SECTION THREE: Special School Health Issues

SECTION THREE: SPECIAL SCHOOL HEALTH ISSUES

CHAPTER 9: NUTRITIONAL HEALTH

INTRODUCTION

Nutrition affects the health of people of all ages and at all stages of the life cycle and is an essential factor to address when assessing overall health. Eating a variety of nutritious foods is important for health. In addition, many other factors -- psychological, cultural, geographic, religious, economic, and social -- influence one's health and nutritional status.

Evidence from nutritional research strongly suggests that dietary patterns that contain excessive intake of foods high in calories, fat (especially saturated fats), cholesterol, and sodium and low in complex carbohydrates and fiber contribute significantly to high rates of major chronic diseases. Diet has been associated with five out of ten of the leading causes of morbidity and mortality in the United States: coronary heart disease, generalized atherosclerosis, stroke, diabetes mellitus, and some types of cancers.

Many chronic illnesses start in early childhood, Studies have documented risk factors associated with the major chronic diseases, such as high serum cholesterol, low calcium intake and high blood pressure, in child and teen populations. Diets that contribute to some of these risk factors are widespread among all income levels and ethnic groups across America.

Schools can play a major role in improving health status by providing students with a solid foundation of health and nutrition information that will be of critical importance over their lifetime. Comprehensive school health programs should provide students with the opportunity to learn and practice healthy food choices and eating behaviors and develop an understanding of the relationship between food, nutrition and health.

NUTRITIONAL NEEDS OF SCHOOL-AGED CHILDREN AND ADOLESCENTS

Children and adolescents require nutritionally sound diets to achieve optimal physical growth and development. Proper nutrition coupled with regular physical activity provide both immediate and long-term health benefits. The child's family plays the most important role in instilling healthy eating behaviors by helping children to develop the mechanical skills to eat independently and by preparing and serving nutritious, age-appropriate

foods to meet the child's growing needs and by modeling these behaviors for the child.

The school also plays a vital role in communicating healthful eating patterns. Ideally, the school should function as an extension of the parents, reinforcing positive nutrition behaviors learned at home. For children who have not learned healthy eating skills at home, schools can help by providing children with well-balanced healthy meals through the school meals program and by reinforcing healthy eating practices through modeling and nutrition education in the classroom.

Nutrient Requirements for Children and Adolescents

The Recommended Dietary Allowances (RDAs) are standards set by the Food and Nutrition Board, National Research Council, and National Academy of Sciences for daily nutrient needs of a population group over time. RDAs are designed to exceed the requirements of most healthy individuals.

RDA values are based on age and gender and are adjusted for pregnant and breast-feeding women. They have not been established for all nutrients; therefore, it is still recommended that RDAs be met by consuming a variety of foods from all the food groups rather than through supplementation or fortification.

RDAs are used to evaluate the adequacy of nutrients in the nation's food supply, establish standards for food assistance programs, determine the nutrient status of the U.S. population, develop food products, and develop the Daily Values as standards for how nutritional content of foods is listed on a product label. The percentages of the Daily Values tell you how well a product meets the nutrient needs of most people. Schools can use RDAs to plan nutritionally balanced school meals.

The Dietary Guidelines and Food Pyramid

The Dietary Guidelines for Americans (1995) have been established to aid persons over age two years in eating a healthful diet:

1. Eat a variety of foods.
2. Balance the food you eat with physical activity -- maintain or improve your weight.
3. Choose a diet with plenty of grain products, vegetables and fruits.

4. Choose a diet is low in fat, saturated fat, and cholesterol.
5. Choose a diet moderate in sugars.
6. Choose a diet moderate in salt and sodium.
7. If you drink alcoholic beverages, do so in moderation.

The most recent dietary guidelines were established in 1995 by the U.S. Department of Agriculture (USDA) and Department of Health and Human Services (DHHS). From this collaborative effort arose a new pictorial representation of healthful food choice, the **Food Guide Pyramid** (see Exhibit 9-1). The pyramid design helps to illustrate how to turn the guidelines into food choices. The design illustrates the recommended daily amounts by the size of space allotted each group: the more required, the bigger the block. As the pyramid demonstrates, a healthy diet is composed primarily of foods from the foundation of the pyramid (breads, cereals, and other grains) together with abundant amounts of fruits and vegetables. Meats, poultry, fish, and other protein foods, as well as milk products, are recommended in smaller quantities, while fats and other oils are recommended for use only sparingly.

Key elements of the current food guide pyramid include:

- Identification of six food groups:
  1) grains, 2) fruits, 3) vegetables, 4) protein sources, 5) dairy products, and 6) fats, oils, and sweets.

- The grain group, at the base of the pyramid, is the group from which Americans should consume the most number of servings per day. This new guideline coincides with scientific research that suggests that increased fiber, a compound abundant in whole grains, can reduce the risk of chronic disease. Grain products contain a variety of other essential nutrients needed for proper growth and development as well.

- Fruits and vegetables are separate categories because each contributes specific nutrients needed by the body. For example, the vitamins they provide, vitamin A, C, E, and fiber have been shown to reduce the risk of some chronic diseases (e.g., cancer).

- Dairy is a primary source of Vitamin D, if fortified and low fat dairy is as nutritious as full fat. Note that yogurt and cheese do not have the Vitamin D of fortified fluid milk.

- Protein sources, low fat meats (including beef) are fine, non-meat sources (beans, peas, lentils) are good also.

- Fats, oils, and sweets are placed at the top of the pyramid in the smallest space, to represent limited consumption. Most Americans eat diets that are too high in fat, especially saturated fat.

The food pyramid is designed to illustrate that no one food group is more or less important than another. It stresses *variety*, the importance of eating a selection of different foods from each of the major food groups every day; *proportion*, the relative amount of food to choose from each major food group; and *moderation*, eating fats, oils, and sweets sparingly.

The following table displays only the six food groups and recommended number of servings for each; it is not specific for age and it does *not* include the serving *sizes*. It is important to include information on age appropriate serving sizes when educating children and adolescents about the pyramid.

Groups of Foods	What They Need Per Day	One Serving Could Be**
Fruits	2 or more servings including at least 1 vitamin C source	1 medium piece of fruit (e.g., apple, orange, or banana), ¾ cup juice, ½ cup cooked fruit
Vegetables	3 or more servings	1 cup leafy salad greens, ½ cup cooked vegetable
Grains	6 or more servings	1 ounce ready-to-eat breakfast cereal; 1 slice whole-grain bread; ½ cup cooked rice, pasta or cereal; 4-6 crackers; 1 tortilla, muffin or diner roll; ½ bagel or hamburger bun
Milk*, Cheese, Yogurt	4 servings	1 cup low-fat or non-fat milk or yogurt, 1½ ounces cheese
Meat, Fish, Poultry, Beans	2-3 servings	2-4 ounces cooked, lean meat fish or chicken. Substitute 1 egg, ½ cooked peas or beans or 2 tablespoons peanut butter for 1 ounce of meat
Fats and Sweets	Go easy on these foods and beverages	
*Children under 2 years of age should drink whole milk. Note that milk substitutes do not have Vitamin D.		
**Younger children may eat smaller serving sizes.		

