POLICY AND PROGRAMMATIC OPPORTUNITIES TO IMPROVE ACCESS TO NUTRITIOUS FOODS AMONG CHILDREN IN CLEVELAND COUNTY

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A capstone project submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Public Health in the Public Health Nutrition and Health Policy and Management in the Gillings School of Global Public Health.

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ABSTRACT

Mary Hartwell, Gabriella Herter, Jessica Kuhn, Ruihan Li, and Esther Udonsi: Policy and Programmatic Opportunities to Improve Access to Nutritious Foods Among Children in Cleveland County
(Under the direction of Dana Rice and Seema Agrawal)

The social and community context in which an individual lives is an essential social determinant of health (SDoH) that has been shown to have wide-ranging effects on quality of life and health. The social and community context interacts reciprocally with food insecurity (FI), making it essential to address FI. Thousands of children under the age of 18 are impacted by FI in Cleveland County, which has detrimental impacts on this vulnerable population's social, emotional, and physical well-being. The Cleveland County Commissioners can appropriate funds to create a Meal Express Summer Food Program (MESFP) and establish the Mobile Meals for Children (MMC) program to address childhood FI. The MESFP will deliver federally funded summer meals, while the MMC program will deliver groceries to food-insecure households Both opportunities expand on evidence-based activities that will provide services and support to the community's children who need it most.

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LIST OF ABBREVIATIONS

CHEAL	Catalyst for Healthy Eating and Active Living
FFQ	Food Frequency Questionnaire
FI	Food Insecurity
FNS	Food and Nutrition Services
LHCC	Live Healthy Cleveland County
MESFP	Meal Express Summer Food Program
MMC	Mobile Meals for Children
NC	North Carolina
SDoH	Social Determinant of Health
SFSP	Summer Food Service Program
SNAP	Supplemental Nutrition Assistance Program
TACC	Transportation Administration of Cleveland County
USDHHS	United States Department of Health and Human Services
USDA	United States Department of Agriculture
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children

COMMON PROPOSAL

Problem Statement

Genetics and behaviors are essential considerations when determining an individual's health status, though they only tell part of the story. Social factors, known as social determinants of health (SDoH)[1], are associated with significant impacts on short- and long-term health outcomes[2] (USDHHS, 2020). One key SDoH highlighted by Healthy People 2030 as influencing health outcomes is the social and community context[3] in which one lives (USDHHS, 2020). The extent of these outcomes is further dependent on the quantity and quality of those relationships and interactions[4] (USDHHS, 2020). Within the social and community context, Healthy People 2030 identifies the *elimination of very low food security in children* as a key priority (USDHHS, 2020). Food insecurity[5] (FI) ranges from low food security to very low food security (USDA Economic Research Service, 2021). While low food security consists of "reduced quality, variety or desirability of diet," very low food security consists of "multiple indications of disrupted eating patterns and reduced food intake" (USDA Economic Research Service, 2021). In 2020, an estimated 6.1 million children lived in food-insecure households, and 584,000 children lived in households experiencing *very low* food security in the United States (USDA Economic Research Service, 2021). Many factors beyond the individual, particularly one's social and community context, contribute to FI.

Health outcomes associated with social and community context can trigger both economic and food insecurity (Higashi et al., 2018). Because of this bilateral relationship, interventions focused on economic insecurity or FI can prove effective strategies in mitigating the poor health outcomes associated with one's social and community context. FI among children can be particularly devastating, given this age group's vulnerability and the long-term consequences of FI on health and quality of life (Haven, 2017). Evidence suggests that FI among children is associated with various health outcomes such as nutritional deficiencies, stunted growth, dental caries, asthma, anemia, and behavioral, emotional, and academic problems (Brown et al., 2019). Paradoxically, there are associations between household FI and obesity in children, particularly children aged 10-15 years old (Au et al., 2019). Without urgent intervention, children experiencing FI are at a higher risk of developing long-term chronic

[1]Encompass all the conditions in the environments where individuals are born, live, learn, work, play, worship, and age (USDHHS, 2020).
[2]Short- and long-term health outcomes include morbidity, mortality, life expectancy, quality of life, cost of care, health issues/status, disability, and health disparities (USDHHS, 2020).
[3]People's relationships and interactions with family, friends, co-workers, and community members (USDHHS, 2020).
[4]Some of the factors which foster or impede building high-quality social and community connections include social cohesion, discrimination, incarceration, and civic participation (USDHHS, 2020).
[5]The United States Department of Agriculture (USDA), defines food insecurity as: "the limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways" (USDA Economic Research Service, 2021).

health conditions, intentional harm (i.e., suicide), and experiencing unintentional injuries or accidents (Heron, 2021). There are clear associations between FI in childhood and the development of adult diseases such as diabetes, hyperlipidemia, and cardiovascular disease (Tomas et al., 2021).

Ideally, all members of every household should have enough access to nutritious food to support a healthy and active lifestyle. However, a study conducted by NC Child in 2018 found that approximately six out of ten children[6] in Cleveland County live in households struggling with hunger or poverty (George, 2020). Given that children represent 21.9% of Cleveland County's population, approximately 12,870 children in Cleveland County are living in households struggling with hunger or poverty (University of Wisconsin Population Health Institute, 2021). Despite less than a quarter of Cleveland County's total population identifying as Black non-Hispanic or Hispanic, an overwhelming majority of Cleveland County's children struggling with hunger identify as Black non-Hispanic or Hispanic (University of Wisconsin Population Health Institute, n.d.).

Children who face FI are an especially vulnerable population. By working to eliminate food insecurity in Cleveland County, the county can build foundations for future adults' mental and physical health, academic achievement, and economic productivity. In addressing childhood FI, the four overarching goals are (1) to improve the social and community context of Cleveland County, (2) to create an environment where children can thrive and practice healthy behaviors, (3) to improve health outcomes in Cleveland County for children and future adults, and (4) reduce factors that perpetuate cycles of poverty.

Policy And Programmatic Changes

Policy Recommendation: Appropriate Funds For "Meal-y's on Wheel-y's"

Children receiving free and reduced-price meals throughout the school year have increased FI during the summer months. During the 2018-2019 school year, 73 percent of students (10,771 children) in Cleveland County received free breakfast and lunch (No Kid Hungry NC et al., 2019). Unfortunately, during the 2019 summer, the average daily attendance for the summer nutrition programs was only 1,124 children (No Kid Hungry NC et al., 2019). To address low attendance, Cleveland County should appropriate funds to implement and sustain a Meal Express Summer Food Program (MESFP), known as "Meal-y's on Wheel-y's." The appropriations will fund program personnel and the purchase and retrofitting of six retired school buses to deliver breakfast and lunch to

[6] Both international and domestic law recognizes, in most cases, that a child is a person under the age of 18 (Children's Bureau, n.d.; UNICEF, n.d.).

children in Cleveland County during the summer in low-income[7] and low access[8] areas[9] to best concentrate service delivery (Dutko et al., 2012; USDA, 2011). Such meals are currently available around the county at select sites participating in the Federal Summer Food Service Program[10] (SFSP), though are frequently inaccessible to children due to distance and lack of transportation (FRAC, 2020).

Similar programs in Maryland, Detroit, Baltimore, Arkansas, Colorado and more, have successfully increased the number of meals accessed by children during the summer (Orovecz et al., 2015; No Kid Hungry, 2014; No Kid Hungry, 2013; No Kid Hungry, 2012). For example, Garrett County Food and Nutrition Services (FNS) in rural Maryland successfully increased the number of meals served by 85 percent between 2012 and 2018 across 14 sites (No Kid Hungry, n.d.). Similarly, Florida has increased its meal delivery sites from 50 locations in 2013 to 135 locations in 2015 (Fried, N., 2015). Given the success of similar programs in other states near North Carolina, if the Cleveland County Commissioners appropriates funds for the "Meal-y's on Wheel-y's" program, the county can help accomplish the program's three primary goals: (1) decrease childhood food insecurity in Cleveland County, (2) improve access to federally funded summer meal programs, and (3) increase the number of children accessing this program by 500 each year.

Programmatic Recommendation: Mobile Meals for Children

Mobile Meals for Children (MMC) is a nutrition program that aims to reduce food insecurity among children and reduce access barriers to food. Specifically, to reduce FI, the program will source food from various places, including local grocery stores, local farmers, and produce growers, to be distributed to enrolled families. Grocery stores may be willing to donate foods approaching their "best-by" or "sell-by" dates, and local farmers and produce growers may donate foods less likely to be sold for aesthetic reasons (size, blemishes, etc.) (Morello and Feeding America, 2021). Additionally, the program can partner with local food banks to deliver non-perishable goods, such as canned fruits and vegetables, boxed snacks, certain spreads, uncooked rice, beans, and canned meats (Morello and Feeding America, 2021). The program will use retrofitted school buses to deliver food to the houses of

[7]A poverty rate of 20 percent or greater, or a median family income at or below 80 percent of the statewide or metropolitan area median family income (Dutko, et al., 2012; USDA, 2011).
[8]At least 500 persons or at least 33 percent of the population live more than 10 miles from a supermarket or large grocery store in rural areas and 1 mile in urban areas (Dutko, et al., 2012; USDA, 2011).
[9]Low-income low access areas were previously referred to as food deserts (Dutko, et al., 2012; USDA, 2011).
[10]The federal SFSP offers funding through reimbursements on a per-meal basis for up to two meals per day in sites where 50 percent or more children qualify for free or reduced-price lunch, most of Cleveland County (USDA, 2021b).

families enrolled in the program, with the goal of reducing transportation and other similar access barriers (Rural Project Summary: Lunch Express Summer Food Program - Rural Health Information Hub, n.d.).

The program will be made available to all families in Cleveland County with children under the age of 18 who screen positive for FI based on established criteria. Program recruitment will occur at local schools, daycares, after-school programs, and social worker's offices. Interested parties will complete a questionnaire to determine if they qualify based on the program's eligibility criteria.

The program will leverage existing assets in the community and implement components of other successful programs in North Carolina, such as Feeding Kids Cleveland County (Feeding Kids Cleveland County 2021). Feeding Kids Cleveland County runs a backpack program, a food delivery program, and hosts community table meals that feed over 850 children on the weekend and during the holidays. The programmatic goals include providing nutritious food to children, building relationships, and providing support to help kids thrive (Feeding Kids Cleveland County, n.d.).

If implemented, the MMC program will ensure that families and children have consistent access to healthy and nutritious foods, reducing food insecurity in Cleveland County. Additionally, by offering a program with broad eligibility standards this program can ensure all children are food secure, including those who are ineligible for federal programs.

Budget

The policy to appropriate funds for an SFSP in Cleveland County, NC - known as "Meal-y's on Wheel-y's" - is estimated to cost the county $350,000 over three years, operating in a deficit for the first two years and a surplus in its third year. Associated costs assume that the program will serve 2,000 children complimentary breakfast and lunch for ten weeks over the summer in year one, for 4,000 meals per day, or 200,000 meals for the summer. In the second and third year, this cost assumes an increase of 500 children accessing the program annually. Broken down by year, this is $461,000 in expenses for year one, $30,000 in costs for year two, and a $141,000 profit in year three. Funds will be used to purchase and retrofit used school buses that will distribute breakfast and lunch to students according to the U.S. Department of Agriculture SFSP guidelines (USDA, 2021). Additional non-personnel and administrative costs include travel, advertising, food, vehicle maintenance, vehicle branding, clean-up supplies, and insurance. Expenses also include staff salaries, training, and fringe benefits, assuming annually two percent inflation in staff salaries, three percent of personnel salaries for training each year, and 30 percent fringe benefits for health

insurance and taxes. Personnel will include one overall program manager and one program coordinator for logistical support. Each of the six sites will also be equipped with one bus driver, one site supervisor, two site monitors, one food service employee, and two volunteers. In addition to revenue from the federal SFSP reimbursement for breakfast and lunch, grants from No Child Goes Hungry and the Carolina Hunger Initiative will help supplement programmatic costs (Carolina Hunger Initiative, n.d.; No Child Goes Hungry, n.d.).

Program/Policy Evaluation Component

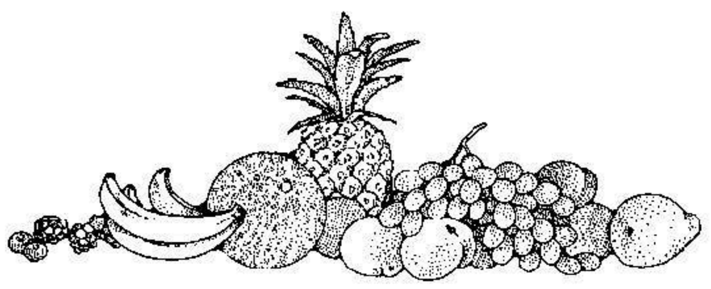
Households with children under the age of 18 experiencing FI will be eligible for the MMC program. The program will deliver groceries with fresh, nutrient-dense fruit and vegetables to eligible households during the weekend and over vacation breaks (Grocers on Wheels - Raleigh, NC, n.d.). The program will evaluate programmatic outcomes at baseline, after one year (the midpoint), and after two years (the endpoint). Evaluation participants will include children 18 years of age and under determined to be food insecure who have given consent or whose parents have given consent. MMC will compare baseline data with data collected after one year and at the endpoint, considering potential confounders such as economic changes. The short-term outcome measured by the program is an increase in fruit and vegetable intake, which the Food Frequency Questionnaire (FFQ) will measure (see Appendix A, Figure 1). The long-term outcome measured is a decrease in the FI rate among children in Cleveland County, measured by the USDA food insecurity evaluation survey (see Appendix A, Figure 2).

APPENDIX A: COMMON PROPOSAL

Figure 1: Example of Food Frequency Questionnaire

OMB# 0925-0450 EXP. DATE: 07/31/2000

NATIONAL INSTITUTES OF HEALTH
EATING AT AMERICA'S TABLE STUDY
QUICK FOOD SCAN



- The person who completed the telephone interviews for the Eating at America's Table Study should fill out this questionnaire.
- Use only a No. 2 pencil.
- Be certain to completely blacken in each of the answers, and erase completely if you make any changes.
- Do not make any stray marks on this form.
- When you complete this questionnaire, please return it in the postage-paid envelope to:

  National Cancer Institute
  EPN, Room 313
  6130 Executive Blvd., MSC 7344
  Bethesda, MD 20892-7344

BAR CODE LABEL HERE

NOTIFICATION TO RESPONDENT OF ESTIMATED BURDEN

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: NIH, Project Clearance Office, 6701 Rockledge Drive, MSC 7730, Bethesda, MD 20892-7730, ATTN: PRA (0925-0450). Do not return the completed form to this address.

PLEASE DO NOT WRITE IN THIS AREA

SERIAL

INSTRUCTIONS

Think about what you usually ate last month.

Please think about all the fruits and vegetables that you ate last month. Include those that were:

- **raw and cooked,**
- **eaten as snacks and at meals,**
- **eaten at home and away from home (restaurants, friends, take-out), and**
- **eaten alone and mixed with other foods.**

Report how many times per month, week, or day you ate each food, and if you ate it, how much you usually had.

If you mark "Never" for a question, follow the "Go to" instruction.

Choose the best answer for each question. Mark only one response for each question.

1. Over the last month, how many times per month, week, or day did you drink **100% juice** such as orange, apple, grape, or grapefruit juice? **Do not count** fruit drinks like Kool-Aid, lemonade, Hi-C, cranberry juice drink, Tang, and Twister. Include juice you drank at all mealtimes and between meals.

○ Never (Go to Question 2) ○ 1-3 times last month ○ 1-2 times per week ○ 3-4 times per week ○ 5-6 times per week ○ 1 time per day ○ 2 times per day ○ 3 times per day ○ 4 times per day ○ 5 or more times per day

1a. Each time you drank **100% juice**, how much did you usually drink?

○ Less than ¾ cup (less than 6 ounces) ○ ¾ to 1¼ cup (6 to 10 ounces) ○ 1¼ to 2 cups (10 to 16 ounces) ○ More than 2 cups (more than 16 ounces)

2. Over the last month, how many times per month, week, or day did you eat **fruit**? Count any kind of fruit—fresh, canned, and frozen. **Do not count** juices. Include fruit you ate at all mealtimes and for snacks.

○ Never (Go to Question 3) ○ 1-3 times last month ○ 1-2 times per week ○ 3-4 times per week ○ 5-6 times per week ○ 1 time per day ○ 2 times per day ○ 3 times per day ○ 4 times per day ○ 5 or more times per day

2a. Each time you ate **fruit**, how much did you usually eat?

○ Less than 1 medium fruit ○ 1 medium fruit ○ 2 medium fruits ○ More than 2 medium fruits

OR

○ Less than ½ cup ○ About ½ cup ○ About 1 cup ○ More than 1 cup

- 1/1

1

3. Over the last month, how often did you eat **lettuce salad (with or without other vegetables)**?

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 4)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

3a. Each time you ate **lettuce salad**, how much did you usually eat?

○	○	○	○
About ½ cup	About 1 cup	About 2 cups	More than 2 cups

4. Over the last month, how often did you eat **French fries** or **fried potatoes**?

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 5)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

4a. Each time you ate **French fries** or **fried potatoes**, how much did you usually eat?

○	○	○	○
Small order or less (About 1 cup or less)	Medium order (About 1½ cups)	Large order (About 2 cups)	Super Size order or more (About 3 cups or more)

5. Over the last month, how often did you eat **other white potatoes**? Count **baked, boiled,** and **mashed potatoes, potato salad,** and **white potatoes that were not fried.**

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 6)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

5a. Each time you ate **these potatoes**, how much did you usually eat?

○	○	○	○
1 small potato or less (½ cup or less)	1 medium potato (½ to 1 cup)	1 large potato (1 to 1½ cups)	2 medium potatoes or more (1½ cups or more)

6. Over the last month, how often did you eat **cooked dried beans**? Count **baked beans, bean soup, refried beans, pork and beans** and **other bean dishes.**

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 7)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

6a. Each time you ate **these beans**, how much did you usually eat?

○	○	○	○
Less than ½ cup	½ to 1 cup	1 to 1½ cups	More than 1½ cups

7. Over the last month, how often did you eat **other vegetables**?

DO NOT COUNT: Lettuce salads
White potatoes
Cooked dried beans
Vegetables in mixtures, such as in sandwiches, omelets, casseroles, Mexican dishes, stews, stir-fry, soups, etc.
Rice

COUNT: All other vegetables—raw, cooked, canned, and frozen

Never (Go to Question 8)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

7a. Each of these times that you ate **other vegetables**, how much did you usually eat?

Less than ½ cup	½ to 1 cup	1 to 2 cups	More than 2 cups
O	O	O	O

8. Over the last month, how often did you eat **tomato sauce**? Include tomato sauce on pasta or macaroni, rice, pizza and other dishes.

Never (Go to Question 9)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

8a. Each time you ate **tomato sauce**, how much did you usually eat?

About ¼ cup	About ½ cup	About 1 cup	More than 1 cup
O	O	O	O

9. Over the last month, how often did you eat **vegetable soups**? Include tomato soup, gazpacho, beef with vegetable soup, minestrone soup, and other soups made with vegetables.

Never (Go to Question 10)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

9a. Each time you ate **vegetable soup**, how much did you usually eat?

Less than 1 cup	1 to 2 cups	2 to 3 cups	More than 3 cups
O	O	O	O

10. Over the last month, how often did you eat **mixtures that included vegetables**? Count such foods as sandwiches, casseroles, stews, stir-fry, omelets, and tacos.

Never	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

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Thank you very much for completing this questionnaire. Please return it in the enclosed, postage-paid envelope or to the address listed on the front page.

Figure 2: USDA Food Insecurity Evaluation 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 ran 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 to." Was that often, sometimes, or never true for you in the last 12 months?

13. "The children were not eating enough because we 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 couldn't afford more food? (Yes/No)

16. In the last 12 months, did any of the children 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)

APPENDIX B: GROUP PRESENTATION

Policy and Programmatic Opportunities to Improve Access to Nutritious Foods Among Children in Cleveland County, NC

Mary Hartwell, Gabriella Herter, Jessica Kuhn, Ruihan Li, & Esther Udonsi

Social Determinants of Health

Social Determinants of Health (SDoH) [1]

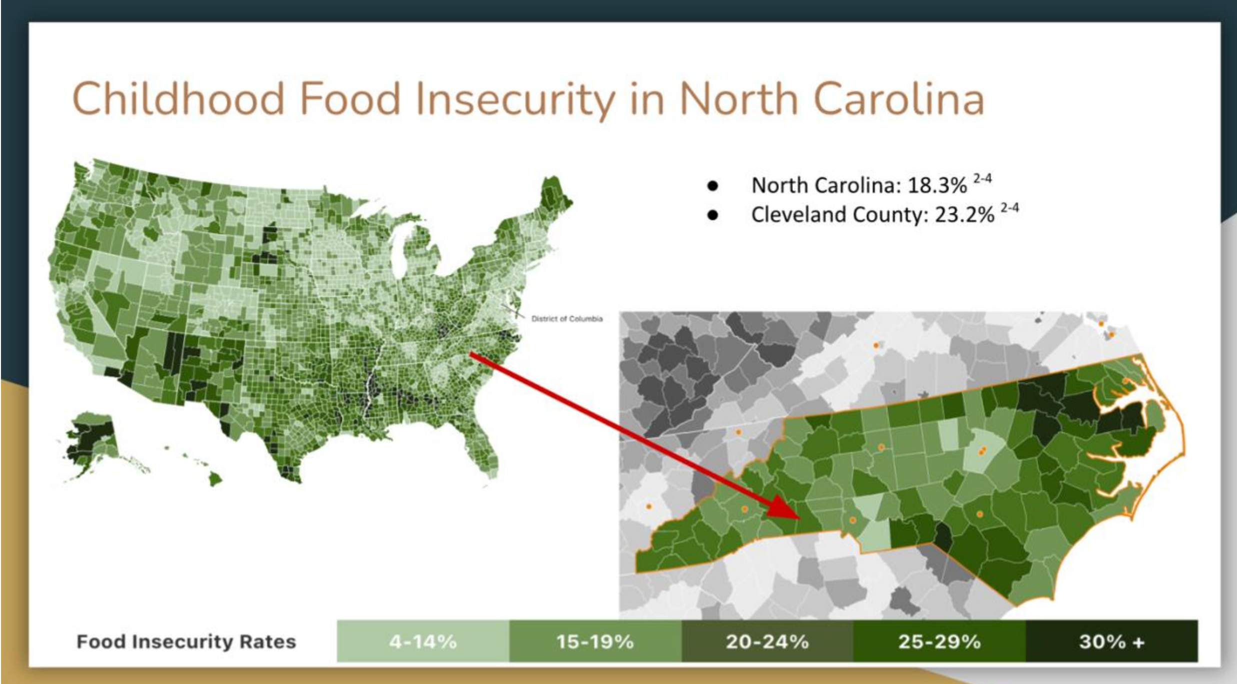
- The environment in which people live, work, play etc.
- Significant impact of health outcomes and quality of life.

Social and Community Context [1]

- People's interactions and relationships with the people in their community.
- Ability to obtain basic necessities such as food and shelter.

Healthy People 2030

- Eliminate very low food security in children.



Meal-y's on Wheel-y's
A Meal Express Summer Food Program

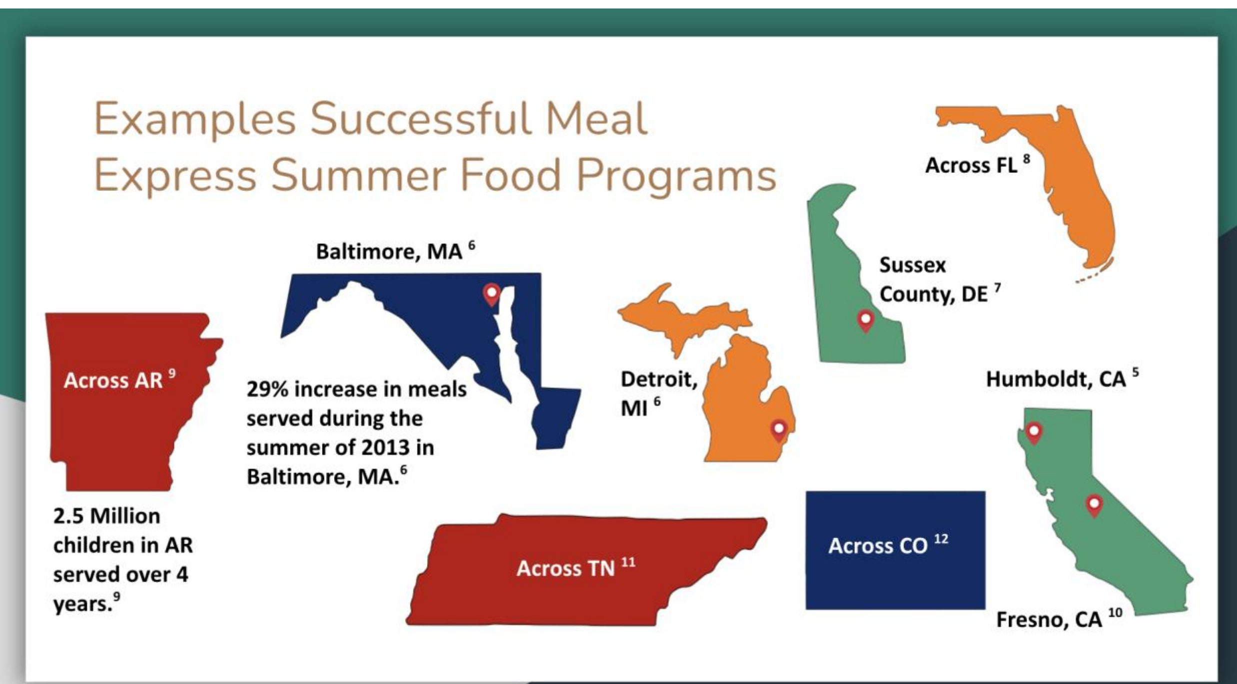
Policy Overview

Use of retrofitted school buses to deliver breakfast and lunch to children in Cleveland County during the summer in low-income and low access areas.

Policy Goals

(1) Decrease childhood food insecurity in Cleveland County.
(2) Improve access to federally funded summer meal programs.
(3) Increase the number of children accessing this program by 500 children each year.

No Kid Hungry, n.d.



Budget: *Meal-Ys on Wheel-Ys*

– $461,000	Year 1 Cost
– $30,000	Year 2 Cost
+ $141,000	Year 3 Profit

Total Cost: $350,000

Budget Assumptions

- Program will initially serve ~2,000 children daily breakfast & lunch for 10 weeks over the summer.
  - Total of 200,000 meals in year one.
- One-time costs for purchasing and retrofitting six used school buses to deliver meals in low-income and low access areas.

Expenses [13]

- Staff training & fringe benefits
- Vehicle maintenance & insurance
- Gas mileage & travel
- Food costs & misc. supplies

Revenue

- Federal SFSP reimbursement [14]
- *No Child Goes Hungry* grant [15]
- Carolina Hunger Initiative [16]

Nutrition Program - Mobile Meals for Children

Implementation plan

- Food sourced from local grocery stores, local farmers, and produce growers local food banks. [17]
- Retrofitted/repurposed school buses will deliver food to houses of families enrolled in the program. [18]

Eligibility

- All families with children under 18 years of age.
- Screens positive for food insecurity using a validated USDA survey.

Existing Assets

- Backpack program, food delivery, community table.
- Feed over 850 children on weekend and during holidays. [19]

Measurement

Food insecurity and the long term average intake of fruits and vegetables among children in Cleveland County [20]

BASELINE	MIDPOINT	ENDPOINT	FOLLOW-UP
Positive food insecurity screening + intake before program start	Assess the dietary composition of participating children	Survey for program quality and satisfaction	Survey for program impact and effectiveness

Analysis

- Determined, based on the findings collected over the course of the evaluation, whether the goals have been accomplished.

NHANES Food Questionnaire

2. Over the last month, how many times per month, week, or day did you eat **fruit**? Count any kind of fruit—fresh, canned, and frozen. **Do not count** juices. Include fruit you ate at all mealtimes and for snacks.

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 3)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

Conclusion

Impact of the policy & program

- Increase food access to food insecure households with children.
- Increase food utilization in the county and reduce the amount of food waste.
- Reduce the rate of childhood insecurity in Cleveland County.

Please support our policy and program initiatives to improve food security for children in Cleveland County.

THANK YOU!

Questions?

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APPENDIX C: GROUP PRESENTATION SCRIPT

Mary Hartwell

When taking account of an individual's health, genetics and health behaviors are important to consider, but they only tell part of the story. Social determinants of health, or the environment in which people live, work, and play also have a significant impact on health and quality of life.

Social Determinants of health is split into 5 domains, one of which is social and community context. This domain pertains to the interactions and relationships that a person has with their community. It also deals with a person's ability to obtain basic necessities such as food, shelter and medical care. Within the domain of social and community context, Healthy People 2030 identified food insecurity as issue of concern, particularly in children.

Food insecurity is defined as lack of consistent access to enough food for an active, healthy lifestyle. More specifically, it refers to a lack of available financial resources for food at the household level. Very low food security is when eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money or other resources for food.

Childhood food insecurity is a pervasive problem across the US but particularly in North Carolina.

North Carolina has childhood food insecurity rate of 18.3%, which is the 10th highest in the nation.

The childhood food insecurity rate in Cleveland County is 23.2% which means nearly 1 in 4 children may not have adequate access to food.

This can have short- and long-term adverse outcomes. Short term, food insecurity in children is associated with decreased focus and poorer academic performance, increased risk of illness and need for hospitalization, as well as increased risk for developmental delays or behavioral issues.

In the long term, these things can result in lower educational attainment, fewer employment opportunities, and higher burden of medical costs due to poorer health outcomes. These factors can work in tandem to further perpetuate the cycle of poverty.

Gabriella Herter

Children receiving free or reduced-price meals throughout the school year are at increased risk of food insecurity during the summer months, due to decreased access to these resources.

Access to these programs is especially limited in designated low-income low access areas.

To ensure that children in Cleveland County have access to these effective resources, the County should appropriate funds to implement and sustain a Meal Express Summer Food Program, or as we have named it, Meal-y's on Wheel-y's.

The program would use retrofitted school buses to deliver breakfast and lunch to children living in low-income low access areas across Cleveland County during the summer, when school is no longer in session.

Meal-y's on Wheel-y's would have three primary goals: (1) decrease childhood food insecurity in, (2) improve access to federally funded summer meal programs, and (3) increase the number of children accessing this program by 500 children each year.

Similar Meal Express Summer Food Programs have been implemented and successful in increasing access to summer meal programs across the United States.

Some of the more notable success stories include Baltimore, who achieved a 29% increase in the number of summer meals served during the summer of 2013 and Arkansas, who increased the number of children receiving summer meals by 2.5 million children over 4 years.

