



CHILD NUTRITION MODULE

Child Nutrition Module

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Introduction

We all know that good nutrition is important, but for preschoolers, a healthy diet is crucial. Young children need energy and nutrients to be active, to think, and to grow. Good nutrition helps a child build strong teeth and bones, fight off colds and viruses, and heal faster. Without good nutrition, children can develop problems like iron-deficiency anemia.

Mealtimes offer more than just vitamins and minerals. Preschoolers develop fine motor skills as they begin to feed themselves, plus different foods help them learn about colors, textures, and flavors. And, when they eat with others, they develop important language and social skills.

What's more, learning healthy eating habits as a child can be a lesson in prevention that lasts a lifetime. Obesity is a serious concern, because one in three children are obese or overweight before their fifth birthday (Centers for Disease Control and Prevention [CDC], 2011). Many overweight children become overweight adults, and obesity and poor diets add to other chronic illnesses, such as diabetes and heart disease. So it's important to start early, helping children develop good eating habits and adopt active lifestyles while they're young.

As a WIC staff member, your knowledge about nutrition can help parents and children in many ways, both now and in years to come.

About the Child Nutrition Module

The purpose of this module is to provide WIC staff with basic knowledge, attitudes, and skills about nutrition for children age 1 through 5. After completing this module, staff will be able to express an understanding that good nutrition is important for young children and promote this in daily interactions with clients. If staff provide nutrition education and/or counseling to parents and caregivers of young children, completing this module may be part of their overall training program.



One in three children under the age of 5 are overweight or obese. WIC staff members have the opportunity to help these families change their lifestyles.



Nutrition Basics for 1- to 5-Year-Olds

Part 1

It is never too early — or too late — for parents and guardians to help children get started on a healthy lifestyle. That means offering a good balance of healthy foods and providing opportunities for their children to be active. In this section, we will review the amounts and types of foods and activity that children need each day.

Objectives

After completing this section, you will be able to:

- List three ways that a parent can encourage a young child to feed himself.
- List four foods that are likely to cause choking in young children.
- Describe the five food groups and the amounts needed from each group.
- State factors that affect a child's calorie needs.
- Write a sample one-day menu for a 3-year-old child.
- Explain the role of snacks in a child's overall diet.
- Identify healthy and unhealthy drink choices for children.
- State three ways parents can encourage their children to be more physically active.

Part 1

A New Skill for Toddlers: Self-feeding

New Motor Skills — For most children, learning to feed themselves is one of the exciting milestones they learn between 1 and 2 years of age. During this time, their motor skills improve and they learn to handle and chew foods of different textures (Brown, 2008). Here are some tips that can help parents teach their children to feed themselves:

- Toddlers prefer small pieces of food that they can feel and explore. It helps to cut meat, vegetables, bread, and cheese into bite-sized pieces or small strips that a child can easily pick up and handle.
- Get a spoon and fork with short, straight, broad, solid handles for the child to use. The spoon should have a wide mouth and the fork should have blunt tines. Children will use a spoon first and then learn to use a fork next. As children get better at using tableware, they won't use their fingers as much.
- Expect messes and spills and don't get upset when they happen. One idea is to cover the floor under a child's seat with paper, vinyl, or other plastic and keep a damp cloth handy. And remember that it's all part of the learning process.

Drinking From a Cup — By 15 months of age, most children can manage a cup by themselves, though they can still have trouble lifting and tilting a cup and lowering it to a tray. By 18 to 24 months of age, children can tip the cup more easily.

There are many cups made for smaller hands such as cups with two handles, and small, chubby cups that are easy to hold. Many parents prefer the sippy cups with lids, but it's best for children to learn to drink from a cup without a lid. When using sippy cups a child has to suck on the spout to get the liquid to come out, much like a bottle. This can lead to tooth decay, plus some children will carry a sippy cup around with them all day long and fill up on juice or other sugary beverages. An easy way to avoid the problem is to use a cup without a lid.

Choking Prevention — Young children are still developing their chewing and swallowing skills, so they are at a higher risk of choking while eating. Also, young children's airways are narrower, which adds to the risk of choking (American Academy of Pediatrics [AAP], 2010).

Parents shouldn't let children of any age "eat on the run." Children should always sit down during meals, either in a booster seat or a high chair (Brown 2008). While most adults follow this advice during mealtimes, they may not think about it in other situations, like family gatherings or social events. Parents should always watch their preschoolers closely, especially when food is available. Also, the more adults who know basic first-aid procedures, the better.

Foods most likely to cause choking:

- Foods that are round, firm, smooth, or slick, like grapes, peanuts, hard candy, hot dogs, large pieces of fruit with skin, peas, round candies.
- Foods that are small, like nuts and seeds.
- Foods that are dry or hard such as raw carrots, pieces of pretzels, potato chips, popcorn.
- Foods that are sticky or tough such as peanut butter, raisins, tough meat, and caramel candy.

Parents should follow these important tips to help prevent choking:

- Cook tough foods, such as raw carrots, until they are soft.
- Cut foods into small pieces or thin slices that can easily be chewed.
- Cut round foods, such as hot dogs or carrots, into short strips rather than round pieces.
- Cut grapes into quarters.
- Remove all bones from chicken, meat, and fish.
- Remove pits and seeds from fruit such as oranges, grapes, watermelon, or plums.
- Serve hamburgers instead of hot dogs.
- Grind or chop nuts.
- Do not give peanut butter to children under 2 years old; for older children, spread a thin layer onto bread or mix it with foods such as jelly or yogurt to make it easier to swallow.

Part 1

Healthy Foods for a Healthy Plate

Choose My Plate — Children are constantly growing, so they need a steady supply of all the essential nutrients. So how can you be sure a child is getting what he needs? Obviously, there's no single food that contains all these nutrients in the right amount, so the key for parents is to offer a wide variety of healthy foods every day.

USDA's **ChooseMyPlate.gov** outlines the types and amounts of foods that kids need based on the 2010 Dietary Guidelines.

ChooseMyPlate.gov encourages Americans to eat a balance of foods from the five food groups, with a focus on eating more vegetables, fruits, and whole grains, and choosing lower-fat dairy and protein. Vegetables and fruits should make up about half of the plate. The key is for parents to offer more **nutrient-dense foods** that have plenty of vitamins, minerals, and fiber, and cut back on **empty-calorie foods** that are loaded with added sugars, solid fats, and extra sodium.



Nutrient-dense foods are foods that are naturally high in vitamins, minerals, and fiber while being low in calories and fat.

Examples include fruits, vegetables, whole grains, beans, and lean meats.

Empty-calorie foods are foods that are high in calories, fat, and simple sugars, and low in vitamins, minerals, and fiber.

Examples include candy, doughnuts, pastries, cakes, cookies, and pies, as well as sugary drinks like sodas and fruit drinks.



If children eat a variety of nutrient-dense foods from each of the five food groups, they should get the nutrients they need. Of course, many parents will quickly tell you that this is easier said than done. In Part 3 of this module, we'll look at practical ideas for helping children eat a balance of healthy foods.

Explore Preschooler Topics on ChooseMyPlate.gov

Go to www.choosemyplate.gov. Click on the "Preschoolers" section and explore the resources available. Be able to identify and describe one helpful resource.

Daily Amounts From Each Food Group – In general, young children need the same variety of foods as older children and adults, but since their body size is smaller, they need smaller amounts. Table 1-1 lists the daily amounts of food from each food group that children need. Note that these amounts are not suggested serving sizes; they are total amounts for the day.

Table 1-1: Daily Amounts from Each Food Group

Food Group	1 –2 Year Olds	2 –5 Year Olds	Equivalent Amounts
Grains	2–3 ounces of grains each day	3–5 ounces of grains each day	1 ounce of grains is equal to: <ul style="list-style-type: none"> • 1 bread slice or tortilla • ½ cup rice • 1 cup dry cereal • 5 crackers
Vegetables	1 cup of vegetables each day	1–2 cups of vegetables each day	1 cup is equal to: <ul style="list-style-type: none"> • 1 cup cooked or raw chopped vegetables • 1 cup vegetable juice
Fruit	1 cup of fruit each day	1–1 ½ cups of fruit each day	1 cup is equivalent to: <ul style="list-style-type: none"> • 1 piece of raw fruit • 1 cup of 100% fruit juice
Milk	2 cups of milk each day	2 cups of milk each day	1 cup is equal to: <ul style="list-style-type: none"> • 1½ ounce cheese • 1 cup yogurt • 1 cup milk
Proteins	2 ounces of proteins each day	3–5 ounces of proteins each day	1 ounce is equal to: <ul style="list-style-type: none"> • ½ chicken leg • ½ hamburger patty • 1 egg • 1 ounce fish • ¼ cup cooked beans • 2 tablespoons peanut butter

Part 1

Calorie Needs — Calorie needs vary from child to child depending on age, sex, and activity level. For example, a 2-year-old girl who is physically active less than 30 minutes each day needs about 1000 calories a day while a 5-year-old boy who is physically active more than 60 minutes a day needs approximately 1600 calories a day. As a comparison, a typical adult needs about 2000 calories a day.

Portion Sizes — Small portion sizes are perfect for a young child's small tummy. For example, many preschoolers will only have a 1/2-cup serving of milk with a meal or snack, or a 1/4-cup serving of vegetables as part of dinner. But at the end of the day, these portions should reflect the total daily amounts shown in Table 1-1.

By offering smaller servings and letting a child ask for more if he's still hungry, parents can help their child learn about fullness and satiety. Likewise, it's important to offer new foods in small "try me" spoonfuls.