Common Nutrition-Related Questions About Children's Food Consumption

Are some types of fat worse than others? Eating excessive amounts of any type of fat is not healthy. School-aged children should follow the dietary guidelines, which recommend that **no more than 30%** of calories be from fat and no more than 10% from saturated fat. Fats in foods contain some combination of the following three types of fatty acids: saturated, monounsaturated, and polyunsaturated.

Saturated fats, found primarily in animal meat and dairy products some vegetable fats such as coconut, palm, and palm kernel oils, and hydrogenated oils (e.g., margarine and shortening) have been shown to raise blood cholesterol levels in many people, thereby increasing their risk for heart disease. **Monounsaturated fats** are found mainly in olive, peanut, and canola oils. **Polyunsaturated** fats are found mainly in safflower, sunflower, corn, soybean, and cottonseed oils, and some fish. These two types of fat are believed to lower cholesterol in the body.

Another recent concern involves **trans fatty acids,** which occur naturally in some animal fats. Such fats also result from hydrogenation of vegetable oils. Some studies have shown trans fatty acids to act like saturated fat in the body, causing a rise in low density lipoproteins (LDL), the "bad" cholesterol, and a decrease in "high-density lipoproteins" (HDL), the cholesterol that protects against heart disease.

Should we worry about children's cholesterol level? Too much cholesterol, a fat-like substance present in all animal foods (meat, poultry, fish, whole milk and whole milk products, and egg yolks), can be harmful. It has been tied to coronary heart disease. Children should limit their intake of foods high in cholesterol. Studies have shown children as young as seven years old have fatty streaks on the walls of their blood vessels, which is the first stage of coronary heart disease.

Is sugar harmful to children's health? Too much sugar intake increases calorie intake, which can contribute to obesity. Foods that are high in sugar are usually low in nutrients, and crowd out food that contributes to daily nutrient intake. The single greatest contributor of sugar today is soft drinks with sugar. Candy, baked goods and certain "fast foods" also contain high amounts of sugar.

Should children give up salt? High-salt diets may affect the development of high blood pressure, especially in people with a family background of hypertension (high blood pressure). Nearly one in four Americans has high blood pressure which increases risk for heart attack, stroke, and kidney disease. (See Chapter 5 for information on blood pressure assessment.) Sodium is essential to health; however, most Americans consume far too much.

Is fiber something children need to be concerned about? Because young children often have trouble with constipation, an adequate intake of fiber helps to control it. Fiber absorbs water, makes stools softer, and makes elimination easier. Some types of fiber have been shown to lower blood cholesterol. There are different types of fiber, which service different functions in the body. Children who are not used to eating a high fiber diet should gradually increase their fiber intake, as they may experience gas, diarrhea or bloating if too much fiber is taken in too quickly. Fluids should also be increased when increasing fiber intake.

The American Health Foundation (AHF) recommendations are children older than two years of age should increase their intake of dietary fiber to an amount equal or greater than their age plus 5 grams. For example, a 2 year old should consume 2 (years) + 5 grams=7 grams.

Age (years)	AHF Recommendation
2-5	7-12
6-11	11-16
12-18	17-23

Compared with current dietary fiber intake in children, the age-plus-5g/day recommendations represents a 25-50% increase for preadolescents and a 70-100% increase for many adolescents. For most children, dietary fiber goals will be met if the daily diet contains:

- 2 vegetable and 3 whole pieces of fruit (8-10 g fiber)
- sandwich made with 2 slices of whole wheat bread (4g fiber)
- serving of breakfast cereal containing fiber (3g fiber)
- 1-2 other fiber containing foods

Williams, C. JADA 1995; 95:1140-1146

How much calcium should children have? School-aged children need 1200 mg; adolescents need 1200 - 1500 mg of calcium daily. Dairy products have the highest concentration of calcium per serving. Low fat (skim or 1%) milk is preferable to whole milk. As children become older, they often substitute soft drinks for milk; this is of special concern because the adolescent period is a critical time for bone formation. A major concern is that soft drinks replace milk and contribute no nutritive value. Foods other than dairy products can also be a source of calcium in children's diet for a list of foods with calcium see table below.

Calcium Content of Various Foods

Food	Serving Size	Calcium Content (mg)
Milk, yogurt	1 cup	300
Cheese	1 oz.	200
Cottage cheese	1 cup	240
Cream cheese	1 tbsp.	10
Ice cream	1 cup	220
Collards, kale	½ cup	100
Other vegetables	½ cup	20-40
Fruits	½ cup or 1 medium	20-40
Legumes (cooked)	1 cup	140
Meat, poultry, fish,	3 oz.	10-20
Eggs,	1	30
Tofu	8 oz.	300
Breads	1 slice	25
Cereals	1 oz.	15
Macaroni, spaghetti	½ cup	15

Are vegetarian diets okay for children? A well-planned vegetarian diet can provide all the nutrients a child needs for growth and activity. Vegetarian diets have many positive health benefits. They are often high in fiber and low in cholesterol and saturated fat. The concern about having children on vegetarian diets come when they are put on a strict vegetarian diet (vegan diet), which does not allow any animal products. A vegan diet may not provide enough of the necessary vitamins, minerals, and energy that a growing child/adolescent needs. Children on vegan diets should have their diets analyzed by a registered dietitian, licensed dietitian, or licensed nutritionist.

Should Children take nutrient supplements? Children who eat a well-balanced diet should have no need for nutrient supplements. Relying on supplements instead of a balanced diet eliminates many trace nutrients and constituents of foods such as fiber and disease-fighting phytochemicals found in fruits and vegetables. If nutrient supplements are consumed, guard against excesses. Anything over 100% RDA is a red flag. Even some water-soluble vitamins pose a danger when taken in excessive amounts. The American Academy of Pediatrics has identified the following groups for whom vitamin supplementation could be appropriate:

- Abused and/or neglected children, or those otherwise living in deprived circumstances.
- Children with anorexia or bulimia, poor or eccentric. appetites, poor eating habits, and those who are on regiments to manage obesity.
- Pregnant teenagers.
- Children who consume vegetarian diets.

FACTORS INFLUENCING EATING BEHAVIORS

Family and environmental factors -- school, cultural influences, television and other media, and economic circumstances -- influence children's eating patterns. Evidence continues to accumulate suggesting that the dietary patterns learned and practiced throughout childhood and the teen years affect health later in life.

Families play a crucial role in helping children and adolescents have adequate nutrition intake, and they also strongly influence children's food preferences. Parents can motivate their children and adolescents to establish healthful eating habits by allowing them increased responsibility and choice within a range of nutritious foods. This approach provides subtle nutrition education through learned experiences. It is an important and necessary part of health promotion and disease prevention.

Following are guidelines for parents in influencing their children's diets:

- Be a positive role model by serving and eating nutritious meals.
- Introduce food changes gradually. Sudden and extreme changes are not readily accepted by children.
- Avoid categorizing particular foods as "bad" or "good." It is the quality of the total diet over the long term that influences health, not specific food or meal.
- Focus on the benefits of a diet that is varied and well balanced instead of concentrating on the negative aspects of a less-than-ideal diet. Children may develop unhealthy attitudes about food and/or the possibility of weight gain or loss which can contribute to eating disorders.
- Aim to have regular meal patterns including breakfast every day.
- It is the parent's job to decide what is served and when. It is the child's job to decide what and how much to eat.

