

International Guidelines Regarding Nutrition for Preschoolers with Type 1 Diabetes: USA Perspective

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Disclosures

- none

Discussion

- US Healthy Eating Guidelines
- Strategies for feeding preschoolers
- Challenges for the parents with a young child with diabetes

Goals of Nutrition Therapy

- Near normal blood glucose levels
- Optimal lipid levels
- Adequate calories to maintain optimal weight for adults, normal growth and development for children and adolescents
- Prevent, delay, or treat nutrition-related complications
- Improvement of overall health through good nutrition

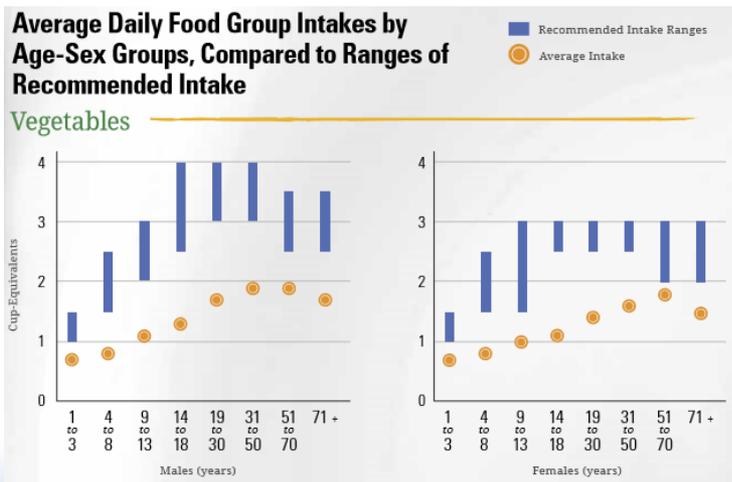
“ In teaching patients their diet, I lay emphasis on carbohydrate values, and teach to a few the value of protein and fat.”



E.P. Joslin – 1935

Nutrition Concerns in Young Children in US

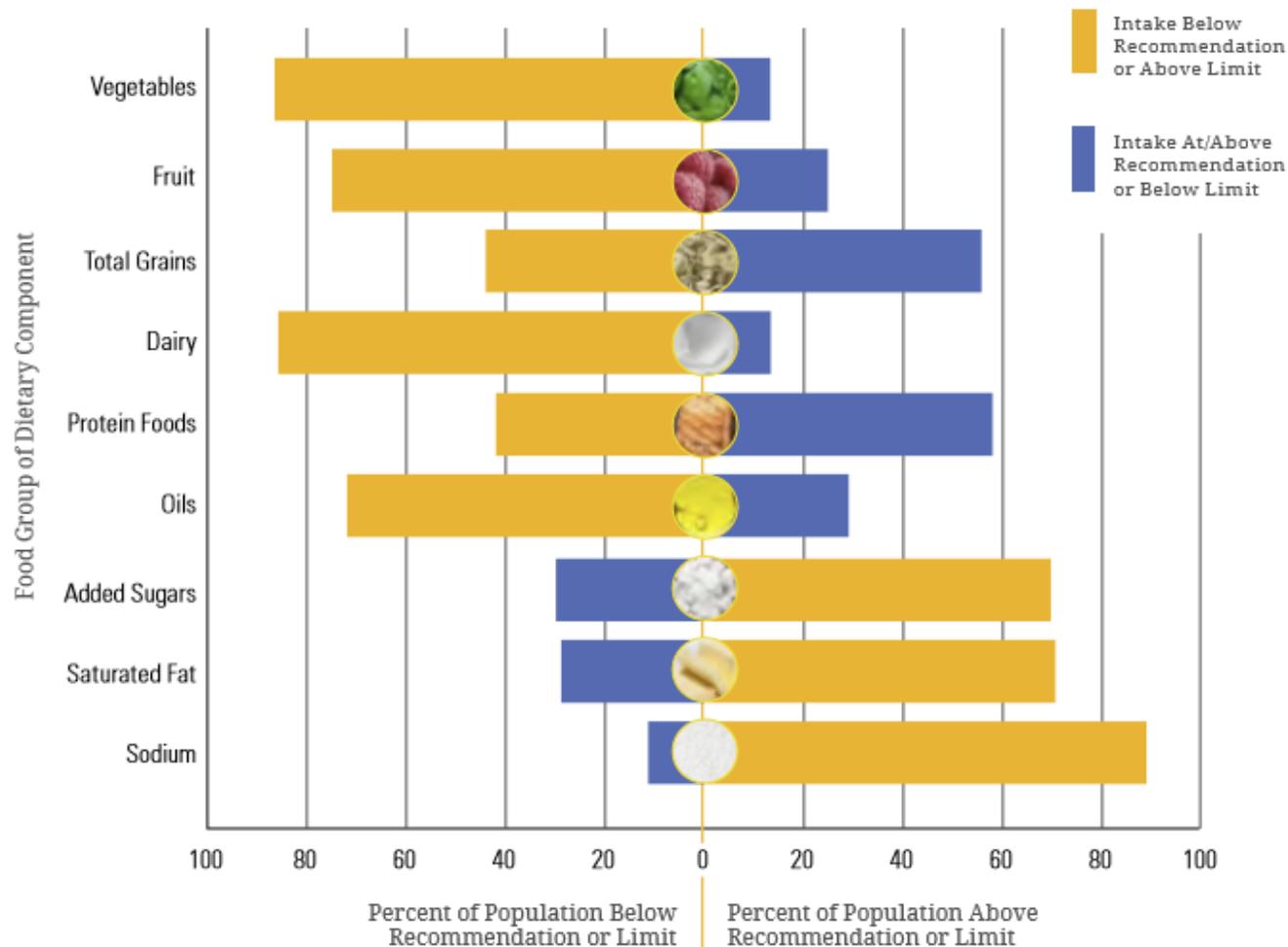
- Energy balance
- Excessive intake of:
 - Dietary fats
 - Saturated fats
 - Sugar
 - Sodium
- Inadequate Intakes of foods rich in:
 - Calcium
 - Potassium
 - Vitamin D
 - Dietary fiber



