

# Unlocking the Power of the Dairy Matrix in Supporting Lifelong Health

Ashley Rosales, RDN  
Nutrition and Industry Affairs Officer

Trina Robertson, MS, RDN  
Health Sector and  
Program Evaluation Director

Dairy Council of California



# Menti Poll

Join at [menti.com](https://menti.com) use code 48049105



Join at [menti.com](https://menti.com) | use code 4804 9105

Mentimeter

Menti

Dairy Matrix Nuestros S...

Choose a slide to present



Before we start: What does the term "dairy matrix" mean to you?

fast bold  
creative  
inspiration leader focus  
transpiration

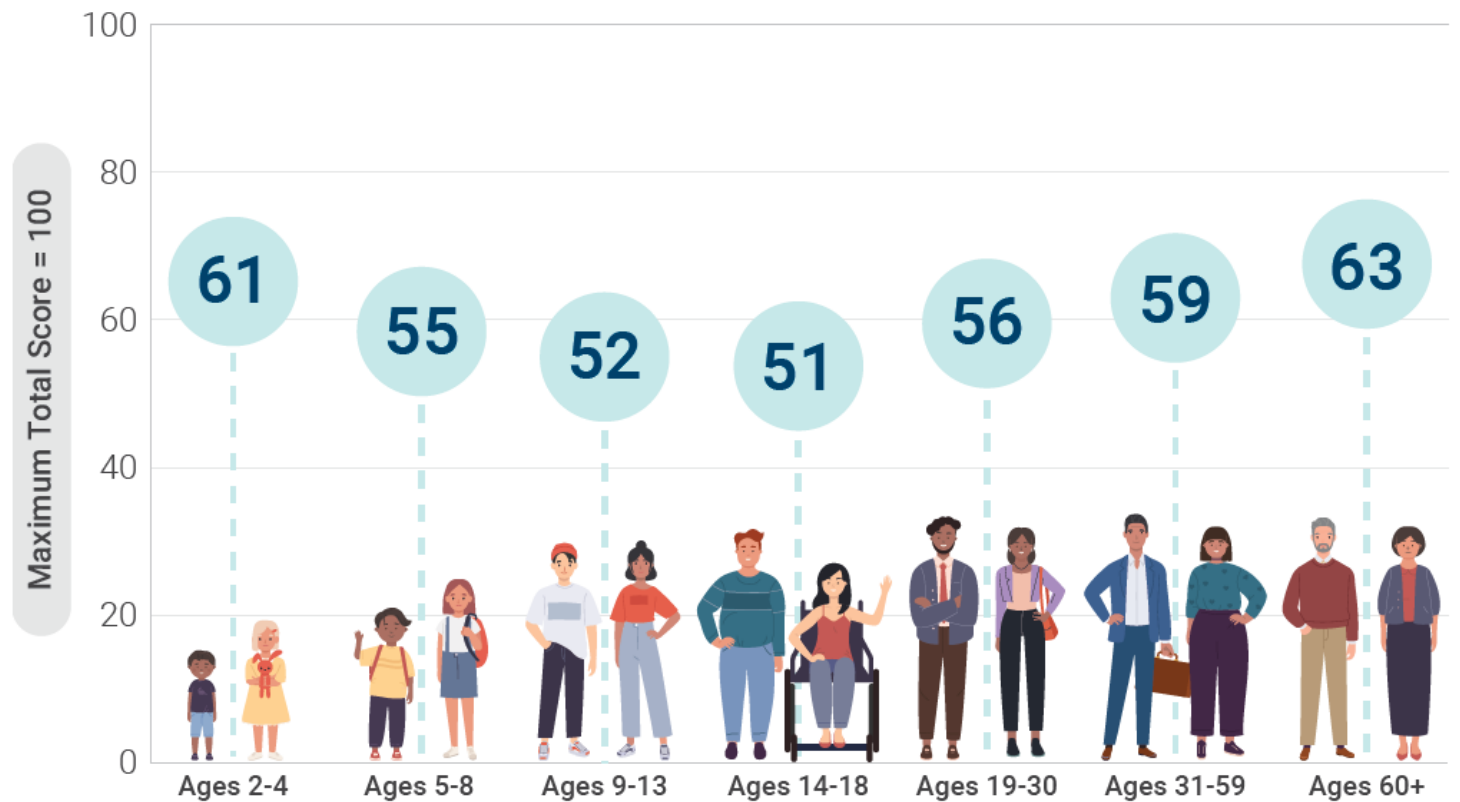


# Learning objectives

- 1 Describe the shift from a nutrient-based approach to food-based dietary guidance.
- 2 Explore how the structure and combination of nutrients in milk and dairy foods, known as the dairy matrix, makes them effective at delivering nutrients.
- 3 Recognize the impact of dairy foods on health outcomes across the life span and on chronic disease risk.
- 4 Identify ways the food matrix concept can enhance public health by supporting more holistic, culturally relevant, food-based nutrition interventions.

# Most Americans Do Not Meet Dietary Recommendations

Adherence of the U.S. Population to the *Dietary Guidelines* Across Life Stages, as Measured by Average Total Healthy Eating Index-2015 Scores



**NOTE:** HEI-2015 total scores are out of 100 possible points. A score of 100 indicates that recommendations on average were met or exceeded. A higher total score indicates a higher quality diet.

**Data Source:** Analysis of What We Eat in America, NHANES 2015-2016, ages 2 and older, day 1 dietary intake data, weighted.



