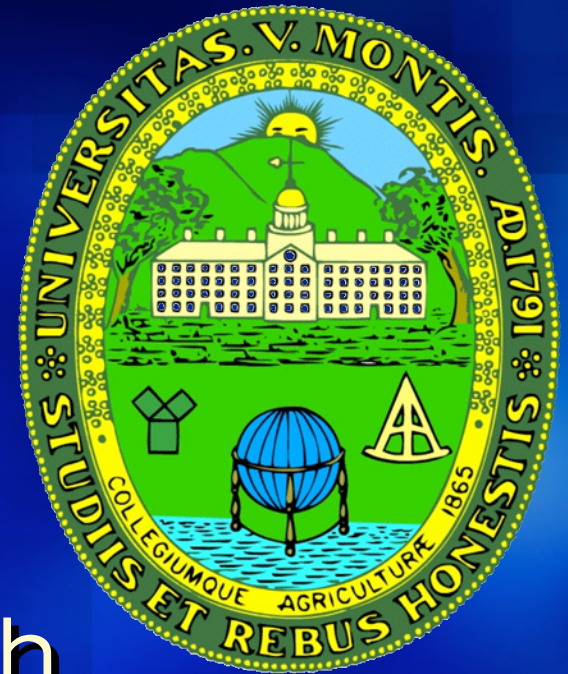


School Milk And Childhood Health



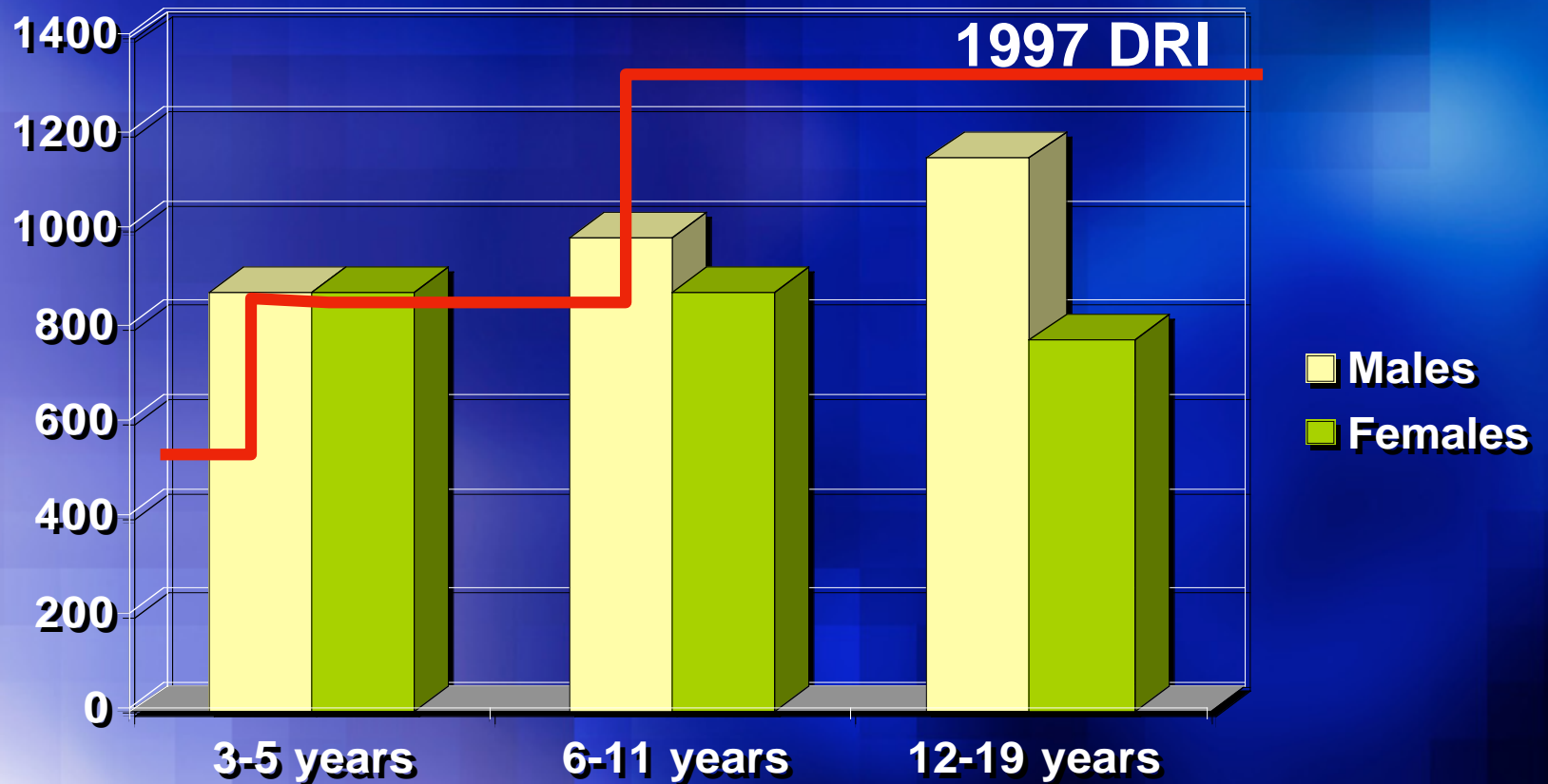
Rachel K. Johnson, PhD, MPH, RD
Professor of Nutrition
Dean College of Agriculture and Life Sciences
The University of Vermont



