



Chapter 7

Nutrition in Childhood

Krause's *Food
& Nutrition Therapy*

Childhood

- Toddlers (1-3 years)
- Preschool children (3-5 years)
- School-age children (5-12 years)
- Adolescence (12-18 years)

Nutrition in childhood

- Nutrient requirements are affected by a generally slowed and erratic growth rate between infancy and adolescence and a child individual needs.
- A child food choices are determined by numerous family and community factors.
- Nutrient intake and developing food patterns in young children are governed by food availability and food choices.
- Considerations in feeding young children are guided by meeting physical and psychosocial needs.
- Nutrition concerns during childhood relate to

Malnutrition in children

- Protein - Energy Malnutrition
- Vitamin A deficiency
- Vitamin D deficiency
- Iron deficiency anemia
- Zinc deficiency
- Lead toxicity

Standards for selected MEL indicators

- Serum total protein (g/dl) < 5.5
- Serum albumin (g/dl) < 3 - 3.5
- Total lymphocyte count (mm³) < 1500
- Creatinine-height index < 0.5

Childhood Growth and Development

- Growth patterns: growth spurts, appetite
- Catch-up growth: after illness or undernutrition
- Assessing growth: CDC growth charts, growth channels

Physical growth during childhood

- Growth rate: the rapid rate of growth during infancy is followed by a deceleration during the preschool and school age years.
- Weight gain approximates 1.8 to 2.7 kg per year.
- Length increases approximately 7.6 cm per year between 1 to 8 years of age, then increases 5.1 cm per year until the pubertal growth spurt.
- Between 6 years of age and the adolescent growth spurt, gender differences can be noted.
- At age 6 boys are taller and heavier than girls.
- By age 9 the height of the average female is the same as that of the 9 year old male and her weight is slightly more.

Growth charts

- The infants growth charts are constructed to 36 months of age and should be used until the child is at least 24 months old.

Energy and Protein

- Energy needs determined on the basis of basal metabolism, rate of growth, and energy expenditure
- The need for protein per kilogram of body weight decreases from approximately 1.1 g in early childhood to 0.95 g in late childhood

Minerals and Vitamins

- Children between 1 and 3 years of age are at high risk for iron deficiency
- Calcium is needed for adequate mineralization and maintenance of growing bone
- Zinc is essential for growth.
- Vitamin D is needed for calcium absorption and deposition in bone

Vitamin-Mineral Supplements

- Fluoride and dental caries
- At-risk groups: deprived families, parental neglect or abuse, anorexia or fad diets, chronic disease, weight-loss diets
- Avoid megadoses
- Complementary nutrition therapies

Intake Patterns

- Changes in food patterns over time
- Family environment
- Societal trends
- Media messages
- Peer influence
- Illness or disease

Feeding Preschool Children

- Developmental progress
- Growth rate slows
- Parents control foods offered and set limits on inappropriate behaviors
- Importance of snacks
- Portion sizes

Feeding Preschool Children–cont'd

- Sensory factors
- Physical environment
- Excessive intake of fruit juice
- Meals and snacks in day-care
- Peer influence

Feeding School-Aged Children

- Slow steady growth
- Influence of peers and significant adults
- School lunch program
- Special diets
- Home-packed lunches
- Importance of breakfast
- Snacks

Overweight/Obesity

- Increasing prevalence
- Influence of access to food, eating tied to leisure activities, children making food decisions, portion sizes, and inactivity
- Consequences: discrimination, negative self-image, depression, decreased socialization
- Increases cardiovascular risk factors (hyperlipidemia, hypertension, and hyperinsulinemia) and type 2 diabetes

Interventions for Childhood Obesity

- Family involvement
- Dietary modifications
- Nutrition information
- Physical activity
- Behavioral strategies
- Prevention

Iron Deficiency

- One of the most common nutrient disorders of childhood
- Affects approximately 9% of toddlers
- Linked to lower test scores
- Dietary factors

Dental Caries

- Composition of the diet and an individual's eating habits are significant factors in developing dental caries
- Frequent use of sweetened drinks in bottles
- Fewer cariogenic snacks should be emphasized
- Protein foods such as cheese, nuts, and meat should be eaten with sticky foods
- Dental hygiene and fluoride

Allergies

- Food allergies usually manifest in infancy and childhood
- Allergic responses include respiratory or gastrointestinal symptoms, skin reactions, fatigue, or behavior changes

Foods that most often cause allergies

- Nuts
- Eggs
- Milk
- Soybeans
- Wheat
- Peanuts
- Fish, shellfish, mollusks, and chicken

Food hypersensitivity

Celiac disease: a sensitivity to gliadin, a fraction of the wheat protein gluten, that causes flattening of the intestinal villi and generalized malabsorption. It is also called gluten-sensitive enteropathy or celiac sprue.

The grains that must be restricted in celiac disease:

Barley

Rye

Oats

Wheat

Lactose intolerance

- Inability to digest the milk sugar, lactose, due to inactivity or insufficiency of the enzyme lactase.
- Symptoms are: gas, abdominal cramping, nausea, watery stools after ingestion of lactose (either in milk, or in other dairy foods).