As children are able, parents can let them serve themselves. This helps preschoolers learn new skills and feel "all grown up." Parents can teach them to take small amounts at first and tell them they can get more if they are still hungry.

The following tables show sample meal plans for children 1 to 2 and 2 to 5 years old.

Table 1-2: Sample Meal Plan for Children 1-2 Years Old

Serve child-sized portions of healthy foods and let your child decide how much to eat.

Day 1	Day 2	Day 3
Breakfast: ½ sliced banana ½ cup dry cereal ½ cup milk	Breakfast: ½ breakfast burrito (1 egg and ¼ cup potatoes) ¼ cup 100% apple juice	Breakfast: 1 slice cheese 1 biscuit ½ cup milk
Snack: ½ cup oatmeal muffin ½ cup applesauce ½ cup milk	Snack: 2-3 graham cracker squares ½ orange	Snack: ½ banana ½ cup yogurt
Lunch: ½ chopped beef sandwich on whole-wheat bread ¼ cup cooked green beans ½ cup milk	Lunch: ½ enchilada (¼ cup beans and 1-2 tablespoons cheese) ¼ cup chopped, cooked broccoli ½ slice cantaloupe ½ cup milk	Lunch: ½ hamburger 1 slice tomato ¼ cup cooked, mixed vegetables ½ cup milk
Snack: ½ cup pudding 2-3 whole-wheat crackers	Snack: ½ cup dry cereal ½ cup milk	Snack: ¼ cup 100% orange juice 1 small cornbread
Dinner: 2 tablespoons chopped chicken ¼ cup mashed potatoes ¼ cup cooked carrots ½ whole-wheat roll ¼ cup tomato juice	Dinner: ½ cup pasta with 2 tablespoons hamburger ¼ cup squash ¼ cup green peas ½ cup yogurt	Dinner: ½ cup cooked brown rice ¼ cup black beans ¼ cup cooked bell pepper ¼ cup cooked zucchini ¼ cup sliced pears

Go to <http://www.choosemyplate.gov> for more ideas.

Part 1

Table 1-3: Sample Meal Plan for Children 2-5 Years Old

Serve child-sized portions of healthy foods and let your child decide how much to eat.

Day 1	Day 2	Day 3
Breakfast: ½ banana ¾ - 1 cup dry cereal 1 scrambled egg ¾ cup low-fat milk	Breakfast: 1 breakfast burrito (1 egg and ¼ cup potatoes) ¼ cup 100% apple juice	Breakfast: 1-2 slices ham 1 biscuit ½ cup low-fat milk
Snack: 1 oatmeal muffin ½ cup applesauce	Snack: ½ fresh orange 3-4 graham cracker squares	Snack: ½ banana ½ cup low-fat milk
Lunch: 1 chopped roast beef sandwich on whole-wheat bread ¼ cup chopped tomatoes ½ cup salad greens ½ cup low-fat milk	Lunch: 1 enchilada (½ cup beans and 3 tablespoons cheese) ½ cup chopped, cooked broccoli 1 slice cantaloupe ½ cup low-fat milk	Lunch: ½ - 1 hamburger on a bun 1 slice tomato ½ cup cooked mixed vegetables ½ cup low-fat milk
Snack: ¾ cup pudding ½ cup zucchini and celery matchsticks	Snack: ½ cup dry cereal ½ cup low-fat milk	Snack: 2 graham cracker squares ½ cup 100% orange juice
Dinner: 1 small chicken leg ¼ cup mashed potatoes ¼ cup carrots 1 whole-wheat roll ½ cup chopped peaches ½ cup low-fat milk	Dinner: 1 cup whole-wheat pasta with ½ cup hamburger ¼ cup squash ½ cup green beans ½ cup yogurt	Dinner: ½ cup cooked brown rice ¼ cup black beans ¼ cup cooked bell pepper ½ cup turkey sausage ½ cup low-fat milk ½ cup sliced pears

Go to <http://www.choosemyplate.gov> for more ideas.

Recommendations for Breastfed Children — It is exciting that some mothers continue to breastfeed their young children past the first year. A breastfed toddler is less likely to become sick, plus he has a lower risk of being overweight or developing diabetes later in life. And a mother who is breastfeeding also has a lower risk of developing illnesses. What's more, nursing is a great way to comfort a toddler who is tired, upset, or hurt.

Many children older than a year only breastfeed a few times a day. On the other hand, some toddlers nurse more often and get more nutrition from their mother's milk. But generally, breastmilk is a supplement to the child's main diet, and breastfed children should get the same variety of foods as other children — including foods from the milk group.

Healthy Snack Choices — Healthy snacks are a great way to help a preschooler get the nutrients he needs. In fact, snacks can provide up to 20 percent of a child's energy and nutrient needs. What's more, since children have small stomachs, they usually need to eat small portions more often so they don't get too hungry. Parents should schedule one or two snacks each day in addition to three meals a day. The key is to offer healthy snacks so that children learn the difference between nutritious foods and occasional treats.

Good snacks are based on wholesome foods from the 5 food groups — things like fresh fruit, veggie sticks, whole grain cereal, yogurt, and peanut butter. But many children tend to eat a lot of cookies, cakes, candy bars, pastries, and other treats loaded with fat and sugar. In moderation, these foods can be part of a healthy diet, but both kids and parents need to learn to “treat treats as treats.” That means enjoying these foods every once in awhile, not three or four times a day.

The bottom line is that cookies and cake just don't compare to the nutrition you get from a handful of carrot sticks, an apple, or some whole-grain crackers topped with peanut butter.

Part 1

Here's a list of other healthy snack ideas for preschoolers:

Snack Ideas

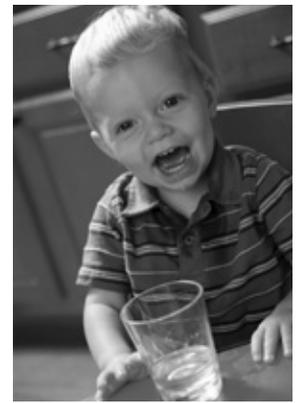
Quick bread or muffins	Make with carrots, zucchini, pumpkin, bananas, or berries.
Corn tortillas	Spread with beans, sprinkle with grated cheese and broil; top with either low-fat sour cream or yogurt and salsa.
Whole wheat pita bread	Place sliced meat, cheese, lettuce, and tomato in open pocket.
English muffins	Top with spaghetti sauce, grated cheese, and meats; broil or bake and cut in fourths.
Yogurt parfait	Make with yogurt, fruit, and cereal.
Frozen fruit cubes	Freeze pureed applesauce or fruit juice into cubes.
Fruit smoothie	Blend fresh or frozen fruits (bananas, berries, or a peach) with yogurt, milk or juice, and ice.
Soft, sliced vegetables	Serve with a dip of hummus, peanut butter,* or low-fat salad dressing.
Bananas	Dip in yogurt or spread with peanut butter* and roll in cereal.
Sliced apples* or crackers	Serve with cheese or spread with peanut butter*.
Whole wheat toast or bagels	Spread with cream cheese or peanut butter* and top with chopped bananas, crushed pineapple, or shredded carrots.
Popcorn*	Serve to older children plain or sprinkle with a little bit of grated cheese.

* Choking hazard to young children

Healthy Drink Choices – Water and milk are the best choices for quenching a young child’s thirst, and small amounts of 100 percent fruit juice are fine, too. But fruit drinks, punch, sodas, sports drinks, and energy drinks have extra calories and added sugars that preschoolers don’t need. Here’s a quick rundown:

- **Water** provides the fluid a child’s body needs without extra sugar, caffeine, calories, or cost. Adults need to be sure to offer water when children play outdoors, especially in hot weather. Bottled water is not better or safer than regular tap water, plus the plastic bottles are an added expense.
- **Milk** has vitamin D, calcium, and other nutrients to help keep kids healthy and strong. Toddlers under 2 years old need extra fat and calories in whole milk to support brain development, but starting at age 2 parents can switch to fat-free or 1% milk. Preschoolers need about 2 cups from the milk group each day. While some children don’t drink enough milk, others tend to fill up on milk and avoid other important foods. The key for preschoolers is to get enough milk but not too much.
- **100 percent fruit juice** provides vitamin C, and some juices are fortified with other nutrients. Parents should look for 100 percent fruit juice on the label, as many sweetened drinks look like fruit juice, but often contain little or no fruit or nutrients. Also, keep in mind that 100 percent fruit juice is a concentrated source of sugar and calories, so too much juice can lead to weight gain (Malik, Schultze, & Hu, 2006), as well as diarrhea and tooth decay. Young children should have no more than 4 to 6 ounces of juice a day. Also, parents should offer real fruits more often, which have more fiber than fruit juice.

Most other beverages are not good choices for preschoolers. Consider soda, which is loaded with calories and sugar. A 12-ounce soda contains about 140 calories and 10 teaspoons of sugar, and soda can also contain caffeine! While most parents would never offer a cup of coffee to their preschooler, many parents don’t hesitate to offer soda and tea to kids. Caffeine has negative effects on the body including anxiety, restlessness, irritability, muscle pain, rapid and irregular



Young children should have no more than 4 to 6 ounces of 100 percent fruit juice a day.

Part 1

heartbeat, sleep delay, and stomach discomfort (National Library of Medicine [NLM], 2009).

When young children drink sodas and other unhealthy drinks, the problem isn't only what they are consuming; it's also what they are not consuming. All too often children fill up on sugary drinks and don't get enough milk or other healthy foods. So encourage parents to skip the sports drinks, fruit punch, and sodas, and fill their children's cups with water or milk (KidsHealth, 2011).