Challenges in the Diets of U.S. Children

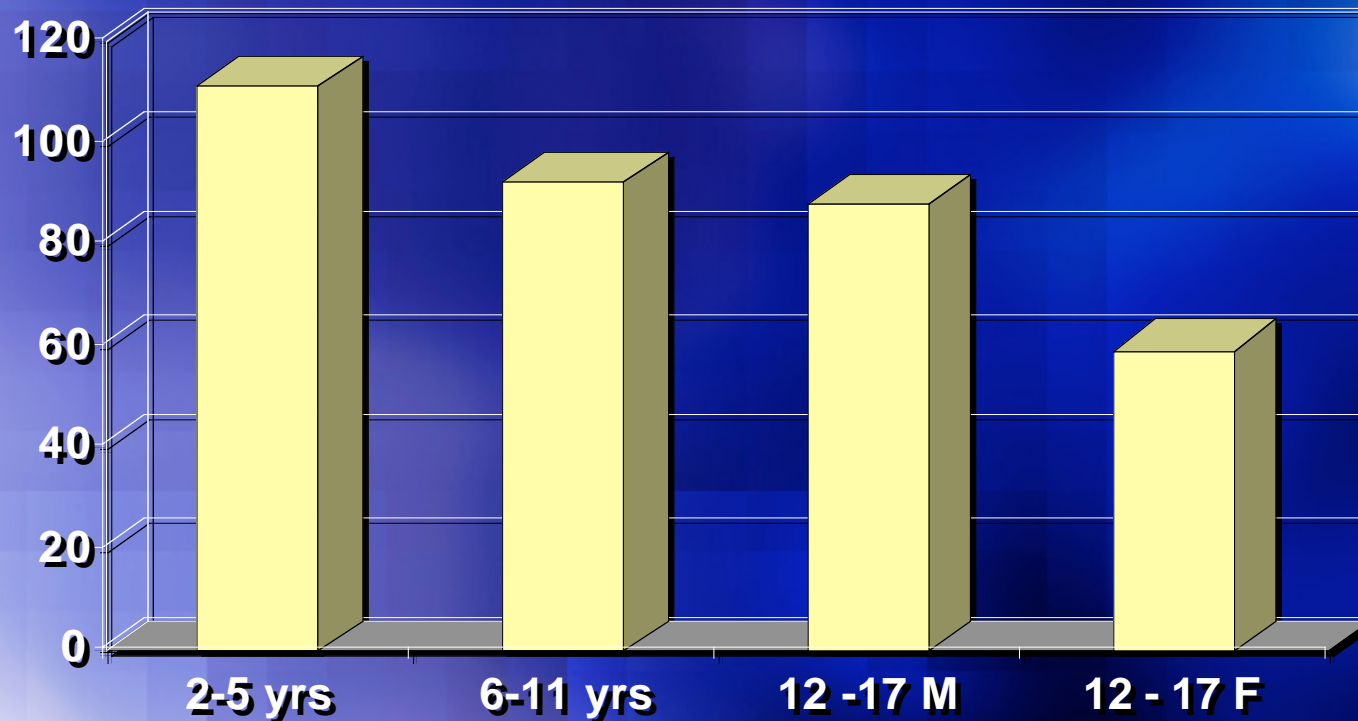
- High intakes of
 - energy
 - saturated fat
 - added sugars
- Low intakes
 - calcium
 - fiber
 - fruits
 - vegetables
 - dairy
 - whole grains
 - Munoz et al.
Pediatrics
1997;100:323-329.

