Discovering Nutrition and Behavior in the Classroom

Jessica Mitchell, RD LD CNSC

Objectives

- Importance of Nutrition in Child-Care Settings and School
- How a steady state of plasma glucose can help young children behave better in the classroom.
- Importance of Child, Parent, and Teacher Education.
- Celiac, Gluten Allergy and ADD/ADHD

Child Care Trends

- America's Population of preschool children has increased by 3.5% in the past 20 years.
- More than 52% of children age 3 to 5 years were enrolled in center based care in 1991.
- Today, approximately 82% of all children younger than age 6 are in care outside the home.

Journal of the American Dietetic Association Sept 2011 "Nutrition and the Child-Care Setting"

More Trends

- Today, 1 in 3 children younger that age 5 years is classified as obese or overweight.
- Being overweight or obese during childhood has been shown to be a strong predictor for comorbidities in adolescents and later in life.
- These include heart disease, diabetes, sleep apnea, HTN, hyperlipidemia, asthma, lower self-esteem, and psychological and social stress.

Journal of the American Dietetic Association Sept 2011 "Nutrition and the Child-Care Setting"

Nutrition Components

- The guidelines adopted at child-care settings in the US for serving meals are variable.
- An average of 2.3 million kids participate daily in centers that receive funds from CACFP.
- RDs and pediatricians suggest children in child care for 8 or more hours per day should receive at least 2/3 of their nutritional intake from the child care center. However, CACFP sets the benchmark for daily intake at 50% leaving the remaining 50% for parents to provide outside the child care setting.

Journal of the American Dietetic Association Sept 2011 "Nutrition and the Child-Care Setting"

Healthy Hunger-Free Kids Act 2010

- Increase the availability of healthy food to low income children.
- Authorizes the USDA to determine the nutrition standards for meals that are provided in school and child care centers.
- Legislation establishes local farm to school distribution networks to increase the volume of local produce in schools.
- Increased availability of drinking water to children in schools and during meal times.

Skipping Breakfast

- Between 1965 and 1991 breakfast consumption declined among children in the US.
- Preschool – 5%
- 8-10 years old – 9%
- 11-18 years old – 13-20%

Decreased Academic Performance

- Impaired cognitive functioning during the day when healthy children skip breakfast.
- Areas of cognitive deficit include: problem solving, attention, and memory.
- Miss more days of school and are tardy more often.
- Obtain lower grades.

Journal of Clinical Nutrition 1989 "Effects of missing breakfast on the cognitive functions of school children of differing nutritional status."
Archives of Pediatric & Adolescent Medicine 1998 "The relationship of school breakfast to psychosocial and academic functioning: Cross-sectional and longitudinal observations in an inner-city school sample."

Missing Micronutrients

- Data from the Bogalusa Heart Study showed that 10 year olds who skipped breakfast failed to meet the Recommended Dietary Allowance (RDA) for:
- Vitamin A, B6, D, Calcium, Magnesium, riboflavin, folic acid, zinc, phosphorous, and iron.
- Than those that ate breakfast.

American Journal of Clinical Nutrition 1998. "Nutrient contribution of breakfast, secular trends, and the role of ready-to-eat cereals: A review of data from the Bogalusa heart study."

Environmental Factors to Related to Breakfast Consumption

- No breakfast foods at home or school.
- Having a lack of breakfast food choices available at school or having no one to prepare food at home.
- Not a scheduled part of the day.
- Parents skip breakfast

Meal and snacking patterns of students... 1981 survey of 3,309 students in grades 3-12. Journal of School Health.

Children's perceived benefits and barriers in relation to eating breakfast in schools with or without universal school breakfast. Journal of Nutrition Education & Behavior. 2002

Factors affecting breakfast intake in children. Topics in Clinical Nutrition. 2003

Adolescent breakfast skipping: An Australian study. Adolescence. 1998

Fixing Trends

- Supporting and educating parents about nutrition related decisions will be paramount for reversing recent trends in obesity among preschool children.
- A registered dietitian should be involved to review a nutrition plan as they are trained to identify nutritional deficits.
- Teacher education would also play an important part in supporting healthy choices for kids while at school.

Digestion

- Macronutrients provide fuel for our body and brain to function every day.
- These macronutrients are carbohydrates, protein, and fat.

