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# NUTRITION FOR THE CHILD LIVING WITH CELIAC DISEASE

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# Learning Objectives



By the end of the presentation, I hope you will be able to:

- Appreciate the unique characteristics of the child living with celiac disease.
- Understand the nutritional requirements for a child living with celiac disease.
- Be able to help the child fit a gluten free diet into their life.

# Children are Not Little Adults



- Rely on adults for food.
- In a rapid stage of growth and development (cognitively and socially).

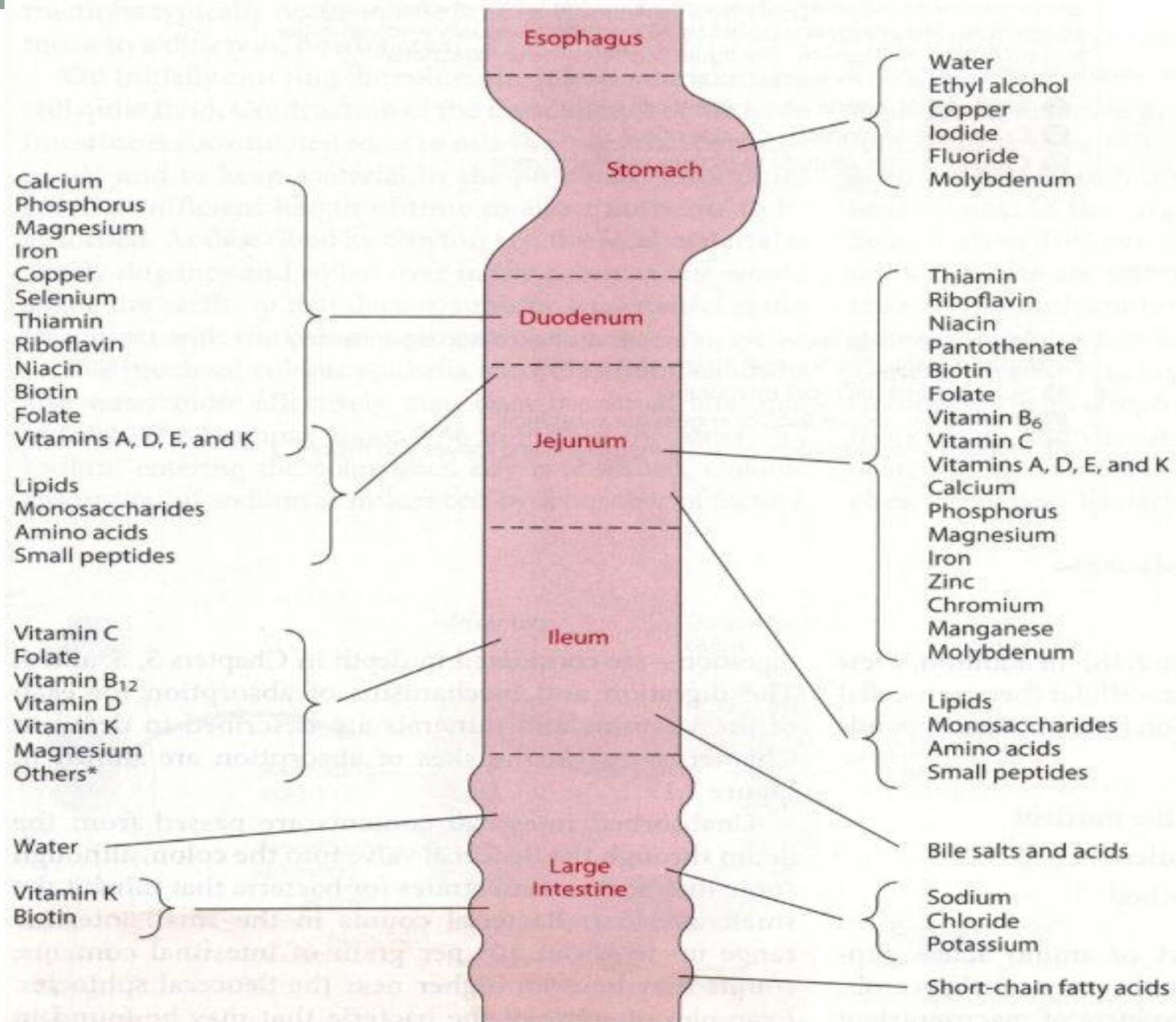
# Classical Symptoms of Celiac Disease in Children

- Slowed growth or failure to thrive
- Weight loss
- Diarrhea
- Abdominal distention (bloating or excess gas)
- Constipation
- Abdominal pain
- Vomiting

Presence of obesity does not exclude the diagnosis of celiac disease.

