TALK DAIRY TO ME:

Facts, Fiction and FAQs

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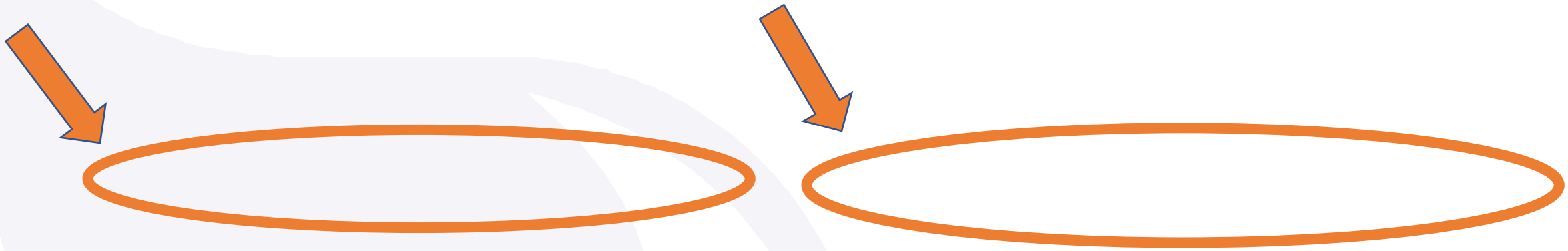
Reminders for today's webinar:

- Having tech issues? Visit https://support.zoom.us/hc/en-us
- A copy of the slides are available (link in the reminder email)
- The webinar will be posted to USDairy.com within 7 days
- This webinar was approved by CDR for 1 CEU and is pending approval through AAFP for 1 CME
- Continuing education certificates will be emailed within 24 hours

Access to Slides and Continuing Ed Certificates

Reminder email (sent yesterday)

Post webinar email (next 24 hours)



Talk Dairy to Me:

Facts, Fiction, FAQS

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Today's Speakers

Abigail Andrew Copenhaver, MS, RD, CDN
Owner
Farmstead Nutrition and Consulting
Ivy Lakes Dairy, Gorham Dairy

Megan Maisano, MS, RDN
Director
Nutrition & Regulatory Affairs
National Dairy Council

Stephanie Masiello Schutte, PhD
Director
Environmental Research
Dairy Management Inc.

Disclosures

Speakers

1. Abigail Andrew Copenhaver, MS, RD, CDN
    - Farmstead Nutrition & Consulting
    - Ivy Lakes Dairy & Gorham Dairy
    - American Dairy Association North East Spokesperson
    - National Dairy Council Ambassador
    - Dairy Sustainability Alliance Farmer Representative
    - Innovation Center for U.S. Dairy Stewardship Task Force
2. Megan Maisano, MS, RDN
    - National Dairy Council
3. Stephanie Masiello Schutte, PhD
    - Dairy Management Inc.

National Dairy Council Planning Team

- Sally Cummins, MS, RD: VP, Nutrition Affairs
- Kerry Hackworth, MS, RD: Director, Nutrition Affairs
- Erin Coffield, RD, LDN: VP, Communications – Health & Wellness

This webinar has been sponsored and approved for continuing education through CDR by National Dairy Council
Credentialed professionals can submit feedback about the quality of this activity directly to the Commission on Dietetic Registration: QualityCPE@eatright.org

Learning Objectives

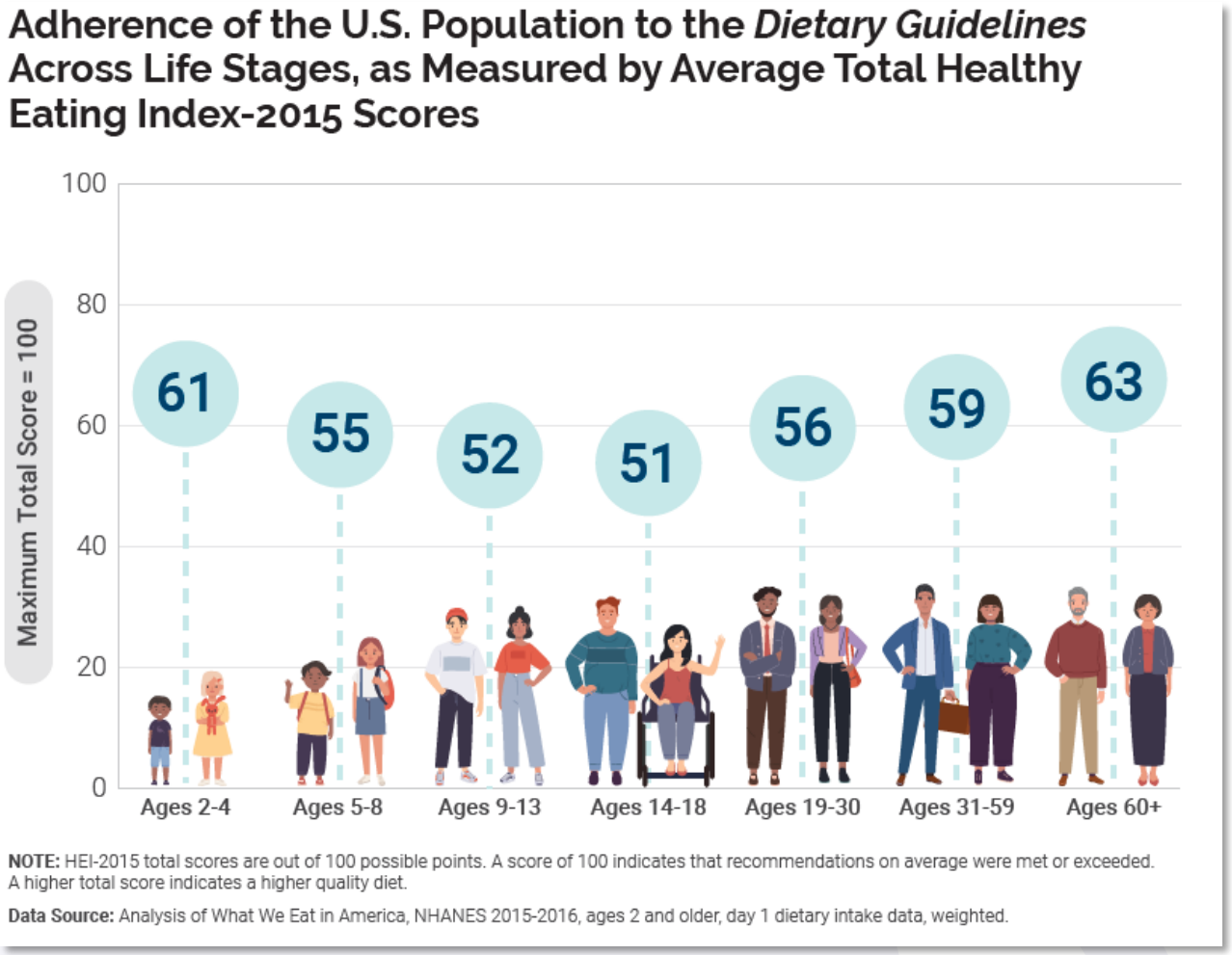
At the end of this webinar attendees will be able to:

1. Describe the role of dairy foods in supporting healthy dietary patterns and sustainable food systems.
2. Identify farming and processing practices that ensure animal wellbeing and food safety.
3. Answer common questions and address misconceptions about dairy food and farming.
4. Communicate evidence-based, practical and cost-effective nutrition guidance.

Suggested CDR Performance Indicators: 4.1.3, 11.2.11, 12.4.2

Background

There's room for improvement in U.S. diets



Percentage of Americans *not* meeting recommendations

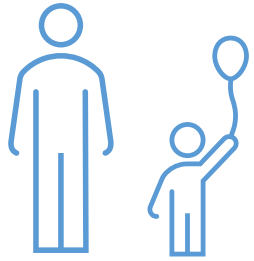
- 98% whole grains
- 90% vegetables
- 90% dairy foods
- 80% fruit

USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.

… and it's taking a toll on our health and quality of life

#1 Heart disease is the leading cause of death

11% Adults have diabetes (I & II)



3 in 4 Adults have overweight or obesity

20% Older adults have reduced muscle strength

45% Adults have hypertension

38% Adults have prediabetes[2]

40% Children have overweight or obesity

20% Women over 50 have osteoporosis[3]

1. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
2. CDC. National Diabetes Statistics Report. 2022.
3. CDC. Does Osteoporosis Run in Your Family? 2022.

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As a part of a healthy dietary pattern, dairy foods can help

DGAC Scientific Report

Lower risk for health outcomes of interest

- ✓ All-cause mortality (strong)
- ✓ Cardiovascular disease (strong)
- ✓ Overweight / Obesity (moderate)
- ✓ Bone health (moderate)
- ✓ Colorectal cancer (moderate)
- ✓ Lung cancer (limited)

Table D8.1 Low-fat dairy inclusion and strength of evidence for adults

USDA, ARS. Dietary Guidelines Advisory Committee. Scientific Report of the 2020 Dietary Guidelines Advisory Committee. 2020.

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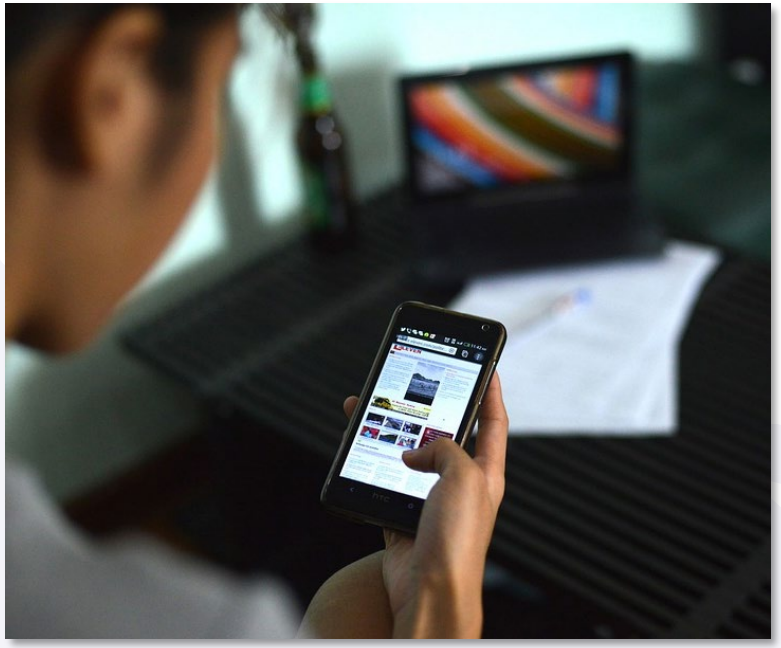
But, people still have questions

From health and nutrition to processing and environmental impact, how can we confidently advise patients, consumers and clients about the role of dairy foods?



You asked, we listened.

- Myth busting
- Animal welfare
- Antibiotic/hormone concerns
- Role in sustainable food systems
- Dairy's saturated fat

NDC Webinar Survey Feedback

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Fact or Fiction?

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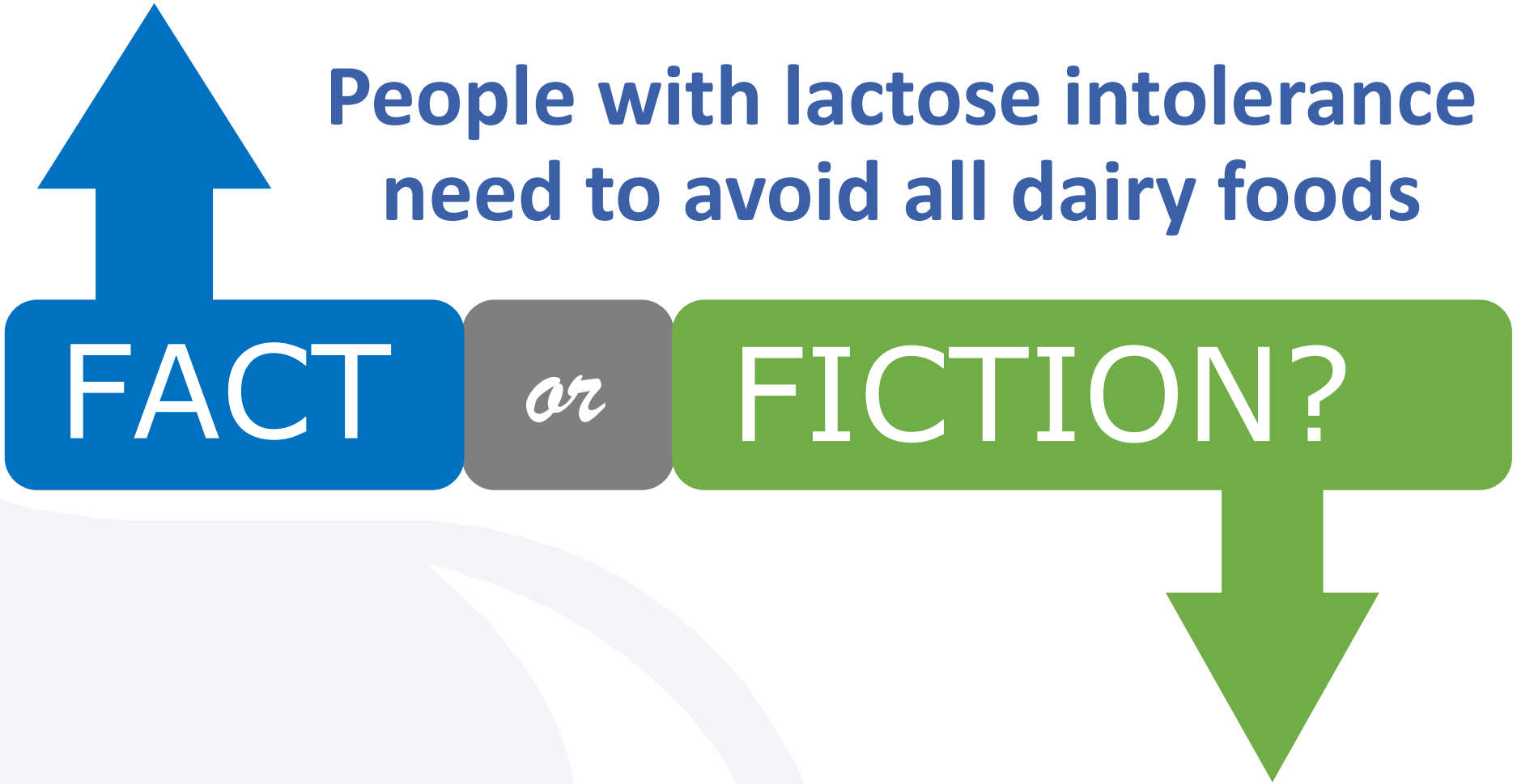
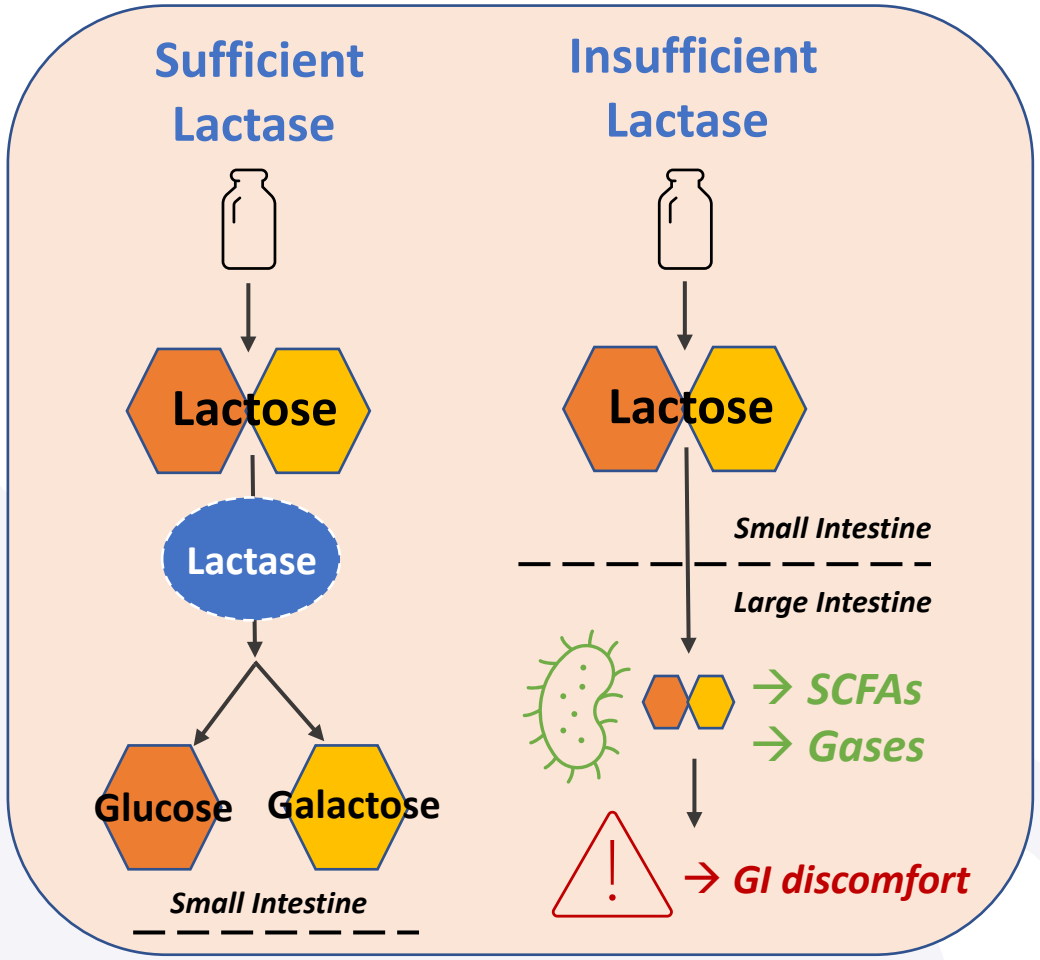

People with lactose intolerance need to avoid all dairy foods
FACT
or
FICTION?