Jessica Kuhn

In order to implement this program, we have developed a three-year preliminary budget. Specific budgetary assumptions will be discussed on the next slide, however, as an overview: this program would require approximately $461,000 in year 1 and $30,000 in year two. Because of the summer food service program reimbursement, expansion of the program, and the elimination of the year 1 one-time costs, the program is anticipated to operate in a surplus in its third year, with a $141,000 profit. In total, this would cost Cleveland County about $350,000 over the course of three years.

In the 2018-2019 school year, only 1,100 of the over 10,000 eligible children accessed the federally funded summer nutrition program in Cleveland County. In year one, Meal-Ys on Wheel-Ys aims to double the number of children accessing the summer nutrition program, serving 2,000 children free breakfast and lunch (or 4,000 additional meals per day). Over the next three years, the goal is to increase the number of children accessing this program by 500 children per year. A large share of initial expenses will be for purchasing and retrofitting six used school buses to serve children in low income and low food access areas that have been identified by the USDA. Personnel composition as well as major budgetary assumptions are informed by the national non-profit No Kid Hungry's best practices for summer meal programs.

Staff for the program will include one overall program manager and one program coordinator to oversee operations and manage program logistics. Each of the six sites will then have one bus driver, one site supervisor, two site monitors, one food service employee, and two volunteers to actually deliver program services. Some of which will come from the local non-profit Feeding Kids Cleveland County.

In addition to staff salaries, other major expenses are listed on the slide here. Revenue will be coming in mainly through the federal summer food service program reimbursements - as meals are reimbursed at an annually set flat rate per meal distributed and up to two meals per child per day. Additionally, two grants, the No Child Goes Hungry Grant, and the Carolina Hunger Initiative, will also be used to support the programs implementation in year one.

Ruihan Li

For the evaluation plan our goal is to determine how many children the program reaches, along with its effectiveness in addressing the child food insecurity problem in Cleveland County, and its long-term feasibility via mixed methods.

Measurements are listed here. At baseline, we will measure the food insecurity rate via the USDA survey mentioned before, and the long-term average intake of fruit and vegetable among children via the food frequency questionnaire, which sample is shown in the bottle

For process measurement, we are assessing the specific dietary structure and intake balance of participating children at the midpoint by using 24-hour recall.

At the endpoint, we will measure food insecurity and long-term intake again for comparing to baseline. And release a survey for program quality and participants' satisfaction feedback.

Finally, a follow-up survey for program impact and effectiveness after the program end.

Data analysis results determined, based on the findings collected over the course of the evaluation, whether the goals or outcome have been accomplished. So, we will be comparing the data collected at endpoint to the baseline.

The picture shown here is the sample of the food frequency questionnaire that could be used for this program, asking how much fruit the participants have consume.

Esther Udonsi

In line with the policy goal, Mobile Meals for Children (MMC) is a nutrition program that aim to increase fruits and vegetable intake among children 18 and under and reduce the overall childhood food insecurity in Cleveland County below the state average.

The program would provide supplemental food items to families with children during long holidays like summers, winters, spring break and 3 days holidays.

The program plans to source food from various places, including local grocery stores, local farmers, food banks and produce growers.

Local farmers and Grocery stores may be willing to donate foods approaching its “best-by” or “sell-by” dates and foods less likely to be sold for aesthetic reasons (size, blemishes, etc.).

Additionally, the program also intends to partner with local food banks to deliver non-perishable goods, such as canned fruits and vegetables.

The program will use repurpose school buses to deliver these food items to the houses of families enrolled in the program, further reducing transportation and other similar access barriers especially for people living in rural areas.

The program will be made available to all families in Cleveland County with children under the age of 18. The only inclusion criteria are a positive test for FI based on pre-established criteria by USDA.

Program recruitment will occur at local schools, daycares, after-school programs, and social worker's offices.

The program also plans to leverage existing assets in the community and implement components of other successful programs in North Carolina, such as Feeding Kids Cleveland County.

Feeding Kids Cleveland County runs a backpack program, a food delivery program, and hosts community table meals that feed over 850 children on the weekend and during the holidays.

If implemented, the MMC program will ensure that families and children have consistent access to healthy and nutritious foods. Additionally, by offering a program with broad eligibility standards, this program can ensure all children are food secure, including those not eligible for federal programs.

Mary Hartwell

This program has the potential to make a significant impact in Cleveland County. Delivering food directly to participants homes will remove transportation barriers and increase access. Partnering with food banks, grocery stores and farmers in the area will increase utilization of food that might otherwise be thrown away. Finally, providing additional food to families, particularly during school breaks, could help feed children from families who struggle to obtain enough food during these times.

Please support our policy and program initiatives to improve food security for children in Cleveland County.

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APPENDIX D: MARY HARTWELL

Individual Problem Statement

Social Determinant of Health: Social & Community Context

When taking account of an individual's health, genetics and health behaviors are important, but they only tell part of the story. Social Determinants of Health (SDoH), or the environment in which a person lives, has a significant effect on a wide range of health outcomes. Determinants are divided into five categories, one of which is social and community context. This category focuses on how social interactions and relationships with the community impact an individual's well-being. This includes factors like interpersonal relationships with family, co-workers, peers, and community members, as well as availability and access to basic necessities.

Food insecurity[11] is one such issue that falls within the social and community context category. Ideally, all members of every household should have enough nutritious food to support a healthy and active lifestyle. However, there are thousands of people in Cleveland County, NC who struggle to afford enough food for themselves and their families. In turn, there are thousands of children in Cleveland County who don't always have enough to eat (Feeding America, 2019). The 2019 Cleveland County Community Health Assessment reported that households living at or below 200% Federal Poverty level were the number one priority for the county. Additionally, limited access to healthy food (due to cost barriers and limited grocery stores) was one of the top priorities directly related to health (Cleveland County Public Health Center, 2019). These issues work in tandem and create an environment where many people don't have enough money to purchase adequate amounts of food or have trouble accessing

Food insecurity doesn't affect all households the same either. Households with children are more likely to face food insecurity than those with no children, and single-parent households are more likely to be food insecure than those with two parents (Feeding America, n.d.). Food insecurity in childhood has been associated with significant short- and long-term adverse outcomes. In the short term, food-insecure children are more likely to get sick and need hospitalization. They are also more likely to have trouble concentrating in school and have poor academic performance as well as develop behavioral issues (Ke and Ford-Jones, 2015; Thomas et al., 2019; Movassagh et al., 2017). All these issues that occur because of food insecurity in childhood can have long-term consequences into

[11] **Food Insecurity:** lack of consistent access to enough food for an active, healthy lifestyle. It specifically refers to a lack of available financial resources for food at the household level (Feeding America n.d.)
Very Low Food Security: eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money or other resources for food (Feeding America n.d.)

adulthood as well. Poor performance in school can lead to fewer employment opportunities, poor health results in higher medical costs, and behavioral issues can negatively impact social interactions and community engagement. Healthy People 2030 recognized food insecurity as an issue of concern and therefore has made eliminating very low food security in children one of its objectives.

Geographic and Historical Context: Cleveland County, NC

Cleveland County, NC is located in the southern part of the state in the foothills of the Blue Ridge Mountains. It encompasses 468 square miles of land and has a population of 98,078 according to the 2020 census. The largest cities in Cleveland County are Shelby and Kings Mountain which have populations of 20,323 and 10,296 respectively. It is a rural area, with some of the smaller towns and villages having a population of only a few hundred people (Cleveland County Government, 2018b). Most of the population in this area identifies as white. About 20% of the population identifies as Black or African American, and the Hispanic, Asian, and American Indian populations collectively make up about 5% of the population (see Appendix D.1, Table 1) (U.S Census Bureau, 2021).

Manufacturing is one of the largest types of employment in Cleveland County with over 40% of the workforce involved in manufacturing of some kind. Truck cabs, paper towels, transmissions, aircraft parts, ceramic capacitor material, electric motors, and production equipment are a few of the products produced in this region (Cleveland County Government, 2018a). The median annual income of Cleveland County residents is $42,247 which is significantly less than the median income in North Carolina. The poverty rate and the rate of food insecurity in Cleveland County are also higher than that of North Carolina as a whole (US Census Bureau, 2021; U.S Census Bureau, 2021).

Priority Population

The 2020 census indicates that children under the age of 18 constitute about 22% of the population in Cleveland County (US Census Bureau, 2021). Of all the children in the area, about 30% of them lived in households at the federal poverty line in 2019. According to Feeding America, as many as 1 in 5 children in North Carolina go hungry because their families do not have enough food (Feeding America, 2020). Childhood is a time of rapid growth and development and therefore requires a balanced diet to support their health, academic endeavors as well as developmental milestones. Proper nutrition is key in providing the youth with the best possible start to set them

up for success later in life. Therefore, it is imperative that all children ages zero-18 have enough nutritious food to support a healthy lifestyle.

There are programs to help alleviate the burden of childhood food insecurity. Food assistance programs like the National School Lunch Program (NSLP), and the School Breakfast Program (SBP) exist to ensure that children from low-income families are fed at school and have high enrollment rates (Kids Count Data Center, 2021). However, many families struggle during the summer months when school is out of session. The Summer Food Service Program aims to bridge this gap; however, it consistently has low enrollment (Food Research & Action Center, 2019). Additionally, not all families in need will qualify for these programs.

Measures of the Problem

Cleveland County is one of the least healthy counties and is in the lower middle range for health factors (County Health Rankings & Roadmaps, 2021). Cleveland County also has a food insecurity rate of 16.4% compared with 13.5% in North Carolina overall (Feeding America, 2019). There is very little research that examines child food insecurity at the county level so proxy measures must suffice. In North Carolina, approximately 1 in 5 children come from food-insecure homes and struggle with hunger. Cleveland County has a lower median income, a higher rate of households living in poverty, and a higher rate of overall food insecurity than North Carolina as a whole Bureau (US Census Bureau, 2021; FRED Economic Research, 2021; U.S Census Bureau, 2021; Feeding America, 2019). At its core, food insecurity is a matter of not having the money or resources to purchase enough food. Based on these proxy measures it is reasonable to extrapolate that the rate of child food insecurity in Cleveland County is similar to that of the state, if not higher.

Rationale

Social determinants of health assert that the conditions and environment in which people live play a significant role in health outcomes. Within the social determinants of health, the social and community context describes how trouble affording necessities like food is linked to adverse health outcomes. Many children in North Carolina don't have enough to eat which can lead to poorer health, lack of focus in school, and developmental delays (Thomas et al., 2019; Cook and Jeng, 2009; Coleman-Jensen, 2021). This disadvantage among youth can have long-term impacts in terms of employability, social connections, and medical costs. This works to further perpetuate the cycle of poverty and widens health disparities between those who live in poverty and those who do not.

Disciplinary Critique

North Carolina is the eighth hungriest state in the nation. Nearly 1.5 million people are food insecure and 20% of the children don't have enough to eat (Feeding America, 2020). The issue is not that there is a lack of food to go around either. Every year 30-40% of the nation's food supply ends up in landfills (USDA, n.d.). Public health professionals and nutritionists need to work together to connect people who can't afford enough food with food that needs to be eaten. Children who face food insecurity are an especially vulnerable population. Not having enough to eat puts them at significant risk for poor academic performance, developmental delays, and poor health. Providing these children with a balanced diet can help close the gap of economic advantage and allow children from low-income backgrounds to reach their full potential.

APPENDIX D.1: Cleveland County – North Carolina Demographics

Table 1: Cleveland County – North Carolina Demographics

Demographic Information	**Cleveland County** (US Census Bureau 2021)	**North Carolina** (U.S Census Bureau 2021)
White	72.8%	62.6%
Black/African American	20.8%	22.2%
Hispanic/Latino	3.8%	9.8%
Asian	1.1%	3.2%
American Indian	0.4%	1.6%

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Nutrition Program Intervention

Background Information

Social Determinants of Health (SDoH) are defined as the environment in which people live, work, and play, and it has been shown to affect health and well-being just as much as people's genetics (CDC, n.d.). There are five domains within SDoH, one of which is Social and Community Context. This domain addresses the way people relate to their peers, community, and society around them. Positive relationships work to improve health outcomes while negative interactions such as bullying, discrimination, and trouble affording necessities can contribute to increased stress and poorer health outcomes (U.S. Department of Health and Human Services, 2020). One issue of concern outlined by Healthy People 2030 is food insecurity, particularly in children and adolescents. Food insecurity occurs when a household does not have adequate access to enough affordable, nutritious food to support an active lifestyle. In these situations, households often must compromise the quality or quantity of food they purchase (USDA Economic Research Service, 2021).

According to Feeding America, the child food insecurity rate in North Carolina was 18.3%, but the food insecurity rate for Cleveland County was 23.2% (Feeding America, n.d.). Cleveland County also has a higher poverty rate than North Carolina with 30.5% of children living in homes at or below the federal poverty line (U.S Census Bureau, 2021; US Census Bureau, 2021; Kids Count Data Center, 2022). Research has shown that experiencing food insecurity as a child can have significant short- and long-term impacts. Children from food-insecure homes are more likely to get sick and require hospitalization than children from food-secure homes (Thomas et al., 2019). They are also more likely to have trouble focusing at school, have poorer academic performance, develop behavioral issues and miss developmental milestones (Gundersen and Ziliak, 2015; Ke and Ford-Jones, 2015). All these issues that occur as a result of food insecurity in childhood can lead to poorer health, and educational attainment, reducing their employment opportunities and earning potential, which further perpetuates the poverty cycle of poverty (Ke and Ford-Jones, 2015; Cook and Jeng, 2009).

Purpose

North Carolina has one of the highest rates of food insecurity in the nation, and Cleveland County has higher rates of food insecurity than the state (Feeding America, 2019; Feeding America, 2020). More specifically, this area suffers a disproportionately high burden of child food insecurity, with 23.5% of children not having enough to eat, compared with the statewide rate of 18.3% (Feeding America, 2019; Feeding America, 2020). There are

currently federal programs that operate in this such as SNAP (previously known as food stamps) and WIC. These programs are proven to help alleviate the effects of child food insecurity, but eligibility to participate is largely based on household income. It's estimated that nearly 25% of families experiencing child food insecurity are not eligible because the household income is higher than 186% of the federal poverty line (Feeding America, 2019). Furthermore, during the 2019-2020 school year, as many as 72% of all children participated in the National School Lunch Program (Kids Count Data Center, 2021). This program offers nutritious meals to children through their schools for free or at a reduced price, but it does not serve meals when school is not in session. During weekends, breaks, and summer months, children who previously relied on the school for their meals are left to find alternate sources of food or go hungry. Some programs attempt to bridge the gap between school meals and breaks, such as the Summer Food Service Program (SFSP) but they are vastly underutilized, only serving about 10% of the estimated need in the County (No Kid Hungry NC et al., 2019).

There are also local resources in Cleveland such as food banks that provide food to families in need. However, the people utilizing food banks may have trouble getting to food distribution sites for various reasons, such as unreliable access to transportation or having to work during food distribution hours (No Kid Hungry, 2020). It is excellent that all these programs exist, but there are still significant gaps in the food safety net system.

Evidence-Based Outcomes

This program has both short- and long-term outcomes. In 2 years, the intervention objectives are to increase fruit and vegetable intake among participating children and decrease the proportion of food insecure children by 25% (Health Affairs et al. 2019). The long-term goal of this intervention is to reduce the rate of children experiencing food insecurity in Cleveland County to below that of the state of North Carolina in 5 years (Save the Children, n.d.). This can be accomplished through leveraging existing resources and collaborating with organizations in the area that are well-positioned to make an impact (Save the Children, n.d.).

Strategies and Activities

This intervention aims to fill the gaps for families who are not eligible for federal assistance programs, families that have trouble accessing food bank distribution sites, or are just food insecure and need extra assistance. The mission of the program is to collect both fresh and packaged foods, box them up, and deliver them to participants' homes monthly. This approach to tackling food insecurity was chosen because there are programs similar to this that operate in other counties. PORCH Food for Families is an organization that operates in the

Carrboro/Chapel Hill area that delivers fresh foods like milk, eggs, fruits, vegetables, and chicken to families with children in Chapel Hill and Carrboro schools. They received goods and monetary donations from individual donations, business sponsorships grants, and in-kind donations of fresh food and non-perishable items (PORCH Chapel Hill/Carrboro 2020). Table is a similar organization that operates in Orange County. It provides emergency food assistance by delivering weekly bags of healthy and non-perishable foods directly to kids' homes. Both organizations operate in mostly urban/suburban settings and volunteers make the deliveries. Additionally, Table does not screen participants based on household income (Table NC 2022). Finally, No Kid Hungry offers a toolkit for best practices regarding implementing mobile meals and grocery delivery (No Hungry Kid North Carolina n.d.).

Based on the model of other grocery delivery programs in the state, and the guidance provided by No Kid Hungry's *Mobile Meal Toolkit,* this intervention would utilize a similar approach. First, to source food, the program would establish partnerships with local grocery stores to secure donations of food that cannot be sold in the store. This is usually because the "sell by" or "best by" date is approaching. Local farmers may also be willing to donate fresh foods that cannot be sold for aesthetic reasons (side, shape, blemishes, etc.) Finally, this program will hold food drives to collect non-perishable goods such as canned fruits and vegetables, uncooked rice and beans, spreads, and canned meats. Donations of this nature could qualify as a tax write off which may further incentivize companies to donate (Internal Revenue Service 2021). The contents of each box will vary depending on the season and the foods that have been donated. This program will obtain old school or city buses or vans and repurpose them for delivery. This would allow for more grocery boxes to be delivered at one time by fewer delivery drivers.

This program will be open to all families with children in Cleveland County Schools, regardless of their eligibility for other federal assistance programs. Recruitment will happen at schools, after-school programs, and offices of social workers. Families will be able to sign up for individual food boxes or for food boxes overall school breaks. This will impact people at the individual, interpersonal and community levels. If each individual family member has adequate access to enough healthy food to sustain them, health outcomes are likely to improve for all. Furthermore, if the household is receiving supplemental food, it allows funds to be allocated to other things such as rent, utilities, health care, or even enrichment activities.

Stakeholders

To implement this program, planners would consult with a wide variety of stakeholders. First, organizations like No Kid Hungry North Carolina and Feeding Kids Cleveland County would be contacted. No Kid

Hungry North Carolina supports operations that seek to feed children with best practices, grant funding, marketing tools, and technical assistance (No Kid Hungry n.d.). Feeding Kids Cleveland County is an established organization that operates a weekend backpack program, as well as a donation-based food box delivery (Feeding Kids Cleveland County 2021). This is an opportunity for a partnership that could expand the variety of food and reach of the program, or at least provide lessons learned and best practices. Partnerships would have to be created to source food for this program. Grocery stores might be willing to donate produce and other perishable foods that are approaching their "sell by" date as well as non-perishable items to put in the food boxes. Local farmers might also have food that cannot be sold through conventional avenues due to aesthetics or blemishes. This program will need a place to collect, store and package food. Partnerships with local food hubs could be helpful in determining the kinds of resources necessary for food storage, packaging, and delivery, and how best to support those needs. This program would also need stakeholders to help with marketing and recruitment. This should include schools, community centers, after-school care, daycare centers, and social workers. Finally, bus-drivers/delivery people would need to be contracted to make deliveries.

Budget

Funding for this program will come from three sources. First, in-kind donations of food and groceries will be made from local grocery stores, food banks, and farmers. Next, the county will allocate funds to purchase materials such as delivery vehicles and packaging for the food boxes. This program will also solicit tax-deductible donations from members of the community and local businesses. Finally, this program will seek out grant funding to hire a program manager and coordinator. Programs in other counties that are similar to this one (such as Table and PORCH in Orange County) successfully utilize these sources of funding (PORCH Chapel Hill/Carrboro 2020; Table 2022).

This program would require up-front costs such as hiring a program manager and as well as buses/delivery vehicles. Recurring costs would be hourly workers such as a site coordinator, drivers/deliverers, and packaging. Most of the food would come from in-kind donations, with an additional sum of money allocated for purchasing additional food (see Appendix D.2, Table 1).

Conclusion

The aim of this program is to close the gaps in the safety net food program and ensure that all children and their families have access to enough healthy food. It also seeks to create a more equitable food system in the rural

counties and bring food to families that might otherwise struggle to find transportation. The advantage of this program is that it capitalizes on community partnership and utilizes food that might otherwise be wasted. The disadvantage is that participants do not get to choose what goes in each box and the fresh items they receive might have to be used (or frozen) rather quickly. This program is also aimed at families who are food insecure, so households that do not have children would not be eligible to enroll, regardless of their food security status.

APPENDIX D.2: Budget

Table 1. Program Budget

Program manager	$40,000/year
Nutrition Program Coordinator	$45,000
Site Coordinator	$20/hour
Vehicle/Bus Driver, Delivery	$20/hour
Buses/repurposing	$50,000
Packaging	$5000
Additional food	$2000

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Implementation and Evaluation Plan

Intervention Summary

The environment in which people live, work and play, or the social determinants of health significantly impact people's health outcomes. Social determinants of health encompass more than just the built environment though; it also includes the social environment (U.S. Department of Health and Human Services 2020). The social and community context of a person's life and the way people engage with their family members, coworkers, peers, and their community also affects health. Healthy People 2030 has identified food insecurity as a social determinant of health that needs to be improved, particularly in children. Food insecurity occurs when a household does not have adequate access to enough affordable, nutritious food. Often these households are forced to compromise the quantity and quality of their meals Research (USDA Economic Research Service 2021).

In 2019 nearly 23% of children in Cleveland County faced food insecurity. This means that nearly 1 in 5 children did not have access to enough food (Feeding America 2019). There are federal and local safety net programs in place, but families still slip through the cracks (Feeding America n.d.). Feeding America estimates that nearly 24% of food-insecure families are not eligible for federal assistance programs like Supplemental Nutrition Assistance Program (SNAP, formerly Food Stamps) or Women, Infants and Children (WIC) because of their income (Feeding America 2019). Additionally, local food banks offer food, but because parts of the county are so rural, some people have a hard time getting to the distribution sites (No Kid Hungry 2020). This intervention aims to fill the gaps for families who are not eligible for federal assistance programs, families that have trouble accessing food bank distribution sites, or are just food insecure and need extra assistance. The screening process will be based on food security rather than income so more families will be eligible. This program will also deliver food boxes directly to participants' homes which will eliminate barriers to access such as timing or transportation.

The short-term objective of this program is to increase child fruit and vegetable consumption by 25%. This will be measured using a Food Frequency Questionnaire (FFQ) (see Appendix D.3, Figure 1) at the beginning and the end of the program (Health Affairs et al. 2019). The long-term objective is to reduce the proportion of children that come from food-insecure homes to below the state average (Save the Children n.d.).

Evaluation Plan

Study Design/Data Collection

This study will use a mixed-methods approach. The exposure will be participation in the intervention program, and the RE-AIM framework (Reach, Effectiveness, Adoption, Implementation and Maintenance) will be used for evaluation. Families with children ages 0-18 will be recruited for this program at schools, community centers, after-school care, and social worker offices. Households will be screened for eligibility using the USDA U.S Household Food Security Survey as seen in Appendix D.3, Figure 2 (US Department of Agriculture 2012). This program will run for two years, and participants will receive a food box, containing fresh and non-perishable goods on a monthly basis. Once admitted into the program, parents will fill out consent forms for their children, and children, if able, will complete assent forms. Each child in the household will complete a validated FFQ at baseline, midpoint (1 year), and at the end of the intervention. Researchers will compare the information from these questionnaires to determine if there is an increase in fruit and vegetable consumption (National Cancer Institute 2021). If the child is too young to fill it out, a parent or caregiver may fill it out as a proxy. In addition, 6 months into the program researchers will hold a focus group with participating families to determine if the program is culturally appropriate, acceptable, and meets the needs of the families.

Sample and Sampling Strategy

Families with children will be recruited from schools, daycare centers, after-school programs, social workers' offices, and community centers. If the family is interested, they will be screened for eligibility using the USDA U.S Household Food Security Survey. If the survey indicates that the family struggles with food security, they will be invited to sign up for the program.

Specific Measures

The short-term objective of this program is to increase child fruit and vegetable consumption by 25%. This will be measured using an FFQ at the beginning, midpoint, and end of the program. These questionnaires will be used for comparison to determine if there is any change in fruit and vegetable intake over time. The long-term objective is to reduce the proportion of children that come from food-insecure homes to below the state average. Every year organizations like Feeding America collect data on food insecurity at the county, state, and national levels. We will partner with them to track how food insecurity changes over time in Cleveland County and how Cleveland County compares to North Carolina.

Analysis Plan

A pre-/post-test analysis will compare the FFQ's from baseline to year 1 and year 2. The research team will run an analysis to determine if there were any significant differences between baseline, year 1, and year 2. The long-term outcome will utilize county-level data to compare rates of childhood food insecurity in Cleveland County to the rates of childhood food insecurity in the state of North Carolina. The researchers will also analyze the qualitative research by coding the responses into a qualitative data analysis software such as Dedoose. From there, major themes will be determined based on code frequency and organized into insights for each question.

Timing

This program will be 3 years, with 1 year to be used for planning and logistics and the next 2 years for program implementation. Planning will begin in August 2022 and last until August 2023. During this time, the research team will meet with key stakeholders, such as grocers, food banks, and farmers to ensure that there will be enough food donations to meet the need of the participants. The program will also need to obtain delivery vehicles and hire and train a program manager and site coordinators who will oversee the food collection, packaging, and delivery. Participant enrollment will begin in February 2023, 6 months before the start of the program. August of 2023 is when families will fill out their first FFQ and start receiving their food boxes. From February to August 2024, the research team will conduct focus groups to assess how the program is running and if it is meeting the needs of the people in the study. Changes will be made if necessary to make the program run more smoothly. August 2024, participants will fill out another FFQ, and enroll in year 2 of the program. In August of 2025, families will fill out their final FFQ. From there, researchers will analyze the data to determine if 1) children consumed more fruits and vegetables over the course of the program, and 2) if the rates of childhood food insecurity decreased in Cleveland County.

Sources of Funding

Funding for this program will come from three sources. First, in-kind donations of food and groceries will be made from local grocery stores, food banks, and farmers. Next, the county will allocate funds to purchase materials such as delivery vehicles and packaging for the food boxes. This program will also solicit tax-deductible donations from members of the community and local businesses. Finally, this program will seek out grant funding in order to hire a program manager and coordinator. Programs in other counties that are similar to this one (such as

Table and PORCH in Orange County) successfully utilize these sources of funding (PORCH Chapel Hill/Carrboro 2020; Table 2022)

Data Use and Dissemination

As with any research, it is important to disseminate the findings of the program and share the successes and lessons learned. No Kid Hungry North Carolina is an organization committed to finding ways to end childhood food insecurity. This type of study would also be appropriate to publish in the Journal of the Academy of Nutrition and Dietetics so that it might be adapted or replicated in other counties. The finding of this study would also be of interest to the Cleveland County Health Department. It would be important to share with them if this program moves the needle on reducing the rates of food insecurity in the county.

Strengths and Challenges

This program has the potential to close many of the gaps that exist in the safety net system in Cleveland County. Since this program would screen for eligibility based on the level of food insecurity rather than income, it would reach a population of people who require assistance but have very few resources. The groceries would be delivered directly to the participants to ensure that food is accessible. Providing extra groceries to families also ensures that all members of the household have enough, especially during the summer months when children are home and are not receiving meals through programs like the National School Lunch Program or the School Breakfast Program. Finally, this program utilizes food that would otherwise be wasted.

There are some challenges to this program, the first being that only food-insecure households with children are eligible for this program. In the future, the program may expand if it is successful in reducing the rates of childhood food insecurity, but to start only families with children may apply. There may also be challenges with assessing how the diets of children are changing. Since the food box is for the whole family, it may be difficult to assess what and how much of the food in each box is being consumed by the children. Finally, the contents of the box will vary depending on the foods that get donated each month. Because of this, participants will have little control over what they receive.

Potential Impact

This program has the potential to create positive change to the food environment in Cleveland County. It could help reduce the number of children from food-insecure households and ensure that they always know where their next meal is coming from. This is particularly important during the summer months when kids do not have

access to school meals. Additionally, the program would reduce the amount of food waste in the county, ensuring that more food stays out of landfills and is utilized by those who need it most.

APPENDIX D.3: FFQ and Example USDA Questionnaire

Figure 1. Example of Food Frequency Questionnaire

OMB# 0925-0460 EXP. DATE: 07/31/2000

NATIONAL INSTITUTES OF HEALTH

EATING AT AMERICA'S TABLE STUDY

QUICK FOOD SCAN

- The person who completed the telephone interviews for the Eating at America's Table Study should fill out this questionnaire.
- Use only a No. 2 pencil.
- Be certain to completely blacken in each of the answers, and erase completely if you make any changes.
- Do not make any stray marks on this form.
- When you complete this questionnaire, please return it in the postage-paid envelope to:

  National Cancer Institute
EPN, Room 313
6130 Executive Blvd., MSC 7344
Bethesda, MD 20892-7344

BAR CODE LABEL HERE

NOTIFICATION TO RESPONDENT OF ESTIMATED BURDEN

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: NIH, Project Clearance Office, 6701 Rockledge Drive, MSC 7730, Bethesda, MD 20892-7730, ATTN: PRA (0925-0460). Do not return the completed form to this address.

PLEASE DO NOT WRITE IN THIS AREA

SERIAL

INSTRUCTIONS

Think about what you usually ate last month.

Please think about all the fruits and vegetables that you ate last month. Include those that were:

- **raw and cooked,**
- **eaten as snacks and at meals,**
- **eaten at home and away from home (restaurants, friends, take-out), and**
- **eaten alone and mixed with other foods.**

Report how many times per month, week, or day you ate each food, and if you ate it, how much you usually had.

If you mark "Never" for a question, follow the "Go to" instruction.

Choose the best answer for each question. Mark only one response for each question.

1. Over the last month, how many times per month, week, or day did you drink **100% juice** such as orange, apple, grape, or grapefruit juice? **Do not count** fruit drinks like Kool-Aid, lemonade, Hi-C, cranberry juice drink, Tang, and Twister. Include juice you drank at all mealtimes and between meals.

○ Never (Go to Question 2)
○ 1-3 times last month
○ 1-2 times per week
○ 3-4 times per week
○ 5-6 times per week
○ 1 time per day
○ 2 times per day
○ 3 times per day
○ 4 times per day
○ 5 or more times per day

1a. Each time you drank **100% juice**, how much did you usually drink?

○ Less than ¾ cup (less than 6 ounces)
○ ¾ to 1¼ cup (6 to 10 ounces)
○ 1¼ to 2 cups (10 to 16 ounces)
○ More than 2 cups (more than 16 ounces)

2. Over the last month, how many times per month, week, or day did you eat **fruit**? Count any kind of fruit—fresh, canned, and frozen. **Do not count** juices. Include fruit you ate at all mealtimes and for snacks.

