Impact of Dairy Products on Diets

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Disclosures

MilkPEP
Milk Processor Education Program

Milk Intake Trends

- Milk consumption among children and adolescents continues to decline (from 1997-2001)

94% ↓ 84%

% of kids drinking milk

3.5 ↓ 2.8

servings per day

460 mL ↓ 410 mL

mL portion size per day

Dairy Intakes in the US

72% of calcium consumed by Americans is from milk and milk products

42% of kids >1 yr old have calcium intakes below the EAR

94% of kids >1 yr old have vitamin D intakes below the EAR

Factors Affecting Dairy Consumption

Consumption decreases with age

Teen girls may have misperception that dairy foods are fattening

For each 30 mL decrease in milk intake, there is a 126 mL increase in sweetened beverage intake (net increase 31 kcal)

Calcium Intake of US Children/Teens from Foods

Dairy products account for 13% of total energy intake

50% of calcium from milk

20% of calcium from milk & cheese in mixed dishes

30% of calcium from calcium fortified foods & natural sources

2015 Dietary Guidelines for Americans Advisory Committee Report (DGAC)

- Recommendations for dairy products in the American diet have been largely driven by contribution of calcium
- Dairy products also provide other key nutrients:
  - Protein, potassium, magnesium, phosphorus, zinc, selenium, vitamin A, riboflavin, thiamine, vitamin B12, and vitamin D (when fortified)
- Dairy Group: Fluid milks, soy milk, cheese, yogurt, milk-based meal replacements, ice cream
  - Almond milk and rice milk are not included

DGAC Report: www.health.gov/DietaryGuidelines/2015

American Heart Association Recommendations (supported by AAP)

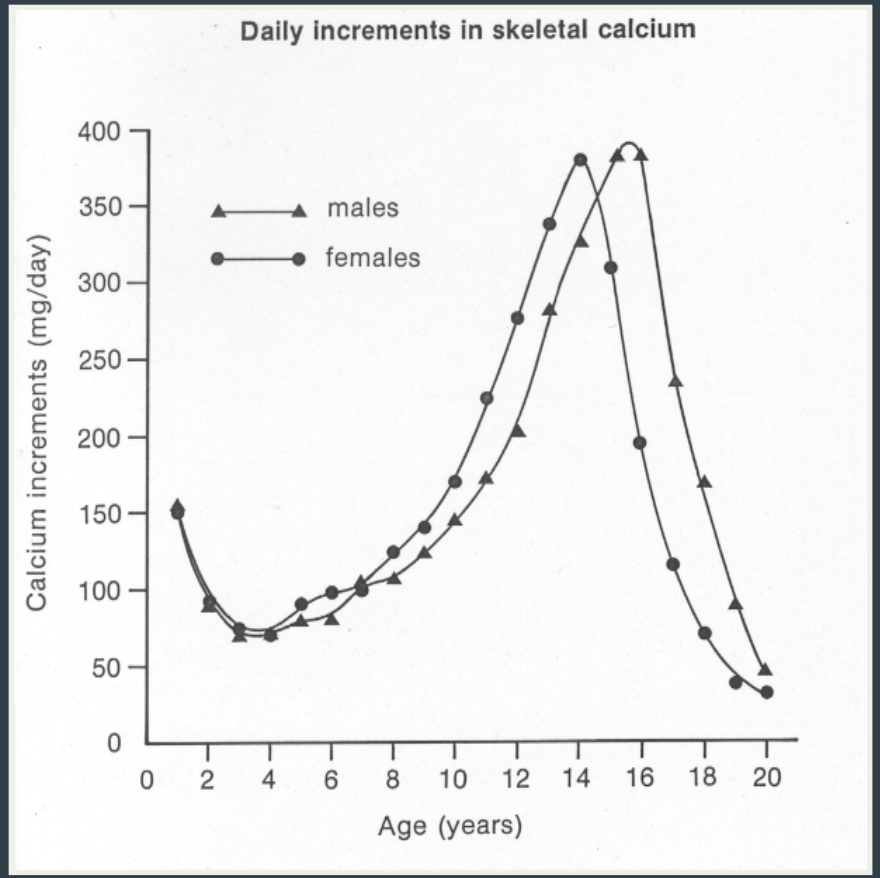
- Serve nonfat or low-fat dairy products (milk or equivalent) daily as sources of calcium and protein

