



**TAMING THE FLAME:**  
*Dairy and Inflammation*

**NDC**  
NATIONAL DAIRY COUNCIL™

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**Today's Speakers**



**Bradley Bolling, PhD**  
Associate Professor, Department of Food Science  
University of Wisconsin-Madison



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Owner, Jim White Fitness & Nutrition Studios  
NDC Ambassador

USDairy.com @NIDairyCouncil #DairyNourishesLife

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**Objectives**


After this session, participants will be able to:

- Summarize the current evidence on dairy food consumption and inflammatory responses as it relates to chronic disease risk and incidence
- Explain how dairy foods provide nutrients that have potential anti-inflammatory effects
- Share tips and recipes that incorporate anti-inflammatory foods including milk, lactose free milk, cheese and yogurt

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**Food Science**  
UNIVERSITY OF WISCONSIN-MADISON

**Food for health:**

**What do we know about dairy consumption and inflammation?**

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## Disclosures

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 USDA HATCH WIS02094  
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 UW Dairy Innovation Hub  
 UW-Madison Graduate School  
 UW-Madison Dept. of Food Science  
 Wisconsin Alumni Research Foundation

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**Honoraria/Travel Support:** **National Dairy Council**  
 NZO (Dutch Dairy Association)

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**Patent:** US Application 17/003,625

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### What is the "perfect meal"?




### What is the "perfect diet"?



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## Dietary Recommendations



DGA: Healthy U.S.-Style Dietary Pattern  
 DGA: Mediterranean-style Dietary Pattern  
 DGA: Vegetarian Dietary Pattern  
 Dietary Approaches to Stop Hypertension (DASH)

Following the Dietary Guidelines Can Help Improve Americans' Health

Each step closer to eating a diet that aligns with the Dietary Guidelines is associated with:


Lower Risk of Heart Disease

Lower Risk of Type 2 Diabetes

Lower Risk of Cancer

Lower Risk of Obesity

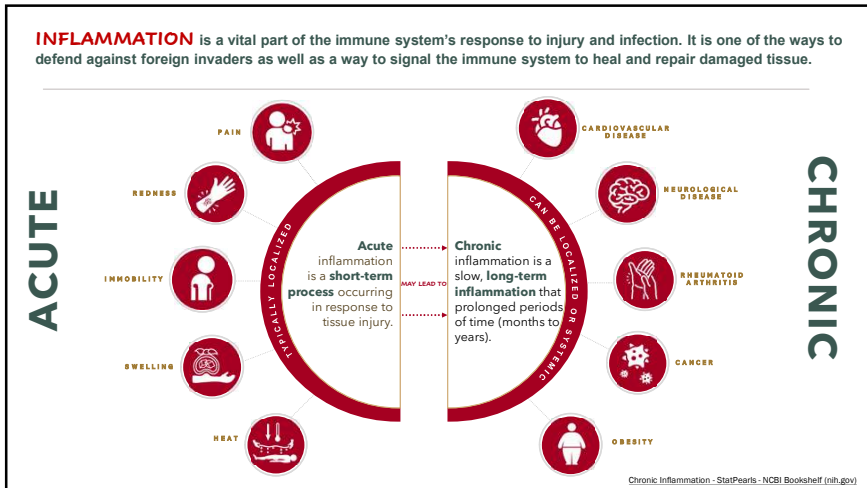
Lower Risk of Hip Fracture



*Diet & risk of chronic disease (in healthy individuals)*

<https://www.nhlbi.nih.gov/health-topics/dash-eating-plan>  
<https://www.fda.gov/food/food-labeling-nutrition/authorized-health-claims-meet-significant-scientific-agreement-ssa-standard>

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## Chronic Inflammation

**Characteristics**

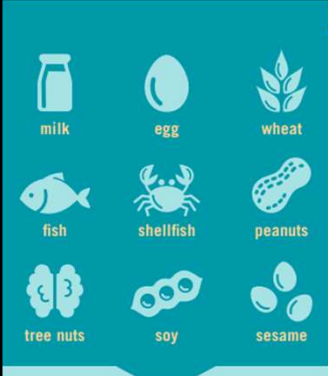
- Low-grade & unresolved
- May not have outward symptoms
- Associated with chronic diseases
- Risks
  - obesity
  - environmental chemical exposure
  - stress
  - nutrition
  - microbiome



<https://www.niehs.nih.gov/health/topics/conditions/inflammation/index.cfm>

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## Foods, immune health and inflammation



**9 MAJOR PROTEINS**  
that trigger allergic reaction

**Pro-inflammatory foods**

- Allergic responses: acute, potentially severe immune response
- Celiac disease: immune response to gluten

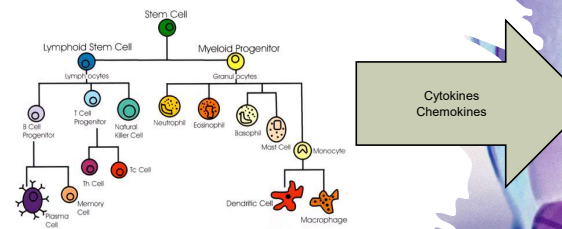
*Are other foods or nutrients pro-inflammatory or anti-inflammatory?*