Physical Activity for Young Children

When it comes to health, physical activity is just as important as healthy foods. Physical activity helps children increase their strength and coordination, build self-confidence, maintain a healthy weight, and lower stress. Remember, just like healthy eating habits, being active throughout life can lower the risk of heart disease, high blood pressure, and diabetes (Nevin-Folino, 2005).

Young children need daily physical activity that includes a combination of structured and unstructured activity (National Association for Sport and Physical Education, 2011). Structured activity is adult-led activity such as games or team sports, while unstructured activity is free play like playing with friends in a safe place outside or indoors.

Table 1-4: Physical Activity Guidelines for Young Children

Age	Recommendation per day
Toddlers (1–3 years)	30 min. structured + 60 min unstructured activity
Preschoolers (3–5 years)	60 min. structured + 60 min. unstructured activity

Source: National Association for Sport and Physical Education, 2011

Most young children are naturally active and have a strong desire to be active. But sadly, watching television and playing video games have replaced hours of running, jumping, and playing active games. The American Academy of Pediatrics recommends no more than 1 to 2 hours of quality screen time per day for older children and

discourages any screen time for children under 2 years old (American Academy of Pediatrics Committee on Public Education, 2001).

Parents can limit the amount of time in front of the television by helping children choose specific programs to watch for the day. Then it's time to turn off the television and get the kids moving. WIC staff can encourage parents to set a good example by being active themselves. Help them think of activities the whole family can do together — taking a walk, dancing in the living room, and tending to a garden all count as physical activity. Remember that having fun should always be part of the plan. Preschoolers are more likely to stay active if they enjoy it themselves.

Here are some great suggestions to get families moving:

- Plan family hikes, nature walks, and camping trips.
- Teach kids to swim and bicycle at a young age, and make these routine activities.
- Turn chores, such as raking leaves and gardening, into fun activities.
- Make up fun races and obstacle courses in the park.
- Think of ways to be active indoors: dancing to music, tossing balloons or soft balls, doing yoga and stretching, dancing with kids' music videos, etc.
- Check to see what sort of recreational programs are available, such as swim lessons, community programs, and city park programs.

Parents and guardians are key players in helping their young children follow a healthy lifestyle. As a WIC staff member, you can help parents come up with ideas and strategies to encourage their preschoolers to enjoy healthy foods and be physically active.



Some types of media encourage children to be active, but it is best to choose programs that involve full body movement. Also encourage plenty of non-media activity.

This is the end of Part 1.



Like adults, preschoolers don't always get the balance and variety of foods they need. In this section, we will review some of the key nutrients important for WIC preschoolers as well as foods to limit.

Objectives

After completing this section, you'll be able to:

- Identify key nutrients that are commonly lacking in young children's diets.
- Identify food sources of the key nutrients commonly lacking in young children's diets.
- Explain why the recommended fat intake for children younger than 2 years is different than for older children.
- Explain why it is important to limit fats, added sugars, and sodium in young children's diets.
- State two situations in which a child may need a vitamin-mineral supplement.

Part 2

Nutrient Recommendations for Children

Each day, a child needs at least 45 essential nutrients for growth and good health. Table 2-1 lists the specific nutrients and amounts that preschoolers should get each day (U.S. Department of Agriculture [USDA], 2010).

Table 2-1: Dietary Reference Intakes, 2010 Dietary Guidelines for Americans (USDA)

Nutrient (Units)	Children, ages 1–3	Children, ages 4–8
Protein (g)	13	19
Carbohydrate (g)	130	130
Fat (% of calories)	30–40	25–35
Calcium (mg)	700	1000
Iron (mg)	7	10
Phosphorus (mg)	460	500
Zinc (mg)	3	5
Copper (mcg)	340	440
Selenium (mcg)	20	30
Vitamin A (mcg RAE)	300	400
Vitamin D (mcg)	15	15
Vitamin E (mg AT)	6	7
Vitamin C (mg)	15	25
Thiamin (mg)	0.5	0.6
Riboflavin (mg)	0.5	0.6
Niacin (mg)	6	8
Folate (mcg)	150	200
Vitamin B6 (mcg)	0.5	0.6
Vitamin B12 (mcg)	0.9	1.2
Choline (mg)	200	250
Vitamin K (mcg)	30	55

Key Nutrients to Increase in Children's Diets

When it comes to getting the nutrients they need, most children tend to fall short on **iron, vitamin A, vitamin C, vitamin D, calcium, and fiber**. We'll briefly review each of these as they pertain to children's diets.

For additional nutrient information, refer to the Basic Nutrition Module.

Iron — Children need plenty of iron-rich foods in order to help prevent iron-deficiency anemia. Meat contains the best source of iron, but some children may not eat much meat, so parents should offer other sources of iron-rich foods like enriched grain products, dried beans and peas, and tofu. Other foods like peanut butter and dried fruits have smaller amounts of iron, but they can still add to a child's iron intake.

For more detailed information about sources of iron and iron deficiency anemia, see Part 5 of this module.

Food Sources of Iron

- Beef
- Chicken, turkey, fish
- Iron fortified ready-to-eat cereal
- Oatmeal
- Soybeans
- Dried beans and peas
- Tofu
- Spinach
- Blackstrap molasses
- Peanut butter
- Dried fruit

Part 2

Vitamins A and C — Children need these two vitamins for healthy skin, eyes, gums, a healthy immune system, and other body systems. That means parents should offer plenty of fruits and vegetables. A goal for parents is to offer at least five servings of fruits and vegetables each day. Juices are also good sources of these vitamins (vegetable juice contains vitamin A and citrus juices provide vitamin C). Remember that it's best to limit juice for preschoolers to 4 to 6 ounces a day.

Food Sources of Vitamin A

- Sweet potato
- Carrots
- Spinach or kale
- Vegetable juice
- Soybeans
- Cantaloupe
- Apricots
- Papaya
- Mango

Food Sources of Vitamin C

- Red and green peppers
- Orange juice, grapefruit juice
- Kiwifruit
- Oranges
- Grapefruit
- Strawberries
- Brussels sprouts
- Broccoli
- Tomato juice
- Cantaloupe
- Cabbage
- Potatoes

Vitamin D — Vitamin D helps to build strong bones and support the immune system. In the past, sunlight was a major source of vitamin D production for children, because the skin makes vitamin D after exposure to sunlight. Many parents now protect their preschoolers from the sun with plenty of sunscreen and clothing, making food sources of vitamin D more important. Sources of vitamin D include

Food Sources of Vitamin D

- Salmon
- Tuna
- Milk
- Yogurt
- Orange juice fortified with vitamin D
- Mushrooms, sliced, exposed to UV light

oily fish like salmon and tuna, as well as vitamin D-fortified orange juice, milk, and yogurt.

Calcium — Children need plenty of calcium since childhood is the time when the body forms most of its bone mass. Most kids get their calcium from milk and milk products. For preschoolers who don't drink milk, parents can look for fortified foods like calcium-fortified orange juice and cereal, and they can offer milk-based

soups, yogurt, cheese, pudding made with milk, and cereal with milk. Also, adding powdered milk to milkshakes and casseroles can boost a child's calcium intake.

Food Sources of Calcium

- Milk
- Cheese
- Yogurt
- Calcium-fortified soy milk
- Orange juice (calcium-fortified)
- Tofu prepared with calcium sulfate
- Fish with edible bones
- Spinach, kale, Chinese cabbage
- Almonds

Fiber — Children need dietary fiber to promote normal bowel movements and prevent bowel diseases, but most children don't get enough fiber in their diets. Young children should get between 14 to 20 grams of fiber daily or about 14 grams of fiber for every 1000 calories (USDA, 2010).

Food Sources of Fiber

- Beans and legumes
- Bran cereal
- Oatmeal
- Fruits
- Vegetables
- Whole wheat bread
- Whole wheat pasta
- Brown rice

Good sources of fiber include fruits, vegetables, whole-grain cereals and breads, and dried beans and peas. Children are likely to meet daily fiber needs by eating five servings of fruits and vegetables, and three servings of breads, cereals, rice, or pasta made with whole grains.

Part 2

Key Items to Decrease in Children's Diets

Many children, like many adults, are going overboard on foods that are high in **fats, added sugars, and sodium** — foods like fast foods, convenience foods, packaged snacks, and sugary drinks. WIC staff can play an important role in helping parents think of ways to offer healthier foods to their children.

Fats — Before age 2, fat is crucial for brain growth and development, so parents should not restrict their young child's fat intake. For example, toddlers between ages 1 and 2 should have whole milk and whole milk products. However, once a child reaches 2 years of age, parents should offer a lower-fat diet and pay more attention to the types of fats they use in their children's foods. The goal is to include healthier fats and oils like avocados, olive oil and canola oil, etc., and cut back on solid fats like butter, shortening, creams, whole milk, and gravies. By following a lower-fat diet early on, children will be more likely to develop low-fat eating habits that will last through adulthood.

Added Sugars — Sweets are an enjoyable part of our food culture. However, foods with added sugars like soft drinks, fruit drinks, and candy add extra calories, cause cavities, and can take the place of healthier foods that children need. The bottom line is that both parents and children should learn to think about sweets as “sometimes” foods. If a healthy child is eating a variety of nutritious foods, then occasional snacks and desserts can be enjoyable treats. If a child's daily diet includes lots of cookies, snack bars, doughnuts, soda, or other sweets, then parents need to find ways to offer a healthier variety of foods to their child.