# Nutritional Status upon Diagnosis

- Depends on the length of time a person has lived with celiac disease , the extent of damage, and the degree of malabsorption.
- 2° lactose intolerance (↓ lactase enzyme production as a result of damaged villi).
- May require temporary or long-term vitamin and mineral supplementation.



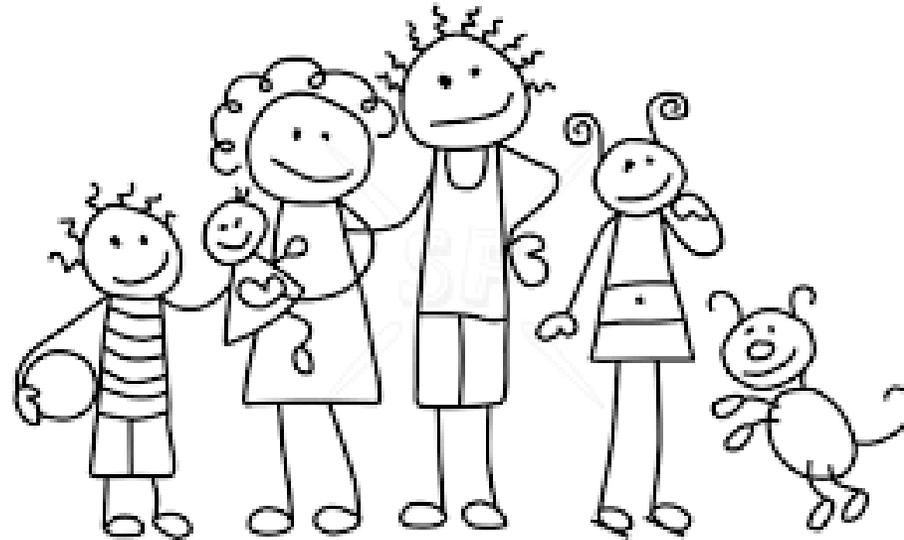
\*Many additional nutrients may be absorbed from the ileum depending on transit time.

# Nutritional Assessment

- Anthropometrics (Ht, Weight, BMI)
- Nutrition related lab values (albumin, CBC, Iron status, vitamin B12, folate)
- Review of symptoms
- Bowel movements
- Intake
  - Diet history / food frequency
  - Cooking abilities
  - Meal structure (who prepares, location, timing etc.)
  - Accidental exposure
- GF Knowledge (child and parent's)