- Dairy foods
- Vegetables
- Fruits
- Seafood
- Whole grains

Dietary Intakes Compared to Recommendations.

Percent of the U.S. Population Ages 1 Year & Older Who Are Below, At, or Above Each Dietary Goal or Limit

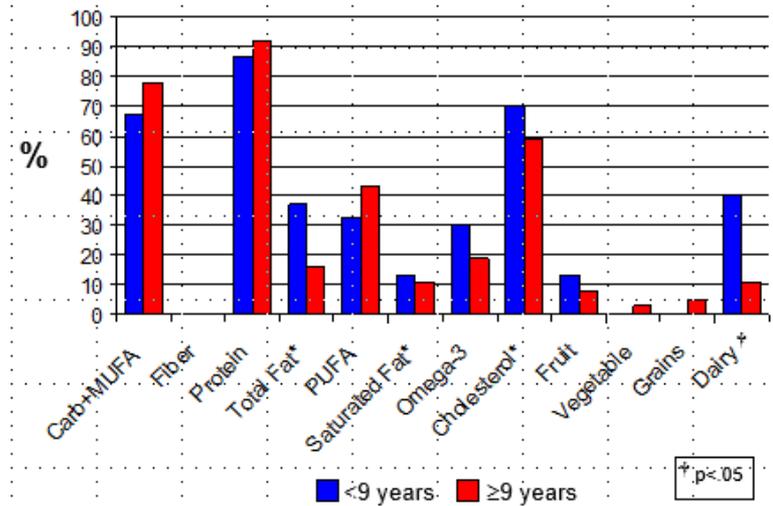


Nutritional Deficiencies among Young Children with Type 1 Diabetes

MACRONUTRIENT AND FOOD INTAKE

Nutrient	Age <9 years		Age ≥ 9 years	
	Daily Intake	Rec	Daily Intake	Rec
Energy intake (EI) (kcal)	1434 ± 346		1771 ± 780	
Carbohydrate (%EI)	51 ± 7		50 ± 6	
MUFA (%EI)	13 ± 2	60-70	14 ± 2	60-70
Fiber (g)	12 ± 4	25	14 ± 5	31
Protein (%EI)	16 ± 5	< 20	15 ± 3	< 20
Total fat (%EI)	33 ± 6	< 30	35 ± 5	< 30
PUFA (%EI)	6 ± 2	~10	7 ± 2	~10
Saturated fat (%EI)	14 ± 3	< 10	14 ± 3	< 10
Trans-fatty acids (g)	4 ± 2	Minimize	6 ± 3	Minimize
Omega-3 FAs (g)	0.8 ± 0.3	0.9	1.0 ± 0.5	1.2
Cholesterol (mg)	172 ± 82	< 300	196 ± 91	< 300
Food Group				
Fruit (servings)	1.1 ± 0.9	≥ 2	0.9 ± 0.8	≥ 2
Vegetable (servings)	1.2 ± 0.8	≥ 3	1.4 ± 0.9	≥ 3
Grains (servings)	2.8 ± 1.1	≥ 6	3.6 ± 1.4	≥ 6
Dairy (servings)	2.8 ± 1.3	≥ 3	2.6 ± 1.3	≥ 4

