



**From Farm to Table to the Gut: Fermented Dairy**

Indiana Academy of Nutrition and Dietetics 2019 Annual Meeting  
April 11, 2019



---

---

---

---

---

---

---

---

---

---

**Today's Presenters**

**Allison Koch, MS, RD, CSSD, LDN**  
Director, Health & Wellness  
Partnerships  
National Dairy Council  
[allison.koch@dairy.org](mailto:allison.koch@dairy.org)  
[@RunningRDN](#)



**#DairyNourishesLife**



---

---

---

---

---

---

---

---

---

---

**Learning Objectives**

1. Distinguish between fermented foods and probiotics
2. Discuss the growing body of scientific evidence supporting consumption of fermented dairy foods within healthy dietary patterns and:
  - a. Reduced risk of type 2 diabetes (T2DM)
  - b. Reduced risk of cardiovascular disease (CVD)
  - c. Emerging evidence on yogurt's role in reducing inflammation
3. Describe the benefits of dairy food / fermented dairy matrix
4. Provide practical examples for building healthy and appealing eating patterns, which incorporate fermented dairy foods



---

---

---

---

---

---

---

---

---

---

**Fermented Foods:  
What is old is new again**



[https://commons.wikimedia.org/wiki/File:Egyptian-woman-painting\\_Beer.jpg](https://commons.wikimedia.org/wiki/File:Egyptian-woman-painting_Beer.jpg)

NationalDairyCouncil.org  
@NIDairyCouncil

**NDC** NATIONAL DAIRY COUNCIL | 4

---

---

---

---

---

---

---

---

**Americas**

<b>Hawaii Poi</b>	<b>Mexico Pozol</b>	<b>Colombia Guarapo</b>	<b>Peru Champus</b>
			

NationalDairyCouncil.org  
@NIDairyCouncil

**NDC** NATIONAL DAIRY COUNCIL | 5

---

---

---

---





---

---

---

---

**Asia**

<b>Korea Kimchi</b>	<b>Japan Natto</b>	<b>Tibet Jun</b>	<b>India Lassi</b>
			

NationalDairyCouncil.org  
@NIDairyCouncil

**NDC** NATIONAL DAIRY COUNCIL | 6

---

---

---

---

---

---

---

---

**Africa**

<b>Ethiopia</b> Injera	<b>Ethiopia</b> Ayib	<b>South Africa</b> Incwancwa	<b>Nigeria</b> Iru
			

NationalDairyCouncil.org @NIDairyCouncil **NDC** NATIONAL DAIRY COUNCIL | 7

---

---

---

---

---

---

---

---

---

---

**Europe**

<b>Germany</b> Sauerkraut	<b>Eastern Europe</b> Smetana	<b>Iceland</b> Skyr	<b>Central Europe</b> Kefir
			

NationalDairyCouncil.org @NIDairyCouncil **NDC** NATIONAL DAIRY COUNCIL | 8

---

---

---

---

---

---

---

---

---

---

**The History of Yogurt**

Herdsman in the Middle East kept milk in goatskin bags, which transformed into a tangy custard

Yogurt became a popular way to preserve milk of domesticated animals

2,000 BC

The Turks were the first to evaluate yogurt's medicinal use in a comprehensive dictionary, *Diwan Lughat al-Turk*

1072

Genghis Khan, is reputed to have fed his army yogurt, based on the belief it instilled strength and bravery

1208

*Lactobacillus bulgaricus*, responsible for milk fermentation is discovered

1905

Metchnikoff's theory on yogurt's "Life-extending" properties

1909

Yogurt is commercialized through pharmacies

1919

NationalDairyCouncil.org Modified from: *Yogurt in Nutrition. Complete History of Yogurt Making* **NDC** NATIONAL DAIRY COUNCIL | 9