Mean Calcium (mg) Intakes of U.S. Children



Older Children (Especially Girls) Are Not Consuming Enough Calcium

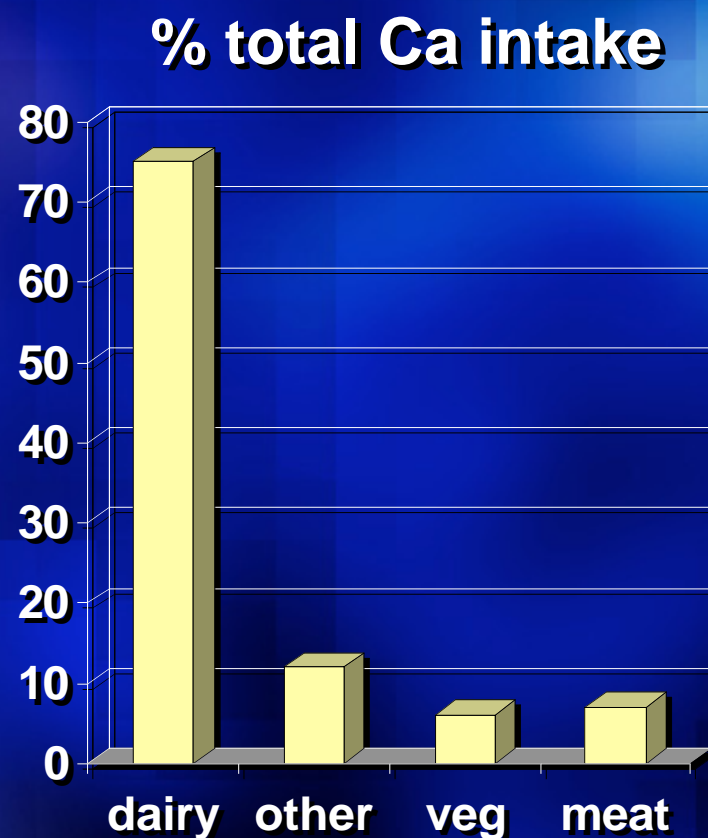
Consumption as % of DRI for calcium



Source: USDA CSFII 1994-1996, 1998

Food Sources Of Calcium in North America

- Americans get 75% of their calcium from milk and dairy products



Per Capita Milk Consumption*

gallons



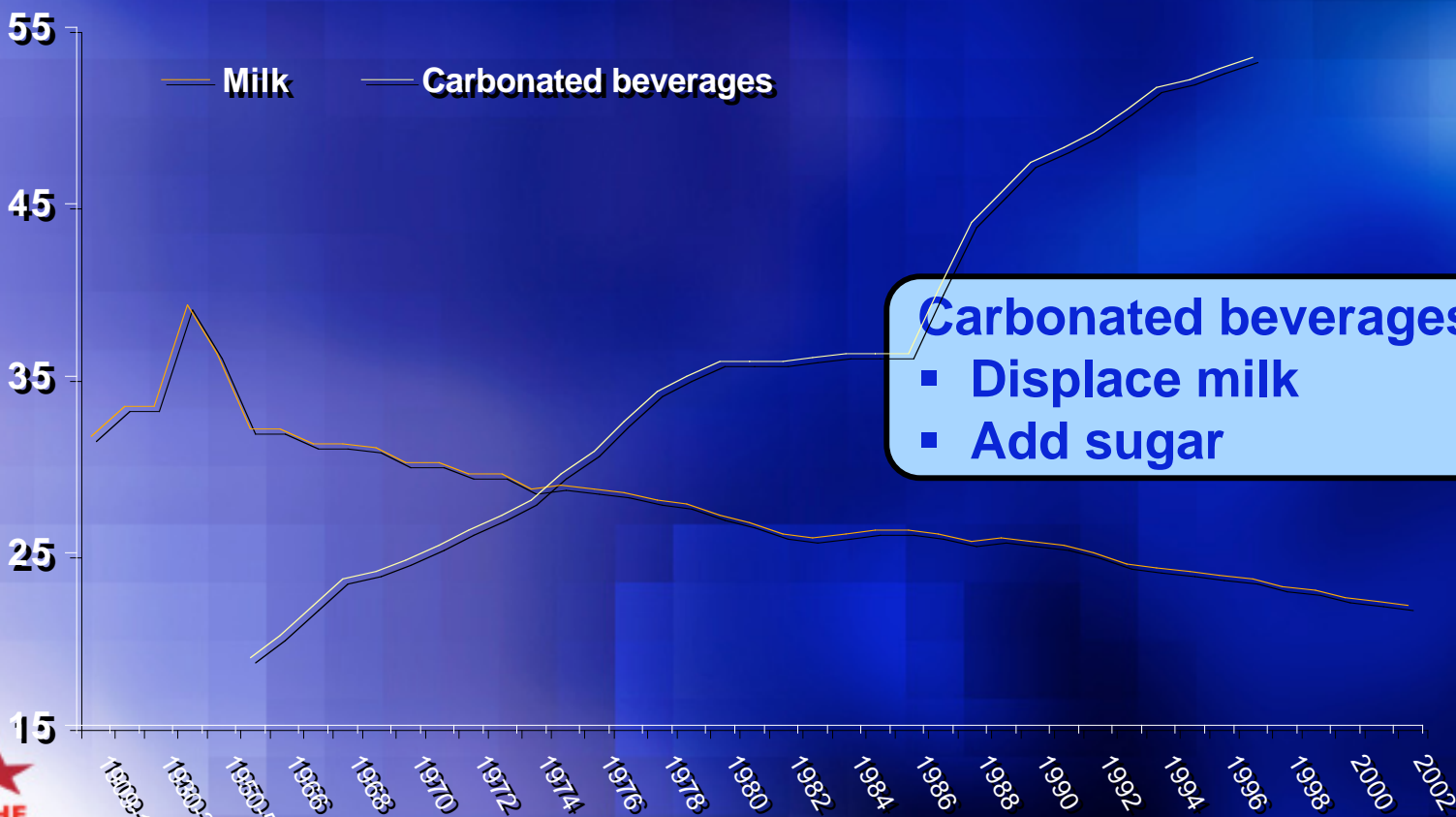
Fluid milk use increased during the 1st half of the 20th century to a high of 337.4 lbs (39 gallons) per person during WW II. Since 1940–49, demand for fluid milk has declined. In 2002, per capita fluid milk consumption