Image: FARE Consumer Journey Infographic.pdf  
Allergy and Asthma Foundation <https://www.usa.aaia.com/news-articles/kids-lactose-intolerance-what-you-need-to-know>

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## Chronic Inflammation

**Cells**



**Cytokines Chemokines** → **Liver**

**Biomarkers**

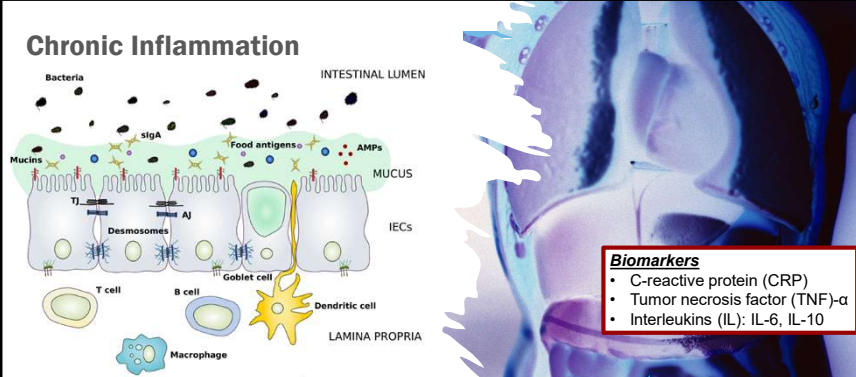
- C-reactive protein (CRP)
- Tumor necrosis factor (TNF)- $\alpha$
- Interleukins (IL): IL-6, IL-10

**Tissues**  
The gut is an important site of immune function ← **Gut**

Image: [http://textbookofbacteriology.net/adaptive\\_2.html](http://textbookofbacteriology.net/adaptive_2.html)

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## Chronic Inflammation



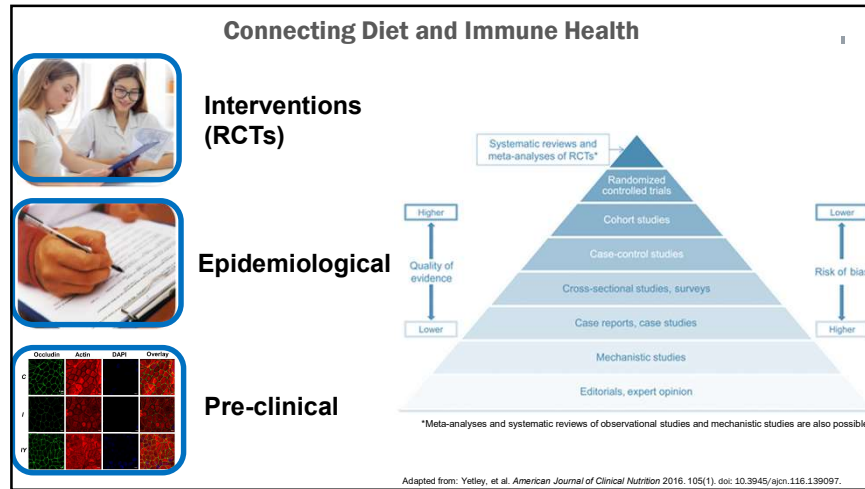
**Biomarkers**

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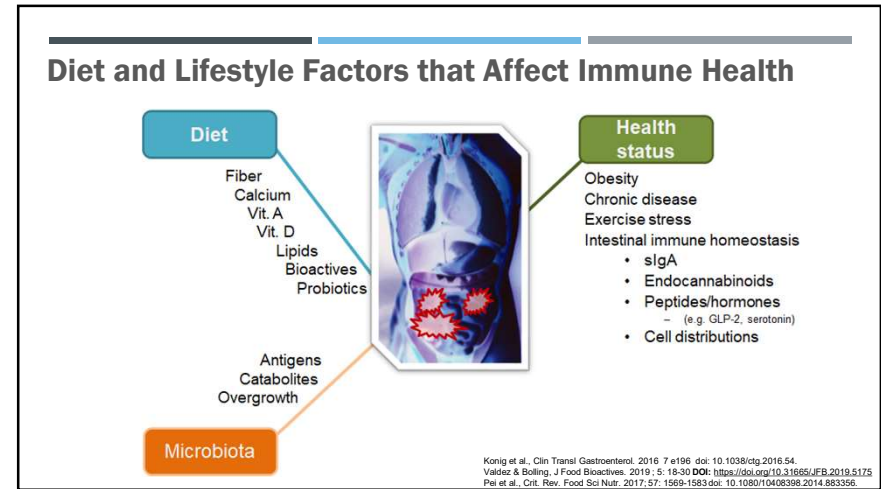
**Tissues**  
The gut is an important site of immune function ← **Gut**

Vancamelbeke & Vermeire '17 Expert Rev Gastroenterol Hepatol 11:821-834 doi: 10.1080/17474124.2017.1343143.

