



Type 2 Diabetes: Nutritional Excess or Food Insecurity



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Cleveland Clinic Children's
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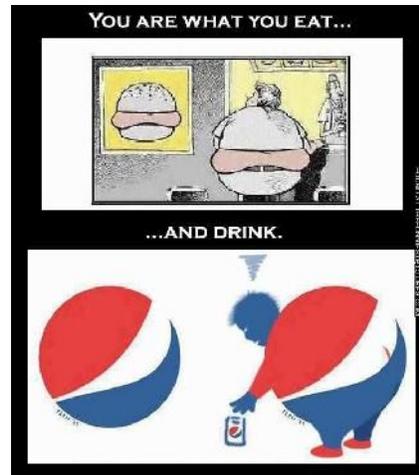
Conflict of Interest Disclosure

- Conflict of Interest
 - None



Objectives

- Explain the prevalence and severity of food insecurity in the United States
- Discuss the impact of food insecurity on children
- Identify methods for assessing food insecurity and providing appropriate education to families





1 in 6 children live in households without regular access to food



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Food Insecurity

- **USDA Definitions**

- **Food Security**

- **High food security** : no reported indications of food-access problems or limitations.

- **Marginal food security** : one or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.

- **Food Insecurity**

- **Low food security** : reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.

- **Very low food security**: Reports of multiple indications of disrupted eating patterns and reduced food intake.

Questions Used To Assess the Food Security of Households in the CPS Food Security Survey

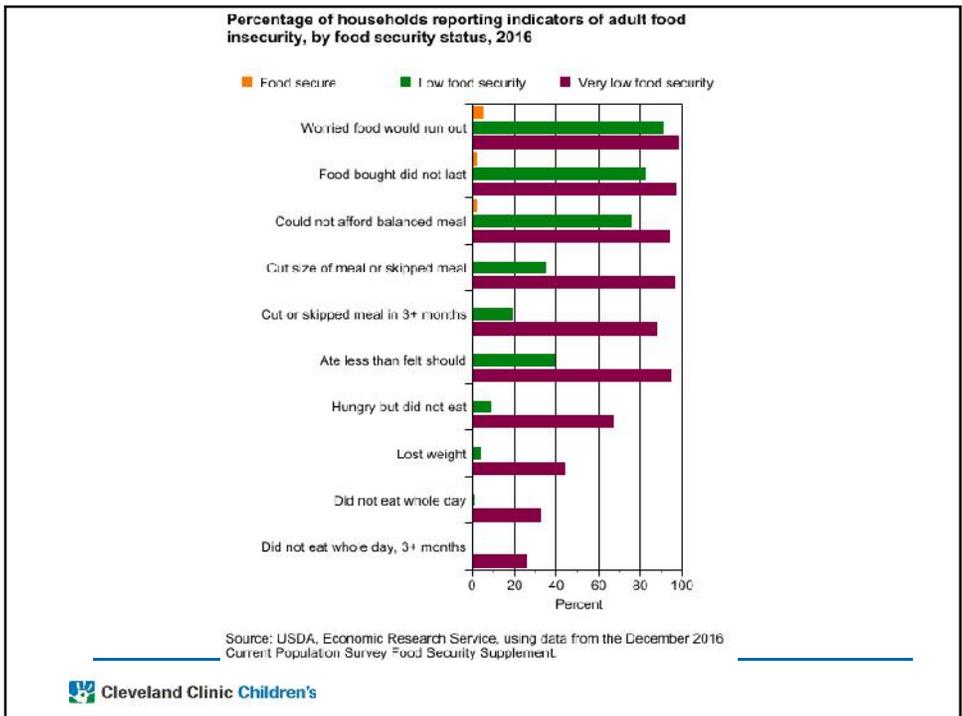
1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?
2. "The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but didn't eat because there wasn't enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn't enough money for food? (Yes/No)
9. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

(Questions 11-18 were asked only if the household included children age 0-17)

11. "We relied on only a few kinds of low cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?
12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months?
13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months, did any of the children ever not eat for a whole day because there wasn't enough money for food? (Yes/No)

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Household Food Security in the United States in 2015, ERSR-227
Economic Research Service/USDA



Food desert: An area where affordable and nutritious food is difficult to obtain due to geographical access