Percent Meeting Recommended Daily Intake



* Based on intakes less than or equal to recommended intake

Intensively managed young children with type 1 diabetes consume high-fat, low-fiber diets similar to age-matched controls

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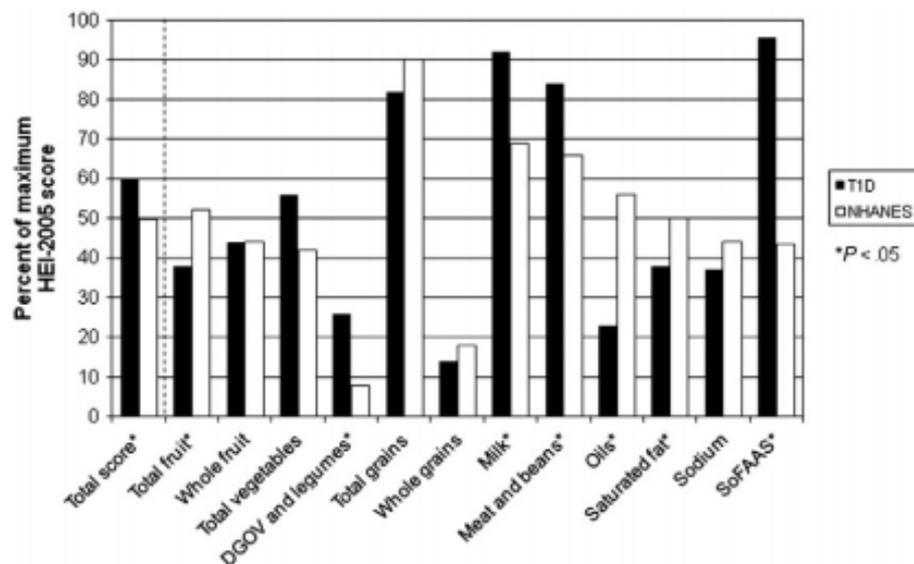


Figure - Dietary quality in children with T1D and age-matched children in the general population (NHANES) presented as percent of maximum HEI-2005 total and component scores; higher percent reflects greater adherence to USDA dietary recommendations. *Significant differences, $P < .05$.

2015-2020 Dietary Guidelines for Americans

Key Recommendations



Healthy eating pattern includes:

- A variety of vegetables from all subgroups—dark green, red and orange, legumes (beans and peas), starchy, and other
- Fruits, especially whole fruits
- Grains, at least half of which are whole grains
- Fat-free or low-fat dairy, including milk, yogurt, cheese, and/or fortified soy beverages
- A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes (beans and peas), and nuts, seeds, and soy products
- Oils



2015-2020 Dietary Guidelines for Americans

Key Recommendations



Healthy eating pattern limits:

- Saturated fats and trans fats, added sugars, and sodium
- Less than 10 percent of calories per day from added sugars
- Less than 10 percent of calories per day from saturated fats
- Less than 2,300 milligrams (mg) per day of sodium
- If alcohol is consumed, it should be consumed in moderation

Macronutrient Requirements

	Source of Goal	1-3 years	Female 4-8 years	Male 4-8 years
Calorie Level		1000	1200	1400 -1600
Macronutrients				
Protein, g	RDA	13	19	19
Protein, % kcal	AMDR	5-20	10-30	10-30
Carbohydrate, g	RDA	130	130	130
Carbohydrate, % kcal	AMDR	45-65	45-65	45-65
Total Fat, % kcal	AMDR	30-40	25-35	25-35