# The Dietary Guidelines for Americans Through the Years

1985-1990

Maintain  
"desirable" weight



1995-2000

Food pyramid introduced



2005-2010

Core message: "Health promotion & disease prevention"



Dietary Guidelines for Americans

2015-2020

MyPlate & healthy eating patterns



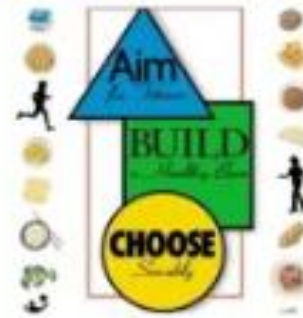
Eat a variety of foods

1980-1985



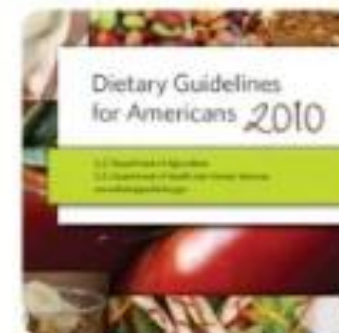
Serving suggestions for food groups

1990-1995



"Aim for fitness, build a healthy base, choose sensibly"

2000-2005



Emphasizes diet & obesity epidemic link

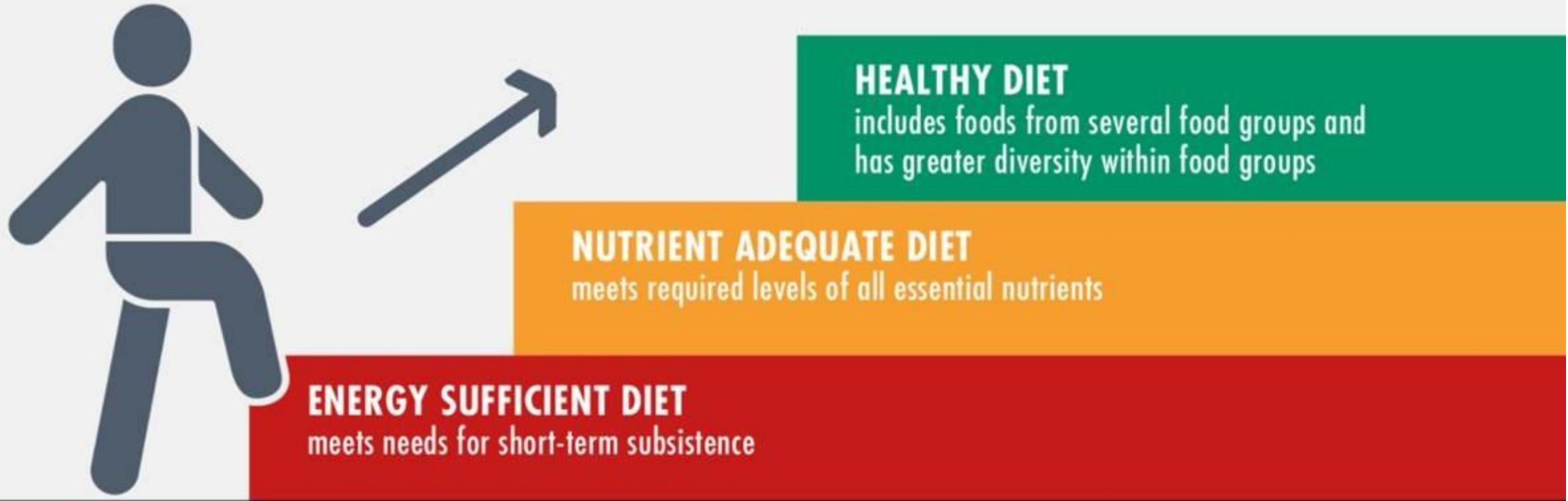
2010-2015



Healthy eating patterns for every life stage

2020-2025

# Shifting Dietary Patterns



Source: FAO's State of Food Security and Nutrition in the World 2020