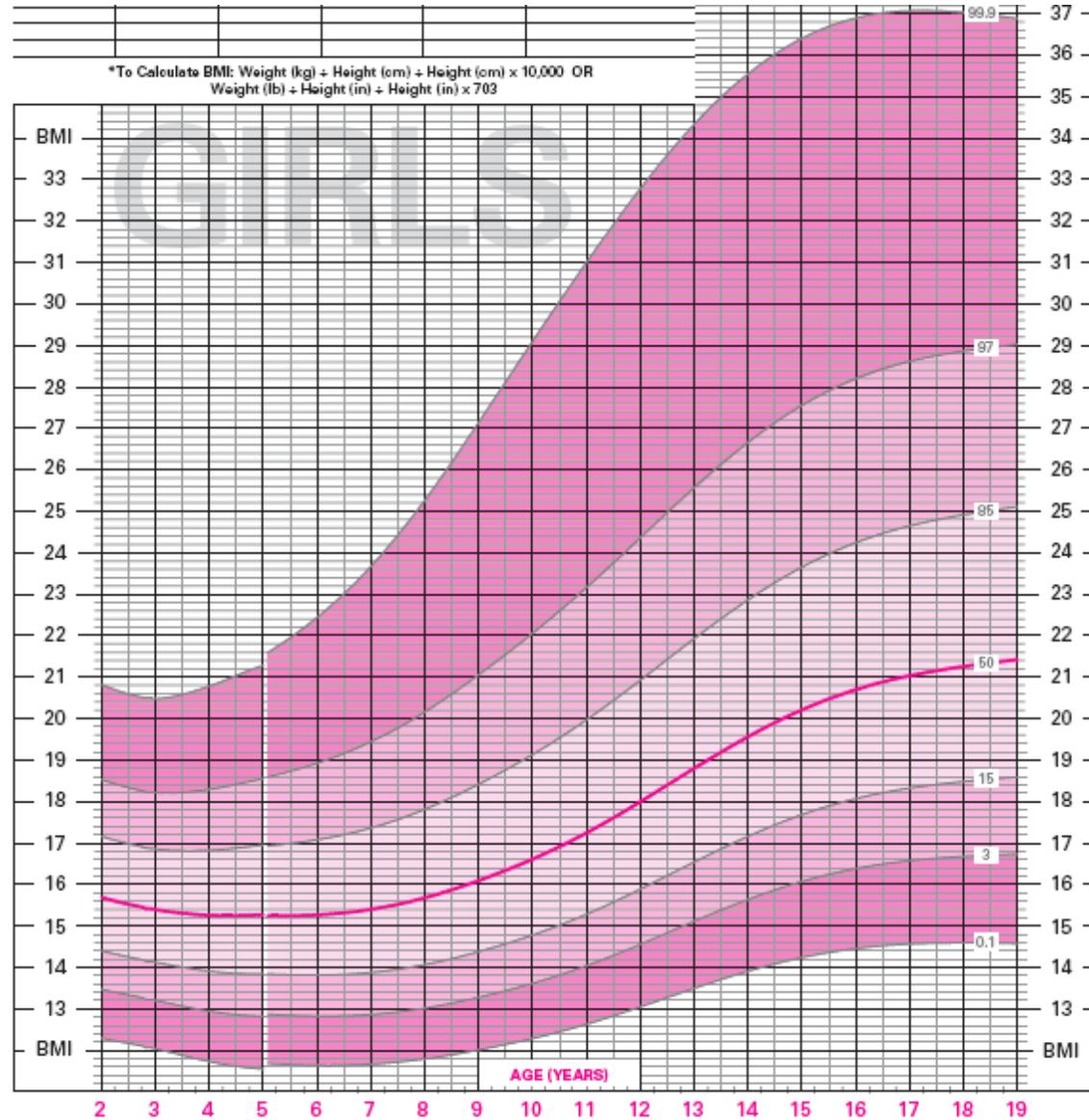
# Social Assessment

- Response to diagnosis
- Family support
- Barriers to compliance





# BMI Percentiles



# Iron Deficiency

- Treatment with a strict gluten-free diet with attention to iron rich foods should correct iron deficiency.
- **Heme iron sources:** meat, fish, poultry.
- **Non-Heme sources:** nuts, seeds, legumes, dark green vegetables, dried fruit (apricots, prunes, raisins), eggs, amaranth, bean flours, quinoa, rice bran, soy flour, black strap molasses.

# Folate Deficiency

- Folate deficiencies may occur in severe cases of malabsorption.
- **Folate rich sources:** legumes, green leafy vegetables, broccoli, asparagus, orange juice, liver, peanuts, walnuts, sesame seeds, sunflower seeds, bean flour, amaranth, flax.
- Recommend enriched and whole grain gluten free products.

# Vitamin B12 Deficiency

- Treatment with a strict gluten-free diet, with special attention to vitamin B12 rich foods.
- B12 rich sources: liver, eggs, milk, meat, poultry, fish , seafood.
- B12 supplementation may be required if inadequate dietary intake and strict vegan diet.

# Lactose Intolerance

- May occur temporarily in newly diagnosed patients as a result of damaged villi and decreased lactase production.
- With a strict gluten-free diet, lactose intolerance symptoms should disappear within 6 months to 1 year (with the healing of the intestine).
- If symptoms persist, consider possibility of primary lactose intolerance or hidden gluten in the diet.

# Lactose Intolerance

- Consider lactase enzyme drops or tablets as tolerated.
- Choose lactose free (and gluten free) beverages fortified with calcium, vitamin D.
- Once a client is asymptomatic, can re-introduce lactose in small amounts to assess tolerance.