Carbohydrates

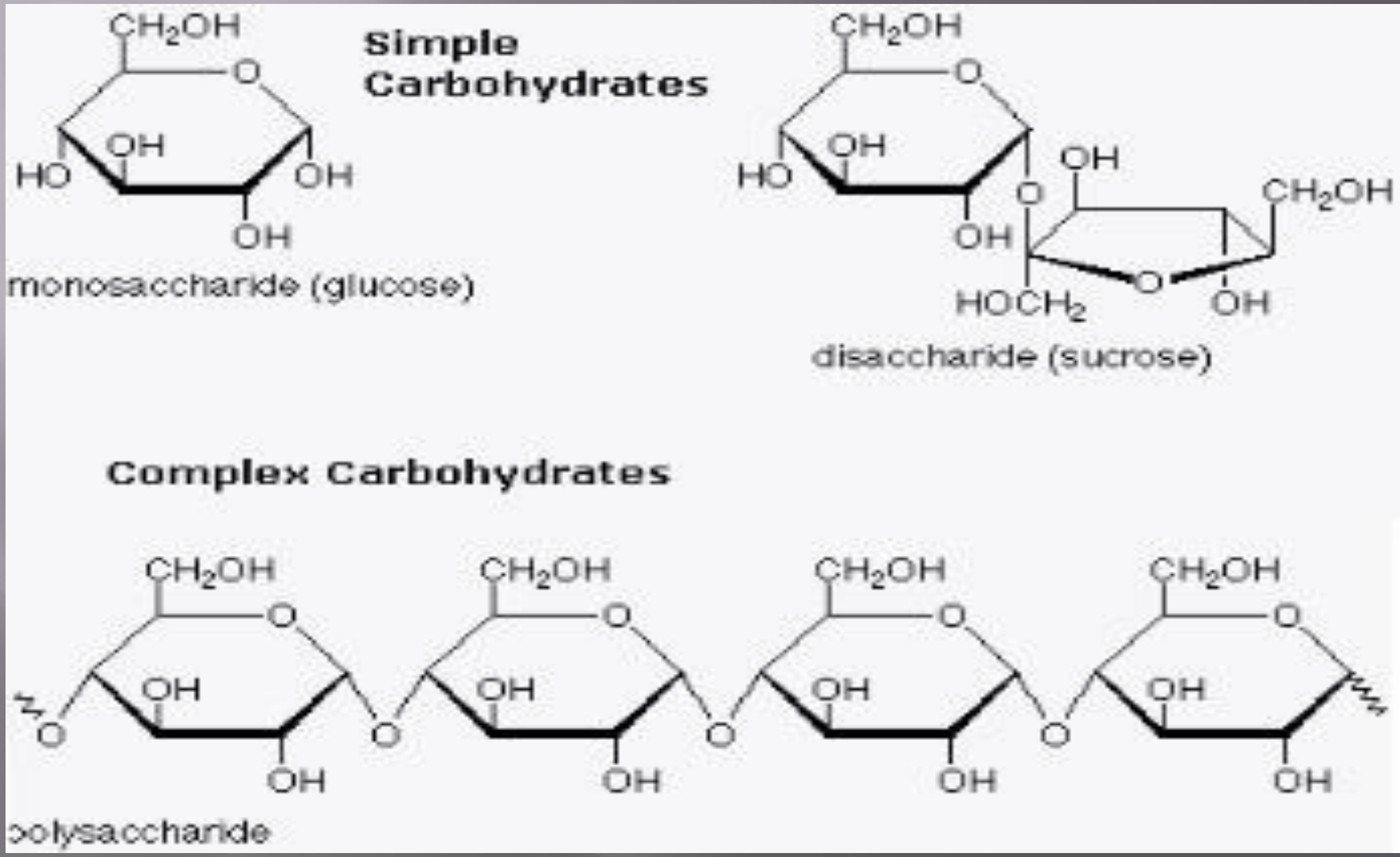
- Carbohydrates (CHO) are your body's main energy source powering everything from jogging to breathing, thinking, and digesting food.

- Glucose comes from three sources: food, synthesis in the body, and break down of glycogen (the form of glucose that the body stores in the liver).