Although adolescents continue to be influenced by their families in what they eat, they generally spend more time away from their families than do children. They socialize more, are more influenced by their peers, and they are making an increasing number of choices on their own. This burgeoning independence of adolescents is often characterized by the following trends in eating behaviors:

- *Irregular meals.* The meal patterns of many adolescents are often erratic. They may skip meals, prioritize social activities over eating, and be fearful of unwanted weight gain. Breakfast and lunch are the meals most often missed by teenagers. Skipping breakfast has been associated with a less than adequate nutrient intake and a reduced ability to concentrate, diet, especially nutrients such as calcium and iron that are most likely to be neglected in a typical adolescent diet. For those adolescents in the midst of a growth spurt and/or who are physically active, between-meal snacks may be the only means of obtaining calories sufficient to meet their increased energy requirements.

The quality and quantity of snacks determines whether or not a positive contribution is being made to an adolescent's diet.

- *Eating in fast food restaurants.* As adolescents get older, meals eaten away from home make up a greater proportion of overall energy intake. Fast food restaurants, one of the most popular sites for adolescents' meals, provide them with a comfortable atmosphere for social gatherings and offer quick service and inexpensive food items. Although many fast food restaurants have begun to offer more nutritious alternatives, the majority of foods available are high in fat, sugar, and salt. Fast foods are regarded as nutritionally acceptable when they are eaten in moderation as part of a nutritionally sound, well-balanced diet, not as the mainstay of an adolescent's diet.

- *Vegetarianism.* Teens may choose to become vegetarians for religious, physiological or economic reasons. An estimated 5% of all Americans consider themselves vegetarians. Vegetarian diets vary and can be classified into six different categories:

  1. Vegan avoids *all* foods from animal origin
  2. Lacto-vegetarian includes dairy products
  3. Ovo-vegetarian includes eggs
  4. Lacto-ovo-vegetarian includes dairy products and eggs
  5. Pesco-vegetarian includes dairy products, eggs, and fish
  6. Semi-vegetarian includes dairy products, eggs, fish, and chicken

Eating patterns associated with vegetarianism may have specific health benefits. Foods consumed tend to be higher in fiber and complex carbohydrates and lower in fat. If the diet is well planned, nutrient intake should be sufficient. However, strict vegetarians who avoid all foods of animal origin may have more difficulty getting the necessary nutrients they need. The major nutrients for potential deficiencies are vitamins Riboflavin, B_{12}, and D and the minerals calcium, iron, and zinc. B_{12} is especially

important for persons on vegan diets because it is available only in animal products. Children who are on strict vegetarian diets should have their diets analyzed by a licensed dietitian or licensed nutritionist to ensure they are getting all the nutrients necessary for proper growth and development.

Television is another influence on the eating habits of children and adolescents. Television advertisements may have a profound impact on children's attitudes toward food and their requests for certain products. Research over the past 25 years has found that excessive television viewing can be harmful to a child's growth and development by promoting a sedentary lifestyle, which can lead to reduced fitness and even obesity. The association between obesity and the amount of time spent watching television by children ages 6 to 11 has been well documented, and research has found that the majority of between-meal snacking on high-fat, sodium, and empty-calorie foods occurs while watching television.

CURRENT NUTRITIONAL ISSUES

When a child or adolescent is nutritionally jeopardized, growth and overall physical and mental health can deteriorate. Therefore, monitoring growth and making appropriate nutrition interventions are essential for ensuring the health of children and adolescents. What follows are common nutritional issues for children and adolescents.

Iron Deficiency Anemia

Iron deficiency anemia, one of the most prevalent nutrition problems in the United States, affects children at all income levels but is especially common among poor children. Adolescent males are at risk for Iron Deficiency Anemia because of the rapid growth spurt and muscle build-up literally "out-growing" iron reserves. Minnesota surveillance data of WIC children shows a slight decrease in Iron Deficiency Anemia overall, but an increase among some ethnic groups.

Iron deficiency anemia is defined as a decreased ability to carry oxygen in the blood to organs and tissues. It does not develop until all storage of iron has been used up and changes are seen in red blood cells (RBC). Children can be tested for anemia by having a hematocrit (hct) or hemoglobin (hgb) blood test.

Symptoms include anorexia, fatigue, and a decrease in attention span, strength, and learning abilities. The effects on learning and behavior are

similar to those of mild to moderate undernutrition. Even mild cases lead to shortened attention span, irritability, fatigue, and a decrease in the ability to concentrate. Anemic children are known to do poorly on vocabulary, reading, math, problem-solving, and psychological tests.

The best way to prevent iron deficiency anemia is to make sure that children are getting enough iron-rich foods in their diets. The RDA for children varies by age. Children ages 4 to 10 need about 10 mg. of iron daily; adolescent males and females (11-18 years old) need 12 mg and 15 mg daily, respectively. The best sources of dietary iron are listed in the table below.

Sources of Dietary Iron		
Food	**Serving Size**	**Iron (mg)**
* Red meat Chicken, ham	3-4 oz. 3-4 oz.	4.0-5.0 1.5-2.0
Legumes	½ cup cooked	2.0-4.0
Rice, cream of wheat Spaghetti, noodles	1 cup ½ cup	0.7 - 1.4 0.3 - 1.4
Broccoli, carrots, collards	1 cup	0.7 - 1.4
Fruits Dried fruits	1 medium 1 cup	0.3 - 0.7 3.0 - 6.1
Nuts	3/4 cup	2.0 - 4.0

Lead

Lead is a great hazard for children and is primarily found in paint and soil. Children who play outside can contaminate themselves by eating dirt or food with soiled hands or breathing dust that has lead particles. Deficiencies in ascorbic acid, calcium, iron, zinc, protein, and excess fat, as well as general malnutrition increase the chances of lead toxicity.

Screening for lead toxicity in young children can prevent irreversible physiological damage and fatality. Careful dietary assessment that includes an assessment of pica habits (the eating of nonfood items) and living environment can also be used to detect lead poisoning. (See Chapter 4 for information on lead in water and Chapter 5 for information on lead screening.)

CHAPTER NINE

Obesity

Obesity, defined as 120% or more of healthy body weight, is a major health concern. It is one of the leading causes of morbidity and mortality, predisposing adults to greater risks of hypertension, heart disease, diabetes mellitus, cancer, and other degenerative diseases. Estimates from nationwide studies reveal 25 to 30% obesity in 6 to 11 years olds and 18 to 25% obesity in 12 to 17 year olds. Many obese children become obese adolescents and adults. In addition, obese children and adolescents are at a greater risk of developing disordered eating patterns than normal individuals.

The causes of obesity are complex and not completely understood, but it is known that both genetic and environmental factors are involved. For instance, a child who has one or two parents who are obese has a 40 to 80% chance of being obese, whereas a child with no obese parents has only about 10% chance of being obese. Environmental factors that influence weight gain include cultural habits, parental supervision of diet, attitudes toward food, and inactivity. Obese children may not eat more than their normal weight peers but may be much less active. Excessive television viewing has been strongly correlated with obesity as well.

The effects of obesity may also have an emotional impact. Society teaches children that fat is bad and thin is good. Fat children may be stigmatized and be seen as having a lack of self-control. They may be ridiculed and picked on by their peers. Studies have shown discrimination against fat people who apply for jobs and admission to organizations or colleges. The child who is made to feel bad about his or her body size will ultimately learn to develop poor self esteem and learn to dislike himself or herself. As the child matures, he or she may fall victim to a cycle of weight loss attempts that can ultimately end in a life-threatening eating disorder.