Lactose intolerance (LI) is real and affects many Americans



36%

U.S. adults are affected by LI[1,2]

- 20-30% white adults
- 70% Mexican descent
- 70% Ashkenazi Jews
- 80% African Americans
- 99% Chinese adults
- 100% Native Americans
- 100% Native Alaskans

1. Storhaug C, Fosse S, Fadnes L. Lancet Gastroenterol Hepatol. 2017;2(10):738-746.
2. Bayless T, Brown E, Paige D. Curr Gastroenterol Rep. 2017;19(5):23.

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LI doesn't have to mean "no more dairy"

Education around lactose content can help people with LI enjoy dairy foods with confidence

Amount of Lactose per Serving

From Lowest to Highest

Lactose-free Dairy Milk
1 CUP (8 OZ) SERVING

Lactose-free dairy milk is real milk, just without lactose.

0g

Natural Cheeses
1.5 OZ SERVING

Due to the steps in cheese making and natural aging, natural cheese contains minimal amounts of lactose. Natural cheeses like Cheddar and mozzarella have less than 1 gram of lactose.

<1g

Ricotta Cheese
1/4 CUP SERVING

This soft, natural cheese contains minimal amounts of lactose.

1.9g

Ice Cream
2/3 CUP SERVING

There are lactose-free dairy milk ice creams available.

3.9g

Yogurt
3/4 CUP SERVING

The live cultures in yogurt help digest some of the lactose.

5.7g

Buttermilk
1 CUP (8 OZ) SERVING

Due to the steps in making buttermilk and its acidity, it naturally contains less lactose than regular milk.

9g

12.6g

Butter
1 TBSP SERVING

Butter is made by separating milk from butter fat, so there are only trace amounts of lactose, if any.

<1g

American Cheese
1 SLICE SERVING

American cheese is made from natural cheese, which contains minimal lactose.

1.2g

Cottage Cheese
1/2 CUP SERVING

Due to the steps in cheese making and curd separation, cottage cheese has a fraction of the lactose in milk. Lactose-free options are also available.

3.2g

Greek Yogurt
3/4 CUP SERVING

There is less lactose in Greek yogurt because the straining process removes some of the lactose.

4.2g

Kefir
1 CUP (8 OZ) SERVING

The live cultures in fermented milk products help digest some of the lactose.

8.5g

Dairy Milk
1 CUP (8 OZ) SERVING

Try small amounts of dairy milk in smoothies, on cereal or with meals. Having milk with solid foods helps slow digestion, which can mean it's better tolerated.

12.6g

1. USDA, ARS. FoodData Central, 2019.
2. Bailey et al. J Natl Med Assoc. 2013;105(2):112-27.
3. Facioni et al. J Transl Med. 2020;18:260.
4. Di Constanzo M, Canani R. Ann Nutr Metab. 2018;73(Suppl4):30-37.
5. FSANZ. Food Details: Ricotta Cheese.

Lactose content based on the Reference Amount Customarily Consumed (RACC) and data from FoodData Central (accessed October 2022). Ricotta lactose content based on Facioni MS et al. 2020, Di Costanzo M et al. 2020 and Food Standards Australia New Zealand.

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Tried-and-true tips can help with lactose digestion

Try It

Opt for lactose-free dairy milk products

Stir It

Mix milk with other foods to help slow lactose digestion

Slice It

Choose natural cheeses (e.g., Cheddar, Swiss)

Shred It

Top dishes with natural cheese

Spoon It

Yogurt's live and active cultures help digest lactose

Sip It

Start small and introduce dairy slowly

Bailey et al. J Natl Med Assoc. 2013;105(2):112-27.

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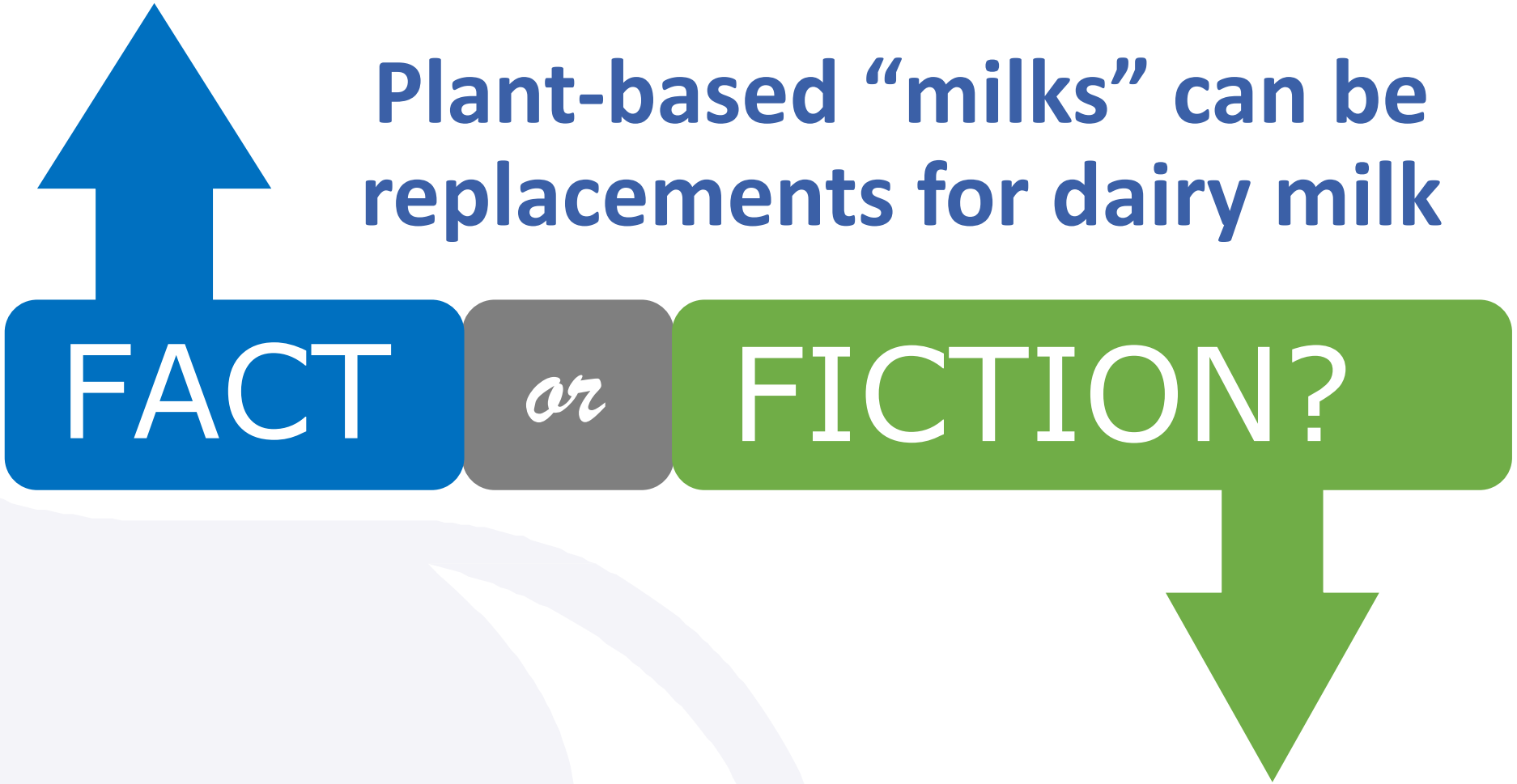
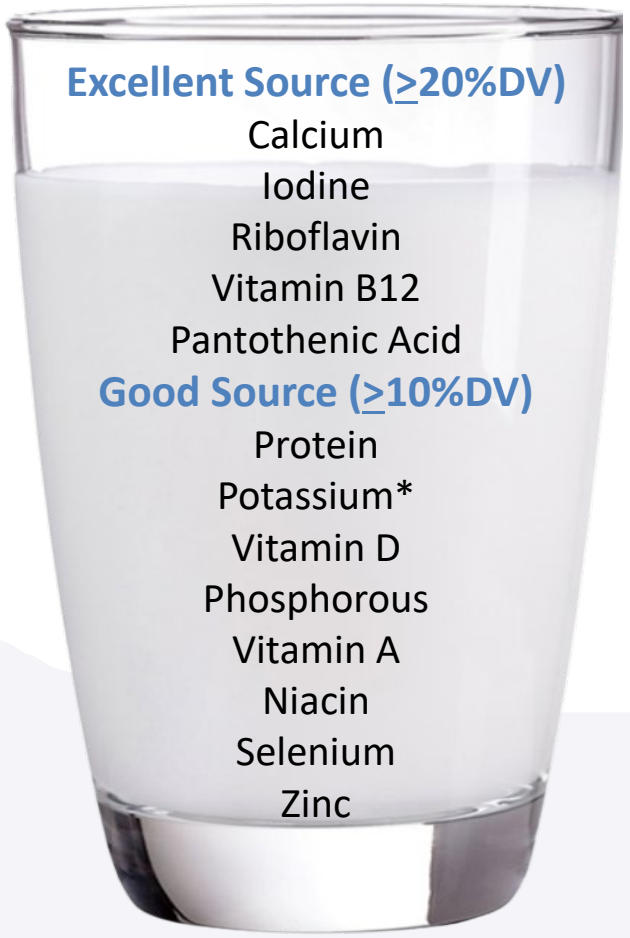
Plant-based “milks” can be replacements for dairy milk



Dairy milk packs in a lot of nutrition at an affordable price



One 8-ounce glass of milk

13
essential nutrients[1]

3 of 4
nutrients of public health concern[2]

✓ Calcium ✓ Potassium
✓ Vitamin D × Fiber

~20¢[3]

1. USDA, ARS. FoodData Central, 2019.
2. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
3. Based on U.S. average price of unflavored, conventional milk, private label, 1 gal. [Source: IRI Multi Outlet + Conv 2022, YTD ending 7-10-22]

*FDA's Daily Value (DV) for potassium of 4700 mg is based on a 2005 DRI recommendation. In 2019, NASEM updated the DRI to 3400 mg. Based on the 2019 DRI, a serving of milk provides 10% of the DRI. FDA rule-making is needed to update this value for the purpose of food labeling

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Dollar for dollar, dairy foods are one of the most economical sources of nutrition[1,2]

Least Expensive Sources of Nutrients of Public Health Concern[1]

Nutrient	Children 2-18	Adults 19-99
Calcium	**1. Dairy milk (tie)** **2. Cheese (tie)** 3. OJ	**1. Dairy milk** **2. Cheese** 3. OJ
Vitamin D	**1. Dairy milk** 2. Eggs 3. Fortified cereal	**1. Dairy milk** 2. Eggs 3. Soy beverage
Potassium	1. Potatoes 2. Juice **3. Dairy Milk**	1. Potatoes 2. Juice **3. Dairy Milk**
Fiber	1. Quinoa 2. Chickpea 3. Pearled Barley	1. Quinoa 2. Chickpea 3. Pearled Barley

A solution for many families[3]

13.5 million

U.S. households are food insecure

12.5%

U.S. households with children are food insecure

1. Hess, J.M., Cifelli, C.J., Agarwal, S. et al. Nutr J. 2019;18(68).
2. Drewnowski A. J Am Coll Nutr. 2011;30(sup5):422S-428S.
3. USDA ERS. Food Security of U.S. Households in 2021. 2022

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Dairy foods help fill important nutritional gaps

Milk is the leading source of 3 nutrients of public health concern (Ca, Vit D, Potassium) for children 2-18[1]

Notable Contributions[1,2]

For Americans (2+), milk, cheese and yogurt contribute:

52%	Calcium and Vitamin D
1/3	Vitamins A & B12, and Phosphorus
~15%	Protein, Zinc, and Potassium

1. National Dairy Council. NHANES 2015-2018. Hyattsville, MD; 2020.
2. Hess JM et al. *Nutrients*. 2020;12(10):E3006.

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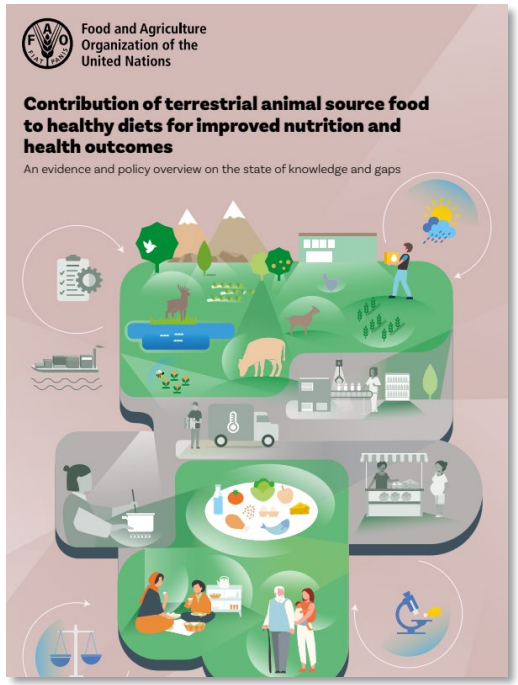
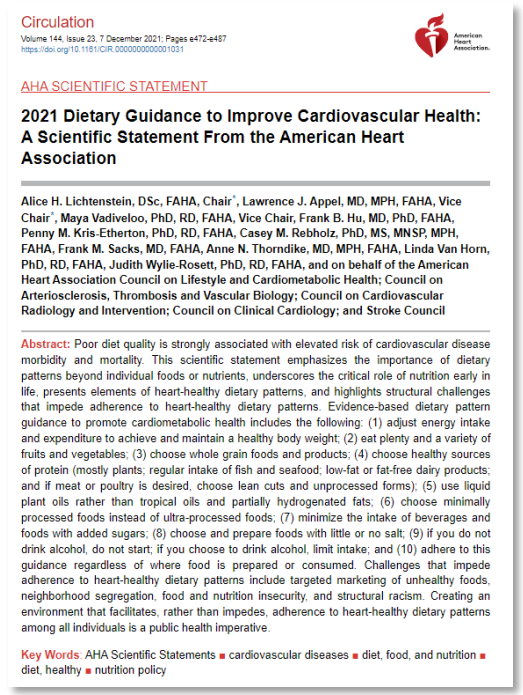
… which is why authoritative health bodies and guidelines underscore dairy's nutritional benefits





Circulation

Volume 144, Issue 23, 7 December 2021: Pages e472-e487

https://doi.org/10.1161/CIR.0000000000001031

AHA SCIENTIFIC STATEMENT

2021 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement From the American Heart Association

Alice H. Lichtenstein, DSc, FAHA, Chair*, Lawrence J. Appel, MD, MPH, FAHA, Vice Chair*, Maya Vadiveloo, PhD, RD, FAHA, Vice Chair, Frank B. Hu, MD, PhD, FAHA, Penny M. Kris-Etherton, PhD, RD, FAHA, Casey M. Rebholz, PhD, MS, MNSP, MPH, FAHA, Frank M. Sacks, MD, FAHA, Anne N. Thorndike, MD, MPH, FAHA, Linda Van Horn, PhD, RD, FAHA, Judith Wylie-Rosett, PhD, RD, FAHA, and on behalf of the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular Radiology and Intervention; Council on Clinical Cardiology; and Stroke Council

Abstract: Poor diet quality is strongly associated with elevated risk of cardiovascular disease morbidity and mortality. This scientific statement emphasizes the importance of dietary patterns beyond individual foods or nutrients, underscores the critical role of nutrition early in life, presents elements of heart-healthy dietary patterns, and highlights structural challenges that impede adherence to heart-healthy dietary patterns. Evidence-based dietary pattern guidance to promote cardiometabolic health includes the following: (1) adjust energy intake and expenditure to achieve and maintain a healthy body weight; (2) eat plenty and a variety of fruits and vegetables; (3) choose whole grain foods and products; (4) choose healthy sources of protein (mostly plants; regular intake of fish and seafood; low-fat or fat-free dairy products; and if meat or poultry is desired, choose lean cuts and unprocessed forms); (5) use liquid plant oils rather than tropical oils and partially hydrogenated fats; (6) choose minimally processed foods instead of ultra-processed foods; (7) minimize the intake of beverages and foods with added sugars; (8) choose and prepare foods with little or no salt; (9) if you do not drink alcohol, do not start; if you choose to drink alcohol, limit intake; and (10) adhere to this guidance regardless of where food is prepared or consumed. Challenges that impede adherence to heart-healthy dietary patterns include targeted marketing of unhealthy foods, neighborhood segregation, food and nutrition insecurity, and structural racism. Creating an environment that facilitates, rather than impedes, adherence to heart-healthy dietary patterns among all individuals is a public health imperative.

Key Words: AHA Scientific Statements ■ cardiovascular diseases ■ diet, food, and nutrition ■ diet, healthy ■ nutrition policy

USDA

American Academy of Pediatrics

eat right. Academy of Nutrition and Dietetics

American Heart Association

AAPD

Food and Agriculture Organization of the United Nations

American Diabetes Association.

1. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
2. Healthy Eating Research. Healthy Beverage Consumption in Early Childhood. 2019.
3. Academy of Nutrition and Dietetics
4. American Academy of Pediatrics
5. American Heart Association
6. FAO. 2013.
7. FAO. 2023.
8. American Diabetes Association
9. American Academy of Pediatric Dentistry

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Dairy alternatives are different

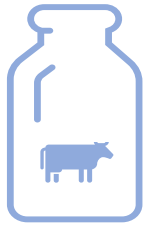
Plant-based beverages can fit in a healthy dietary pattern, but nutrition-wise they're not the same as dairy milk

Nutrition Facts

Serving size	8 fl oz
Amount Per Serving	
Calories	**110**
	% Daily Value*
Total Fat 2.5g	3%
Saturated Fat 1.4g	7%
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Monounsaturated Fat 0.5g	
Cholesterol 0mg	0%
Sodium 95mg	4%
Total Carbohydrate 13g	5%
Dietary Fiber < 1g	2%
Total Sugars 12g	
Includes 0g Added Sugars	0%
Protein 8g	16%
Vitamin D 2.6mcg	15%
Calcium 312mg	25%
Iron 0mg	0%
Potassium 376mg	8%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Milk, Lowfat, Fortified
FDC ID: 746772



Plain Dairy Milk

- Minimal ingredients
  - *Milk*
  - *Vitamins D, A*
- 13 essential nutrients
- Good source of high-quality protein
- Higher in energy/fat
- Bioactive compounds
  - Food matrix
  - Bioavailability

Plant-based Beverage*

- More extensive ingredient list
  - *Water + base (almond, etc.)*
  - *Micronutrients*
  - *Gums, salts, sugars, lecithin, protein, natural flavors, oils*
- Nutrition depends on fortification
- Low in natural protein**
- Lower in energy/fat

Nutrition Facts

Serving size	8 fl oz
Amount Per Serving	
Calories	**40**
	% Daily Value*
Total Fat 2.5g	3%
Saturated Fat 0.2g	1%
Trans Fat 0g	
Polyunsaturated Fat 0.6g	
Monounsaturated Fat 1.6g	
Cholesterol 0mg	0%
Sodium 190mg	8%
Total Carbohydrate 3g	1%
Dietary Fiber < 1g	2%
Total Sugars 2g	
Includes 0g Added Sugars	0%
Protein 1g	2%
Vitamin D 2.6mcg	15%
Calcium 481mg	35%
Iron 0.72mg	4%
Potassium 188mg	4%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Almond Beverage (Unsweetened, Shelf-Stable)
FDC ID: 174832

1. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
2. Healthy Eating Research. Healthy Beverage Consumption in Early Childhood. 2019.
3. USDA, ARS. FoodData Central, 2019.
4. Nutrition Label Generator

*Plant-based beverage nutrition and ingredients vary.
** Soy beverage is good source of protein.

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Which is why plant-based alternatives are generally not recommended for growing children

Healthy Eating Research Healthy Beverage Consumption in Early Childhood

✓ Water ✓ Plain milk

PBAs "not recommended for exclusive consumption in place of dairy milk (exception of soy)."

- Varying nutritional profiles
- Added sugars
- Unknown bioavailability

"Plain cow's milk is a common, familiar beverage in U.S. diets, and its **availability, affordability, and nutrient density** make it a good choice for healthy, growing children."

2020-2025 Dietary Guidelines for Americans

Only fortified soy products are considered dairy equivalents

Almond, rice, oat 'milks' "may contain calcium … but they are not included as part of the dairy group because their overall nutritional content is not similar to dairy milk and fortified soy."

1. Healthy Eating Research. Healthy Beverage Consumption in Early Childhood. 2019.
2. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.

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Swapping dairy milk with PB alternatives can have unintended nutritional consequences, especially for children

	Population Group				
	All (2 Years+)	Young Children (2–3 Years)	Young Men (19–30 Years)	Young Women (19–30 Years)	Older Adults (71+ Years)
Energy	−0.8	−3.3	−0.8	−0.7	−0.7
Protein	−2.6	−7.4	−1.9	−2.3	−3.2
Total fat	−0.1	−3.3	−0.2	0.0	0.7
Saturated fat	−6.5	−20.7	−6.3	−5.5	−6.4
Monounsaturated fat	1.3	1.5	0.9	1.2	2.3
n-3 long-chain fatty acids	−0.8	−5.0	−0.8	−0.9	−0.6
Vitamin A (ret. equiv)	−1.7	−7.2	−3.2	−1.1	−0.2
Riboflavin	−5.1	−8.7	−5.7	−3.6	−4.7
Niacin (der. equiv)	−2.0	−5.6	−1.4	−1.8	−2.5
Vitamin B6	0.1	11.4	−1.4	−0.3	3.4
Vitamin B12	−11.7	−24.3	−10.8	−10.0	−11.6
Calcium	−5.4	−7.4	−4.9	−4.2	−6.5
Iodine	−17.4	−38.9	−15.7	−15.6	−19.1
Iron	3.4	9.2	3.2	2.9	3.6
Magnesium	2.1	7.0	2.3	1.9	2.0
Phosphorus	−5.2	−13.2	−4.4	−4.8	−6.3
Potassium	−2.4	−5.9	−2.2	−2.4	−3.1
Selenium	−0.7	−3.2	−0.5	−0.7	−0.8
Sodium	0.9	3.1	0.8	0.7	1.1
Zinc	−3.1	−8.5	−2.4	−2.9	−3.7

Estimated % Change in Mean Daily Intake of Key Nutrients if Dairy Milk is Replaced with Plant-Based 'milk'

Undesirable Changes
5-10%
10-20%
>20%

Implications

- ✓ Early childhood nutrition & growth
- ✓ Pregnancy/lactation and neurodevelopment (B12, iodine)
- ✓ Older adults (B12 deficiency)

Lawrence et al. Nutrients. 2023;15(8):1825.

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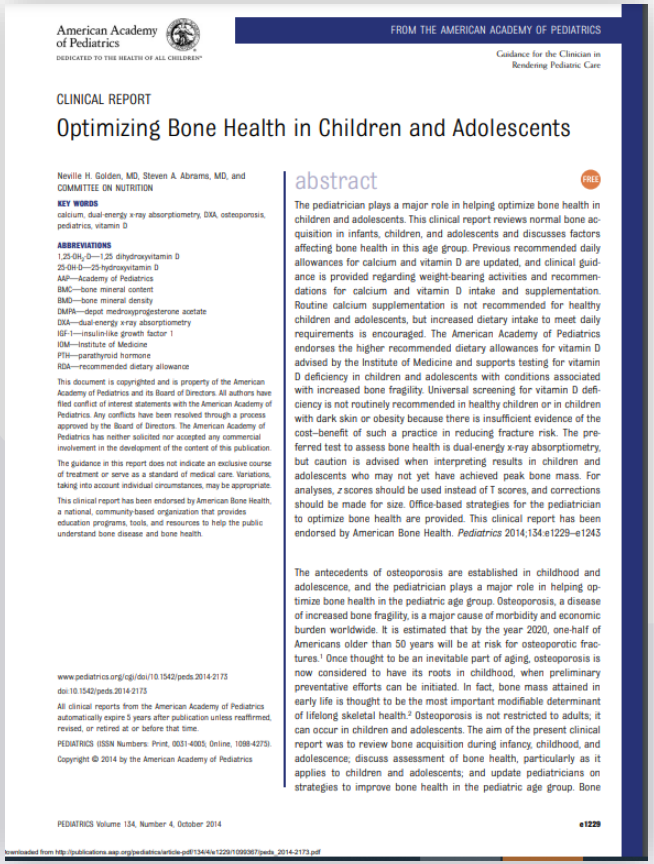
Milk is just for kids and bones

The AAP, NIH and Dietary Guidelines recommend eating dairy foods daily to achieve peak bone mass



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DEDICATED TO THE HEALTH OF ALL CHILDREN™

FROM THE AMERICAN ACADEMY OF PEDIATRICS

Guidance for the Clinician in Rendering Pediatric Care

CLINICAL REPORT

Optimizing Bone Health in Children and Adolescents

Neville H. Golden, MD, Steven A. Abrams, MD, and COMMITTEE ON NUTRITION

KEY WORDS
calcium, dual-energy x-ray absorptiometry, DXA, osteoporosis, pediatrics, vitamin D

ABBREVIATIONS
1,25-$(OH)_2$-D—1,25 dihydroxyvitamin D
25-OH-D—25-hydroxyvitamin D
AAP—Academy of Pediatrics
BMC—bone mineral content
BMD—bone mineral density
DMPA—depot medroxyprogesterone acetate
DXA—dual-energy x-ray absorptiometry
IGF-1—insulin-like growth factor 1
IOM—Institute of Medicine
PTH—parathyroid hormone
RDA—recommended dietary allowance

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The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

This clinical report has been endorsed by American Bone Health, a national, community-based organization that provides education programs, tools, and resources to help the public understand bone disease and bone health.

abstract

FREE

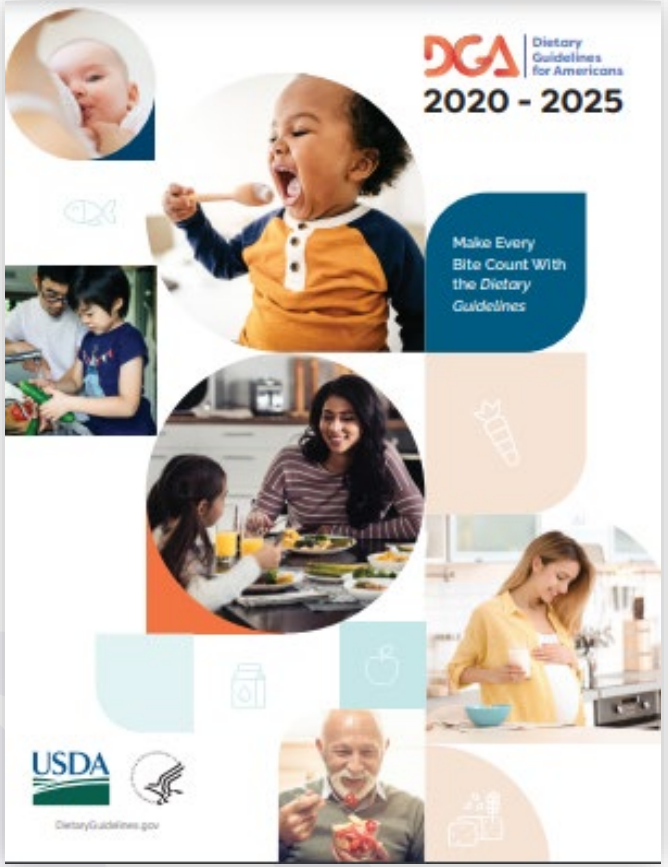
The pediatrician plays a major role in helping optimize bone health in children and adolescents. This clinical report reviews normal bone acquisition in infants, children, and adolescents and discusses factors affecting bone health in this age group. Previous recommended daily allowances for calcium and vitamin D are updated, and clinical guidance is provided regarding weight-bearing activities and recommendations for calcium and vitamin D intake and supplementation. Routine calcium supplementation is not recommended for healthy children and adolescents, but increased dietary intake to meet daily requirements is encouraged. The American Academy of Pediatrics endorses the higher recommended dietary allowances for vitamin D advised by the Institute of Medicine and supports testing for vitamin D deficiency in children and adolescents with conditions associated with increased bone fragility. Universal screening for vitamin D deficiency is not routinely recommended in healthy children or in children with dark skin or obesity because there is insufficient evidence of the cost–benefit of such a practice in reducing fracture risk. The preferred test to assess bone health is dual-energy x-ray absorptiometry, but caution is advised when interpreting results in children and adolescents who may not yet have achieved peak bone mass. For analyses, *z* scores should be used instead of T scores, and corrections should be made for size. Office-based strategies for the pediatrician to optimize bone health are provided. This clinical report has been endorsed by American Bone Health. *Pediatrics* 2014;134:e1229–e1243

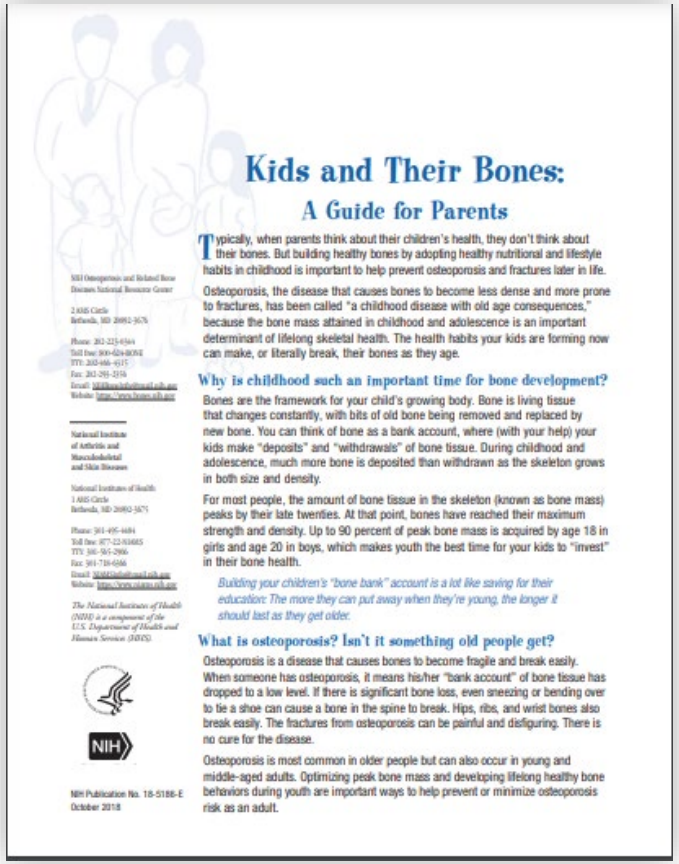
The antecedents of osteoporosis are established in childhood and adolescence, and the pediatrician plays a major role in helping optimize bone health in the pediatric age group. Osteoporosis, a disease of increased bone fragility, is a major cause of morbidity and economic burden worldwide. It is estimated that by the year 2020, one-half of Americans older than 50 years will be at risk for osteoporotic fractures.[1] Once thought to be an inevitable part of aging, osteoporosis is now considered to have its roots in childhood, when preliminary preventative efforts can be initiated. In fact, bone mass attained in early life is thought to be the most important modifiable determinant of lifelong skeletal health.[2] Osteoporosis is not restricted to adults; it can occur in children and adolescents. The aim of the present clinical report was to review bone acquisition during infancy, childhood, and adolescence; discuss assessment of bone health, particularly as it applies to children and adolescents; and update pediatricians on strategies to improve bone health in the pediatric age group. Bone

www.pediatrics.org/cgi/doi/10.1542/peds.2014-2173
doi:10.1542/peds.2014-2173

All clinical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).





Kids and Their Bones:

A Guide for Parents

Typically, when parents think about their children's health, they don't think about their bones. But building healthy bones by adopting healthy nutritional and lifestyle habits in childhood is important to help prevent osteoporosis and fractures later in life.

Osteoporosis, the disease that causes bones to become less dense and more prone to fractures, has been called "a childhood disease with old age consequences," because the bone mass attained in childhood and adolescence is an important determinant of lifelong skeletal health. The health habits your kids are forming now can make, or literally break, their bones as they age.

Why is childhood such an important time for bone development?

Bones are the framework for your child's growing body. Bone is living tissue that changes constantly, with bits of old bone being removed and replaced by new bone. You can think of bone as a bank account, where (with your help) your kids make "deposits" and "withdrawals" of bone tissue. During childhood and adolescence, much more bone is deposited than withdrawn as the skeleton grows in both size and density.

For most people, the amount of bone tissue in the skeleton (known as bone mass) peaks by their late twenties. At that point, bones have reached their maximum strength and density. Up to 90 percent of peak bone mass is acquired by age 18 in girls and age 20 in boys, which makes youth the best time for your kids to "invest" in their bone health.

Building your children's "bone bank" account is a lot like saving for their education: The more they can put away when they're young, the longer it should last as they get older.

What is osteoporosis? Isn't it something old people get?

Osteoporosis is a disease that causes bones to become fragile and break easily. When someone has osteoporosis, it means his/her "bank account" of bone tissue has dropped to a low level. If there is significant bone loss, even sneezing or bending over to tie a shoe can cause a bone in the spine to break. Hips, ribs, and wrist bones also break easily. The fractures from osteoporosis can be painful and disfiguring. There is no cure for the disease.

Osteoporosis is most common in older people but can also occur in young and middle-aged adults. Optimizing peak bone mass and developing lifelong healthy bone behaviors during youth are important ways to help prevent or minimize osteoporosis risk as an adult.

NIH

NIH Publication No. 18-5188-E
October 2018

1. Golden N, Abrams S, Committee on Nutrition. Pediatrics. 2014;134(4):e1229-43.
2. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
3. NIH. Kids and their Bones: A Guide for Parents. 2005.