- Hormones maintain a constant concentration of glucose in the blood, which is especially important for the brain because it cannot make or store glucose but depends on glucose supplied by the blood. Even brief periods of low glucose levels (hypoglycemia) can cause multiple symptoms including organ damage.

ADA Complete Food and Nutrition Guide 2nd Ed.

Simple vs. Complex CHO



Carbohydrates

- Simple CHO are digested and absorbed rapidly in the body within 10-30 minutes.

- This is important when talking about blood sugar regulation.

Protein

- Building blocks of our body.
- Protein makes up your muscles, immune function, and your organs. (Think brain!)
- Protein is the second macronutrient metabolized by the body.

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Fat

- Fats supply energy.
- They also play a role in other physiological functions like nutrient transport, growth, and is a part of many different cells.
- Fat is the third macronutrient metabolized by the body.

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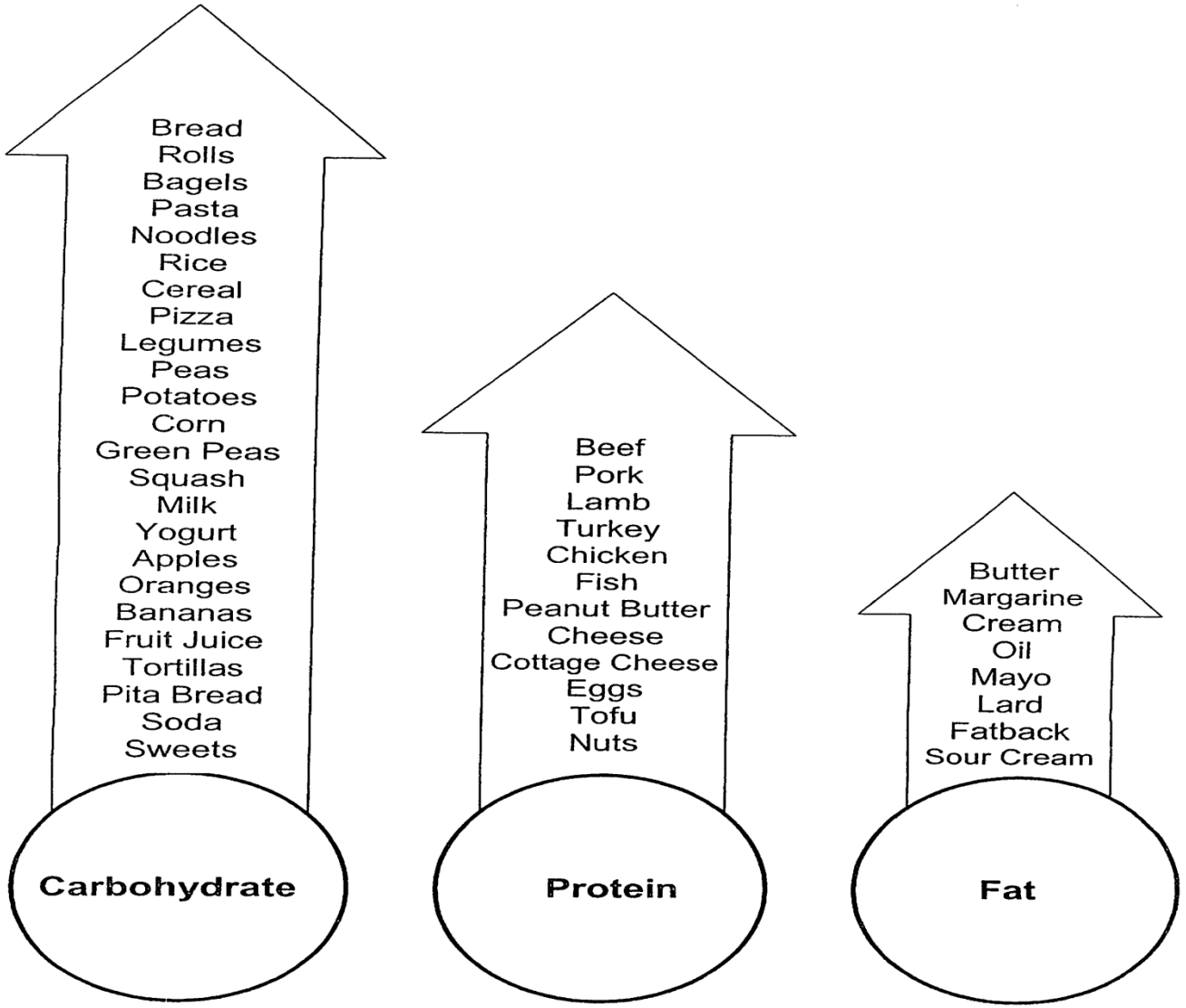
How Nutrients Affect Blood Sugars



Blood Sugar Regulation

- Happiness is a steady plasma glucose level.
- The key to ideal blood sugar regulation is eating a combination of macronutrients.
- Never eat a CHO without protein or fat.