## Daily Recommended Elemental Calcium and Vitamin D intake

Age	Elemental Calcium (mg)	Vitamin D (IU)
0-6 months	200	400
7-12 months	260	400
1-3 years	700	600
4-8 years	1000	600
9-18 years	1300	600

# Calcium

## **Milk Free Sources**

- Fortified Milk alternatives (300mg per 250ml)
- Canned sardines with bones (400mg per can)
- Calcium fortified orange juice (185mg per 125ml)
- Almonds (45mg per ounce)
- Blackstrap molasses (44mg/ 15ml)
- Baked beans (45mg per 125ml)
- Broccoli (22mg per 125ml)

# Calcium Supplements

- Look at the amount of elemental calcium.
- Come in chewable, liquid or tablet.
- If source is calcium carbonate – take with food.
- Take no more than 500-600mg at a time.
- If also taking iron supplements, do not take both at the same time.

# Calcium Supplements

## **Ingredients**

- if you have a shellfish allergy, do not take supplements that have coral or oyster.
- Bone meal, fossils, oyster Shell and dolomite (rock mineral) may contain high levels of lead.

# Vitamin D

## **Milk Free Sources**

- Milk alternatives (100 IU per 250ml)
- Eggs (30-40 IU per egg)
- Salmon, Sockeye (200-280 per ounce)
- Tuna, albacore (35-42 IU per ounce)

# Fibre

- **Insoluble fibre** helps promote regularity and a healthy digestive system.
  - skins of vegetables and fruit and the bran portion of whole grains.
- **Soluble fibre:** help slow the digestion of food.
  - some vegetables, fruit and legumes like dried beans and peas.

# Fibre

- There is no data for the reference fibre intake for children less than 1 year of age.
- The dietary reference intake for children is as follows;
  - 1-4 years of age is 19g/day
  - 4-8 years of age 25g/day
  - Females: 9-18 years of age 25+
  - Males: 9-18 years of age 30+

# Increasing Fibre on a Gluten Free Diet

- Choose higher fibre gluten free flours/starches.
- Add corn bran, ground flax, rice bran to cereals, pancakes, baked products.
- Use brown rice or wild rice.
- Add chickpeas or other beans to salads, soups and casseroles.

# Increasing Fibre on a Gluten Free Diet

- Roast chickpeas, use hummus for dipping
- Choose high fibre snacks such as fruit, vegetables, nuts.
- Make homemade gluten free trail mix (dried fruit, gluten free cereal, gluten free pretzels).
- Gradually increase dietary fibre to minimized adverse gastrointestinal side effects.
- Ensure adequate fluid intake.

# Oats

- Is an excellent source of iron and fibre.
- Traditionally excluded from diet because of cross contamination with gluten containing grains.
- The individual should be stabilized on the gluten-free diet and their celiac antibody levels should have normalized. (6-18 months).
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- When adding oats to the diet, individuals may experience a change in stool pattern or mild gastrointestinal symptoms, including abdominal bloating and gas.
- Start with a small amount of oats per day (adults; 1/4-3/4 cup dry rolled oats and children; 1/8-1/4 cup) and gradually increase as tolerated.

# Balance of food groups is essential to meet nutrient requirements

**Recommended Number of Food Guide Servings per Day**

Age in Years	Children			Teens		Adults			
	2-3	4-8	9-13	14-18	19-50		51+		
	Girls and Boys		Females	Males	Females	Males	Females	Males	
<b>Vegetables and Fruit</b>	4	5	6	7	8	7-8	8-10	7	7
<b>Grain Products</b>	3	4	6	6	7	6-7	8	6	7
<b>Milk and Alternatives</b>	2	2	3-4	3-4	3-4	2	2	3	3
<b>Meat and Alternatives</b>	1	1	1-2	2	3	2	3	2	3

The chart above shows how many Food Guide Servings you need from each of the four food groups every day.

Having the amount and type of food recommended and following the tips in *Canada's Food Guide* will help:

- Meet your needs for vitamins, minerals and other nutrients.
- Reduce your risk of obesity, type 2 diabetes, heart disease and other chronic diseases.