Schools can:

- Educate teachers, parents, and children about stages of growth and the full range of body sizes and shapes.
- Teach children to love themselves regardless of their body type and build their self-esteem.
- Support weight maintenance and encourage the child to “grow into” his or her weight.

- Encourage participation in school and home exercise programs.
- Educate about healthy eating patterns, using appropriate nutrition education materials.
- Ensure that foods provided and available through the school food programs are low-fat and low-sugar healthy food choices.
- Ensure that vending machines and extracurricular activities that offer food provide healthy options.

Eating Disorders

There is a spectrum of eating disorders which have underlying psychological characteristics as well as common physical characteristics. The disorders are extremely complex. They are believed to involve a combination of biological, psychological, prevailing cultural views and social factors which create a disturbance in eating attitudes and behaviors. The disorders, which can be precipitated by a stressful life situation, are thought to be the result of a subconscious attempt to exert control over a life that may seem out of control. (See also Chapter 11 for a discussion of eating disorders as related to mental health.) The table below lists some of the common behaviors associated with disordered eating patterns.

Danger Signs of Disordered Eating Patterns	
Common Behaviors Associated With Disordered Eating	**Danger Signs**
Avoidance of meals	Abruptly stops joining family at dinner; constantly has an excuse to leave the table; regularly avoids meals; gradual but constant weight loss; frequent loss of appetite
Exercises obsessively	Forces oneself to endure rigorous workouts on a regular basis; becomes extremely anxious at thoughts of missed exercise session
Preoccupation with food	Discusses food at the exclusion of any other subject of interest; cooks a lot for others but not for self
Hiding food or stealing money	Consumes food in such large quantities that she feels compelled to conceal behavior; resorts to thievery to buy food; may be binging and purging
Low self-esteem	Becomes overly critical of self: "I'm too fat" and "I never do anything right"
Striving for perfection	Places excessive demands on self to excel in all areas, from attaining the "perfect" body to excelling in recreational activities and school work
Hiding weight loss	Wears large, layered clothing; may conceal heavy objects in pockets if to be weighed
Drug use for weight control	Uses diuretics, laxatives, or ipecac syrup to induce vomiting; uses diet pills

Athletes are found to be particularly at risk for eating disorders. Sports that emphasize a very slender body such as ballet, gymnastics, and long-distance running can lead a youngster to decrease food intake for optimum performance when extra nutrients are actually needed. Participation in sports such as wrestling, which require competitors to maintain a prescribed weight, can lead to eating disorders. (See section on Nutritional Needs of Adolescent Athletes later in this chapter.)

Girls are nine times more likely than boys to be affected by eating disorders. Males comprise approximately 5% of cases. The risk periods for eating disorders are between 14 and 15 years of age (the transition period into adolescence) and 18 and 19 years (the transition into adulthood), although they can start as early as age 9. It is estimated that

about 1 million teenagers are affected by anorexia nervosa or bulimia nervosa. In Minnesota this is as true as anywhere else in the country. According to the Minnesota Student Survey, by twelfth grade 37% of girls have used fasting, diet pills or purging to control their weight.

Anorexia nervosa is clinically defined as an intense fear of fatness and obesity, extreme weight loss (more than 25% ideal body weight), amenorrhea, and distorted body image. There are two types of anorectic: the restrictive anorectic, who is constantly fasting or eating small amounts of food; and the bulimic anorectic, who fasts, engages in excessive eating, and induces vomiting to eliminate the food. It is conservatively estimated that 4% of 13 to 18 year olds have symptoms of anorexia nervosa.

Anorexia nervosa is a serious disorder. A girl can literally be starving herself to death and still see herself as fat. Extended periods of nutrient deficiencies can have irreversible effects including muscle wasting and osteoporosis (weak bones caused by inadequate calcium intake and hormonal changes). The mortality rate for anorexia nervosa ranges from 5 to 20%. Other associated health problems are amenorrhea, hormone imbalances, lowered basal metabolic rate, cold intolerance, anemia, pallor, dry skin, constipation, hypotension, bradycardia, growth of downy hair over the entire body, sleep disturbances, electrolyte imbalance, dehydration, and dental caries (brought on by purging).

Bulimia nervosa is more common than anorexia nervosa. This disease is characterized by repeated episodes of binge eating followed by feelings of depression and self-induced vomiting, use of diuretics, laxatives, dieting or rigorous exercise. Bulimia is harder to detect than anorexia nervosa because women who are bulimic typically go to unusual lengths to hide the behaviors. In addition, many bulimics tend to be within a normal weight range. Eight percent (8%) of 14 to 24 year olds are estimated to have symptoms of bulimia. The hazards associated with bulimia nervosa include electrolyte and fluid imbalances, anemia, tears in the lower esophagus, difficulty swallowing, swollen salivary glands, and dental caries.

Chronic dieting is a type of disordered eating pattern. It is described as ongoing, constant dieting behavior. The behavior may be cyclical, often comprised of fasting and overeating, or may be an obsession with "get thin fast" diet products. This type of dieting behavior typically results in little or no permanent weight loss.

Limited and restricted food intake can lead to an increased risk for nutritional deficiencies and compromise growth and development. There is an increased risk for long-term metabolic disorders due to periods of induced starvation offset by overeating. Individuals may become emotionally frustrated and view food as "the enemy," resulting in a distorted relationship with food and an increased risk of becoming a true anorectic or bulimic.

Schools can:

- Ensure that positive body image is discussed as part of a nutrition/health education class. Stress a healthy, strong body type as the desired image and the importance of adequate nutrient intake as a means to achieve this.

- Identify psychological motives for weight loss. Students should be referred to a counselor when appropriate.

- Encourage healthy eating habits through the food service program and classroom activities.

- Provide healthy nutritious foods through the school breakfast and lunch program.

- Have available appropriate nutrition education materials to reinforce healthy eating patterns and positive body image.

- Encourage physical activity and appropriate participation in school and community physical activity programs as alternatives to dieting.

- Refer students to a weight loss support group if offered at community centers or the neighborhood health center.

- Initiate a support program in school for students who are chronically dieting.
- Be cognizant of danger signs for nutrition-related problems.
- Enforce appropriate coaching practices.

Food Allergies

Food allergies are an immune response to an allergy-producing substance. When the offending food is eaten, the body releases antibodies to attack it, and the immune system releases chemicals that irritate body tissues and trigger reactions immediately (within 2 hours) or later (2-4 hours): diarrhea, vomiting, malabsorption, abdominal pain, eczema, irritability, hyperactivity, rhinitis, anaphylactic reactions, and even death. Foods commonly associated with food allergies are milk, wheat, eggs, shellfish, and nuts. (See Chapter 2 for emergency care planning.)

Individuals suffering allergic reactions to food may develop an emotional aversion to food resulting in a decreased amount and variety of foods they are willing to eat. Offending foods containing food allergens are not likely to be replaced with foods having nutrient equivalents, resulting in increased risk of nutritional deficiencies in vitamins, minerals, and a decrease in energy.