# Shifting from Isolated Nutrients to the Food Matrix





# Food Matrix

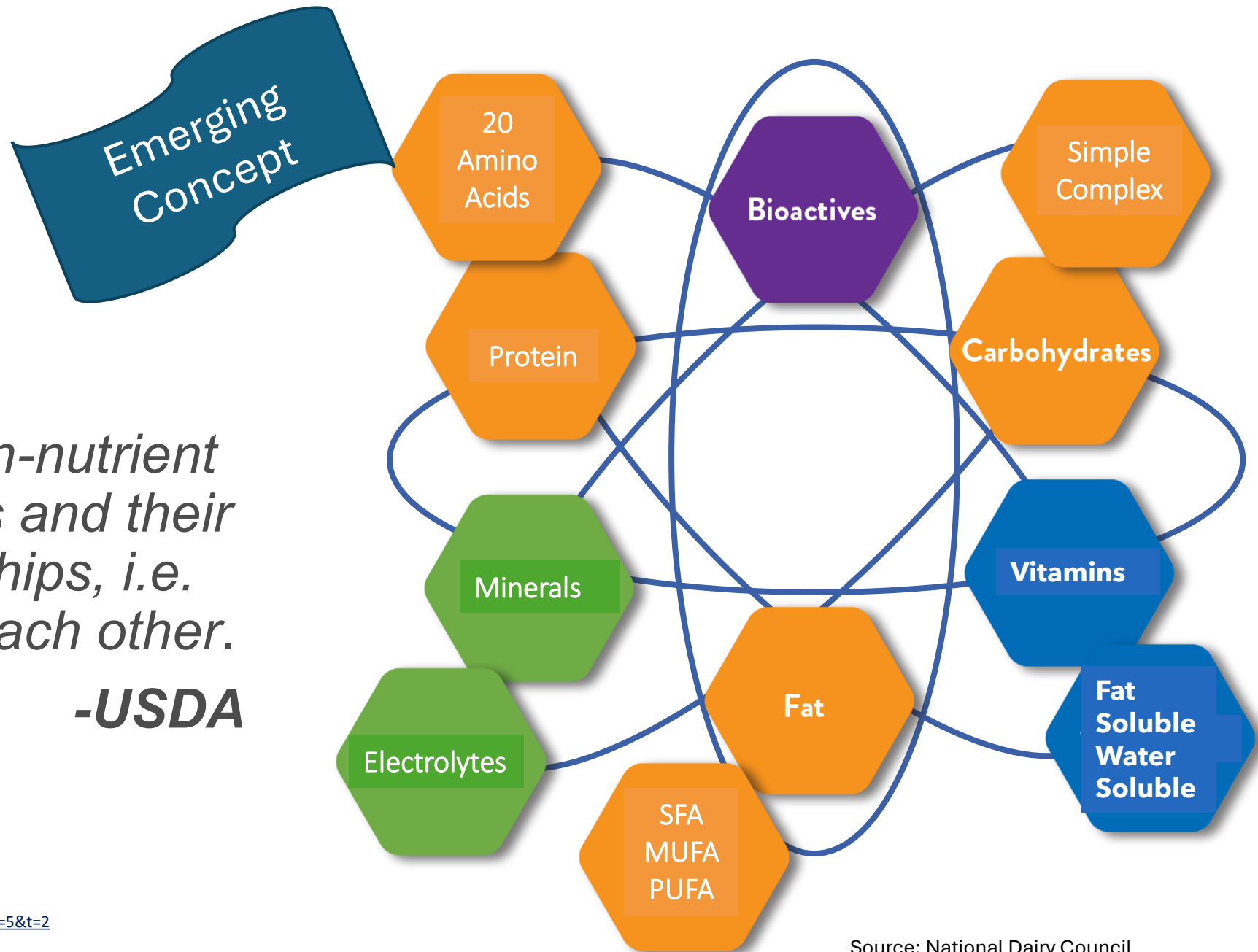
food ma·trix

***noun***

*The nutrient and non-nutrient components of foods and their molecular relationships, i.e. chemical bonds, to each other.*

**-USDA**

<https://agclass.nal.usda.gov/mtwdk.exe?k=glossary&l=60&w=6026&s=5&t=2>



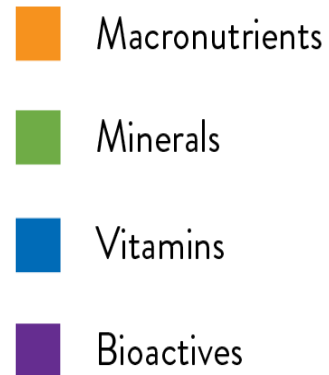
Source: National Dairy Council

# Nutrient Contribution of Dairy Foods



# Dairy Foods' Matrix is Unique: Whole is Greater than the Sum of its Parts

- Protein
- Fat
- Carbohydrates
- Bioactives
- Vitamins
- Minerals

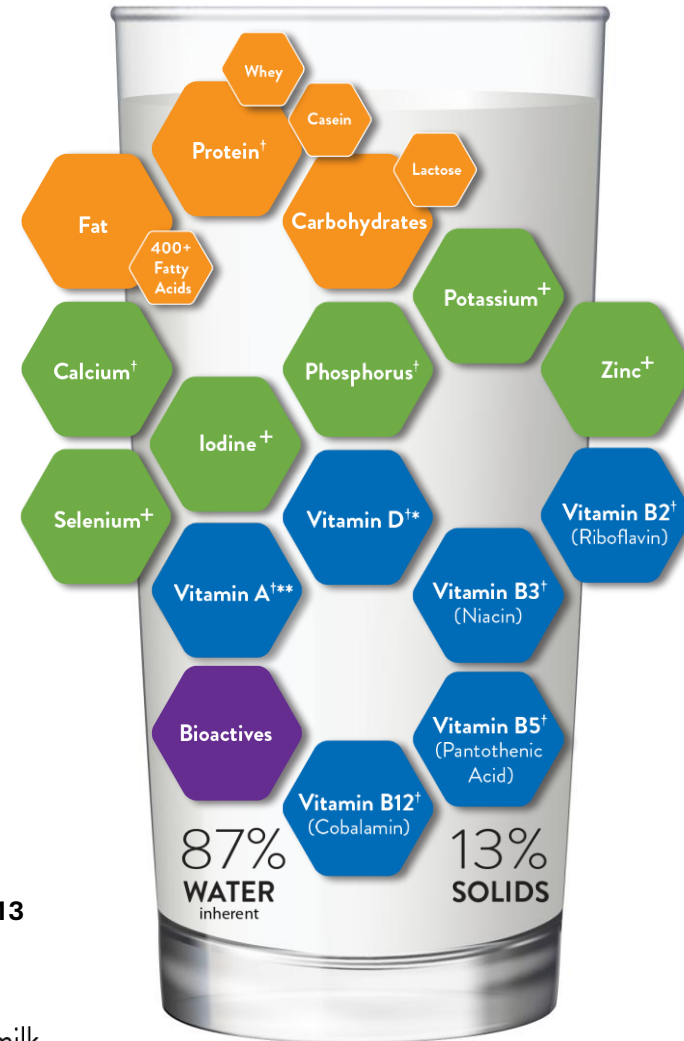


† Milk is a good or excellent source of 13 essential nutrients.