---

---

---

---

---

---

---

---

---

---

### Fermented Foods: Topping the Trends Lists

Pickled, fermented foods are great for gut health

Go with your gut: Why fermented foods could be next superfood trend

**TOP 10 SUPERFOODS**  
 1. Fermented foods  
 2. ...  
 10. ...

Health Beat: Fermented food boosts health

Who Knew? Fermented Ingredients Also Do Amazing Things for Your Skin Care

Source: Pollack Today's Dietitian, What's Trending in Nutrition, 2019

National Dairy Council | 10

---

---

---

---

---

---

---

---

---

---

### What are fermented foods?

A fermented food or beverage is a type of food made by extensive microbial growth. These foods are nothing new. They've been around for thousands of years. To understand how fermented foods are made, let's look at yogurt.

Yogurt is a fermented food made from milk. During yogurt fermentations, lactic acid-producing bacteria grow on the sugars and other nutrients in milk. As they multiply, the bacteria produce compounds that change the flavor, texture, and nutrients in the milk to give us what we know as yogurt.

**The value of fermented foods**

- Source of live, active microbes
- Improve food taste, texture, and food digestibility
- Increase concentrations of vitamins and bioactive compounds in foods
- Remove/reduce toxic or anti-nutrients in raw foods
- Increase food safety and shelf life

National Dairy Council | 11

---

---

---

---

---


---

---

---

---

---



National Dairy Council | 12

---

---

---

---

---

---

---

---

---

---

### Fermented Food or Probiotic?

#### Fermented Foods

- ✓ Made with microorganisms
- ✓ May or may not contain live active cultures at a level to confer a health benefit
- ✓ Most cheeses are fermented foods



The voluntary Live & Active Culture seal indicates a significant amount of the good bacteria remain alive after the fermentation process is complete.

#### Probiotics

- ✓ Should meet FAO definition: "Probiotics are *live microorganisms* that, when administered in *adequate amounts* confer a *health benefit*"
- ✓ Yogurts can be considered probiotic for people with lactose intolerance because traditional cultures, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, have been well studied for their ability to help with lactose digestion

---

---

---

---

---

---

---

---

---

---

### Fermented Foods and Gut Health

- The human digestive tract contains approximately 100 trillion bacterial cells = gut microbiota<sup>1</sup>
- An imbalance between "good" bacteria and "bad" bacteria = dysbiosis<sup>2</sup>
- Factors influencing the gut microbiota composition<sup>2</sup>
  - Vaginal birth vs. Cesarean
  - Breast vs. formula feeding infants
  - Diet and intake of fiber
  - Antibiotic use
  - Hygiene levels
  - Genetic background
- Some diseases are characterized by microbial colonization patterns that differ from healthy controls<sup>3</sup>
- Fermented foods *may* contain living cultures that can add beneficial bacteria to the digestive tract<sup>3</sup>
- Eating fermented foods helps maintain a balance between good and bad bacteria → contributing to a healthier microbiota<sup>3</sup>

---

---

---

---

---

---

---

---

---

---

## Dairy Foods and Health Outcomes

---

---

---

---

---

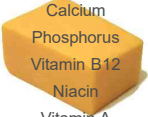
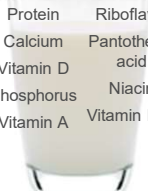
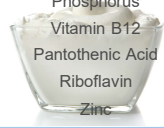
---

---

---


---

---

<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"><b>Cheese*:</b> 6 essential nutrients</div>  <ul style="list-style-type: none"> <li>Protein</li> <li>Calcium</li> <li>Phosphorus</li> <li>Vitamin B12</li> <li>Niacin</li> <li>Vitamin A</li> </ul>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"><b>Milk:</b> 9 essential nutrients</div>  <ul style="list-style-type: none"> <li>Protein</li> <li>Calcium</li> <li>Vitamin D</li> <li>Phosphorus</li> <li>Vitamin A</li> <li>Riboflavin</li> <li>Pantothenic acid</li> <li>Niacin</li> <li>Vitamin B12</li> </ul>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"><b>Yogurt:</b> 7 essential nutrients</div>  <ul style="list-style-type: none"> <li>Protein</li> <li>Calcium</li> <li>Phosphorus</li> <li>Vitamin B12</li> <li>Pantothenic Acid</li> <li>Riboflavin</li> <li>Zinc</li> </ul>
--	--	--