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### Overview of Dairy Specific Studies

**Epidemiological studies**

- Byrd et al., *J. Nutr.* 2019;149:2206-2218
- Shi et al., *J. Acad. Nutr. Diet.* 2021;13:S2212-2672
- Yuan et al., *Nutrients* 2021;13:506

**Intervention studies**

- Systematic reviews
  - Bordonni et al., *Crit. Rev. Food Sci. Nutr.* 2017;57:2497-2525
  - Ulven et al., *Adv. Nutr.* 2019;10(S2):S239-S250
  - Nieman et al., *J. Am. Col. Nutr.* 2020;1800532
  - Moosavian et al., *Nutr. Met. Cardio. Dis.* 2020;30:872-888
- Pei et al., *Br. J. Nutr.* 2017;118:1043-51
- Pei et al., *J. Nutr.* 2018;148:910-6

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### Dairy Foods have Unique Components that Could Benefit Health

**Bioactives**

- α-lactalbumin
- β-lactoglobulin
- glycomacro-peptide
- lactoferrin
- polar lipids

**Bioactives**

- cultures
- probiotics
- peptides
- metabolites

**Bioactives**

- cultures
- probiotics
- metabolites
- peptides
- exopolysaccharides

Images: Milk, Cheese: UW-Madison College of Agriculture and Life Sciences (CALS); Yogurt: Michael P. King/UW-Madison CALS

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Epidemiology

## Dairy Consumption is Associated with Anti-inflammatory Dietary Factors

JN THE JOURNAL OF NUTRITION

**Development and Validation of Novel Dietary and Lifestyle Inflammation Scores**

Dharati A Byrd,<sup>1</sup> Suzanne E Jude,<sup>2</sup> W Diana Flanders,<sup>3</sup> Terry J Hartman,<sup>4</sup> Veronika Fedirko,<sup>5</sup> and Robert M Bonick<sup>1,6</sup>

**Reasons for Geographic and Racial Differences in Stroke Study (REGARDS)**  
N = 14,210 for hsCRP

**Outcomes**

- DIS, LIS positively associated with hsCRP
- Individual diet and lifestyle factors have modest association with inflammation (hsCRP)
- Aggregation of these factors may have more significant impact on inflammation

Byrd et al., J. Nutr. 2019;149:2206-2218. doi: 10.1093/jn/nxz165.

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Epidemiology

## Dairy Consumption is Inversely Associated with CRP and IL-6 Biomarkers

Journal of the Academy of Nutrition and Dietetics

**Associations of Dairy Intake with Circulating Biomarkers of Inflammation, Insulin Resistance, and Dyslipidemia among Postmenopausal Women**

Women's Health Initiative  
N = 35,352 postmenopausal women, aged 50-79

CRP, IL-6, IL-10, TNF- $\alpha$ , TNFR-2, adiponectin, leptin

"Higher intakes of total dairy, low-fat dairy, full-fat dairy, total cheese, full-fat cheese, and total yogurt (1 serving increments) were associated with lower CRP and IL-6 concentrations, with yogurt showing the largest percent decrease (-10.0% ...) in CRP concentrations and in IL-6 concentrations (-10.0%...)"

Shi et al., J. Acad. Nutr. Diet. 2021;22:2672. doi: 10.1016/j.jand.2021.02.029

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Epidemiology

## Yogurt Consumption is Inversely Associated with IL-6 & Fibrin; Cheese & Milk have No Association with Biomarkers of Inflammation

**nutrients**  
an Open Access Journal by MDPI

Article  
**Yogurt Consumption Is Associated with Lower Levels of Chronic Inflammation in the Framingham Offspring Study**

Mengjie Yuan, Matha R. Singar and Lynn L. Moore

**Table 2. Adjusted mean levels of inflammation biomarkers according to dairy food intake category.**

Biomarkers <sup>1</sup>	Yogurt		p-Value
	None	Some	
Log-CRP	1.19 ± 0.02	1.16 ± 0.03	0.40
Log-IL-6	1.31 ± 0.01	1.26 ± 0.02	0.02
Log-TNF $\alpha$	0.81 ± 0.01	0.82 ± 0.02	0.84
Log-ICAM1	5.50 ± 0.01	5.48 ± 0.01	0.26
Log-MCP1	5.72 ± 0.01	5.74 ± 0.02	0.51
Log-Fibrin	5.91 ± 0.01	5.89 ± 0.01	0.03

**Framingham Offspring Study**  
n = 1753  
Dairy intake from diet records  
Biomarkers: CRP, IL-6, TNF- $\alpha$ , ICAM1, MCP1, fibrin

"Results showed that those who consumed yogurt (vs. those who did not) had statistically significantly lower levels of interleukin-6 (IL-6) (mean log-transformed levels of 1.31 and 1.26 in consumers/non-consumers, respectively, p = 0.02) and fibrin (mean log-transformed levels of 5.91 and 5.89 in consumers/non-consumers, respectively, p = 0.03). ... No statistically significant associations were observed between any of these inflammation biomarkers and milk or cheese intakes."