\* Vitamin D is added to milk

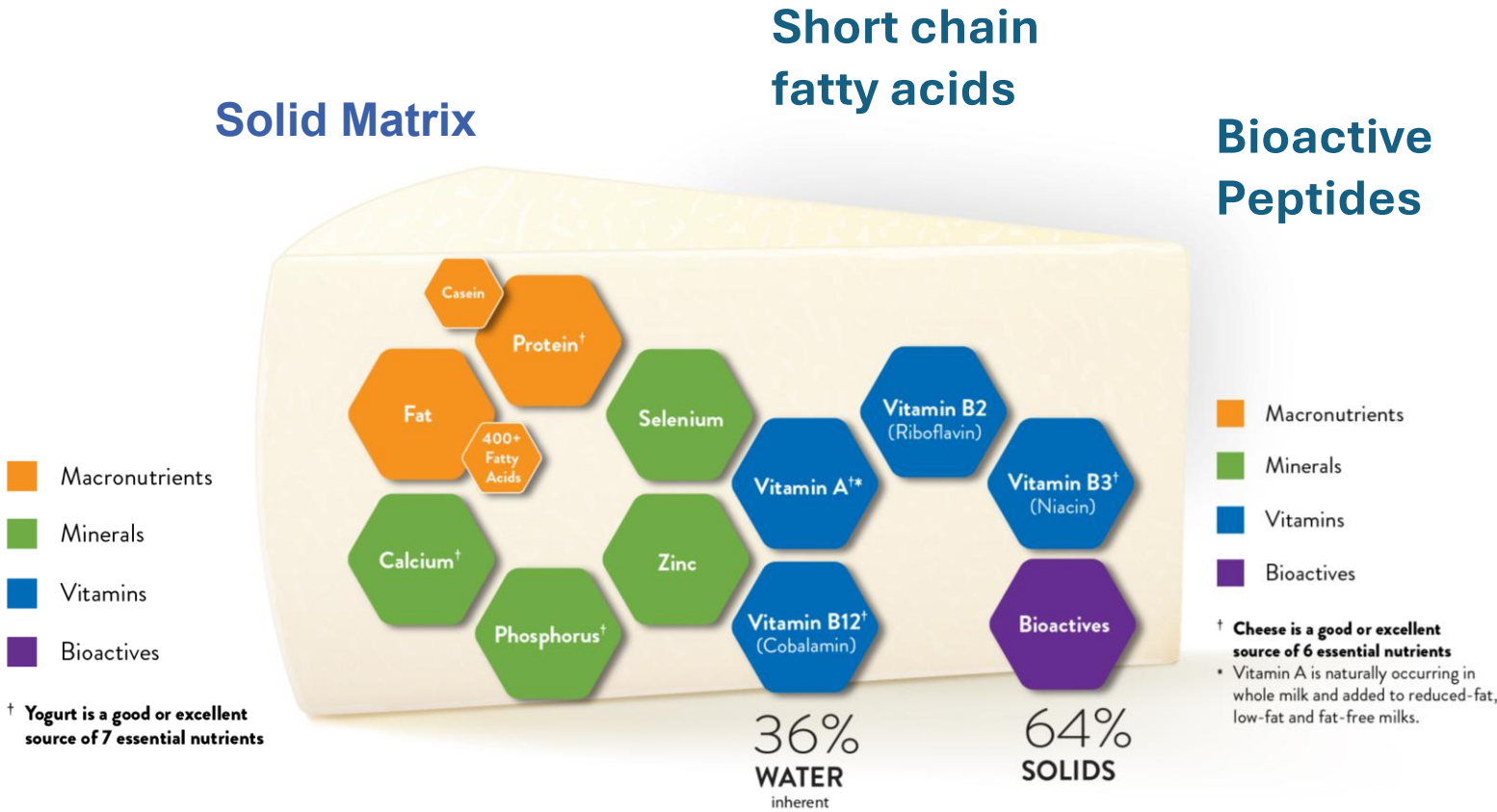
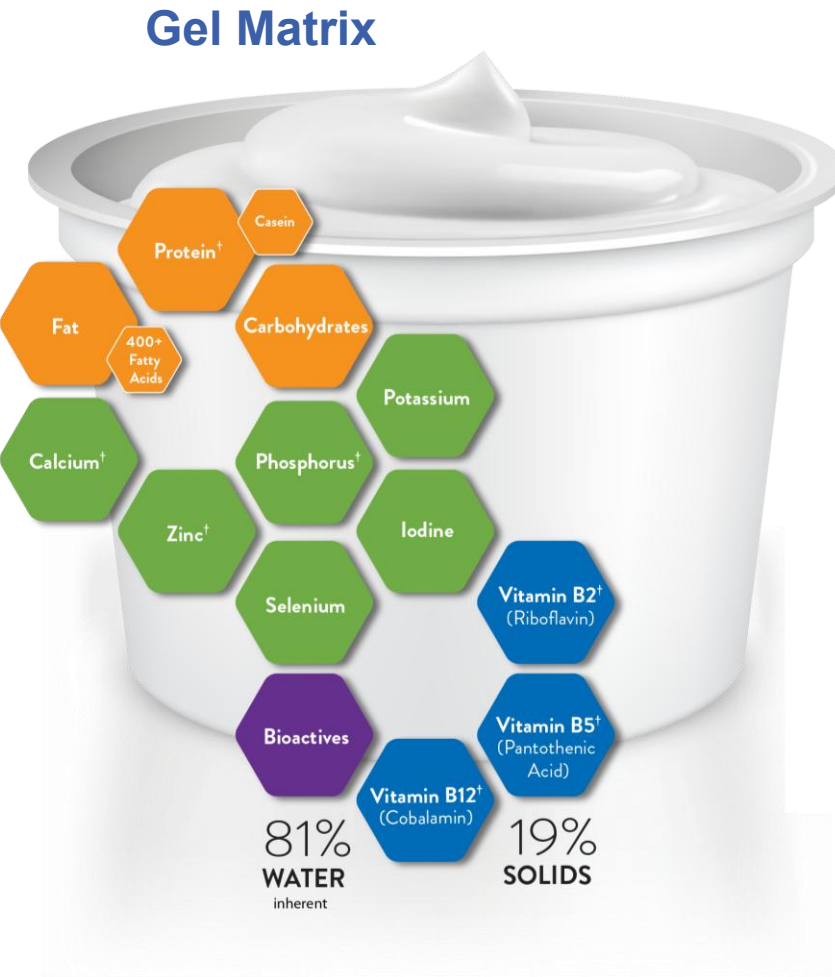
\*\* Vitamin A is naturally occurring in whole milk and added to reduced-fat, low-fat and fat-free milks

## Liquid Matrix



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.