\*This Photo by Unknown Author is licensed under CC BY-SA/NC

NationalDairyCouncil.org  
@NIDairyCouncil
Nutrients based on USDA Database for Cheddar #01009

 | 16

---

---

---

---

---

---

---


---

---

---

2005, 2010, 2015\*  
Dietary Guidelines  
Recommend  
3 Daily Servings of  
Dairy Foods  
for Those  $\geq 9$  years


\*3 servings for Americans 9 years and older in the Healthy U.S. Style and Healthy Vegetarian Eating Patterns.



The 2015 DGA states that healthy eating patterns, including low-fat or fat-free dairy foods, are associated with reduced risk for several chronic diseases, including cardiovascular disease (strong evidence) and type 2 diabetes (moderate evidence). Research has also linked dairy intake to improved bone health, especially in children and adolescents.

Dietary Guidelines for Americans, 2015-2020

NationalDairyCouncil.org  
@NIDairyCouncil

 | 17

---

---

---

---

---

---

---


---

---

---

## Fermented Dairy Foods and Health Outcomes

NationalDairyCouncil.org  
@NIDairyCouncil

 | 18

---

---

---

---

---

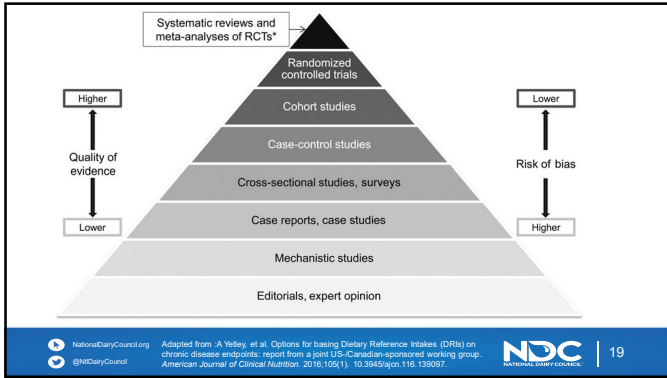
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

## Fermented Dairy Foods & Type 2 Diabetes

Visit Science Summaries at [nationaldairycouncil.org](http://nationaldairycouncil.org)

NationalDairyCouncil.org  
 @NIDairyCouncil NDC NATIONAL DAIRY COUNCIL | 20

---

---

---

---

---

---

---

---

---

---

### Dairy Foods are Linked to Reduced Risk of Type 2 Diabetes

The American Journal of CLINICAL NUTRITION | PLOS ONE

Dairy products and the risk of type 2 diabetes: a systematic review and dose-response meta-analysis | Dairy Products Consumption and Risk of Type 2 Diabetes: Systematic Review and Dose-Response Meta-Analysis

What does 400g of dairy a day look like?  
 1 cup fluid milk = 245g  
 1 oz cheese = 28g  
 1, 6-oz container yogurt = 170g  
 TOTAL = 443g or 3 servings

Total dairy intake risk of type 2 diabetes: Beneficial associations with dairy products, low-fat

Meta-Analysis of Studies: 0 subjects  
 3% reduced risk of type 2 diabetes with 30g/d of dairy

\*For reference: 8 fl oz (1 cup) fluid milk = 245 g; 1 oz (slice) cheese = 28g; 1, 6-oz (container) yogurt = 170 g (US Department of Agriculture (USDA), Agricultural Research Service, Nutrient Data Laboratory; USDA National Nutrient Database for Standard Reference, Legacy, Version Current: April 2018. Internet: <http://www.ars.usda.gov/nutrientdata/>)

NationalDairyCouncil.org  
 @NIDairyCouncil Aune D et al. *Am J Clin Nutr*. 2013; 98(4):1066-83. Gao D et al. *PLOS One*. 2013; 8(9):e73965. NDC NATIONAL DAIRY COUNCIL | 21