○ Never (Go to Question 3)
○ 1-3 times last month
○ 1-2 times per week
○ 3-4 times per week
○ 5-6 times per week
○ 1 time per day
○ 2 times per day
○ 3 times per day
○ 4 times per day
○ 5 or more times per day

2a. Each time you ate **fruit**, how much did you usually eat?

○ Less than 1 medium fruit
○ 1 medium fruit
○ 2 medium fruits
○ More than 2 medium fruits

OR

○ Less than ½ cup
○ About ½ cup
○ About 1 cup
○ More than 1 cup

- 1/1

3. Over the last month, how often did you eat **lettuce salad (with or without other vegetables)**?

Never (Go to Question 4)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

3a. Each time you ate **lettuce salad**, how much did you usually eat?

About ½ cup	About 1 cup	About 2 cups	More than 2 cups

4. Over the last month, how often did you eat **French fries** or **fried potatoes**?

Never (Go to Question 5)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

4a. Each time you ate **French fries** or **fried potatoes**, how much did you usually eat?

Small order or less (About 1 cup or less)	Medium order (About 1½ cups)	Large order (About 2 cups)	Super Size order or more (About 3 cups or more)

5. Over the last month, how often did you eat **other white potatoes**? Count **baked, boiled**, and **mashed potatoes, potato salad,** and **white potatoes that were not fried.**

Never (Go to Question 6)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

5a. Each time you ate **these potatoes**, how much did you usually eat?

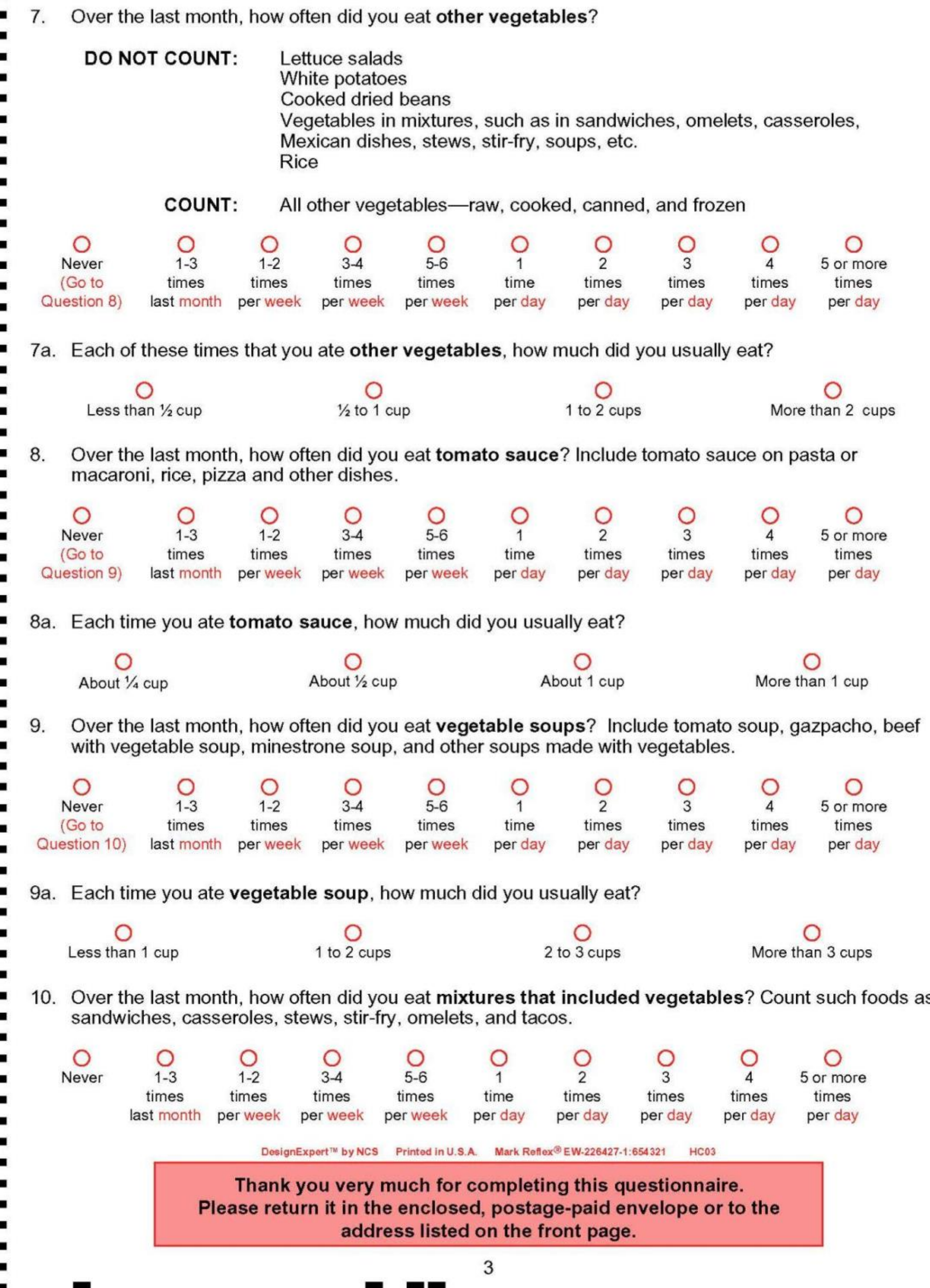
1 small potato or less (½ cup or less)	1 medium potato (½ to 1 cup)	1 large potato (1 to 1½ cups)	2 medium potatoes or more (1½ cups or more)

6. Over the last month, how often did you eat **cooked dried beans**? Count **baked beans, bean soup, refried beans, pork and beans** and **other bean dishes.**

Never (Go to Question 7)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

6a. Each time you ate **these beans**, how much did you usually eat?

Less than ½ cup	½ to 1 cup	1 to 1½ cups	More than 1½ cups



7. Over the last month, how often did you eat **other vegetables**?

DO NOT COUNT: Lettuce salads
White potatoes
Cooked dried beans
Vegetables in mixtures, such as in sandwiches, omelets, casseroles, Mexican dishes, stews, stir-fry, soups, etc.
Rice

COUNT: All other vegetables—raw, cooked, canned, and frozen

Never (Go to Question 8)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

7a. Each of these times that you ate **other vegetables**, how much did you usually eat?

Less than ½ cup	½ to 1 cup	1 to 2 cups	More than 2 cups
O	O	O	O

8. Over the last month, how often did you eat **tomato sauce**? Include tomato sauce on pasta or macaroni, rice, pizza and other dishes.

Never (Go to Question 9)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

8a. Each time you ate **tomato sauce**, how much did you usually eat?

About ¼ cup	About ½ cup	About 1 cup	More than 1 cup
O	O	O	O

9. Over the last month, how often did you eat **vegetable soups**? Include tomato soup, gazpacho, beef with vegetable soup, minestrone soup, and other soups made with vegetables.

Never (Go to Question 10)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

9a. Each time you ate **vegetable soup**, how much did you usually eat?

Less than 1 cup	1 to 2 cups	2 to 3 cups	More than 3 cups
O	O	O	O

10. Over the last month, how often did you eat **mixtures that included vegetables**? Count such foods as sandwiches, casseroles, stews, stir-fry, omelets, and tacos.

Never	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day
O	O	O	O	O	O	O	O	O	O

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**Thank you very much for completing this questionnaire.
Please return it in the enclosed, postage-paid envelope or to the address listed on the front page.**

3

Figure 2. USDA Food Insecurity Evaluation 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 ran 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 to." Was that often, sometimes, or never true for you in the last 12 months?

13. "The children were not eating enough because we 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 couldn't afford more food? (Yes/No)

16. In the last 12 months, did any of the children 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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Presentation Slides and Script

Social Determinants of Health

Social Determinants of Health (SDoH) [1]

- The environment in which people live, work, play etc.
- Significant impact of health outcomes and quality of life.

Social and Community Context [1]

- People's interactions and relationships with the people in their community.
- Ability to obtain basic necessities such as food and shelter.

Healthy People 2030

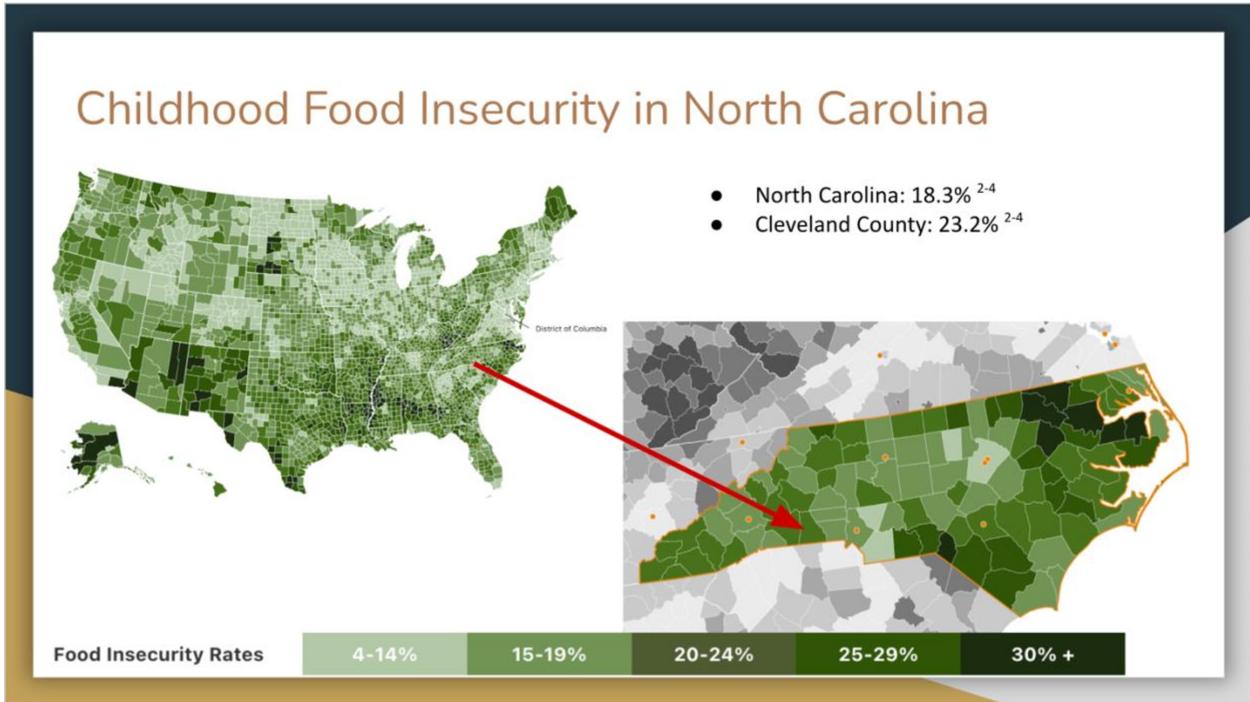
- Eliminate very low food security in children.

Social Determinants of Health

When taking account of an individual's health, genetics and health behaviors are important to consider, but they only tell part of the story. Social determinants of health, or the environment in which people live, work, and play also have a significant impact on health and quality of life.

Social Determinants of health is split into 5 domains, one of which is social and community context. This domain pertains to the interactions and relationships that a person has with their community. It also deals with a person's ability to obtain basic necessities such as food, shelter and medical care. Within the domain of social and community context, Healthy People 2030 identified food insecurity as issue of concern, particularly in children.

Food insecurity is defined as lack of consistent access to enough food for an active, healthy lifestyle. More specifically, it refers to a lack of available financial resources for food at the household level. Very low food security is when eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money or other resources for food.



Childhood food insecurity is a pervasive problem across the US but particularly in North Carolina. North Carolina has childhood food insecurity rate of 18.3%, which is the 10th highest in the nation. The childhood food insecurity rate in Cleveland County is 23.2% which means nearly 1 in 4 children may not have adequate access to food.

This can have short- and long-term adverse outcomes. Short term, food insecurity in children is associated with decreased focus and poorer academic performance, increased risk of illness and need for hospitalization, as well as increased risk for developmental delays or behavioral issues.

In the long term, these things can result in lower educational attainment, fewer employment opportunities, and higher burden of medical costs due to poorer health outcomes. These factors can work in tandem to further perpetuate the cycle of poverty.

Conclusion

Impact of the policy & program

- Increase food access to food insecure households with children.
- Increase food utilization in the county and reduce the amount of food waste.
- Reduce the rate of childhood insecurity in Cleveland County.

Please support our policy and program initiatives to improve food security for children in Cleveland County.

This program has the potential to make a significant impact in Cleveland County. Delivering food directly to participants homes will remove transportation barriers and increase access. Partnering with food banks, grocery stores and farmers in the area will increase utilization of food that might otherwise be thrown away. Finally, providing additional food to families, particularly during school breaks, could help feed children from families who struggle to obtain enough food during these times.

Please support our policy and program initiatives to improve food security for children in Cleveland County.

APPENDIX E: GABRIELLA HERTER

Problem Statement: Addressing Childhood Food Insecurity in Cleveland County, NC

Social Determinant of Health

An individual's health can be impacted by medical[12] factors or social influences; health outcomes affected by social factors are called social determinants of health (SDoH)[13] (Green & Allegrante, 2011; USDHHS, 2020e). One notable SDoH is the social and community context[14] in which one lives, as it can positively or negatively impact short- and long-term health outcomes such as morbidity, mortality, life expectancy, cost of care, health issues/status, disability, and health disparities (USDHHS, 2020). The extent of these outcomes is further dependent on the quantity and quality of those relationships and interactions (USDHHS, 2020). Some of the factors which foster or impede building high-quality social and community connections include social cohesion[15], discrimination[16], incarceration[17], and civic participation[18] (USDHHS, 2020).

Indicators of social cohesion include social capital[19], collective efficacy[20], social networks[21], and social support[22] (USDHHS, 2020f). Lack of social cohesion is associated with mortality, perceived health, neighborhood violence, health behaviors and outcomes, and access to resources like medical care, healthy food options, and places to exercise (USDHHS, 2020f). Discrimination can be structural[23] or individual[24] and results in intentional or unintentional harm regardless of whether the individual perceives it (USDHHS, 2020b). Discrimination acts as a social stressor, causing adverse physiological, psychological, and emotional outcomes, which can be amplified over time resulting in long-term health concerns (USDHHS, 2020b). Racial/ethnic minorities and lower-income individuals disproportionately represent the incarcerated population (USDHHS, 2020d). The incarcerated, their families, and their communities experience higher than average mental and physical health concerns and distress (USDHHS, 2020d). Finally, civic participation is associated with social cohesion, emotional and psychological well-being, physical activity, self-reported mental and physical health, etc. (USDHHS, 2020a).

[12] Medically related health factors include genetics, biology, lifestyle/behaviors, and more(Green & Allegrante, 2011).
[13] Encompass all the conditions in the environments where individuals are born, live, learn, work, play, worship, and age (USDHHS, 2020g).
[14] One of five domains used by Healthy People 2030 to group numerous SDoH (USDHHS, 2020e).
[15] The strength of relationships and the sense of solidarity among community members (USDHHS, 2020f).
[16] An unjust or prejudicial treatment of persons or populations based on socially constructed characteristics such as age, race, gender, sexual orientation, or disability (USDHHS, 2020b).
[17] A mechanism within the legal system used to punish individuals who have committed criminal offenses (USDHHS, 2020d).
[18] A range of formal and informal activities that typically benefit either a group (playing on a soccer team) or society (voting) (USDHHS, 2020a).
[19] Refers to shared group resources (USDHHS, 2020f).
[20] A community's ability to influence behavior through social norms (USDHHS, 2020f).
[21] These are sources of multiple forms of social support (USDHHS, 2020f).
[22] Includes emotional support (encouragement) and instrumental support (a ride to an appointment) (USDHHS, 2020f).
[23] Macro-level conditions that limit opportunities, resources, and well-being among minority populations (USDHHS, 2020b)
[24] Micro-level negative interactions between individuals based on one's individual characteristics such as race, gender, etc. (USDHHS, 2020b).

The short and long-term health outcomes associated with social and community context and the resulting need for acute medical care related to social and community context can trigger economic and food insecurity, and vice versa (Banks et al., 2021). Specifically, food insecurity exists because of numerous issues such as low income, lack of affordable housing, social isolation, economic/social disadvantage resulting from structural racism, chronic or acute health problems, high medical costs, and low wages (Hunger and Health, 2020). Children 18 years and under are at increased risk of food insecurity as they are highly dependent on their parents and other social and community context. Food insecurity among children is associated with various health outcomes such as asthma, anemia, and behavioral, emotional, and academic problems (Brown et al., 2019).

Geographic and Historical Context

Cleveland County is geographically located in the southwestern region of North Carolina, less than 50 miles of Charlotte and less than 100 miles of Asheville. Despite its proximity to prosperous metropolitan areas, Cleveland County is a rural county, classified as a Tier 1 Economically Disadvantaged County (Cleveland County Health Department & Alliance for Health in Cleveland County, Inc., 2020). A Tier 1 designation[25] indicates that Cleveland County is one of North Carolina's most distressed counties (North Carolina Department of Commerce, 2022). For Cleveland County's demographics, see Appendix E.1, Table 1.

To date, two major initiatives have been established in Cleveland County to address healthy eating and physical activity among their residents: Catalyst for Healthy Eating and Active Living (CHEAL)[26] and Live Healthy Cleveland County (LHCC) (Live Healthy Cleveland County, 2018; North Carolina Division of Public Health, 2022). During their six-year partnership with Cleveland County, CHEAL contributed to implementing three local programs (see Appendix E.2, Figure 1) (North Carolina Division of Public Health, 2022). Unlike CHEAL, which is no longer an active program, LHCC continues to promote opportunities for healthy eating and physical activity in Cleveland County (see Appendix E.3, Table 2) (Live Healthy Cleveland County, 2018).

The Transportation Administration of Cleveland County (TACC) seeks to address transportation barriers by offering safe and convenient transportation for elderly and disabled citizens (TACC, 2021). Unfortunately, no other public transit exists, leaving other Cleveland County residents without public transit options (TACC, 2021).

[25] Tier designations are determined by average unemployment rate, median household income, percentage growth in population, and adjusted property tax base per capita (North Carolina Department of Commerce, 2022).
[26] Partnered with eight rural counties in North Carolina from 2012-2018 to align community partners and initiatives, expand resources, engage, and energize communities, and equip communities for lasting change (North Carolina Division of Public Health, 2022).

Priority Population

Food insecurity is influenced by several factors, leaving certain groups of people at higher risk. Some of these factors include income, employment, race/ethnicity, disability, neighborhood condition, social and community support, household composition, and access to transportation (USDHHS, 2020c). According to the USDA (n.d.) and USDHHS (2020), households with children 18 years and under, single parents, Black non-Hispanic or Hispanic/Latinx reference persons, incomes below 185 percent of the federal poverty threshold, in rural areas and principal cities of metropolitan areas, limited transportation options, little social cohesion, or limited access to supermarkets and other sources of healthy foods are at greater risk of food insecurity than the rest of the population. One study conducted by NC Child found that roughly six out of ten children in Cleveland County (12,870 children[27]) live in households struggling with food and income security (George, 2020). Based on the prevalence of FI among children in Cleveland County, and the fact that children are reliant on their parents, guardians, and communities, children 18 years of age and under will be the priority population in addressing FI in Cleveland County.

Measures of Problem Scope

Understanding the risk of food insecurity at the national, state, and county levels is vital to understand better which groups are at increased risk of food insecurity, especially among children. At the national level, data indicate that household characteristics are essential determinants for the overall risk of food insecurity among children (see Appendix E.4, Tables 3 and 4) (USDA, 2021b). Such findings indicate that household characteristics can be attributed to food insecurity. This data further demonstrates the disparities associated with food insecurity. For example, minority populations are at much higher risk of food insecurity when compared to white non-Hispanic individuals in the United States (U.S.) (USDA, 2021b). At the county level, lack of access to supermarkets, access to a vehicle, and higher poverty rates disproportionately impact certain areas of Cleveland County (see Appendix E.5, Figures 2-6) (USDA, 2021a). This data would indicate that specific communities in Cleveland County are at higher risk of food insecurity than others. Similarly, access to federal programs such as Supplemental Nutrition Assistance Program (SNAP) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), which can

[27] 0.219 * 97,947 = 21,450 children in Cleveland County; (21,450/10) * 6 = 12,870 children living in households struggling with food and income security (University of Wisconsin Population Health Institute, 2021).

help alleviate the burden of food insecurity, are not available to everyone (see Appendix E.6, Figures 7 and 8) (Feeding America, 2020b, 2020a).

Rationale/Importance

Comparing specific indicators of food insecurity at the county, state, and national levels indicate worse outcomes in Cleveland County (see Appendix E.7, Table 5) (University of Wisconsin Population Health Institute, 2021). This data suggests a lack of necessary resources and services to address the environmental, social, and economic barriers faced by the residents of Cleveland County in accessing and affording sufficient and healthy foods. Additionally, the geographic clusters in Cleveland County experiencing higher than average poverty rates and less than average access to transportation and supermarkets indicate that specific populations are disproportionately impacted by food insecurity than others (see Appendix E.5, Figures 2-6) (USDA, 2021a). Given the overlapping indicators of food insecurity and poor social and community context, addressing these indicators will help improve food insecurity and social and community ties, relationships, and interactions.

Disciplinary Critique

While theory, research, and evidence offer critical insights to those who wish to understand the impact of public health in their communities, those negatively impacted will continue to fall through the cracks without someone to turn these insights into action. Unfortunately, this has been the trend in the United States for many years and has resulted in numerous setbacks for public health. Implementing evidence-based policies and programs has become increasingly tricky between minority mistrust in the health system (rightfully so) and increasing politicization of health-related problems and programs. Health policy professionals have the necessary skills and insights to develop health-related strategies and policies that are feasible among all stakeholders and can improve the health of our communities.

APPENDIX E.1: Cleveland County Demographics

Table 1. Cleveland County Demographics, 2021

Demographic	*Cleveland County*
Total Population	97,947
Non-Hispanic White	72.8%
Non-Hispanic Black	20.8%
Hispanic/Latinx	3.8%
Asian	1.1%
Native American/Alaska Native	0.4%
Two or More Races	1.9%
Children (ages 0-18)	21.9%

(University of Wisconsin Population Health Institute, 2021)

APPENDIX E.2: CHEAL Contributions to Cleveland County

Figure 1. Catalyst for Healthy Eating and Active Living (CHEAL) Contributions to Cleveland County, 2012-2018.

Training Physical Education teachers to implement the *Let's Go NC! Bike Safety Curriculum* for the county's 4th and 5th graders.

Partnered with the local initiatives to secure funding and plan for sidewalks to connect three neighborhoods and Boiling Spring Elementary School.

Developed a process for Foothills Farmers' Market to accept debit and SNAP/EBT payment at two locations, in addition to helping secure funding and strengthening partnerships to sustain outreach efforts.

(North Carolina Division of Public Health, 2022)

APPENDIX E.3: LHCC Promoted Opportunities

Table 2. Healthy Eating and Physical Activity Opportunities Promoted by LHCC

Opportunity	***Number Available in Cleveland County***
Playground	31
Walking Tracks/Trails	45
State Parks	3
Fruit & Vegetable Stands and Farmers Markets	13
Hot Lunch Programs	7
Food Pantries	16

(Live Healthy Cleveland County, 2018)

APPENDIX E.4: National Prevalence of Food Insecurity by Indicator

Table 3. Prevalence of Food Insecurity in the US by Household Characteristic, 2020

Indicator	*Prevalence (%)*
Overall	11.7%
Household Composition	
With Children < 18	14.8%
With Children < 6	15.3%
Married Couples with Children	9.5%
Single Women with Children	27.7%
Single Men with Children	16.3%
Other Household with Child	12.3%
With No Children < 18	8.8%
More Than One Adult, No Children	7.1%
Women Living Alone	11%
Men Living Alone	11.4%
With Elderly	6.9%
Elderly Living Alone	8.3%
Education Status	
Less than High School	15.2%
High School	10.5%
Some College	8.6%
College or More	2.8%
Employment Status	
Other, Not in Labor Force	17%
Not in Labor Force – Disabled	17%
Unemployed	17%
Part-Time (Economic Reasons)	26%
Part-Time (Non-Economic)	10%
Retired	4%
Full-Time	6%
Disability Status	
Disabled (Not in Labor Force)	15%
Disabled (Adults 18-64)	11%
Disabled (Adults 65+)	5%
Not Disabled	6%
Income-to-Poverty Ratio	
Under 1.00	35.3%
Under 1.30	33.1%
Under 1.85	28.6%
1.85 and Over	4.9%
Race/Ethnicity of Household Reference Person	
White Non-Hispanic	7.1%
Black Non-Hispanic	21.7%
Hispanic/Latinx	17.2%
Other Non-Hispanic	8.8%
Area of Residence	
Inside Metropolitan Area (Principal Cities)	12.7%
Inside Metropolitan Area (Not in Principal Cities)	8.8%
Outside Metropolitan Area (Rural)	11.6%

(USDA, 2021b)

Table 4. Prevalence of Food Insecurity Among Children in the US by Household Characteristics, 2020

Household Characteristic	*Prevalence (%)*
Among Children in a Single Parent Home (Mothers)	14.8%
Among Children in a Single Parent Home (Fathers)	8.4%
Among Children, Black Non-Hispanic Household Head	13%
Among Children, Hispanic Household Head	12.2%
Food Insecurity Among Household with Children	14.8%

(USDA, 2021b, 2021c)

APPENDIX E.5: Cleveland County Clusters – Access to Supermarkets, Access to Vehicles, and Poverty Rates

Figure 2. More than 100 housing units do not have a vehicle and are more than ½ mile from the nearest supermarket, or a significant number or share of residents are more than 20 miles from the nearest supermarket - Cleveland County, 2019

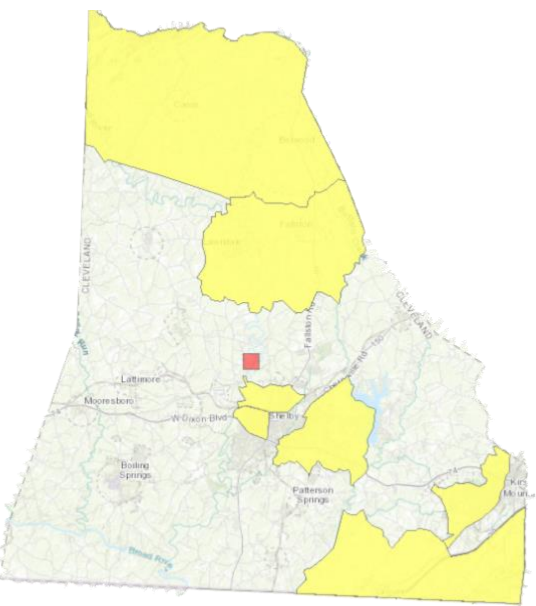


Figure 3. Significant number of residents is more than 1 mile (urban) or 10 miles (rural) from the nearest supermarket - Cleveland County, 2019

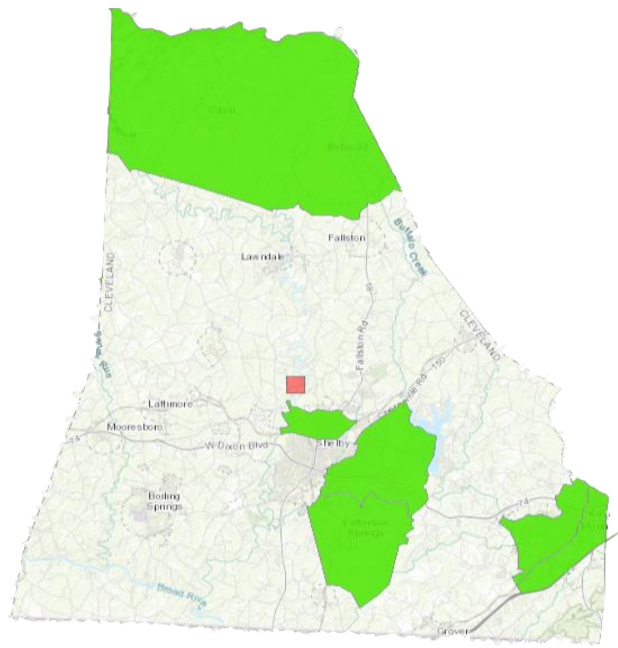


Figure 4. Significant number of residents is more than 1 mile (urban) or 20 miles (rural) from the nearest supermarket - Cleveland County, 2019

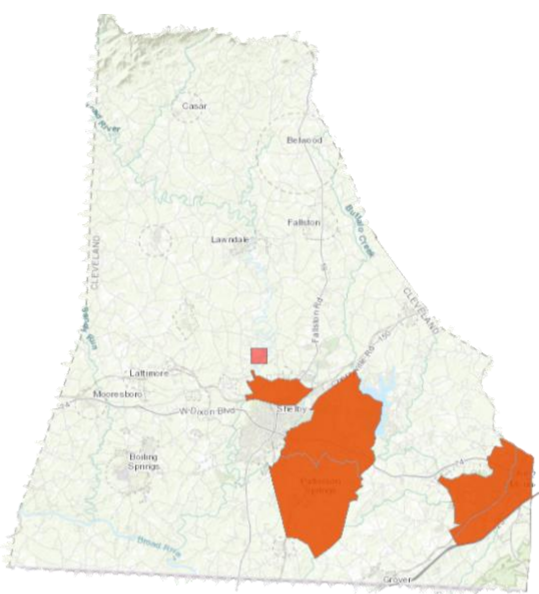


Figure 5. More than 100 households have no access to a vehicle and are more than 1/2 mile from the nearest supermarket, or a significant number or share of residents are more than 20 miles from the nearest supermarket – Cleveland County, 2019