**Less than 1 cup
per person per day**

*Source: USDA, NMPF

Per Capita Beverage Consumption

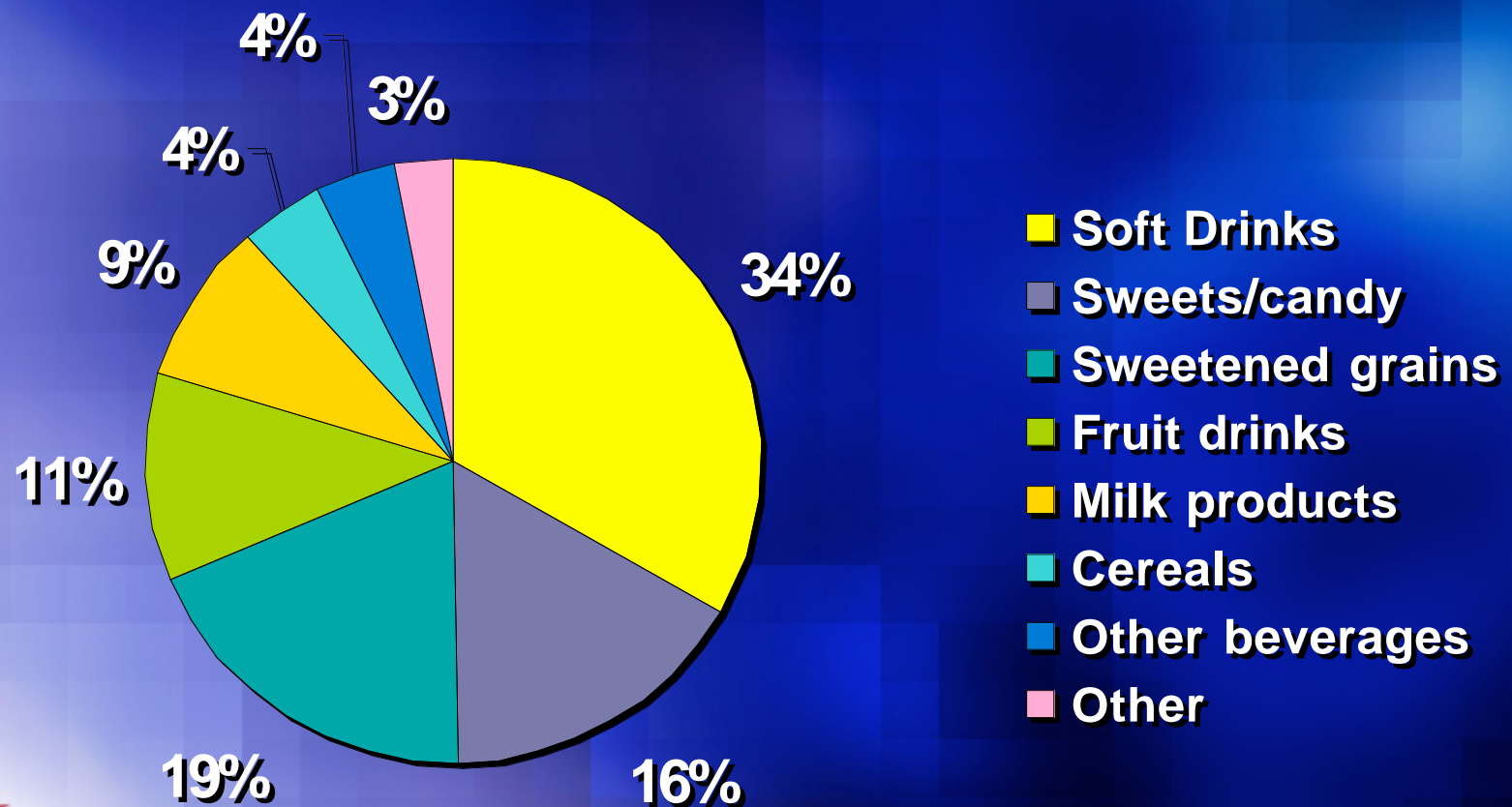
gallons



Source: USDA, NMPF

**THE
EVOLUTION
OF
SCHOOL MILK**
Changing Attitudes.
Changing Needs

Sources of added sugars in the U.S. diet



Nutritional Consequences of Soft Drink Consumption

Soft drink intake is associated with:

- Higher energy intakes
- Lower intakes of vit C, folate, pro, riboflavin, vit A, calcium and phosphorus
 - Harnack et al. JADA 1999;99:436–441