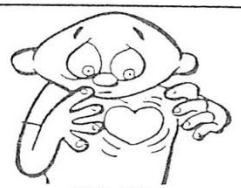
HYPOGLYCEMIA
(Low Blood Glucose)

Causes: Too little food, too much insulin or diabetes medicine, or extra activity.

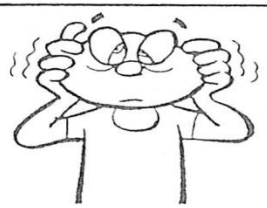
Onset: Sudden, may progress to insulin shock.

SYMPTOMS

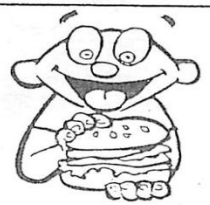

SHAKING

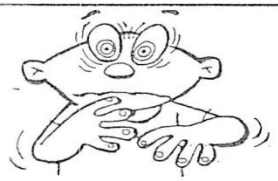

FAST HEARTBEAT


SWEATING


DIZZINESS


ANXIOUS


HUNGER


IMPAIRED VISION

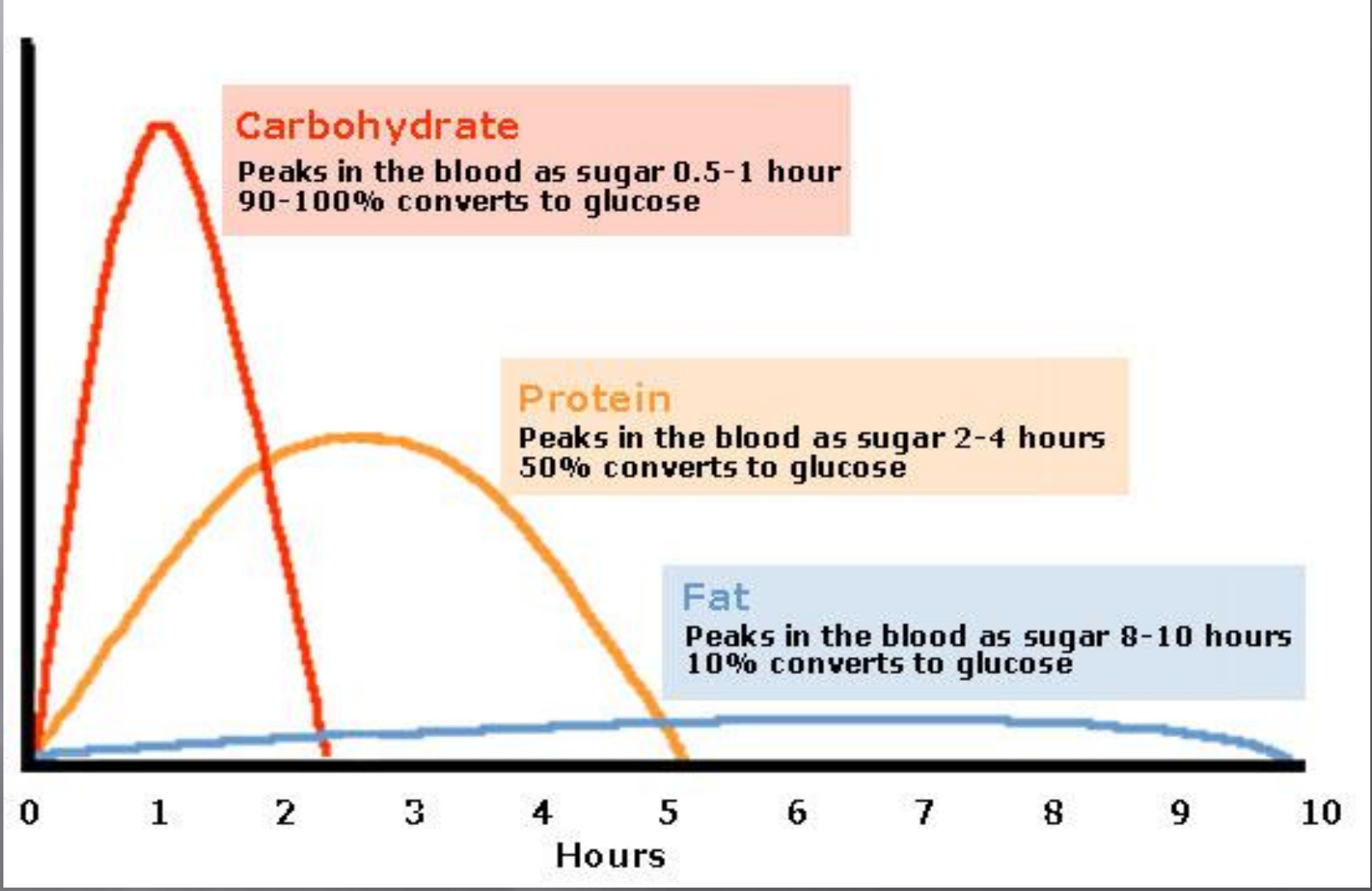

WEAKNESS FATIGUE


HEADACHE


IRRITABLE

Concept developed by Rhoda Rogers, RN, BSN, CDE, Sunrise Community Health Center, Greeley, Colorado
 000-114 1998 Printed in U.S.A.

Macronutrients Metabolized



Healthy Blood Sugar Snacks

- Peanut butter/almond/other nut butter and graham crackers.
- Cheese and fresh fruit
- Banana bread including walnuts, flax seed, and quinoa with milk.
- Nuts and dried fruit.
- Plain yogurt including some fat mixed with a touch of maple syrup. (Not yoplait or Dannon)
- Ants on a log. (celery, peanut butter, raisins)

Lunchtime at School

- In 1999 the National Food Service Management Institute conducted a study on 18 schools evaluating how long students receive to eat lunch.

- The results of these studies represented 17,400 observations and timing of student behavior.

Study Conclusion

- Total time to eat at school (service, time at table, and bussing) ranged from 13-35 minutes.
- Time students spent at the dining table ranged from 74-81% of total lunch time.
- Eating time was very consistent among students of all ages. Students required approximately 10 minutes, on average, to eat their lunch.