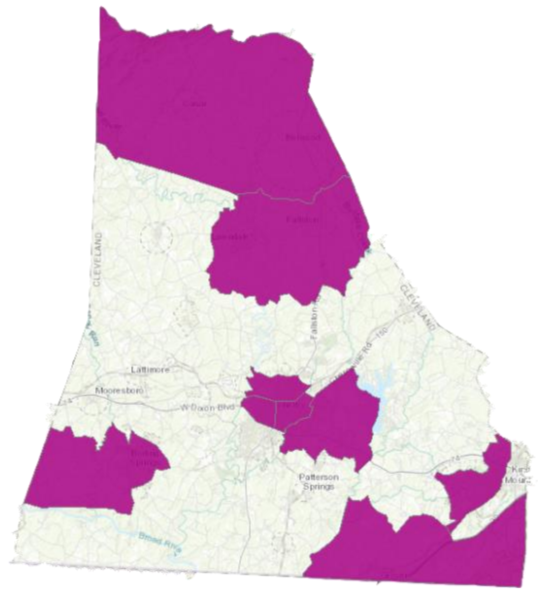
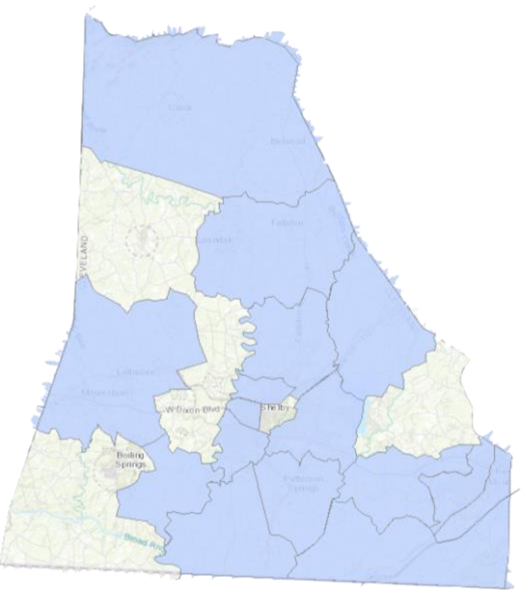


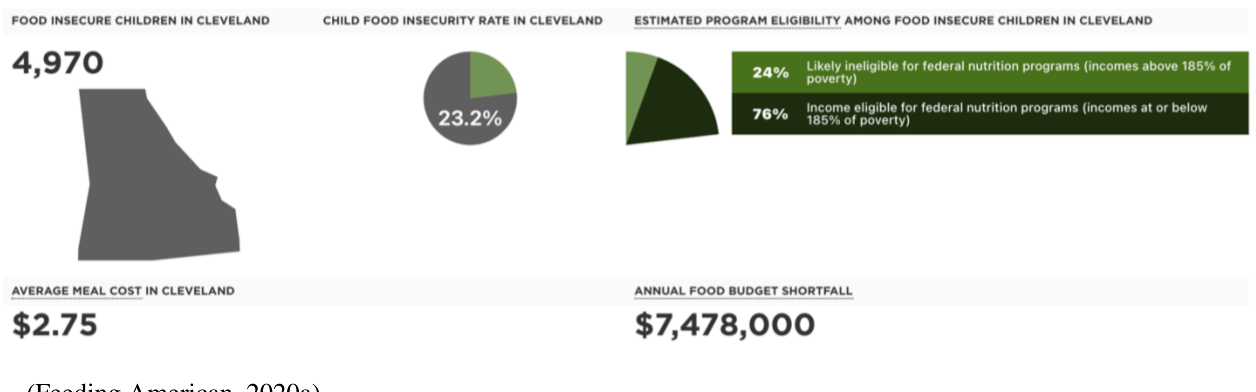
Figure 6. Areas with a poverty rate of 20% or higher, or areas with a median family income less than 80% of median family income for the state or metropolitan area – Cleveland County, 2019



(USDA, 2021a)

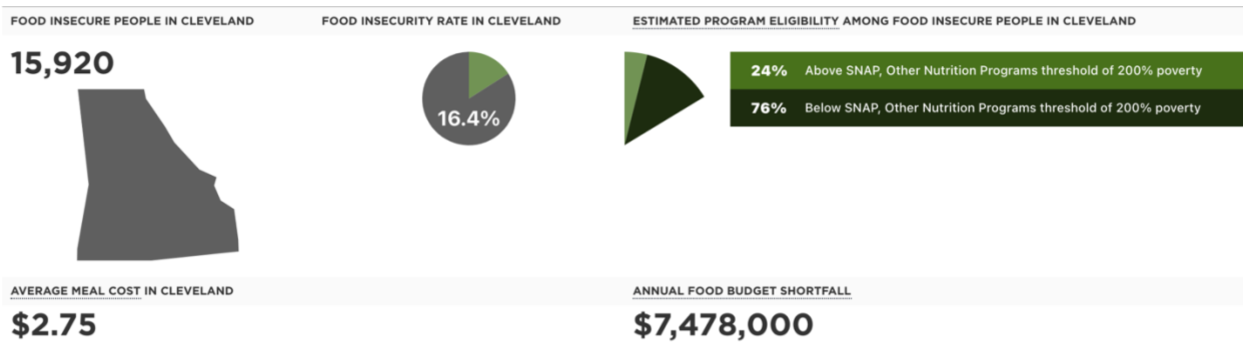
APPENDIX E.6: Food Insecurity and Estimated Program Eligibility

Figure 7. Child County Food Insecurity in North Carolina – Cleveland County, 2019



(Feeding American, 2020a)

Figure 8. Overall County Food Insecurity in North Carolina – Cleveland County, 2019



(Feeding America, 2020b)

APPENDIX E.7: County, State, and National Comparison of Health Indicators Associated with Food Insecurity Among Children

Table 5. Comparison of Health Indicators Associated with Food Insecurity Among Children, 2021

Indicator	Cleveland County	Top U.S. Performers	North Carolina
Food Insecurity	16%	9%	14%
Limited Access to Healthy Foods	7%	2%	7%
Children living in single parent households	45%	20%	35%
Children in Poverty	28%	11%	20%
Children Eligible for Free or Reduced-Price Lunch	69%	32%	56%

(University of Wisconsin Population Health Institute, 2021)

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Policy Analysis: Addressing Food Insecurity in Cleveland County

Background Information

In 2019, 23.2% of children in Cleveland County were food insecure[28] (Feeding America, 2019). Low-income households are at higher risk of food insecurity due to limited or lack of money to buy food (USDHHS, 2020). Additionally, neighborhood conditions may affect access to food (USDHHS, 2020). Neighborhood conditions can affect food insecurity when there is limited access to full-service grocery stores and limited transportation options (USDHHS, 2020). Children's food insecurity is associated with various short and long-term health outcomes, such as asthma, anemia, and behavioral, emotional, and academic problems (Brown et al., 2019). Numerous barriers impact food insecurity, including affordability and geographic availability of healthy food choices (Haskell, 2021). Addressing geographic availability and affordability will be the goal of this policy analysis. To measure geographic availability, the United States Department of Agriculture (USDA) identified low-income[29] areas that had geographic barriers to affordable and healthy foods[30] (Ver Ploeg, Nulph, & Williams, 2011). These areas are called low-income and low access (previously referred to as "food deserts"[31]) (Dutko, Ver Ploeg, & Farriga, 2012; Ver Ploeg et al., 2011). Currently, six locations in Cleveland County are designated "low-income and low-access" (see Appendix E.8, Figure 1) (USDA, 2021).

In 2021, 69% of school-aged children in Cleveland County were eligible for free or reduced-price lunch and breakfast at school (University of Wisconsin Population Health Institute, 2021). To ensure that children still have access to these food services during the summer, Cleveland County offers a summer nutrition program (No Kid Hungry NC, UNC Center for Health Promotion and Disease Prevention, NC Summer Nutrition Programs, & Public Schools of North Carolina, 2019). Despite such efforts, many children face barriers (such as a lack of transportation) in accessing the sites offering these meals across the county, resulting in only 16%[32] of children in Cleveland County using this service (4NCKIDS!, 2021; Bread for the World Institute, 2019; No Kid Hungry NC et al., 2019). This policy analysis examines two options to increase food access for children in Cleveland County: increasing

[28] Inconsistent access to sufficient affordable, healthy, and nutritious food due to a lack of money or other resources.
[29] A poverty rate of 20 percent or greater, or a median family income at or below 80 percent of the statewide or metropolitan area median family income.
[30] At least 500 persons or at least 33 percent of the population live more than 10 miles from a supermarket or large grocery store in rural areas and 1 mile in urban areas.
[31] As of 2013, the USDA stopped using the term "food desert," replacing it with "low-income and low access"
[32] Summer Nutrition Program Participation in Cleveland County, Summer 2021 – 2,492 children in June, 1,232 children in July, and 6,651 children in August.
= 16%

access to summer feeding programs for children and providing financial incentives for grocery stores to operate in low-income and low-access areas.

Policy Options and Evaluation Criteria

Policy Options

Policy Option 1: Meal Express Summer Food Program – Meal-y's on Wheel-y's.

Children receiving free and reduced-price meals throughout the school year have increased food insecurity during the summer months. During the 2018-2019 school year, 73% of students (10,771 children) in Cleveland County received free breakfast and lunch. Unfortunately, during the 2019 summer, the average daily attendance for the summer nutrition programs was 1,124 children (No Kid Hungry NC et al., 2019). Cleveland County should appropriate funds to implement and sustain a Meal Express Summer Food Program (MESFP), proven successful in Maryland, Detroit, Baltimore, Arkansas, Colorado and more (Orovecz et al., 2015; No Kid Hungry, 2014; No Kid Hungry, 2013; No Kid Hungry, 2012). The appropriations will fund the purchase and repurpose of retired school buses and hire drivers to deliver breakfast and lunch to children in Cleveland County during the summer. The MESFP would have three primary goals: (1) decrease childhood food insecurity in Cleveland County, (2) improve access to federally funded summer meal programs, and (3) increase the number of children using this program by 500 children each year.

Policy Option 2: Healthy Food Financing Initiative in Low-Income Low Access Areas.

According to a study conducted in eastern North Carolina, lack of access to and unaffordability of healthy foods are two significant contributors to food insecurity (Lyonnais, Rafferty, Jilcott Pitts, Blanchard, & Kaur, 2020). Healthy Food Financing Initiatives (HFFI) provide financing to healthy food retailers looking to build in new locations or expand their businesses (Policy Link, The Food Trust, & TRF, 2015). Numerous states have implemented HFFIs, including Louisiana, Alabama, Minnesota, Massachusetts, and more using local and state-level policies (The Food Trust, 2012). Healthy food retailers have been associated with increased access to nutritious foods and serve as economic anchors for further commercial revitalization, creating local jobs, and generating tax revenues, in addition to numerous other economic and community development outcomes (The Food Trust, 2012). Using the HFFI model, Cleveland County Commissioners should implement a policy that provides long-term capital for the construction, establishment, renovation, or expansion of healthy food retailers in low-income and low-access areas. The county can provide such capital using low-interest loans, forgivable loans, grants, or recoverable grants.

The HFFI would have three primary goals: (1) expand already existing food retail activities, (2) attract new food retail activities to the county, and (3) facilitate opportunities for low-interest loans to HFFI applicants.

Evaluation Criteria

This analysis uses four evaluation criteria to analyze the different options: costs to the County, impact, equity, and political feasibility. Cost to the County refers to the sum of all expenses for which the county government is responsible for implementing the policy option. Typically, less costly options are more politically feasible. Impact refers to the extent to which the policy option has improved child food insecurity in Cleveland County. Equity refers to the extent to which the policy option reduces disparities in food insecurity among low-income households in Cleveland County. Political feasibility refers to the probability that the policy option will be supported and accepted by stakeholders and politicians at the state and county levels. The Cleveland County Commissioners are all registered with the Cleveland County Republican Party (Cleveland County GOP, 2022). Thus, this criterion examines the extent to which conservative County Commissioners may support these policies.

Policy Analysis

Cost to the County

While both proposed policy options will require financial support at the local level, the Meal Express Summer Food Program would be less costly to the county, and grants can offer supplemental financial support (Carolina Hunger Initiative, 2022; National Institute of Food and Agriculture, 2022; No Kid Hungry NC, 2022). The MESFP will cost the county approximately $74,000 in the first year, combined with an estimated annual cost of $100,000. Additionally, the county should assume a 2% inflation in annual costs. Programmatic costs for the first year include personnel costs, purchase of six buses and associated interior and exterior retrofitting costs, bus maintenance, gas, tag renewal, liability insurance, and miscellaneous expenses. Following annual costs account for personnel, bus maintenance, tag renewal, gas, liability insurance, and miscellaneous expenses. These costs include savings from available grants to fund the program. Comparatively, the HFFI will require an initial investment from the county amounting to approximately $600,000[33] per plot of commercial property in low-income low access areas in Cleveland County. It should be noted that despite the high initial costs, the county will be leasing the land to HFFI healthy food retailers at a deeply discounted rate. Therefore, the county would be making a return on their

[33] Based on the cost of land that is the average size of a Trader Joe's or Aldi franchise store (12,000 – 20,000 SQFT). https://www.loopnet.com/Listing/330-S-Lafayette-St-Shelby-NC/18189555/

investment in the long run. Grants can supplement additional costs for predevelopment, brick and mortar facility development, other hard capital costs, equipment needs, and one-time soft costs (Policy Link et al., 2015). Based on a comparison of both options, while the HFFI has potential for long-term investment and hold more promise for economic sustainability, it is much more costly (Policy Link et al., 2015). Therefore, the MESFP is less costly to the county.

Impact

When comparing the impact of both policy options, the MESFP is more likely to directly result in improved and reliable access to healthy and affordable food options. Specifically, studies have consistently proven that programs like the MESFP can increase summer food program participation and provide children with the nutrition they need during the summer and remote learning days (Sather et al., 2021; Fried, N., 2015). In comparison, studies that have examined the impact of HFFIs in the United States (U.S.) have varied in effect on food insecurity. Some studies have found that the presence of new supermarkets in low-income low access areas has resulted in increased food security, reduced SNAP participation, and a decrease in new diagnoses of high cholesterol and arthritis among residents (Ford & Dzewaltowski, 2008; Larson, Story, & Nelson, 2009; Morland, Diez Roux, & Wing, 2006). Other similar studies indicate that while the presence of healthy food retailers can reduce the price of healthy foods in low-income, low access areas, healthy food remains more costly in these areas when compared to higher-income and higher access areas (The Food Trust, 2012). These high costs may directly impact the availability of income needed to maintain food security among families in low-income, low-access areas. Further limiting available income needed to ensure food security, another study found that the increased presence of healthy food retailers can increase the temptation to overspend on non-essential items (The Food Trust, 2012).

Equity

Children face numerous barriers to reliable access to healthy and nutritious foods, including transportation, affordability, and structural racism (Bread for the World Institute, 2019). Further, children hold little to no power over these barriers given their reliance on their parents or guardians. Of the two policy options, the MESFP is more likely than the HFFI to improve equity by addressing children’s barriers regarding food security. While some HFFI studies indicate that the presence of healthy food retailers is associated with numerous benefits in addressing food insecurity, children still rely on their parents’ or guardians’ overall financial circumstances and food purchasing

behaviors. In comparison, the MESFP delivers healthy and nutritious meals and snacks to children at no cost to the children or their families, eliminating all barriers faced by children.

Political Feasibility

The Cleveland County Commissioners comprises four registered Cleveland County Republicans, meaning that the final policy option should consider these political values. Additionally, the County Commissioners' have five focus areas, including citizen engagement, economic development, public safety, fiscal sustainability, and community wellness (prioritized in this order) (Cleveland County Government, 2021).Given such information, the Healthy Food Financing Initiative in Low-Income Low Access Areas is the more politically feasible option presented in this analysis. Specifically, the HFFI is more likely to address all five County strategic priorities than the MESFP, which will have a limited impact on the county's economic development and fiscal sustainability.

Stakeholders

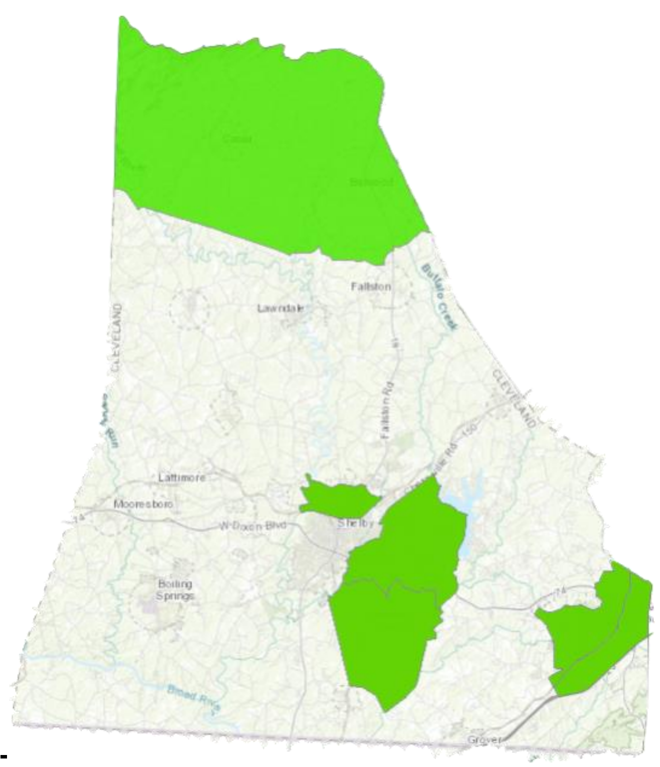
Given the influence stakeholders can have on the success or failure of a policy option, those proposing the final policy option should consider the following stakeholders. For the MESFP, Eat Smart Move More Coalition of Cleveland County will likely support the policy option. At the same time, the Women Conservatives of Cleveland County are likely to oppose the policy option. Regarding the HFFI, the Cleveland County Chamber of Commerce will likely support the policy option, while local grocery stores in Cleveland County are likely to oppose the policy option.

Final Recommendation

Both policy options provide an opportunity for improvement in child food insecurity in Cleveland County. While the Healthy Food Financing Initiative in Low-Income Low Access Areas policy is more likely to be accepted by the Cleveland County Commissioners, the Meal Express Summer Food Program policy is more likely to improve child food security, address barriers to food security among children in Cleveland County and is less costly. Based on such findings, this analysis recommends that the Cleveland County Commissioners appropriate funding to the Munch Express Summer Food Program to address food insecurity among children in their county.

APPENDIX E.8: Low-Income Low Access Areas in Cleveland County

Figure 1. Low-income low access areas in Cleveland County



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LEGEND

Significant number or share of residents are low-income and more than 1 mile (urban) or 10 miles (rural) from the nearest supermarket.

Significant number or share of residents are low-income and more than 1 mile (urban) or 10 miles (rural) from the nearest supermarket AND a significant number or share of residents are low-income and more than 1 mile (urban) and 20 miles (rural) from the nearest supermarket.

(USDA, 2021)

APPENDIX E.9: Policy Option Comparison

Table 1. Policy Option Comparison Chart

Evaluation Criteria	*Policy Option 1: Meal Express Summer Food Program Appropriations*	*Policy Option 2: Healthy Food Financing Initiative in Underserved Areas*
Cost – County	**X**	
Impact	**X**	
Equity	**X**	
Political Feasibility		**X**

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Financial Oversight: Meal Express Summer Food Program Budget

Program Summary

To ensure children in Cleveland County have access to nutritious meals during the summer, the Meal Express Summer Food Program (MESFP) retrofits used school buses into mobile cafeterias, delivering free meals funded by the North Carolina Summer Nutrition Program. The MESFP has two primary goals: (1) decrease childhood food insecurity in Cleveland County and (2) improve access to federally funded summer meal programs. To accomplish its goals, the MESFP retrofits old school buses for meal delivery and provides children with a location to eat lunch in a cafeteria-like environment. Once buses are ready, bus drivers pick up meals from locations participating in the NC Summer Nutrition Program to be delivered to set areas. Meal delivery sites will be selected based on accessibility, either walking or biking.

Budget Narrative

Developing a budget for the proposed program required estimations and assumptions regarding the likely costs and incomes of the program being considered. This budget assumes that the program would start with six retrofitted buses, one for each low-income low access area in Cleveland County. The following personnel will be needed to run the program: one full-time program manager, one part-time program coordinator, six part-time bus drivers, and three part-time volunteers. For this program, part-time assumes 0.25 FTE, accounting for the summer months. Staff costs are assumed to increase by 2% per year, and fringe benefits (including taxes and health insurance benefits) are estimated to cost 30% of annual wages. Training costs are based on 3% of annual salaries.

Another critical assumption is that the program will be able to build a partnership with Feeding Kids Cleveland County and Live Healthy Cleveland County. This partnership will provide the program with volunteers, free coolers, and hot box rentals. If additional coolers and hot boxes are needed, the program can ask local schools to borrow theirs. In addition to building a partnership with Feeding Kids Cleveland County and Live Healthy Cleveland County, the program should create a partnership with local sites participating in the federal summer meals program. These sites will provide the meals for the program to distribute.

Based on the NC Bus Safety website, the average cost of used buses in running condition is $5,000. The website further stipulates that they offer a 25% discount when multiple buses are purchased. Additional direct costs associated with retrofitting the buses for the program are assumed to include exterior wrapping for décor (at $7,000/bus), four tables for the inside of each bus (at $357/table), and $5,000 for miscellaneous purchases such as

incidentals. These non-personnel bus costs are one-time expenses. Finally, indirect and administration costs for the program include bus maintenance (at $1,000/bus/year), DMV costs (at $240/bus/year), gas (at $2,823/bus/year), and liability insurance (at $1,500/bus/year). Given recent economic inflation, an inflation rate of 2% has been included for all recurring expenses.

To minimize the cost to the county, the program will apply for the following three grants with the hope of securing the associated amount of funds: the Carolina Hunger Initiative Grants for School Districts (at $25,000), the Community Food Projects Competitive Grant (at $100,000), and the SNF Equipment Grant for the purchase of school buses and associated equipment (at $70,000).

Request to the County

To implement the Meal Express Summer Food Program and successfully decrease childhood food insecurity and improve access to federally funded summer meal programs in Cleveland County, $88,190 is being requested for year one, $115,075 for year two, and 119,377 for year three.

Budget

When considering all the expenses described above, it would cost the Cleveland County Commissioners a total of $322,641.07 to implement the Meal Express Summer Food Program in Cleveland County. See Appendix E.10, Tables 1 and 2 for a three year, below the line program budget.

APPENDIX E.10: MEAL-Y'S ON WHEEL-Y'S BUDGET

Table 1. Program Staffing Plan - FTE

Position	FTE	Rate	Salary	Fringe Benefits	Total
Program Manager	1	$ 55,000.00	$ 55,000.00	$ 16,500.00	$ 71,500.00
Program Coordinator	0.5	$ 45,000.00	$ 22,500.00	$ 6,750.00	$ 29,250.00
Bus Driver 1	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 11,375.00
Bus Driver 2	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 11,375.00
Bus Driver 3	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 11,375.00
Bus Driver 4	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 11,375.00
Bus Driver 5	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 11,375.00
Bus Driver 6	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 11,375.00
Volunteer 1	0.25	$ -	$ -	$ -	$ -
Volunteer 2	0.25	$ -	$ -	$ -	$ -
Volunteer 3	0.25	$ -	$ -	$ -	$ -
Total Income	3.75		$ 130,000.00	$ 39,000.00	$ 169,000.00

Table 2. Full Cost Below the Line Three Year Program Budget

Lunch Express Summer Food Program	Year 1	Year 2	Year 3	All Years
Direct Costs				
Personnel				
Salaries	$ 130,000.00	$ 132,600.00	$ 135,252.00	$ 397,852.00
Training	$ 3,900.00	$ 3,978.00	$ 4,057.56	$ 11,935.56
Benefits	$ 39,000.00	$ 40,575.60	$ 41,387.11	$ 120,962.71
Total Personnel	$ 172,900.00	$ 177,153.60	$ 180,696.67	$ 530,750.27
Non-Personnel				
Retrofitted Bus	$ 22,500.00	$ -	$ -	$ 22,500.00
Exterior	$ 42,000.00	$ -	$ -	$ 42,000.00
Tables	$ 8,568.00	$ -	$ -	$ 8,568.00
Coolers	$ -	$ -	$ -	$ -
Hot boxes	$ -	$ -	$ -	$ -
Meals	$ -	$ -	$ -	$ -
Miscellaneous	$ 5,000.00	$ 5,100.00	$ 5,202.00	$ 15,302.00
Total Non-Personnel	$ 78,068.00	$ 5,100.00	$ 5,202.00	$ 88,370.00
Total Direct Costs	**$ 250,968.00**	**$ 182,253.60**	**$ 185,898.67**	**$ 619,120.27**
Indirect & Admin				
Bus Maintenance	$ 6,000.00	$ 6,120.00	$ 6,242.40	$ 18,362.40
Registration Fees	$ 43.25	$ -	$ -	$ 43.25
Tag Renewal	$ 240.00	$ 244.80	$ 249.70	$ 734.50
Gas	$ 16,938.00	$ 17,276.76	$ 17,622.30	$ 51,837.06
Liability Insurance	$ 9,000.00	$ 9,180.00	$ 9,363.60	$ 27,543.60
Indirect & AdminTotal	**$ 32,221.25**	**$ 32,821.56**	**$ 33,477.99**	**$ 98,520.80**
Total Expenses	**$ 283,189.25**	**$ 215,075.16**	**$ 219,376.66**	**$ 717,641.07**
Income				
Carolina Hunger Initiative Grants for School Districts	$ 25,000.00			$ 25,000.00
Community Food Projects Competitive Grant Program	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 300,000.00
SNF Equipment Grant	$ 70,000.00			$ 70,000.00
Total	$ 195,000.00	$ 100,000.00	$ 100,000.00	$ 395,000.00
Balance				
	$ (88,189.25)	$ (115,075.16)	$ (119,376.66)	$ (322,641.07)

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Presentation Slides and Script

Meal-y's on Wheel-y's
A Meal Express Summer Food Program

Policy Overview

Use of retrofitted school buses to deliver breakfast and lunch to children in Cleveland County during the summer in low-income and low access areas.

Policy Goals

(1) Decrease childhood food insecurity in Cleveland County.
(2) Improve access to federally funded summer meal programs.
(3) Increase the number of children accessing this program by 500 children each year.

No Kid Hungry, n.d.

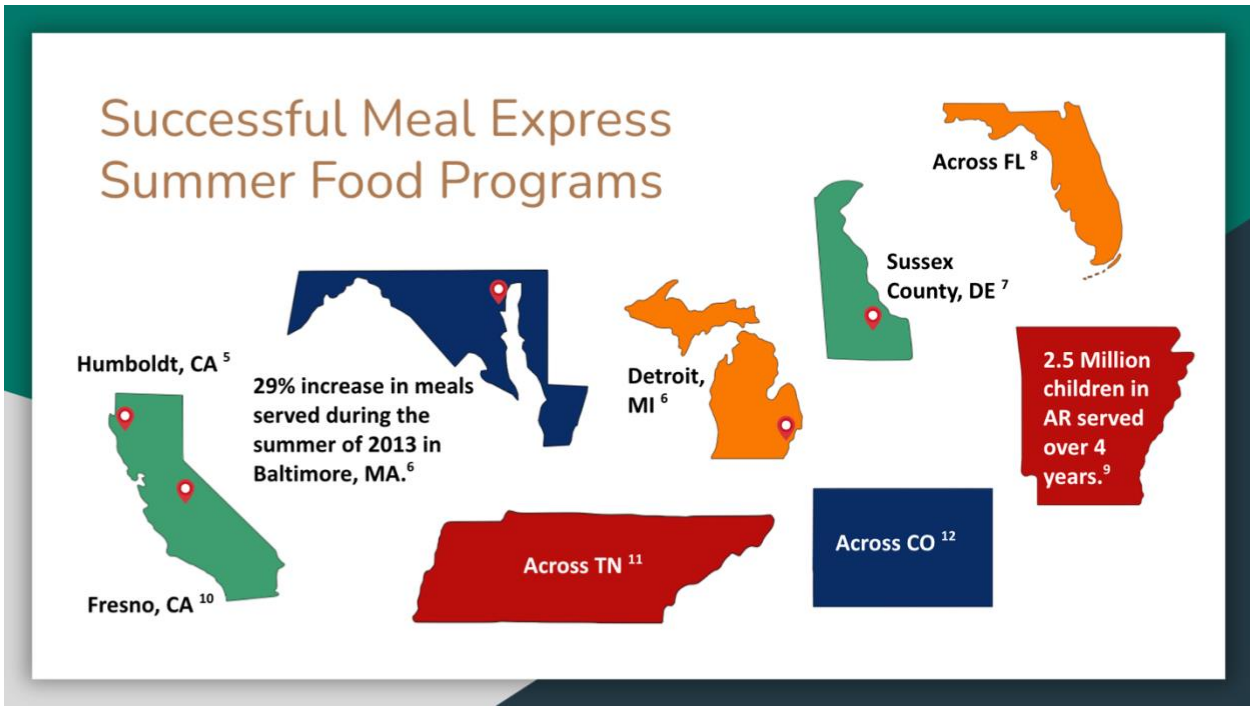
Children receiving free or reduced-price meals throughout the school year are at increased risk of food insecurity during the summer months, due to decreased access to these resources.

Access to these programs is especially limited in designated low-income low access areas.

To ensure that children in Cleveland County have access to these effective resources, the County should appropriate funds to implement and sustain a Meal Express Summer Food Program, or as we have named it, Meal-y's on Wheel-y's.

The program would use retrofitted school buses to deliver breakfast and lunch to children living in low-income low access areas across Cleveland County during the summer, when school is no longer in session.

Meal-y's on Wheel-y's would have three primary goals: (1) decrease childhood food insecurity in, (2) improve access to federally funded summer meal programs, and (3) increase the number of children accessing this program by 500 children each year.



Similar Meal Express Summer Food Programs have been implemented and successful in increasing access to summer meal programs across the United States.

Some of the more notable success stories include:

Baltimore, who achieved a 29% increase in the number of summer meals served during the summer of 2013.

And Arkansas, who increased the number of children receiving summer meals by 2.5 million children over 4 years.

APPENDIX F: JESSICA KUHN

Problem Statement: Childhood Food Insecurity in Cleveland County, NC

Social Determinant of Health (SDoH)

Social determinants of health (SDoH) are "conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes" (CDC, n.d.). Addressing SDoH not only improves population health but is a way to address health disparities and inequities (Artiga & Hinton, n.d.). Healthy People 2030 differentiates five essential groups of SDoH, one of which is social and community context. Within this domain, the goal of Healthy People 2030 is to increase the support that individuals receive from their social groups and surrounding community (U.S. Department of Health and Human Services, n.d.). An individual's social and community context[34] is a key driver for overall health and wellbeing. Social and community context is more likely to impact health than individual health behaviors (MDHHS State Innovation Model, n.d.). Social factors can also play an antecedent role in unduly influencing an individual's health behaviors (Artiga & Hinton, n.d.).

Within the social and community context, Healthy People 2030 identifies the *elimination of very low food security in children* as a key priority (USDHHS n.d.). Food insecurity[35] (FI) is described as ranging from low food security to very low food security. While low food security consists of "reduced quality, variety or desirability of diet," very low food security consists of "multiple indications of disrupted eating patterns and reduced food intake" (USDA Economic Research Service, 2021). In 2020, an estimated 6.1 million children lived in food-insecure households, and 584,000 children lived in households experiencing *very low* food security in the United States (USDA Economic Research Service, 2021). Many factors beyond the individual, particularly regarding the social and community context, often contribute to FI. Higashi et al. (2017) explain the importance of understanding the family and social context of individuals presenting with FI and underscore the impact of social and community stressors. Carter et al. (2012), who studied the relationship between social environmental factors and FI in children, found increased odds of FI in neighborhoods with low social cohesion – exhibited by lack of trust and support

[34]Barnett & Casper define the social environment as: "the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. Components of the social environment include built infrastructure; industrial and occupational structure; labor markets; social and economic processes; wealth; social, human, and health services; power relations; government; race relations; social inequality; cultural practices; the arts; religious institutions and practices; and beliefs about place and community"(Barnett & Casper, 2001).

