University

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**AgriNovus**  
INDIANA



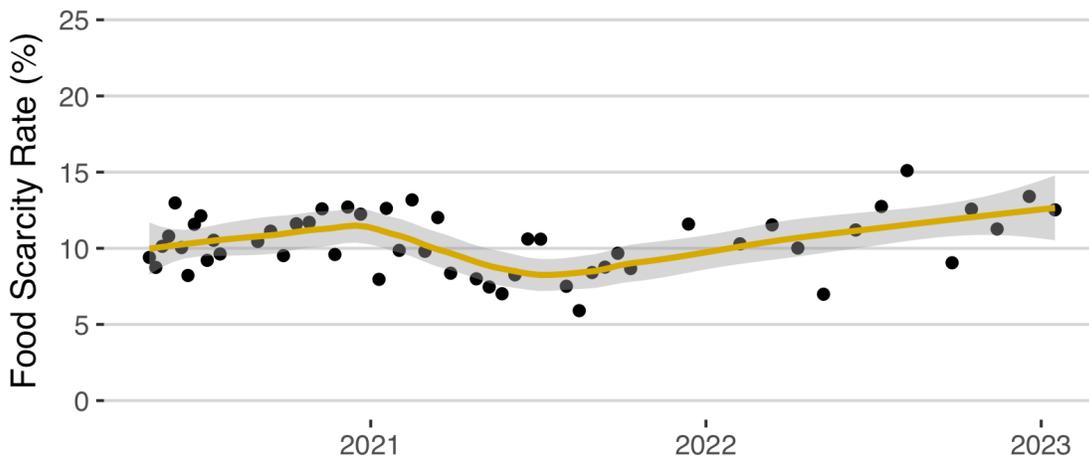
Center for Food Demand,  
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# BACKGROUND

Food insecurity is a severe and pervasive problem in Indiana. Food insecurity is described as the limited or uncertain availability of nutrient-adequate and safe foods or the inability to obtain such foods in socially acceptable ways [1]. The United States Department of Agriculture (USDA) estimates that 13.5 million U.S. households, or 10.2% of all households, faced food insecurity in 2021. This means that they had trouble providing adequate food for themselves and their family members due to a lack of resources. In Indiana, the average household food insecurity rate for 2019-21 was 9.7%, which is 3.8 percentage points lower than the state's average rate from 2016-18 (13.5%) [1].

Since May 2020, the United States Census Bureau has used a rapid response tool – the Household Pulse Survey – to collect information on households who have suffered from food scarcity, defined as those that have 'sometimes or often' not had enough to eat in the last 7 days (see Figure 1) [2]. The data show a more complicated trend as the share of Indiana households that had difficulty purchasing enough food rose from 9.4% in May 2020 to a high of 13.4% in December 2022, with the lowest percentage of 7% in May 2021. The recent increase in food insecurity in Indiana has occurred at a time when food prices have increased at their fastest rate in forty years.

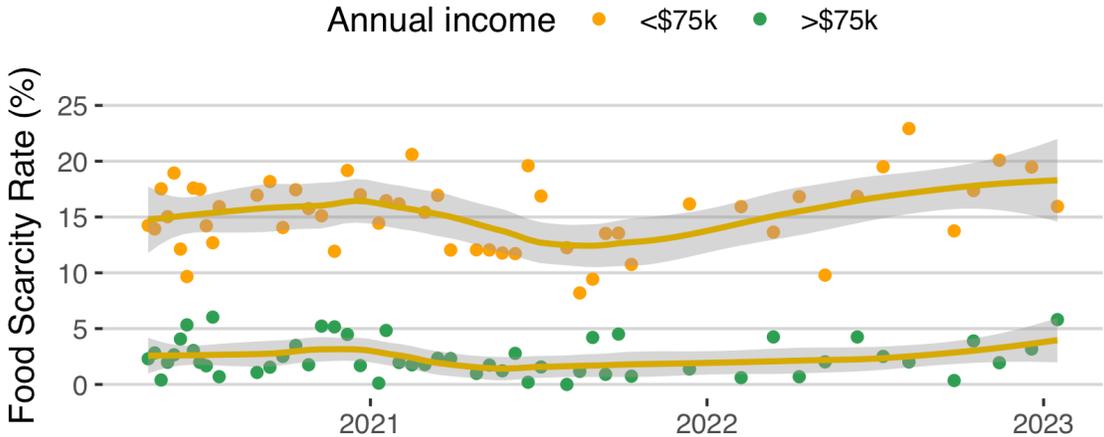
**Figure 1.** Food scarcity rate in Indiana (Source: US Census, Household Pulse Survey)