## What is One Food Guide Serving? Look at the examples below.



**Fresh, frozen or canned vegetables**  
125 mL (½ cup)



**Leafy vegetables**  
Cooked: 125 mL (½ cup)  
Raw: 250 mL (1 cup)



**Fresh, frozen or canned fruits**  
1 fruit or 125 mL (½ cup)



**100% Juice**  
125 mL (½ cup)



**Bread**  
1 slice (35g)



**Bagel**  
½ bagel (45 g)



**Flat breads**  
½ pita or ½ tortilla (35 g)



**Cooked rice, bulgur or quinoa**  
125 mL (½ cup)



**Cereal**  
Cold: 30 g  
Hot: 175 mL (¾ cup)



**Cooked pasta or couscous**  
125 mL (½ cup)



**Milk or powdered milk (reconstituted)**  
250 mL (1 cup)



**Canned milk (evaporated)**  
125 mL (½ cup)



**Fortified soy beverage**  
250 mL (1 cup)



**Yogurt**  
175 g (¾ cup)



**Kefir**  
175 g (¾ cup)



**Cheese**  
50 g (1 ½ oz.)



**Cooked fish, shellfish, poultry, lean meat**  
75 g (2 ½ oz.)/125 mL (½ cup)



**Cooked legumes**  
175 mL (¾ cup)



**Tofu**  
150 g or 175 mL (¾ cup)



**Eggs**  
2 eggs



**Peanut or nut butters**  
30 mL (2 Tbsp)



**Shelled nuts and seeds**  
60 mL (¼ cup)

## Make each Food Guide Serving wherever you are – at home, at work, at school, or on the go.

- ▶ **Eat at least one dark green and one orange vegetable and one fruit every day.**
  - Go for dark green vegetables such as broccoli, spinach, and kale.
  - Go for orange vegetables such as carrots, sweet potatoes, and pumpkin.
- ▶ **Choose vegetables and fruit that are high in fibre.**
  - Enjoy vegetables steamed, baked or stir-fried.
- ▶ **Have vegetables and fruit most of the time.**

- ▶ **Make at least half of your grain products whole grain.**
  - Eat a variety of whole grains such as barley, oatmeal, whole wheat, and wild rice.
  - Enjoy whole grain breads, oatmeal or whole wheat pasta.
- ▶ **Choose grain products that are high in fibre.**
  - Compare the Nutrition Facts table on labels.
  - Enjoy the true taste of grain products. When you eat whole grain products, you'll get more fibre and nutrients.

- ▶ **Drink skim, 1%, or 2% milk every day.**
  - Have 500 mL (2 cups) of milk every day for adults and 250 mL (1 cup) for children.
  - Drink fortified soy beverages if you do not drink milk.
- ▶ **Select lower fat milk alternatives.**
  - Compare the Nutrition Facts table on yogurt labels.

- ▶ **Have meat alternatives such as fish, tofu, eggs, peanut or nut butters, and shelled nuts and seeds.**
- ▶ **Eat at least two Food Guide Servings of fish, tofu, eggs, peanut or nut butters, and shelled nuts and seeds every week.**
  - Choose fish such as char, herring, mackerel, salmon, and tuna.
- ▶ **Select lean meat and alternative protein sources.**
  - Trim the visible fat from meats. Remove the skin from poultry.
  - Use cooking methods such as roasting, baking, broiling, and grilling.
  - If you eat luncheon meats, sausages or prepared meats, choose lean varieties.



## Oils and Fats

- Include a small amount – 30 to 45 mL (2 to 3 Tbsp) – of unsaturated fat each day. This includes oil used for cooking, salad dressings, margarine, and nut butters.



Enjoy a variety of foods from all food groups.

# What Does Gluten Free Mean in Canada

- No ingredients that contain any gluten proteins from barley, oats, rye, triticale or wheat, including kamut and spelt, have been deliberately added to the product.
- No ingredients that contain modified or hydrolyzed proteins from gluten contain grains have deliberately added to the product.
- Gluten levels from accidental contamination are less than 20 ppm.

# What Does Gluten Free Mean in Canada

- Good manufacturing practices have been used to minimize the risk of accidental contamination from gluten grains.
- Any ingredients from gluten grain have been processed to remove the gluten protein using methods that have been demonstrated to be effective (i.e. wheat syrup and wheat maltodextrin).
- Recognized testing methodologies have been used to measure gluten levels.
- The food has been specially processed or formulated to meet the needs of individuals living with celiac disease.

# Canada Food labeling Laws

- Came into effect in 2012
- Require the 10 priority allergens, gluten sources, and added sulphites of 10ppm be identified using plain language either in the ingredient list or in a contains statement that appears immediately after the ingredient list.

