

Appendix A
Background Information

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The bivariate analyses using the key sociodemographic characteristics (see Chapter 1, Section 1.8.2) address many of the research questions posed for this study. Table A-1 lists specific chapters that address individual research questions. Table A-2 presents examples of analyses addressing the different research questions.

Table A-1. Study research questions

	Research question	Chapter
1.	How do feeding practices vary with caregiver work/school status (e.g., part-time, full-time), family circumstances (e.g., number and age of household members, household member's participation in WIC, Supplemental Nutrition Assistance Program [SNAP], etc.), and childcare/preschool/school circumstances?	2, 5
2.	In what food environments (home, school, childcare, etc.) do children consume meals and snacks during the sixth year of life? How do these environments vary by subgroups of interest?	2, 5
3.	What proportion of intake is consumed in the various food environments? To what extent does this vary across subgroups of interest?	2
4.	To what extent do feeding practices during the sixth year of life vary by household continued participation in WIC (i.e., someone else in the household is receiving WIC benefits) and/or by the household's participation in other Federal food assistance programs?	2, 5
5.	For caregivers who received referrals through WIC, how do they get referred or connected to other health, welfare, and social services once the household is no longer receiving WIC services?	2
6.	Do caregivers continue to purchase the foods they previously received in their child's WIC food package, even when no one in the household is receiving WIC?	2
7.	What is the food security status for children and their households overall and for key subgroups and characteristics of interest?	2
8.	How does food security status change when the child ages out of WIC? To what extent does prior WIC participation, or current household WIC participation, influence food security status during the sixth year of life?	2
9.	How does participation in other food assistance programs by the child or their household impact household food security overall and by subgroups of interest?	2
10.	What are the meal and snack patterns, both overall and by subgroups of interest?	3
11.	How many 5-6-year-olds exhibit unhealthy eating patterns, and what characteristics are associated with these habits?	3, 6
12.	How do dietary intake patterns change once a child ages out of WIC? How do changes in these patterns vary across subgroups?	3, 4

Table A-1. Study research questions (continued)

Research question	Chapter
<p>13. What is the relationship, if any, between (1) cumulative years of participation in WIC, (2) ages during WIC participation, and (3) continuity of WIC benefit receipt (e.g., constant vs. intermittent) and dietary behaviors and energy and nutrient intake after aging out of WIC?</p> <p>a. Are differences affected by eligibility for and/or participation in other food benefit programs (e.g., National School Lunch Program [NSLP]/School Breakfast Program [SBP], Summer Food Service Program [SFSP], SNAP)?</p> <p>b. Do dietary patterns of children with longer durations of participation in WIC more closely reflect nutrients emphasized by WIC than those who have shorter duration/more intermittent benefits?</p> <p>c. Do early feeding practices, meal/snack patterns, or food and nutrient intakes between ages 0 and 24 months relate to feeding practices, meal/snack patterns, and food and nutrient intakes at age 6 years? How do these vary based on characteristics of WIC participation of the child/household?</p>	3, 4, 5
<p>14. What is the impact of participation in other Federal food assistance programs (e.g., NSLP/SBP, SFSP, SNAP) on feeding practices and health outcomes (i.e., weight status, developmental outcomes) during the sixth year of life?</p>	3, 4, 5, 6
<p>15. What are the food/beverage (including water), energy, and nutrient intakes of the study children both overall and by subgroups of interest?</p>	3, 4
<p>16. How do dietary intake patterns change once a child ages out of WIC? How do changes in these patterns vary across subgroups?</p>	4
<p>17. What is the influence of caregiver practices at home and broader environmental factors—such as the media—on dietary behaviors that may affect childhood obesity?</p>	5, 6
<p>18. To what extent do feeding practices during the sixth year of life vary by cumulative years of participation in WIC, and by reasons for exiting the WIC program?</p>	5
<p>19. How do early feeding practices impact children’s weight status and growth during the sixth year of life?</p>	6
<p>20. How many 5-6-year-olds exhibit unhealthy eating patterns, and what characteristics, including weight-for-height status, are associated with these habits?</p>	3, 4, 6
<p>21. Do early feeding practices, meal/snack patterns, or food, energy, and nutrient intakes relate to the health status and weight trajectories or childhood overweight/obesity of 5-6-year-olds?</p>	6