The factors contributing to food insecurity are complex and interrelated, including poverty, unemployment, low wages, limited access to healthy and affordable food, broadband connectivity, and the high cost of housing, transportation, and health care. These factors may result in a shortage of resources, making it challenging for households to get nourishing food regularly. For example, only a small fraction (less than 5%) of Indiana households making more than \$75,000 annually face food scarcity compared to nearly 20% of households making less than \$75,000 (see Figure 2).

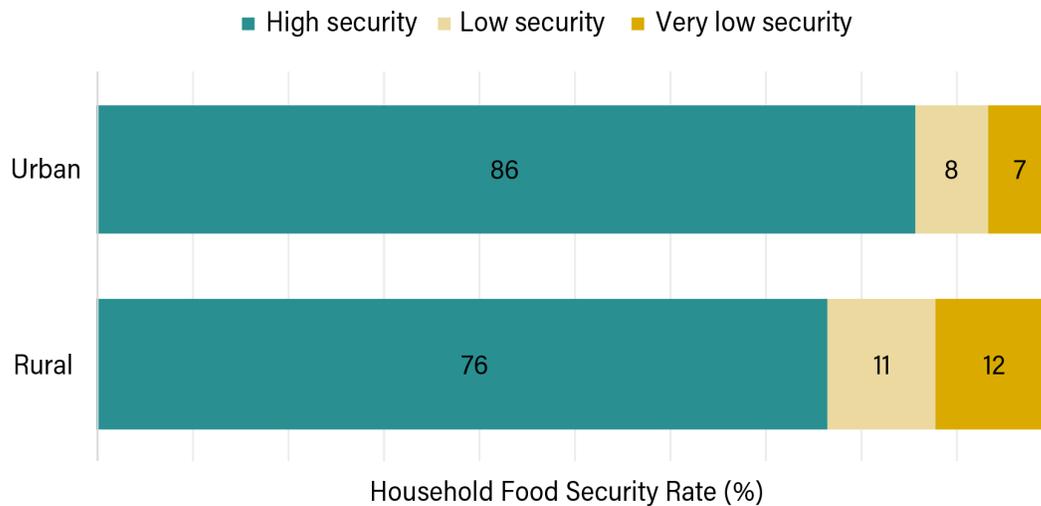
In fact, the recent rise in households struggling to acquire enough food has almost exclusively affected households making less than \$75,000 annually.

**Figure 2.** Food scarcity rate in Indiana by income (Source: US Census, Household Pulse)



Of the 92 counties in Indiana, 48 are classified as rural, and just under 30% of all Indiana residents live in rural areas [12]. Data from Purdue University's Center for Food Demand Analysis & Sustainability (CFDAS)'s Consumer Food Insights national monthly survey of 1,200 consumers, indicates that rural households are impacted by food insecurity in different ways than urban households. Access to fresh, healthy, nutritious products within a close distance to a consumer's home can sometimes be a challenge for rural households, and data indicate rural households face higher rates of food insecurity. On average, 23% of rural respondents reported low or very low food security, compared to 15% of urban respondents (see Figure 3) [13]. Additionally, there is a higher rate of food pantry use in rural households (21%) compared to urban households (18%) and a greater dependence on superstore purchases (29% rural compared to 21% urban) [13].