# Milk Matrix Transformation: Fermentation ➡ Yogurt and Cheese

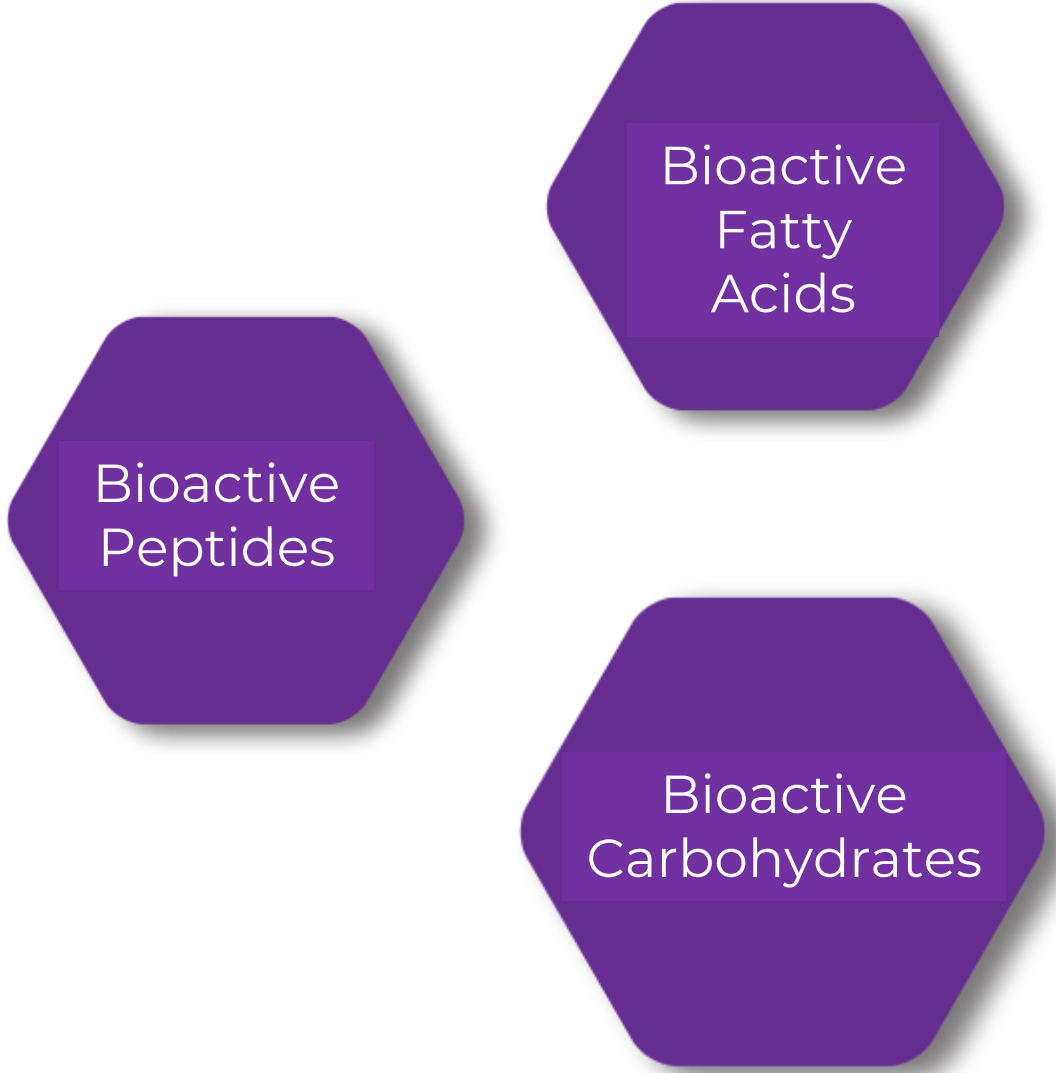


Greek Yogurt - Food Data Central: 171304  
Cheddar Cheese - Food Data Central: 170899

# Milk Bioactives

“Bioactives are constituents in foods, other than those to meet basic nutritional needs, that are responsible for a change in human health.”