Table A-2. Study research questions by Example Independent and Dependent Variables^a

Research question	Example Independent Variables	Example Dependent Variables ^b	Chapter
Background and Environmental Characteristics			
1. How do feeding practices vary with caregiver work/school status (e.g., part-time, full-time), family circumstances (e.g., number and age of household members, household member's participation in WIC, Supplemental Nutrition Assistance Program [SNAP], etc.), and childcare/preschool/school circumstances?	a. Key sociodemographic characteristics such as participation in non-WIC benefit programs and parity b. Use of childcare during the school year	a. Days of school week lunch provided from home b. Number of time family eats together	a. Section 2.6.2 b. Section 5.6.3
2. In what food environments (home, school, childcare, etc.) do children consume meals and snacks during the sixth year of life? How do these environments vary by subgroups of interest?	a. Key sociodemographic characteristics b. Key sociodemographic characteristics	a. Frequency of school lunches during the school week b. Frequency of television viewing during meals	a. Section 2.6.2 b. Section 5.6.2
3. What proportion of intake is consumed in the various food environments? To what extent does this vary across subgroups of interest?	a. Key sociodemographic characteristics	a. Days of school week breakfast provided from school	a. Section 2.6.2
4. To what extent do feeding practices during the sixth year of life vary by household's continued participation in WIC (i.e., someone else in the household is receiving WIC benefits) and/or by the household's participation in other Federal food assistance programs?	a. Key sociodemographic characteristics including pattern of WIC participation and participation in non-WIC benefit programs	a. Frequency with which caregiver tries to get the child to finish his or her food	a. Section 5.5
5. For caregivers who received referrals through WIC, how do they get referred or connected to other health, welfare, and social services once the household is no longer receiving WIC services?	a. Key sociodemographic characteristics	a. Non-WIC sources of referral	a. Section 2.8.2
Nutrition and Health Outcomes			
6. Do caregivers continue to purchase the foods they previously received in their child's WIC food package, even when no one in the household is receiving WIC?	a. Key sociodemographic characteristics	a. Households purchasing beans	a. Section 2.8.1
7. What is the food security status for children and their households overall and for key subgroups and characteristics of interest?	a. Key sociodemographic characteristics b. SNAP participants by income	a. Household food security status b. Household food security status	a. Section 2.9.1 b. Section 2.9.2

Table A-2. Study research questions by Example Independent and Dependent Variables^a (continued)

Research question	Example Independent Variables	Example Dependent Variables ^b	Chapter
Nutrition and Health Outcomes			
8. How does food security status change when the child ages out of WIC? To what extent does prior WIC participation, or current household WIC participation, influence food security status during the sixth year of life?	a. Key sociodemographic characteristics b. Current WIC participation status given that another child between ages 0 and 4 was reported	a. Household food security status b. Household food security status	a. Section 2.9.1 b. Section 2.9.2
9. How does participation in other food assistance programs by the child or their household impact household food security overall and by subgroups of interest?	a. Key sociodemographic characteristics b. Current WIC participation status given child ages 0-4	a. Household food security status b. Household food security status	a. Section 2.9.1 b. Section 2.9.2
10. What are the meal and snack patterns, both overall and by subgroups of interest?	a. Key sociodemographic characteristics	a. Sources of snacks	a. Section 2.6.2
Impact of WIC			
11. How many 5-6-year-olds exhibit unhealthy eating patterns, and what characteristics are associated with these habits?	a. Key sociodemographic characteristics b. Key sociodemographic characteristics	a. Vegetable intake b. Healthy Eating Index-2015 (HEI-2015) scores	a. Section 3.5.2 b. Section 3.6
12. How do dietary intake patterns change once a child ages out of WIC? How do changes in these patterns vary across subgroups?	a. Interview age 60 and 72 months b. Interview age 60 and 72 months	a. Added sugars intake at 60 and 72 months b. Vitamin C	a. Section 3.5.9 b. Section 4.4.3