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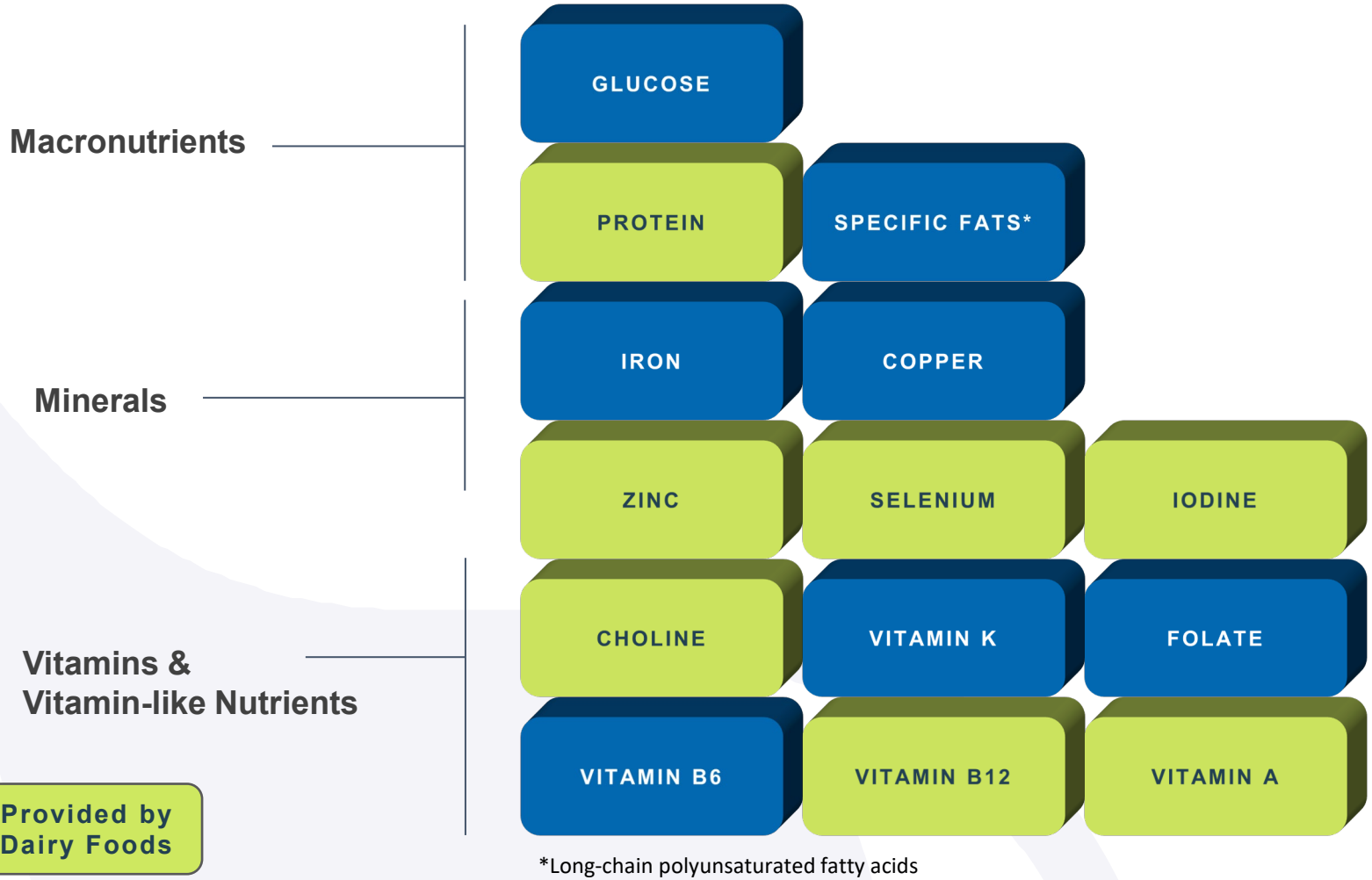
Beyond bones, dairy foods support early brain development



*Long-chain polyunsaturated fatty acids

Dairy foods offer 7 of the 14 nutrients AAP notes as important for early cognitive development.

1. Schwarzenberg SJ, Georgieff MK, AAP COMMITTEE ON NUTRITION. *Pediatrics.* 2018;141(2):e20173716
2. Georgieff MK, Brunette KE, Tran PV. *Dev Psychopathol*. 2015;27(2):411-423.
3. USDA, ARS. FoodData Central, 2019.

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Beyond childhood, dairy is linked to functional benefits throughout the lifespan

Muscular Health & Body Composition[1-3]

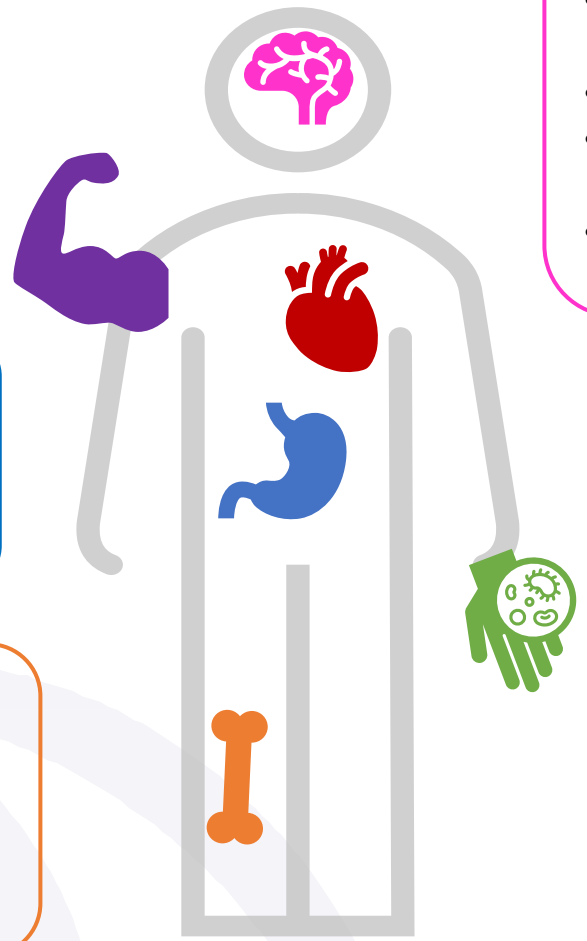
- High-quality protein and BCAAs
- May help mitigate sarcopenia
- Can support improved body composition and weight management

Digestive Health[4,5]

- Probiotic cultures from fermented dairy food
- Can support a healthy microbiome

Bone Health[6,7]

- Calcium, vitamin D, zinc, phosphorus, potassium, magnesium
- Can help children achieve peak bone mass
- Linked to reduced fracture risk



Brain Health and Sleep[8-12]

- Milk linked to improved brain antioxidant (glutathione) levels
- Associated with cognitive function in adults
- Milk has 7 of 14 nutrients important for baby brain development
- Dairy's tryptophan, magnesium and zinc can contribute to improved sleep quality

Cardiometabolic Health[13-16]

- Linked to reduced risk of hypertension and type 2 diabetes
- Neutral to lower risk of CVD

Immune Health[5,17]

- Vitamins A, D, B12, protein, zinc and selenium have immune-supporting roles
- Probiotics can benefit microbiome and improve mucosal immunity

1. Cuesta-Triana et al. Adv in Nutr. 2019;10(S2)S105-S119.
2. Hanach et al. Adv in Nutr. 2019;10(1):59-69.
3. Geng T, Qi L, Huagng T. Mol Nutr Food Res. 2018;62(1).
4. Savaiano D, Hutkins R. Nutrition Reviews. 2020;79(5):599-614
5. Burgos et al. Journal of Functional Foods. 2020;72(3).
6. Wallace et al. Crit Rev Food Sci Nutr. 2021;61(21):3661-3707.
7. NDC. Science Summary: Bone Health. 2021.
8. Choi et al. Front Nutr. 2022;15(9).
9. Park K, Fulgoni V. Br J Nutr. 2013;109(6):1135-42.
10. NDC. Dairy Foods for Infant Brain Development. 2022.
11. St-Onge M, Zuraikat F, Neilson M. Adv in Nutr. 2023;14(2):283-294.
12. Komada et al. Int J Env Res Pub Health. 2020;17(24):9440.
13. Drouin-Chartier et al. Adv Nutr. 2016;7(6):1026-1040.
14. Bhavadharini et al. BMJ Open Diabetes Res Care. 2020 Apr;8(1):e000826
15. Dehghan et al. The Lancet. 2018;392(10161):P2288-2297.
16. NDC. Science Summary. Cardiovascular Disease (2021) and Blood Pressure (2018).
17. Illikoud et al. Immunology Letters. 2022;251-252:91-102.

Dairy foods are not inflammatory, and may have beneficial anti-inflammatory effects


Meta-Analysis › PLoS One. 2013 Oct 11;8(10):e76480. doi: 10.1371/journal.pone.0076480. eCollection 2013.

Effects of high and low fat dairy food on cardio–metabolic risk factors: a meta–analysis of randomized studies

Jocelyne R Benatar [1], Karishma Sidhu, Ralph A H Stewart

Meta-analysis[1]

- 6 RCTs
- 4 found **no difference**
- 2 found **lower CRP levels**

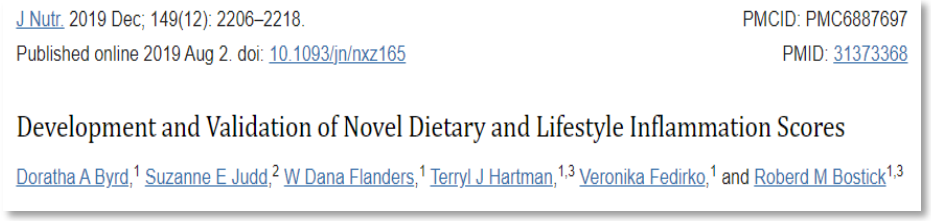

› Adv Nutr. 2019 May 1;10(suppl_2):S239-S250. doi: 10.1093/advances/nmy072.

Milk and Dairy Product Consumption and Inflammatory Biomarkers: An Updated Systematic Review of Randomized Clinical Trials

Stine M Ulven [1], Kirsten B Holven [1 2], Angel Gil [3 4 5 6], Oscar D Rangel-Huerta [1]

Systematic Review[3]

- 16 RCTs
- **Not inflammatory**
- Weak **anti-inflammatory effect**


J Nutr. 2019 Dec; 149(12): 2206–2218. PMCID: PMC6887697

Published online 2019 Aug 2. doi: 10.1093/jn/nxz165 PMID: 31373368

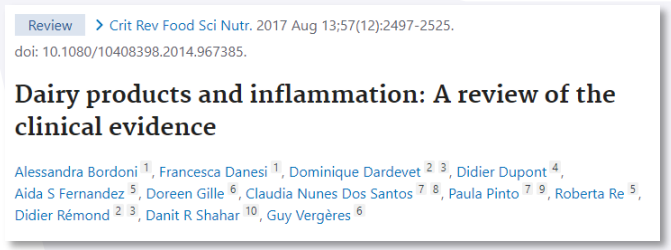
Development and Validation of Novel Dietary and Lifestyle Inflammation Scores

Doratha A Byrd,[1] Suzanne E Judd,[2] W Dana Flanders,[1] Terryl J Hartman,[1,3] Veronika Fedirko,[1] and Roberd M Bostick[1,3]

Inflammation Scoring Study[4]

- Validated scoring system
- Both high-fat and low-fat dairy foods received **anti-inflammatory scores**

2013 — 2017 — 2019 — 2021


Review › Crit Rev Food Sci Nutr. 2017 Aug 13;57(12):2497-2525. doi: 10.1080/10408398.2014.967385.

Dairy products and inflammation: A review of the clinical evidence

Alessandra Bordoni [1], Francesca Danesi [1], Dominique Dardevet [2 3], Didier Dupont [4], Aida S Fernandez [5], Doreen Gille [6], Claudia Nunes Dos Santos [7 8], Paula Pinto [7 9], Roberta Re [5], Didier Rémond [2 3], Danit R Shahar [10], Guy Vergères [6]

Systematic Review[2]

- 52 trials
- **Anti-inflammatory scores, particularly fermented dairy**
- Pro-inflammatory only for people with dairy allergy


› J Am Coll Nutr. 2021 Aug;40(6):571-582. doi: 10.1080/07315724.2020.1800532. Epub 2020 Sep 1.

The Effects of Dairy Product and Dairy Protein Intake on Inflammation: A Systematic Review of the Literature

Kristin M Nieman [1], Barbara D Anderson [2], Christopher J Cifelli [3]

Systematic Review[5]

- 19 RCTs
- 8 found **anti-inflammatory effects**
- 10 found **neutral effects**

1. Benatar JR, Sidhu K, Stewart RAH. PLoS One. 2013;8(10):1-12.
2. Bordoni et al. Crit Rev Food Sci Nutr. 2017;57(12):2497-2525.
3. Ulven et al. Adv Nutr. 2019;10(suppl_2):S239-S250.
4. Byrd et al. J Nutr. 2019;149(12):2206-2218.
5. Nieman K, Anderson B, Cifelli C. J Am Coll Nutr. 2021;40(6):571-582.
6. National Dairy Council. Science Summary: Dairy and Inflammation. 2021.

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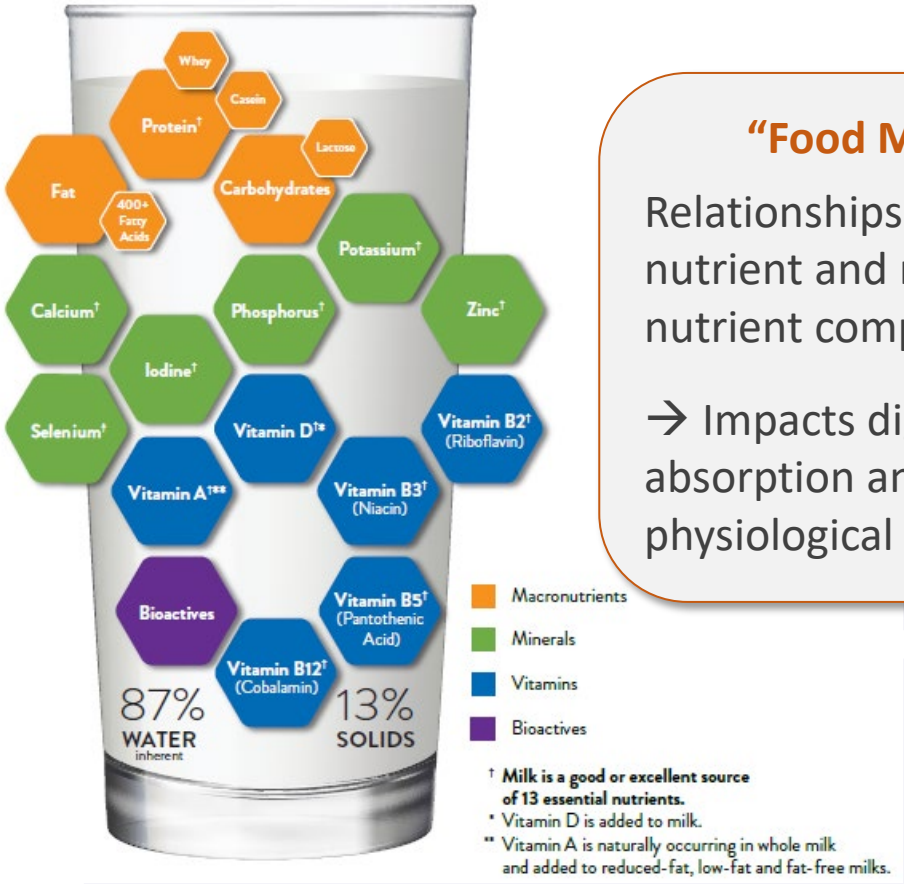
Full-fat dairy should be avoided or limited

Dairy's food matrix plays a role in how we look at saturated fat

We eat foods, not nutrients



"Food Matrix"

Relationships between nutrient and non-nutrient components

→ Impacts digestion, absorption and physiological functions

Bioactive Component	Potential Beneficial Mechanisms
Peptides[1]	Anti- oxidant, -inflammatory, -microbial, -thrombotic, -hypertensive Glucose control
Lipids (400+ FAs)[2-4] Milk Fat Globule Membrane	Circulating cholesterol and TGs Gut inflammation
Carbohydrates[2,3,5] Oligosaccharides Lactose	Prebiotic effects Mineral balance Calcium absorption

1. Nielson et al. 2017. Food Chem. 2017;232:673-682.
2. Weaver C. Nutr Reviews. 2021;79(S2):4-15.
3. Gordon MH. Milk Lipids. In: Young WP, Editor. *Milk and Dairy Products in Human Nutrition.* New York, NY: John Wiley & Sons Ltd. (2013).
4. Bruno et al. Nutrition Reviews. 2021;79(S2):16-35.
5. Ilesanmi-Oyelere B, Kruger M. Front Nutr. 2020;7:578702.

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… which may explain the paradox with CV risk

Emerging research shows neutral to beneficial outcomes of full-fat dairy, highlighting the nuance and complexity of the dairy matrix

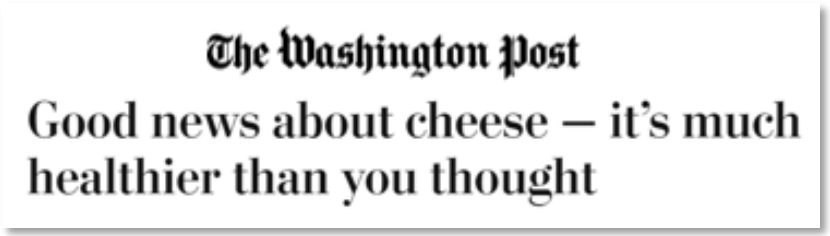
Full-fat dairy foods have shown protective effects on cardiometabolic risks/outcomes:

- CVD[1-5]
- Type 2 DM[2,3,5]
- Mortality[2,3,5]
- CVD Mortality[3]
- Stroke[3,5]
- Hypertension[5]
- Waist circumference and body comp.[4-7]

The New York Times

Whole Milk May Be Better When It Comes to Children's Weight

Kids who drank whole milk were at a 39 percent reduced risk for being overweight than those who drank low-fat milk.



The Washington Post

Good news about cheese — it's much healthier than you thought

1. Trieu et al. PLOS Medicine. 2021;18(9):e1003763.
2. Astrup et al. Journal of the American College of Cardiology. 2020;76(7):844-857.
3. Dehghan et al. The Lancet. 2018;392(10161):P2288-2297
4. Duarte et al. Crit Rev Food Sci Nutr. 2020;61(3):450-461
5. Hirahtake et al. Adv in Nutr. 2020;11(3):533-547.
6. Geng T, Huang T. Mol Nutr Food Res. 2018;6(21)
7. Vanderhout et al. Clinical Nutrition. 2019;111(2):266-279.