**Figure 3.** Household food security status (Source: CFDAS)



A potential cause of the higher food insecurity rates in rural areas may be lower incomes and higher food prices in rural vs. urban areas. The Center for Food Demand Analysis and Sustainability (CFDAS) is innovatively collecting daily information through web scraping of prices on grocery items every day from 20 online grocery store chains across 47 states across 342 zip codes in the US. Data are being collected in several categories, but this report focuses specifically on fresh meat.

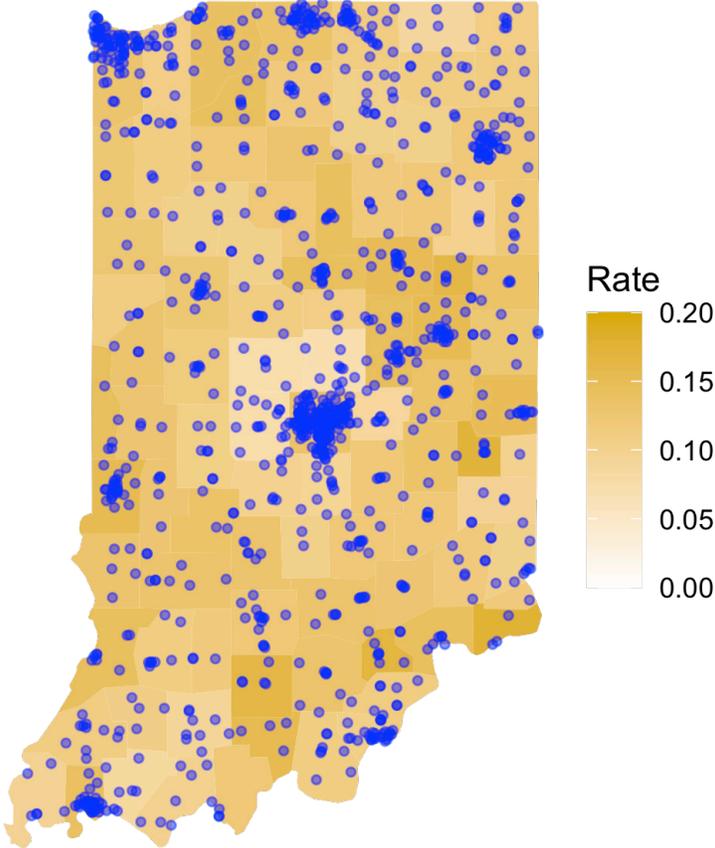
Using these web-scraped data, we are able to compare meat items between urban and rural areas from September 2022 to January 2023. Table 1 shows the comparisons. Average prices are neither uniformly higher or lower in rural than urban areas, at least among the grocery stores for which we are able to web scrape data.

**Table 1.** Comparison in prices of meat items between urban and rural grocery stores (Source: CFDAS)

Items	Prices in urban areas (\$ per lb)	Prices in rural areas (\$ per lb)	Percent differences rural vs. urban prices
Chicken breast, boneless	6.21	6.65	7.1%
Chicken, fresh, whole	2.80	2.80	0.0%
Chops, boneless	6.13	6.24	1.8%
Chops, centelster cut, bone-in	5.51	5.39	-2.2%
Chuck roast, USDA Choice, boneless	7.78	8.17	5.0%
Round roast, USDA Choice, boneless	6.26	5.96	-4.8%
Ground chuck, 100% beef	6.43	5.80	-9.8%
Ground beef, 100% beef	5.69	5.53	-2.8%
Ground beef, lean and extra lean	7.52	7.27	-3.3%
Steak, round, USDA Choice, boneless	7.62	7.98	4.7%
Steak, sirloin, USDA Choice, boneless	10.93	10.11	-7.5%
Turkey, frozen, whole	1.78	1.83	2.8%