Education

- **Eating habits and food preferences of young children are established early in life.**

- **The December 2010 issue of the Journal of the ADA the diets of young children were reportedly far from ideal.**

Today's Dietitian, Sept 2011

Child Education

- **Preschool age children consumed too much sodium, saturated fat, and added sugar and came up short on fruit, vegetable, and whole grain consumption.**

- **About 85% of preschoolers consumed a sweetened beverage, a dessert, or a sweet or salty snack each day.**

Journal of the American Dietetic Assoc. Dec 2010

Child Education

- **Another study showed preschoolers appeared to be at greater risk of low intakes of the recommended dietary allowances for folate, vitamin A, vitamin E, calcium, iron, and potassium.**

- **A few studies suggest that kids eat too many low nutrient foods at home as well as at school.**

Today's Dietitian Sept 2011

FISH Kids Program

Outcomes:

Student	Initial Eval		Final Eval	
	Identified Food Groups	Identified specific foods into groups	Identified Food Groups	Identified specific foods into groups
1	0	2	5	5
2	0	3	5	5
3	0	0	5	5
4	2	1	3	3
5	2	2	5	5
6	2	2	4	4
7	2	1	5	5
8	3	3	3	3

Outcomes

- **7 out of 8 children showed improvement (88%).**
- **100% of children participated in nutrition and physical activities.**
- **100% of children enjoyed the program.**

Student identified several new foods at the store. She discussed foods and food groups during dinner.

Student wanted to try new things.

Student asking for foods in the store that parents have never tried.