Beverage Consumption and Diet Quality

- Children who consume milk (all types) at the noon meal have the highest daily intakes of
 - vitamin A, E, calcium, and zinc
- The opposite is true for children who consume soft drinks, juice, and fruit drinks
- Milk serves as a marker for diets that are higher in the shortfall vitamins and minerals
 - Johnson et al. J Child Nutr and Mngt 1998;22:95–100

Flavored Milk Consumption in U.S. School-aged Children and Adolescents

Johnson RK, Frary C, Wang MQ

The nutritional consequences of flavored milk consumption by school-aged children and adolescents and the United States

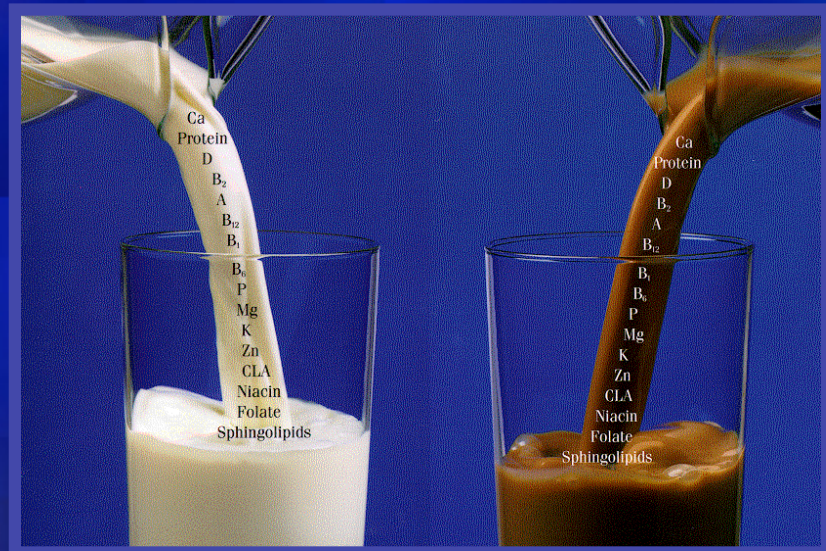
J Amer Diet Assoc 2002;102:853-856



Concerns about flavored milk

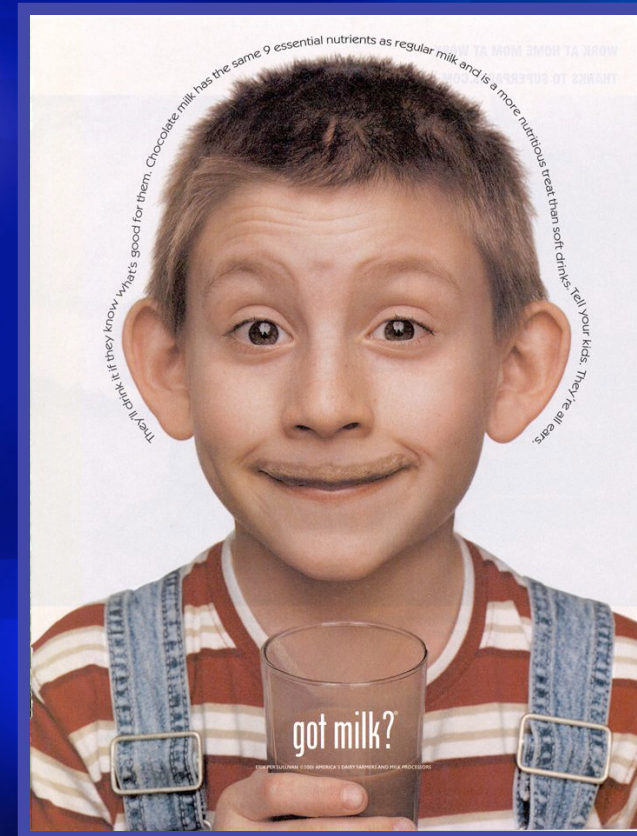
Perception that flavored milk will:

- have a negative impact on children's overall diet quality – especially added sugars intake
- lead to overall lower milk consumption due to children developing a taste preference for flavored milk



Sample Children

- Children age 5–17 participating in the USDA/CSFII 1994–96, 98 surveys
 - Children age 5–11 = 2,763
 - Adolescents age 12–17 = 1,125



Association Between Flavored Milk Consumption and Total Milk Consumption

- Flavored milk intake positively and significantly associated with total milk intake
- Of those children who consumed more than 1 cup of flavored milk/day
 - 5–11 year olds had total milk intake that was 192 gms higher
 - 12–17 year olds had total milk intake that was 277 gms higher

Flavored Milk Consumption and Nutrient Intakes

- Children 5–11
 - Positively associated with calcium, phosphorus, and fiber intakes
- Adolescents 12–17
 - Positively associated with calcium, phosphorus, and fiber intakes
 - Negatively associated with vitamin A
- Total group
 - No association with total fat and added sugars intake

Flavored Milk Consumption and Soft Drink, Fruit Drink and Fruit Juice Consumption