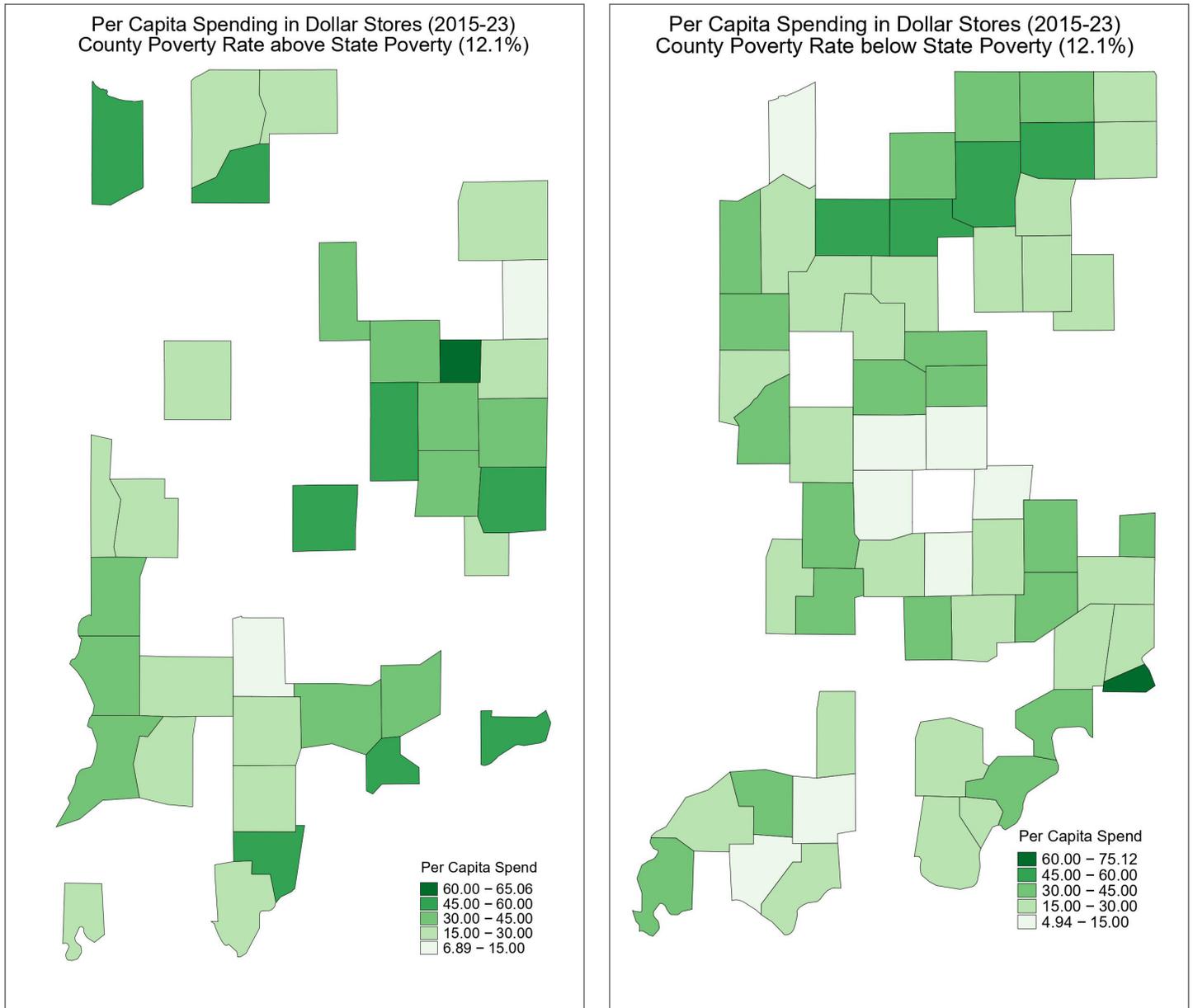
Although data indicate rural households spend the higher share of their food dollar at superstores, dollar store chains are increasing their presence and gaining popularity in these rural communities. The number of dollar store establishments increased 11.3% from 2013 to 2022, (from 63,747 to 70,960 establishments) [15]. Even though food and beverages stocked by dollar stores are usually lower in nutrients and higher in calories, these stores are an important source of food for rural communities. Figure 4 shows a heat map of the food insecurity rate by county according to Feeding America, overlaid with the dollar store locations in the state of Indiana [16].