RDA – Recommended Dietary Allowance

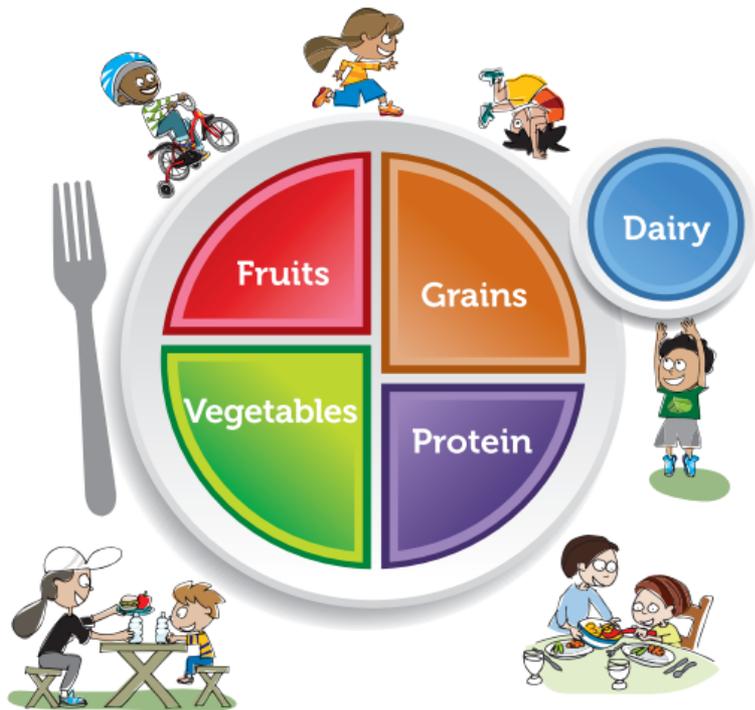
AMRD – Acceptable Macronutrient Distribution Range

DGA – 2015-2020 Dietary Guidelines Recommendations limit

AI – Adequate Intake



Healthy Eating ^{for} preschoolers



Choose**MyPlate**.gov

USDA
U.S. Department of Agriculture
Food and Nutrition Service

Get your child on the path to healthy eating.



Focus on the meal and each other.

Your child learns by watching you. Children are likely to copy your table manners, your likes and dislikes, and your willingness to try new foods.

Offer a variety of healthy foods.

Let your child choose how much to eat. Children are more likely to enjoy a food when eating it is their own choice.

Be patient with your child.

Sometimes new foods take time. Give children a taste at first and be patient with them. Offer new foods many times.

Let your children serve themselves.

Teach your children to take small amounts at first. Let them know they can get more if they are still hungry.

Cook together.

Eat together.

Talk together.

Make meal time family time.



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 **Joslin Diabetes Center**

USDA Guidelines for the Preschoolers

- Encourage fruits, vegetables, grains, protein foods, and dairy provide the nutrients that their bodies need. Keep an eye on the amount of added sugars, sodium, and saturated (solid) fat.
- **Fruits** – offer a variety of whole or bite-sized fruits such as apples, sliced bananas, and mandarin orange pieces.
- **Vegetables** – Prepare red, orange, and dark-green vegetables like tomatoes, sweet potatoes, and broccoli as part of a child's meals and snacks.
- **Grains** – Make at least half their grains whole grains by offering 100% whole-grain cereals, breads, and pasta.
- **Protein Foods** – Choose a variety of protein foods such as seafood, beans, and small portions of meat or poultry.
- **Dairy** – Give them low-fat milk, yogurt, and cheese to provide much needed calcium.
- **Encourage water instead of fruit juice or sugary drinks** – Too much 100% juice or sugar-sweetened beverages, such as soda, juice drinks, or sport drinks, can add more calories than a child needs.
- **Check out the sodium (salt) in canned foods, bread, and frozen meals** – Read the Nutrition Facts label to find foods with lower numbers.
- **Watch the amount of saturated fats in foods** – Cakes, cookies, ice cream, pizza, cheese, sausages, and hot dogs are okay sometimes but not every day.

Healthy Eating for preschoolers

Daily Food Plan



Use this Plan as a general guide.

- These food plans are based on average needs. Do not be concerned if your child does not eat the exact amounts suggested. Your child may need more or less than average. For example, food needs increase during growth spurts.
- Children's appetites vary from day to day. Some days they may eat less than these amounts; other days they may want more. Offer these amounts and let your child decide how much to eat.