Dairy Recommendations by Country

Country and Population Group	Daily Recommendation
US	
2-3 y	2 c low-fat milk, yogurt, fortified beverage
4-8 y	2.5 c low-fat milk, yogurt, fortified beverage
>9 y	3 c low-fat milk, yogurt, fortified beverage
Canada	
2-8 y	2 servings milk, yogurt, kefir, or cheese
9-18 y	3-4 servings milk, yogurt, kefir, or cheese
Australia	
4-11 y	2 servings milk, yogurt, cheese, or custard
12-18 y	3 servings milk, yogurt, cheese, or custard
India	5 portions milk
UK	Eat some milk and dairy foods every day

Weaver, *AJCN*, 2014

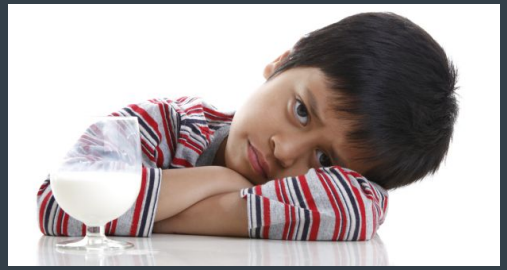
Peak Timing of Skeletal Calcification



DGAC: Impact on Nutrient Adequacy if No Dairy Foods were Consumed

Calcium intakes drop by 68-88%

Vitamin D intakes drop by 20-30%



Potassium intakes drop by 15%

Magnesium intakes drop by 69%

DGAC: Impact on Nutrient Adequacy if No Dairy Foods were Consumed

- Some potential Dairy Group alternatives contain more calories than fat-free milk
- Recommended individuals 9 yrs and older consume 3 cup equivalents from Dairy Group
  - Amount of alternatives to provide sufficient calcium would be challenging for many

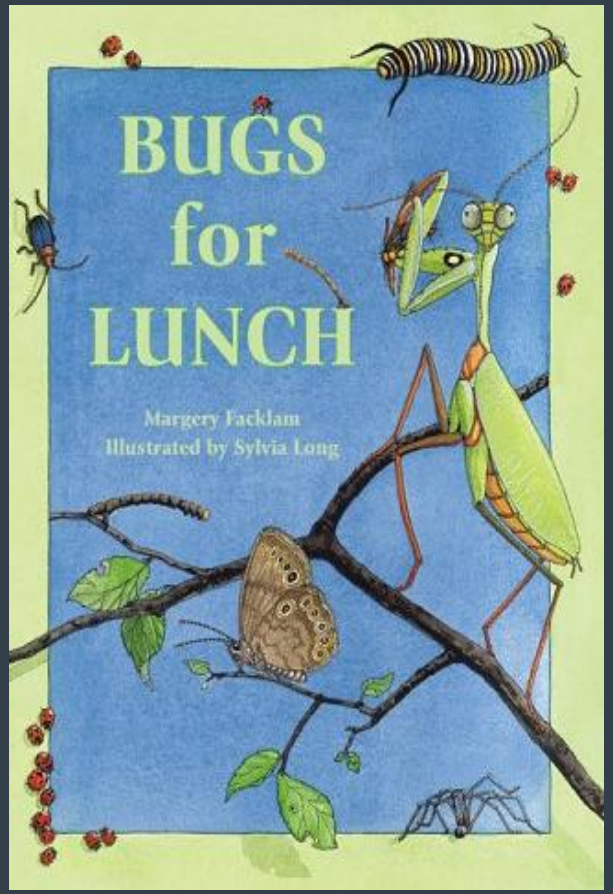
DGAC Report: www.health.gov/DietaryGuidelines/2015

Calcium Bioavailability

Food	Serving Size	Calcium Content	Fractional Absorption	Servings needed to equal 1 cup milk
Milk	240 g	300 mg	32%	1
Yogurt	240 g	300 mg	32%	1
Cheddar cheese	42 g	303 mg	32%	1
Tofu	126 g	258 mg	31%	1.2
Kale	85 g	61 mg	49%	3.2
Broccoli	71 g	35 mg	61%	4.5
Pinto beans	86 g	45 mg	27%	8.1
Spinach	85 g	115 mg	5%	16.3