**Figure 4.** Food insecurity rates (2020) by county and dollar store locations in Indiana (Source: IBISWorld and Feeding America)



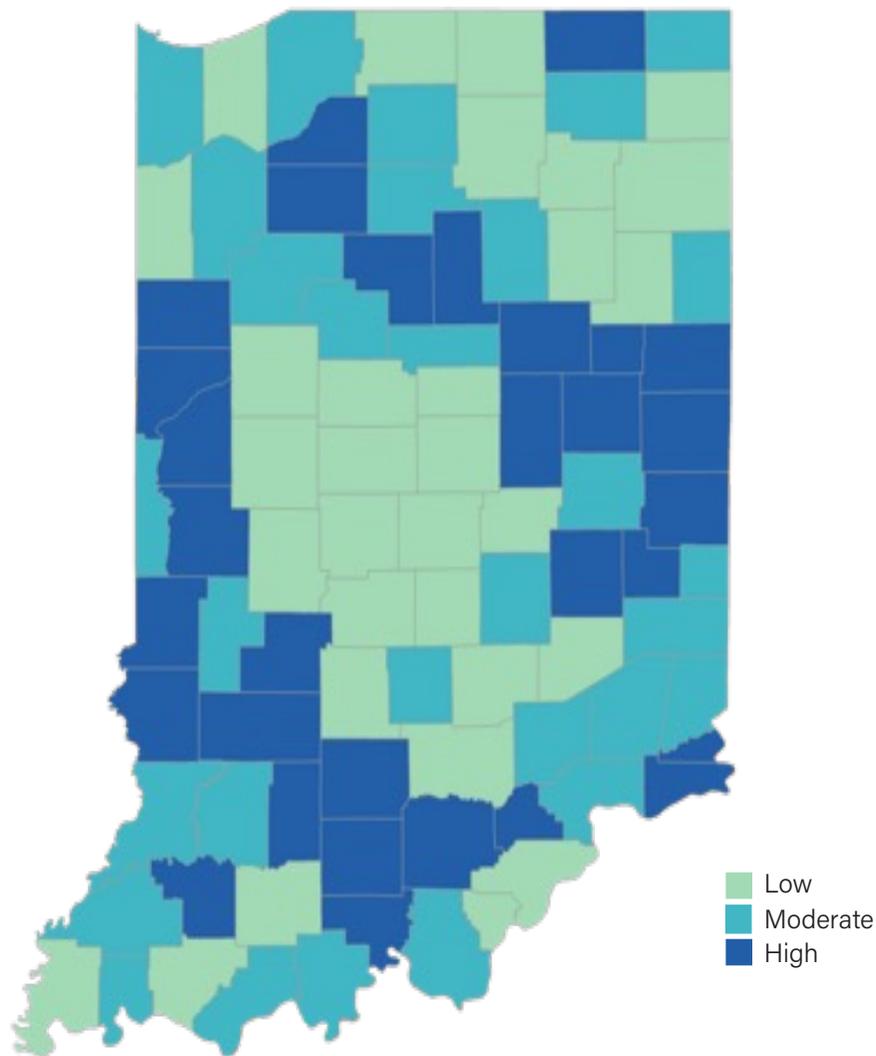
According to a recent study describing household food purchases from 2008 to 2020, consumers in rural and low-income spend 5% of their food budget at dollar store retailers, compared to the national average of 2.1% [14]. Specifically in Indiana, high poverty counties (>12.1% state poverty rate) spend more at dollar stores (\$34.36) on average than low poverty counties (\$28.63) (see figure 5) [13].