Table A-2. Study research questions by Example Independent and Dependent Variables^a (continued)

Research question	Example Independent Variables	Example Dependent Variables ^b	Chapter
Impact of WIC			
<p>13. What is the relationship, if any, between (1) cumulative years of participation in WIC, (2) ages during WIC participation, and (3) continuity of WIC benefit receipt (e.g., constant vs. intermittent) and dietary behaviors and energy and nutrient intake after aging out of WIC?</p> <p>a. Are differences affected by eligibility for and/or participation in other food benefit programs (e.g., National School Lunch Program [NSLP]/School Breakfast Program [SBP], Summer Food Service Program [SFSP], SNAP)?</p> <p>b. Do dietary patterns of children with longer durations of participation in WIC more closely reflect nutrients emphasized by WIC than those who have shorter duration/more intermittent benefits?</p> <p>c. Do early feeding practices, meal/snack patterns, or food and nutrient intakes between ages 0 and 24 months relate to feeding practices, meal/snack patterns, and food and nutrient intakes at age 6 years? How do these vary based on characteristics of WIC participation of the child/household?</p>	<p>a. Pattern of WIC participation</p> <p>b. SNAP participation at 72 months</p> <p>c. Interview ages 15-72 months</p>	<p>a. Plain skim and 1% milk consumption on a given day; saturated fat as a percentage of total dietary energy on a given day</p> <p>b. Vegetable density on a given day</p> <p>c. Frequency of meals together</p>	<p>a. Sections 3.5.8 and 4.6</p> <p>b. Section 3.7</p> <p>c. Section 5.6.1</p>
<p>14. What is the impact of participation in other Federal food assistance programs (e.g., NSLP/SBP, Summer Food Service Program, SNAP) on feeding practices and health outcomes (i.e., weight status, developmental outcomes) during the sixth year of life?</p>	<p>a. Participation in SNAP</p> <p>b. Participation in NSLP/SBP/SFSP</p>	<p>a. Vegetable density</p> <p>b. Body mass index (BMI) expressed as percentage of the 95th percentile</p>	<p>a. Section 3.7</p> <p>b. Section 6.6.3</p>
<p>15. What are the food/beverage (including water), energy, and nutrient intakes of the study children both overall and by subgroups of interest?</p>	<p>a. Key sociodemographic characteristics</p> <p>b. Key sociodemographic characteristics</p>	<p>a. Water as a beverage</p> <p>b. Energy intake</p>	<p>a. Section 3.5.7</p> <p>b. Section 4.4.1</p>
<p>16. How do dietary intake patterns change once a child ages out of WIC? How do changes in these patterns vary across subgroups?</p>	<p>a. Interview age 60 and 72 months</p> <p>b. Key sociodemographic characteristics</p>	<p>a. Energy intake at each eating occasion</p> <p>b. Energy intake</p>	<p>a. Section 4.4.1</p> <p>b. Section 4.4.1</p>

Table A-2. Study research questions by Example Independent and Dependent Variables^a (continued)