-Office of Disease Prevention & Health Promotion, National Institutes of Health



Bioactive  
Peptides

Bioactive  
Fatty  
Acids

Bioactive  
Carbohydrates

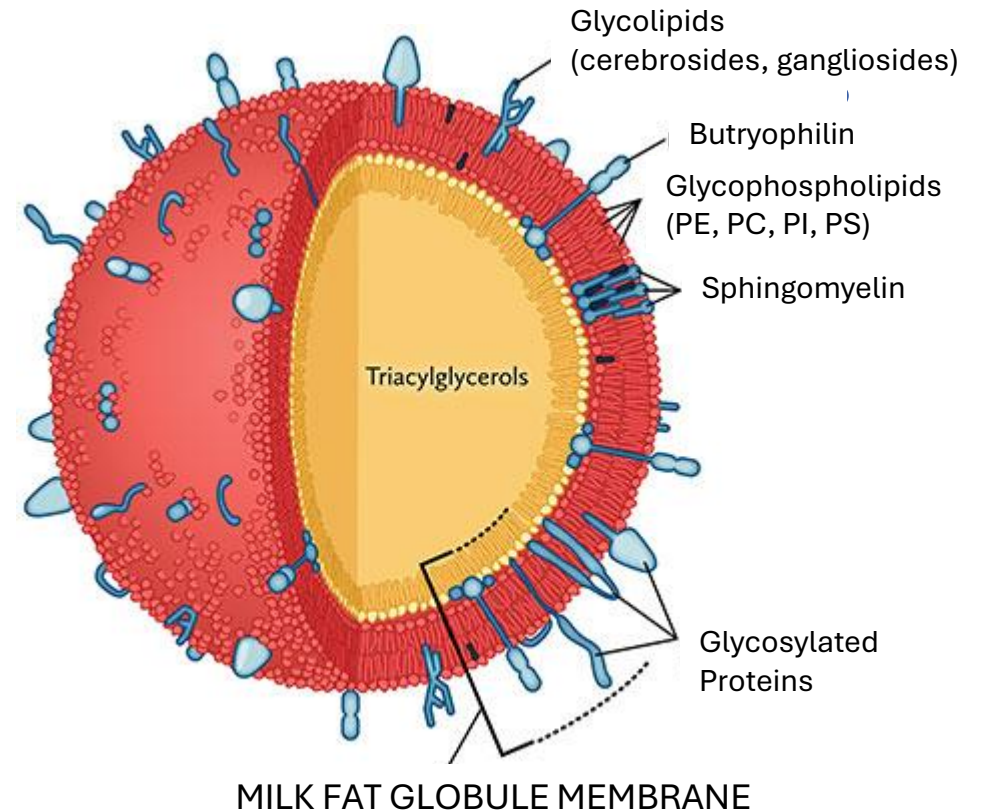
# Potential Bioactive Lipids

## Emerging Research

### Lipid Classes Within the Milk Fat Globular Membrane (MFGM)

- Short, medium and long chain fatty acids
- Naturally occurring trans fatty acids
- Branched chain fatty acids
- Polar Lipids
  - Phospholipids
  - Sphingolipids

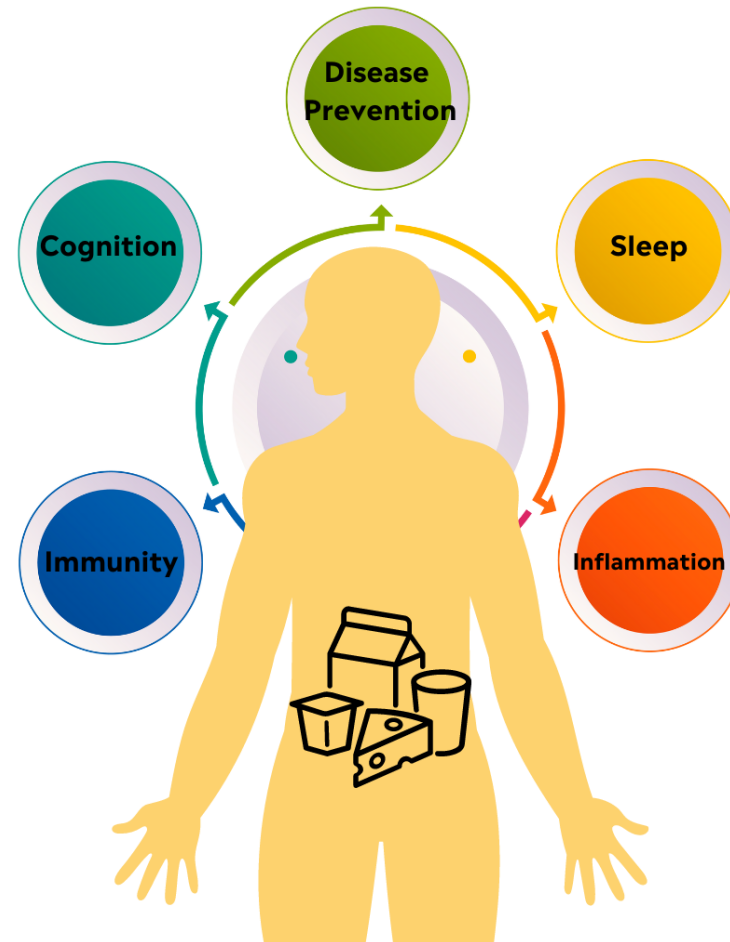
### Milk Fat Globular Membrane





# Functional Health Benefits of Dairy

- Immunity
- Cognition
- Disease prevention
- Sleep
- Inflammation



# Cognition

- Dairy provides nutrients like protein, B12, iodine and choline, essential for brain development in early childhood and beyond.
- Drinking 3 servings of cow's milk a day, may improve brain health in older adults.

[Choi IY, et al. P, et al. Front Nutr. 2022.](#)  
[Schwarzenberg SJ, et al. Pediatrics. 2018.](#)



# Sleep

- Dairy foods provide nutrients that promote sleep.
- Fermented dairy foods, like yogurt and kefir are linked with better sleep, potentially by contributing to improvements in the gut microbiome.

[Komada Y, et al. Int J Environ Res Public Health. 2020.](#)  
[Yu L, et al. Microbiol Res. 2020.](#)



# Immunity

- Six of milk's thirteen essential nutrients, protein, vitamin A, vitamin D, zinc, selenium and vitamin B12 work together to contribute to healthy immune function.

[Calder PC. Nutrients. 2020.](#)



# Inflammation

- Systemic inflammation can contribute to:
  - Cardiovascular disease
  - Type 2 diabetes
  - Immune function
- Inclusion of dairy foods in the diet is associated with lower levels of inflammation.

[Furman D, et al. Nat Med. 2019.](#)  
[Nieman KM, et al.. J Am Coll Nutr. 2021.](#)





# Disease Prevention and Management

- Eating 3 servings of dairy foods a day is associated with a lower risk of:
  - Overweight and obesity
  - Cardiovascular disease
  - Type 2 diabetes
  - Stroke