[35]The United States Department of Agriculture (USDA), defines food insecurity as: "the limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways" (USDA Economic Research Service, 2021).

among neighbors – and social deprivation – exhibited by limited social networks and communication outside the household.

FI has been shown to impact the physical and emotional health of children at all stages of life. For example, infants born into food insecure households are more likely to experience birth complications or defects and low birth weight (American Academy of Pediatrics, 2021). Food insecure children have been shown to exhibit poorer academic performance in school and have an increased risk for developing mental illness or substance use disorder upon adolescence (American Academy of Pediatrics, 2021; Bottino et al., 2017). Physically, FI can lead to nutritional deficiencies, stunted growth, inappropriate feeding practices, and dental caries (Bottino et al., 2017; Oregon State University, 2021). Paradoxically, there are also associations between household FI and obesity in children, particularly among those children aged 10-15 years old (Au et al., 2019). Children living in food insecure households are more likely to miss scheduled doctor's appointments, underutilize routine primary care services, and fail to receive the recommended number of well-child visits (Bottino et al., 2017; Children's Hospital of Philadelphia, PolicyLab, n.d.). However, they are at higher odds for emergency room visits and primary care treatment visits (Peltz & Garg, 2019).

Geographic and Historical Context

Cleveland County is a rural county located in the southwestern part of North Carolina (NC) with a population of 97,645 (Cleveland County Public Health Center, 2020). The main industry for the county was agriculture until the 1960s, when there was a major shift towards manufacturing and distribution. With no publicly funded transportation system and less farm land, a majority of residents are served by corner stores and low cost retailers such as Dollar General or Family Dollar, which often do not stock healthy food choices (Cleveland County Public Health Center, 2020). Residents have a lower median household compared to both NC and the US national average (see Table 1). Approximately 11 percent of residents have a reported household income below $10,000 (Cleveland County Public Health Center, 2020). Over 30 percent of children under the age of 18 are living in poverty[36] compared to national and state averages (see Table 2). An overwhelming majority of these children identify as Black or Hispanic, despite representing less than a quarter of the total population in Cleveland County (see Table 3) (University of Wisconsin Population Health Institute, n.d.).

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[36]Children in poverty is defined as the percentage of people under the age of 18 living in a household whose income is below the poverty level. For more information see: https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html

Regarding community assets, seven hot lunch programs and 16 food pantries are located within Cleveland County (Live Healthy Cleveland County, 2018). Most of these programs are located in or around Shelby, which is also the county's largest city. There is also a local food program, Feeding Kids Cleveland County, that provides meals to children over the weekend and during school breaks (Feeding Kids Cleveland County, n.d.). In March of 2016, the county completed a new Public Health Center and Behavioral Health facility to improve accessibility to social service programs for residents. The county also holds the Satellite Foothills Farmers' Market at the Cleveland Public Health Center in the summer, where residents have the opportunity to purchase fresh food from local vendors (Cleveland County Public Health Center, 2020). The federal Department of Justice identified the 28150-zip code to receive a "Weed and Seed" grant, which has been noted to include "two high-risk, low-income neighborhoods." This subsequently led to several faith communities settling in the area and offering food pantries and youth programs for the community (Cleveland County Public Health Center, 2020). Unfortunately, Cleveland County has less local food outlets and more residents without access to a large grocery store when compared to both state and national averages (U.S. News, n.d.).

Priority Population

Both international and domestic law recognizes, in most cases, that a child is a person under the age of 18 (Children's Bureau, n.d.; UNICEF, n.d.). According to the 2019 Cleveland County Community Health Assessment (CHA), 5.5 percent of Cleveland County residents are below the age of 5 and 19.3 percent are between the ages of 5-17. FI among children can be particularly devastating, given this age group's vulnerability and the long-term consequences of food insecurity on health and quality of life (Haven, 2017). There are clear associations between FI in childhood and the development of adult diseases such as diabetes, hyperlipidemia, and cardiovascular disease (American Academy of Pediatrics, 2021). A study done by NC Child in 2018 found that approximately six out of every 10 children in Cleveland County live in households struggling with hunger or poverty (George, 2020). Households with children are more likely to experience food insecurity than those without (Gundersen & Ziliak, 2015). Further, rates of FI are also higher in households with children that are headed by a single parent or caregiver, and in Cleveland County 37 percent of children live in such households (Ashbrook et al., 2021; Cleveland County Public Health Center, 2020).

Measures of Problem Scope

Overall, NC ranks tenth highest in its rate of FI compared to the rest of the United States (Kennedy, 2021). In Cleveland County, the food insecurity rate is higher than the NC average for both the general population and among children under the age of 18 (see Table 4). Cleveland County also fares worse in comparison to many neighboring counties in the state (see Figure 1). According to Feeding America (n.d.), almost 5,000 children in Cleveland County are food insecure. Over half of students in grades K-12 participated in the free and reduced lunch program in the 2018-2019 school year (Cleveland County Public Health Center, 2020). FI is known to be a contributory factor in many of the poor health outcomes we see in Cleveland County, including babies born with low birth weight, obesity, poor mental health, and the development of conditions such as heart disease and diabetes (Gundersen & Ziliak, 2015; U.S. News, n.d.).

Rationale/Importance

Cleveland County is ranked one of the least healthy counties in NC regarding health outcomes, and among the bottom half of counties regarding health factors (University of Wisconsin Population Health Institute, n.d.). Many of the county's reported health challenges align with the effects of FI (see Tables 5 and 6). FI is not the only cause of these conditions, however, improving FI may lessen the burden of these negative health outcomes (Cavaliere et al., 2021; Office of Disease Prevention and Health Promotion, n.d.). Research shows that unemployment and poverty are associated with higher rates of FI, and rural areas experience "deeper levels" of FI compared to their urban counterparts (American Academy of Pediatrics, 2021; Piontak & Schulman, 2014).

Disciplinary Critique

Addressing FI in childhood is one way to improve a multitude of health outcomes for both current children and future adults (Hall et al., 2020; Tester et al., 2020). This issue disproportionately impacts racial and ethnic minorities, as well as households with incomes under the Federal Poverty Level (FPL) (see Figure 2). It is not a novel idea to address FI through policy. Currently, federal and state nutrition programs exist to provide temporary assistance to families – such as the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). However, an increasing number of families have been forced to rely on these programs for many years at a time (Runkle & Nelson, 2021). Eligibility requirements for these programs also exclude a subset of the population due to citizenship requirements of income thresholds. For example, 24% of food insecure children in Cleveland County live in households with incomes above

185% FPL, making them likely ineligible for many nutrition programs (Feeding America, n.d.). Cleveland County ranked access to healthy food as a top ten priority in their CHA. Health policy professionals can advocate for the development of evidence-based policies that will address the up-stream determinants that impact food insecurity and provide support for children and their families.

APPENDIX F.1: Median Household Income

Table 1. 2019 Median Household Income in USD

Cleveland County, North Carolina	North Carolina (average)	United States (average)
$46,000	$57,400	$68,703

(Cleveland County Public Health Center, 2020; Semega et al., 2020)

APPENDIX F.2: Children Living in Poverty

Table 2. Percentage of Children Under the Age of 18 Living in Poverty in 2019

Cleveland County, North Carolina	North Carolina (average)	United States (average)	Top U.S. Performer
31%	19%	14%	10%

(Thomas & Fry, 2020; University of Wisconsin Population Health Institute, n.d.)

APPENDIX F.3: Disparities in Childhood Poverty by Race/Ethnicity in Cleveland County

Table 3. Percentage of Children Living in Poverty, Stratified by Race/Ethnicity, Compared to the Demographic Make-Up of Cleveland County

Race/Ethnicity	**Population in Cleveland County** (% of total population in Cleveland County)	**Children in Poverty** (% of total children living in poverty in Cleveland County)
White/Caucasian	72.8%	22%
African American/Black	20.6%	47%
Hispanic	3.8%	41%
Asian	1.1%	6%

(University of Wisconsin Population Health Institute, n.d.)

APPENDIX F.4: Measure of Adequate Access to Food Resources

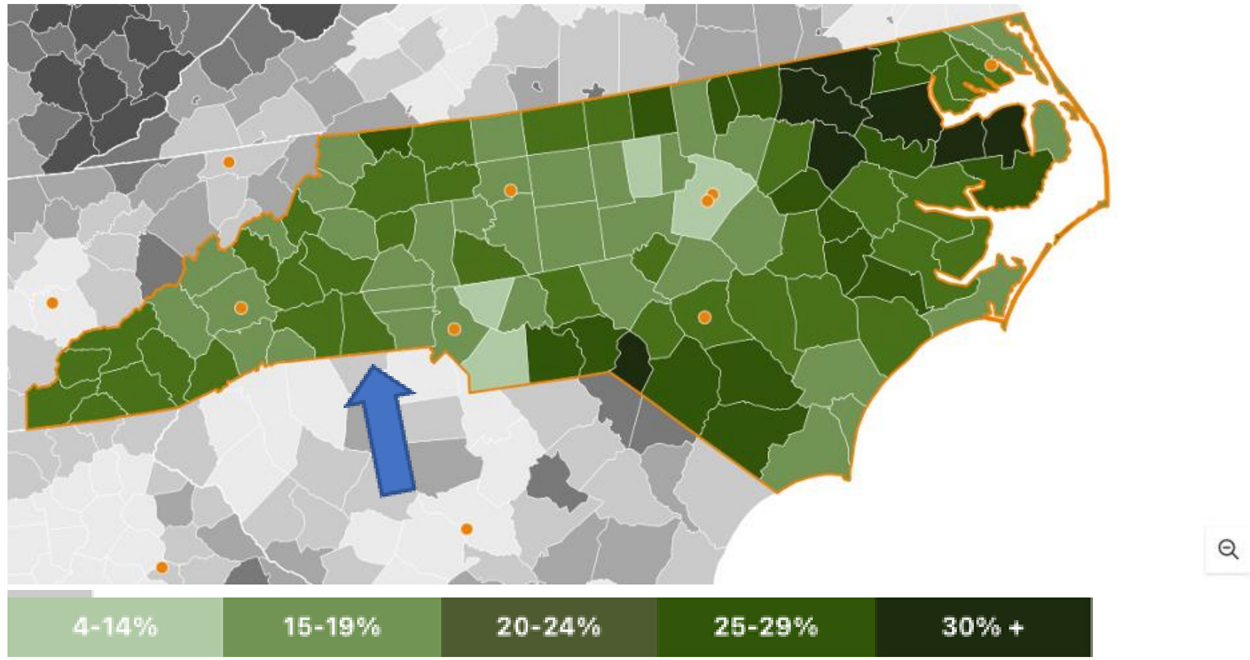
Table 4. Percentage of Children and the Overall Population that Lack Adequate Access to Food in Cleveland County and North Carolina (Average)

Population	**Cleveland County, North Carolina**	**North Carolina** (average)
Overall	16.4%	13.5%
Children (> age 18)	23.2%	18.3%

(Feeding America, n.d.).

APPENDIX F.5: Childhood Food Insecurity Rates Across North Carolina

Figure 1. Rate of Childhood Food Insecurity in North Carolina, with Emphasis on Cleveland County



(Feeding America, n.d.).

APPENDIX F.6: Comparison of Deaths Attributed to Heart Disease and Diabetes Mellitus

Table 5. Deaths Attributed to Heart Disease and Diabetes Mellitus in Cleveland County Compared to North Carolina

	Cleveland County, NC			North Carolina (State Average)		
Condition	**Number of Deaths**	**Rate** (per 100,000)	**Rank Among Leading Causes of Death**	**Number of Deaths**	**Rate** (per 100,000)	**Rank Among Leading Causes of Death**
Heart Disease	1,264	260	#1	97,303	181.9	#2
Diabetes Mellitus	240	49.4	#7	14,170	27.9	#7

(Cleveland County Public Health Center, 2019).

APPENDIX F.7: Comparison of Health Outcomes Related to Food Insecurity

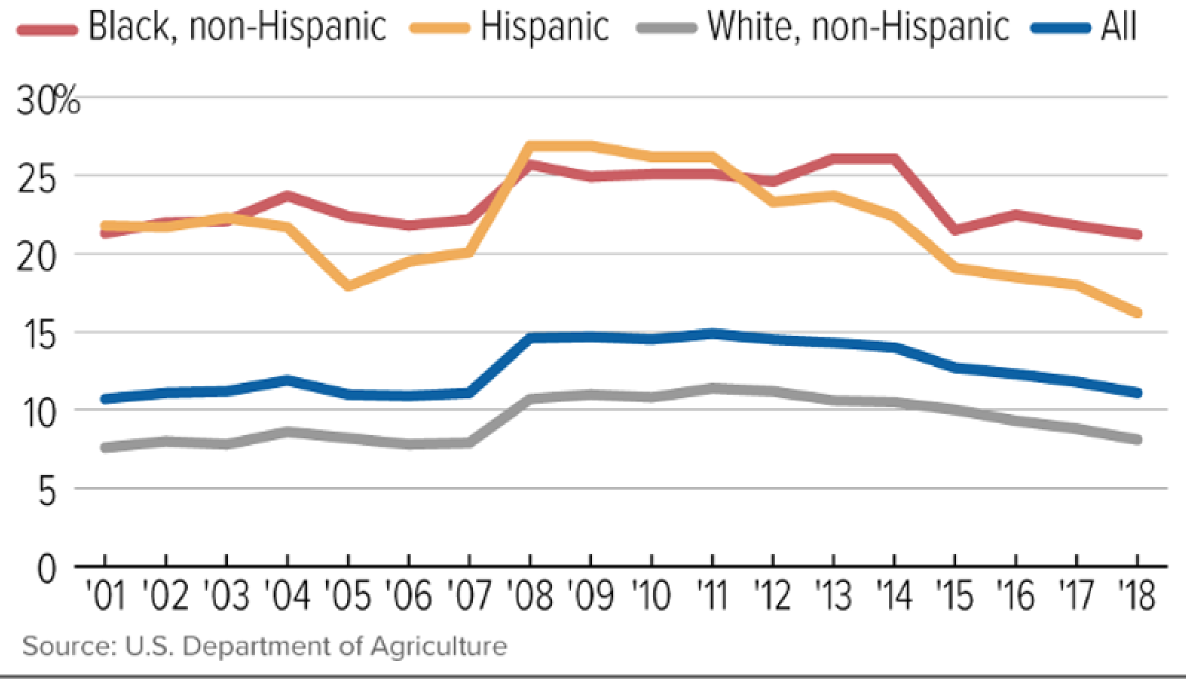
Table 6. Comparison of Various Health Outcomes that May be Related to Food Insecurity Between Cleveland County, North Carolina, and the United States Top Performer for Reference

Outcome Measured	Cleveland County	North Carolina	Top U.S. Performer
Poor mental health days in the year (number of days)	5.0 days	4.1 days	3.1 days
Obesity (percent)	37%	32%	26%
High school completion (percent)	84%	88%	94%
Suicides (raw number)	16	13	11

(University of Wisconsin Population Health Institute, n.d.).

APPENDIX F.8: National Disparities in Food Insecurity by Race and Ethnicity

Figure 2. Percentage of Households that Lacked Access to Adequate Food at Some Point in the Year, by Race and Ethnicity, 2001-2018.



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Policy Analysis: Addressing Childhood Food Insecurity in Cleveland County, NC

Background Information

Food insecurity (FI) impacts nearly 5,000 children under the age of 18 in Cleveland County, North Carolina (NC) (Feeding America, n.d.). This rate (23.2 percent) is almost five percentage points higher than the average FI rate in NC (18.3 percent) (Feeding America, n.d.). Research shows that racial and ethnic minorities, particularly Black and Hispanic/Latinx individuals, experience higher levels of FI (American Academy of Pediatrics, 2021). Food resources exist in the community, such as hot lunch programs and food pantries (Live Healthy Cleveland County, 2018). However, families may not take advantage of these resources due to their unreliability, fear of stigma, lack of information, or difficulty with access (Cooksey Stowers et al., 2020; Fong et al., 2016; Ginsburg et al., 2019). For example, about one in six individuals across the United States that were eligible for the Supplemental Nutrition Assistance Program (SNAP) did not participate in the benefits in fiscal year 2019 (Foster et al., 2021). Similarly, benefits from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are underutilized. In NC, the coverage rate for those eligible for WIC services was only 56.6 percent in 2018 (Farson Gray et al., 2021).

Other resources may be inadequate to meet family needs or are only available at certain times. For example, half of students in grades K-12 participated in the free and reduced lunch program in the 2018-2019 school year (Cleveland County Public Health Center, 2020). However, this program becomes obsolete during summer break or holiday vacations. Further 24 percent of food insecure children in Cleveland County live in households with incomes above 185 percent FPL, making them likely ineligible for many nutrition programs (Feeding America, n.d.). These gaps in assistance underscore the need for policy intervention that will improve food security status among the children in Cleveland County, NC.

This paper analyzes two policy options to address food insecurity among children in Cleveland County. The first is appropriating funds for the recruitment of community health workers in the Cleveland County Department of Social Services. The second is appropriating funds to support the "Weekend Backpacks" program administered by the local nonprofit, Feeding Kids Cleveland County (FKCC).

Policy Option 1: Funding for the Recruitment of Community Health Workers in Social Services

Community health workers (CHWs) are "lay members of communities who work either for pay or as volunteers in association with the local health care system in both urban and rural environments and usually share

ethnicity, language, socioeconomic status and life experiences with the community members they serve" (U.S. Department of Health and Human Services et al., 2007). CHWs influence FI by assisting community members in navigating and understanding the health and social service system (National Heart, Lung, and Blood Institute, 2014) They are "vital to linking underserved populations to health and social service systems" (Spencer et al., 2010). CHWs can assist with connection to local resources, such as federal nutrition programs (e.g., WIC or SNAP) or community safety net programs (e.g., food pantry or hot meal programs).

Current data on the number of CHWs is limited because of the diverse roles or titles of CHWs, a historical lack of standardization in certification, licensure, trainings, or qualifications across the United States, a high proportion of volunteers, and frequent staff turnover (The National Center for Health Workforce Analysis, n.d.). However, according to the Bureau of Labor Statistics, an estimated 58,670 CHWs are employed nationally and 910 in NC, with *Community Food and Housing and Other Relief Services* employing the largest concentration of CHWs (U.S. Bureau of Labor Statistics, 2021a). The Piedmont North Carolina nonmetropolitan area, which includes Cleveland County alongside 12 other NC counties, has no estimate for the number of CHWs; however, this area does have an estimated 3,850 Community and Social Service Occupations in general (U.S. Bureau of Labor Statistics, 2021b).

CHWs are often employed with a high school diploma and on the job training, making them a feasible option for bolstering the health workforce (Social Work Degree Guide, n.d.). Leveraging the assets that already exist in Cleveland County, CHWs could be employed at the Cleveland County Department of Social Services, located in Shelby NC. This would allow them to work alongside the current social workers, who are ideal to provide supervision and support for CHWs and can help them adjust into the existing workflows (Schulman & Thomas-Henkel, 2017; Spencer et al., 2010). Nationwide, there is a shortage of social workers to meet increasing demands for services, particularly in rural areas (Lin et al., 2016; QIC WD, 2020; The Realtime Report, 2020). CHWs, who have historically advocated for social justice, can play a unique role in filling this gap, addressing FI, and increasing overall social support for community members (Briskin, 2021; Pérez & Martinez, 2008).

Addressing FI is more complex than eliminating food deserts – it is crucial to address other social determinants of health (SDoH) in order to improve accessibility (George & Tomer, 2021). CHWs may be able to address the commonly reported barriers to receiving SNAP, which include a lack of information about the program or eligibility requirements, concerns with the application process, administrative issues, and immigration concerns

(Bailey et al., 2011). CHWs may also be able to address the commonly reported logistical barriers to food pantry assistance (e.g., long lines, low food quality) and support families in overcoming the cultural understandings and perceptions of self-sufficiency, morality, and respect that is attributed to non-food pantry use (Fong et al., 2016).

Policy Option 2: Funding for "Weekend Backpacks" Administered by Feeding Kids Cleveland County

Feeding Kids Cleveland County (FKCC) is a local food program that provides meals to children over the weekend via a backpack program and over school breaks and summer breaks via large food box deliveries (Feeding Kids Cleveland County, n.d.) These programs rely on food donations and volunteers for operation. During the 2020-2021 school year, 60 kids received backpacks each weekend and over 850 children received monthly food box deliveries to their home (Feeding Kids Cleveland County, n.d.).

Currently, FKCC operates solely based on donations and volunteer staff members (Feeding Kids Cleveland County, n.d.). In 2020, over 500 local volunteers helped to administer the program (Feeding Kids Cleveland County, n.d.). Over the last few years, the program has reported having difficulty procuring enough donations to serve the number of kids in the area (Orlando, 2018). In its current workflow, school social workers identify children that may be eligible for the Weekend Backpacks and report out to the program administrators. Backpack food programs are not unique to FKCC, as many other organizations use food backpacks to provide families with free groceries for weekends and school breaks (Feeding America, n.d.). One study suggests that weekend backpack programs show improvements in student's math and reading scores (Kurtz et al., 2020). Another study reports improvements in school attendance (Fiese et al., 2020). In addition to Weekend Backpacks, FKCC is unique in offering Home Deliveries over school and summer breaks, delivering larger food boxes directly to students' homes (Feeding Kids Cleveland County, n.d.). Appropriating funds to FKCC would allow them to hire a staff of dedicated and reliable full-time employees and ensure that the program has an adequate supply of food to meet the needs of the community.

Assessment Criteria and Evaluation

Each of these policies were evaluated based on four assessment criteria: (1) costs to Cleveland County, (2) impact on childhood FI, (3) political feasibility, and (4) equity. Below is a comparison of each policy based on the assessment criteria. A more detailed analysis of each policy can be found in Table 1 and Table 2 below.

Criterion One: Costs

Cost refers to the monetary costs incurred by Cleveland County in the form of procuring funding, purchasing resources, upgrading infrastructure, or supporting new staff salaries. Funding for the recruitment of CHWs is likely to cost less than funding the FKCC Weekend Backpack program. Based on the rate of CHW employment in North Carolina and the annual mean wage for a CHW, salary alone would likely cost the county approximately $817,400 each year (U.S. Bureau of Labor Statistics, 2021a). However, based on the number of food insecure children in Cleveland County and the average cost of weekend backpacks, the annual cost of this program could easily exceed $1.5 million (Food for Free, 2019).

Criterion Two: Impact on Childhood Food Insecurity

Policy impact is evaluated based on the potential number of children that would garner access to food resources which would, overtime, improve food security status for children under the age of 18 in the community. Funding for FKCC's Weekend Backpack program is likely to have a more targeted impact on childhood FI. The narrow scope of this program directly services those children experiencing FI in Cleveland County by providing them with nutritious food that will have a more immediate and concentrated impact. Funding CHWs may indirectly and more marginally reduce FI through case management and connecting families to long-term resources. However, this may not have as much of an immediate impact on childhood FI.

Criterion Three: Political Feasibility

Political feasibility refers to general support by the Cleveland County Commissioners as well as other relevant stakeholders and political actors. Given that CHWs can help connect clients with health resources, large health care organizations (such as Atrium Health) are likely to wield their strong political power to support this policy. Further, funding the recruitment of CHWs would create jobs in the community. While the Women Republicans of Cleveland County are traditionally against safety net programs, which CHWs may promote, employing CHWs does not directly antagonize the conservative ideology and therefore is likely to wane only low to moderate opposition (Myers, n.d.). More controversial, however, and less politically feasible would be funding the FKCC Weekend Backpack program. The Women Republicans of Cleveland County would be more likely to oppose a direct food assistance program, as they have historically opposed increases in benefits such as WIC or SNAP (Myers, n.d.). That is not to say that this program would have no political support. Given that these programs have

been shown to increase school attendance and improve school performance, Cleveland County Schools would likely support this initiative (Kurtz et al., 2020; Fiese et al., 2020).

Criterion Four: Equity

Finally, equity refers to the development of the policy in a way that provides additional resources and supports to those populations that have been historically marginalized and disadvantaged – with a particular focus on racial/ethnic minorities. CHWs often come from the communities that they serve, sharing identities, geography, and/or experiences with their clients (Minnesota Community Health Worker Alliance, n.d.). This specialized knowledge allows them to play a unique role in reducing health disparities and improving access to food resources for racial/ethnic minorities (NC Department of Health and Human Services, 2018). Funding for the recruitment of CHWs supports advancements in equity more than the FKCC Weekend Backpack program, which does not address racial/ethnic disparities. Further, the Weekend Backpack program may not reach underserved individuals, particularly those that may be experiencing other SDoH's that impede them from taking advantage of the program or whose children are not enrolled in school.

Final Recommendation

Summary policy evaluation matrix, with the "✓" marking the better outcome for that category.

Criterion	**Funding for the Recruitment of CHWs in Social Services**	**Appropriate funds to support Feeding Kids Cleveland County**
Costs to Cleveland County	✓	
Impact		✓
Political feasibility	✓	
Equity	✓	
Total Score	**3**	**1**

Based on the above evaluation, I recommend funding for the recruitment of CHWs in Social Services. Compared to the alternative, this policy is less expensive for Cleveland County, has greater political feasibility, and supports equity as it will address racial/ethnic disparities in food access. The following measures will be used to assess policy effectiveness after implementation:

- Process Measure: Percent of children/families referred to a CHW in Cleveland County
- Outcome Measure: Reported food security status

Increasing the presence of CHWs in Cleveland County will foster connections to existing food resources for children and their families that will hopefully lead to more long-term, sustainable change in food security status. Seeing as FI is a multi-faceted issue, CHWs can also assist in addressing other SDoH that influence food security status such as unaffordable housing or unemployment (Staren, 2020).

APPENDIX F.9: Evaluation of Funding for the Recruitment of Community Health Workers in Social Services.

Table 1. Evaluation of Community Health Workers Policy Option

Costs to Cleveland County ✕	Weekend backpacks range between $2.00-6.00 per bag (Food for Free, 2019). With 5,000 food insecure children in Cleveland County, this could easily cost $1.5 million/year, using a generous estimate that assumes backpacks are given every weekend. Full-time staff members will also be required to carry out the program alongside existing volunteers.
Impact ✓	A more targeted intervention to address childhood food insecurity as this program provides the student directly with nutritious food. Assuming the program is funded to provide weekend backpacks for all food insecure children in Cleveland County (see above), this program would have an immediate impact on reducing FI for the target population.
Political Feasibility ✕	Supporting Stakeholders: Cleveland County Schools – programs keep students full and healthy outside traditional school hours, which would improve attendance rates. Programs have also been shown to improve school performance. Would likely work on this issue and yield a considerable amount of power at the county level. Opposing Stakeholders: Women Republicans of Cleveland County – historically against food assistance programs. Likely to get involved as they will not support funding this program and they have moderate power.
Equity ✕	This program does not address racial/ethnic disparities. It may not reach all underserved individuals, particularly those that may be experiencing other SDOHs that impede them from taking advantage of the program or whose children are not enrolled in school.

APPENDIX F.10: Evaluation of Funding "Weekend Backpacks," as Administered by Feeding Kids Cleveland County

Table 2. Evaluation of "Weekend Backpacks" Policy Option

Costs to Cleveland County ✓	North Carolina employs CHW at a rate of 0.212 per 1,000 with an annual mean wage of $40,870 (U.S. Bureau of Labor Statistics, 2021a). Given that the population of Cleveland County is approximately 98,000, following these trends the county would employ approximately 20 CHWs. Salary alone would cost the county $817,400/year. This does not include associated training (per the new NC Community Health Worker Initiative and Core Competency Training) and updates to infrastructure/workflow to incorporate the new personnel into the Social Services Department (NCDHHS, n.d.).
Impact ✗	CHWs can reduce FI through case management, providing access to food benefits and connecting families to long-term resources (Alvardo, 2020; National Health Foundation, 2021). However, this may not have an immediate impact on childhood FI. Connection to resources could impact *household* FI over a longer period of time, which could then impact childhood FI specifically.
Political Feasibility ✓	Supporting Stakeholders: Atrium Health– CHWs help connect clients with health resources and can assist in keeping patients healthy outside of the clinic. They may also increase care quality and decrease patient costs (Heath, n.d.). This group is likely to be involved in the process, as health systems have highlighted the importance of partnerships with CHWs in an effort to advance the quadruple aim (Henry, 2020). Health systems historically have high political power. Opposing Stakeholders: Women Republicans of Cleveland County – traditionally against safety net programs and "the welfare state" – things that community health workers may promote. This group is moderately likely to be involved in this issue, as the policy does not directly antagonize the conservative idea and they have moderate political power.
Equity ✓	CHWs often come from the communities that they serve, sharing identities, geography, and/or experiences with their clients (Minnesota Community Health Worker Alliance, n.d.). This specialized knowledge allows them to play a unique role in reducing health disparities and improving access to food resources for racial/ethnic minorities (NC Department of Health and Human Services, 2018).

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Program Budget for Meal-y's on Wheel-y's

Summary of Program

During the 2018-19 school year in Cleveland County (NC) 10,771 children were eligible for the federally-funded summer nutrition program, yet only 1,124 children were served (No Kid Hungry NC et al., 2019). The Cleveland County commissioners should appropriate funds to create a mobile, long-term Summer Food Service Program (called "Meal-y's on Wheel-y's") to improve the accessibility of the summer food program across the county. These funds will be used to purchase and retrofit used school buses that will distribute breakfast and lunch to students in accordance with the USDA Summer Food Service Program (SFSP) (Rural Health Information Hub, n.d.). The federal SFSP offers funding through reimbursements on a per-meal basis for up to two meals per day. Sites are eligible for the SFSP if they are located within a census block group where 50 percent or more children qualify for free or reduced price lunch, which is most of Cleveland County (USDA, 2021b). In an effort to streamline the program, six buses will operate within areas designated as low-income and low-access food deserts per the Economic Research Service of the U.S. Department of Agriculture (USDA, 2021a). This program will be supported by the existing community volunteer organization, Feeding Kids Cleveland County, and informed by the No Kid Hungry's Center for Best Practices (No Kid Hungry, n.d.-a). The buses will run six to eight hours a day, five days a week, for ten weeks over the summer break. The high-level goals of this program are to:

1. Decrease childhood food insecurity in Cleveland County and
2. Improve county-wide access to federally funded summer meal programs.