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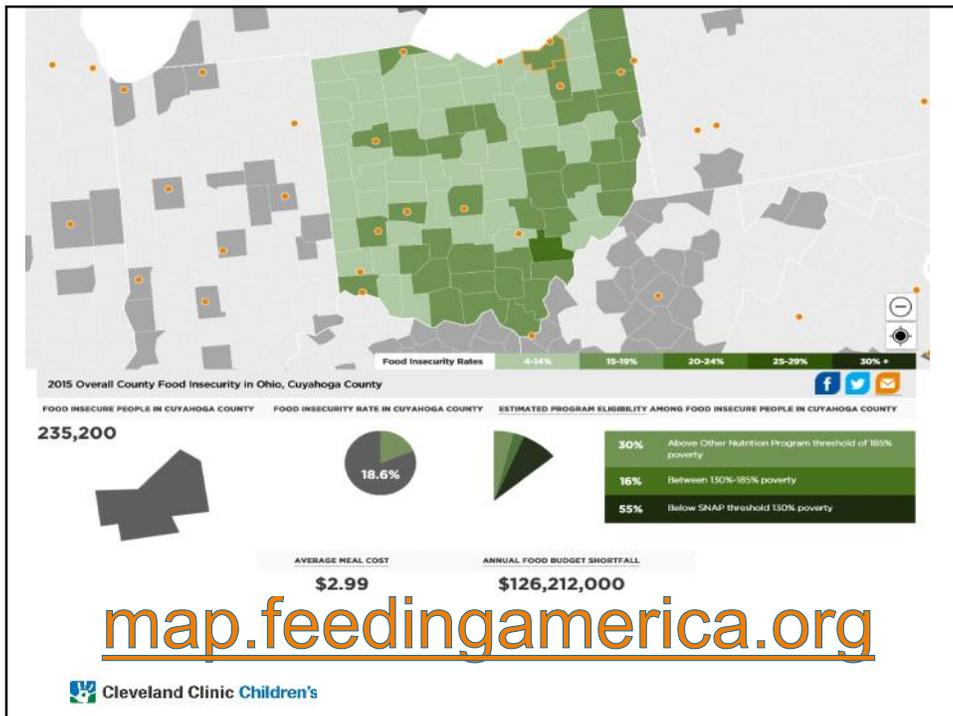
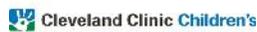
Map the Meal Gap – Feeding America

- Estimate how many people, including children, are food insecure in every county and congressional district in the country
- Estimate how many are likely to qualify for federal nutrition assistance programs
- Estimate how food prices vary from county to county
- Goal to improve understanding of food insecurity and food costs to develop target strategies

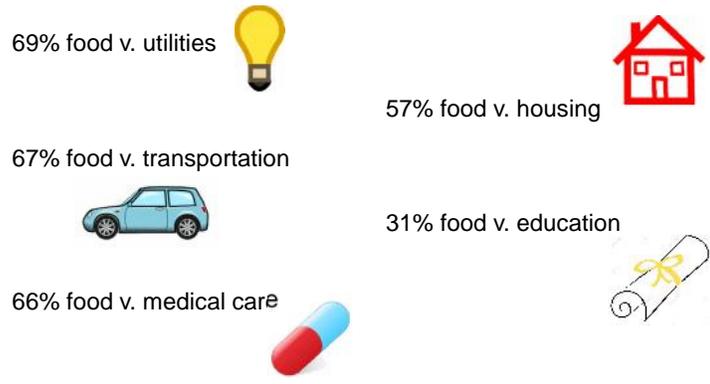
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2018 Report on Food Insecurity

- 41 million people in United States are living in food insecure households
 - 1 in 8
- 13 million children
 - 1 in 6
- More than half of food insecure people live above the poverty line (\$37,000 per year)



Feeding America – Necessary Choices



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Feeding America – Food Budget



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Effect of Food Insecurity on Children

- Physical and mental health
 - Delayed development in young children
 - Asthma and anemia
 - **Obesity, diabetes** and high blood pressure
 - Behavioral problems – hyperactivity, anxiety, aggression
- Academic achievement
- Social relationships
- Future economic prosperity

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RESEARCH
Original Research



The Association between Food Insecurity and Obesity in Children—The National Health and Nutrition Examination Survey

Jasbir Kaur, MHS; Molly M. Lamb, PhD; Cynthia L. Ogden, PhD



ARTICLE INFORMATION

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<http://dx.doi.org/10.1016/j.jand.2015.01.003>

ABSTRACT

Background Food insecurity can put children at greater risk of obesity because of altered food choices and nonuniform consumption patterns.