Interventions

- **At the end of the 1 year study 73% of the children were at normal weight as opposed to 68.4% baseline. The intervention group children also ate less junk food and more fruits and vegetables.**

- **Physical activity is just as important as eating healthy for school aged kids.**

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Keys to Preventing Obesity

- Children have free access to water. (41 states)
- Sugar-sweetened beverages are limited. (7 states)
- Foods of low nutritional value are limited. (9 states)
- Children are not forced to eat. (32 states)
- Food is not used as a reward. (10 states)
- Support given for breastfeeding. (9 states)
- Screen time is limited. (17 states)
- Physical activity is required daily. (3 states)

Today's Dietitian, Sept 2011

Healthy Halloween Snacks

Resources

- www.ourkidsourschools.com
- www.mindlesseating.org
- www.chefann.com/blog
- www.edibleschoolyard.org
- www.foodfight.org
- www.foodmaster.org
- www.healthcorps.net
- www.letsmove.gov
- www.thelunchbox.org

Celiac/Gluten Intolerance

- Celiac is an auto-immune disease that attacks the small intestine and prevents absorption.
- The damage is due to a reaction to eating gluten, which is found in wheat, barley, rye, and possibly oats.

Celiac/Gluten Intolerance

- Autoimmune disorders such as rheumatoid arthritis, lupus, and Sjogren syndrome.
- Addison's disease
- Down syndrome
- Intestinal cancer
- Intestinal lymphoma
- Lactose intolerance
- Thyroid disease
- Type 1 diabetes

Celiac/Gluten Intolerance

- 1 in 133 people have Celiac Disease.
- Among people who have a first-degree relative—a parent, sibling, or child—diagnosed with celiac disease, as many as 1 in 22 people may have the disease.

Archive of Internal Medicine, 2003
National Digestive Diseases

Healthy normal villi of the small intestine(as seen under the microscope)

Damaged villi of the small intestine

Symptoms of Gluten Allergy

- Abdominal Pain
- ADD/ADHD
- Anxiety
- Canker sores
- Constipation
- Diarrhea
- Fatigue
- Fibromyalgia
- Gas
- Headaches
- Heartburn
- Indigestion
- Infertility
- Iron deficient anemia
- Irritability
- Irritable bowel syndrome
- Joint Pain
- Osteoporosis
- Poor Growth
- Poor immune function (frequent illness)
- Sinusitis

Dr. Stephen Wangen foodallergysolutions.com

Child Celiac Distended Abdomen

- The symptoms of celiac disease in children typically become apparent three to five months after first consuming gluten- containing foods.

- **Symptoms to Expect.** Personality changes may occur in children with celiac disease; selected children may become unable to concentrate, be irritable, cranky, and have difficulties with mental alertness and memory function; however, the same process may also occur in teens and adults.

- In children, this malabsorption may also cause bone problems because of lack of calcium, varying levels of abdominal distention, vomiting, muscle wasting, and failure to properly grow and develop.

- Celiac patients may experience selected neuro-psychiatric symptoms including mood changes, irritability, and depression. The celiac parent may need to reduce expectancies in learning, following explicit directions, and in carrying out selected aspects of basic discipline for their celiac child.

Classroom Behavior

- The mechanisms involved in the etiology and pathogenesis of mental and behavioral disorders related to Celiac are unclear.
- Nine of 15 children with untreated CD showed signs of "behavioral disturbances" and were irritable or apathetic.
- In some of these patients, mood and behavioral problems improved after starting a gluten-free diet.

Celiac and ADD/ADHD

- There is a growing body of evidence suggesting that psychoactive peptides derived from gluten and casein may be at the root of these ADD or ADHD symptoms. It can take up to 12 months on a strict gluten-free/casein-free diet to eliminate the offending peptides.

Classroom Activities

- **Arts and crafts**
- Some materials used for arts and crafts projects may contain gluten. Paste-type glues and Play Dough are potential hazards and should be investigated. Crayons may also be a problem for small children. Work with the child's family to provide safe materials or an alternative project.

Elimination Diet

- Try and elimination diet for students having trouble with focus or learning.
- 5 Days meat, vegetables, fruit only.
- Add back dairy first for a couple days.
- If symptoms haven't returned add back gluten.

Summary

- Steady blood sugar helps improve attention of students.
- Education is the key to success for parents, teachers, and students of all ages.
- Undiagnosed food allergies may also play a role in attention span of the rambunctious student.

Questions?