---

---

---

---

---

---

---

---

---

---

### Consistent Evidence Demonstrates Eating Yogurt is Associated with Reduced Risk for Type 2 Diabetes

**BMC Medicine**

Dairy consumption and risk of type 2 diabetes: 3 cohorts of US adults and an updated meta-analysis

**The American Journal of CLINICAL NUTRITION**

Consumption of dairy foods and diabetes incidence: a dose-response meta-analysis of observational studies<sup>1,2</sup>

Wu Qian<sup>1</sup>, Gao Lian<sup>1</sup>, Gibbers Consensus<sup>1,2</sup>, Davich Mozaffarian<sup>1,2,3</sup>, Johnson E Marcell<sup>1,2</sup>, White C. Willett<sup>1,2</sup> and Frank B Hu

Erica Sajilata<sup>1</sup>, Amy J. Almy<sup>1,2</sup>, Stewart J. Mink<sup>1</sup>, Anne M. Karim<sup>1</sup>, Johannes W. Gidding<sup>1</sup>, and Subhojit Chakrabarti<sup>1</sup>

<b>14 Prospective Cohort Studies</b> >450,000 participants	<b>22 Cohort Studies</b> >570,000 individuals
---	--

Yogurt intake (one serving/day) associated with a 17% reduced risk for type 2 diabetes

14% reduced risk per 80 g/day (~1/3-1/2 cup per day) compared to 0 g/day yogurt intake

NationalDairyCouncil.org  
NationalDairyCouncil

Chen et al. *BMC Med.* 2014; 12:216.  
Gibbers et al. *Am J Clin Nutr.* 2016; 103(4):1111-24.

**NDC** | 22  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

---

---

---

### Changes in Diet and Lifestyle and Long-Term Weight Gain in Women and Men

**The NEW ENGLAND JOURNAL of MEDICINE**

Dariusz Mozaffarian, M.D., Dr.P.H., Tao Hao, M.P.H., Eric B. Rimm, Sc.D., Walter C. Willett, M.D., Dr.P.H., and Frank B. Hu, M.D., Ph.D.

3 Cohort Studies (NHS I & II, HPFS)  
>120,000 women and men

Each serving of yogurt/d was associated with -0.82 lb. weight change over a 4 year period

Food	NHS (women)	NHS II (women)	HPFS (men)
Potato chips	~1.6	~1.4	~1.1
Potatoes or fries	~1.4	~1.2	~0.9
Processed meats	~1.1	~1.0	~0.8
Unprocessed red meats	~0.9	~0.8	~0.7
Butter	~0.3	~0.2	~0.1
Sweets and desserts	~0.3	~0.2	~0.1
Refined grains	~-0.4	~-0.4	~-0.3
Cheese	~-0.4	~-0.4	~-0.3
Vegetables	~-0.4	~-0.4	~-0.3
Nuts	~-0.4	~-0.4	~-0.3
Whole grains	~-0.4	~-0.4	~-0.3
Fruits	~-0.4	~-0.4	~-0.3
Yogurt	~-0.8	~-0.8	~-0.7

NationalDairyCouncil.org  
NationalDairyCouncil

Mozaffarian D et al. *NEJM.* 2011; 364:2392-2404.

**NDC** | 23  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

---

---

---

## Fermented Dairy Foods & Cardiovascular Disease

Visit Science Summaries at [nationaldairy council.org](http://nationaldairy council.org)

NationalDairyCouncil.org  
NationalDairyCouncil

**NDC** | 24  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

---

---

---





### Hypertension Results: Yogurt and DASH Scores

**Journal of Hypertension**  
Long-term yogurt consumption and risk of incident hypertension in adults

3 Cohort Studies (NHS I & II, HPFS)  
~184,000 participants

"Higher total dairy intake (3 to <6 servings/day), especially in the form of yogurt (at least 5 servings/week), was associated with lower risk of incident HBP in middle-aged and older adult men and women."