Yuan et al., Nutrients. 2021; 13(2), 506. doi: 10.3390/nu13020506.

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Overview of Dairy Specific Studies


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  - Moosavian et al., Nutr. Met. Cario. Dis. 2020;30:872-888
- Pei et al., Br. J. Nutr. 2017;118:1043-51
- Pei et al., J. Nutr. 2018;148:910-6

Dairy is not "pro-inflammatory"  
Some inverse associations w/ inflammatory biomarkers, esp. yogurt



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## Dairy Foods Do Not Cause Inflammation

**The American Journal of CLINICAL NUTRITION**

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

Critical Reviews in Food Science and Nutrition

**Dairy products and inflammation: A review of the clinical evidence**

ISSN: 1040-4398 (Print) 1548-7652 (Online) journal homepage: <http://www.tandfonline.com>

Advances in Nutrition

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

**Systematic Review**  
27 Randomized Control Trials

"This systematic review shows that consumption of dairy products [i.e., milk, cheese, yogurt] and proteins [i.e., whey, casein] has neutral to beneficial effects on biomarkers of inflammation."

**Systematic Review**  
52 Clinical Trials

"Our review suggests that dairy products, in particular fermented products, have anti-inflammatory properties in humans not suffering from allergy to milk, in particular in subjects with metabolic disorders."

**Systematic Review**  
16 Studies

"The consumption of milk or dairy products did not show a proinflammatory effect in healthy subjects or individuals with metabolic abnormalities."

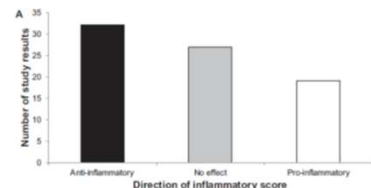
Hemari K, et al. The Effects of Dairy Product and Dairy Protein Intake on Inflammation: A Systematic Review of the Literature. J Am Coll Nutr. 2021 Aug; 40(6):571-582. doi: 10.1080/07315724.2020.1800532

Bordoni A, et al. Dairy Products and Inflammation: A Review of the Clinical Evidence. Crit Rev Food Sci Nutr. 2017 Aug 13; 57(12):2497-2525. doi: 10.1080/10408398.2014.967385

Ulven SM, et al. Milk and Dairy Product Consumption and Inflammatory Biomarkers: An Updated Systematic Review of Randomized Clinical Trials. Adv Nutr. 2019 May; 10(5):621-631. doi: 10.1093/advances/nmy072

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## Dairy Interventions Lead to Anti-inflammatory Effects, Except in those with Dairy Allergies



**"Inflammatory Score"**  
N = 52 intervention studies  
Included studies on allergy

**Conclusions:**

- Overall, net anti-inflammatory trend observed in both LF and HF dairy products
- Pro-inflammatory effects in allergic subjects

"The IS was strongly indicative of an anti-inflammatory activity in subjects with metabolic disorders and of a pro-inflammatory activity in subjects allergic to bovine milk."

Bordoni et al., Cr. Rev. Food Sci. Nutr. 2017; 2497-2525. doi: 10.1080/10408398.2014.967385

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## Recent RCTs Do Not support a "Pro-inflammatory" Effect of Dairy Consumption in Healthy Adults - Rather the Trend is Anti-inflammatory

Advances in Nutrition  
AN INTERNATIONAL REVIEW JOURNAL

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

Stine M Ulven,<sup>1</sup> Kirsten B Holven,<sup>1,2</sup> Angel Gil,<sup>1,3</sup> and Oscar D Rangel-Huerta<sup>1</sup>

**Other reviews**  
Nieman et al., 2020. J. Am. Col. Nutr. <https://doi.org/10.1080/07315724.2020.1800532>  
N = 27 RCTs through 2019; Neutral to beneficial effects on inflammation

Moosavian et al., 2020 Nutr Met. Cardio. Dis. 30, 872-888  
N = 11 RCTs through 2019; Null to anti-inflammatory effects

**Systematic review**  
N = 16 intervention studies,  
1/12 - 4/18

**Conclusions:**

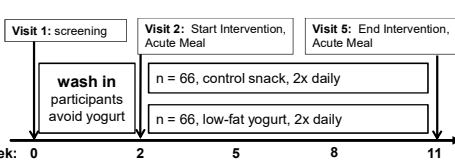
- Lack of pro-inflammatory effect in healthy or overweight/obese participants
- Weak anti-inflammatory effect in healthy and metabolically abnormal adults with long-term supplementation, but inconclusive from short-term interventions

"The consumption of milk or dairy products did not show a proinflammatory effect in healthy subjects or individuals with metabolic abnormalities. The majority of studies documented a significant anti-inflammatory effect in both healthy and metabolically abnormal subjects, although not all the articles were of high quality."