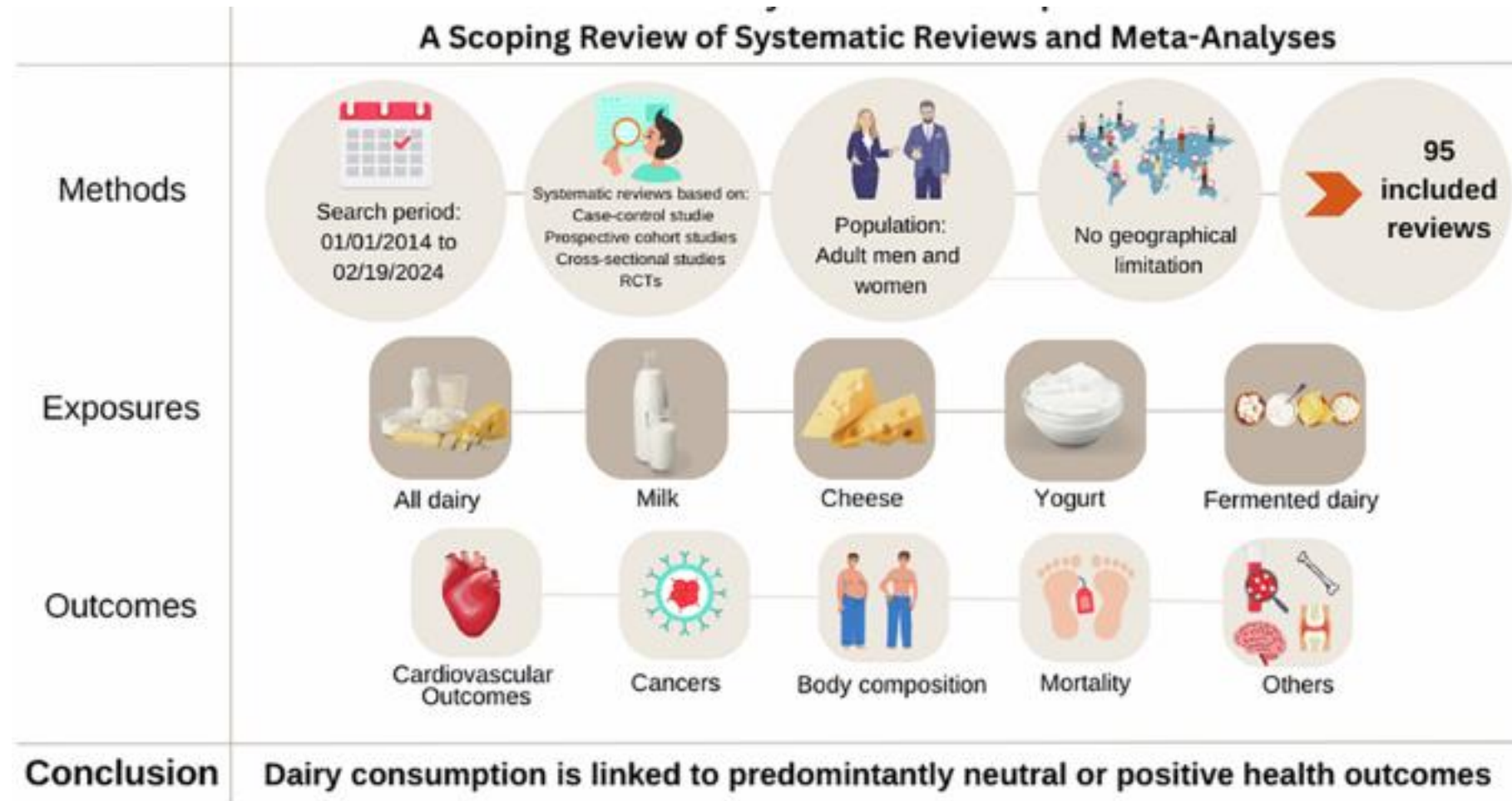
[Feng Y., et al. Adv Nutr.2022.](#)

[Deng C, et al. Public Health Nutrition.2018.](#)





# Association between dairy intake and multiple health outcomes

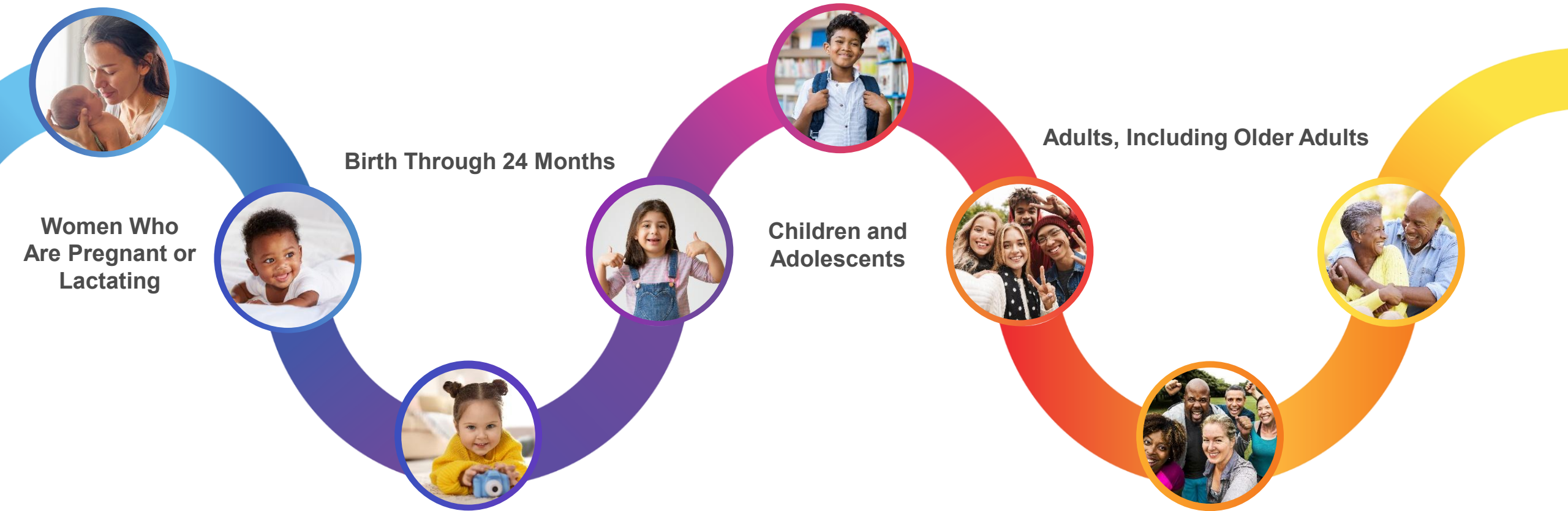


# Qualified Health Claim for Yogurt + Reduced Risk of Type 2 Diabetes

“Eating yogurt regularly, at least 2 cups (3 servings) per week, may reduce the risk of type 2 diabetes according to limited scientific evidence.”