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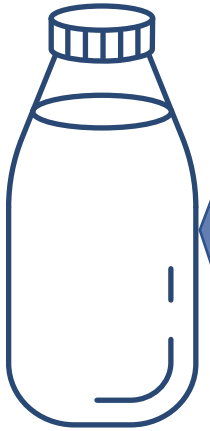
Organic dairy is better than conventional dairy

Both organic and conventional dairy foods offer the same nutrient package

Organic is a farming method and personal preference, not a health claim

USDA Organic

- Strict USDA Organic standards
  - Organic fertilizers/pesticides
  - Pasture access ≥120 days/year
  - Organic feed
  - No antibiotic/hormone use
  - UHT pasteurization (shelf-life purpose)
- 13 essential nutrients
- Committed farmers and cared for cows
- Sustainability depends on practices
- Regulated/inspected



Non-Organic

- 13 essential nutrients
- Committed farmers and cared for cows
- Sustainability depends on practices
- Regulated/inspected

1. ADANE. What is the difference between organic and conventional milk?
2. USDA Agricultural Marketing Service. National Organic Program.
3. 7 CFR 205. National Organic Program. 2000.

Many factors affect milk's composition

Farm location and climate can affect the cow's diet and milk

What affects milk's nutrition?[1]

- Diet
- Cow breed
- Genetic variability
- Season/weather
- Stage of lactation
- Interactions between these factors

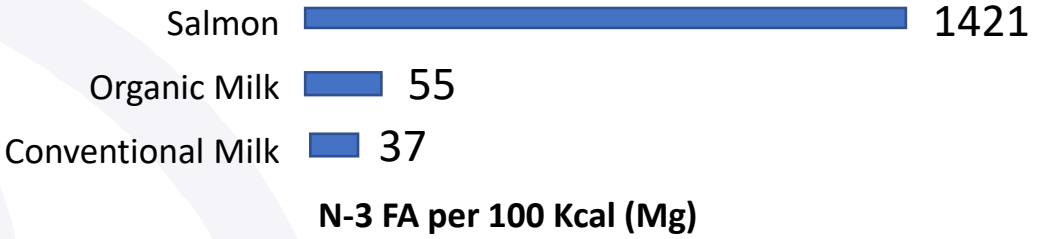
What is "grass-fed"?[2]

- Not federally regulated
- Independent certifications
- Self-feeding/grazing
- Not necessarily same as "pasture-raised"

Is Grass-fed or Organic more nutritious?[2-4]

- Higher CLA and omega-3 fatty acids
- Not biologically significant

Unless milk is fortified it's best to get omega-3's from other sources[3,4]

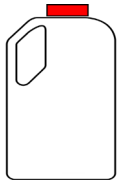


1. Schwendel et al. J Dairy Sci. 2015;98(2):721-746.
2. Davis et al. Sustainability. 2020;12(9):3688.
3. Benbrook et al. PLOS ONE. 2013;9(8):E82429.
4. USDA FoodData Central. Atlantic Salmon. FDC ID: 173686.

Milk contains harmful hormones and antibiotics

Hormones can be misunderstood

It can be helpful to understand rbST and animal biology



Recombinant Bovine Somatotropin (rbST)[1-3]

- Cows naturally produce BST
- rbST for cows developed in 1980s for sustainability purposes (↑milk, ↓ resources)
- Rigorously tested/scrutinized prior to approval in 1993, monitored today
- Consumer misconception → dwindled use
- Most milk today comes from rbST-free cows

Natural Hormones[3-5]

- All living things produce hormones
- Plant- and animal-foods both have hormones
- Inactivated during human digestion
- Evidence shows no adverse effects on humans

1. FDA. Bovine Somatotropin (Bst). 2023.
2. NDC. Quick Reference Guide: rbST. 2022
3. Cornell University. Consumer Concerns about Hormones in Food. 2000.
4. Palacios et al. Toxicology Research and Application. 2020;4.

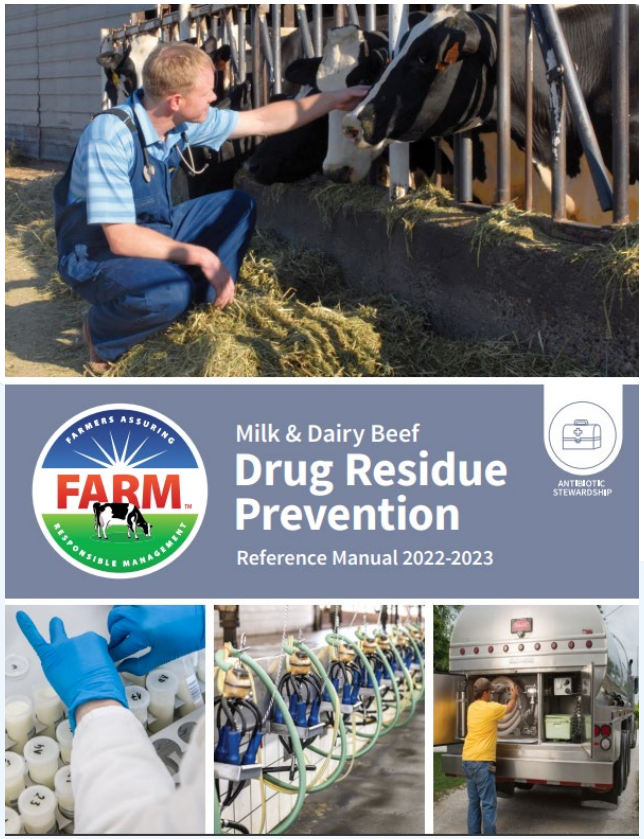
All dairy foods – *labeled or not* – are required by the FDA to be free of antibiotics

Antibiotics are not used lightly[1-3]

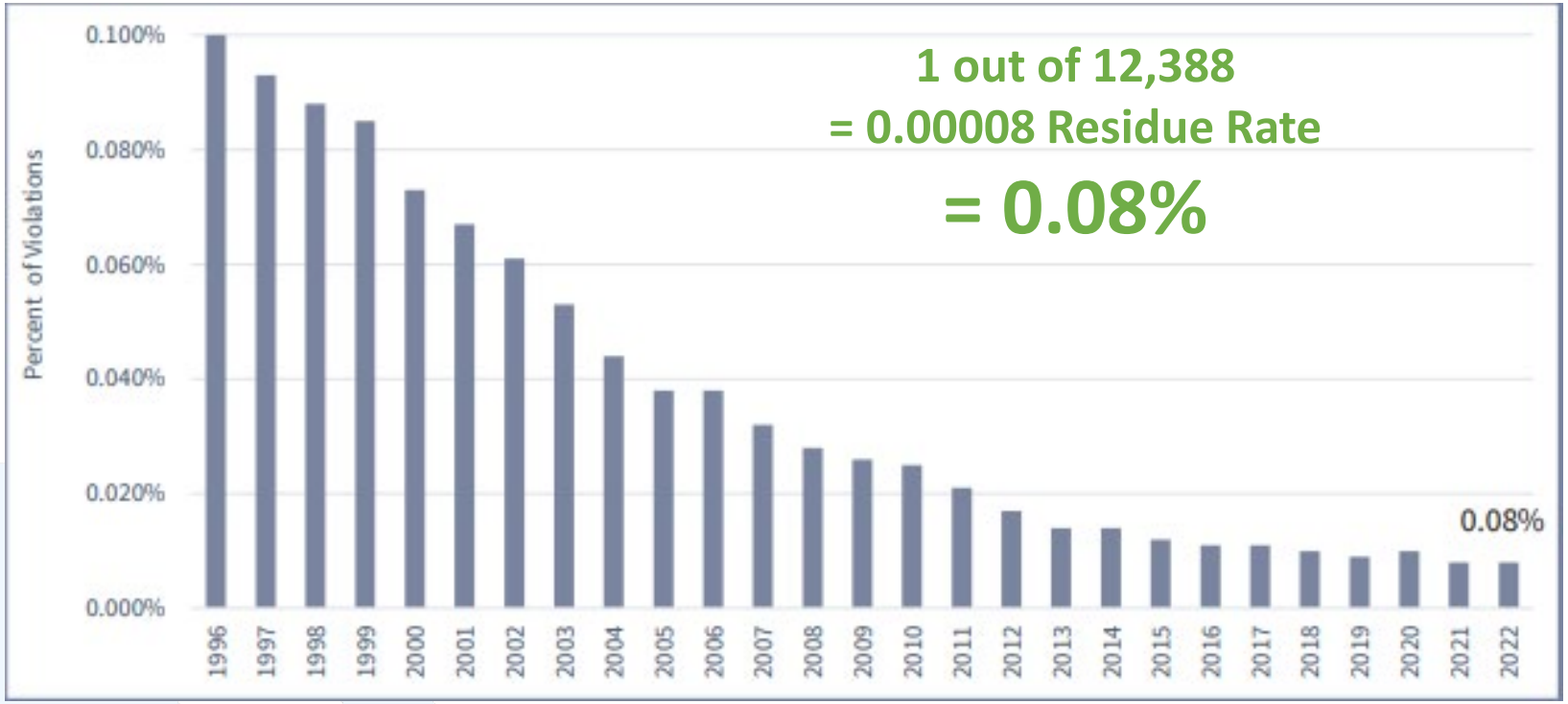
- Cow care is the top priority for farmers
- Highly regulated, overseen by veterinarian
- FDA prohibits antibiotics in milk
- Numerous checkpoints in place as milk moves from farm to dairy case
- Any milk that tests positive is rejected and does not enter the food supply
- Violations = $$$ (fine, loss of milk, permit, suspension)

1. Cornell College of Veterinary Medicine. NYSCHAP.
2. FDA. GFI 263. 2021.
3. FARM. FARM Antibiotic Stewardship.
4. National Dairy Farm Program. 2022 Year in Review.

Procedures are in place to ensure antibiotics never end up in our milk



2022 Milk Tanker Residue Violations



National Dairy Farm Program. 2022 Year in Review

It’s helpful to know the farm to table journey

Strict standard operating procedures ensure quality and safety every step of the process

1. NDC. Farm to Table: How Milk Goes from the Cow to your Home. 2015.
2. USDHHS, FDA. Pasteurized Milk Ordinance. 2019.
3. FDA. CDR Title 21. Part 131 – Milk and Cream. 2023.

From the farm → the milk truck

Cows Are Milked

Cows are milked in milking parlors, where no human hands touch the milk

The Milk Is Stored

Once collected, the milk is cooled and stored in a tank for quality and safety

The Milk Is Picked Up

A milk truck comes to pick up the milk

From the milk truck → the processing plant

The Milk Pickup Is Tested for Purity at the Farm

Positive Test
The entire milk pickup is discarded

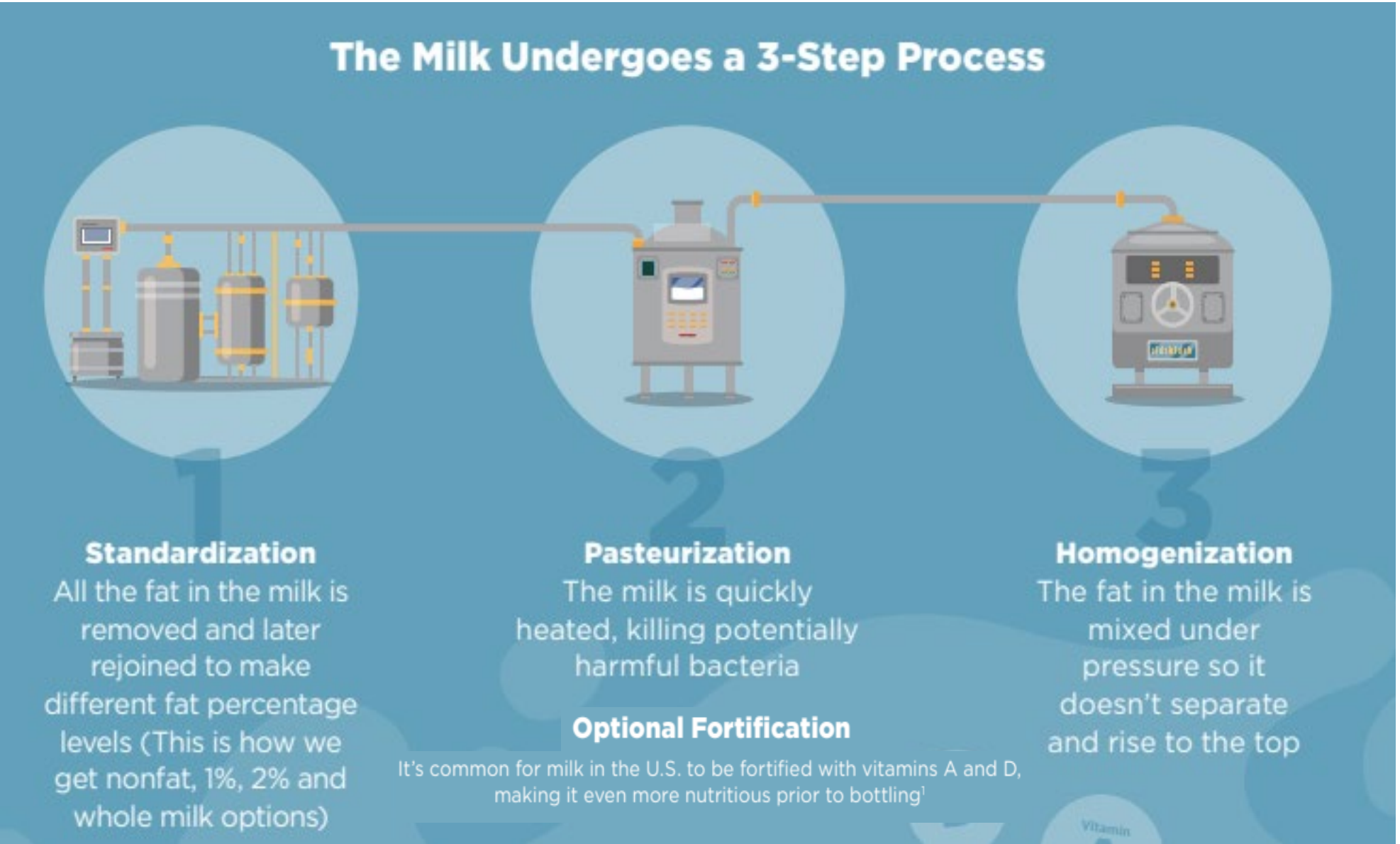
Negative Test
The milk is taken to the processing plant

The Milk Pickup Is Tested for Purity at the Plant

Positive Test
The entire milk pickup is discarded

Negative Test
The milk moves on to processing

From the processing plant → your local store



~ 48 hours

From the farm to the store

Our food system is broken

"The food supply needs to provide foods that are **healthy** and **safe, affordable, culturally acceptable**, and with **low impact on the environment.**"

Dr. Adam Drewnowski

Drewnowski A, Ecosystem Inception Team. Front. Nutr. 2018;4(74).

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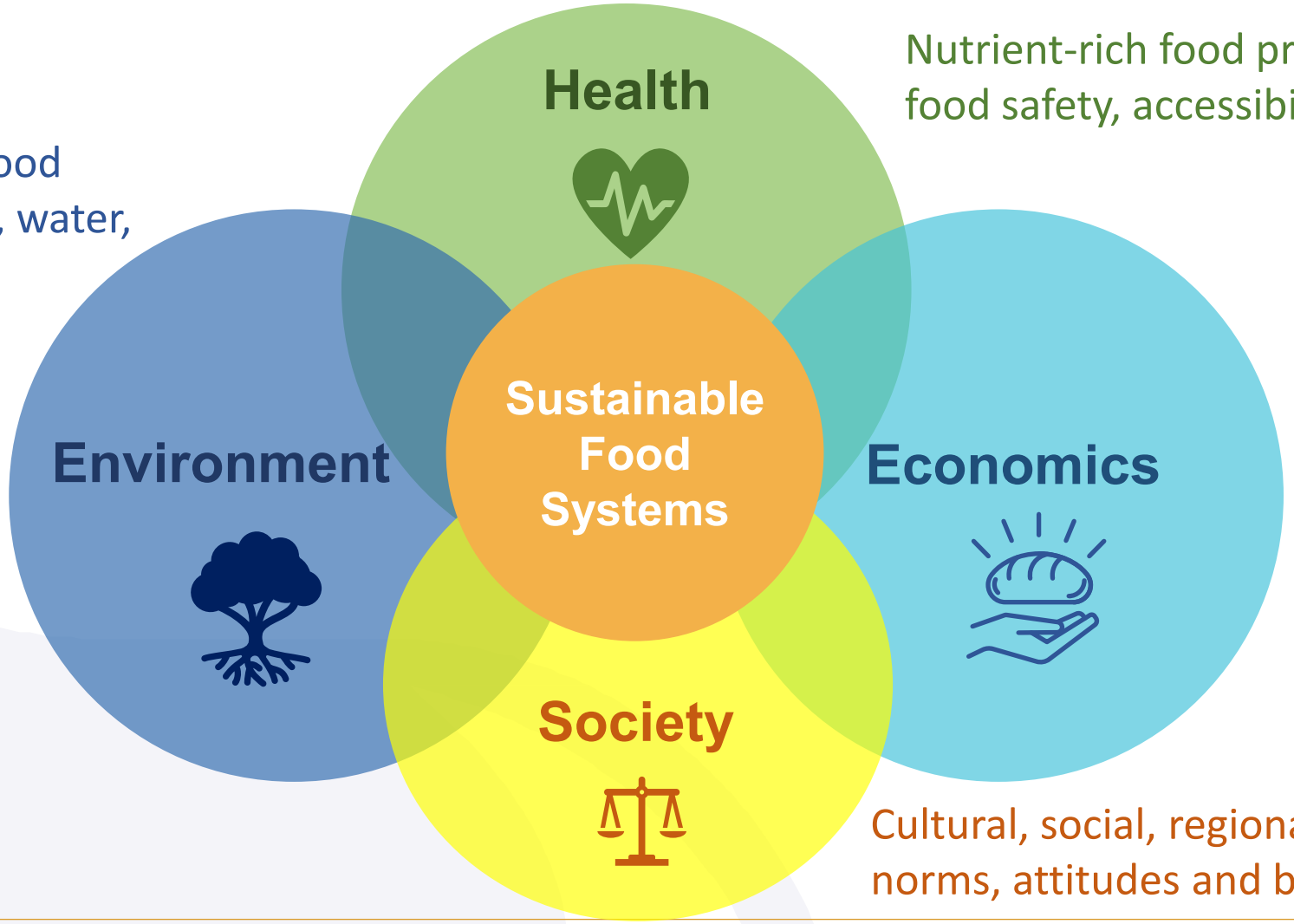
Food systems are complex and multifaceted



Nutrient-rich food production, food safety, accessibility, appeal

Impact of the food system on land, water, air, energy use

Food pricing, food equity, profitability, wages

Cultural, social, regional and religious factors; norms, attitudes and behaviors; social justice

Drewnowski A, Ecosystem Inception Team. Front. Nutr. 2018;4(74).