Sodium — The 2010 Dietary Guidelines recommend choosing and cooking foods with less salt (sodium chloride) because a high-sodium diet can increase blood pressure, even in children (USDA, 2011). Processed foods like lunch meats, packaged snack foods, and canned soups are high in salt, and many are also high in fat. Also, a preference for salty foods is an acquired taste that most people develop during childhood. So it's a good idea to avoid adding extra salt to children's foods and to keep salty snacks and processed foods to a minimum.

Vitamin-Mineral Supplements

According to the American Academy of Pediatrics, healthy children who eat a variety of foods don't need to take vitamin-mineral supplements on a routine basis (Brown, J.E., 2008). Exceptions are supplementing with fluoride if there is not enough fluoride in the drinking water, and supplementing with vitamin D if children don't get at least 400 IU of vitamin D from foods and milk; these children should get a supplement of 400 IU of vitamin D daily (NIH, 2011).

For more information about fluoride see Part 5 of this module.

For more information about vitamin D, see the Basic Nutrition Module.

In special situations where children are at nutritional risk, vitamin-mineral supplements may be appropriate and should provide approximately 100 percent of the recommended intakes of nutrients for children unless a doctor advises higher levels. Groups at nutritional risk include:

- Children who suffer from parental neglect or abuse.
- Children with extremely poor appetites.
- Children with chronic disease (such as cystic fibrosis, inflammatory bowel disease, or liver diseases).
- Children consuming vegetarian diets without adequate dairy products — they need supplements, particularly vitamin B12.

The American Academy of Pediatrics does not recommend vitamin-mineral supplementation for children except for these few high-risk groups.

Parents should aim to offer vitamins and minerals through a healthy diet; but some parents tend to rely on multivitamin/mineral supplements to nourish their children. It is important to remember that supplements are not regulated by the U.S. government. They also can be expensive and dangerous, especially in high doses.

A common concern of parents may be that their child is not receiving enough nutrients from foods, especially if their child is a picky eater. Remind parents that many food companies add vitamins and minerals to certain foods like cereals, bread, grain products, milk, and juices, so their children may be getting more vitamins and minerals than they realize.

This is the end of Part 2.



Helping Young Children Develop Healthy Food Habits

Part 3

When it comes to eating healthy foods, parents and guardians are the people who have the most influence on their children. As a WIC staff person, you can be a great resource in helping parents come up with practical ideas.

Objectives

After completing this section you will be able to:

- Name three positive feeding strategies that parents can use.
- Identify ways to make foods more appealing to a child.
- List two ways young children can help make foods in the kitchen.
- Identify ways to manage three eating problems common in young children.

Part 3



It is the parents' responsibility to provide nutritious foods. It is up to the child to decide what to eat and how much to eat.

Creating a Positive Feeding Relationship

Most parents have good intentions when it comes to feeding their kids. However, they often fall into the trap of trying to control their child's intake by doing things like forcing foods, withholding foods, restricting amounts, or making a child clean his plate. These types of strategies tend to backfire, leading to mealtime battles and negative attitudes about foods and body image.

In a positive feeding relationship, parents help to encourage healthy eating habits by following the “**division of responsibility.**”

According to feeding specialist and family therapist Ellyn Satter, the *parent* is responsible for feeding a child healthy foods at regular times in a pleasant atmosphere. The *child* is responsible for whether he eats and how much he eats from the food the parents provide (Satter, 2005). A basic part of the parent's job is “trusting children to decide how much and whether to eat. If parents do their jobs with respect to feeding, children do their jobs with respect to eating.” (Satter, 2005).

So rather than pleading, bribing, and demanding that their kids “eat their vegetables,” parents who create a positive feeding relationship learn to let their children make their own choices during a meal and eat according to their own appetites.

For some parents, this may be a new concept and different from what they have known.

Parents' Responsibilities in a Positive Feeding Relationship

- Set a good example by eating and enjoying a variety of foods. Parents are powerful role models — children will watch and model what they see their parents eating.
- Provide healthy meals and snacks on a regular schedule. Children should not graze on foods and drinks between meals and snack times.
- Offer a variety of foods, including new foods. It helps to change up menus and recipes so children get familiar with all kinds of foods.
- Eat family meals together, and don't make a different meal for your preschooler. Offer the same foods for the whole family. It helps to always include at least one thing the child will eat, such as a whole-grain roll or a certain fruit or vegetable.
- Offer foods in a neutral manner, without demanding or bribing. Keep family mealtimes pleasant without arguing, fighting, or scolding. Make sure the TV is off; focus on the meal and each other.
- Do not make a child eat all the food on his plate. Likewise, avoid praising a child who does clean his plate. Instead, let a child know that it's okay to only eat as much as he or she wants at that time.
- Do not use food as a reward or punishment. If you tell a child he can't have dessert until he eats his vegetables, he may see vegetables as a punishment and dessert as something extra-special.
- Do not restrict the amounts of food a child eats. It is human nature to want what we can't have, so limiting a food just creates more desire for it. Also, restricting food can interfere with a child's natural ability to understand his own internal processes of hunger, appetite, and satiety. If a child can't tell if he's hungry or full, he can lose the ability to regulate his weight (Satter, 2005).

Part 3

Practical Tips for Feeding Young Children

Each child's appetite, food preferences, and eating habits will vary, but these ideas will be helpful for many families.

Encourage Children to Try New Foods – It's normal for children to reject foods they have never tried before. It can take up to a dozen tries for a child to accept a new food. Here are specific tips:

- Try to offer only one new food at a meal. Be sure to also serve something the child likes along with the new food. If all a child does is look at the new food or just feel or smell it, that is okay; it is a part of learning to accept it.
- Some children like their foods plain and separate, so keep that in mind with new foods. For other kids, it helps to serve a new food mixed in with something familiar.
- Some children prefer cooked vegetables, while others like them raw. Try different forms of the same food.
- Serve very small "try me" portions of new foods.
- Encourage a child to try new foods in a positive, neutral manner. Don't lecture or force a child to eat.
- Be a good role model by trying new foods yourself.

Make Foods Fun, Interesting, and Easy to Eat – Many families tend to eat the same foods and meals over and over – especially when there are young children in the family. Here are some ideas for parents to mix things up.

- Ask a child to help pick out a fruit and vegetable at the store and make plans to serve them that week.
- Serve different colors. Green, orange, yellow, and red are common colors in food. Try adding a bit of tomato, carrot, or zucchini to perk up a child's interest.
- Serve different textures like soft foods, crisp foods, and chewy foods that are still easy to chew for young children.
- Try one new food or recipe a month – involve your child or the whole family in the effort.
- Vary the cereals, types of bread, and sandwich filling you buy each week.
- Dry foods are especially hard for children to eat, so when planning a meal, balance dry foods with one or two moist foods.
- Prepare foods so that a child can eat them with his fingers. Serve food in small bite size pieces that can be easily picked up with small fingers.
- Young children may prefer food that is not too hot. Allow food to cool off a bit just before serving.

Get Kids in the Kitchen – Children who help an adult in the kitchen are more likely to try and like more foods. They learn basic math and science concepts, along with new words and helping to clean up is always a good skill to learn early on. Parents should always remind children to wash their hands first. Also, patience is a big part of having kids help in the kitchen. Be sure to praise them for their efforts.

Part 3

What Can Kids Do in the Kitchen?

2- and 3-year-olds can help...

- shuck corn and snap beans
- wash vegetables
- unload the dishwasher (with help)
- wipe the table
- tear lettuce
- peel bananas (if the top is cut)
- place things in the trash
- clear their own place setting

3- and 4-year-olds can help ...

- break eggs into a bowl
- measure and mix ingredients
- open packages
- knead and shape dough
- pour cereal, milk, and water
- make sandwiches
- toss salads
- “wash” baking utensils (water play)
- put food items back in the refrigerator or pantry

5-year-olds can help...

- make cakes and cookies
- use blenders or hand mixers (with close supervision)
- make pancakes, scrambled eggs, hot cereal
(with close supervision)
- set and clear the table
- load the dishwasher
- select and prepare a healthy side dish
- shop for fruits and vegetables at the store or farmer’s market
- decide on the dinner vegetable or what goes into salads

Stay Positive with Picky Eaters – Being a parent of a picky eater is frustrating, but picky eating is a typical behavior for many preschoolers. As long as a child is growing normally and has plenty of energy, he is most likely getting the nutrients he needs. If parents are concerned that a child's eating behavior has lasted a long time or is very restrictive, they should talk to the child's doctor.

All of the tips that we've covered in this section are great ideas to try with picky eaters. Here are a few more ideas for parents of picky eaters.

- Offer choices. Instead of “What vegetable would you like with dinner?” ask “Which would you like with dinner: broccoli or cauliflower?”
- Don't be a short-order cook for a picky eater. This puts the child in control of the foods he gets, but it's the parent's job to offer healthy foods. So offer the child the same foods that the rest of the family is eating. It does help to include something the child likes so he doesn't skip eating all together. And even if he does, it will be okay. He'll make up for it in another meal or snack.
- Try serving foods with toppings like a new fruit with a yogurt dressing or a steamed vegetable with a bit of grated cheese on top. While it's best to avoid adding many high fat sauces and dressings to lots of foods, if a cheese sauce will help a young child finally try broccoli, then it's helpful. Next time, try serving the broccoli without the sauce and see how it goes.
- What you say to your child affects the way he eats. Turn negative phrases into positives one. Use phrases that encourage children to try new foods and phrases that help your child recognize when he is full. Instead of saying “Eat that for me.” say something like “This is kiwi fruit; it's sweet like a strawberry.” Instead of saying “You have to take one more bite before you leave the table.” say something like “Has your tummy had enough?” (USDA, 2011b).