Research question	Example Independent Variables	Example Dependent Variables ^b	Chapter
Impact of WIC			
17. What is the influence of caregiver practices at home and broader environmental factors—such as the media—on dietary behaviors that may affect childhood obesity?	<ul style="list-style-type: none"> a. Carefully control how much the child eats b. Frequency of family meals in the past week c. Frequency of television viewing during meals 	<ul style="list-style-type: none"> a. HEI-2015 total scores on a given day b. HEI-2015 total scores on a given day c. HEI-2015 total scores on a given day 	<ul style="list-style-type: none"> a. Section 5.5.2 b. Section 5.6.4 c. Section 5.6.4
18. To what extent do feeding practices during the sixth year of life vary by cumulative years of participation in WIC, and by reasons for exiting the WIC program?	<ul style="list-style-type: none"> a. Left WIC prior to 54 months because no longer qualified 	<ul style="list-style-type: none"> a. Frequency of trying to get the child to eat even when he or she does not seem hungry 	<ul style="list-style-type: none"> a. Section 5.5.1
19. How do early feeding practices impact children's weight status and growth during the sixth year of life?	<ul style="list-style-type: none"> a. Ask child to help prepare food 	<ul style="list-style-type: none"> a. BMI as a percentage of the 95th percentile 	<ul style="list-style-type: none"> a. Section 6.6.3
20. How many 5-6-year-olds exhibit unhealthy eating patterns, and what characteristics, including weight-for-height status, are associated with these habits?	<ul style="list-style-type: none"> a. Key sociodemographic characteristics b. Pattern of WIC participation 	<ul style="list-style-type: none"> a. Total vegetables consumed per day b. Saturated fat as percentage of total dietary energy on a given day 	<ul style="list-style-type: none"> a. Section 3.5.2 b. Section 4.6
21. Do early feeding practices, meal/snack patterns, or food, energy, and nutrient intakes relate to the health status and weight trajectories or childhood overweight/obesity of 5-6-year-olds?	<ul style="list-style-type: none"> a. Early introduction of complementary foods b. Energy intake 	<ul style="list-style-type: none"> a. BMI expressed as a percentage of the 95th percentile b. BMI expressed as a percentage of the 95th percentile 	<ul style="list-style-type: none"> a. Section 6.6.5 b. Section 6.6.3

^a The independent and dependent variables presented in this table are examples of the analyses conducted in order to answer the designated research questions. This table is not an exhaustive list of all analyses conducted.

^b Dependent variables are assessed at 72 months unless otherwise noted.

Table A-3 presents a summary of criteria used to determine the study child’s pattern of WIC participation from age 1 month through age 54 months.

Table A-3. Criteria for determining patterns of participation in WIC

Patterns of WIC participation	Criteria (Interview month requirements)
In Year 1 only	Receiving WIC at 13-month interview or not receiving WIC at this interview but receiving WIC at all interviews prior ^a and not receiving WIC subsequently.
In Years 1 and 2 only	Receiving WIC in Year 1 (as above) and either (a) receiving WIC at 24 months and not receiving WIC subsequently or (b) not receiving WIC at 24 months but receiving WIC at 15 and 18 months and not receiving WIC subsequently.
In Years 1, 2, and 3 only	Receiving WIC in Years 1 and 2 (as above) and receiving WIC at 30 or 36 months or both and not receiving WIC subsequently.
In Years 1, 2, 3, and 4 only	Receiving WIC in Years 1 and 2 (as above) and receiving WIC at 30 or 36 months or both and receiving WIC at 42 or 48 months or both and not receiving WIC subsequently.
In Years 1, 2, 3, 4, and 5	Receiving WIC in Years 1 and 2 (as above) and receiving WIC at 30 or 36 months or both and receiving WIC at 42 or 48 months or both and receiving WIC at 54 or 60 months or both but not consistently (below).
Consistently	On WIC in Years 1 and 2 (as above) and receiving WIC at every interview month subsequent to the 24-month interview through the 54-month interview. ^b
Intermittently	Receiving WIC benefits sporadically throughout the first 60 months of the study.

^a Month 1 is not considered in order to give respondents sufficient time immediately after birth.

^b The 60-month interview is excluded because the child may no longer be eligible for WIC (because he or she is older than 5 years) when the 60-month interview is administered.

Table A-4 offers the definition of food pattern component groups used in this report, the Food Patterns Equivalents Database (FPED) variables within those groups, and their descriptions. More information about FPED can be found at <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/fped-overview/>.