More specifically, the mobile meal program aims to double the number of children accessing the summer nutrition program, serving an additional 2,000 children free breakfast and lunch (or 4,000 additional meals per day). Over the next three years, the goal is to increase the number of children accessing this program by 500.

Budget

Cleveland County Summer Food Service Program (Meal-ys on Wheel-ys) - 3 Year Budget

EXPENSES

Personnel Costs by Position (Staffing Table)

Position	Number of Employees	FTE	Rate	Actual Salary	Fringe Benefits	Total
Program Manager	1	0.25	$ 50,000.00	$ 12,500.00	$ 3,750.00	$ 16,250.00
Program Coordinator	1	0.25	$ 42,000.00	$ 10,500.00	$ 3,150.00	$ 13,650.00
Vehicle Driver	6	0.25	$ 35,000.00	$ 8,750.00	$ 2,625.00	$ 68,250.00
Site Supervisor	6	0.25	$ 39,000.00	$ 9,750.00	$ 2,925.00	$ 76,050.00
Site Monitors	12	0.25	$ 31,200.00	$ 7,800.00	$ 2,340.00	$ 121,680.00
Food Service	6	0.25	$ 30,000.00	$ 7,500.00	$ 2,250.00	$ 58,500.00
Volunteers	12	0.25	N/A	N/A	N/A	N/A

Personnel	Year 1	Year 2	Year 3	3 Year Total
Salaries	$ 354,380.00	$ 361,467.60	$ 368,696.95	$ 1,084,544.55
Training	$ 10,631.40	$ 10,844.03	$ 11,060.91	$ 32,536.34
Fringe Benefits	$ 106,314.00	$ 108,440.28	$ 110,609.09	$ 325,363.37
Total Personnel Costs	**$ 471,325.40**	**$ 480,751.91**	**$ 490,366.95**	**$ 1,442,444.25**

Non-Personnel	Cost/Unit	Quantity	Year 1	Year 2	Year 3	3 Year Total
Vehicles	$ 5,000.00	6	$ 30,000.00	N/A	N/A	$30,000
Retrofitting	$ 55,000.00	6	$ 330,000.00	N/A	N/A	$ 330,000.00
Travel/Mileage	$ 81.90	50	$ 4,095.00	$ 4,095.00	$ 4,095.00	$ 12,285.00
Outreach/Advertising	$ 0.12	1000	$ 120.00	$ 120.00	$ 120.00	$ 360.00
Breakfast Meal Cost	$1.44 cost/meal Year 1 $1.47 cost/meal Year 2 $1.50 cost/meal Year 3	100,000 Year 1 breakfast 125,000 Year 2 breakfast 150,000 Year 3 breakfast	$ 144,000.00	$ 183,750.00	$ 184,500.00	$ 512,250.00
Lunch Meal Cost	$2.00 cost/meal year 1 $2.04 cost/meal Year 2 $2.08 cost/meal Year 3	100,000 Year 1 lunch 125,000 Year 2 lunch 150,000 Year 3 lunch	$ 200,000.00	$ 255,000.00	$ 312,000.00	$ 767,000.00
Vehicle Maintenance	$ 3,000.00	6	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 54,000.00
Vehicle Branding	$ 1,400.00	6	$ 8,400.00	N/A	N/A	$ 8,400.00
Clean-up Supplies	$0.03 per meal	200,000 Year 1 meals 250,000 Year 2 meals 300,000 Year 3 meals	$ 6,000.00	$ 7,500.00	$ 9,000.00	$ 22,500.00
Total Non-Personnel Costs			**$ 740,615.00**	**$ 468,465.00**	**$ 527,715.00**	**$1,736,795**

Indirect/Administrative Costs	Year 1	Year 2	Year 3	3 Year Total
Insurance	$ 9,420.00	$ 9,420.00	$ 9,420.00	$ 28,260.00
Total Indirect/Administrative Costs	**$ 9,420.00**	**$ 9,420.00**	**$ 9,420.00**	**$ 28,260.00**

EXPENSES	
YEAR 1 EXPENSES	$ 1,221,360.40
YEAR 2 EXPENSES	$ 958,636.91
YEAR 3 EXPENSES	$ 1,027,501.95
TOTAL EXPENSES OVER 3 YEARS	**$ 3,207,499.25**

REVENUE

Source		Year 1	Year 2	Year 3	3 Year Total
Summer Food Service Program Reimbursement - Breakfast	2.6050 reimbursement/meal Year 1 2.73 reimbursement/meal Year 2 2.861 reimbursement/meal Year 3	$ 260,500.00	$ 341,250.00	$ 429,150.00	$ 1,030,900.00
Summer Food Service Program Reimbursement - Lunch	4.4875 reimbursement/meal Year 1 4.7029 reimbursement/meal Year 2 4.9286 reimbursement/meal Year 3	$ 448,750.00	$ 587,862.50	$ 739,290.00	$ 1,775,902.50
No Child Goes Hungry Grant		$ 50,000.00	N/A	N/A	$ 50,000.00
Carolina Hunger Initiative Gift Grant		$ 1,000.00	N/A	N/A	$ 1,000.00
Total Revenue		**$ 760,250.00**	**$ 929,112.50**	**$ 1,168,440.00**	**$ 2,857,802.50**

REVENUE	
YEAR 1 REVENUE	$ 760,250.00
YEAR 2 REVENUE	$ 929,112.50
YEAR 3 REVENUE	$ 1,168,440.00
TOTAL REVENUE OVER 3 YEARS	**$ 2,857,802.50**

COST TO THE COUNTY	
YEAR 1 COST	$ 461,110.40
YEAR 2 COST	$ 29,524.41
YEAR 3 COST	$ (140,938.05)
TOTAL COST	**$ 349,696.75**

Budget Justification

Personnel

- Each employee is employed at 0.25 FTE seeing as the summer meal program only operates for 10 weeks out of the year. The 0.25 FTE also assumes an additional 2-3 weeks for training and program set-up.
- Staff composition and salary informed by No Kid Hungry best practices for summer meal programs (No Kid Hungry, 2021).
- One Program Manager to oversee operations, hire staff, and ensure program compliance with federal SFSP standards.
- One Program Coordinator to assist the Program Manager and manage logistics/administrative tasks.
- Six Vehicle Drivers (1 per site), working 5 days/week for 6-8 hours per day (based on the average route time) responsible for transporting meals on-time according to their route (No Kid Hungry, 2021).
- Six Site Supervisors (1 per site) to oversee meal delivery/food safety and record meal counts
- 12 Site Monitors (2 per site) paid $15/hour to support meal preparation and delivery and support site activities.
- Six Food Service staff (1 per site) to prepare meals, monitor food safety, and ensure that meals meet SFSP guidelines/nutrition requirements.
- Volunteers recruited from the local nonprofit Feeding Kids Cleveland County (Feeding Kids Cleveland County, n.d.).
- Training – 3% of total salary costs training includes meal preparation, safe food handling practices, and understanding of SFSP guidelines/requirements (Westfall, 2018).
- Fringe benefits - 30% for taxes and health insurance.
- Personnel costs assume a 2% inflation factor over 3 years.

Non-Personnel

- Vehicle (one time cost) - Average cost of a used school bus between $3,000-7,000 (Calabrese Shackleford, 2019). No Kid Hungry reports used vehicles for ~$4,000-10,000 (No Kid Hungry, 2021). Estimate unit price $5,000/vehicle.

- Retrofitting (one time cost)– Additions such as freezer, refrigeration, cabinets, generator, flat top grill, cutting boards, counter tops, etc. for meal preparation and safe storage. Avg. $55,000-60,000 cost. Estimated $55,000 per bus (Harper, 2018).
- Travel/Mileage – Average school bus gets 4-6 miles per gallon (M&R Specialty Trailers and Trucks, 2018). Gas costs on average $3.50/gallon. Bus routes will cover ~117 sq. miles[37] each day = $81.90/day or $4,095/summer.
- Outreach/Advertising – Use of free No Kid Hungry customizable materials and no-cost partnerships with faith-based organizations, schools, and local-elected officials (No Kid Hungry, n.d.-b). Costs for this line item associated with printing (average cost for color printing between 12-15 cents/page). Estimated 1,000 pages of printing materials per year @ $0.12 per page (Errera, 2019).
- Breakfast Meal Cost – The average school breakfast in 2014-15 cost $2.72, 45% of which was the actual food costs = $1.23/breakfast (Fox & Gearan, 2019).[38] Assuming a 2% per year increase in retail food pricing, estimated 2022-23 food costs = $1.44/breakfast (Martin, 2022). Subsequent years also assume 2% increase.
- Lunch Meal Cost – The average school lunch in 2014-15 cost $3.81, 45% of which was the actual food costs = $1.71/lunch (Fox & Gearan, 2019). Assuming a 2% per year increase in retail food pricing, estimated 2022-23 food costs = $2.00/lunch (Martin, 2022). Subsequent years also assume 2% increase.
- Maintenance – oil change, fuel filters, coolant flush, any major repairs (variable cost) average $3,000/year (Kochan & Shaeffer, n.d.).
- Vehicle Branding (one time cost) – Average branding cost is $1,400 per vehicle (No Kid Hungry, 2021).
- Clean-up Supplies – Anticipated 3 cents per meal served (No Kid Hungry, 2021).[39]

Indirect/Administrative Costs

- Insurance – Average across the US for commercial bus insurance is $9,420/year (Bus Insurance HQ, n.d.).

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[37]The 6 food deserts in Cleveland County cover approximately 25% of the county. The county in its entirety is ~465 sq. miles (Lewis, n.d.). 25% of 465 sq. miles = approximately 117 sq. miles each day. 117 miles divided by 5 mpg = 23.4 gallons. 23.4 gallons at a rate of $3.50/gallon = $81.90 in gas per day. Program operates 5 days/week for 10 weeks = 50 days.

[38]2,000 breakfasts * 5 days a week * 10 weeks = 100,000 breakfasts for the entire summer in Year 1. Increase by an additional 500 children per day each year (or an additional 500 breakfasts).

[39]The program goal is to serve approximately 2,000 children twice a day (for a total of 4,000 meals/day). 4,000 meals * 5 days a week * 10 weeks = 200,000 meals for the entire summer in Year 1. 5,000 meals * 5 days a week * 10 weeks = 250,000 meals for the entire summer Year 2. 6,000 meals * 5 days a week * 10 weeks = 300,000 meals for the entire summer Year 3.

Revenue

- SFSP Reimbursement – Federal reimbursement is available for up to two meals per day through the Summer Food Service Program. In 2022 breakfast is reimbursed for rural sites at a rate of 2.6050 and lunch/supper at a rate of 4.4875 (Food and Nutrition Service, 2021). This reimbursement is for both operational and administrative payments, therefore leftover reimbursement can go towards personnel/meal prep costs. Assuming the 2021 reimbursement rate will increase by 4.8% each year.[40]
- No Child Goes Hungry Grant– Ability to build a hunger advocacy program that targets the needs of the specific community with a goal of eliminating childhood hunger (No Child Goes Hungry, n.d.). Requesting a $50,000 grant to cover start-up costs in Year 1.
- Carolina Hunger Initiative Gift Grant – Partnership with the NC Department of Public Instruction's School Nutrition Services team to support summer meal programs in North Carolina. In 2021, the partnership gave $1,000 "gift grants" in the form of equipment to serve summer meals to rural counties in NC, with an expectation to do the same in 2022 (Carolina Hunger Initiative, n.d.).

[40]Assuming 4.8%/year as the average of 3.8% increase in SFSP reimbursement for 2020-21 (Food and Nutrition Service, 2021) and 5.8% increase for 2021-22 (Food and Nutrition Service, 2022).

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Presentation Slides and Script

In order to implement this program, we have developed a three-year preliminary budget. Specific budgetary assumptions will be discussed on the next slide, however, as an overview: this program would require approximately $461,000 in year 1 and $30,000 in year two. Because of the summer food service program reimbursement, expansion of the program, and the elimination of the year 1 one-time costs, the program is anticipated to operate in a surplus in its third year, with a $141,000 profit. In total, this would cost Cleveland County about $350,000 over the course of three years.

Budget Assumptions

- Program will initially serve ~2,000 children daily breakfast & lunch for 10 weeks over the summer.
  - Total of 200,000 meals in year one.
- One-time costs for purchasing and retrofitting six used school buses to deliver meals in low-income and low access areas.

Expenses [13]

- Staff training & fringe benefits
- Vehicle maintenance & insurance
- Gas mileage & travel
- Food costs & misc. supplies

Revenue

- Federal SFSP reimbursement [14]
- *No Child Goes Hungry* grant [15]
- Carolina Hunger Initiative [16]

In the 2018-2019 school year, only 1,100 of the over 10,000 eligible children accessed the federally funded summer nutrition program in Cleveland County. In year one, Meal-Ys on Wheel-Ys aims to double the number of children accessing the summer nutrition program, serving 2,000 children free breakfast and lunch (or 4,000 additional meals per day). Over the next three years, the goal is to increase the number of children accessing this program by 500 children per year. A large share of initial expenses will be for purchasing and retrofitting six used school buses to serve children in low income and low food access areas that have been identified by the USDA. Personnel composition as well as major budgetary assumptions are informed by the national non-profit No Kid Hungry's best practices for summer meal programs.

Staff for the program will include one overall program manager and one program coordinator to oversee operations and manage program logistics. Each of the six sites will then have one bus driver, one site supervisor, two site monitors, one food service employee, and two volunteers to actually deliver program services. Some of which will come from the local non-profit Feeding Kids Cleveland County.

In addition to staff salaries, other major expenses are listed on the slide here. Revenue will be coming in mainly through the federal summer food service program reimbursements - as meals are reimbursed at an annually set flat rate per meal distributed and up to two meals per child per day. Additionally, two grants, the No Child Goes Hungry Grant, and the Carolina Hunger Initiative, will also be used to support the programs implementation in year one.

APPENDIX G: RUIHAN LI

Problem Statement

Social Determinant of Health

From the Healthy People 2030, Social Determinants of Health (SDoH) is defined as "the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks." This means anything that could affect people's life quality, health and well-being will be considered as a SDoH (Social Determinants of Health - Healthy People 2030 | Health.Gov, n.d.). Examples of SDoH include education, housing, income, discriminations, access to healthy foods, etc. In the short-term, undesirable social determinants could cause disability, health disparity, illness, decrease of life-quality. In the long-term, this could affect the general health that increases morbidity and mortality and decreases life expectancy. Social and community context is one of the five domains of SDoH, which refers to all the social and community network, connection, and relationships. Social relationships such as family and friends could provide positive or negative influence on individuals' lives. Relations between individuals and organizations (social, religion, and cultural etc.) are also included. The community is the most general environment surrounding us, where we live and grow (Social and Community Context - Healthy People 2030 | Health.Gov, n.d.). Healthy People 2030 listed "eliminate very low food security in children" as one of the objects under Social and Community Context to work on. Food security is the measure of the access to healthy, nutrient dense foods. USDA defines the range of food security into four levels: high food security, marginal food security, low food security, and very low food security. Very low food security is one of the categories of food insecurity[41]. Therefore, the object for this paper is to "eliminate food insecurity among children 0 to 18-year-old in Cleveland County. For children under 18-year-old, they depend on their families or caregivers to get access to foods. This is considered part of the social relationship. And the food programs are mostly based in the care centers and schools that are social or community organizations.

Geographic and History Context

Cleveland County (CC) is under the Blue Ridge Mountain. The location between Ashville, Charlotte, and Greensville is a gateway between those metropolitan areas. It contains 15 cities, and almost a hundred thousand residents (population demographic see Appendix G.1, Table 1). The local economy is diverse, without dependence

[41] Food insecurity: If the household has economic and social conditions limited, or uncertain access to adequate foods, they are defined as food insecurity. Different from hunger, individuals are limited to healthy, nutrient-dense, desirable meals is the main problem for food insecurity (USDA ERS - Definitions of Food Security, n.d.).

on any of the industries. CC has been famous for its agricultural production. During the 1930s-1950s, cotton production always led the state; and then turned to dairy production. Recently, the leading agricultural production are poultry, grain, soybeans, and beef (NCDA&CS - Agricultural Review Cleveland County Book to Raise Funds for Farmland Preservation, n.d.). The local products are changed from paper towels to trunk cabs. Geographically, this county has access to multiple highways that provide a good environment for product flows. More than half of the nation can be reached in 24 hours (Welcome to Cleveland County, NC, n.d.). From the most recent U.S census, 75.8 % are White; 20.8% are Black; 21.9% of the local population are under 18 years old (see Appendix G.1, Table 1 for more demographic information). Also from the census, estimated about 15% of the population in this county are in poverty (U.S. Census Bureau QuickFacts, n.d.).

Priority Population

As the objective defined, the priority population is all children 0-18 in CC. Over 20% of the population (about 20,000) in CC are children 18-year-old or under. 2020-2021 Academic year K-12 enrollment 14,713. About 5.2% of these children don't have any health insurance.

Poverty is one of the factors linked to food insecurity. Residents in CC are at a lower income level compared to the NC state average. Both median household income and per capita income are lower than the NC state average. The overall poverty rate for the county is 19.9%, but for children under 18 the rate is increased to 27.5%; and for single mothers with children, the poverty rate is 45.9% (2019 Cleveland County Community Health Assessment). This makes them in higher risk of food insecurity.

Measure of Problem Scope

From the 2015 data, 66.97% of students participate in the free or reduced-price lunch program. And the data from Child Nutrition Programs in CC shows 58.3% of K-12 students enrolled in the free/ reduced-price lunch program in 2018 (Cleveland County Health Assessment). The federal lunch programs mostly covered the lunch at school, but kids also need meals at home for breakfast and dinner. Before the pandemic, the overall food insecurity rate was about 16%. The food insecurity rate for children is 22.8%. As comparison, the child food insecurity rate in NC state is 20.1%. Feeding America data from 2017 shows that 4770 children in CC are food insecure. And the current number could be higher because of the pandemic (Child Hunger & Poverty in North Carolina | Map the Meal Gap, n.d.). For infant and adolescent, the Women, Infants, Children supplemental nutrition program (WIC) serves

2,682 individuals each month in average. In year 2017-2018, the WIC voucher been used for 1.9 million worth of foods in CC.

Not all children and their family who need help are eligible for the nutrition and food programs. Estimates about 15% of people from the above data are likely ineligible for the federal nutrition programs, because their income is higher than the eligibility standards (Child Hunger & Poverty in North Carolina | Map the Meal Gap, n.d.).

Rationale/Importance

The 2030 health indicators ranking in the health assessment shows "Limited access to healthy food" as the number seven indicator for CC. From the 2019 county health assessment, the food insecurity problem score is 6.9, compared to the NC average 7.5 (0 for the worst, 10 for the best). This means this country has a higher prevalence, or severe food insecurity compared to the state average. Both historical and current agriculture production are not including fruit and vegetables which are nutrient-dense foods. The population would have less chance to be benefits from cheaper local production. Less access to healthy food could lead to either insufficient or imbalance of energy intake. Children and their households might choose energy-dense foods that are cheaper and easier to access. For those children who are considered very low food security, lack of consistent food access might skip their meal, which could lead to hunger. There is also evidence suggesting that unstable nutrition status will affect children's academic performance. They will find it hard to focus on the class and get lower average grades compared to food secure students (Tan et al., 2019).

Disciplinary Critique

Food insecurity is associated with negative health outcomes in children (Gundersen & Ziliak, 2015). Children from food insecure households experience higher rates of asthma and depression throughout their life, especially compared to food secure children. Food insecurity children are generally worse in health and have a higher rate of emergency department use (Thomas et al., 2019). Some common problems linked to nutrition status also affected food insecurity in children. Food insecurity has been associated with increased risk of birth defects, anemia, lower nutrition intake, and cognitive problems (Gundersen & Ziliak, 2015). Eliminating food insecurity can help to reduce these risks. Nutrition intake early in life can help to mitigate the health disparities in later life.

APPENDIX G.1: Demographic of Cleveland County

Table 1. Cleveland County Demographics

Demographic	Cleveland County	NC State
Population	97,947	10,488,084
Child Population	21.9%	21.9%
White	72.8%	70.6%
African American	20.8%	22.2%
Education Level		
College Graduation	16.5%	21.3%
High School Graduation	88.0%	87.6%
Reading Proficiency	57.7%	56.8%
Food Insecurity	16.2%	14%
Low Access to Grocery Store	16.7%	N/A
Child Food Insecurity	22.8%	20.1%

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Nutrition Program Intervention: Mobile food delivery program for Cleveland County

Background Information

Social determinants of Health (SDoH) are critical parts of people's lives that affect and influence their health status (*Social Determinants of Health - Healthy People 2030 | Health.Gov*, n.d.). Any of the conditions and environment that could affect people's health, life quality, and well-being are considered SDoH. The group objective "Eliminate Food insecurity among Children 0-18" is generated from Healthy People 2030's object in the Social and Community Context category. Aiming to help food insecurity children access to healthy foods and decrease negative health outcomes related to food insecurity. In Cleveland County, this problem is obvious, according to data from the recent county health assessment. According to data from 2017, almost 5000 children in Cleveland County are food insecure (*Map the Meal Gap*, n.d.). And the actual number could be even higher due to the pandemic. Children from food-insecure households are associated with a higher risk of asthma and depression in later life. The limited access to healthy food affects their general health, which leads to higher emergency room use (Thomas et al., 2019).

Food security is a measurement of the food access status, so it can directly reflect the nutrition status of children and their households (USDA ERS - Definitions of Food Security, n.d.). Less access to healthy food could lead to either insufficient or imbalance of energy intake. Children and their households might choose energy-dense foods that are cheaper and easier to access. For those children who are considered to have very low food security, lack of consistent food access might cause them to skip their meals, which could lead to hunger. There is also evidence suggesting that unstable nutrition status will affect children's academic performance. They will find it hard to focus on class and get lower average grades compared to secure food students (Tan et al., 2019). Eliminating the low food security status could help to mitigate the disparity caused by the low nutrition status, including health disparity in later life and their future academic or career success.

Purpose

Food insecurity is defined as limited access to enough healthy and nutritious food. Therefore, a key point of eliminating food insecurity is to provide better nutritional food support to children for optimal growth. Evidence shows that food insecurity children have more energy intake on average compared to those children from food security households (Tan et al., 2019). And there is a significant association between personal food insecurity and obesity for children between 6 to 11 years old (Kaur et al., 2015). For general health, food-insecure children face higher emergency room use, and the foregone medical care was over 179.8% higher compared to food-secure

children. If we provide healthy meals to the food insecurity children to support their nutrition needs, they will not experience all these negative outcomes associated with food insecurity (Thomas et al., 2019). High energy intake and a higher risk of obesity lead to health disparities and could cause more comorbidities in their future life, such as hypertension, diabetes, and cardiovascular disease, which are all related to obesity. An increase in emergency department use will increase the bill for their families, worsening the economic status in general.

Evidence-Based Outcomes

Short-term Outcome Objectives

1. By June 1st, 2024, increase the fruit and vegetable consumption in children from Cleveland County (Racine et al., 2013).
2. By June 1st, 2024, decrease the proportion of children that are food insecure (Currently around 5,000 in Cleveland County) (Gundersen et al., 2012).

Long-Term Impact

1. Decrease the total number of children that are in food insecurity, have the % down below the state or national average.
2. Better nutrition education increased knowledge of better food choices among children and their households and improved nutritional and behavioral change.

Strategies and Activities

The program planned to use in Cleveland County is the Mobile Food Delivery program. This idea is from one of the local nutrition programs called Feeding Kids Cleveland County (Feeding Kids Cleveland County. n.d.). There are also some similar successful programs in other places in North Carolina, such as the Grocers on Wheel, which was set up in Raleigh over the years to support local people's food access (Grocers on Wheels - Raleigh, NC, n.d.). Foods and groceries will be delivered to those children who asked for nutrition support during weekends, holiday breaks, and any out-of-school time periods. For delivery, the program could re-purpose the old school buses for food delivery to children (Glowicki, n.d.). Using the normal school bus route and delivering the food to where those children's usual pick-up point. For better reach to the target population, there would be no eligibility requirement for this program. And this idea is a copy of the universal free meal program, which has passed permanently in California (Sheldon, 2021). California has passed the permanent Universal free school meals program and became the first one in the US. And this could be a model to use for the implementation plan, starting

from sending free meals for weekend and vacation periods. Parents would not have to go through complicated paperwork to prove their poor socioeconomic status, and their children will not face the stigma (Sheldon, 2021). Any children or their households could apply for meals through the school or care facilities when they need them. And the bus delivery will help to reach out to those children who lack transportation to get food during out-of-school times.

The main reason for not setting up a standard of eligibility qualification is to increase access to nutrition support. From previous background information research, about 15% of food insecurity children are not eligible for any of the federal nutrition programs (FeedingAmerica.org). The universal free meal program is not a new program. During the pandemic, a lot of waivers have been released to the federal nutrition program, and this includes opening the eligibility process to provide foods for all children that applied for help (USDA). USDA's waivers allow schools to offer free meals to all students during the COVID pandemic, but this will expire at the end of the 21-22 school year. The universal free meal without eligibility qualification could reduce the barrier for children to ask for nutritional help (Fuller, 2021). Current nutrition programs all have some kind of paperwork and process that could block children who need meals outside the federal programs. And more importantly, most of the programs use income as a measurement for eligibility, which might create a stigma toward students who receive free or reduced-price meals. Some students could give up their benefits because of this reason (Fighting the Stigma of Free Lunch, n.d.). This could also improve the interpersonal level relationship in the socioecological model. Children might have better relationships and social environments in school without the stigmas of free meals. Because this is a universal free meal setting, we expected to reach all the food insecure children 0-18 in Cleveland County.

Stakeholders

Potential stakeholders will include four groups. The first stakeholder will be targeting the population, the food insecure children from zero to 18 years old in Cleveland County and their households. The implementation program will directly apply to them to increase their access to healthy meals. The second group will be local health departments. The public health departments will be in charge of providing budget and program standards for running the plan. Third stakeholders will be local schools and childcare facilities or programs such as Head Start. All the children and their families who want to get nutrition meal support from this program will need to sign-up through the school, so the program can get information about who and how much food is needed. And the last stakeholder will be nutrition food programs. There are some supplemental food programs in Cleveland County which provide

meals to children and do not consider eligibility with federal food programs. They could be potential partners to provide food with this implementation plan and serve more food insecurity children in this county.

Because the meal is delivered to the home, there will be educational pieces put with the meals that allow the parents and children to learn about healthy food intake. The information in the educational material could be obtained from the organization's online resources, such as USDA MyPlate, WIC, Academy of Nutrition, and Dietetics (eatright.org). Some healthy, easy to make, and low-cost recipes could also be included.

Budget

The budget of this program will include staff, maintenance fee and extra fee for meals (see Appendix G.2, Table 1). The main part of the budget will be the food and groceries. From the data, the current reimbursement rate for each free meal from the National School Lunch Program (NSLP) is $3.66. And the breakfast rate is $1.77 from the School Breakfast Program (SBP). This program will set $2.0 to $2.5 per meal price and count for three meals per day as the budget for food. But the groceries and food will also come from donations from the local market which safe some money. The initial budget will also include the price of buses. And the gas fee and driver's salary will be long-term payments throughout the program. We will also need staff to manage the program, such as data collection and the organization of meal delivery.

Conclusion

The program is trying to provide meals to all food-insecure children who need them. Because current programs have so many barriers that not everyone who needs them will get the help. And the food insecurity status could be a period, not consistent. Such as the current pandemic has led to a higher unemployment rate which causes more children to face food insecurity. It could be hard to provide enough evidence to apply for the meal when such an incident happens. The universal free meal setting will make sure all children will get nutrition support whenever they need it. The only disadvantage of this plan will be the increased budget pressure on the public health department.

APPENDIX G.2: Budget

Table 1. Program Budget

Program manager	35,000-40,000/year
Bus maintained	10,000/year
Meals cost	2.0-2.5/ meal
Bus driver	35,000/year
Site staff	20-25/hr

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Implementation and Evaluation Plan: Mobile Food Delivery Program for Food Insecure Children

Intervention Summary

Food insecurity is a problem in Cleveland County and needs intervention. Mobile food on Wheel program planning to support fruit and vegetables to families with children 0-18 that are in food insecurity[42] To increase their access to healthy foods (2019 Cleveland County Community Health Assessment). This food delivery program will provide groceries and non-perishable foods during vacation breaks and weekends. Food will be delivered to households with food insecure children and support their meals during after-school times. This program focuses on the object "Eliminate food insecurity in children" from the Social Determinants of Health (SDoH) in Healthy People 2030. SDoH describes the condition and environment that affect people's health, quality of life, and well-being (Healthy People 2030 | Health.Gov, n.d.). The objects focusing in this program talk about the social determinant Social and Community Context that interpersonal relationships and community support could influence the health status of the target population (Social and Community Context - Healthy People 2030 | Health.Gov, n.d.).

Two outcomes will be measured during and after the program. The short-term outcome, an increase of fruit and vegetable intake, will be measured by the Food Frequency Questionnaire (FFQ) (see Figure 1) for longer-term intake changes and 24 hour-recall for specific intake measures. The long-term outcome, which is a decrease in the food insecurity rate in Cleveland County, will be measured through the USDA survey (see Figure 2) and new county health assessment.

Evaluation Plan

Study Design

For study design, this program will use mixed methods. The exposure is set up as the intervention program and evaluated with the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) model. The study will examine a mobile meal on wheels program for food insecurity (Grocers on Wheels - Raleigh, NC, n.d.) in Cleveland County. Households with children 0-18 years old in food insecurity identified as food insecure are eligible for this program. No extra limitations are set for access, such as income level. Participants will have groceries with fresh fruit and vegetable that are nutrient-dense delivered to their house for the weekend and vacation breaks (Grocers on Wheels - Raleigh, NC, n.d.). Data will be collected at baseline, midpoint (1 year), and the

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[42] Food insecurity: If the household has economic and social conditions limited or uncertain access to adequate foods, they are defined as food insecurity. Unlike hunger, individuals limited to healthy, nutrient-dense, desirable meals, which is the main problem for food insecurity (USDA ERS - Definitions of Food Security, n.d.).

endpoint of intervention from the same population, which is children. The outcome will be measured by comparing the data collected in 1 year and endpoint to baseline information. Feedback surveys and focus group meetings will be held during the program running to evaluate the participant satisfaction and the program reaches.

Sampling

A USDA survey (see Appendix G.3, Figure 1) will be provided to all families for determining food security levels. The survey was created in 1995 and has been revised a few times for newer food standards. This program will use the most relevant version from 2012(USDA survey tools). The survey could be applied to all US households for the food insecurity level measurement. Free food supplies will be provided to food insecurity families who are willing to participate.