Food group	2 year olds	3 year olds	4 and 5 year olds	What counts as:
Fruits 	1 cup	1 - 1½ cups	1 - 1½ cups	½ cup of fruit? ½ cup mashed, sliced, or chopped fruit ½ cup 100% fruit juice ½ medium banana 4-5 large strawberries
Vegetables 	1 cup	1½ cups	1½ - 2 cups	½ cup of veggies? ½ cup mashed, sliced, or chopped vegetables 1 cup raw leafy greens ½ cup vegetable juice 1 small ear of corn
Grains Make half your grains whole 	3 ounces	4 - 5 ounces	4 - 5 ounces	1 ounce of grains? 1 slice bread 1 cup ready-to-eat cereal flakes ½ cup cooked rice or pasta 1 tortilla (6" across)
Protein Foods 	2 ounces	3 - 4 ounces	3 - 5 ounces	1 ounce of protein foods? 1 ounce cooked meat, poultry, or seafood 1 egg 1 Tablespoon peanut butter ¼ cup cooked beans or peas (kidney, pinto, lentils)
Dairy Choose low-fat or fat-free 	2 cups	2 cups	2½ cups	½ cup of dairy? ½ cup milk 4 ounces yogurt ¾ ounce cheese 1 string cheese

Some foods are easy for your child to choke on while eating. Skip hard, small, whole foods, such as popcorn, nuts, seeds, and hard candy. Cut up foods such as hot dogs, grapes, and raw carrots into pieces smaller than the size of your child's throat—about the size of a nickel.

There are many ways to divide the Daily Food Plan into meals and snacks. View the "Meal and Snack Patterns and Ideas" to see how these amounts might look on your preschooler's plate at www.choosemyplate.gov/preschoolers.html.



kid-friendly veggies and fruits



10 tips for making healthy foods more fun for children

Encourage children to eat vegetables and fruits by making it fun. Provide healthy ingredients and let kids help with preparation, based on their age and skills. Kids may try foods they avoided in the past if they helped make them.

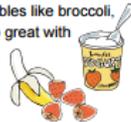
1 smoothie creations

Blend fat-free or low-fat yogurt or milk with fruit pieces and crushed ice. Use fresh, frozen, canned, and even overripe fruits. Try bananas, berries, peaches, and/or pineapple. If you freeze the fruit first, you can even skip the ice!



2 delicious dippers

Kids love to dip their foods. Whip up a quick dip for veggies with yogurt and seasonings such as herbs or garlic. Serve with raw vegetables like broccoli, carrots, or cauliflower. Fruit chunks go great with a yogurt and cinnamon or vanilla dip.



3 caterpillar kabobs

Assemble chunks of melon, apple, orange, and pear on skewers for a fruity kabob. For a raw veggie version, use vegetables like zucchini, cucumber, squash, sweet peppers, or tomatoes.

4 personalized pizzas

Set up a pizza-making station in the kitchen. Use whole-wheat English muffins, bagels, or pita bread as the crust. Have tomato sauce, low-fat cheese, and cut-up vegetables or fruits for toppings. Let kids choose their own favorites. Then pop the pizzas into the oven to warm.

5 fruity peanut butterfly

Start with carrot sticks or celery for the body. Attach wings made of thinly sliced apples with peanut butter and decorate with halved grapes or dried fruit.

6 frosty fruits

Frozen treats are bound to be popular in the warm months. Just put fresh fruits such as melon chunks in the freezer (rinse first). Make "popsicles" by inserting sticks into peeled bananas and freezing.

7 bugs on a log

Use celery, cucumber, or carrot sticks as the log and add peanut butter. Top with dried fruit such as raisins, cranberries, or cherries, depending on what bugs you want!

8 homemade trail mix

Skip the pre-made trail mix and make your own. Use your favorite nuts and dried fruits, such as unsalted peanuts, cashews, walnuts, or sunflower seeds mixed with dried apples, pineapple, cherries, apricots, or raisins. Add whole-grain cereals to the mix, too.



9 potato person

Decorate half a baked potato. Use sliced cherry tomatoes, peas, and low-fat cheese on the potato to make a funny face.

10 put kids in charge

Ask your child to name new veggie or fruit creations. Let them arrange raw veggies or fruits into a fun shape or design.



Fruit Juice in Infants, Children, and Adolescents: Current Recommendations

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American Academy
of Pediatrics



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Age	Recommendations
< 12 months	Do not routinely give fruit juice to children < 1 year of age
1 to 3 years	Limit fruit juice to a maximum of 4 fl. oz. (120 cc) per day Serve with meal or snack do not allow the child to carry the juice to sip on thorough out the day
4 to 6 years	Limit fruit juice to a maximum of 4 to 6 fl. oz. (180 cc) per day Serve with meal or snack do not allow the child to carry the juice to sip on thorough out the day
7 to 18 years	Limit juice to 8 fl. oz. (240 cc) a day

Strategies for Healthy Eating

- Allow child to enjoy their foods
- Recognize the hunger and full signs
- Let them determine amount
- Make mealtime relaxed and enjoyable
- Variety – Repetition
- Avoid foods that you do not want them to love when they are older
- Balance foods with other attentions
- Be a good role model
- Family eating

Physical Activity Guidelines

Adults

- At least 150 minutes of moderate intensity physical activity and should perform muscle-strengthening exercises on 2 or more days each week.