Schools can:

- Provide regular nutritional assessments which include growth monitoring.
- Ensure that nutritional needs are being met through exposing students to a variety of food choices.
- Help students identify appropriate nonallergic foods.
- If a food allergy is suspected, refer to primary health care provider for a work-up.
- Work with parents to ensure an adequate diet is provided in the home. (To accomplish this the school most likely will need to utilize the services of a licensed dietition or licensed nutritionist.)

Lactose Intolerance

Lactose intolerance is found in 70 to 95% of the African-American and Asian population and 10 to 15% of Caucasians. Lactose intolerance is the inability (or limited ability) to metabolize disaccharide lactose which is found in all dairy products or food products prepared with dairy products. Symptoms include flatulence, bloating, abdominal cramping and diarrhea. Individuals with lactose intolerance face an increased risk of nutrient deficiencies, specifically vitamin A and D, calcium, and riboflavin, and

increased risk of bone disease in childhood and adult life, such as rickets and osteoporosis.

Schools can:

- Encourage consumption of fermented lactose products such as cheese, yogurt, and buttermilk to supply calcium and vitamins D and A.
- With permission of a primary care provider, recommend the use of lactaid milk or a packaged lactaid enzyme to aid in lactose digestion.
- Monitor the child or teen for vitamin D and calcium intake, and provide alternative sources of calcium in lunchroom menus.
- Identify foods in the school cafeteria that have hidden sources of lactose or dairy products such as cream soups and baked goods.
- Refer the child or adolescent for nutrition consultation and assessment.

Drugs and Alcohol

Marijuana and alcoholic beverages are the two most commonly used and abused substances of the school-aged population. (See Chapter 14.) The degree to which nutritional health is compromised is directly correlated with frequency of consumption.

Folic acid and vitamins B12, B6, and thiamin are common nutrient deficiencies seen in alcohol users. Alcohol also has a toxic effect on the gastrointestinal tract and may result in malabsorption or hyperabsorption of nutrients. Marijuana alters the senses and may heighten appetite, but sweet foods and foods with low nutrient density are generally craved, resulting in excessive intakes of these types of foods. Hard drugs may cause a user to become preoccupied with the substance of choice which may in turn cause him/her to forget to eat. A chronic decrease in nutrient-energy intake will compromise health status and growth.

Schools can:

- Refer identified users of alcohol, marijuana or hard drugs to a comprehensive drug treatment program for evaluation for evaluation.

- Educate students about drugs and alcohol, including their negative nutritional impact.

- Reinforce information with age-appropriate handouts and activities.

- Develop prevention groups in the school or community.

- Support healthy eating behaviors through nutrition education activities in school settings.

Tobacco

Tobacco use may depress appetite, provide falsely high hemocrit readings, and decrease serum vitamin C levels, which can compromise the immune system as well as wound healing and tissue development. (See Chapter 14.) There are a number of teens that utilize smoking to control weight.

Schools can:

- Educate students about the long-term complications of tobacco use.

- Contact the Minnesota Department of Health Non-Smoking and Health Program in the Division of Family Health.

- Monitor weight and growth status to ensure that students are getting adequate nutrition for growth.

- Encourage healthy eating patterns through nutrition education activities at school.

- Distribute nutrition handouts to reinforce health education and anti-smoking messages.

Hyperactivity

Hyperactivity is prevalent in 3 to 5% of school-aged children, with boys being more affected than girls. Learning disabilities or attention deficit disorders (ADD) are often associated with hyperactivity. (See Chapter 11.)

There is no proven or consistent link between ADD and diet. While for some families, diet alteration has been helpful, it remains unclear as to whether or not the benefit is from a change in psychodynamics of the family or from a change of nutrients in the diet. The Feingold diet, for example, recommends omitting foods and products that contain salicylate, such as certain fruits, ice cream and candies, certain beverages, medicines, perfumes, and toothpastes.

However, therapeutic diets typically limit variety of food choices which can increase the risk of nutritional deficiencies. A side effect of medication is decreased appetite leading to weight loss. A long-term side effect of the ADD medication Ritalin may be linear growth suppression.

Schools can:

- Monitor students for nutritional intake.
- Help students identify foods on the therapeutic diet and offered in the school breakfast or lunch program.
- To offset anorexia associated with medication, administer medication with meals (with primary care provider's permission) and offer high-caloric, nutrient-rich foods as snacks such as peanut butter and crackers, between meals.
- Monitor growth status and contact primary health providers when no or slow growth occurs. This is done in consultation with primary care providers.

Family Stress

Stress experienced by children and adolescents (as well as that experienced by their parents or guardians) can affect eating behavior. If the home environment is stressful or the parent-child relationship is one of continuous struggle, dietary intake may be affected, resulting in nutritional disorders.

A child or teen undergoing stress may display a disinterest in food and decreased appetite, may begin to have unusual eating patterns, or may develop eating disorders or an unhealthy relationship with food.

Schools can:

- Educate staff to recognize signs and symptoms of eating disorders.
- Work with families to help identify problems that may be at the root of an eating disorder.
- Identify and recommend appropriate social services.
- Help students to cope emotionally with stress by providing peer support groups to discuss stress and its relationship to food intake.
- Educate families about the role they play in optimizing the nutritional health of their children.
- Encourage good nutrition and healthy food intake to support catch-up growth (if needed) as well as ongoing growth and development throughout childhood and puberty.

Hunger

Poverty is the most common root cause of hunger and undernutrition, and both are experienced by children in the United States.

It is difficult to isolate hunger from other factors that might have a negative impact on learning and behavior. Hunger is known to have an independent effect on learning and behavior, however, and its effects are even worse if coupled with chronic undernutrition. The consensus of researchers is that during periods of undernutrition, learning is slowed considerably. Significant side effects include:

- Excessive irritability.
- Low attentiveness.
- Apathy.
- Lack of social stimulation.
- Low curiosity.
- Anxiety.
- Low physical activity.
- Increased hostility.
- Inability to concentrate well.
- Lessened independence.
- Fatigue.

- Low tolerance to frustration.
- Impaired ability to elicit effective and supportive stimulation from social environment.
- Obesity.

Such effects as these can profoundly affect school performance. Research indicates that the brain can be significantly affected by long-term fasting or hunger. Skipping breakfast, for example, has been shown to affect children's performance negatively in problem-solving situations similar to ones faced in a classroom.

Food insecurity can also lead to obesity -- children who are unsure if there will be food tomorrow eat as much as they can today when there is food. If they don't know that there will be dinner, they will eat as much as possible for lunch. Making sure children are properly fed, therefore, can be a vital investment in a child's scholastic performance and future success. Teachers, school officials, and other school personnel can support healthy food choices through nutrition education. School feeding programs are known to improve a child's learning ability, provide substantial amounts of a child's daily nutrient needs, and decrease the rate of tardiness and absenteeism.

NUTRITIONAL CONCERNS OF CHILDREN WITH SPECIAL HEALTH CARE NEEDS

Children with "special health care needs" comprise 10 to 20% of the youth population. They have a variety of disabilities, handicaps, and chronic illnesses: neurological disorders such as cerebral palsy, congenital anomalies such as a cleft palate, metabolic disorders such as diabetes mellitus, infectious diseases such as AIDS, chronic diseases such as cancer, and gastrointestinal disorders such as Crohn's disease. (See Chapter 7.) Common problems include inadequate intake of calories and nutrients leading to malnutrition, poor growth and short stature, obesity, dental problems, anemia, and constipation. Malnutrition can adversely affect a child's ability to learn and her or his resistance to stress and disease. Early assessment of nutritional status followed by appropriate nutrition intervention and monitoring can prevent or minimize these conditions.