Specific Measure

Food insecurity rate will be measure before and after getting the intervention (with the same survey from USDA). The Food Frequency Questionnaire (FFQ) will be provided to the family to assess the fruit and vegetable intake before, during and after intervention (main target group will be children in the family, but the FFQ will send to parents/caregivers in case the literacy level for children are not able to finish the questionnaire). For food insecurity measurement, participants will receive the USDA survey for baseline and 2-year end of the program for long-term outcome measurement. Fruit and vegetable intake FFQ (see Appendix G.4, Figure 2) will send to participants at baseline, 1-year, and 2-year end of the program to measure the change of short-term outcome. And 24 hour-recall will provide to selected families (50 families randomly selected) for specific food and nutrition measures.

Analysis Plan

Measure the change of the fruit and vegetable intake servings changes before and after the intervention. Quantitative data from FFQ and 24 hour-recall will be collected and analyzed. And the percentage of people who remain food insecure will be compared using the USDA.

Timing

This implementation will be a 2-year program. And for easy measure, we use school years, which start from August 2022 to August 2024.

Source of Funding

The funding could come from the educational funding cause good meal to support academic success (California is doing this right now that increase education program funding for universal free meals). Also, collaborate with local grocery stores and farmers getting fruit and vegetable donations (ugly fruit and vegetables that are not able to sell but good to eat).

Data Use and Dissemination

This program will use existing data and resource from local assess such as No Kid Hungry NC, Cleveland County health department, and other successful programs. Data will be shared with the local health department to address the problem and get funding. Flyers, local schools, and community events will be included for sharing information to further dissemination.

Strength and Weakness

All the food will be delivered to families that participate in this program, so it can reach more people who are in food insecurity with transport barriers. The setting of food packages instead of single meals could also provide more variety in meals and easier to store. It supports the out-of-school time for children during vacations and weekends that are not covered by current federal programs. And no specific income level limit for participation, so more food insecure children could be involved in this program.

The limitation will be the actual intake of children. Because the food supply is delivered to the home and could be provided to the whole family, it will be hard to measure how much food is provided to the children, who are the target population.

APPENDIX G.3: Survey Questions Used by USDA to Assess Household Food Security

Figure 1. Survey Questions Used by USDA to Assess Household Food Security

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)

How Many Households are Interviewed in the National Food Security Surveys?

USDA's food security statistics are based on a national food security survey conducted as an annual supplement to the monthly Current Population Survey (CPS). The CPS is a nationally representative survey conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CPS provides data for the Nation's monthly unemployment statistics and annual income and poverty statistics.

APPENDIX G.4: FFQ Sample

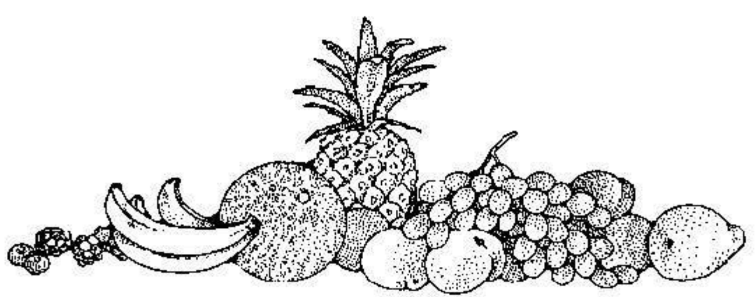
Figure 2. FFQ sample

OMB# 0925-0450 EXP. DATE: 07/31/2000

NATIONAL INSTITUTES OF HEALTH

EATING AT AMERICA'S TABLE STUDY

QUICK FOOD SCAN



- The person who completed the telephone interviews for the Eating at America's Table Study should fill out this questionnaire.
- Use only a No. 2 pencil.
- Be certain to completely blacken in each of the answers, and erase completely if you make any changes.
- Do not make any stray marks on this form.
- When you complete this questionnaire, please return it in the postage-paid envelope to:

  National Cancer Institute
  EPN, Room 313
  6130 Executive Blvd., MSC 7344
  Bethesda, MD 20892-7344

BAR CODE LABEL HERE

NOTIFICATION TO RESPONDENT OF ESTIMATED BURDEN

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: NIH, Project Clearance Office, 6701 Rockledge Drive, MSC 7730, Bethesda, MD 20892-7730, ATTN: PRA (0925-0450). Do not return the completed form to this address.

PLEASE DO NOT WRITE IN THIS AREA

SERIAL

INSTRUCTIONS

Think about what you usually ate last month.

Please think about all the fruits and vegetables that you ate last month. Include those that were:

- **raw and cooked,**
- **eaten as snacks and at meals,**
- **eaten at home and away from home (restaurants, friends, take-out), and**
- **eaten alone and mixed with other foods.**

Report how many times per month, week, or day you ate each food, and if you ate it, how much you usually had.

If you mark "Never" for a question, follow the "Go to" instruction.

Choose the best answer for each question. Mark only one response for each question.

1. Over the last month, how many times per month, week, or day did you drink **100% juice** such as orange, apple, grape, or grapefruit juice? **Do not count** fruit drinks like Kool-Aid, lemonade, Hi-C, cranberry juice drink, Tang, and Twister. Include juice you drank at all mealtimes and between meals.

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 2)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

1a. Each time you drank **100% juice**, how much did you usually drink?

○	○	○	○
Less than ¾ cup (less than 6 ounces)	¾ to 1¼ cup (6 to 10 ounces)	1¼ to 2 cups (10 to 16 ounces)	More than 2 cups (more than 16 ounces)

2. Over the last month, how many times per month, week, or day did you eat **fruit**? Count any kind of fruit—fresh, canned, and frozen. **Do not count** juices. Include fruit you ate at all mealtimes and for snacks.

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 3)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

2a. Each time you ate **fruit**, how much did you usually eat?

○	○	○	○
Less than 1 medium fruit	1 medium fruit	2 medium fruits	More than 2 medium fruits

OR

○	○	○	○
Less than ½ cup	About ½ cup	About 1 cup	More than 1 cup

3. Over the last month, how often did you eat **lettuce salad (with or without other vegetables)**?

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 4)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

3a. Each time you ate **lettuce salad**, how much did you usually eat?

○ About ½ cup
○ About 1 cup
○ About 2 cups
○ More than 2 cups

4. Over the last month, how often did you eat **French fries** or **fried potatoes**?

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 5)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

4a. Each time you ate **French fries** or **fried potatoes**, how much did you usually eat?

○ Small order or less (About 1 cup or less)
○ Medium order (About 1½ cups)
○ Large order (About 2 cups)
○ Super Size order or more (About 3 cups or more)

5. Over the last month, how often did you eat **other white potatoes**? Count **baked, boiled**, and **mashed potatoes, potato salad,** and **white potatoes that were not fried.**

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 6)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

5a. Each time you ate **these potatoes**, how much did you usually eat?

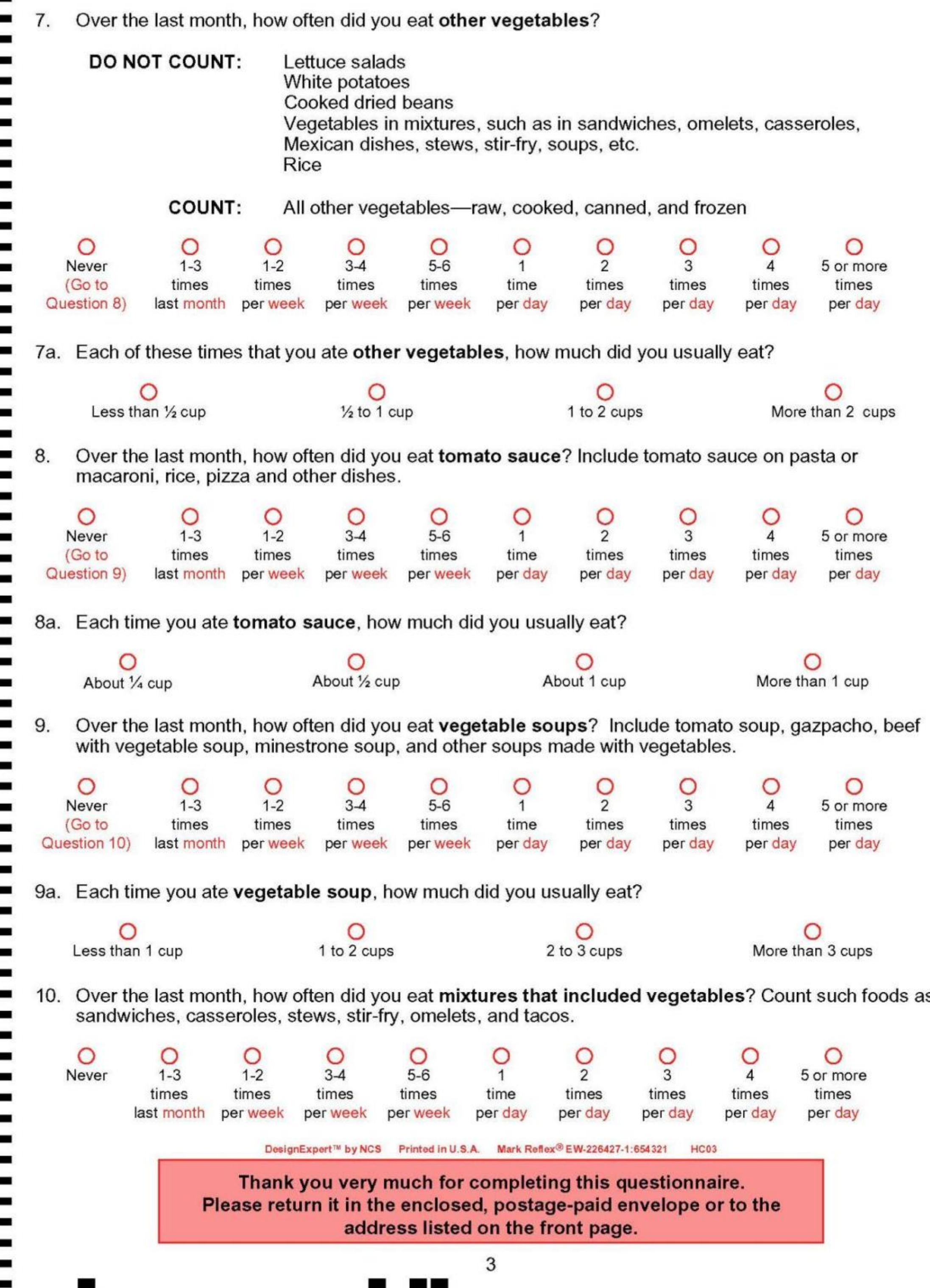
○ 1 small potato or less (½ cup or less)
○ 1 medium potato (½ to 1 cup)
○ 1 large potato (1 to 1½ cups)
○ 2 medium potatoes or more (1½ cups or more)

6. Over the last month, how often did you eat **cooked dried beans**? Count **baked beans, bean soup, refried beans, pork and beans** and **other bean dishes.**

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 7)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

6a. Each time you ate **these beans**, how much did you usually eat?

○ Less than ½ cup
○ ½ to 1 cup
○ 1 to 1½ cups
○ More than 1½ cups



7. Over the last month, how often did you eat **other vegetables**?

DO NOT COUNT: Lettuce salads
White potatoes
Cooked dried beans
Vegetables in mixtures, such as in sandwiches, omelets, casseroles, Mexican dishes, stews, stir-fry, soups, etc.
Rice

COUNT: All other vegetables—raw, cooked, canned, and frozen

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 8)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

7a. Each of these times that you ate **other vegetables**, how much did you usually eat?

○	○	○	○
Less than ½ cup	½ to 1 cup	1 to 2 cups	More than 2 cups

8. Over the last month, how often did you eat **tomato sauce**? Include tomato sauce on pasta or macaroni, rice, pizza and other dishes.

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 9)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

8a. Each time you ate **tomato sauce**, how much did you usually eat?

○	○	○	○
About ¼ cup	About ½ cup	About 1 cup	More than 1 cup

9. Over the last month, how often did you eat **vegetable soups**? Include tomato soup, gazpacho, beef with vegetable soup, minestrone soup, and other soups made with vegetables.

○	○	○	○	○	○	○	○	○	○
Never (Go to Question 10)	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

9a. Each time you ate **vegetable soup**, how much did you usually eat?

○	○	○	○
Less than 1 cup	1 to 2 cups	2 to 3 cups	More than 3 cups

10. Over the last month, how often did you eat **mixtures that included vegetables**? Count such foods as sandwiches, casseroles, stews, stir-fry, omelets, and tacos.

○	○	○	○	○	○	○	○	○	○
Never	1-3 times last month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

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**Thank you very much for completing this questionnaire.
Please return it in the enclosed, postage-paid envelope or to the address listed on the front page.**

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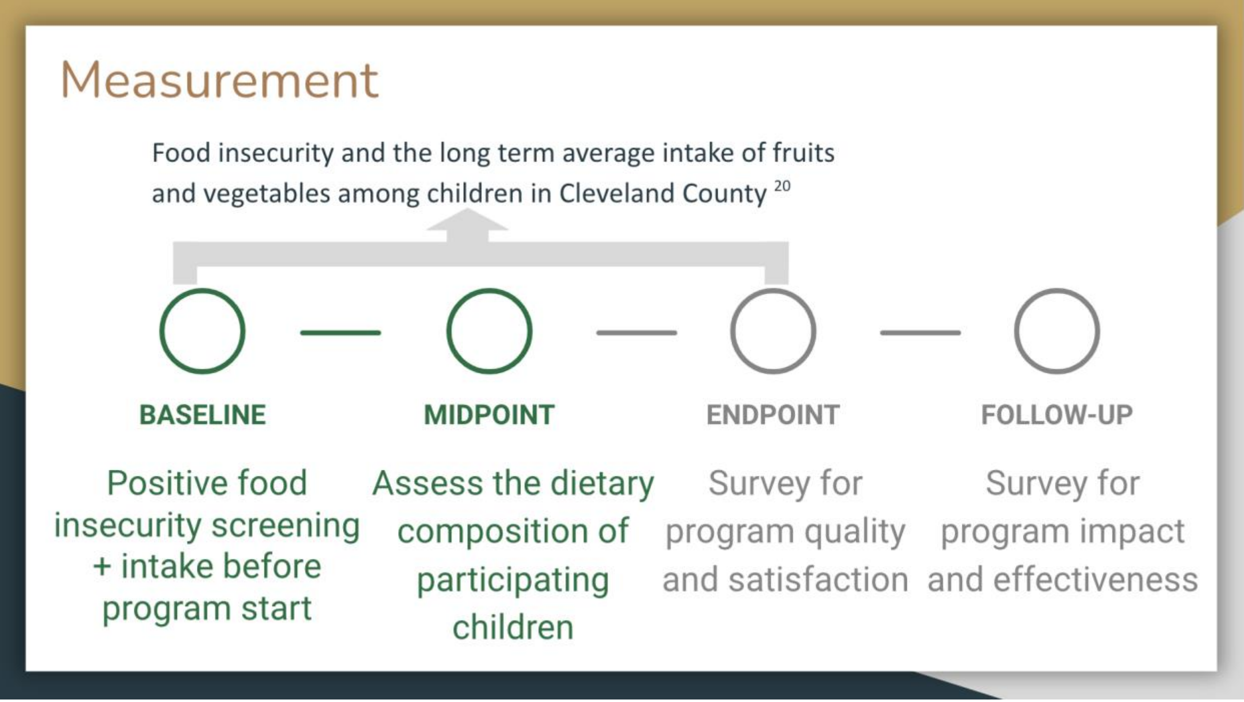
Presentation Slides and Script



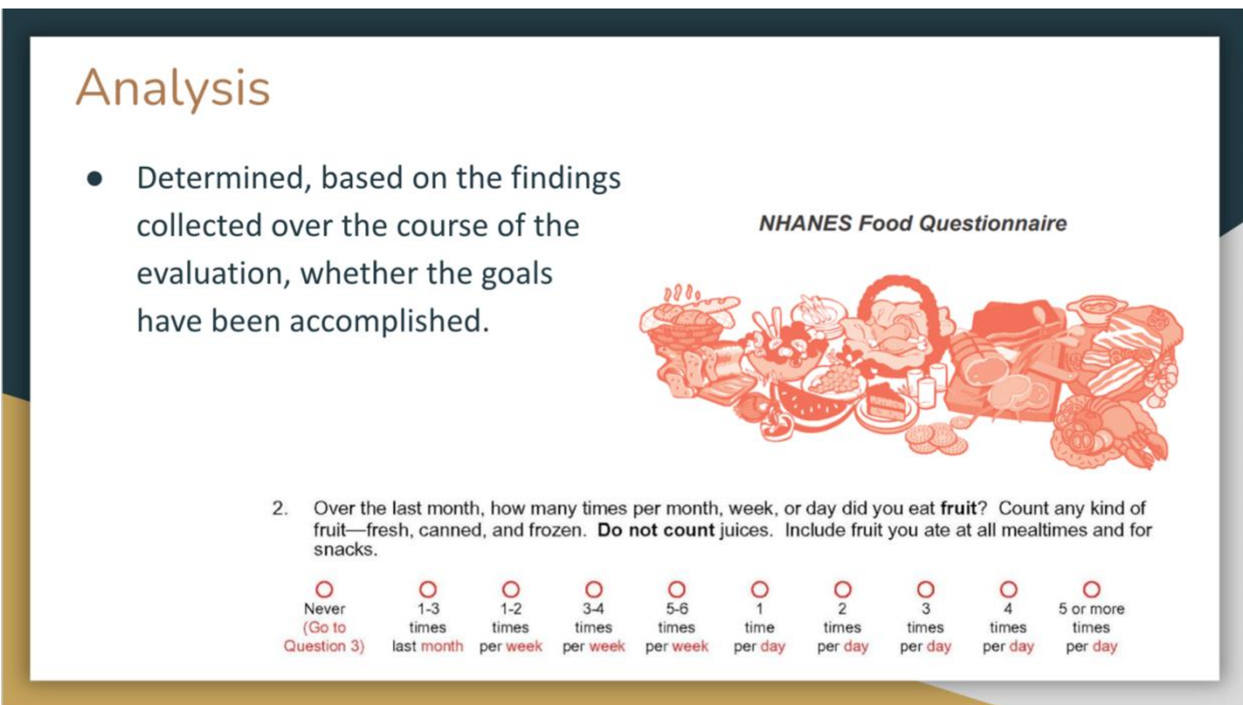
For the evaluation plan our goal is to determine how many children the program reaches, along with its effectiveness in addressing the child food insecurity problem in Cleveland County, and its long-term feasibility via mixed methods.

Measurements are listed here. At baseline, we will measure the food insecurity rate via the USDA survey mentioned before, and the long-term average intake of fruit and vegetable among children via the food frequency questionnaire, which sample is shown in the bottle

For process measurement, we are assessing the specific dietary structure and intake balance of participating children at the midpoint by using 24-hour recall.

At the endpoint, we will measure food insecurity and long-term intake again for comparing to baseline. And release a survey for program quality and participants' satisfaction feedback.

Finally, a follow-up survey for program impact and effectiveness after the program end.



Data analysis results determined, based on the findings collected over the course of the evaluation, whether the goals or outcome have been accomplished. So, we will be comparing the data collected at endpoint to the baseline

The picture shown here is the sample of the food frequency questionnaire that could be used for this program, asking how much fruit the participants have consume

APPENDIX H: ESTHER UDONSI

Problem Statement

Social Determinant of Health (SDoH)

According to Healthy people 2030, social determinants of health are the conditions that affect a wide range of health, functioning, and quality-of-life among individuals within an environment (U.S. Department of Health and Human Services, 2021). These determinants are grouped into five domains, the social and community context of SDOH focuses on how relationships and interactions significantly impact the health and well-being of an individual (U.S. Department of Health and Human Services, 2021). Cleveland County's 2019 health assessment shows poverty and adverse childhood experiences as the top issues in the county. Statistics show that children living in a poverty household are at a greater disadvantage and experience higher food insecurity (Epstein, 2000).

Children living in food insecurity have increased adverse health outcomes. They develop behavioral issues, experience decreased school performance and psychological issues (Murray 2006). Malnutrition and failure to thrive are also top concerns for children living in food insecurity. Food-insecure children also have higher lifetime asthma diagnoses and depressive symptoms than food secured children and visit the emergency department more frequently than their peers (Thomas et al., 2019). Statistics show that these issues directly correlate to poor nutrition/ lifestyle and could result in further nutrition-related issues such as obesity, heart disease, hypertension, and diabetes. (Murthy 2016). Research shows that health and poverty are intertwined to where the average daily function of a person depends on the baseline of good health (Murray 2006). Through nutrition intervention, the objective is to eliminate low food insecurity among children 0-18 in Cleveland County, NC (Cleveland County, 2020, n.d.).

Geographic and Historical Context

Geographically, Cleveland County is located on the southwestern border of North Carolina. The county is rural and has historically thrived on agriculture, especially cotton production. Today the county focuses on manufacturing and distributing electric motors, glass fibers, transmissions, truck cabs, aerospace, motor vehicle parts, and textile (Cleveland County 2 0, n.d.). Over 40% of Cleveland's workforce involves manufacturing, which offers high-paying jobs but mainly in the cities (Cleveland County 2 0, n.d.). One primary obstacle to accessing these jobs is transportation. There are no bus lines linking cities like Shelby and Kings Mountain with the smaller cities/towns across the county and no publicly funded transportation system. Some individuals rely on family members and friends for transportation or use the transportation administration of Cleveland County for regular

transportation (Cleveland County 2 0, n.d.). Transportation is also a barrier to health care access due to the location of primary physicians, mainly in Shelby and King Mountain. Low-income earners living outside of the major county cities who do not have personal transportation have to spend extra money to get to locations with better job opportunities and healthcare (Cleveland County 2 0, n.d.).

Priority Population

Looking at Cleveland County, NC, as the community of interest, Cleveland County has a population of 97,645 residents. Of the total population, 17% of the population reported experiencing food insecurity, and 29% of children reported living in poverty (Cleveland County 2 0, n.d.). In 2019, the total number of children living in food insecurity in Cleveland County was 23.2%, compared to the state at 18.3% (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d. There are 10,050 children eligible for free and reduced-price school meals in Cleveland County. Of the 10,050, only 78 percent of children get free, reduced-price school lunches, and only 41 percent of eligible children get free and reduced-price school breakfast. During the summer, this number drops drastically to zero percent, meaning that a significant number of children experience extreme food insecurity during the summer (Food Insecurity Statistics in N.C. | Hunger Research, n.d.). In 2016- 2017, Cleveland County Department of Social Services issued $28,246,670 worth of food assistance to a monthly average of 18,281 families and children (Food Insecurity Statistics in N.C. | Hunger Research, n.d.). However, the County still reported an annual food budget deficit of $7,478,000. The annual deficit is the amount reported that individuals need to purchase just enough food to meet their needs yearly (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d.).

Measures of Problem Scope

Cleveland County is rated as one of the most economically disadvantaged counties in North Carolina compared to the general population. Food insecurity in this county is prevalent among the minority population. Judging by household income, African American residents have the lowest household income compared to Caucasians, and native Americans (Cleveland County 2 0, n.d.). Certain areas within the county that experience higher risk of food insecurity can be differentiated by zip codes. For example, the 28150-zip code in the City of Shelby includes two high-risk, low-income neighborhoods. The Town of Kingstown is a second example, and it lies within the 28152-zip code. Most children who live in households within these areas are guaranteed to be directly

impacted by poverty and food insecurity. Due to financial hardships, parents of these children are unable to provide nutritious meals that children need to grow into healthy adulthood (Epstein, 2000).

Rationale/Importance

According to an article by save-the-children, over 1.6 million children in California and nearly 1.7 million children in Texas were at risk of hunger in 2017. The highest child food insecurity is recorded in New Mexico and Arkansas at 24.1% and 23.6%, respectively, more than twice the rates in Massachusetts and North Dakota. (Statistics About Food Insecurity in America, n.d.). With over 40 million people enrolled in SNAP benefits and $103.6 billion supporting federal food and nutrition assistance programs shows that food insecurity especially among low-income earners is a pressing issue that requires urgent intervention (Boston & Ma 02115 +1495 1000, 2018). If childhood food insecurity equity gaps were closed in all 50 states, there would be 3.5 million fewer food-insecure children in America. Reducing the number of children struggling with hunger by a quarter (26%) (Statistics About Food Insecurity in America, n.d.). It would take collaborative effort from impacted states/ counties like Cleveland County to reduce childhood hunger. Without urgent intervention, food-insecure children are at risk of developing chronic health diseases such as hypertension, coronary heart disease (CHD), hepatitis, stroke, cancer, asthma, diabetes, arthritis, chronic obstructive pulmonary disease (COPD), and kidney disease in in the future due to poor nutritional intake (Hunger and Health - the Impact of Poverty, Food Insecurity, and Poor Nutrition on Health and Well-Being - Food Research & Action Center, 2018).

Disciplinary Critique

To fulfill the objectives of healthy people 2030, public health leaders and dietitians must take an interest in rural communities such as Cleveland County. Addressing food security is a complex issue that requires a multisector effort to address the problems related to social determinants of health (Murthy, 2016). Providing these communities access to much-needed resources and information would help improve health outcomes in the area. When individual health outcomes improve within communities, that improves the overall county health outcomes. Also, studies show that improving health outcomes such as nutrition intervention and raising incomes for families in poverty may dampen poverty's related effect, such as food insecurity for low-income children (Berger et al., 2009). Early intervention would reduce potential future barriers that these children would face in health care due to food insecurity related diseases/conditions.

APPENDIX H.1: Cleveland County Demographics

Table 1. Demographics

Cleveland County (CC)	
Total Population	97,645
% Childhood food insecurity	23.2% CC 18.3% NC
% Poverty rate	19.9%
% Childhood Poverty rate	27.5%

APPENDIX H.2: Federal Nutrition Program Statistics

Table 2. Federal Nutrition Program

Cleveland County SNAP program	
Children eligible for free and reduced-price school meals	10,050
Percent of children who receive free, reduced-price school lunches	78%
percent of eligible children get free and reduced-price school breakfast	41%

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Nutrition Program

Background Information

Social determinants of health, the conditions in the environments that affect a person's health, functioning, and quality-of-life outcomes, are grouped into five domains. These domains focus on the different factors contributing to individual and community health outcomes (U.S. Department of Health and Human Services, 2021). The social and community context focuses explicitly on the impact of relationships and interactions on the health and well-being of an individual (U.S. Department of Health and Human Services, 2021). Looking at Cleveland County 2019 health assessment, the number of food insecure children was 29%. This number is significantly higher than the reported childhood food insecurity rate in NC (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d.). The health assessment also reported poverty and adverse childhood experiences as the top issues in the county (Cleveland County, 2 0, n.d.). Through nutrition intervention, the objective is to eliminate low food insecurity among children 0-18 in Cleveland County, NC (Cleveland County, 2 0, n.d.).

Statistics show that children living in a poverty household are at a greater disadvantage and experience higher food insecurity (Epstein, 2000). With over 10,050 children eligible for free and reduced-price school meals in Cleveland County, only 78 % of children receive free or reduced-price school lunches, and only 41 % of eligible children get free and reduced-price school breakfast. During the summer/long holiday, the number of children who receive government meal assistance drops drastically. Therefore, increasing the total rate of childhood in food insecurity (Food Insecurity Statistics in N.C. | Hunger Research, n.d.). Research shows that food-insecure children develop higher behavioral issues, experience decreased school performance, suffer from childhood obesity and psychological issues (Murray 2006). They also show higher depressive symptoms than food secure children and develop lifetime asthma diagnoses (Thomas et al., 2019). Due to lack of routine medical care, food insecure children visit the emergency department more frequently than their peers (Thomas et al., 2019). The long-term implication of not addressing childhood food insecurity in Cleveland County would result to chronic health diseases in the future such hypertension, coronary heart disease (CHD), hepatitis, stroke, cancer, asthma, diabetes, arthritis, chronic obstructive pulmonary disease (COPD) due to poor nutritional intake (Hunger and Health - the Impact of Poverty, Food Insecurity, and Poor Nutrition on Health and Well-Being - Food Research & Action Center, 2018).

Purpose

Cleveland County, NC, has a disproportionately higher number of food-insecure children compared to the state of N.C. (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d.). In 2019, the total number of children living in food insecurity in Cleveland County was 23.2%, compared to the state at 18.3% (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d.). Childhood insecurity in NC is also highly racialized and skewed towards the marginalized population (Nichol & Hunt, 2021). African and Native American children experience higher food insecurity due to lower household income (Cleveland County 2 0, n.d.). Currently, there is an annual food budget deficit of $7,478,000 in Cleveland County. The annual deficit is the amount reported that individuals need to purchase just enough food to meet their needs yearly. Despite federal efforts to mitigate food insecurity, 25 % of the children experiencing food insecurity are ineligible for federal nutrition programs (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d.). These children are forced to either seek help elsewhere, pay more for meals or go without food. Through the nutrition intervention programs (mobile groceries for children), children in Cleveland County have hope to receive supplemental food support (Feeding Kids Cleveland County, n.d.)

Evidence-Based Outcomes

The short-term objective of the program (mobile groceries for children) is to increase fruit and vegetable consumption among children in Cleveland County and decrease the proportion of children that are food insecure by providing supplemental groceries to families with children 18 and under. In two years, these interventions aim to reduce the incidence of poor health-related nutritional intake in children 0-18 (Food Insecurity and Disordered Eating | Duke Center for Eating Disorders, n.d.). Provide nutrition education and reduce the number of times children skip meals due to poverty and lack of access to food. (Food Support Programs and Their Impacts On Very Young Children, 2019)

The long-term goal of this intervention is to mitigate childhood food insecurity in Cleveland County and decrease the total number of children experiencing food insecurity (Food Security and Nutrition, n.d.). The goal is to have the total percent down below the state or national average through a collaborative effort with schools, local food banks/hubs, community partnerships, and non-governmental agencies (NGOs) to provide monthly grocery deliveries to households with children. The intervention would also partner with Atrium health dieticians and nutritionists to provide nutrition education that helps individuals and families make better food choices and

ultimately improve their children's overall health. The long-term health outcome of this intervention will improve overall health of children in Cleveland County and reduce hospital visits (Food Support Programs and Their Impacts on Very Young Children, 2019). This outcome is possible because children would learn healthy nutrition habits and reduce uncertainties about the next meal (Food Security and Nutrition, n.d.)

Strategies and Activities

This intervention (mobile groceries for kids) will fill the gaps for children who do not qualify for any federal assistance program and families with children who still need food assistance even though they are in a federal nutrition program. The goal is to deliver groceries to families that indicate a need for grocery assistance during long school breaks such as summer, winter, spring, and three days breaks as well as monthly. The program would evaluate applicants to ensure they match the criteria that indicate food insecurity administered through verbal or written assessment. This would ensure that the program captures the right participants. This program will help tackle not only food insecurity but also reduce barriers to accessing healthy food, such as transportation and the lack of supply of healthy food options due to the limited availability of grocery stores (Hathaway, 2008).