Part 3

Help! Answers to Parents' Questions about Their Child's Common Eating Challenges

Q: My son won't eat his vegetables. How can I get him to eat them?

A: Learning to like vegetables can be challenging for some children. As long as you keep offering vegetables without pressuring your child to eat them, you are doing a good job. He will eventually learn to like them. It can take some children up to a dozen times to learn to like a food. That's a lot of tries!

Q: Every day, it's the same thing — all she ever wants to eat is macaroni and cheese! How do I get her to try new foods?

A: Young children are cautious about new foods. Sometimes they get into food jags and want to eat the same thing all the time. As long as you do not pressure her to eat the new food, she will eventually try it out by putting some in her mouth and tasting it. You can also offer a familiar food along with the new food. The new foods will be better accepted if she is hungry and sees the rest of the family enjoying them.

Q: Sometimes my child doesn't want to eat at mealtime but wants to eat snacks and drink milk all day. Is it okay to give her all those snacks and milk whenever she asks for them?

A: It's okay to give children some healthy snacks because their stomachs can't hold very much food. On the other hand, you shouldn't let her eat snacks and drink milk or juice all day long. Try to schedule 3 meals and 2 snacks throughout the day to get in enough food. Regular mealtimes are important and if your child asks for a snack close to meal time, let her know that she will be fed soon. If you do decide to offer a snack because the meal is running late, offer a light snack so that your child will still be hungry when it's time to eat.

This is the end of Part 3.



Growth and Weight in Young Children Part 4

All parents want their children to grow into healthy adults. But many of today's children are overweight or obese, while others are severely underweight. Both extremes are related to serious health issues, as well as self-esteem and other psycho-social issues. One way WIC staff can make a difference is to help parents find ways to create healthy feeding relationships with their children.

Objectives

After completing this section you will be able to:

- Explain why a child's appetite may decrease during the preschool years.
- Identify the purpose of plotting a child's growth on a growth chart.
- Describe the possible causes and consequences of childhood obesity.
- Provide three counseling points for parents of an overweight preschooler.
- Provide two counseling points for parents of an underweight preschooler.
- Describe two ways that hunger can affect a preschooler's health.

Part 4

Normal Growth and Healthy Weight Gain

Growth is most rapid in the first year of life. Most healthy infants double their birth weight by 4 to 6 months of age and triple their birth weight by 1 year of age. Then they gain weight at a slower rate, averaging about 5 pounds per year until adolescence.

As weight gain slows down after the first year of life, children's appetites usually drop off as well. It is perfectly normal for young children to be less interested in food at mealtimes, but many parents worry because it seems their child isn't eating like before. As long as the child is following his or her growth curve, his appetite is fine. The best advice for parents is to relax, keep offering a variety of healthy foods, and let the child choose how much to eat.

There are many different normal body shapes and sizes for children. Some children are short and stocky, some are tall and slender. In a healthy child, his genes usually determine his growth, so the size and shape of his mother and father often serve as indicators. But diet and physical activity can also greatly affect a child's growth patterns and weight gain.

Early, positive experiences are important. The most important thing parents can do to help their child follow a healthy growth pattern is to have a positive feeding relationship with their child and also provide plenty of opportunities for physical activity.

For more information about creating a positive feeding relationship, see Part 3 of this module.

Using Growth Charts to Assess Growth — Whether children are taller or shorter or heavier or lighter, their heights and weights usually follow certain patterns as they grow. Growth charts show typical patterns of growth, and these curves are helpful in checking an individual child's growth over time.

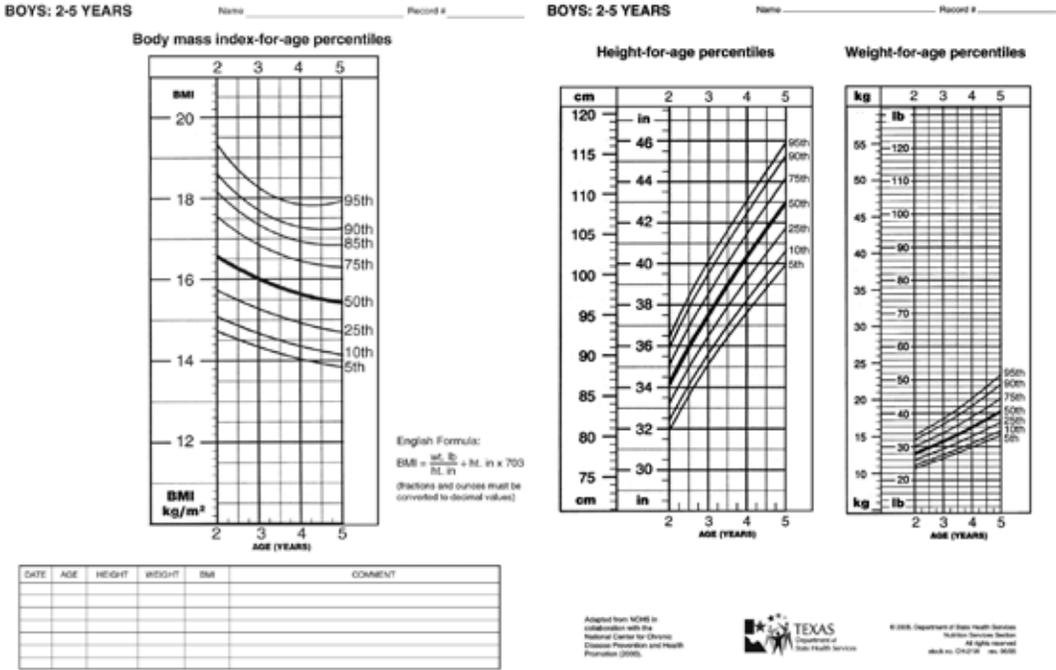
A child's growth over time should follow one of the percentile curves on the chart. As a child gets older, he may show small shifts in his growth pattern, rather than closely following a curve on the chart. If his shift in weight or height is smooth, crossing only one percentile curve over several months, or two curves over several years, his growth is probably normal. However, if a child rapidly shifts up

Growth and Weight in Young Children

or down across percentile curves on his chart, something may be disrupting his growth.

Figure 4-1 shows an example of a WIC growth chart for boys 2–5 years of age. It is based on age and sex specific growth charts developed by the National Center for Health Statistics/Centers for Disease Control and Prevention (CDC, 2011a). The front of this chart shows Body Mass Index-for-age percentiles. Body Mass Index (BMI) is a calculation based on a child’s height and weight. The back of this chart shows height-for-age and weight-for-age. WIC staff also use different, sex-specific growth charts for children birth to 24 months of age. It is important for WIC staff to learn about the different growth charts and how to use them properly.

Figure 4-1: Growth chart for boys: 2-5 years.





Approximately one-third of children in the U.S. under the age of 5 are overweight or obese.

Overweight and Obesity

Overweight and obesity are problems for adults as well as young children in the U.S., with many experts calling our country's weight problems an epidemic. The increasing number of young children who are overweight or obese is especially worrisome. These children often have medical problems like high blood pressure, high blood sugar, and high cholesterol, as well as respiratory and orthopedic problems. Also, overweight children are more likely to become overweight adults, which means they have a higher risk of diabetes, heart disease, and certain types of cancer. Perhaps the most serious consequence of childhood obesity is psychological. Obese children have lower self esteem and self confidence than thinner children, and they are more likely to experience teasing, discrimination, and depression (AAP, 2011b).

Causes of Overweight and Obesity – Many factors contribute to childhood obesity. We know that today's families eat a lot of convenience foods, fast foods, packaged snacks, and sugary drinks. At the same time, children spend more time in front of televisions and computers and less time playing outside. Some schools have also cut back on physical education classes.

However, obesity in children is more than a matter of too many calories and too little activity. It is also a complex interaction of genes and cultural practices mixed with economic, social, and psychological factors. For example, we know that if both parents are overweight, there is a high chance that their children will be overweight. Also, overweight children are more common in low-income populations.

Assessing Weight – For children *younger than 2 years*, WIC assesses weight using weight-for-length. Plotting at or above the 97.7th percentile for weight-for-length indicates high weight-for-length (CDC, 2010b).

For children *older than 2 years*, WIC uses Body Mass Index (BMI) to assess a child's weight status. The first step is to calculate BMI using a child's height and weight. Then use the BMI-for-age growth charts (for girls or boys) to plot the BMI and see which percentile the child's

Growth and Weight in Young Children

BMI is in. Children with a BMI at or above the 85th percentile are in the overweight category, and those at or above the 95th percentile are in the obese category (Barlow, 2007).

Even though a child may be overweight or obese according to his BMI on a growth chart, he's not necessarily overly fat. Some children have bigger bones or heavier muscles. If one or both of the parents are large, the child may resemble one of them due to genetics. It is important to assess not only a child's weight but also the family's lifestyle and encourage parents to help the child be the size and weight that is right for him.

Treating Obesity in Children — Treating an obese child often requires a team approach — physicians, dietitians, and psychologists all have expertise that can help families make positive changes. Research suggests that successful treatment of child obesity needs to involve the child's parents and focus on changing behaviors, not just foods (Epstein, 2001). A child's physician, however, should first rule out any medical conditions or medications that may be causing a problem.

So how should a nutrition educator counsel a parent who is concerned that her child is overweight? By using client-centered counseling techniques, a counselor can help families identify their own reasons for making changes (Barlow, 2007). Skills such as asking open-ended questions and reflecting back what the parent says can help a counselor to learn about feeding behaviors and attitudes. For example, how do the parents feel about the child's weight and what do they think is contributing to it? What changes, if any, has the family recently experienced, and what effect may these have had on the child? What are the parents interested in talking about, and how ready are they to make changes? Counselors can then help parents to work through barriers and challenges so that they can make healthy changes over time.