Youth ages 6 to 17 years – 60 minutes a day

- **Aerobic:** most of the 60 minutes should moderate to vigorous, should include vigorous-intensity at least 3 days a week.
- **Muscle-strengthening:** at least 3 days of the week.
- **Bone-strengthening:** least 3 days of the week.

Pre-School Children²

- 15 minutes activity for every hour in care



1. U.S. Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. Washington (DC): U.S. Department of Health and Human Services; 2008. ODPHP Publication No. U0036. Available at: <http://www.health.gov/paguidelines>.

2. Physical Activity Guidelines for Americans Midcourse Report Subcommittee of the President's Council on Fitness, Sports & Nutrition. Physical Activity Guidelines for Americans Midcourse Report: Strategies to Increase Physical Activity Among Youth. Washington, DC: U.S. Department of Health and Human Services, 2012

Physical Activity

Preschoolers need quiet time but make sure your preschooler is not inactive for too long.

- Limit TV/screen time to < 2 hours daily, as recommended by the American Academy of Pediatrics.
- Encourage reading or crafts rather than TV time.
- Quiet time is best before naps or bed.
- Be a role model and limit your own inactivity. Preschoolers will learn that being physically active is part of a healthy life. Manage the time you spend watching TV or using mobile devices.
- Look for childcare settings that engage children in active play and regular physical activity. After 60 minutes of inactivity (such as watching TV) your child should be encouraged to be active.
- Avoid having the TV on during mealtimes.
- Only put TVs in family rooms. Don't put a TV in your child's bedroom.



Feeding the Infant

- Breast milk or formula
 - Carb content
 - Breast milk – 7.4 g 3.8 fl.oz. (100 ml)
 - Formula – 6.7 g 3.8 fl.oz. (100 ml)
- Feeding – 6 months
 - Every 3-4 hours
 - 5-8 fl.oz. (150-240 ml) (11 – 18 grams carb/feeding)
- 4-6 months introduction of food



Preschool Children Feeding Behaviors

- Appetite slows down ~ 1 year of age - “They eat just enough to survive and drive their parents crazy” T Berry Brazelton, PhD
- “Food Strikes” or “Food Jags” are normal
- Environment plays a role
 - Quite time before the meal
- Meals and snacks should be at a table with an appropriate chair and utensils
- Child-size portions
 - 1 tablespoon for every year of age
- More willing to eat foods that they help to prepare
- Require 2-3 snacks per day, which should be planned, not random

Introducing New Foods

- One at a time
- Offer new foods at the beginning of the meal
- Serve the new food with a familiar food
- Preschoolers can try something 10 to 14 times before they decide they like it
- Continue to offer foods even if they have refused it in the past

Food is the Preschoolers Only Control!

- Do not assume that refusal is due to stubbornness
- Work with your child's eating patterns
- Do not use food as a reward, encouragement, or punishment
- Do not discuss their non-eating behavior in front of them
- Be consistent with food refusal replacements
 - One standby

Food is the Preschoolers only Control!

- Do not become a short order cook
- Use your window of opportunity wisely (15-20 minute rule)
- Do not give into tantrums over food
- Learn to recognize hunger signals
- Treats or once in while foods
- Positive reinforcement

Diabetes Nutrition Meal Plan

- Individualized plan
 - Not a “Diabetic Diet”
 - Cultural and family traditions
- Advanced Carb Counting (Matching Insulin to Carbs)
 - Weigh and measure food
- Healthy Eating
 - Fat, protein, glycemic index
- Cover all meals and snacks with insulin
 - Do the math!
- Free Foods vs. Non Carb foods
- Carb restriction not recommended
- Frequent visits dietitian/nutritionist

Challenges Feeding the Preschooler

- Pre-packaged foods
- Bolus before the meal
- Hypoglycemia
 - Feeding the insulin
 - CGM – downward trends
 - Treatment
 - Limiting activity
- Diabetic foods
 - Sugar alcohols
- Good vs. bad

Summary

- Healthy lifestyle
 - Nutrition
 - Carbohydrates
 - Fat
 - Protein
 - Glycemic index
 - Physical activity