Other Calcium Sources

Insect	Protein (g)	Calcium (mg)	Iron (mg)
Giant Water Beetle	19.8	43.5	13.6
Red Ant	13.9	47.8	5.7
Dung beetle	17.2	30.9	7.7
Cricket	12.9	75.8	9.5
Grasshopper	20.6	35.2	5.0



The Food Insects Newsletter, July 1996 (Vol. 9, No. 2, ed. by Florence V. Dunkel, Montana State University)
Bugs In the System, by May Berenbaum, http://www.ent.iastate.edu/misc/insectnutrition.html

Calcium intake

- Evidence supports average need for 800-1200 mg/day after early childhood
  - Intakes of 1200-1400 mg/day provide a safety margin, most important during limited time period of peak adolescent growth
- Some young adult catch-up is possible, may be more difficult with intakes <600-800 mg/d
- Intakes in US are low, but probably not a “crisis” level for most children due to adaptation to low intakes

Effects of Very Low Intake on Net Calcium Retention

TABLE 2. CALCULATED CALCIUM BALANCE VALUES IN GIRLS DURING EARLY PUBERTY

	LO-Ca	*REC-Ca*	p *Value*
Calcium intake (mg/day)	386 ± 14	1222 ± 42	<0.0001
Calcium absorption (%)	62.9 ± 1.9	43.0 ± 2.2	<0.0001
Total absorbed (mg/day)	241 ± 10	525 ± 32	<0.0001
Urinary calcium (mg/day)	53 ± 8	91 ± 10	<0.0001
Endogenous fecal calcium (mg/day)	57 ± 4	86 ± 4	<0.0001
Total intestinal calcium (mg/day)	125 ± 10	142 ± 8	0.16
Calcium retention (mg/day)	131 ± 14	349 ± 32	<0.0001

Data are for the 36 subjects in whom fecal collections were performed. Total intestinal calcium was calculated by the method of Heaney and Recker.[10]

Abrams et al, *JBMR*, 2004

What about Vit D in children?

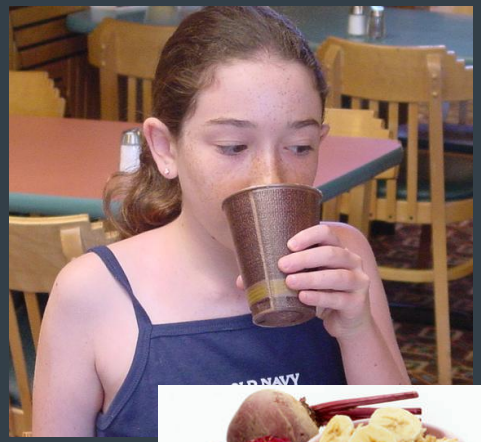
- Dairy provides modest amount of vitamin D
  - Do children need high doses instead?
- Cochrane/systematic review: No overall benefit
  - Very small effect in those with 25-OHD <14 ng/mL

- Authors conclusions "These results do not support vitamin D supplementation to improve bone density in healthy children with normal vitamin D levels, but suggest that supplementation of deficient children may be clinically useful"

Note that deficient is defined by review as <14 ng/mL and that RDA of 600 IU/day will bring >97.5% of children to a level above 20 ng/mL

Winzenberg et al, *BMJ*, 2011

Important Bone Health Factors



Conclusions

- DGAC 2015 reaffirmed dairy products as healthy nutrient sources for Americans
- Dairy products provide key nutrients – calcium, phosphorus, potassium, and vitamin D among others
  - 2/3 of calcium intake comes from dairy products
- Alternative, non-milk sources exist but may not provide an equivalent nutrient profile or within reasonable serving sizes
- Modest levels of vitamin D in dairy are important in reaching RDA goals, no evidence for routine use of high dose supplements

Recommendations

It is recommended that dairy remain part of a healthy diet for those who choose to include dairy, recognizing that dairy is often a critical source of nutrients for most children/teens in the United States

If dairy is omitted, need careful attention to sources of critical nutrients in diet, especially in children/teens