NDC sponsored study

NationalDairyCouncil.org | Buendia JR et al. J of Hypertension. 2018;36(8):1671-79. | NDC | 28

---

---

---

---

---

---

---

---

---

---

### Yogurt Consumption Associated with Reduced Cardiovascular Disease Risk in Adults with Hypertension

**METHODOLOGY**

**How many people participated?**  
Data from more than 55,000 females in the Nurses' Health Study and 18,000 males in Health Professionals Follow-up Study was analyzed.

**What did the researchers study?**  
The association between eating yogurt and CVD risk (myocardial infarction and stroke) among adults with high blood pressure.

**AJH AMERICAN JOURNAL OF HYPERTENSION**  
Regular Yogurt Intake and Risk of Cardiovascular Disease Among Hypertensive Adults

2 Cohort Studies (NHS & HPFS)  
~74,000 participants

**RESULTS**  
Eating at least 2 cups of yogurt per week

**30%** reduction in risk of having a heart attack or stroke

**19%** reduction in risk of having a heart attack or stroke

"Hypertensive men and women who consumed  $\geq 2$  servings/week of yogurt, especially in the context of a healthy diet, were at lower risk for developing CVD."

NDC sponsored study

NationalDairyCouncil.org | Buendia JR et al. Am J Hypertension. 2018; 31(5): 557 - 65. | Infographic adapted from Bell Institute | NDC | 29

---

---

---

---

---

---

---

---

---

---

### Fermented Dairy Foods & Inflammation

**Inflammation**

- ✓ Eating dairy foods does not seem to be linked to increased inflammation
- ✓ In some cases eating dairy foods has been linked to reduced indicators of systemic inflammation

**Critical Reviews in Food Science and Nutrition**  
Dairy products and Inflammation: A review of the clinical evidence

Alessandra Bordini, Francesca Danesi, Dominique Dardevet, Didier Dupont, Aida S. Fernandez, Doreen Gilie, Claudia Nunes dos Santos, Paula Pinto, Roberta Rio, Didier Rémond, Dani R. Shabar & Guy Vergères

Systematic Review of 52 Clinical Trials

NDC sponsored study

NationalDairyCouncil.org | NDC | 30

---

---

---

---

---

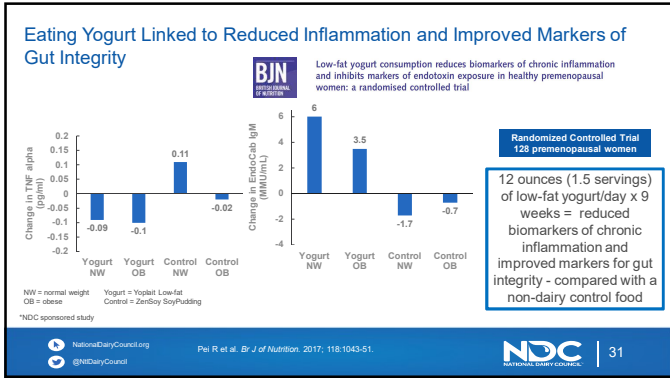
---

---

---

---

---




---

---

---

---

---

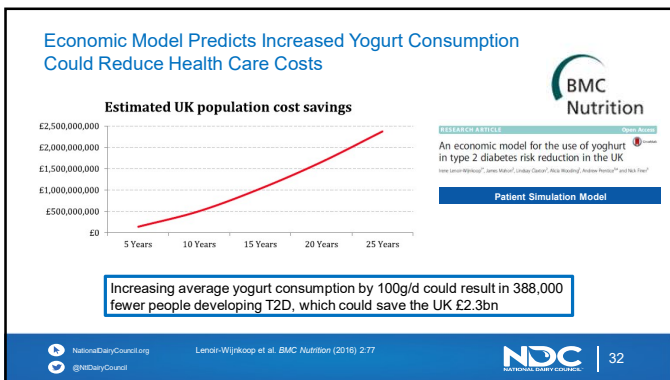
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