Ulven et al., Adv. Nutr. 2019; 1:10:239-250. doi: 10.1093/advances/nmy072.

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## Yogurt Modulates Markers of Gut Barrier Function and Inflammation

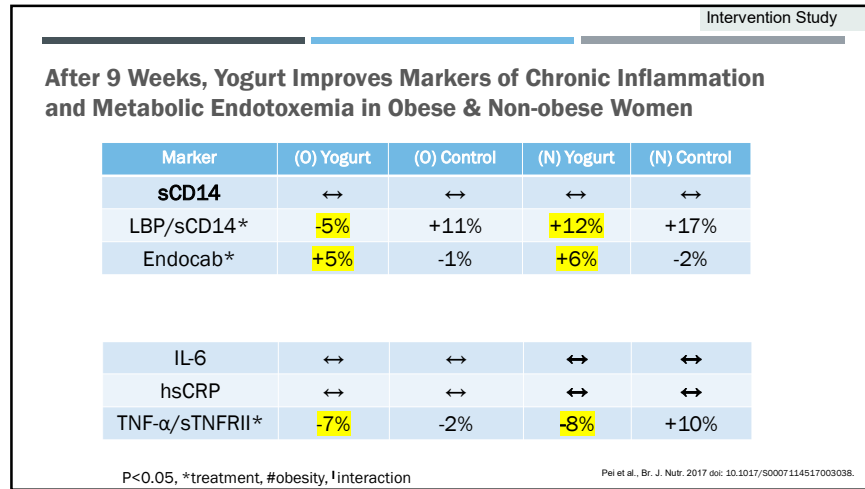


Non-obese: 18.5-27 kg/m<sup>2</sup>  
Obese: 30-40 kg/m<sup>2</sup>

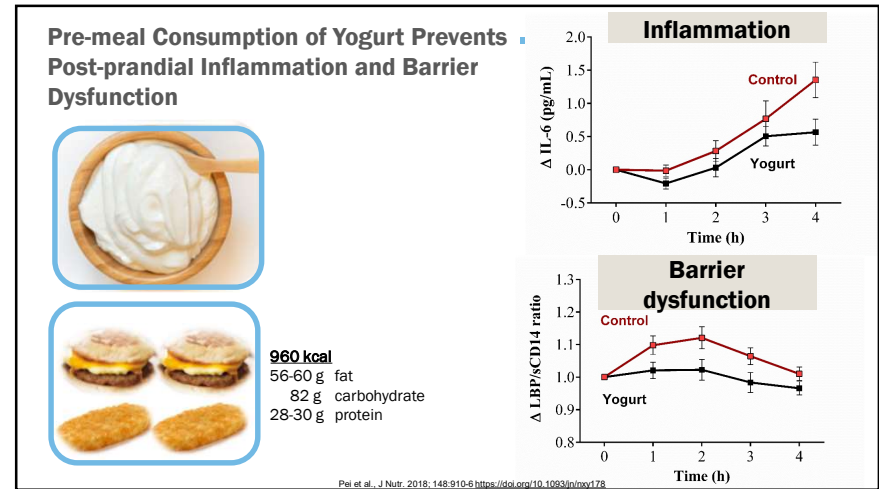


Pei et al., Br. J. Nutr. 2017;118:1043-51 doi: 10.1017/S0007114517003038.