Table A-4. *Dietary Guidelines for Americans* food groups and Food Patterns Equivalent Database (FPED) variables

Food pattern component group	Component (FPED variable)	Description
Fruit	Total Fruit	Total intact fruits (whole or cut) and fruit juices (cup eq.)
	Citrus, Melons, and Berries	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)
	Other Fruits	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
	Fruit Juice	Fruit juices, citrus and non-citrus (cup eq.)
Vegetables	Total Vegetables	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)
	Dark Green Vegetables	Dark green vegetables (cup eq.)
	Total Red and Orange Vegetables	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
	Tomatoes	Tomatoes and tomato products (cup eq.)
	Other Red and Orange Vegetables (V_REDOR_OTHER)	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
	Total Starchy Vegetables (V_STARCHY_TOTAL)	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
	Potatoes (V_STARCHY_POTATO)	White potatoes (cup eq.)
	Other Starchy Vegetables (V_STARCHY_OTHER)	Other starchy vegetables, excluding white potatoes (cup eq.)
	Other Vegetables (V_OTHER)	Other vegetables not in the vegetable components listed above (cup eq.)
	Beans and Peas (Legumes) (V_LEGUMES)	Beans and peas (legumes) computed as vegetables (cup eq.)
Grains	Total Grains (G_TOTAL)	Total whole and refined grains (oz. eq.)
	Whole Grains (G_WHOLE)	Grains defined as whole grains and contain the entire grain kernel, the bran, germ, and endosperm (oz. eq.)
	Refined Grains (G_REFINED)	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)

Table A-4. *Dietary Guidelines for Americans* food groups and Food Pattern Equivalent Database (FPED) variables (continued)

Food pattern component group	Component (FPED variable)	Description
Protein Foods	Total Protein Foods (PF_TOTAL)	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
	Total Meat, Poultry, and Seafood (PF_MPS_TOTAL)	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)
	Meat (PF_MEAT)	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)
	Cured Meat (PF_CUREDMEAT)	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
	Organ Meat (PF_ORGAN)	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)
	Poultry (PF_POULT)	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)
	Seafood High in n-3 Fatty Acids (PF_SEAFD_HI)	Seafood (finfish, shellfish, and other seafood) high in n-3 fatty acids (oz. eq.)
	Seafood Low in n-3 Fatty Acids (PF_SEAFD_LOW)	Seafood (finfish, shellfish, and other seafood) low in n-3 fatty acids (oz. eq.)
	Eggs (PF_EGGS)	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
	Soy Products (PF_SOY)	Soy products, excluding calcium fortified soy milk and immature soybeans (oz. eq.)
Nuts and Seeds (PF_NUTSDS)	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)	
Beans and Peas (Legumes) (PF_LEGUMES)	Beans and peas (legumes) computed as protein foods (oz. eq.)	
Dairy	Total Dairy (D_TOTAL)	Total milk, yogurt, cheese, whey. For some foods, the total dairy values could be higher than sum of D_MILK, D_YOGURT, and D_CHEESE because Misc dairy component composed of whey which is not included in FPED as separate variable. (cup eq.)
	Milk (D_MILK)	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
	Yogurt (D_YOGURT)	Yogurt (cup eq.)
	Cheese (D_CHEESE)	Cheeses (cup eq.)
Oils	Oils (OILS)	Fats naturally present in nuts, seeds, seafood; unhydrogenated vegetable oils, except palm oil, palm kernel oil, coconut oils; fat in avocado and olives above allowable amount; 50% of fat present in stick/tub margarines, margarine spreads (grams)
Solid Fats	Solid Fats (SOLID_FATS)	Fats naturally present in meat, poultry, eggs, dairy (lard, tallow, butter); hydrogenated/partially hydrogenated oils; shortening, palm, palm kernel, coconut oils; coconut meat, cocoa butter; 50% of fat in stick/tub margarines, margarine spreads (grams)
Added Sugars	Added Sugars (ADD_SUGARS)	Foods defined as added sugars (tsp. eq.)
Alcoholic Drinks	Alcoholic Drinks (A_DRINKS)	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)