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

NationalDairyCouncil.org  
@NIDairyCouncil

**NDC** | 34  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

---

---

**Fermented Dairy Foods Matrix**

**DELIVERY OF LIVE FERMENTS TO THE GI TRACT**

- Microorganisms in the diet**  
The consumption of 'living' fermented foods potentially increases the numbers of microorganisms by up to 10 000-fold<sup>10</sup>.  
It could be equivalent to introducing new, albeit transient, bacteria into the indigenous, intestinal microbiota<sup>11</sup>.
- Practical vehicle**  
The delivery of microorganisms to the GI tract is supported by the food matrix, which promotes the long-term survival of microorganisms during distribution and storage<sup>12</sup>.  
The consumption of 'live' yogurt cultures in yogurt contributes to improve digestion of lactose in individuals with lactose maldigestion<sup>13</sup>.

**YOGURT NUTRITION**  
INITIATIVE FOR A BALANCED DIET

NationalDairyCouncil.org For full list of references, visit: <http://www.yogurtinnutrition.com/live-ferments-fermentation-of-milk-into-yogurt/>  
@NIDairyCouncil

**NDC** | 35  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

---

---

**People are Asking...**

*Is this good for my body?*

*Is this good for the animals?*

*Is this good for the planet?*

NationalDairyCouncil.org  
@NIDairyCouncil

**NDC** | 36  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

---

---




---

---

---

---

---


---

---

---

---

---



**Recombinant Bovine Somatotropin (rbST): A Safety Assessment**

Initially presented at the Joint Annual Meeting of the American Dairy Science Association\*, Canadian Society of Animal Science, and American Society of Animal Science

Montreal, Canada  
July 14, 2009

Updated on March 22, 2010

"...food products from cows treated with rbGH are safe for consumption by human."

"The FDA's review of rbGH has been scrutinized by both the Department of Health and Human Services' Office of Inspector General (OIG) and by GAO, as well as by JECFA."

NationalDairyCouncil.org  
@NDCDairyCouncil

**NDC**  
NATIONAL DAIRY COUNCIL

38

---

---

---

---

---

---

---

---

---

---

**In Only 70 Years,  
We've Reduced our Impact...**

- 90% less land
- 65% less water
- 76% less manure
- 63% less GHG

The dairy community has a voluntary commitment to further reduce GHG 25% by 2020

US Dairy Stewardship Commitment

Croper J, Cady A, Bauman D. 2009. The environmental impact of dairy production, 1944 compared with 2007. Journal of Animal Science, 87: 2100-2107

---

---

---

---

---

---

---

---

---

---

## From Research to Resources and Recipes


[NationalDairyCouncil.org](http://NationalDairyCouncil.org)  
[@NDCDairyCouncil](https://twitter.com/NDCDairyCouncil)

 | 40

---

---

---

---

---

---

---

---


---

---

### Safety & Storage to Minimize Food Waste

#### Cheese

- Do not leave at room temperature for  $\geq 2$  hours, 1 hour if  $\geq 90^\circ$  F
- Keep refrigerator at 35-40° F
- Factor 20-30 minutes to come to room temp
  - **Soft Cheeses:** Toss after 2 hours
  - **Hard Cheeses:** Can sit out for 2 hours then wrap well; refrigerate to use again




Mold?


- **Soft Cheeses:**  
Don't eat
- **Hard Cheeses:**  
Cut  $\geq 1"$  around and below the mold spot, re-cover the cheese in fresh wrap

What about freezing?