Flavored milk intake

- Not associated with fruit juice intake
- Negatively associated with
 - soft drink intake
 - fruit drink intake



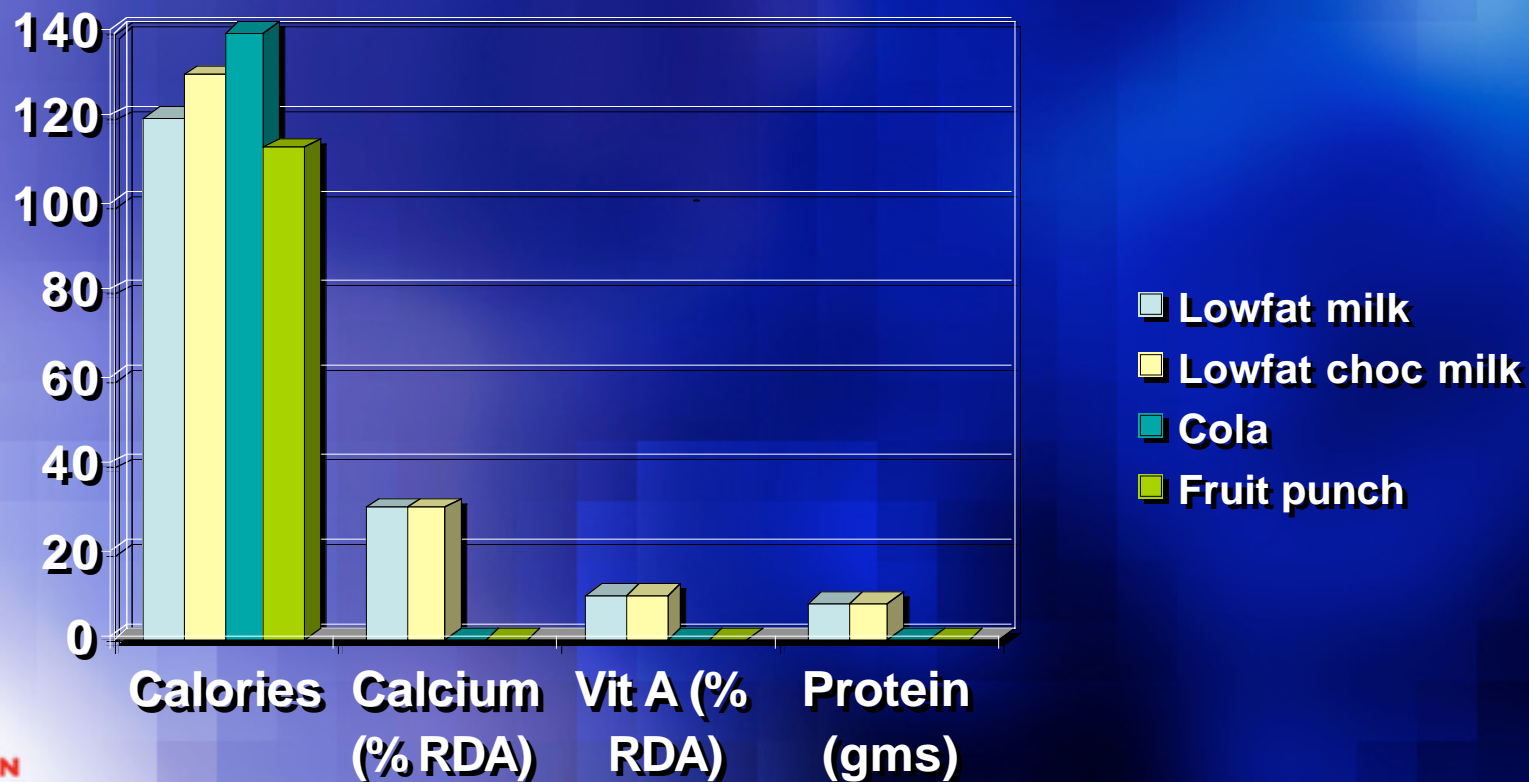
Conclusion

- Flavored milks offer a well-accepted, nutritious alternative in the wide array of beverages available to children



Nutrient Content of Popular Beverages

1 carton of milk (lowfat and chocolate)
vs. 1 can of cola vs. 1 cup of fruit punch



Impact of Foods and Beverages High in Added Sugars on the Diets of American Children

Frary CD, Johnson RK, Wang MQ

Children and adolescents' choices of foods and beverages high in added sugars are associated with intakes of key nutrients and food groups

J Adol Health 2004;34:56-63



Why Worry About Added Sugars in Children's Diets?