# Canada Food labeling Laws

- Check the warning statement.....if it states, contains wheat, rye, barely, oats or gluten not OK
- If the contains statement does not include wheat or a gluten grain it is ok
- If the ingredient list states oats, assume they are contaminated with gluten unless, they are specially identified as pure uncontaminated oats or by the source (Cream hill Estates, Only Oats etc.)
- If there is no contains statement Check the ingredient list for wheat, rye, barely, oats.

# Type 1 Diabetes and Celiac Disease

- Autoimmune disease that results in total destruction of insulin producing cells.
- Are dependent of insulin injections for life.
- Fast acting Insulin is given to match carbohydrate intake.
- Families are taught to read labels to calculate carbohydrate content of foods.

# Nutritional Labeling

<b>Nutrition Facts</b>			
Per 90 g serving (2 slices)			
Amount		% Daily Value	
<b>Calories 170</b>			
<b>Fat</b> 2.7 g			<b>4 %</b>
Saturated 0.5 g			<b>5 %</b>
+ Trans 0 g			
<b>Cholesterol 0 mg</b>			
<b>Sodium</b> 200 mg			<b>8 %</b>
<b>Carbohydrate</b> 36 g			<b>13 %</b>
Fibre 6 g			<b>24 %</b>
Sugars 3 g			
<b>Protein 8 g</b>			
Vitamin A	1 %	Vitamin C	0 %
Calcium	2 %	Iron	16 %

- Check serving size
- Net carbs = (total carbs – fibre)
- $36\text{g} - 6\text{g} = 30\text{g}$  net carbs

insulin to carb ratio

- 1 unit of fast acting insulin (lipsro or aspart) : 15g of carbs
- $30\text{g} / 15 = 2$  units of rapid acting insulin

# Nutrient Composition Resources

- Nutrient Value of Some Common Foods  
Publications, Health Canada, Ottawa, Ontario  
1-866-225-0709  
Email: publications@hc-sc-gc-ca
- Nutrient Canada App (adapted from the Canadian Nutrient File; \$3.99)
- Eat tracker – Dietitians of Canada
- Common Baking Ingredients- BC Children's Hospital  
<http://www.bcchildrens.ca/NR/rdonlyres/F6C898A0-EC49-4AD3-83C9-2D4CED725B0D/72931/carbbaking.pdf>



## ✓ Eater

**Respect your child's appetite — or lack of one**

- Don't force a meal or snack.
- Don't bribe or force your child to eat.
- Serve small portions to avoid overwhelming your child and give him or her the opportunity to independently ask for more.

# Picky Eater



## **Stick to the routine**

- Serve meals and snacks at about the same times every day.
- Allowing your child to fill up on juice, milk or snacks throughout the day might decrease his or her appetite for meals.

## **Be patient with new foods**

- Young children often touch or smell new foods, and might even put tiny bits in their mouths and then take them back out again.
- Your child might need repeated exposure to a new food before he or she takes the first bite.

# Picky Eater



## Make it fun

- Serve broccoli and other veggies with a favorite dip or sauce.
- Cut foods into various shapes with cookie cutters. Offer breakfast foods for dinner. Serve a variety of brightly colored foods.

## Recruit your child's help

- Ask your child to help you select fruits, vegetables and other healthy foods.
- Encourage your child to help you rinse veggies, stir batter or set the table.

# Picky Eater



## **Set a good example**

- If you eat a variety of healthy foods, your child is more likely to follow suit.

## **Minimize distractions**

- No TV, iPad, radio etc.

## **Do not be a short order cook**

# Child Activities



- Play-doh
- Birthday parties / school parties
- Sleep-overs
- Part-time jobs
- Home-economic class

# Resources

## Celiac Association

- National Association 1-800-363-7296
- Manitoba Chapter 204-772-6979
- <http://www.manitobaceliac.com/>
- Pocket dictionary

## Dietitians of Canada – Gluten Free Eating

[http://www.glutenfreediet.ca/media/Gluten\\_Free\\_Eating\\_Apr\\_2011.pdf](http://www.glutenfreediet.ca/media/Gluten_Free_Eating_Apr_2011.pdf)

“Gluten Free Diet A comprehensive Resource Guide” by Shelley Case, RD; <https://www.glutenfreediet.ca/>

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