Attention Deficit Hyperactivity Disorder

- Dietary factors have been suggested as causes of ADHD
- Various dietary treatments include Feingold diet, omission of sugar, allergy elimination diets, and megavitamin therapy
- Little evidence to support these interventions

Hyperactivity syndrome (attention deficit disorder)

- A cluster of symptoms in which “the essential features are signs of developmentally inappropriate inattention, impulsivity, and hyperactivity”.
- Other important features are:
- Onset before age seven
- Duration of six months or more
- Proven absence of mental illness or mental retardation.

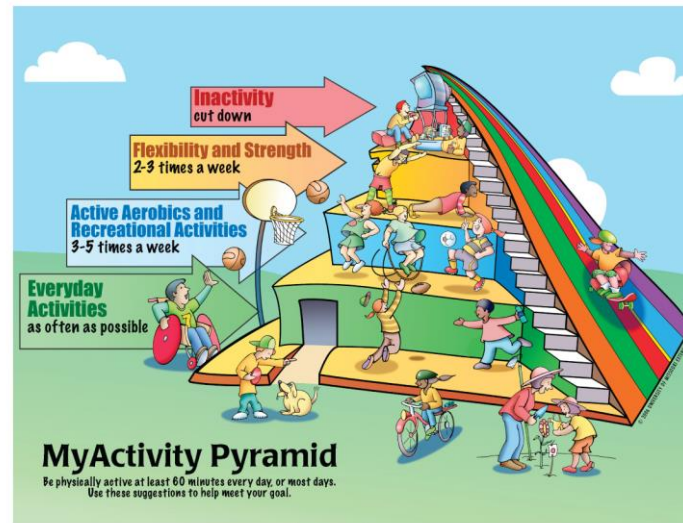
Autism Spectrum Disorders

- Affect 1 in 166 children
- Affects children's nutrition and feeding, with very restricted food acceptance, hypersensitivities, and difficulty in making transitions: behavioral interventions may be helpful
- Little success with elimination diets, essential fatty acid supplements, megadoses of vitamins, other alternative therapies

Preventing Chronic Disease

- Roots of chronic diseases in adults, such as heart disease, cancer, diabetes, and obesity are often based in childhood
- Dietary fat and cardiovascular disease
- Calcium and bone health and obesity
- Fiber
- Physical activity

MyActivity Pyramid



MyActivity Pyramid

Be physically active at least 60 minutes every day, or most days.
Use these suggestions to help meet your goal.

Family Nutrition Education Programs
Revised and updated by Missouri Extension

MyActivity Pyramid

Be physically active at least 60 minutes every day, or most days.
Use these suggestions to help meet your goal:

Everyday Activities As often as possible	Active Aerobics and Recreational Activities 3-5 times a week	Flexibility and Strength 2-3 times a week	Inactivity Cut down
<ul style="list-style-type: none"> • Playing outside • Helping with chores around the house or yard • Taking the stairs instead of the elevator • Picking up toys • Walking 	<ul style="list-style-type: none"> • Playing basketball • Biking • Playing baseball or softball • Rollerblading • Skateboarding • Playing soccer • Swimming • Playground games • Jumping rope 	<ul style="list-style-type: none"> • Practicing martial arts • Rope climbing • Stretching • Practicing yoga • Doing push-ups and pull-ups 	<ul style="list-style-type: none"> • Watching television • Playing on the computer • Sitting for too long • Playing video games 

Find your balance between food and fun:

- Move more. Aim for at least 60 minutes every day, or most days.
- Walk, dance, bike, rollerblade — it all counts. How great is that!

This publication is adapted from USDA's MyPyramid and was funded in part by USDA's Food Stamp Program.

UNIVERSITY OF MISSOURI Extension Based on Extension of Cooperative Extension Work Act of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture, L. J. Sawyer, State Director, Cooperative Extension, University of Missouri, Columbia, MO 65211. © University of Missouri Extension does not discriminate on the basis of race, color, national origin, sex, marital status, religion, age, disability or ability to communicate in English or language. If you require information, 1-888 Agriculture Building, Columbia, MO 65211, or call (314) 862-7210. Please make efforts to be made to accommodate your special needs.

N 288

Revised 7/06/100M

Focal Points

- Children's diets should provide enough energy to support optimal growth and development without causing excessive weight gain.
- For children's diets emphasis should be placed on fruits and vegetables, whole-grain products, low-fat dairy products, legumes, and lean meat, fish, and poultry.
- Fermentable carbohydrate intake should be controlled for good dental health.
- Adherence to general food guidelines is beneficial for children because their total fat intake decreases and their food fiber and micronutrient intake increases, resulting in a more nutrient-dense diet.
- Physical changes in the years between infancy and adolescence happen at a slower and steadier pace, and the cognitive, physical, and socioemotional growth is significant.
- Nutrition education and resources for families and children can help establish healthy, positive eating and activity patterns that carry through during adolescence and adulthood.