Nutritional problems of children and teens with special health care needs cover a wide range of areas. Feeding issues are frequently found in

association with various medical conditions such as cerebral palsy (CP), Down syndrome, seizure disorders, and hypotonia (poor muscle tone). Other conditions that may place a child at nutritional risk include HIV/AIDS, asthma, diabetes, cystic fibrosis, heart disease, and other metabolic disorders (e.g., diabetes) or digestive disorders (e.g., celiac sprue, short gut).

Additionally, children and teens with developmental delay or limited cognitive skills may also be at risk for poor nutrition. If a child has developmental delays, feeding skills may also be delayed. It may take longer to bring the child or teen through the steps of sucking, swallowing, eating pureed foods, and chewing and swallowing solid foods.

One of the most common nutritional concerns (which is not diagnosis or disability specific) is inadequate intake of calories and nutrients due to a limited ability or inability to ingest, consume, or digest foods. This results in children who are underweight and experience poor growth. Alternatively, overweight or obesity can result from limited physical mobility or exercise, and/or inadequate diet. Dental problems, drug and nutrient interactions, constipation and/or diarrhea, behavioral issues, food allergies, or intolerances are other frequently identified concerns in children and teens with special health care needs.

Under federal legislation in the Individuals with Disabilities Education Act (IDEA), persons with special health care needs are to be integrated into the regular school environment, including participation in the school lunch and breakfast programs. School health staff working with school food service staff can incorporate appropriate modifications or substitutions into the school lunch and/or breakfast meals to accommodate the special dietary needs of these children, ensure that nourishing meals are provided, and help to make mealtime a pleasant experience. Most children with special health care needs are under the care of a physician and dietitian who are available to work with the family and the child to discuss care and dietary guidelines. A dietary plan can be part of an individual student's education plan. The school food service will need a medical statement that indicates the type of modifications required. The following are nutritional concerns that may require extra support from school personnel.

Obesity

Helping children to learn healthy eating and exercise habits is the key to prevention of obesity. This may be more difficult for a child or teen with special health care needs, whose mobility may be limited by her or his

disability. In addition to a healthful diet, children and teens with special health care needs should be encouraged to participate in physical activity programs within their ability. (See the **Obesity** section in this chapter).

Growth Delays and Underweight

Some children with chronic illness, handicapping conditions, or special health care needs are underweight. The child or teen's dietitian can work with the school nurse and food service personnel to develop individualized meal plans to encourage weight gain. Special dietary supplements may be prescribed by the physician or dietitian to provide needed nutrients and calories not available through a regular diet. Some children and teens may need to take these supplements either orally or via a gastrostomy tube, administered by the parent or school health personnel.

Drug and Nutrient Interactions

Medications are prescribed for many conditions in students with special health care needs. Some medications cause unwanted side effects in addition to their beneficial effects and may interfere with food intake or nutrient absorption. It is important to know whether or not medications should be taken before or during meals and be able to identify any negative side effects.

Constipation or Diarrhea

Constipation in children or teens with special needs may be caused by a variety of factors, including inadequate or limited physical activity, over medication, digestive disorders, inadequate fiber or liquid intake, inadequate time for the child in the bathroom, and excessive water loss through drooling in children with oral motor problems. Some children and teens with special health care needs may have chronic diarrhea caused by medications or the requirements of a special diet. School health personnel should discuss a child's special needs with the family and physician or nutritionist so that the bowel habits and diet can be managed properly in the school setting.

Dental

Dental care for students with special needs is another area in which school health and food service personnel can be helpful. If tooth brushing is suggested during school hours, school health personnel may need to remind the child to brush after meals.

Inborn Errors of

Metabolism and Other Metabolic Disorders

A child with phenylketonuria (PKU) or any other inborn error of metabolism needs to be on a carefully controlled diet in order to promote normal growth and development and ensure intake of adequate nutrients. Other metabolic conditions such as diabetes require only minor changes in the menu. Food for the child's meals and snacks is typically provided by the family or served only with the prior involvement of the child's family, physician, or dietitian.

Pediatric HIV/AIDS

Healthy foods and dietary supplements play an important role in helping a child with HIV/AIDS maintain weight, strength, and energy, and may help fight infections. During bouts with HIV illness, fever, diarrhea, nausea, and weight loss may occur, and a child may require a special diet and food supplements. School health personnel can work with the child's health care provider and nutritionist to develop and implement a proper nutritional plan.

Food Allergies and Intolerances

Some children and teens with special health care needs may experience food allergies or intolerances, the most common of which is lactose intolerance. The severity of the body's reaction to allergens, including food, can be minor or life threatening. (See previous sections in the chapter on **Food Allergies** and **Lactose Intolerance**.)

NUTRITIONAL NEEDS OF ADOLESCENT ATHLETES

Rigorous athletic training demands caloric intake over and above that necessary to support normal growth and the physical maturation associated with the pubertal growth spurt. Thus, adolescent athletes require specific nutritional support in order to sustain the physical stress of growth and development.

The amount of additional energy needed depends on the intensity, duration, and specific type of exercise. (See Chapter 10.) The majority of the additional calories required by these athletes to fuel muscles are best supplied by carbohydrate foods such as breads, cereals, pasta, dried beans and peas, fruits, and vegetables. Abnormally high levels of protein are not required and can lead to dehydration as the body rids itself of nitrogenous waste products. The need for protein, following an initial muscle building phase, is not much greater than that of the nonathlete. Approximately 2 to 3 grams above the RDA will maintain nitrogen balance in most athletes. Increased demands for energy can be met by consuming larger quantities of

high-quality foods and beverages. The recommended food intake guideline for athletes is:

- *Energy:* RDA for age plus 800 to 1700 kcal/day per 2 hours of strenuous exercise.
- *Protein:* 10-15% of total calories.
- *Carbohydrates:* 50-55% of total calories.
- *Fat:* 30% or less of total calories.
- *Vitamins/minerals:* Should be met by eating a variety of foods.

Some athletes may limit food intake to the point of undernutrition in an effort to achieve "the competitive edge." When undernutrition is coupled with intensive training, significant risk to proper growth and development can occur. Short-term effects may include chronic fatigue, hypoglycemia, and increased incidence of illness and heat exhaustion.

In young women, the long-term effects may include delayed menarche and amenorrhea (ceasing of menstrual period) which can impair skeletal growth and result in an increased risk of scoliosis, stress fractures, loss of potential stature, and osteoporosis later in life.

Adolescent females who are athletes and amenorrheic should be referred to a primary health care provider for an assessment. A change in the quality and quantity of the diet is a worthwhile first step for the amenorrheic athlete and should be initiated prior to the use of hormone therapy. Such young women may not be aware of their risk of osteoporosis later in life. Therefore, they should be informed about the risk of bone fractures and hypothermia when exercising in cold temperatures and encouraged to follow more appropriate healthful dietary practices.