It is important for a family to make healthy changes together. Oftentimes, the parents of an overweight child are also overweight or obese, so healthier approaches to food and physical activity will usually benefit the whole family.

Part 4

Behaviors that help families stay healthy include (Barlow, 2007):

- Eating family meals together.
- Eating plenty of fruit and vegetables.
- Eating breakfast each morning.
- Offering appropriate portion sizes.
- Practicing regular physical activity.
- Limiting sugar-sweetened drinks.
- Limiting restaurant visits.
- Cutting back on TV and computer time.

In many families of obese or overweight children, parents put certain foods off limits and try to control their child's portion sizes. They may have good intentions, but this approach generally doesn't work. Instead, parents need to learn about the division of responsibility – parents are responsible for providing nutritious and appealing food at regular and pleasant times. Once they have done their part, parents need to trust children to choose from what is available and to eat as much or as little as they want (Satter, 2005).

For more information on creating a positive feeding relationship, see Part 3 of this module.

Most importantly, parents need to help their child feel good about himself, no matter what his body size. Parents should not scold a child for being overweight or overeating, but rather help him develop interests and skills in which he can take pride. Praise and unconditional love will help a child feel good about himself. In some cases, it may be helpful to refer the family to another health professional like a psychologist or social worker. Most nutrition educators are not trained to deal with all of the strong psychosocial issues that may be adding to the situation.

Underweight

Being underweight may also be a cause for concern. Underweight is defined as growing at or below the 2.3rd percentile for weight-for-length (for children up to 2 years of age) or below the 5th percentile for BMI-for-age (for children 2 to 5 years old) (CDC, 2010b).

However, falling in these ranges could also be normal for a child, if the growth pattern is stable. Even shifting across growth percentile curves can be normal, if the shift happens very slowly over several months or years. However, a child rapidly crossing downward across growth percentile curves is a cause for concern, and a doctor should review the case to rule out any medical conditions that might contribute to weight loss or below normal weight gain.

Creating a positive feeding relationship is an important step for parents of underweight children. If parents are concerned that a child is too small and not eating enough, they may try bribes, threats, or rewards to get the child to eat more, and a mealtime battle is likely to start. The more the parents force the child to eat, the more the child resists.

A good strategy for poor eaters is to offer a variety of foods at each meal and then allow the child to select what and how much he wants to eat. Also, parents should offer moderate amounts of healthy fats by using ingredients like olive oil, canola oil, avocados, nuts, and nut butters.

Refer to Part 3 of this module for more tips on feeding picky eaters.

Part 4

Failure to Thrive

Failure to thrive (FTT) is a chronic disorder of infancy and early childhood characterized by growth failure, malnutrition, and delays in motor and social development. FTT may result from medical, social, or environmental factors, or a combination of these. If a child is considered potentially failing to thrive, WIC staff should refer the case to a child-health clinic or a physician for further assessment and treatment.

Short Stature

Short stature is defined as length-for-age below the 2.3rd percentile (for children up to 2 years of age) or height-for-age below the 5th percentile (for children 2 to 5 years old) on a reference growth curve (CDC, 2010b). Short stature may indicate that a child is malnourished. It may also be related to genetics or certain disease conditions. Differences in stature exist among children of different ethnic and racial groups, but these are relatively minor compared with environmental and nutritional factors.

Poverty and Hunger

In 2006–2008, approximately 1 in 4 children in Arkansas were food insecure, or at risk of hunger. In fact, Arkansas has the highest rate of childhood food insecurity in the United States (Feeding America, 2010).

Young children grow very quickly, and a very low intake of energy, protein, and other nutrients can have lasting, harmful effects on their cognitive, emotional, and social development. Hungry children have higher rates of chronic illnesses, and are also more likely to experience anxiety, depression, and behavior problems (Weinreb, 2002).

Hunger and malnutrition are still serious problems, and they demonstrate the need for federal food programs like WIC to help meet the nutritional needs of low-income children.

Growth and Weight in Young Children

This is the end of Part 4.



In addition to weight and growth issues, WIC staff see other nutritional concerns in children, including iron deficiency, dental caries, and lead poisoning. This section talks about these problems, addressing both prevention and counseling tips.

Objectives

After completing this section you will be able to:

- List two possible causes of iron-deficiency anemia in preschoolers.
- List two healthy practices to reduce the risk of lead poisoning in children.
- State three practices for preventing tooth decay in children.
- State tips for managing constipation and diarrhea in children.
- Describe two food-safety practices that can reduce the risk of foodborne illness.
- Name three foods that are most likely to cause allergic reactions in children.

Iron-Deficiency Anemia

Like adults, children need iron to form healthy red blood cells. In the body, iron combines with protein to form **hemoglobin**, the red substance in the blood that takes oxygen to the cells and carbon dioxide away from the cells. Also, iron helps the body to fight infections.

Iron deficiency happens when a person either doesn't eat enough iron, loses a lot of blood, or doesn't absorb iron very well. If a child has an iron deficiency that persists, he will begin to use up his body's iron stores and, over time, his hemoglobin levels will drop below normal. At that point, he develops **iron-deficiency anemia**.

Symptoms of anemia include:

- Fatigue
- Irritability
- Pale appearance
- Loss of appetite
- More colds and infections
- Problems learning for children

The body needs iron for growing new body tissues, and since young children grow so quickly, it's no surprise that iron deficiency is a common problem in this age group. During the first 2 years of life, a child's brain reaches two-thirds of its total growth. If a child has an iron deficiency during this critical time, his brain and nervous system might not develop properly, which can cause learning problems.

In January 2013, 14% of children ages 1 to 5 on WIC in Arkansas had hemoglobins less than 11.1 and were at risk for iron deficiency anemia. The prevalence of iron deficiency is higher among low-income children, and higher among black and Mexican- American children than among white children.

Causes of Iron-Deficiency Anemia — At 1 year of age, there is a sudden drop in dietary iron for most children when they switch from either breastmilk or iron-fortified formula to cow's milk, which is a poor source of iron. What's more, some toddlers drink more milk than they need and as a result, don't eat enough iron-rich foods. This low intake of solid foods combined with drinking too much milk may add to the problem.



Iron-deficiency anemia occurs when hemoglobin levels in the blood drop below normal.

Preventing and Managing Common Nutrition Problems

After 2 years of age, children do not grow as fast, and their diets are usually more varied, so the risk of iron-deficiency anemia is lower. Then past age 3, most children are getting enough iron and their dietary iron and iron status is usually good. Still, for older children, risks for iron deficiency include:

- Limited access to food because of low family income.
- Migrant or refugee status.
- A low-iron or other specialized diet.
- Medical conditions that affect iron status, such as bleeding disorders.

Preventing Iron-Deficiency Anemia — WIC staff can help parents and caregivers plan meals for their children that have plenty of iron-rich foods like meats, beans, and fortified breads and cereals. The body absorbs the iron in meats better than the iron in non-meat foods, but eating a food rich in vitamin C at the same meal will help the body absorb more iron.

Parents should focus on healthy meals and snacks, and cut back on giving empty-calorie foods like candy, sodas, and chips. Tea is another thing to avoid since it has no nutritive value and interferes with iron absorption. Also, most young children should not drink more than 16 ounces of milk a day.

Treating Iron-Deficiency Anemia — If a child's hematocrit or hemoglobin meets the WIC policy criteria for low iron status, WIC staff should refer to the Child Health Manual for the policy on referral/treatment. Usually, a doctor will provide iron supplements and nutrition information. If the anemia doesn't respond to treatment, a doctor will order tests to see if there are other causes for the child's anemia.



Iron-deficiency anemia in preschoolers is often due to low intake of iron-rich foods, limited access to food, or medical conditions.

WIC Iron-status Screening Criteria

For ages 12–24 months:

Hgb <11.0 g/dL and

Hct <33.0%

For ages 2–5 years:

Hgb <11.1 g/dL and

Hct <33.0%

Lead Poisoning

Lead is a substance that serves no known purpose in the body. Lead enters your body when you swallow or breathe in lead dust or particles from the air, water, food, and soil. Small amounts of lead can build up in the body and cause temporary or permanent damage.

In recent years, cases of lead poisoning in young children in the U.S. have declined. Still, lead poisoning is a major concern because of the serious health problems it can cause.

- In 2007, 1.0 percent of children (up to age 6) that were tested for lead had elevated blood levels.
- In 2011, less than 0.5 percent of young children (up to age 6) that were tested for lead had elevated blood levels.

CDC National Surveillance Data (1997-2011)

Lead poisoning occurs in young children for a number of reasons. First, they have a tendency to put their hands in their mouths, plus they like to chew or eat non-food items, such as dirt, window sills, etc. Children younger than 7 are at risk because their brains and internal organs are still developing and their growing bodies readily absorb more lead than adults. Children living at or below the poverty level who live in older housing are at greatest risk (Centers for Disease Control and Prevention, 2009). The effects of lead depend on how much lead the child absorbs. Even low levels of lead in the blood can affect a child's intelligence, and higher levels can affect a child's growth, damage the kidneys, and lead to seizures, coma, and even death.

Preventing and Managing Common Nutrition Problems

Sources of Lead Include:

- Houses and playground equipment with lead-based paint (painted before 1980).
- Factories where lead-containing chemicals are used.
- Hobbies, such as fishing with lead weights or reloading ammunition.
- Some pottery glazes contain lead.
- Some imported toys and candy wrappers contain lead paint or ink.
- Pipes may be lead-soldered and may leach lead into the drinking water.
- Folk medicines such as greta and azarcon contain powdered lead.