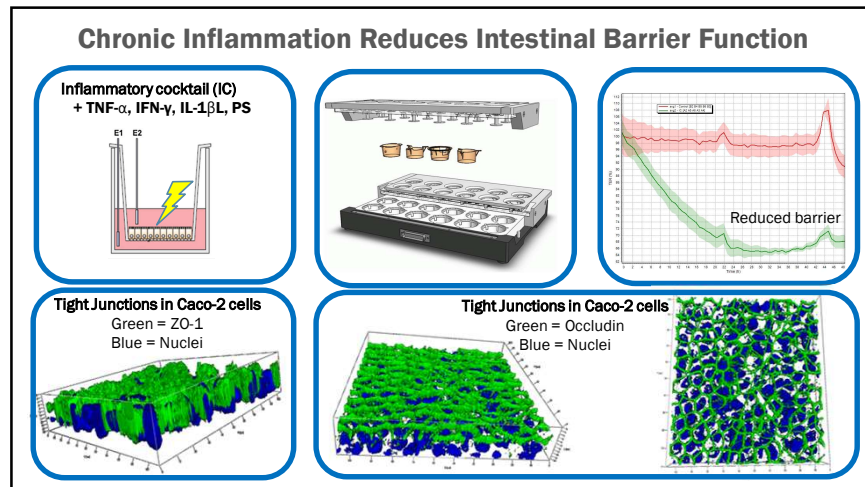
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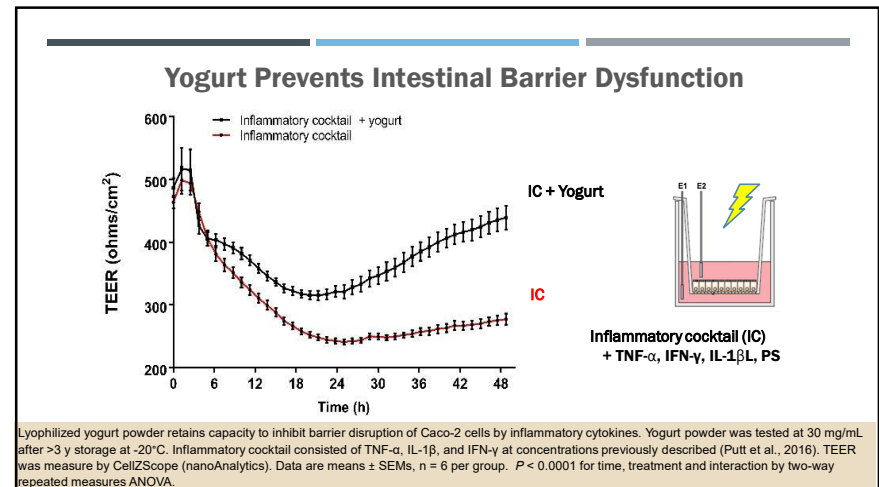
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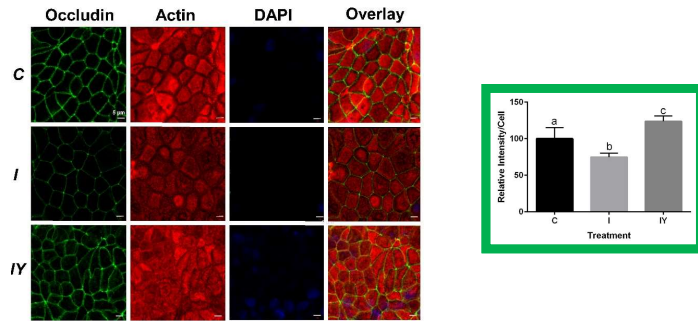


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### Yogurt Prevents Loss of Tight Junctions in Inflamed Caco-2 Cells



Putt et al. Food & Function 2017;8:406-414 DOI <https://doi.org/10.1039/C6FO01592A>

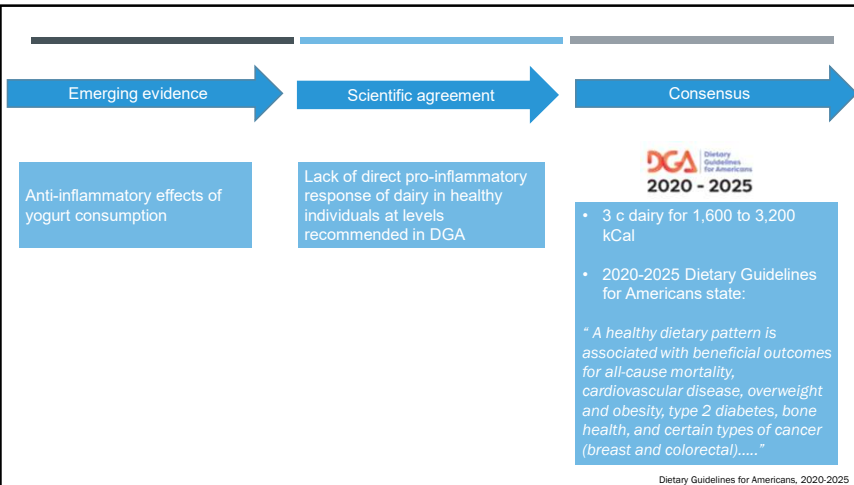
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### Take Home Messages

- Dairy is not pro-inflammatory, some studies indicate anti-inflammatory effects.
- Still working to understand the importance of food, diet, and immune health.
- Healthful dietary patterns still advised and include dairy.
- Certain foods might modestly reduce biomarkers of inflammation, but more work is needed to confirm importance with chronic disease risk.



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### Acknowledgment

#### Collaborators

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QinLei Gu

#### Research Support

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USDA HATCH WIS02094  
UW-Madison Dept. Food Science

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**TAMING THE FLAME:**  
*Dairy and Inflammation*

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Practical Applications

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**Speaker Disclosure**

**I currently serve as a National Dairy Council Ambassador for this presentation, including:**

- Honoraria

*Other Disclosures:* California Grapes, Soy Institute, Plenity, National Cattlemen’s Beef Association

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**POLL #1**

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**POLL #2**

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# What are people saying about dairy?

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## Dairy in the media in celebrity media spokespeople



"Chemical defoamers are added to yogurt."



No: Coffee, alcohol, caffeine, tomatoes, peppers, mushrooms, eggplants, fungus, dairy, gluten, corn, soy, added sugar, artificial sweeteners, MSG, GMOs.