Dehydration

Dehydration can lead to serious health consequences. The intensity and duration of a sports event, the environmental temperature, an individual's level of fitness, and the state of an individual's hydration prior to exercise will contribute to the extent of dehydration. Additionally, unsafe rapid weight loss (restricting fluids, purging, and diuretic use) can also play a role in dehydration. Repeated bouts of dehydration and rehydration - a practice

common to wrestlers who compete according to weight class - are dangerous and may have a detrimental effect on the kidneys.

It is recommended that plenty of fluids be consumed before exertion and every 20 minutes or so during endurance activities. In warm weather, fluids should be replenished every 10 to 15 minutes. Plain cold water is the best fluid for rehydration. Electrolyte replacement formulas are not warranted unless the activity is particularly stressful and the heat is extreme.

Anabolic Steroids

A number of strength-trained athletes, particularly adolescent males who wish to increase strength and muscle mass, and boys who just want to look better may experiment with anabolic steroids. These are synthetic versions of testosterone, the male hormone responsible for stimulating muscle growth. Approximately 7% of high school males and 3% of high school females have used anabolic steroids to enhance physical performance muscle mass.

Anabolic steroid use has known toxic effects. Short term, they can cause fatigue, rashes, and combative behavior, called "roid rages." Over the long term, they can contribute to premature cardiovascular disease by lowering HDL cholesterol (the "good" cholesterol that carries cholesterol away from the arteries) and increasing LDL cholesterol (the "bad" cholesterol that is left behind in the arteries). They also contribute to the development of liver tumors.

The acute side effects of steroids include acne, baldness, breast growth, diminished libido, altered sexual function, and mood swings producing increased irritability or psychotic symptoms. These effects may present to the adolescent a more convincing argument against the use of steroids than an account of the long-term cardiovascular influences.

Protein Supplements and Other Food Fads

Athletes and their coaches are particularly vulnerable to food fads and nutrition myths that promise improved physical performance and a muscular build. The claim that additional vitamins, protein and amino acid supplements will enhance athletic performance remains largely unsubstantiated and potentially dangerous.

While most protein supplements are made up of good-quality proteins, they are expensive, have no proven effect on performance, and do not increase muscle mass or strength. The use of protein supplements and

vitamin/mineral preparations is generally not harmful if balanced and used in moderation. But implementing such practices at the expense of a nutritionally sound, well-balanced diet can adversely affect health and performance.

Young athletes who participate in contact sports, weight lifting, heavy weight wrestling, and long-distance cold water swimming may attempt to enhance their sports performance by increasing their body weight. Because they may consume excessive amounts of high-protein foods that are also high in saturated fat and cholesterol, they should be taught appropriate ways to increase their caloric intake without adding saturated fat and cholesterol to their diets.

Iron Deficiency and "Sports" Anemia

Athletes require more of the mineral iron when they are practicing or competing. If insufficient iron is consumed, they can develop "sports" anemia, which is characterized by a depressed hemoglobin and a reduction in oxygen-carrying capacity.

Iron deficiency anemia may occur in males during periods of rapid growth, but adolescent female athletes (especially black females) are at greater risk. It is recommended that female long-distance athletes (e.g., runners and swimmers) be screened for signs of non-anemic iron deficiency (e.g., normal hemoglobin, depressed serum ferritin, and transferrin) and for signs of iron deficiency anemia by hemoglobin and serum ferritin determination. If a transient iron deficiency goes unchecked, continued stress in a young, growing athlete can lead to a chronic form of anemia and may cause long-term health problems.

Role of the Teacher and Coach

Given the abundant misinformation about nutrition and the role it plays in sports performance, there is a great need for adolescents, coaches, teachers, school nurses, parents, and school officials to become well versed in nutrition education. School staff should learn effective counseling techniques to assist adolescent athletes in improving their dietary patterns by helping them to understand the important role nutrition plays in fitness and health. Adolescents participating in sports are typically a highly motivated group and are receptive to learning and applying proper nutrition.

NUTRITIONAL NEEDS OF PREGNANT ADOLESCENTS

Each year there are approximately 1.1 million births to teenagers nationwide, most of them unplanned. Pregnancy places great physical demands on a woman at any age; however, for a teenager, there are recognized additional risks. A pregnancy that comes at the same time as adolescent growth can compromise the growth of both the mother and baby. The nutritional status of a pregnant adolescent is closely linked to the future health of her baby. Many studies show teens to be the most poorly nourished Americans. If good nutritional habits are not well established before pregnancy, it becomes difficult for them to catch up once pregnant. The health of their babies is placed at risk by the problems associated with less access to adequate food and health care. Studies have demonstrated that poor teens have more babies with low birth weight and prematurity.

Nutrient Needs

The additional energy and nutrients needed to meet the demands of pregnancy place the adolescent at increased nutritional risk. The RDA for pregnant women constitutes the most complete source of scientific information for determining nutrient intakes; however, RDAs do not address the possible increased needs of the pregnant adolescent who may still be growing. Moreover, RDAs may be inadequate for teens who enter pregnancy with a compromised nutritional status, chronic disease, or other complicating conditions.

Surveys indicate that the major nutrients lacking in a pregnant adolescent's diet are energy or total calories, vitamins A, B_6, folic acid, riboflavin, calcium, iron and zinc. The following table displays recommended daily servings for women and pregnant teens.

	Dairy	Fruit and Vegetables		Protein	Grains	Misc.
	cups	other cups	vit. C cups	ounces	slices or equivalents	units
Pregnant Women	4	1½	1	4-6	4+	9
Pregnant Teens	6	1½	1	6	5+	10
Lactating Women	4	1¾	1	4-6	4+	8
Lactating Teens	6	1¾	1	6	5	9
Post-partum Non-breastfeeding Women	2	1½	½	4	4	8
Post-partum Non-breastfeeding Teens	4	1½	½	5	5	10

Prenatal Supplements

With the exception of iron, adolescents should be able to obtain all their nutrient needs through a well-balanced diet. However, due to typically poor dietary habits, it is often recommended that adolescents take a prenatal multivitamin/mineral supplement when pregnant.

Role of Schools

Schools can:

- Facilitate continued access to school services during pregnancy.
- Provide credit for participating in a pregnancy and parenting course which incorporates nutrition education as it relates to pregnancy, delivery, and infant care.

- Facilitate access to medical care and nutritional services.
- Refer to community nutrition resources as needed.
- Develop support groups for pregnant and parenting teens in an environment that is supportive and nonjudgmental.
- Help teen's parents identify day care resources or start a day care program in the school.
- Provide credit for learning about infant development and care.

FOOD IN THE SCHOOL ENVIRONMENT

The School Lunch and Breakfast Programs are a cooperative effort of federal, state, and local authorities. At the federal level, it is administered by the U.S. Department of Agriculture's Food, Nutrition and Consumer Service. In Minnesota, it is the responsibility of the Department of Children, Families and Learning to administer both programs.

Participation in the School Breakfast and Lunch Programs is available to all public and nonprofit private schools as well as nonprofit child care institutions. Participation is not required, however, all public schools in Minnesota are currently participants. School Food Authorities participating in the school meals programs must agree to:

- Operate on a nonprofit basis for all children
- Serve meals that meet the nutritional standards established by USDA
- Offer free and reduced price meals to children whose families meet income eligibility criteria. Such children must not be overtly identified or discriminated against in any way.