- Childhood Obesity
- Dental Caries
- Hypertriglyceridemia
- Bone Health
- Diet Quality



Diet Quality & Added Sugars

- Bowman (1999): added sugars in the diet of Americans over age 2 had a dilutional effect
 - Significant ↓ in micronutrients, pro, fiber

Research Aim

- To determine the associations among U.S. children and adolescents' intakes of the primary foods and beverages high in added sugars and intakes of selected key nutrients and food groups
 - Sugar-sweetened beverages
 - Sweetened dairy products
 - Sugars & sweets
 - Sweetened grains
 - Presweetened cereals

Measures of Diet Quality

- % DRI for calcium (AI), folate, iron
- Grams of saturated fat, fiber, added sugars
- Number of fruit, vegetable, dairy servings

Key Findings

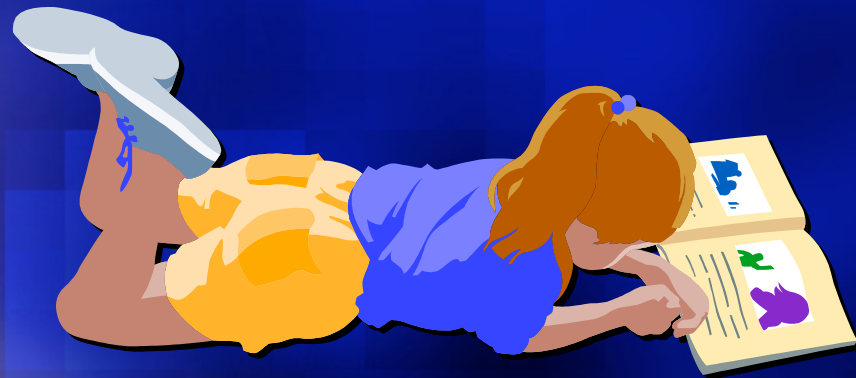
- High consumers (>6 oz children, >8 oz teens) of sweetened dairy
 - Higher calcium
 - Lower saturated fat
 - More fiber (teens)
 - No higher added sugars (teens)
 - More dairy servings
- Non-consumers sugar-sweetened beverages
 - Only group that met the AI for calcium (children)

Conclusions

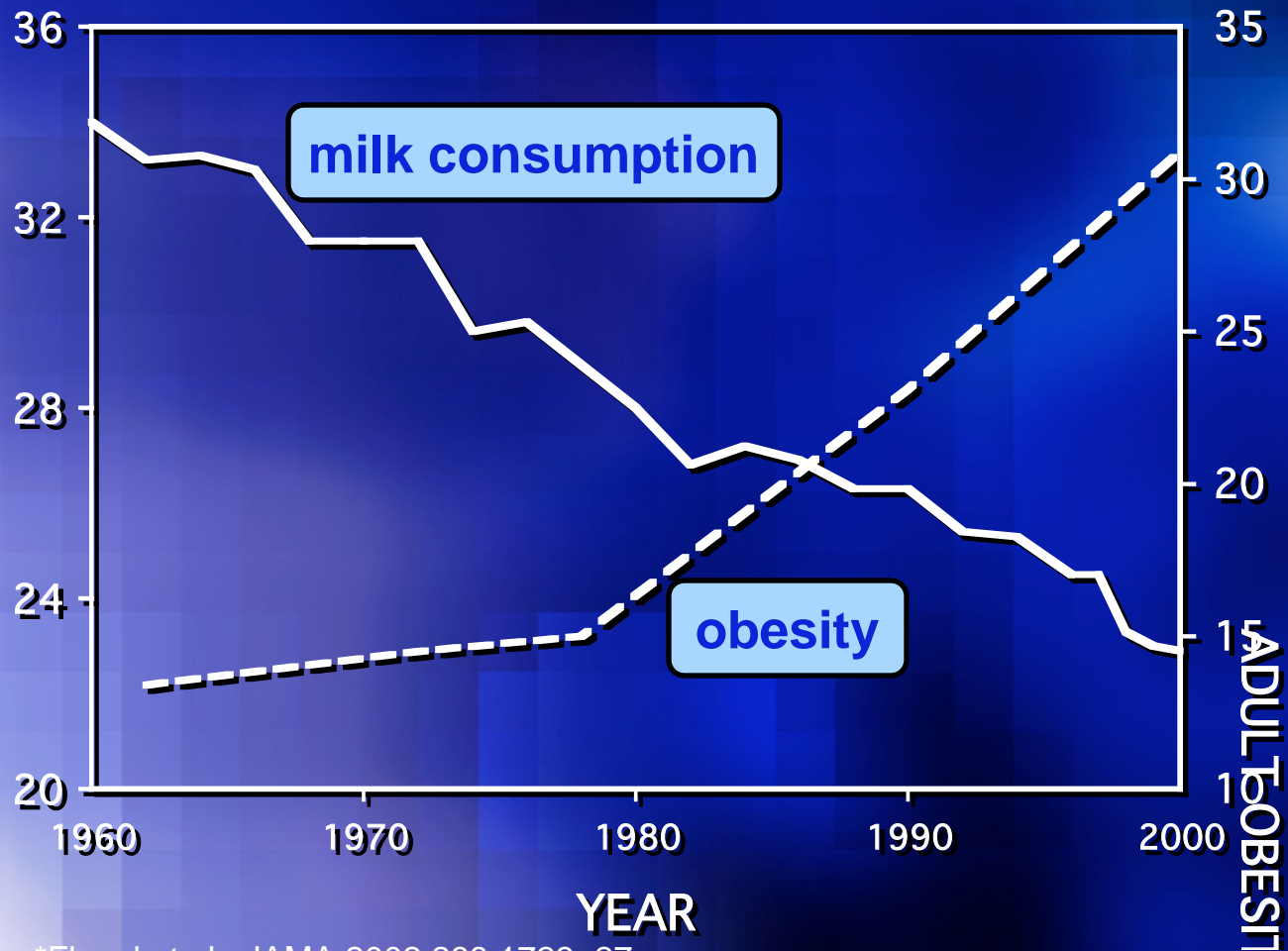
- On average, higher intakes of sugar-sweetened beverages, sugars and sweets, and sweetened grains appear to have a negative impact on children's intake of the critical shortfall nutrients and food groups
- On average, higher intakes of sweetened dairy products and presweetened cereals appear to have a positive impact