- Softer cheese freeze well when shredded
- Aged cheese may become crumbly
- Thaw 24-28 hours in refrigerator


[NationalDairyCouncil.org](http://NationalDairyCouncil.org)  
[@NDCDairyCouncil](https://twitter.com/NDCDairyCouncil)

<https://dairygood.org/content/2016/how-long-can-cheese-sit-out>  
<https://dairygood.org/content/2018/can-you-freeze-cheese>  
<https://dairygood.org/content/2018/can-you-eat-moldy-cheese>

 | 41

---

---

---

---

---

---

---

---


---

---


### Safety & Storage to Minimize Food Waste

#### Yogurt


- Do not leave at room temperature for  $\geq 2$  hours, 1 hour if  $\geq 90^\circ$  F
- Keep refrigerator at 35-40° F
- Stored properly, shelf-life: 7-14 days
- Store tightly covered in original container on top shelf of refrigerator
- Eating only a portion of a carton?
  - Spoon out what you intend to eat and return the carton to the refrigerator



- If separation occurs, stir the liquid (aka: whey) back into the yogurt
- What about freezing?
  - Changes texture; may lose active cultures
  - Won't significantly impact nutritional value


[NationalDairyCouncil.org](http://NationalDairyCouncil.org)  
[@NDCDairyCouncil](https://twitter.com/NDCDairyCouncil)

<https://dairygood.org/content/2017/how-long-can-yogurt-sit-out>  
<https://dairygood.org/content/2018/can-you-freeze-yogurt>

 | 42

---

---

---

---

---

---

---

---

---

---

**Quick Tips for Adding More Fermented Dairy to Your Plate**

**Breakfast**

- Add yogurt, kefir or buttermilk to your smoothies, granola or oatmeal
- Create a savory breakfast bowl and top with yogurt and shredded cheese



**Lunch/Dinner**

- Use yogurt in place of mayonnaise on your sandwiches
- Try a yogurt-based salad dressing or make your own ranch using buttermilk
- Top salads with flavorful cheeses to add depth



**Snacks**

- Create your own dips using buttermilk or yogurt as the base
- Create yogurt parfaits by layering yogurt with granola & fresh fruit




---

---

---

---

---

---

---

---

---

---

**Bringing Science to the Table**



Visit [www.nationaldairyCouncil.org/recipes](http://www.nationaldairyCouncil.org/recipes) for inspiration on how to bring the benefits of fermented dairy foods to the table



**RECIPE**

9 Simple Ways to Help You Get 3 Servings of Dairy



**LUNCH**

Grilled Shrimp with Yogurt Cilantro Salsa



**BREAKFAST**

14 Tasty Twists on Overnight Oats



**APPETIZER**

Roasted Red Pepper Yogurt Dip

---

---

---

---

---

---

---

---

---

---

**Conclusions**

- Current Dietary Guidelines for American 9 years and older recommend 3 daily servings of dairy foods as part of healthy diet patterns
- Fermented dairy food consumption is on the rise and is associated with lower risk of type 2 diabetes and cardiovascular disease as part of healthy diet patterns
- Emerging evidence suggest a reduction in post-meal and chronic inflammation may be one of the mechanisms mediating these beneficial effects
- Foods are more than just the sum of their individual nutrients; the dairy foods/fermented dairy matrix is unique and needs to be considered collectively when looking to understand these health benefits

---

---

---

---

---

---

---

---

---

---

**Dairy Nourishes**  
— NETWORK —

Dairy Nourishes Network members will receive:

- Quarterly updates
- Advance notice of webinars
- Recipe ideas/meal tips
- Engaging contests
- Opportunities to be highlighted on NDC's social
- In-person educational and networking events

[www.NationalDairyCouncil.org/DairyNourishesNetwork](http://www.NationalDairyCouncil.org/DairyNourishesNetwork)

NationalDairyCouncil.org  
@NIDairyCouncil

**NDC** | 46  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

**Questions?**

**Allison Koch, MS, RDN, CSSD**  
Director, Health & Wellness  
Partnerships  
National Dairy Council  
allison.koch@dairy.org  
@RunningRDN



#DairyNourishesLife

**NDC** | 47  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---

**Thank You!**

#DairyNourishesLife

**NDC** | 48  
NATIONAL DAIRY COUNCIL

---

---

---

---

---

---

---

---