Objective We examined the association between obesity and both child-level food insecurity and personal food insecurity in US children.

Design Data from 9,701 participants in the National Health and Nutrition Examination Survey, 2001–2010, aged 2 to 11 years were analyzed. Child-level food insecurity was assessed with the US Department of Agriculture's Food Security Survey Module based on eight child-specific questions. Personal food insecurity was assessed with five additional questions. Obesity was defined, using physical measurements, as body mass index (calculated as kg/m²) greater than or equal to the age- and sex-specific 95th percentile of the Centers for Disease Control and Prevention growth charts. Logistic regressions adjusted for sex, race/ethnic group, poverty level, and survey year were conducted to describe associations between obesity and food insecurity.

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Association Between Food Insecurity and Obesity

- Previous data shows inconsistent findings resulting from the fact that food insecurity is not measured in individual children
 - Household level v. personal food insecurity
- NHANES data
 - 9701 participants analyzed
 - In home family interview collecting demographic info and socioeconomic status (18 question USDA survey)
 - Private interview and physical exam

Kaur, J et al. 2015

Association Between Food Insecurity and Obesity

- Prevalence of obesity was higher among food insecure boys, girls, low income children and 6-11 year old children for both child level and personal level food insecurity
- Obesity significantly higher among 2-5 year old children with child level food insecurity, not personal level
- For child-level food insecurity, when separated by age group there was no longer a statistically significant association
- For personal food insecurity, when separated by age group there was still a statistically significant association for 6-11 year olds

Kaur, J et al. 2015

Association Between Food Insecurity and Obesity

- Reduced quality of food, reduced food intake, altered food choices and disrupted/non uniform eating patterns
- Periods of insufficient food leading to overconsumption when food is available
- Higher intake of fats, saturated fats, sweets and fried foods
- Greater intake of total energy, calcium and percentage of calories from fats and added sugar
 - Reliance on high energy dense foods

Kaur, J et al. 2015



Clinical Nutrition 31 (2012) 230–234

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Clinical Nutrition

journal homepage: <http://www.elsevier.com/locate/clnu>

Original article

Food insecurity is related to glycemic control deterioration in patients with type 2 diabetes

Hiba Ahmad Bawadi^{a,*}, Fawaz Ammari^b, Dima Abu-Jamous^{a,f}, Youssef Saleh Khader^{c,g}, Safa'a Bataineh^d, Reema Fayez Tayyem^e

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Original Research

Food Insecurity and Glycemic Control Among Low-Income Patients With Type 2 Diabetes

Hilary K. Sellgman, MD, MAS^{1,11}, Elizabeth A. Jacobs, MD, MPP¹, Andrea López, BS¹¹, Jeanne Tschann, PhD¹ and Alicia Fernandez, MD¹

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Diabetes Care 2012 Feb; 35(2): 233-238. <https://doi.org/10.2337/dc11-1627>

Association Between Food Insecurity and Glycemic Control for Type 2 Diabetics

- 843 adult patients
 - Results:
 - Deterioration of glycemic control for food insecure patients
 - Higher HgbA1C
 - Higher BMI
 - Contributing factors: fewer years of completed education and unemployment associated with poor glycemic control
- 711 adult patients
 - Results:
 - Deterioration of glycemic control for food insecure patients
 - Higher HgbA1C (>8.5)
 - Contributing factors: food insecure patients more likely to report difficulty affording diabetic diet; lower diabetes specific self efficacy and higher emotional distress

Bawadi et al. 2012

Seligman et al. 2012



Diabetes Care 1




Food Insecurity, Food “Deserts,” and Glycemic Control in Patients With Diabetes: A Longitudinal Analysis

Seth A. Berkowitz,^{1,2,3} Andrew J. Karter,⁴ Giselle Corbie-Smith,^{5,6} Hilary K. Seligman,^{7,8} Sarah A. Ackroyd,⁹ Lily S. Barnard,¹⁰ Steven J. Atlas,^{1,3} and Deborah J. Wexler^{2,3}

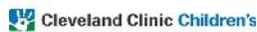
<https://doi.org/10.2337/dc17-1981>



Longitudinal Analysis 2013-2017

- 371 adult patients followed for a mean of 37 months
- 20% reported food insecurity
 - Participates more likely to be racial minorities, have Medicaid insurance and low education compared with those food secure
 - Patients had a greater number of outpatient follow ups during the study
- 31% resided in an area of low physical food access
- Food insecurity was associated with higher HgbA1C (0.6% difference, $P < 0.0001$)
- Low physical access to food was not associated with HgbA1C