Preventing Lead Poisoning — Good nutrition practices can reduce the amount of lead that a child absorbs. Because more lead is absorbed on an empty stomach, it helps when a child eats three meals and two or three snacks each day. In addition, foods high in calcium and iron can reduce lead absorption.

Also, health specialists recommend storing foods in glass, plastic or pottery made with lead-free glaze (never use imported pottery or pottery items not intended to be used with food). And it is best to use only cold water for drinking, cooking, and preparing infant formula since lead from pipes is more likely to leach into hot water. Before using water from lead pipes, it helps to run it for 15 to 30 seconds or until it feels colder to help flush out the pipes. This is especially important when the water has not run for several hours (Centers for Disease Control and Prevention, 2009).

Washing is another step in prevention:

- Wash children's hands and faces before they eat.
- Wash pacifiers and toys each time they fall on the ground.
- Wash fruits and vegetables before cooking to remove soil that might contain lead.
- Wash hands and counter surfaces before preparing foods.



Lead poisoning can decrease intelligence, impair growth, damage kidneys and cause seizures, coma, and even death.

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Testing for Lead Poisoning — Parents can have their children screened for lead poisoning as part of the Arkansas EPSDT child health checkups (if they are on Medicaid), or through their private physician. If a child has a high blood-lead level, it is important to evaluate the environment to determine the source of lead, and then separate the child from the source. Also, if the blood lead level is extremely high, a child can receive treatment.

Tooth Decay

Two out of every 10 preschool-aged children have had tooth decay in their primary (baby) teeth, and these children generally are from low-income and minority families.

Certain foods high in sugars and starches promote tooth decay. Decay starts with bacteria found naturally in the plaque on the teeth. When mixed with sugar, the bacteria produce an acid that attacks the tooth surface and can create a hole or cavity.

Each time a child eats food with sugar or starch, the bacteria on the teeth have a chance to form acid. If a child snacks often on sugar-rich foods, his teeth are bathed in acid all day and tooth decay is more likely to occur.

Preventing Tooth Decay — Parents play a crucial role in caring for their young children's teeth early on, through both dental care and good nutrition. They can start by planning regular meals and snacks, and not allowing free access to food between meals. Good choices for snacks include cheese, fresh vegetables, and fresh fruit. Snacks that are not good for the teeth include cakes, candies, ice cream, and soft drinks. Parents should brush their children's teeth twice a day and floss them once a day.

Although fluoride is not an essential nutrient, fluoridated drinking water is extremely beneficial in reducing dental cavities. If the drinking water supply has fluoride levels less than 0.6 parts per million, then a dentist or pediatrician may prescribe oral fluoride supplementation for a preschooler. It is important to find out the level of fluoride in the drinking water in a particular community by calling the local health department, contacting the local water supplier, or consulting with a local dentist or pediatrician. The

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supplement dose is determined by the fluoride content of the drinking water as well as by the fluoride found in food, beverages, and toothpaste. The dentist or pediatrician will prescribe the appropriate dose.

Baby-Bottle Tooth Decay — Baby-bottle tooth decay is a serious dental health concern, but it is something that parents can prevent. This problem occurs when infants or children are put to bed with a bottle or carry around a bottle of a sweetened liquid and drink from it throughout the day. Children who use sippy cups in this same manner are also at risk for baby-bottle tooth decay. The teeth are bathed in sugar, leading to cavities, especially on the upper front teeth. Parents should look for white spots on the upper front teeth near the gum line — these are early signs of baby-bottle tooth decay. It is best for a child to have the first dental visit within 6 months after the first tooth appears but no later than the child's first birthday (American Dental Association, 2010).



To prevent baby-bottle tooth decay, parents shouldn't use bottles for juice or sweetened beverages. Also, a child should not have a bottle or sippy cup in bed or carry them around throughout the day.

Constipation

If a child does not have a bowel movement every day, this does not mean the child is constipated. Healthy children have a range of normal bowel patterns that varies depending on age and usual dietary intake. Constipation in children is usually caused by poor toilet habits, not enough fiber and fluid, lack of physical activity, stress, or a combination of these. Also, a medical problem or medication can cause constipation.

Constipation is the passage of firm or hard stools. *Infrequent or irregular bowel movements do not by themselves indicate constipation.* Often constipation occurs along with other symptoms like difficulty passing stools, bloody stools, and abdominal pain.

Preventing Constipation — Parents can help their children prevent constipation through diet, regular physical activity, and regular bathroom habits. Preschool children should drink about 6 to 8 cups of fluid each day and should eat a variety of fruits, vegetables and whole grains each day in order to get enough fiber. At least 60 minutes of moderate physical activity on a daily basis should be encouraged. Also, parents should set regular schedules for taking children to the bathroom, and ask them to sit on the toilet with proper foot support for 5 to 10 minutes after each meal.

Treating Constipation — Fiber acts like a sponge in the digestive tract, absorbing water as it travels. This adds bulk and softness to the stool, and helps to avoid constipation. High-fiber foods include cooked dry beans (such as black-eyed peas or pinto beans), broccoli, corn, baked potato with skin, strawberries, dried fruit (such as raisins), fruits with skin (such as apples and pears), bran muffins, oatmeal, and bread labeled “100 percent whole wheat.”

When a child is constipated, gradually add more fiber-rich foods to the diet. As the child gets more fiber-rich foods, he also needs more fluids. Water and unsweetened 100 percent juices are best. Limit milk to no more than 16 ounces per day. Likewise, most children shouldn't drink more than 4 to 6 ounces of juice per day.



Adequate fluids, fiber, and physical activity can help prevent constipation in preschoolers.

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Parents should avoid over-the-counter medications for constipation unless a doctor prescribes them. If vomiting, stomach pains, bloody stools, or poor growth accompany the constipation, or if it doesn't improve by the above-mentioned suggestions, there may be a more serious problem and a physician should see the child (National Digestive Diseases Information Clearinghouse [NDDIC], 2008).



Diarrhea

A child with diarrhea has an increase in frequency, fluidity, or volume of stools compared to his normal stools. As already mentioned, normal bowel patterns vary among healthy children. Young children with diarrhea can quickly become dehydrated and, if they aren't treated immediately, the condition can be fatal. Diarrhea can be acute (lasting fewer than 2 weeks) or chronic (lasting longer than 2 weeks).

Acute diarrhea can result from a viral or bacterial infection or when a child ingests a poison. Conversely, children with chronic diarrhea may have a gastrointestinal disorder, infection, or cow's milk or soy-protein allergy. Also, some young children who drink too much fruit juice can get diarrhea because they aren't able to absorb the types of sugars in some juices.

Managing Acute Diarrhea — Treating acute diarrhea is twofold: first, the child needs extra fluids and electrolytes to prevent dehydration, plus he needs to eat enough solid foods to stay nourished. Parents can use commercially produced oral electrolyte solutions (OES) or, they can make a homemade electrolyte solution by slowly adding 2 cups of boiled and cooled water and a ¼ teaspoon of salt to ½ to 1 cup of infant rice cereal. For children younger than 2, parents should give a half cup of OES slowly every hour using a small spoon. If the child is older than 2, they can give a half to 1 cup every hour.

Diarrhea can be dangerous if not treated quickly because it can lead to severe loss of fluid from the body (dehydration).

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An oral electrolyte solution (OES) contains sodium and potassium and is designed to replace lost body fluids.

There are a number of fluids that parents shouldn't give to a child with acute diarrhea, unless they are the only fluids available or are the only fluids the child will take. These include sports drinks, fruit juice, sweetened fruit drinks, or sweetened tea. Sugary solutions tend to increase diarrhea, so if resorting to these fluids, parents should dilute them first (e.g., a half cup fruit juice mixed with a half cup water).

In order to stay nourished, a child should continue to eat foods he normally eats, including meat or fish, eggs, beans, milk products, cooked vegetables, and bananas.

Refer an Infant or Child with Diarrhea to a Doctor if

- The child has black or bloody stools.
- There are signs of dehydration such as dry sunken eyes, dry mouth or tongue.
- The child has a fever higher than 99°F.
- Diarrhea continues for more than 24 hours.

Preventing Foodborne Illness — Certain populations, such as infants, young children, and the elderly, are at greater risk of foodborne illness. Foodborne illness can cause diarrhea and vomiting, which can lead to dehydration. In some cases foodborne illness may even lead to death if the child is not treated soon enough. Parents should follow food safety rules when shopping for, storing, preparing, and serving food. One of the most important rules is to keep certain foods out of the danger zone — the middle range of temperatures in which bacteria multiply. To avoid this danger zone, hot foods need to stay hot, at an internal temperature of 140°F or warmer. Likewise, cold foods need to stay cold, at an internal temperature of 40°F or colder.

Adverse Food Reactions

Food Intolerance versus Food Allergy – An adverse food reaction is any negative response by the body after eating a food. An adverse food reaction can be either **food intolerance** or a **food allergy** (food hypersensitivity).

Food intolerance doesn't involve the immune system, although with many food intolerances, the gastrointestinal tract is involved. Food intolerances can be a result of digestive disorders, such as lactose intolerance. Food intolerances make up the majority of adverse reactions to foods, and people often mistakenly refer to them as food allergies.