# Dairy Supports Health at Every Life Stage





## Dairy Foods Fit Within Diverse and Cultural Eating Patterns





# Dairy and Digestive Symptoms: Management options

- Lactose-free dairy milk
- Natural cheeses such as cheddar and Parmesan
- A1 vs. A2 milks
- Fermented dairy foods like yogurt and kefir



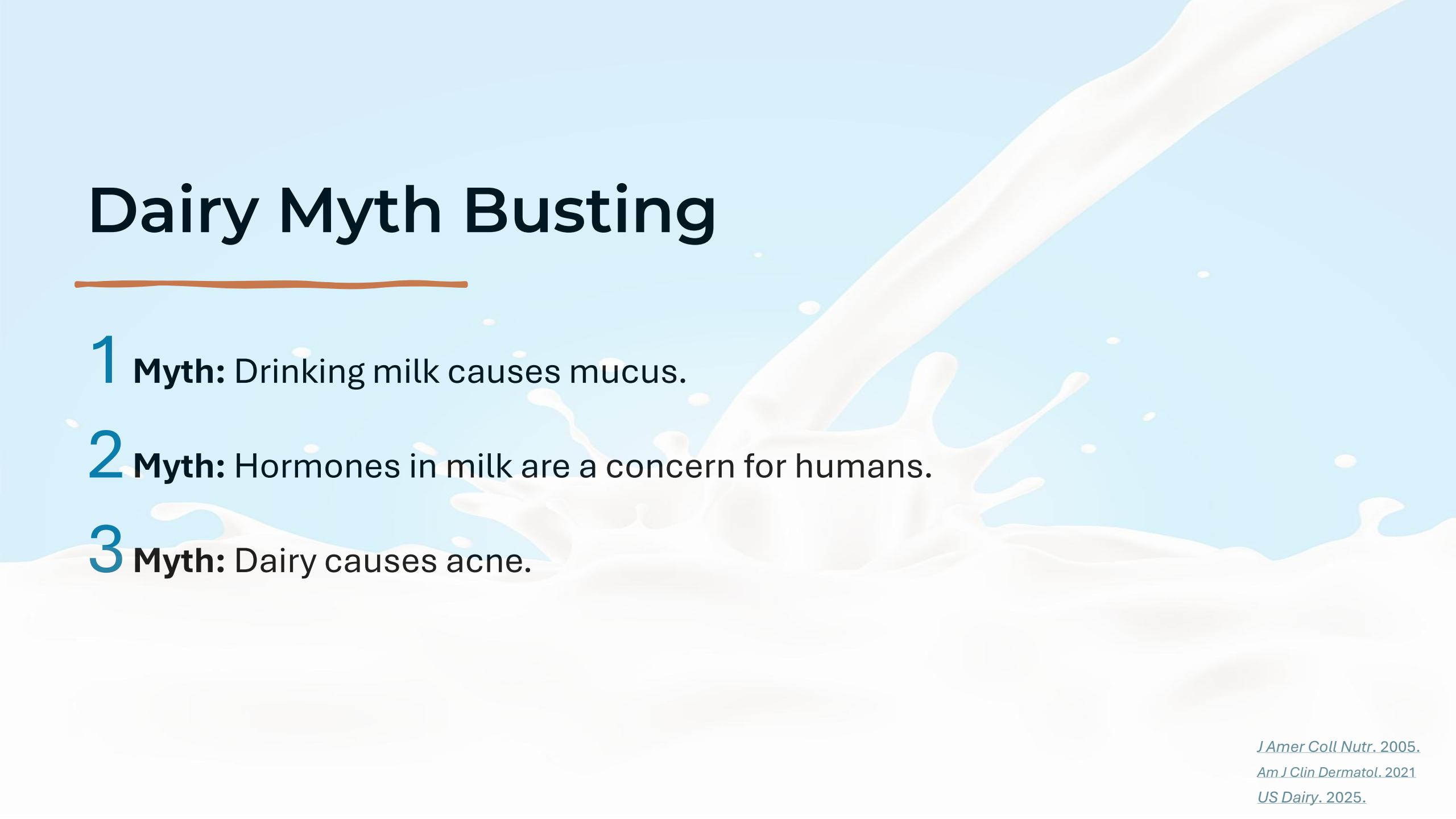
# Milk Matrix Transformation: Fermented Dairy Foods



- Yogurt
- Cultured Buttermilk
- Sour Cream
- Kefir
- Koumiss
- Labneh (pictured)



# Dairy Myth Busting



- 1 **Myth:** Drinking milk causes mucus.
- 2 **Myth:** Hormones in milk are a concern for humans.
- 3 **Myth:** Dairy causes acne.

# Dairy as Part of Recommended Eating Patterns

## Mediterranean Diet



2 ½ servings/day

## DASH Diet



2-3 servings/day

**Dairy adds to the nutrients, flavor and texture in plant-forward plates.**





## In Summary...

- Nutrition science continues to evolve
- Foods are more than the sum of their nutrients
- The dairy food matrix and its unique combination of nutrients and bioactives may help explain:
  - why dairy foods are associated with functional health benefits and multiple positive health outcomes
- Dairy foods fit into healthy, culturally relevant eating patterns

# Menti Poll

Join at [menti.com](https://menti.com) use code 48049105



Join at menti.com | use code 4804 9105

What does the term "dairy matrix" mean to you?

fast bold  
creative  
inspiration leader focus  
transpiration



Mentimeter

Menti

Dairy Matrix Nuestros S...



Choose a slide to present





Q&A