Berkowitz et al. 2018



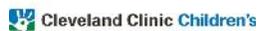
The collage features several fast-food promotional images:

- KFC VALUE MENU 99¢**: Includes a KFC sandwich, biscuits, and apple turnovers.
- WHERE CRAVINGS MEET SAVINGS. \$2.99**: Promotes a hot dog and moffin.
- 99¢ SPECIALS**: Lists items like hot dog, chili's, fruit juice, bottle of water, and giant moffin.
- \$10 DINNER BOX**: Features a pizza and breadsticks.
- \$5 BUCK BOX**: Includes a beefy crunch burrito, fries, and a drink.
- Maruchan Ramen**: Shows packages of Ramen with a price tag of .15.

Calorie counts are listed on the right side of the collage:

- 1,200 calories (with chicken nuggets)
- 875 calories (with a Coca-Cola)
- 250 calories (with vegetables)
- 170 calories (with fruit)

\$1 buys



What Can We Do?

- Awareness
 - Ask the right questions
- Education
 - Food choices
 - Food access and assistance programs
- Program development



Education

- Consult to registered dietitians
 - Help families to create healthy meals affordably
 - Assist in food choices within budget
 - Assist in choosing nutrient dense foods, rather than calorically dense foods that will keep them full – more “bang for your buck”
- Consult to social workers
- Education on services and programs available

PROTEIN

MyPlate says:
Choose lean proteins and vary your protein food choices.

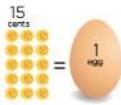
The Budget Shopper says:
Use healthy, affordable proteins like beans, eggs, and canned fish several times per week.



Check your receipts next time you go to the store. Protein foods are likely one of the biggest strains on your wallet when it comes to food shopping. Save big by using budget-friendly proteins more often. Replace half the ground meat in tacos with your favorite beans. Use canned tuna or salmon in your next casserole. Or top a salad with hardboiled eggs for protein power. If you're buying meat or poultry, check your store flyers before you shop. If you have enough space in your freezer, buy in bulk whatever is on deep discount and freeze what you won't use right away.

Time-saving tip: Dried beans are great when you have the time to soak them, but canned beans are a great time-saver for weeknight meals. Rinse and drain before using to cut the sodium by almost half, or look for low-sodium or no-salt-added versions.

Other Egg-cellent Benefits

Studies suggest that healthy individuals can enjoy an egg a day without increasing blood cholesterol levels.

Eggs are one of the most affordable sources of high-quality protein.

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DAIRY

MyPlate says:
Choose low-fat (1%) or nonfat milk and milk products.

The Budget Shopper says:
Compare unit prices to find the best deal.



Larger packages of foods often have a lower unit price. In the dairy aisle, compare unit prices for a gallon versus a half-gallon of milk, a tub of yogurt versus individual-size packages, or a larger versus smaller bag of cheese. Choose the item with the lower unit cost. Worried you won't use up the larger item before it goes bad? Dairy foods can be frozen for later use.

Not sure where to find unit price? You can usually find it on the shelf tag just under the food. It will often be listed as "price per ounce" or "price per gallon" — think of gas prices, which are listed as "price per gallon." The unit price tells you how much it costs for a set amount of food, so you can compare "apples to apples" (or "yogurt to yogurt").

Time-saving tip: Compare unit prices for block and pre-shredded cheese. Sometimes pre-shredded cheese can have a lower unit price, particularly if it's on sale. You won't know until you check.



1 Gallon Store Brand Milk

Unit Price \$0.02 Per Ounce	You Pay	\$2.99
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Unit price
The price per unit (e.g., price per pound, price per ounce).

Retail price
Your total cost for the item.

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10 Meeting Your MyPlate Goals on a Budget
12 Meeting Your MyPlate Goals on a Budget

Food Assistance Programs

**FEDERAL NUTRITION PROGRAMS
 “SERVE AS CRITICAL SUPPORTS
 FOR THE PHYSICAL AND MENTAL
 HEALTH AND ACADEMIC
 COMPETENCE OF CHILDREN.”**

**-AMERICAN ACADEMY OF
 PEDIATRICS**

Food Assistance Programs

- SNAP
- WIC
- USDA Programing:
 - NSLP
 - SBP
 - Child and Adult Care Food Program
 - Summer Food Service Program
 - Fresh Fruit and Vegetable Program
 - After-School Snacks and Suppers



Food Assistance Programs

- Food Banks and Food Pantries
- Feeding America
 - Services >12 million children each year
- USDA community food systems website
- [State Anti Hunger Organizations](#)



2-1-1 Your link to health and human services

2-1-1 is a free community service that provides information about social, health and government resources 24 hours a day. Simply dial 2-1-1 to be directed to helping agencies that provide:

- Food, clothing, housing and utility assistance
- Services for older adults and people with disabilities
- Family support, children and youth services, and parenting
- Substance abuse and mental health treatment
- Employment programs
- Tax assistance, budgeting and credit counseling
- Volunteerism and donation programs
- Community voice Mail

... and much more!