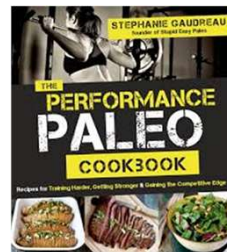
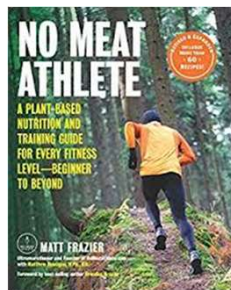
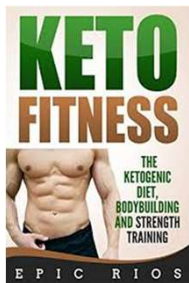
"Don't drink less than 2% milk because it contains more sugar than full fat"



"I just tried a goat milk cleanse for eight days to rid my system of parasites."

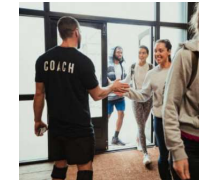
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## Dairy in our media



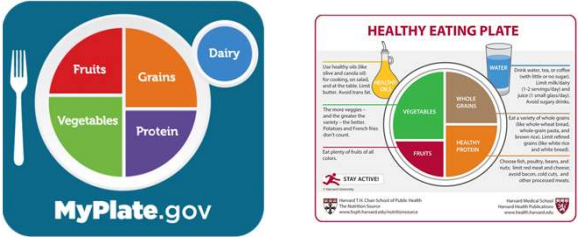
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## Dairy in the community in our hometowns



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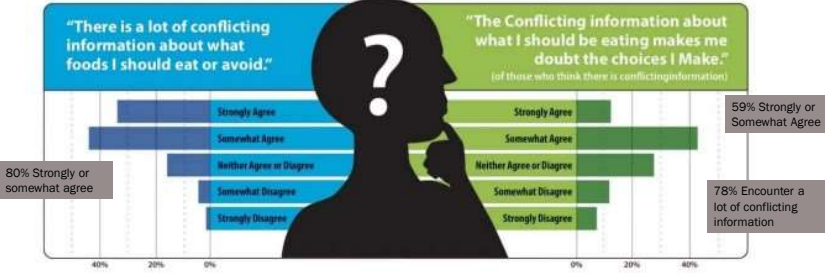
### Dairy and dietary recommendations



The image shows two dietary guides. On the left is the MyPlate.gov logo, a circular plate divided into Fruits (red), Grains (orange), Vegetables (green), and Protein (purple), with a separate circle for Dairy. On the right is the Healthy Eating Plate diagram, which includes sections for Vegetables, Whole Grains, Healthy Protein, and Fruits, along with a glass of water. Text around the diagrams provides additional dietary advice.

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### Conflicting Information Creates “Confusion”



The chart displays survey results for two statements. The first statement is "There is a lot of conflicting information about what foods I should eat or avoid." The second statement is "The conflicting information about what I should be eating makes me doubt the choices I Make." (for those who think there is conflicting information). The x-axis represents the percentage of respondents, ranging from 0% to 40% on both sides of the central silhouette.

Statement	Strongly Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Strongly Disagree
"There is a lot of conflicting information about what foods I should eat or avoid."	80%	15%	5%	0%	0%
"The conflicting information about what I should be eating makes me doubt the choices I Make." (for those who think there is conflicting information)	59%	25%	10%	6%	0%

80% Strongly or somewhat agree

59% Strongly or Somewhat Agree

78% Encounter a lot of conflicting information

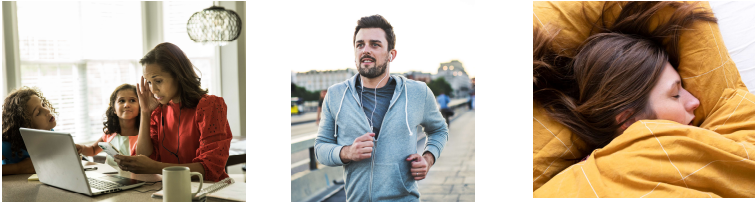
Food Insight, Survey: Nutrition Information Abounds, But Many Doubt Food Choices, 2017.

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### What are the science-based recommendations on inflammation?

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### Anti-Inflammatory Lifestyle practices



The image shows three lifestyle practices with associated statistics: Stress (50%), Exercise (21%), and Sleep (40 M). Each practice is accompanied by a representative image: a group of people working at a laptop for stress, a man in a hoodie for exercise, and a woman sleeping for sleep.

Practice	Percentage
Stress	50%
Exercise	21%
Sleep	40 M

American Psychological Association      National Institute of Health      Sleep Association

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## Stress Causes Inflammation

**THROAT**  
Difficulty swallowing  
Stress can lead to hyperextension or asthma attacks. It can also lead to acid reflux after eating.

**STOMACH**  
Stomach ache  
Stress can lead to stomach issues, nausea or pain, and some may vomit if the stress is overwhelming.