**Figure 5.** Per Capita Spending in Dollar Stores (2015-23) based on county poverty rates above and below State Poverty (12.1%) (Source: CFDAS and Factus)



Additionally, in rural communities across the state many are faced with lack of connectivity or slow connectivity rates compared to other areas. The Center for Rural Development at Purdue, created a Digital Divide Index (or DDI) that ranges from 0 to 100, where 100 is the highest digital divide. This score ranks counties and areas by a low, moderate, or high DDI that measures, “physical access/adoption and socioeconomic characteristics that may limit motivation, skills, and usage [17].” Figure 6 shows the DDI index for counties in Indiana.

**Figure 6.** Digital Divide Index for Indiana Counties (Source: Purdue Center for Rural Development)



According to Feeding America, the counties with the highest food insecurity rate in 2020 – Switzerland County (17.4%) and Fayette County (17%) – have a high digital divide. In Fayette County, 16.7% of households do not have access to internet and 76.6% of people do not have access to 100/20 Mbps, or what may be considered “fast” internet [16] [17]. On the contrary, the counties with the lowest food insecurity rate in 2020 – Hamilton County (6.8%) and Hendricks County (7.4%) – both have a low digital divide, with less than 6.5% of households without access to internet in these areas [16] [17]. In fact, when looking at the food insecurity rate and the DDI across all 92 counties in Indiana, there is a positive significant relationship between these two variables,  $r(90) = .63$ ,  $p < .001$ . As such, when considering solutions to food insecurity in the state and around the country, it is important to consider how connectivity may play a role for rural and food insecure communities.

# CHALLENGES

Overall, food insecurity has serious ramifications for individuals, communities, and the entire country. Families who lack access to food are more likely to face malnutrition, poor health outcomes, and lower quality of life [3]. Children from food-insecure homes are more likely to experience behavioral issues, academic challenges, and developmental delays [3]. Food insecurity can negatively impact society by raising crime rates, decreasing productivity, and raising healthcare expenditures [4]. Food insecurity is associated with lower economic growth and higher social service spending at the national level [4]. These effects highlight the significance of addressing food insecurity as a health and socioeconomic policy concern.

In the 2022 White House Conference on Food, Nutrition, and Health, the Administration called upon the private sector and other institutions to take part in ending hunger and food insecurity recognizing that the federal government cannot do it alone [5]. Based upon the recommendations in [5, 6, 7], and our own reading of the literature on data, what follows are a list of priority areas ripe for private sector innovation:

- 1. Developing and implementing innovative food access solutions for targeted populations:** Food insecurity is not randomly distributed in the population and is more concentrated among rural, low-income, minority, and older populations [8]. There is an opportunity to target and tailor solutions for improving food access via food affordability, distribution, grocery access, or transportation.
- 2. Empowering consumers to make healthy choices:** Creating technology solutions that can educate consumers about healthy food and product choices and help consumers make sense of the healthfulness and affordability of products (as product labeling may be too confusing for some consumers). Examples may include, focusing on research and the development of nutrient-dense and affordable food options, identifying behavioral marketing solutions that encourage healthy eating habits, and collaborating with healthcare providers to integrate nutrition into medical treatment plans [9]. Companies may pursue new interventions that work with existing food aid programs to improve educational content, reduce food spoilage, and inform guidance around the expiration of whole foods.
- 3. Connecting consumers to food networks:** Increasing the availability of healthy and affordable food options in low-income communities through food assistance programs like food hubs, farmers markets, and community-supported agriculture (CSA) [10]. Startups may identify a technology or connectivity solution that can help food-insecure households more easily join a food hubs or CSAs or connect consumers with food sources in the local economy that might otherwise go to waste.
- 4. Creating analytics around food insecurity:** Use data and research insights to help companies and nonprofit organizations understand food business practices and product offerings and whether specific programs are reliably helping to promote food security and improve health outcomes [11].

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