Federal and state funds are used to reimburse schools and institutions for costs related to the operation of the program. Receipt of federal monies is dependent of the appropriation of matching state funds. The USDA supports participating schools with donated commodity food products.

Program specialists are available from the Food and Nutrition Service section of the Minnesota Department of Children, Families and Learning to

assist schools in all aspects of school meals programs. There is also a state certification program for school food and nutrition staff developed and administered by the Food and Nutrition Service section.

School Lunch Program

Since 1946, the National School Lunch Program has made it possible for schools throughout the nation to serve nutritious, low-cost lunches to children each day. In 1975, the program was expanded to include residential child care institutions. The primary objective of the Program is to "safeguard the health and well-being of the nation's children," and to encourage the consumption of nutritious agricultural commodities.

The School Lunch is designed to provide approximately 1/3 of the RDAs over a period of time for school-aged children. A variety of menu planning options are available to assist schools in meeting the Dietary Guidelines for Americans as well as specific nutrient standards for Calories, Protein, Iron, Fat, Vitamin A, Vitamin C, and Calcium. The menus can be planned using a specific meal pattern or by using a computer software program that averages specific nutrients over a week's time. To be eligible for reimbursement, a meal pattern lunch for grades 7-12 must include as a minimum:

Fluid Milk	½ pint
Meat/Meat Alternate	2 oz.
Vegetable/Fruit	Two or more servings to total 1 cup.
Grains/Breads	1 serving/day minimum, 15 servings/week

The School Breakfast Program

The School Breakfast Program, which began with the passage of the federal Child Nutrition Act of 1966, helps give children a healthy start for the day's activities by providing a breakfast in school at a cost that most families can afford to pay.

In Minnesota, a school district shall offer a school breakfast program in every school building in which at least 33% of the school lunches served during the second preceding school year were served free or at a reduced price.

The School Breakfast Program is designed to give a child a good start toward meeting his or her daily nutritional needs by providing for 1/3 of a

child's Recommended Daily Requirements, (RDAs). To meet the nutritional standards and be eligible for cash reimbursement, a School breakfast must offer the following meal pattern for grades K-12:

1. Fluid Milk	½ pint served as a beverage and/or on cereal
2. Fruit/Vegetable/Juice	½ cup
3. Grains/Breads	1 serving (whole-grain, enriched or fortified bread items or cereal)
AND	
Meat/Meat Alternate	1 oz.
OR	
2 Servings from either group	

Grains/Breads include whole-grain or enriched bread, biscuits, rolls, muffins, pancakes, etc., or whole-grain or enriched or fortified cereal.

Nutrition Improvement Initiatives

Healthy School Meals Initiative for Healthy Children expands the variety of foods in students' diets. It adds more fruits, vegetables and grains as well as a diet lower in fat.

Nutrition Integrity in Schools

Schools are encouraged to establish nutrition integrity policies at the district level. Minnesota Children, Food and Nutrition Service, as well as the American School Food Service Association recommends that Nutrition Integrity policies encompass the following concepts:

- Nutrition standards, based on scientific recommendations will be adopted to set appropriate goals. Emphasis will be placed on eating a variety of foods with adequate dietary fiber and lower amounts of fat, sodium, and sugar in school meals.

- Student preferences will be considered in menu planning. Since foods must be eaten to provide nutrients, menu changes will be gradual to ensure acceptance.

- Meals will contain adequate calories and a variety of foods to support growth, development, and the maintenance of healthful body weight.

- The nutritional value of school meals will be evaluated over a period of days.

- Purchasing practices will be developed to ensure the use of high-quality ingredients and prepared products to maximize flavor and acceptance. School food service professionals will work with industry to develop appetizing and affordable products which meet nutrition standards.

- Foods will be prepared in ways that ensure a balance between optimal nutrition and student acceptance.

- Foods sold in addition to program meals must be thoughtfully selected to ensure optimal nutrition and to foster healthful eating habits. These foods should be limited in number to prevent the separation of students who can and cannot afford the additional purchases.

Foods Served at School Events

Schools are encouraged to carry over the nutrition standards of the meal programs to after-school events and fund raisers. In lieu of candy sales during school hours, students and staff are encouraged to coordinate fund raisers with the school food service. The school food service director can assist in planning food-oriented fund-raising events such as community suppers, pancake breakfasts, and bake sales. Such collaboration results in successful fund raising, positive public relations for the school food service, and a strong sense of school-community team work.

A la Carte and Vending Machine Sales

A la carte food sales (foods sold as individual components rather than part of a complete meal) and vending machines may be an important supplemental income for some school food authorities. A la carte programs are intended to supplement the school meals programs by providing additional choices for students with higher caloric and nutritional needs. When schools find it necessary to supplement the meal programs with a la carte or vending machine sales, they are encouraged to offer food items that support the nutritional integrity of the school meals program. Good a la carte selections include foods from all four food groups, e.g., fresh fruits, vegetable sticks with low-fat dip, juice, cheese, peanuts, yogurt, milk, bagels, and pretzels.

In addition, schools participating in the NSLP or SBP are prohibited form selling "foods of minimal nutritional value" (soda water, water ices, certain candies, and gum), in the cafeteria area during meal periods.

RESOURCES

American Anorexia/Bulimia Association, (212)891-8686

American Cancer Society, Minnesota Division Inc. (612)925-6389 or (800)582-5152

American Diabetes Association, (612)927-3393

American Heart Association/Minnesota Affiliate, (612)835-3300

American Institute of Cancer Research, (800)843-8114

American Medical Association, (312)464-5000 or (800)621-8335

Anorexia Nervosa and Related Eating Disorders, (503)344-1144

Consumer Nutrition Hotline, (800)366-1655

Eating Disorders Awareness & Prevention, Inc., (206)382-3587

FDA Seafood Hotline, (800)FDA-4010

Food and Drug Administration, (612)334-4100

Food and Consumer Service/USDA, (Admin. Only, WIC, foodstamp), (703)305-2000

Food and Nutrition Information Center, (301)504-5719

International Diabetes Center, (800)232-3972 x-290

Juvenile Diabetes Foundation International Helpline, (800)223-1138

March of Dimes Birth Defects Foundation, (612)835-3033

Minnesota Department of Children, Families and Learning. Food and Nutrition Services. (612) 296-6986 or (800) 366-8922

Minnesota Department of Children, Families and Learning. Nutrition Education and Training Program. (612) 296-0192

Minnesota Department of Children, Families and Learning Nutrition Program (612)296-6986 or (800)366-8922

Minnesota Department of Health, Nutrition Unit, (612)623-5279

Minnesota Dietetic Association, (612)628-9250

National Association of Anorexia and Associated Disorders, (708)831-3438

National Cancer Institute, Cancer Information Line, (800)4-Cancer

National Center for Education in Maternal and Child Health, (202)625-8404

National Diabetes Information Clearinghouse, (301)654-3327

National Eating Disorders Organization, (614)436-1112

National Food Service, Management Inst., (800)321-3054

National Heart, Lung and Blood Institute, (301)251-1222, Heart Information Line (800)575-WELL

NIH Communications, (wide variety of information available), (301)496-4143

Office for Substance Abuse Prevention, (800)729-6686

USDA Meat & Poultry Hotline, (800)535-4555

Weight Control Information Network, (301)951-1120

WIC: Supplemental Food for Women, Infants and Children, (612)623-5266

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