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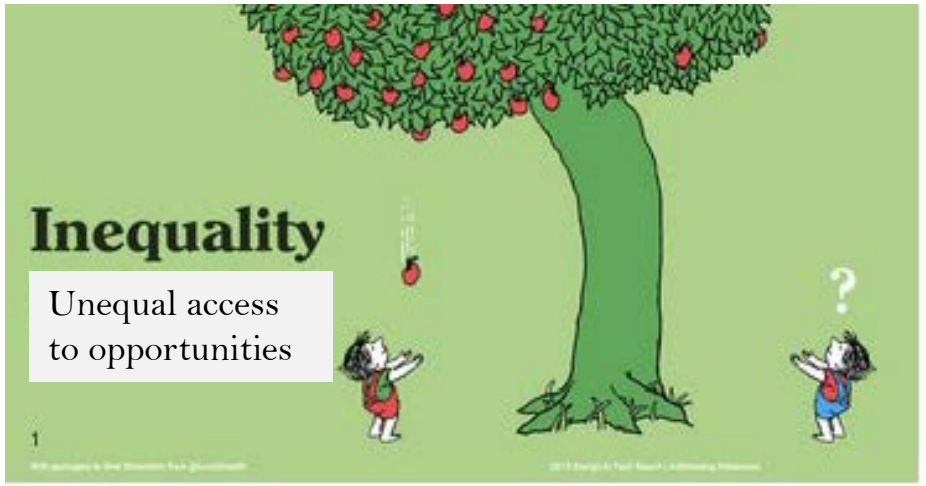
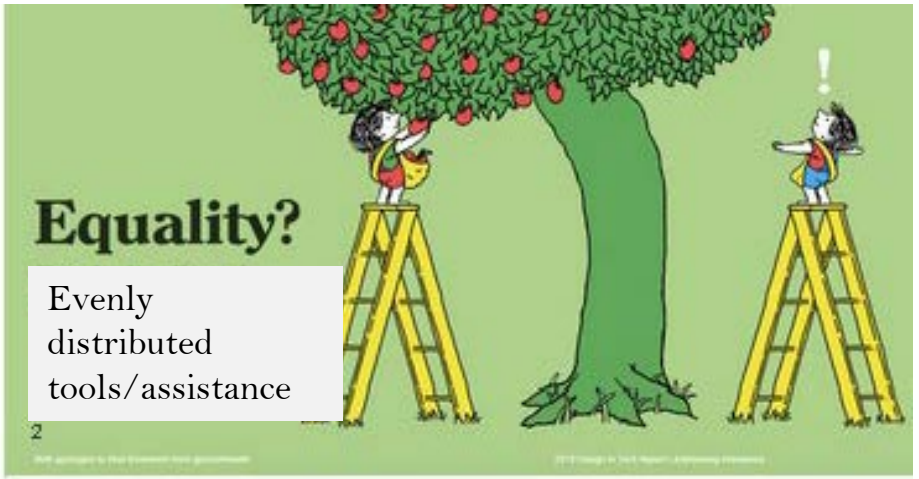
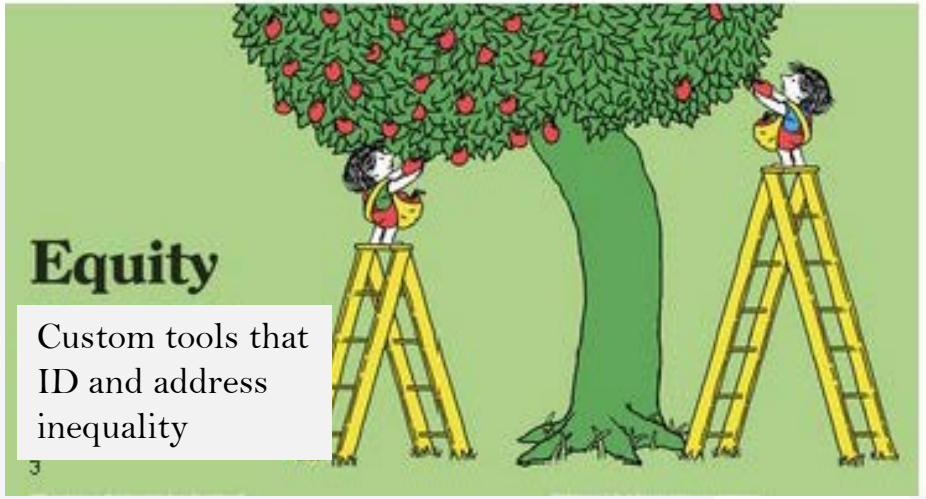
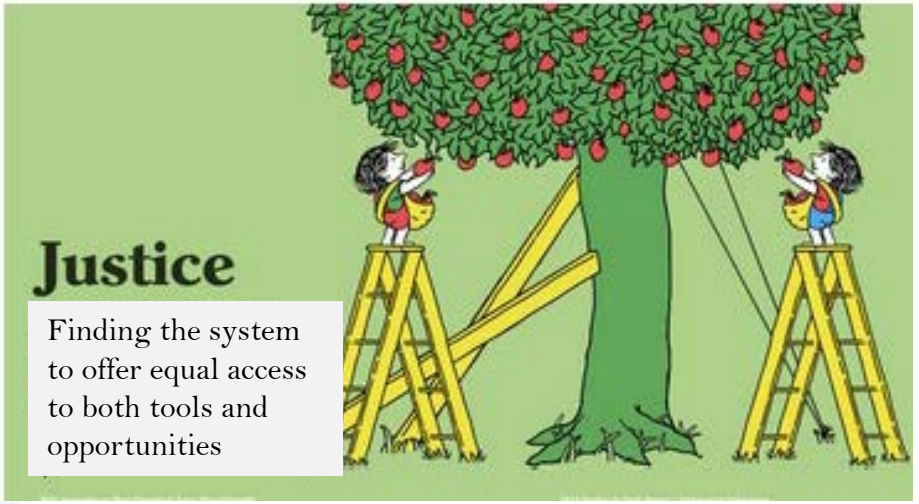
Equality and equity are different

It's an important consideration from a public health lens



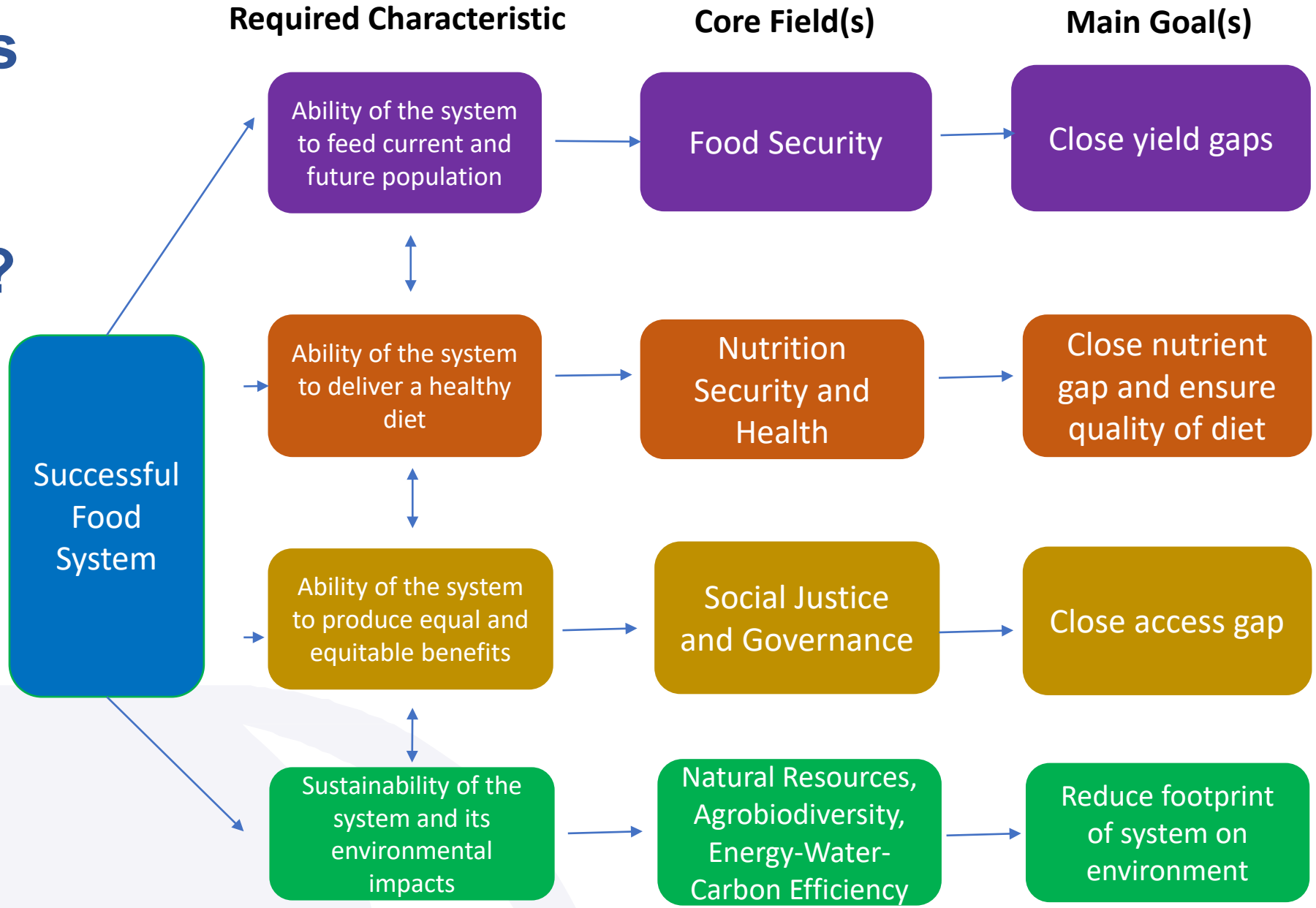






Design in Tech Report. 2019.

What makes a food system successful?



Béné et al. World Development. 2019;113:116-130.

Dairy can play a role in each pillar

Close yield gaps[1]

- ✓ Affordable and accessible
- ✓ Component of federal food and nutrition service programs

Close nutrient gap and ensure quality of diet[2]

- ✓ Significant contributions to nutrients of public health concern
- ✓ Part of healthy dietary pattern

Close access gap[3,4]

- ✓ Significant contributions to U.S. economy (local, state, federal) – 3.3M jobs
- ✓ Supports livelihood of >1B people worldwide

Reduce footprint of system on environment[5]

- ✓ Life Cycle Assessments highlight priority areas
- ✓ Targets efficiencies in feed, enteric methane, manure, and energy

1. USDA. FNS Nutrition Programs.
2. USDA and USDHHS. Dietary Guidelines for Americans, 2020-2025. 9th Edition.
3. IDFA. U.S. Dairy Industry's Economic Impact Totals $753 Billion. 2021.
4. FAO. Contribution of terrestrial animal source food to healthy diets for improved nutrition and health outcomes. 2023.
5. U.S. Dairy Net Zero Initiative.

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Dairy farmers are committed to their animals and the environment
FACT
or
FICTION?

Dairy farmers are dedicated stewards of the land: caring for their cows and the environment

A perspective from the 1% who feed 100%

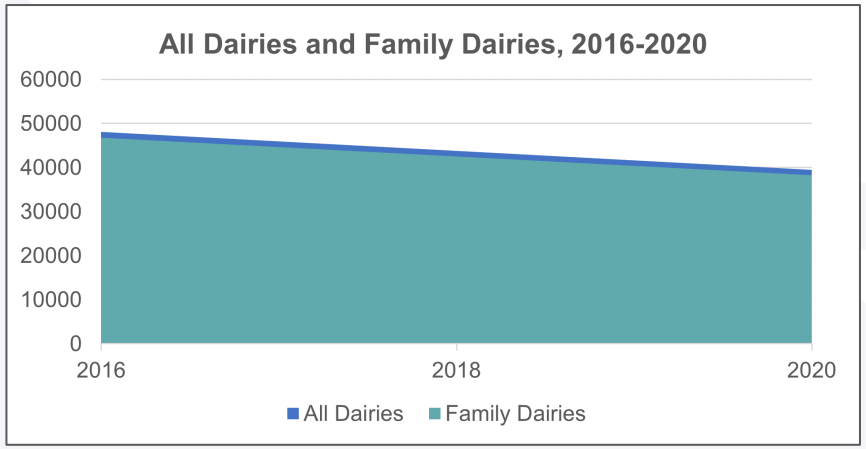
USDA ERS. Ag and Food Sectors and the Economy. 2021.

Dairy farming is a family business

Family farms remain a key part of U.S. agriculture

97% U.S. dairy farms are family-owned[1,2]

90% U.S. farms are small family farms[2]



Farms are changing and consolidating, but often to other family farms or joint family farms[1]

1. NMPF. Family Farms Drive Dairy. 2022.
2. USDA. A Look at America's Family Farms. 2015.

Cow care is a top priority for dairy farmers

Comfort leads to happy and healthy cows

Facility Design Features

- ✓ Housing (lighting, sleep space, bedding, ventilation, social groups)
- ✓ Nutrient management
- ✓ Diet, water supply/access
- ✓ Activity/space per cow
- ✓ Temperature control

It takes a dedicated team

- ✓ Farmer
- ✓ Veterinarian
- ✓ Nutritionist
- ✓ Environmental consultant
- ✓ State welfare

1. Cornell University.CALS: Facilities.
2. FARM Animal Care

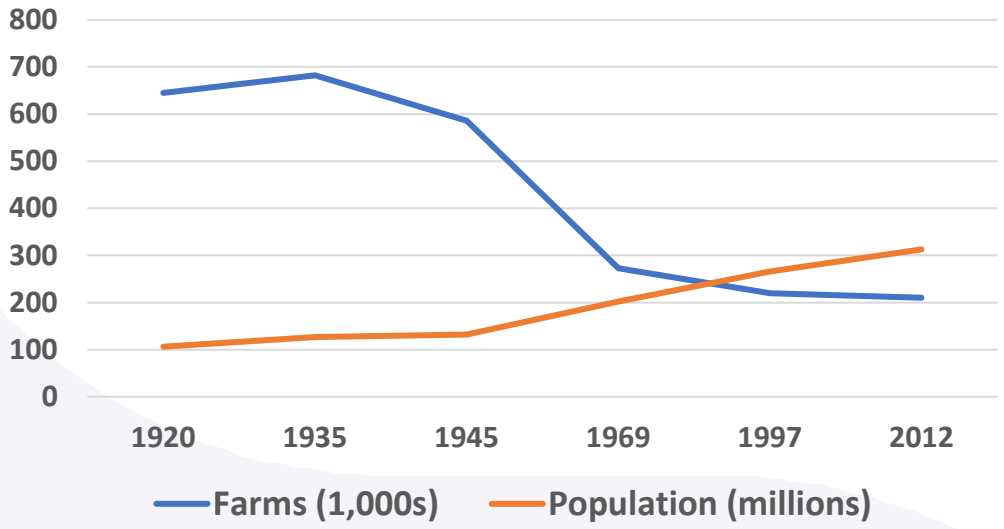
More than 99% of U.S. milk comes from farms participating in the FARM Program

FARM Animal Care.

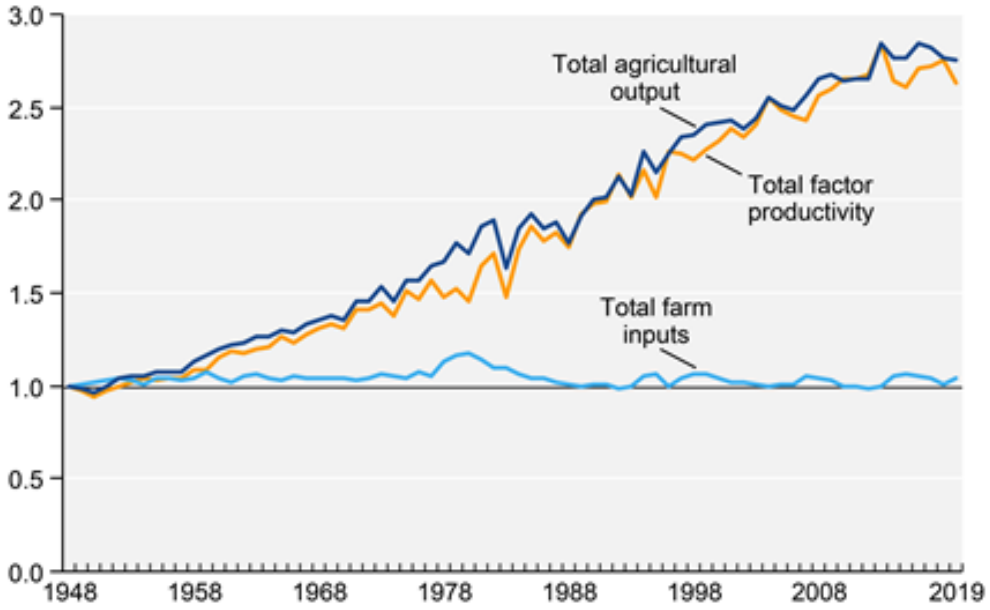
Farmers are feeding more Americans with less

Agricultural technology and research improves efficiency and sustainability

As the U.S. population has grown, the number of farms has decreased[1]



Productivity continues to grow[3]



1935 → 2021

1 farm fed ~**19 people**[1] 1 farm feeds ~**166 people**[2]

Even as the amount of land and labor used declined, **total farm output nearly tripled between 1948 and 2019**[3]

1. USDA Census of Agriculture. 1935.
2. American Farm Bureau Federation. Fast Facts About Agriculture & Food.
3. USDA. ERS. Farming and Farming Income. 2023.