Childhood Obesity

- If we don't effectively prevent and treat childhood obesity this may be the first generation of children who don't live as long as their parents



Opposite Trends



*Flegal et al., JAMA 2002;288:1723-27

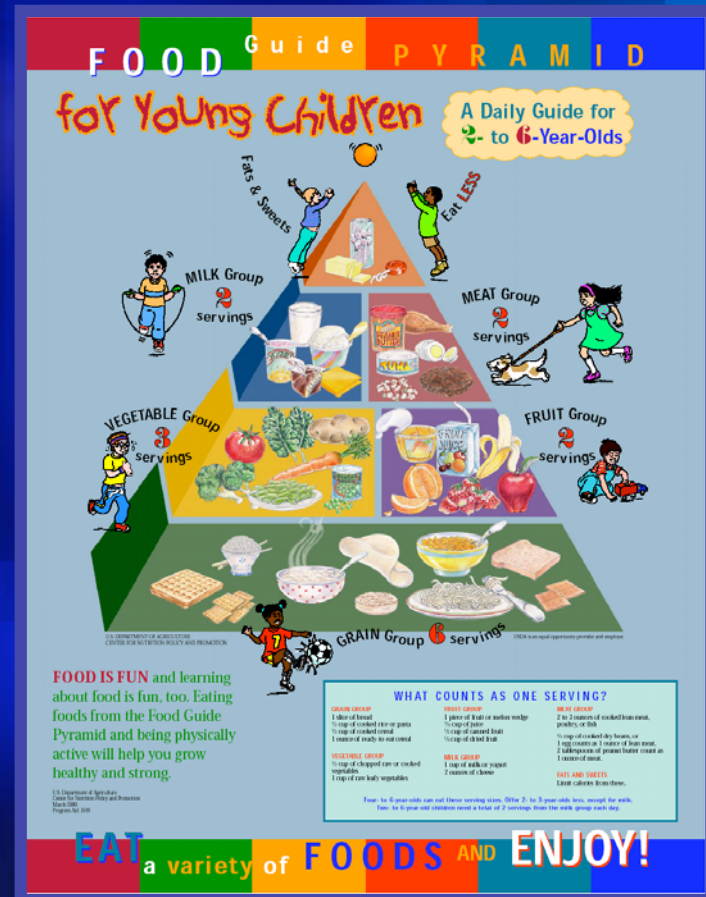
Child Health Consequences of Soft Drink Consumption

- Consumption of sugar-sweetened beverages is associated with childhood obesity
 - For every additional serving of sugar-sweetened drink consumed, the odds of becoming obese increased by 60 percent
 - * sugar-sweetened beverages defined as soda, Hawaiian punch, lemonade, Koolaid or other sweetened fruit drink, iced tea (not artificially sweetened)
 - Ludwig et al. The Lancet 2001;357:505–508

Dairy's role in childhood obesity

- Children age 2–8
 - Milk, cheese and yogurt intake associated with lower body fat
 - JADA
2003;103:1626–1631
- Girls age 9–14
 - For every 300 mg of Ca consumed girls were 1.9 lbs. lighter
 - FASEB
2003;17(4):A453.8
- Children age 2–5
 - Diet rich in Ca and dairy foods associated with lower body fat
 - Int J Obesity
2001;25:559–566
- Adolescent girls
 - Dairy consumption not associated with higher BMI or increase in % body fat
 - Int J Obesity
2003;27:1106–1113

- “The epidemic of childhood obesity is **CRITICAL** and needs as much attention in this country as tobacco”
 - Dr. David Satcher
 - Former US Surgeon General



On-going Challenges

- Reverse the trend of increasing soft drink consumption and declining milk consumption by U.S. children
- Counteract misleading information about dairy products
- Address the widespread calcium shortages among our children by making milk and dairy products accessible and popular

Thank You

- Northeast Dairy Foods Research Center
- Vermont Dairy Promotion Council
- New England Dairy Promotion Board
- National Dairy Council / Dairy Management Incorporated
- Vermont, New England, and U.S. Dairy Farmers