Call 2-1-1 or visit us online at 211neohio.org



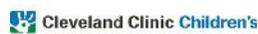


**Greater Cleveland
Food Bank**

Food Banks

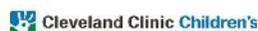
- Donate: GreaterClevelandFoodBank.org
 - More than 15,000 volunteers help get food out to the community
- Help center:
 - Assists clients in applying for SNAP as well as 20 other assistance programs over the phone or in our office
 - Connects clients to pantries, hot meals and mobile pantries in their neighborhood

Need Help?
Call Our Help Center
216-738-2067



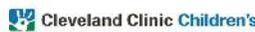
**Greater Cleveland
Food Bank**

Food is provided to over 800 programs in the greater Cleveland area
15,300 children served in 2015 through programing



Cleveland Clinic ACTiVHOS

- Activity, Cognitive Therapy, Incentives for Health Outreach to Students
- Office of Diversity and Inclusion, Cleveland Clinic Children's, Endocrinology and Metabolic Institute
- Community partners: Esperanza Inc, YMCA, Thomas Jefferson school
- Hispanic children represent the highest percentage of obesity rates at 26.1% compared with white children at 13.1% and African American children at 23.8%.
- Goal: We seek to engage youth to become physically active and inspire them to adopt healthy behaviors by incorporating fun, educational dialogues and fitness activities with incentive-based awards and prizes.



44109: Clark Fulton "Fast Food Row"



CMUSD-West has some of the highest rates of adolescents who are **obese** (18.1%), describe themselves as **overweight** (27.8%), and are trying to **lose weight** (46.2%)¹.
 In Cuyahoga County, **Hispanic adolescents** are amongst the most **obese** (16.7%), **overweight** (20.3%), **self-described overweight** (27.5%), and trying to **lose weight** (45.9%)¹.



Many CMUSD-West adolescents **eat fast food** and **drink soda** (66.7%) at least once a week.
 In Cuyahoga County, most **Hispanic adolescents** **eat fast food** (78.3%) and **drink soda** (67.7%) at least once a week¹.

25-50% of households in the **Clark Fulton** neighborhood are **without vehicles**, and the same percentage of residents are **food stamp** recipients².

Additionally, the **Clark Ave/W. 25th** area scores as "worst outcomes" according to the Food Balance Theory. This suggests that residents are **closer to fast food, a farther from grocers**².



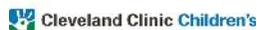
26.6% of **Hispanic adolescents** in Cuyahoga County walk to school every day¹.

With **fast food less than one mile** from any school in the **W. 25th** area, the opportunity for daily interaction with food options is great, highlighting its nutritional.

Cleveland Clinic ACTiVHOS

- Community outcomes: Over 3 summers (2015-2017) reached 91 students ages 10-14
 - 40% of patients are overweight or obese
 - 10% underweight
- Spanish preferred: 60% of students
- Parents influenced

- School based outcomes: 2018 school year reached 31 immigrant children



Cleveland Clinic ACTiVHOS

“I honestly want to thank you and your team for such a wonderful program! The students were very into it - logging their foods, exercise, and steps. They really started to try the fruits and vegetables that we are given 2 to 3 times a week through a grant program because you made them realize that trying it won't kill you and it can actually taste really good. They have made a conscious effort to be more fit and walk more... They learned how to put together a healthy meal. For a population that has only been exposed to fast food/processed foods at the level the US has for only approximately 2 years they have already become addicted and they see how it has affected them... Please know that you have forever changed and touched 31 lives; 32 with me!” - 5th grade teacher





Addressing Food Insecurity: A Toolkit for Pediatricians

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Two Primary Questions for LIPs to Ask

Question #1

Within the past 12 months, we worried whether our food would run out before we got money to buy more.

Question #2

Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.

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Every life deserves world class care.