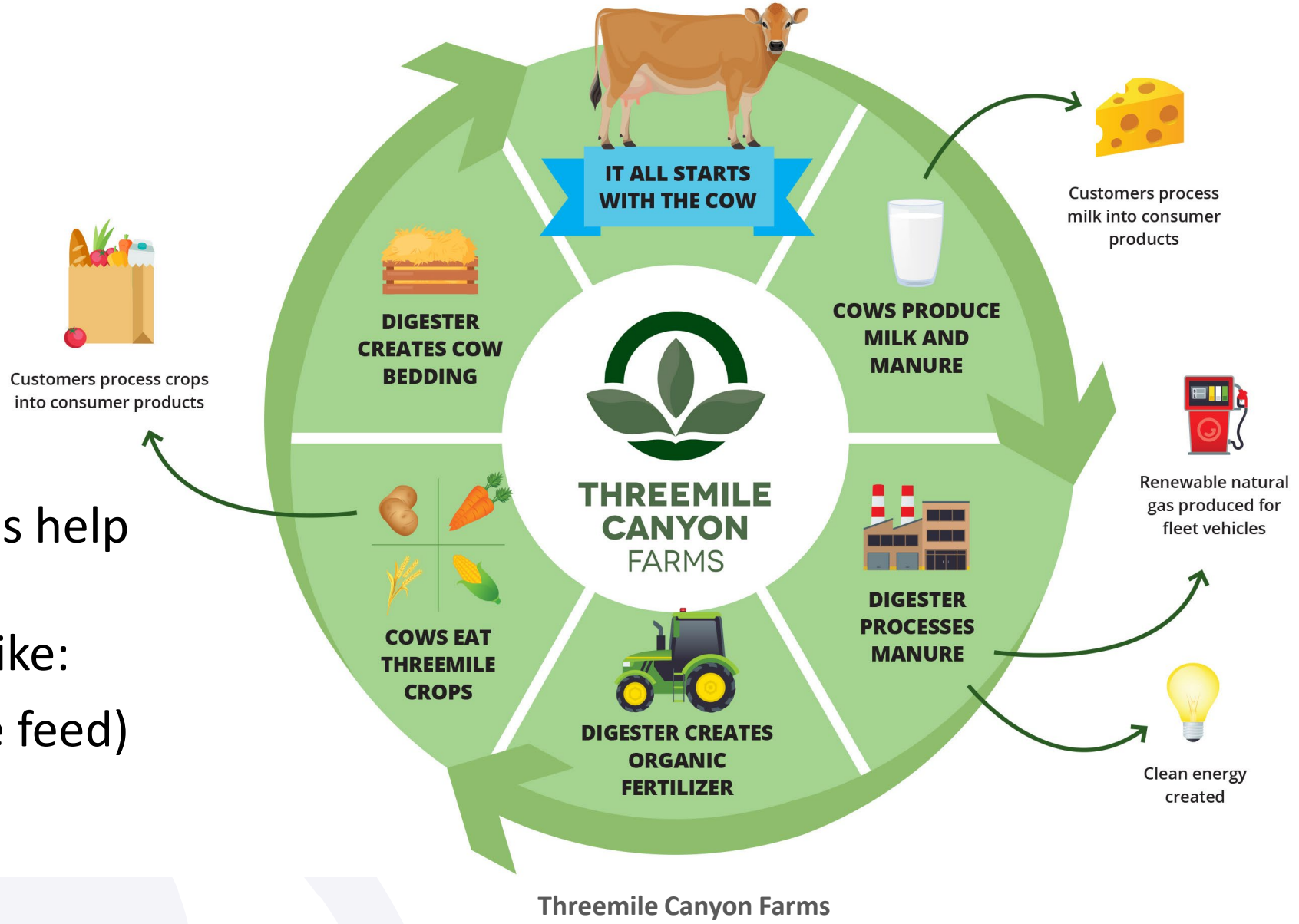
A closed loop concept reduces waste

New technologies on farms help turn cow manure into environmental resources like:

→Fertilizer (growing more feed)

→Renewable energy

→Cow bedding



Threemile Canyon Farms

New England Dairy. Dairy Farm Manure Management.
Threemile Canyon Farms. It All Starts With the Cow. 2022.

Cows are naturally great up-cyclers

30-40%

U.S. food supply is wasted[1]

~80%

Cow's food is indigestible by humans[2]

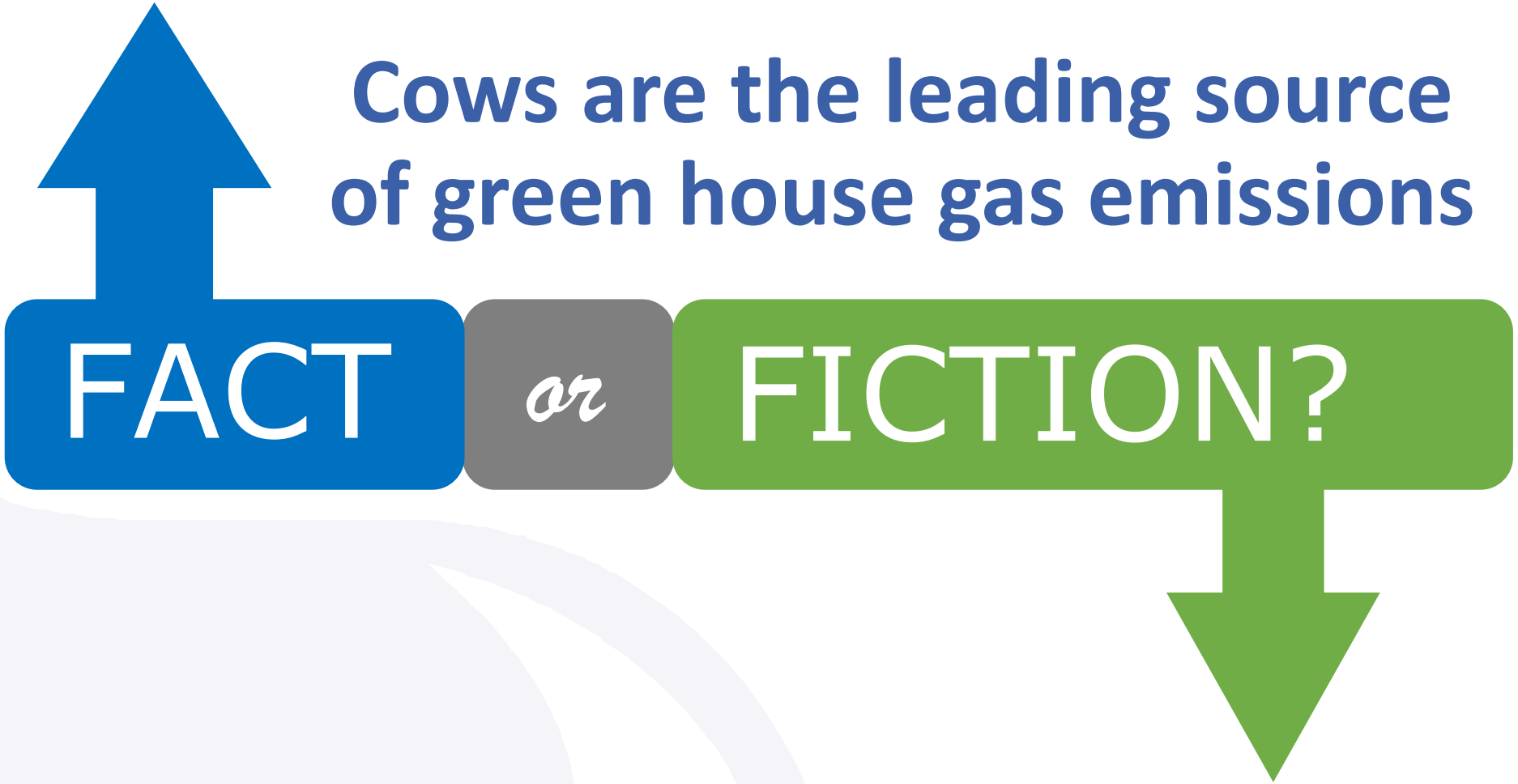
39%

Cow's diet is byproducts
→ upcycled to nutritious dairy
→ kept out of landfills (<GHG)[2,3]

Cows consume byproducts like almond hulls, distiller grains, cotton seeds, soybean meal and citrus pulp

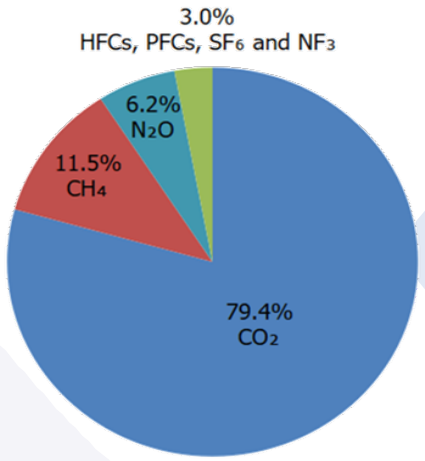
1. USDA. Food Waste FAQs.
2. UC Davis. CLEAR Center. Dairy Cows – The Original Upcyclers. 2022.
3. Ondarza M.B., Tricarico J. Journal of Cleaner Production. 2021;315:128125.

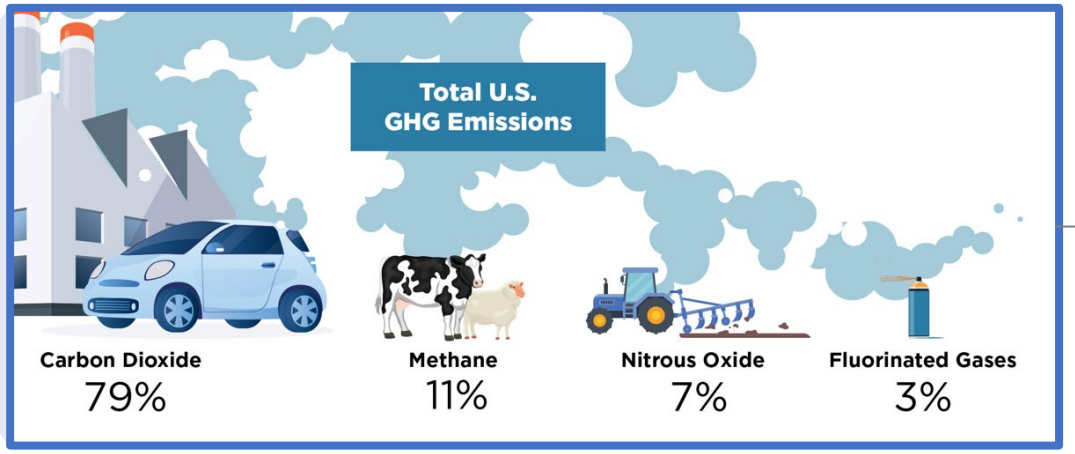
Cows are the leading source of green house gas emissions



GHGs are unique and require different mitigation strategies

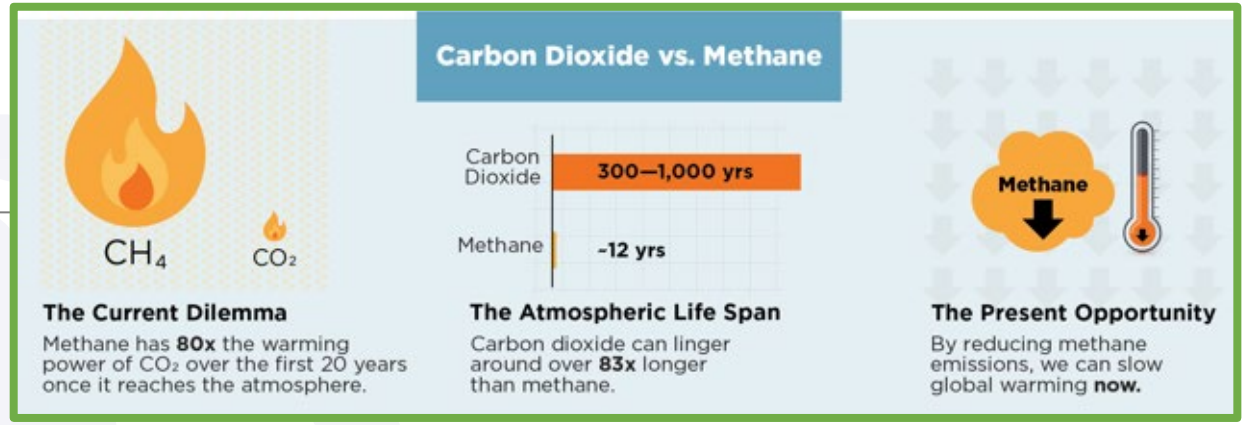
Environmental solutions require progress in multiple sectors





- **CO2** makes up majority of GHG and comes from transportation, electricity and industry[1]
- **Methane** makes up 11%, coming from natural gas, enteric fermentation and landfills[1]

- **Methane** is initially more damaging, but short-lived[1,2]
- **CO2** lives in the atmosphere much longer[1,2]



1. EPA. Overview of Greenhouse Gas Emissions. 2021.
2. UC Davis. CLEAR Center. 2020.
3. Graphics from NDC. How Dairy Farmers are Reducing Methane and Greenhouse Gas Emissions. 2022.

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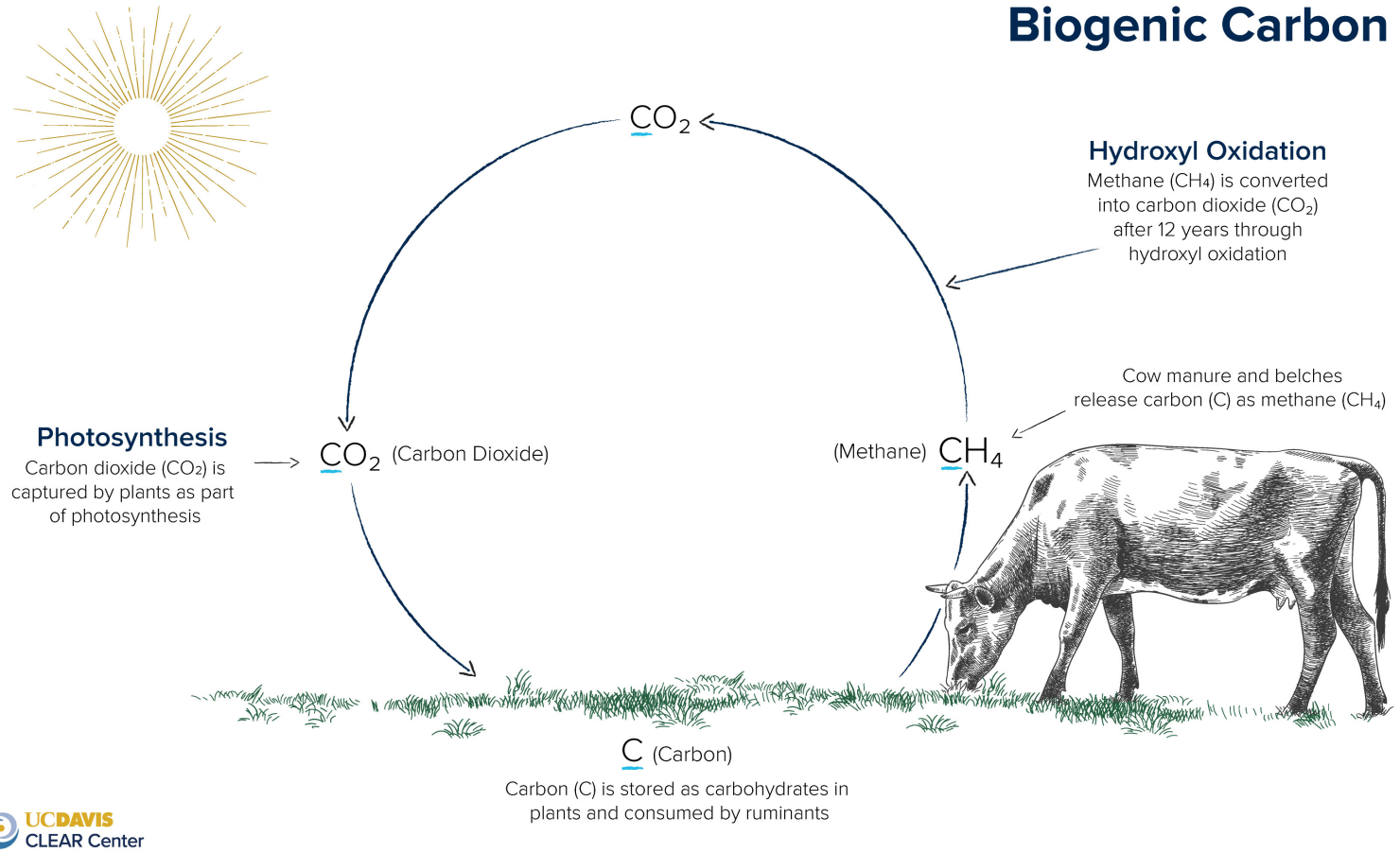
The biogenic carbon cycle can help explain how different gases have different warming impact

Biogenic carbons are recycled, whereas fossil fuel carbons are new



UC Davis. CLEAR Center. 2020.