A food allergy, on the other hand, involves a response by the immune system. When a person eats a food he's allergic to, his body produces antibodies to destroy the allergen, which is a protein in the food. Overall, only 2 to 4 percent of children are believed to have food allergies, and 90 percent of food allergies in the United States are caused by eight foods or food groups. These include: milk, eggs, peanuts, tree nuts (examples: cashews, almonds, pecans, walnuts), soy, wheat, fish, and shellfish (Academy of Nutrition and Dietetics, 2011).

Below is a table that describes common symptoms of food allergies and food intolerances. The severity and types of symptoms can vary from person to person (National Institutes of Health [NIH], 2011).

Table 5-1: Common Symptoms of Food Allergies and Food Intolerances

Food Allergy	Food Intolerance
Rash or hives	Gas, cramps, or bloating
Difficulty breathing	Diarrhea
Itchy skin	Nausea
Shortness of breath	Heartburn
Chest pain	Stomach pain
Anaphylaxis	Vomiting



A food intolerance is a negative reaction to a food that does not involve the immune system.

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A food allergy is a negative reaction to a food that involves the immune system and includes such symptoms as hives or swelling.

Testing for Food Allergies — To test for food allergies, a physician will take a careful history and perform a physical examination. Also, physicians can use skin prick tests with food extracts or radioallergosorbent tests (RASTs) to identify food allergies. Once the suspected foods are identified, the next step is to eliminate them from the diet for 1 to 2 weeks. Then the foods are slowly added back to the child’s diet to see if they still cause allergic reactions.

Treating Food Allergies — The only way to treat a food allergy is to eliminate the food from the child’s diet and educate the parents about avoiding the particular food. Parents need to learn to read food labels and look for hidden forms of the foods that cause the allergies. Also, they need to be sure that they still provide a balanced diet for their child. Most children will outgrow allergies to milk, egg, soy, and wheat while allergies to peanut or tree nuts are often lifelong (National Institute of Allergy and Infectious Disease, 2010).

For information about the prevention of food allergies, see the Infant Nutrition module

Hyperactivity and Diet

Hyperactivity is a term that describes excessive restlessness or movement. Some children who are hyperactive may be diagnosed by their doctor with attention deficit–hyperactivity disorder (ADHD) which refers to a group of various behavior problems that impair a child’s learning. Some symptoms of ADHD include hyperactivity, short attention span, talking excessively, inability to play quietly, being easily distracted, etc.

Some people claim that eliminating certain foods, such as foods with artificial food colors, from the diet can improve behaviors in children with ADHD. Children can be sensitive to certain foods or ingredients and may show improvements in behavior when these foods are eliminated, but it has not been established that food sensitivities are a main cause of ADHD (Stevens, Kuczek, Burgess, Hurt, Arnold, 2011). Studies also fail to support the claim that sugar has an effect

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on hyperactivity, attention span, aggressive or disruptive behavior, or learning problems. Some children may have unusual reactions or rare allergies, but researchers haven't found sugar to be the cause in these instances (National Institute of Mental Health, 2009).



Studies do not support claims that sugar or food additives are a main cause of hyperactivity in children.



References

- American Academy of Pediatrics. (2010a). *Policy Statement-Prevention of Choking Among Children*. Retrieved from <http://pediatrics.aappublications.org/content/early/2010/02/22/peds.2009-2862.full.pdf>
- American Academy of Pediatrics. (2011b). *Prevention and Treatment of Childhood Overweight and Obesity*. Retrieved from <http://www.aap.org/obesity/about.html>
- American Academy of Pediatrics Committee on Public Education. (2001) Children, adolescents, and television. *Pediatrics*. 107(2), 423-426.
- American Dental Association. (2010). *Baby Bottle Tooth Decay*. Retrieved from <http://www.ada.org/3034.aspx?currentTab=1#top>
- American Dietetic Association. (2011). *Size-Wise Nutrition for Toddlers*. Retrieved from <http://www.eatright.org/Public/content.aspx?id=8055>
- American Dietetic Association Pediatric Nutrition Care Manual. (2011). *Food Allergic Disorders*. Retrieved from http://www.nutritioncaremanual.org/content.cfm?highlight=food%20allergies&ncm_content_id=92350
- Barlow S.E. (2007) Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report. *Pediatrics*. 120, S164-S192.
- Brown, J. E., Issacs, J.S., Krinkle, U.B., Murtaugh, M.A., Sharbaugh, C., Stang, Wooldridge, N.H. (2008). *Nutrition through the life cycle*. (3rd ed.). Belmont, CA: Thompson Wadsworth.
- Centers for Disease Control and Prevention. (2007). *Tested and Confirmed Elevated Blood Levels by State, Year and Blood Lead Level Group for Children < 72 month*. Retrieved from http://www.cdc.gov/nceh/lead/data/StateConfirmedByYear_1997_2007Web.htm
- Centers for Disease Control and Prevention. (2009a) *CDC Growth Charts*. Retrieved from <http://www.cdc.gov/growthcharts/charts.htm>
- Centers for Disease Control and Prevention. (2009b). *Lead: Prevention Tips*. Retrieved from <http://www.cdc.gov/nceh/lead/tips.htm>

References

- Centers for Disease Control and Prevention. (2010a). *Prevalence of Obesity Among Children and Adolescents: United States, Trends 1963–1965 Through 2007–2008*. Retrieved from http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.p
- Centers for Disease Control and Prevention. (2010b). *Use of World Health Organization and CDC growth Charts for Children Aged 0-59 Months in the United States*. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5909a1.htm#fig4>
- Centers for Disease Control and Prevention. (2011). *Obesity Among Low-Income Children*. Retrieved from <http://www.cdc.gov/obesity/downloads/PedNSSFactSheet.pdf>
- Dwyer J.T., Butte N.F., Deming D.M., Siega-Riz A. M., Reidy K.C. (2010). Feeding infants and toddlers study 2008: progress, continuing concerns, and implications. *Journal of the American Dietetic Association*, 110 (12), Suppl. 3, S60-S67.
- Epstein L.H., Roemmich J.N., Raynor H.A. (2001). Behavioral therapy in the treatment of pediatric obesity. *Ped Clinics of North Amer.* 48, 981-993.
- Feeding America. (2010). *Childhood Food Insecurity in the United States: 2006-2008*. Retrieved from <http://feedingamerica.org/hunger-in-america/hunger-studies/~media/Files/research/state-child-hunger-2010.ashx?.pdf>
- KidsHealth. (2011). *What should preschoolers drink?* Retrieved from http://kidshealth.org/parent/nutrition_center/healthy_eating/preschool_drinks.html
- Kranz, S. (2006). Meeting the dietary reference intakes for fiber: sociodemographic characteristics of preschoolers with high fiber intakes. *American Journal of Public Health*, 96 (9), 1538-1541.
- Malik, V.S., Schultze, M.B., & Hu F.B. (2006). Intake of sugar-sweetened beverages and weight gain: a systematic review. *American Journal of Clinical Nutrition*, 84, 274-288.

References

- National Association for Sport and Physical Education. (2011). *Active start: a statement of physical activity guidelines for children from birth to age 5, 2nd edition*. Retrieved from <http://www.aahperd.org/naspe/standards/nationalGuidelines/ActiveStart.cfm>
- National Digestive Diseases Information Clearinghouse. (2008). *Constipation in children*. Retrieved from <http://digestive.niddk.nih.gov/ddiseases/pubs/constipationchild/>
- National Institutes of Allergy and Infectious Diseases (2010). *Guidelines for the Diagnosis and Management of Food allergy in the United States*. Retrieved from <http://www.niaid.nih.gov/topics/foodallergy/Pages/default.aspx>
- National Institutes of Health, Office of Dietary Supplements. (2011). *Dietary supplement fact sheet: vitamin D*. Retrieved from <http://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>
- National Institute of Mental Health. (2009). *What causes ADHD*. Retrieved from <http://www.nimh.nih.gov/health/publications/attention-deficit-hyperactivity-disorder/what-causes-adhd.shtml>
- National Library of Medicine, MedlinePlus. (2009). *Caffeine in the diet*. Retrieved from <http://www.nlm.nih.gov/medlineplus/ency/article/002445.htm>
- National Library of Medicine, MedlinePlus. (2011). *Food allergy*. Retrieved from <http://www.nlm.nih.gov/medlineplus/foodallergy.html>
- Nevin-Folino, N. (2008). *Sports Nutrition for Children and Adolescents. In Handbook of Pediatric Nutrition (3rd ed.)* Sudbury, MA. Jones and Barlett.
- Ogden C.L., Carroll M.D., Curtin L.R., Lamb M.M., Flegal K.M. (2010). Prevalence of high body mass index in U.S. children and adolescents, 2007-2008. *JAMA* 303(3), 242-9.
- Satter, Ellyn. (2005). *Your Child's Weight: Helping Without Harming Birth Through Adolescence*. Madison, WI: Kelcy Press.

References

- U.S. Department of Agriculture. (2011a). *MyPlate*. Retrieved from <http://www.choosemyplate.gov/>
- U.S. Department of Agriculture. (2011b). *Phrases that Help and Hinder*. Retrieved from <http://www.choosemyplate.gov/preschoolers/HealthyHabits/phrasesthathelp.pdf>
- U.S. Department of Agriculture & U.S. Department of Health and Human Services. (2010a, December). *Dietary Guidelines for Americans 2010*. (7th Edition).
- U.S. Department of Agriculture & U.S. Department of Health and Human Services. (2010b, May). Report of the Dietary Guidelines Advisory Committee on the
- Weinreb L., Wehler .C, Perloff J., Scott R., Hosmer D., Sagor L., Gunderson C. (2002). Hunger: its impact on children's health and mental health. *Pediatrics*. 110(4):e41.



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