The program intervention would deliver fresh fruit and vegetable and other healthful food items to families with children in need in Cleveland County. The items would serve as supplemental nutrition assistance when kids are out of school and do not have access to school meals. By purchasing and repurposing broken school buses, the program can ensure that insecure families with children who need food receive groceries and food deliveries when they sign up at designated locations (Schools, clinics/hospitals, food banks). The program would also utilize existing bus routes for faster delivery (Rural Project Summary: Lunch Express Summer Food Program - Rural Health Information Hub, n.d.). The program plans to collaborate with schools to identify food-insecure students and students who do not qualify for federal nutrition programs. Families who sign up automatically get monthly food deliveries. Partnership with food banks and hubs, community, and local non-governmental agencies would ensure constant availability of food items. This intervention aims to reach at least 150 families that are food insecure. Similar interventions are currently in place in different states, including North Carolina and Florida. (Mobile FARMacy bringing grocery stores on wheels to food-insecure neighborhoods - Feeding South Florida, n.d.) (Feeding Kids Cleveland County, n.d.). Through these partnerships, more families would know about the program.

Stakeholders

This program intervention will utilize top stakeholders to ensure success. The key stakeholders are selected based on their potential contribution and current participation in community efforts. Stakeholders include community members, parents with children, food banks/hubs, Atrium health, schools, Cleveland County commissioners, and public health practitioners.

Community members would provide first-hand experience and suggestions needed to implement a successful intervention plan. Parents and children are the primary stakeholders. Their role will be to provide information that would help us determine the level of food insecurity and nutrition needed. Parents would be the first point of contact and a decision-maker for children and provide parental support. The program would also partner with food banks/hubs and NGOs to ensure constant grocery donations/provision. The program would rely heavily on the generosity of this stakeholders. The community health department would take anthropometric measurements, provide food insecurity and malnutrition screening, and provide medical treatment to children with conditions related to food insecurity. Also, the program would gain insight and suggestions on efforts that worked and did not work with another supplemental program. Partnership with Atrium health dietitians would provide nutrition educations with families on nutrition choices. Schools in Cleveland County would help promote program intervention and facilitate signups.

Conclusion

This program intervention would prioritize families with children under 18 and children who do not qualify for any federal nutrition program. Even though this intervention would provide food assistance to all, families that do not partake in any other nutrition assistant program would receive top priority. The final recommendation would reduce food insecurity, improve school performances, decrease children's emergency room visits, and improve overall short- and long-term child health outcomes. Despite the potential benefit of implementing this program, there are some disadvantages. Program implantation is not only time-consuming but costly; therefore, public health practitioners would need to work tirelessly to obtain funds to implement this program. Another disadvantage is potential bullying among children receiving benefits from the program. Research shows that children who receive food assistance have a higher exposure to bullying compared to children who do not. (APA PsycNet, n.d.)

APPENDIX H.3: Budget

Table 1. Program Budget

Item/Activity	Budget (annually)
School bus purchase and repairs	$15,000
Gas per month for school bus	Summer/holiday: $500 Monthly deliveries:100
Travel reimbursement	58.3cents per mile
Office space per month	$6,500
Compensation/staff salaries	$60,000
Equipment/publication/ supplies	$5000
Event/meeting refreshments	$1000

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Implementation and Evaluation Plan

Summary

Social determinants of health (SDOH), the conditions in the environments that affect a person's health, functioning, and quality-of-life outcomes, are grouped into five domains. The social and community context focuses explicitly on the impact of relationships and interactions on the health and well-being of an individual (U.S. Department of Health and Human Services, 2021). Looking at Cleveland County, the 2019 health assessment showed a population of 97,645 residents. Of the total population, 17% reported experiencing food insecurity, and 29% of children reported living in poverty, with poverty and adverse childhood experiences as the top issues in the county (Cleveland County, 2 0, n.d.). Through nutrition intervention, the objective is to eliminate low food insecurity among children 0-18years in Cleveland County, NC. Statistics show that children living in a poverty household are at a greater disadvantage and experience higher food insecurity (Epstein, 2000).

In addition, to household poverty that impact food insecurity, 25 % of the children experiencing food insecurity are ineligible for federal nutrition programs (Child Hunger & Poverty in Cleveland County, North Carolina | Map the Meal Gap, n.d.). Research shows that food-insecure children have higher lifetime asthma diagnoses, forgone medical care, and depressive symptoms than food-secured children (Thomas et al., 2019). These children also visit the emergency department more frequently than their peers (Thomas et al., 2019). Food insecure children develop behavioral issues, experience decreased school performance, suffer from childhood obesity and psychological issues (Murray 2006). Without urgent intervention, food-insecure children are at risk of developing long term chronic health disease/conditions.

The short- and long-term outcomes of the intervention (mobile groceries for children) is to increase fruit and vegetable consumption among children in Cleveland County (Food Support Programs and Their Impacts on Very Young Children, 2019) and decrease the total number of children experiencing food insecurity (Food Security and Nutrition, n.d.). The goal is to have the total percent below the state or national average through a collaborative effort with schools, local food banks/hubs, community partnerships, and non-governmental agencies (NGOs) to provide monthly grocery deliveries to households with children. The Program would mitigate two pressing issues in the social and community contexts of SDOH, which is, reducing the barrier to food access by delivering food items to families in need in Cleveland County and reduce food insecurity by providing supplemental food items when kids are out of school and do not have access to school meals. By purchasing and repurposing broken school buses, the

program can utilize existing routes to ensure that insecure families with children in need receive groceries and food deliveries when they sign up at designated locations (Schools, clinics/hospitals, food banks). (Rural Project Summary: Lunch Express Summer Food Program - Rural Health Information Hub, n.d.)

Evaluation Plan

The program would evaluate short term outcomes using food frequency questionnaires which would take place at baseline, mid-point (1 year) and end point (2 years). Using surveys, the program aims to capture parents' feedback. Parents are an important part of our implantation since groceries are delivered to the household. The success of the intervention relies on parents/guardians to prepare and feed these meals to the children. Hence the need to get parents' input.

Sample and Sampling Strategy

The inclusion criteria will depend heavily on the assessment response from the participants at sign up. The program would adopt and modify the USDA household food insecurity assessment (Appendix H.4, Figure 1) to screen for childhood and household food insecurity, and partner with schools and local hospitals to recommend children to the program. Participants whose assessments show signs for food would automatically be enrolled into the program once they sign up.

Specific Measures

The program would measure the short-term outcome (Increase fruit and vegetable consumption among children in Cleveland County) using data collected on the food frequency questionnaire (FFQ) at baseline and comparing it to the midpoint (1 year) assessment (Appendix H.5, Figure 2). The program would measure long term outcome (decrease the total number of children experiencing food insecurity, have the total percent down below the state or national average) using the USDA food insecurity assessment by comparing the food insecurity assessment questionnaire participants filled during sign up and at endpoint (2 years).

Analysis Plan

The program would use both descriptive and inferential statistical analysis when evaluating information collected from participants' nutrition intake at baseline using food frequency questionnaire (FFQ) and food insecurity assessment. After completion of the program, the pre and post data would be compared using paired T-Test statistical analysis against the NC statistics on food insecurity to determine if the intervention met the goals to improve fruits and vegetable consumption for children and long-term outcome of reducing food insecurity.

Timing

The program would run for two academic years (August year 1- August year 2). Stakeholder engagement activity would begin 2-6 months prior to the start of the intervention. At the end of each academic year, there would be an evaluation at midpoint (year 2) and endpoint (year 2). A midpoint analysis with 50% or greater satisfaction indicates positive progress. Suggestions for program improvement would be taken at this point. After program completion, the team would follow up quarterly with families who benefited from the program for one year through surveys for both parent and children. The survey would contain detailed questions on current nutrition practices and capture any nutritional benefits seen or experienced in children.

Sources of Funding

The program aims to receive funding from multiples sources e.g., grants, donations cash/grocery items (from individual, governmental, private companies, NGO's), extra funds from the education success program and county level funds (Rural Project Summary: Lunch Express Summer Food Program - Rural Health Information Hub, n.d.).

Data Use and Dissemination

The program would utilize flyers, print, school and community events and hospitals bulletin boards for further dissemination.

Strengths and Challenges

Through this program, there would be increased food accessibility especially for children in rural areas. children enrolled would not have to worry about where their next meal will come from and as a result focus on academic improvement. By providing for children, parents would also have reduced stress and anxiety.

Since intervention is only applicable to food insecure households. There is always fear of turning down people who really need help but did not clear the inclusion assessments. It would be challenging to know how much food the children are consuming since groceries are delivered to the house. The biggest challenge the program might have would be with reaching children since most food insecure children are ashamed of asking for help.

Potential Impact

Implementing mobile meals for children would reduce the burden of food insecurity and improve overall health outcomes.

APPENDIX H.4: Survey Questions Used by USDA to Assess Household Food Security

Figure 1. Survey Questions Used by USDA to Assess Household Food Security

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)

How Many Households are Interviewed in the National Food Security Surveys?

USDA's food security statistics are based on a national food security survey conducted as an annual supplement to the monthly Current Population Survey (CPS). The CPS is a nationally representative survey conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CPS provides data for the Nation's monthly unemployment statistics, and annual income and poverty statistics.

APPENDIX H.5: FFQ

Figure 2. FFQ (link to full FFQ) 244004-4.ps (cdc.gov)

NHANES Food Questionnaire

More than one member of your household may have received a questionnaire. Please make sure this is your booklet before answering any questions.

LABEL HERE

GENERAL INSTRUCTIONS

- **Answer each question as best you can. Estimate if you are not sure. A guess is better than leaving a blank.**
- **Use only a No. 2 pencil.**
- **Be certain to completely blacken in each of the answers.**
- **Erase completely if you make any changes.**
- **Do not make any stray marks on this form.**
- **If you blacken NEVER or NO for a question, please follow any arrows or instructions that direct you to the next question.**

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

1. Over the past 12 months, how often did you drink **tomato juice** or **vegetable juice**?

- ◯ NEVER

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

2. How often did you drink **orange juice** or **grapefruit juice?**

- ◯ NEVER

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

3. How often did you drink **apple juice?**

- ◯ NEVER

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

4. How often did you drink **grape juice?**

- ◯ NEVER

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

5. How often did you drink **other 100% fruit juice** or **100% fruit juice mixtures** (such as pineapple, prune, or others)?

- ◯ NEVER

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

6. How often did you drink other **fruit drinks** (such as cranberry cocktail, Hi-C, lemonade, or Kool-Aid, diet or regular)?

- ◯ NEVER **(GO TO QUESTION 7)**

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

6a. How often were your fruit drinks **diet** or **sugar-free drinks**?

- ◯ Almost never or never
- ◯ About 1/4 of the time
- ◯ About 1/2 of the time
- ◯ About 3/4 of the time
- ◯ Almost always or always

7. How often did you drink **milk as a beverage** (NOT in coffee, NOT in cereal)? (Please include chocolate milk and hot chocolate.)

- ◯ NEVER **(GO TO QUESTION 8)**

- ◯ 1 time per month or less
- ◯ 2–3 times per month
- ◯ 1–2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2–3 times per day
- ◯ 4–5 times per day
- ◯ 6 or more times per day

7a. What kind of **milk** did you usually drink?

- ◯ Whole milk
- ◯ 2% fat milk
- ◯ 1% fat milk
- ◯ Skim, nonfat, or 1/2% fat milk
- ◯ Soy milk
- ◯ Rice milk
- ◯ Raw, unpasteurized milk
- ◯ Other

BAR CODE LABEL HERE

Question 8 appears on the next page.

Over the past 12 months...

13. Did you eat **oatmeal, grits,** or **other cooked cereal?**

○ NO (GO TO QUESTION 14)

○ YES

13a. How often did you eat **oatmeal, grits,** or **other cooked cereal IN THE WINTER**?

○ NEVER

○ 1–6 times per winter
○ 7–11 times per winter
○ 1 time per month
○ 2–3 times per month
○ 1 time per week
○ 2 times per week
○ 3–4 times per week
○ 5–6 times per week
○ 1 time per day
○ 2 or more times per day

13b. How often did you eat **oatmeal, grits,** or **other cooked cereal DURING THE REST OF THE YEAR?**

○ NEVER

○ 1–6 times per year
○ 7–11 times per year
○ 1 time per month
○ 2–3 times per month
○ 1 time per week
○ 2 times per week
○ 3–4 times per week
○ 5–6 times per week
○ 1 time per day
○ 2 or more times per day

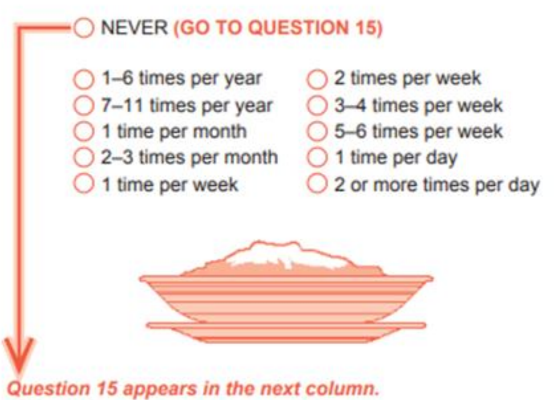
13c. How often was the cooked cereal you ate **oatmeal**?

○ Almost never or never
○ About 1/4 of the time
○ About 1/2 of the time
○ About 3/4 of the time
○ Almost always or always

14. How often did you eat **cold cereal**?

○ NEVER (GO TO QUESTION 15)

○ 1–6 times per year
○ 7–11 times per year
○ 1 time per month
○ 2–3 times per month
○ 1 time per week
○ 2 times per week
○ 3–4 times per week
○ 5–6 times per week
○ 1 time per day
○ 2 or more times per day



Question 15 appears in the next column.

14a. How often was the cold cereal you ate a **whole grain type** (such as shredded wheat, Wheaties, Cheerios, Raisin Bran or other bran, oat, or whole wheat cereal)?

○ Almost never or never
○ About 1/4 of the time
○ About 1/2 of the time
○ About 3/4 of the time
○ Almost always or always

14b. Was **milk** added to your cold cereal?

○ NO (GO TO QUESTION 15)

○ YES

14c. What kind of **milk** was usually added?

○ Whole milk
○ 2% fat milk
○ 1% fat milk
○ Skim, nonfat, or 1/2% fat milk
○ Soy milk
○ Rice milk
○ Raw, unpasteurized milk
○ Other

15. How often did you eat **applesauce**?

○ NEVER

○ 1–6 times per year
○ 7–11 times per year
○ 1 time per month
○ 2–3 times per month
○ 1 time per week
○ 2 times per week
○ 3–4 times per week
○ 5–6 times per week
○ 1 time per day
○ 2 or more times per day

16. How often did you eat **apples**?

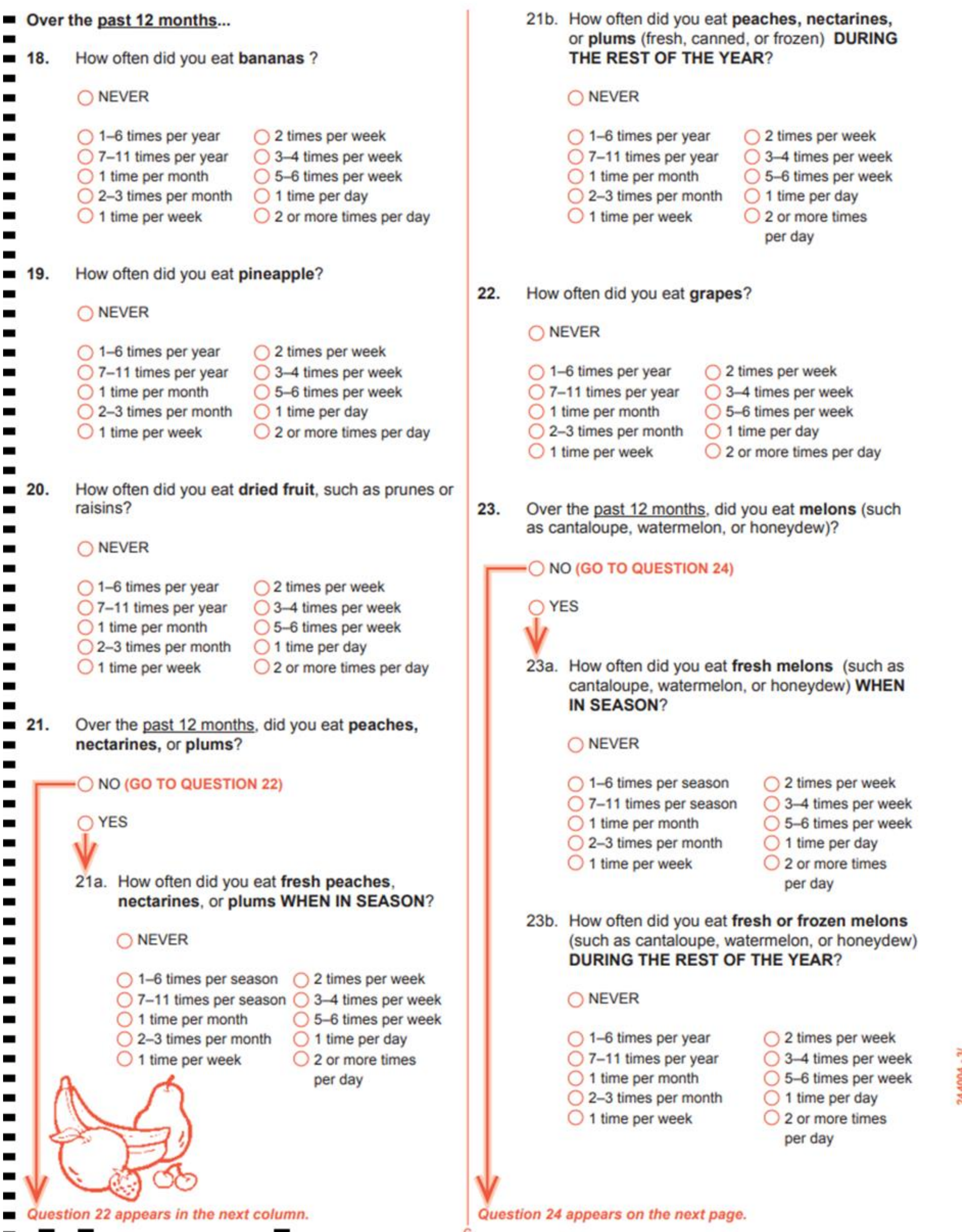
○ NEVER

○ 1–6 times per year
○ 7–11 times per year
○ 1 time per month
○ 2–3 times per month
○ 1 time per week
○ 2 times per week
○ 3–4 times per week
○ 5–6 times per week
○ 1 time per day
○ 2 or more times per day

17. How often did you eat **pears** (fresh, canned, or frozen)?

○ NEVER

○ 1–6 times per year
○ 7–11 times per year
○ 1 time per month
○ 2–3 times per month
○ 1 time per week
○ 2 times per week
○ 3–4 times per week
○ 5–6 times per week
○ 1 time per day
○ 2 or more times per day



Over the past 12 months...

18. How often did you eat **bananas** ?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

19. How often did you eat **pineapple**?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

20. How often did you eat **dried fruit**, such as prunes or raisins?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

21. Over the past 12 months, did you eat **peaches, nectarines,** or **plums**?

- NO **(GO TO QUESTION 22)**
- YES

21a. How often did you eat **fresh peaches, nectarines**, or **plums WHEN IN SEASON**?

- NEVER
- 1–6 times per season
- 7–11 times per season
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

Question 22 appears in the next column.

21b. How often did you eat **peaches, nectarines,** or **plums** (fresh, canned, or frozen) **DURING THE REST OF THE YEAR**?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

22. How often did you eat **grapes**?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

23. Over the past 12 months, did you eat **melons** (such as cantaloupe, watermelon, or honeydew)?

- NO **(GO TO QUESTION 24)**
- YES

23a. How often did you eat **fresh melons** (such as cantaloupe, watermelon, or honeydew) **WHEN IN SEASON**?

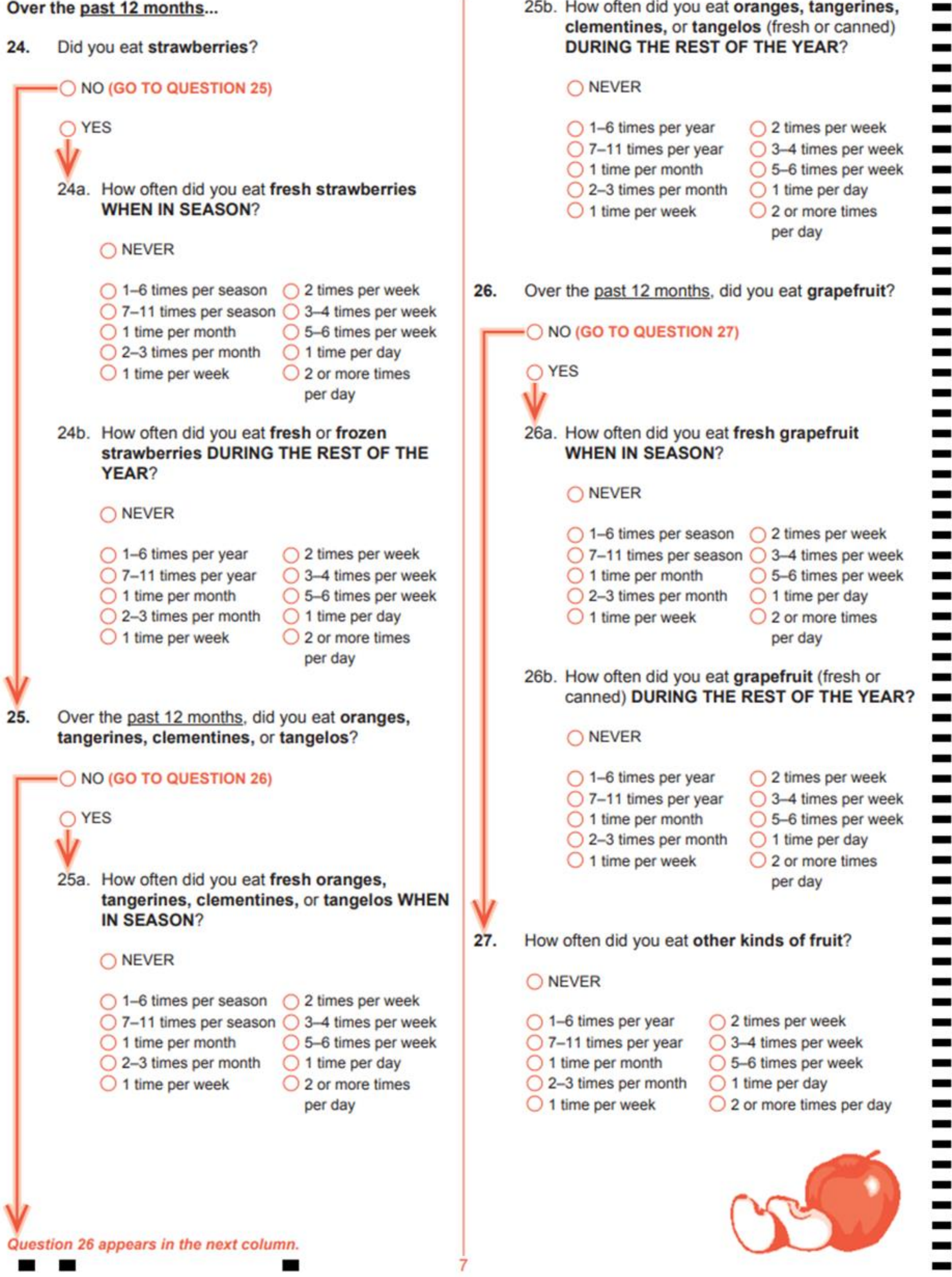
- NEVER
- 1–6 times per season
- 7–11 times per season
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

23b. How often did you eat **fresh or frozen melons** (such as cantaloupe, watermelon, or honeydew) **DURING THE REST OF THE YEAR**?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

Question 24 appears on the next page.

6



Over the past 12 months...

24. Did you eat **strawberries**?

- ◯ NO **(GO TO QUESTION 25)**
- ◯ YES

24a. How often did you eat **fresh strawberries WHEN IN SEASON**?

◯ NEVER

◯ 1–6 times per season	◯ 2 times per week
◯ 7–11 times per season	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

24b. How often did you eat **fresh** or **frozen strawberries DURING THE REST OF THE YEAR**?

◯ NEVER

◯ 1–6 times per year	◯ 2 times per week
◯ 7–11 times per year	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

25. Over the past 12 months, did you eat **oranges, tangerines, clementines,** or **tangelos**?

- ◯ NO **(GO TO QUESTION 26)**
- ◯ YES

25a. How often did you eat **fresh oranges, tangerines, clementines,** or **tangelos WHEN IN SEASON**?

◯ NEVER

◯ 1–6 times per season	◯ 2 times per week
◯ 7–11 times per season	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

Question 26 appears in the next column.

25b. How often did you eat **oranges, tangerines, clementines,** or **tangelos** (fresh or canned) **DURING THE REST OF THE YEAR**?

◯ NEVER

◯ 1–6 times per year	◯ 2 times per week
◯ 7–11 times per year	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

26. Over the past 12 months, did you eat **grapefruit**?

- ◯ NO **(GO TO QUESTION 27)**
- ◯ YES

26a. How often did you eat **fresh grapefruit WHEN IN SEASON**?

◯ NEVER

◯ 1–6 times per season	◯ 2 times per week
◯ 7–11 times per season	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

26b. How often did you eat **grapefruit** (fresh or canned) **DURING THE REST OF THE YEAR?**

◯ NEVER

◯ 1–6 times per year	◯ 2 times per week
◯ 7–11 times per year	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

27. How often did you eat **other kinds of fruit**?

◯ NEVER

◯ 1–6 times per year	◯ 2 times per week
◯ 7–11 times per year	◯ 3–4 times per week
◯ 1 time per month	◯ 5–6 times per week
◯ 2–3 times per month	◯ 1 time per day
◯ 1 time per week	◯ 2 or more times per day

7

Over the past 12 months...

28. How often did you eat **COOKED greens** (such as spinach, turnip, collard, mustard, chard, or kale)?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

29. How often did you eat **RAW greens** (such as spinach, turnip, collard, mustard, chard, or kale)? *(We will ask about lettuce later.)*

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

30. How often did you eat **coleslaw**?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

31. How often did you eat **sauerkraut** or **cabbage** (other than coleslaw)?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

32. How often did you eat **carrots** (fresh, canned, or frozen)?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

33. How often did you eat **string beans** or **green beans** (fresh, canned, or frozen)?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

34. How often did you eat **peas** (fresh, canned, or frozen)?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

35. Over the past 12 months, did you eat **corn**?

- NO **(GO TO QUESTION 36)**
- YES

35a. How often did you eat **corn** (fresh, canned, or frozen) **WHEN IN SEASON**?

- NEVER
- 1–6 times per season
- 7–11 times per season
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

35b. How often did you eat **corn** (fresh, canned, or frozen) **DURING THE REST OF THE YEAR**?

- NEVER
- 1–6 times per year
- 7–11 times per year
- 1 time per month
- 2–3 times per month
- 1 time per week
- 2 times per week
- 3–4 times per week
- 5–6 times per week
- 1 time per day
- 2 or more times per day

Question 36 appears on the next page.

Over the past 12 months...

36. How often did you eat **broccoli** (fresh or frozen)?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

37. How often did you eat **cauliflower** or **Brussels sprouts** (fresh or frozen)?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

38. How often did you eat **mixed vegetables**?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

39. How often did you eat **onions** (including in mixtures)?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

40. Over the past 12 months, how often did you eat **sweet or hot peppers** (green, red, or yellow)?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

41. How often did you eat **raw cucumbers** (not including pickles)?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

42. Over the past 12 months, did you eat **fresh tomatoes** (including those in salads)?

- ◯ NO **(GO TO QUESTION 43)**
- ◯ YES

42a. How often did you eat **fresh tomatoes** (including those in salads) **WHEN IN SEASON**?

- ◯ NEVER
- ◯ 1–6 times per season
- ◯ 7–11 times per season
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

42b. How often did you eat **fresh tomatoes** (including those in salads) **DURING THE REST OF THE YEAR**?

- ◯ NEVER
- ◯ 1–6 times per year
- ◯ 7–11 times per year
- ◯ 1 time per month
- ◯ 2–3 times per month
- ◯ 1 time per week
- ◯ 2 times per week
- ◯ 3–4 times per week
- ◯ 5–6 times per week
- ◯ 1 time per day
- ◯ 2 or more times per day

Question 43 appears on the next page.

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Presentation Slides and Script

Nutrition Program - Mobile Meals for Children

Implementation plan

- Food sourced from local grocery stores, local farmers, and produce growers local food banks. [17]
- Retrofitted/repurposed school buses will deliver food to houses of families enrolled in the program. [18]

Eligibility

- All families with children under 18 years of age.
- Screens positive for food insecurity using a validated USDA survey.

Existing Assets

- Backpack program, food delivery, community table.
- Feed over 850 children on weekend and during holidays. [19]

In line with the policy goal, Mobile Meals for Children (MMC) is a nutrition program that aim to increase fruits and vegetable intake among children 18 and under and reduce the overall childhood food insecurity in Cleveland County below the state average.

The program would provide supplemental food items to families with children during long holidays like summers, winters, spring break and 3 days holidays.

The program plans to source food from various places, including local grocery stores, local farmers, food banks and produce growers.

Local farmers and Grocery stores may be willing to donate foods approaching its “best-by” or “sell-by” dates and foods less likely to be sold for aesthetic reasons (size, blemishes, etc.).

Additionally, the program also intends to partner with local food banks to deliver non-perishable goods, such as canned fruits and vegetables.

The program will use repurpose school buses to deliver these food items to the houses of families enrolled in the program, further reducing transportation and other similar access barriers especially for people living in rural areas.

The program will be made available to all families in Cleveland County with children under the age of 18. The only inclusion criteria are a positive test for FI based on pre-established criteria by USDA.

Program recruitment will occur at local schools, daycares, after-school programs, and social worker's offices.

The program also plans to leverage existing assets in the community and implement components of other successful programs in North Carolina, such as Feeding Kids Cleveland County.

Feeding Kids Cleveland County runs a backpack program, a food delivery program, and hosts community table meals that feed over 850 children on the weekend and during the holidays.

If implemented, the MMC program will ensure that families and children have consistent access to healthy and nutritious foods. Additionally, by offering a program with broad eligibility standards, this program can ensure all children are food secure, including those not eligible for federal programs.