Dairy spearheaded ag Life Cycle Assessments (LCAs)

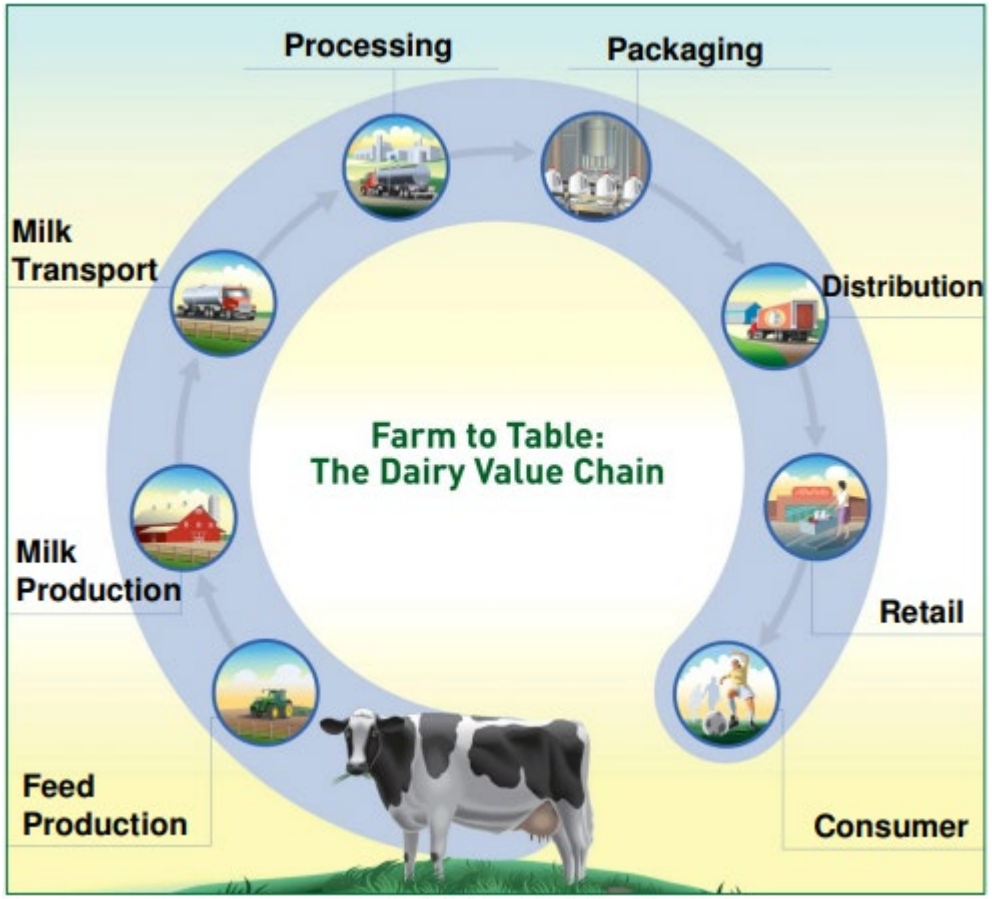
In 2008, the U.S. dairy industry was the first in the food agricultural sector to conduct a full LCA at a national scale[1]

- Utilized 2007 data of >150 variables to assess GHG emissions of the fluid milk full value chain
- Survey responses from 500+ farms

→ Calculated GHG emission intensity of fluid milk

→ Estimated GHG emission of the entire dairy sector

→ Identified opportunities for greatest impact and improvement



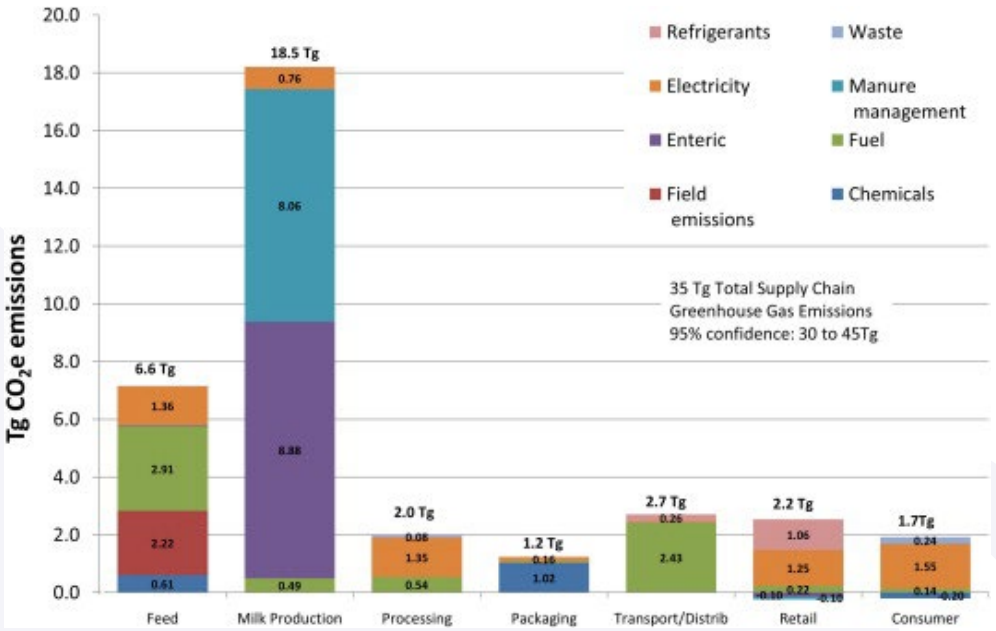
LCA measures impact throughout the entire product process[2]

1. Thoma et al. International Dairy Journal. 2013;31(S1):S3-S14.
2. Innovation Center for U.S. Dairy. U.S. Dairy Life Cycle Assessment: From Grass to Glass. 2011.

It's estimated that ~2% of U.S. GHG come from the dairy industry

LCA highlights areas for improvement and opportunity, driving agricultural technology, innovation and research

Majority of emissions occur prior to the farm gate



GHG emissions by supply chain stage

Top GHG contributors

1. Enteric methane
2. Manure management
3. Feed production

Target areas for innovation

→*Reduce enteric methane*

→*Improve manure management*

→*Increase feed efficiency*

1. Thoma et al. International Dairy Journal. 2013;31(S1):S3-S14.
2. Innovation Center for U.S. Dairy. U.S. Dairy Life Cycle Assessment: From Grass to Glass. 2011.

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What does innovation look like?

Estimated GHG contribution of each "print" to the total*

FEED 26%

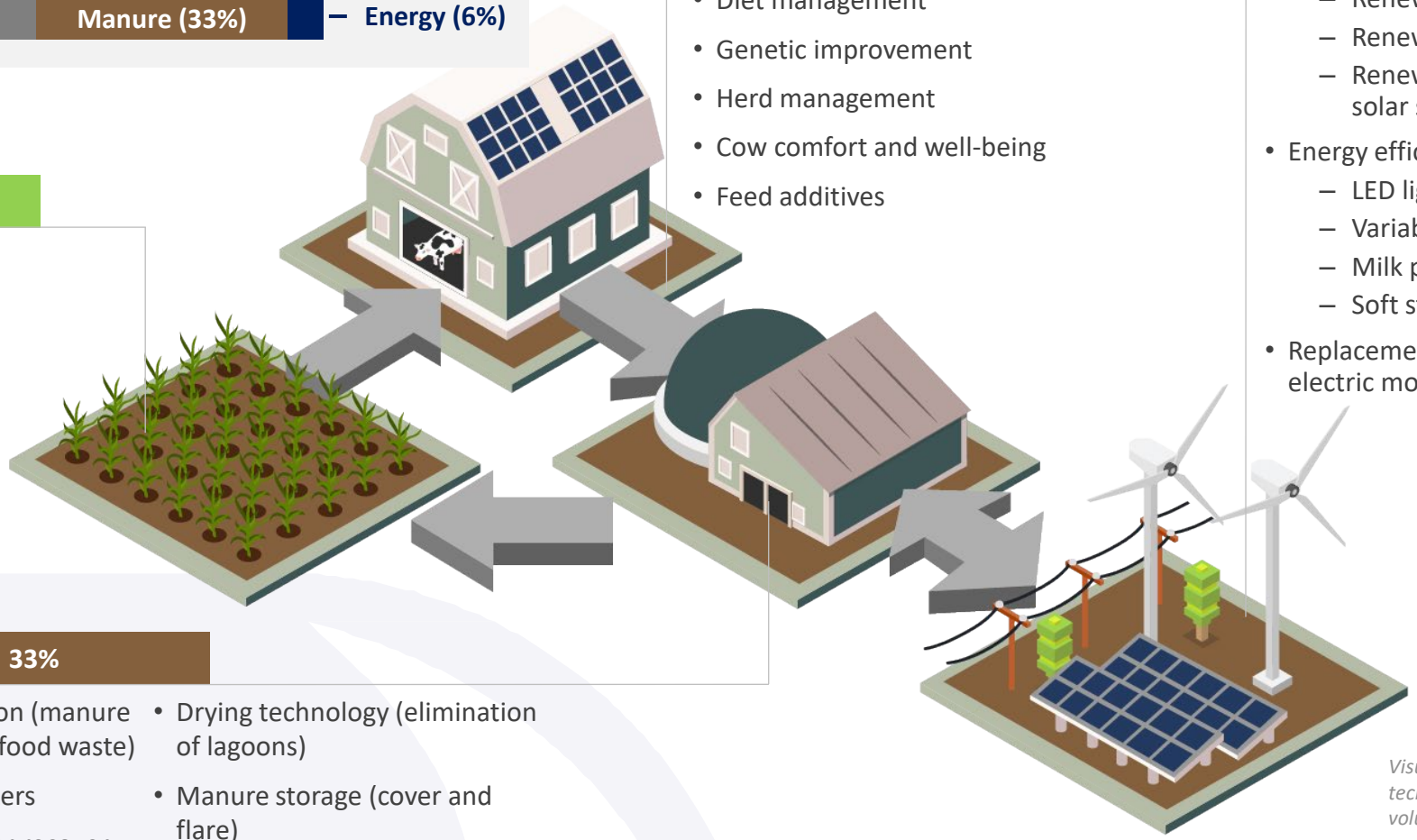
- No/low-till farming
- Cover crops
- Nutrient management
- Precision agriculture
- Water use efficiency

ENTERIC METHANE 35%

- Diet management
- Genetic improvement
- Herd management
- Cow comfort and well-being
- Feed additives

ENERGY 6%

- Renewable energy:
  - Renewable electricity
  - Renewable natural gas
  - Renewable energy from wind and solar sources
- Energy efficiency:
  - LED lighting
  - Variable speed pumps
  - Milk pre-cooling technology
  - Soft start motors
- Replacement of fossil-fueled engines with electric motors



MANURE 33%

- Anaerobic digestion (manure & co-digestion of food waste)
- Renewable fertilizers
- Nutrient and water recovery
- Drying technology (elimination of lagoons)
- Manure storage (cover and flare)

Visuals do not represent all possible practices, technologies or benefits. Each farm can voluntarily contribute to net zero efforts based on their individual operation.

U.S. Dairy Net Zero Initiative.

*Adapted from: Thoma et al. International Dairy Journal. 2013;31(S1):S3-S14

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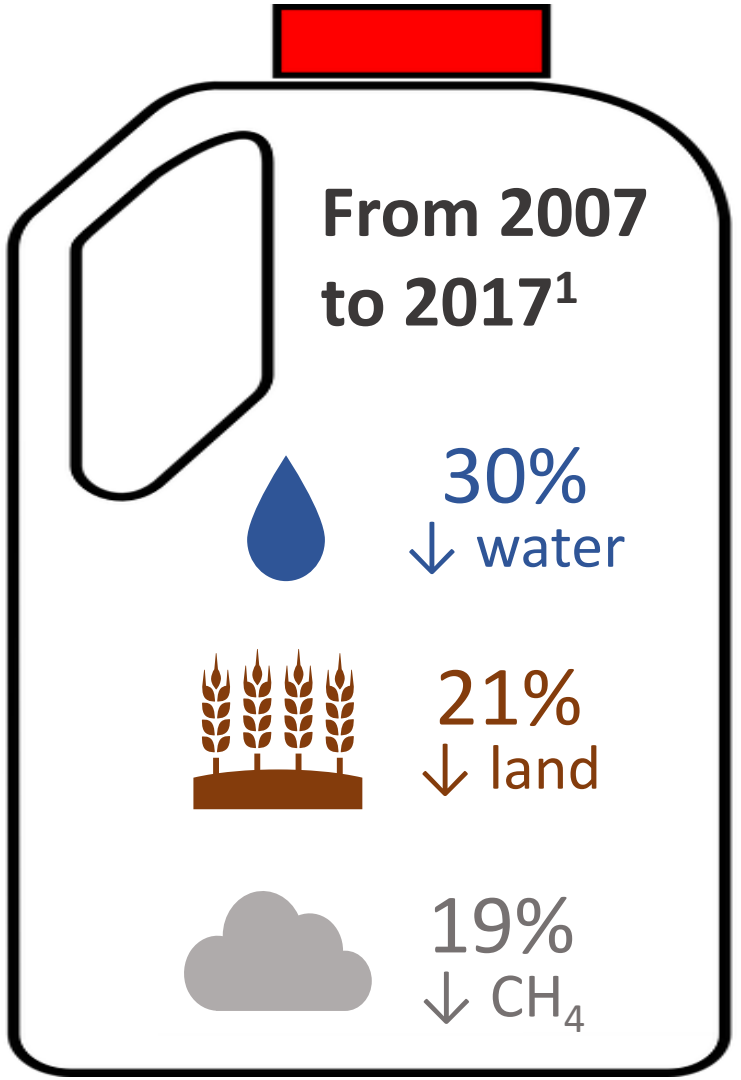
What does progress look like?

279 operational anaerobic digesters in U.S. dairy farms[2]

Cattle feeding innovation and technologies can reduce methane emissions[3]

4x one gallon of water recycled for other purposes (chilling, cow drinking water, cleaning stalls, irrigation)[4]

Producing 1 gal of milk in the U.S.[1]



1. Capper et al. Journal of Animal Science. 2020;98(1).
2. EPA. AgSTAR Data and Trends. 2022.
3. Baceninaite et al. Animals. 2022;12(19):2687.
4. NDC. Ask A Dairy Farmer: How do Farmer Reuse Water? 2019.

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But there's still work to be done!

The dairy community is committed to sustainably feeding a growing population

2050 U.S. Dairy Environmental Stewardship Goals

- ❑ Achieve GHG neutrality
- ❑ Optimize water use while maximizing recycling
- ❑ Improve water quality by optimizing utilization of manure/nutrients

Innovation Center for US Dairy. Vision: Dairy is an Environmental Solution.

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Teamwork and industry-wide collaboration will be essential to meeting the 2050 goals

FOR FIELD AND FARM

Net Zero Initiative

A collaboration of dairy organizations with the aim to knock down barriers and create incentives for farmers that will lead to economic viability and positive environmental impact, in the areas of feed production, enteric methane, energy efficiency and manure management.

Core Tracks

- GROUNDWORK
- DAIRY SCALE FOR GOOD (DS4G)
- COLLECTIVE IMPACT

FOR PROCESSORS

Processor Working Group

Led by the Innovation Center, a working group of more than 40 participants representing over 20 processing organizations convenes regularly and engages in facility-focused workstreams for waste, water, packaging, and GHG emissions to drive action and demonstrate progress towards the goals.

Sub-Teams

- GHG
- PACKAGING
- WASTE
- WATER

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US Dairy. U.S. Dairy Net Zero Initiative. Innovation Center for US Dairy.

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Removing dairy from our diet is the sustainable solution

Removing dairy probably isn't the solution

Health, diet quality and cost are considerable pillars of sustainability

2020 Modeling Study[1]

Removing dairy cows from the US food system …

→ Little impact on GHG emissions

→ Significant impact on American nutrient supply

2020 NHANES Programming Study[2]

Replacing dairy nutrients with non-dairy foods …

→ Can fill protein & shortfall nutrient gaps

→ Considerable increase in cost, energy intake, and food volume

1. Liebe D, Hall M, White R. J Dairy Sci. 2020;103(11):10867-10881.
2. Cifelli C, Auestad N, Fulgonia V. Public Health Nutrition. 2020;25(2).

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Meeting DGA dairy recommendations can have positive health and economic impacts

Conformance with DGA dairy recommendations (2.5-3 servings a day)

Billions $ in annual cost savings due to reduction in:

- CVD
- T2D
- Stroke
- HTN
- Colorectal cancer

Scrafford et al. Nutrients. 2020;12(1):233.
Scrafford et al. JAND. 2018;119(4):599-616.

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Environmental impact should be considered in the context of nutritional provision

FAO 2023 Global Assessment

- 500+ scientific papers, 250 policy documents
- Animal foods contribute crucial nutrients
- Particularly during pregnancy, lactation, childhood, adolescence and older age

Milk's nutritional contributions should be considered when evaluating tradeoffs[2,3]

- Satisfies large % of global requirements for protein and micronutrients
- Particularly vitamin B12, riboflavin, calcium, phosphorous, and zinc

1. FAO. 2023.
2. White R, Gleason C. J Dairy Sci. 2023;106(5):3287-3300.
3. Lawrence et al. Nutrients. 2023;15(8):1825.

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Takeaways

- Dairy foods are an affordable and accessible source of nutrition for many American families
- Dairy farmers are innovative and passionate stewards of the land and its resources
- Dairy foods play an important role in sustainable food systems, contributing essential nutrients, reducing the burden of chronic disease, and supporting local and global economies
- The dairy community remains committed to environmental progress through technological advances, research and initiatives

Thank you!

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- Dairy Nutrition and Bone Health
- Dairy Innovations for Sustainable Future Webinar
- Taming The Flame— Dairy And Inflammation
- * Prenatal Nutrition: Dairy's Building Blocks for Baby's Brain Development

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Questions?

Please enter your questions into the Q&A window.

Continuing education certificates will be sent via email within 24 hours of this webinar.

The full webinar recording will be available next week on USDairy.com.

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