**INTESTINES**  
Diarrhea  
Stress can lead to diarrhea or constipation and affects how your intestines absorb nutrients.

**BLOOD VESSELS**  
Adrenaline  
Stress causes the release of adrenaline and other stress hormones, which during a prolonged period of time can lead to heart.

**BRAIN**  
Headache, migraine  
Stress can trigger headaches or migraines.

**HEART**  
Heart problems  
Long term stress can cause heart issues that can lead to a heart attack, hypertension or stroke.

**LIVER**  
Diabetes/obesity  
When stress hormones cortisol and epinephrine are released, the liver produces additional glucose - blood sugar - to give the body energy for a "fight or flight" scenario. But for some people, additional sugar production can lead to Type 2 diabetes.

**NERVOUS SYSTEM**  
Fight or flight  
Stress leads to the nervous system generating energy for the "fight or flight" response. During a short period of time, this response isn't dangerous, but chronic stress can damage to the nervous system and body.

(Infographic) Effects of Stress on the Human Body | Jefferson Online 47

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## Exercise: Acute Inflammation vs Long Term Anti-Inflammatory Effects

- Acute, high intensity, or unaccustomed exercise causes the skeletal muscles to release pro-inflammatory molecules.
- A single bout of exercise may elevate oxidative stress which increases inflammation.
- According to research, exercise decreases inflammation in the long term by:
  1. Reducing fat mass
  2. Increasing the production of anti-inflammatory molecules

Chronic Low-grade Inflammation after Exercise: Controversies <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3589131/pdf/UBMS-15-1008.pdf>  
 Exercise, Inflammation and Aging <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3328801/> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3328801/#:~:text=There%20is%20evidence%20that%20exercise,interstitial%20and%20for%20prolonged%20durations>

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## Exercise recommendations for adults

### Cardiovascular training

- All healthy adults aged 18–65 years should participate in moderate intensity aerobic physical activity for a minimum of 30 min on five days per week, or vigorous intensity aerobic activity for a minimum of 20 min on three days per week.

### Weight training

- Every adult should perform activities that maintain or increase muscular strength and endurance for a minimum of two days per week.

Physical Activity Guidelines for Americans, 2<sup>nd</sup> edition 49

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## Sleep and Impact on Inflammation

<p><b>Impact of Poor Sleep</b></p> <p>↓</p> <p>Growth hormone Energy levels Immune system Testosterone</p> <p>↑</p> <p>Fatigue Obesity Increase in cortisol</p>	<p><b>Impact of Good Sleep</b></p> <p>↓</p> <p>Fatigue</p> <p>↑</p> <p>Mood Better reaction time Regulates metabolism Anti inflammatory properties when prolactin released Muscle repair</p>
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Reilly T, Piercy M. The effect of partial sleep deprivation on weight-lifting performance. *Ergonomics*. 1994; 37(1): 107-15. 50  
<https://www.ncbi.nlm.nih.gov/pubmed/9615946> -<https://www.ncbi.nlm.nih.gov/pubmed/211632481>

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# MYTH 1: Dairy products cause inflammation


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## Dairy foods reduce inflammatory biomarkers

**JN** THE JOURNAL OF NUTRITION  
Development and Validation of Novel Dietary and Lifestyle Inflammation Scores

**Foods Found to Reduce Inflammatory Biomarkers**

- Apples
- Berries
- Tomatoes
- Deep yellow and orange fruits and vegetables
- Dairy foods (e.g., whole and low-fat milk, cheese and yogurt)
- Leafy green vegetables
- Cruciferous vegetables
- Nuts
- Legumes
- Fish
- Poultry
- Coffee
- Tea



Byrd, et al. The Journal of Nutrition, 2020. doi: 10.1093/jn/nz165.

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## The evidence is clear – dairy foods do not cause inflammation

**Science Summary Dairy and Inflammation** **NDC**

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

**Can Dairy Help Lower Inflammation?** Watch later Share

**Healthy Eating Patterns Included:** Lower Dairy Foods, Higher Dairy Foods, Higher Dairy Protein

**Lower Chronic Inflammation** → **Reduced Chronic Disease Risk**

Grilled Halloumi and Veggie Skewers | Fall Harvest Farmers Cheese Grain Bowl

**Resources and recipes available on USDairy.com**

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## Case study: Feared Dairy Caused inflammation

**Meet Victor**

- Increased dairy, fruits, vegetables in diet
- Reduce fried foods, refined carbohydrates
- Went to yoga 2x a week
- Slept 8 hours a night

✓ Lost 93 pounds over 2 years

✓ Gained 100 pounds on his bench press



*Client testimonials have approved with Jim White Fitness Inc. to showcase their success stories for all and any presentation materials.*

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## MYTH 2: Lactose Intolerance = Lactose Avoidance

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## What's the difference between milk allergy and lactose intolerance?

	Milk Allergy	Lactose Intolerance
<b>Prevalence</b>	More common in children 0 to 3 years old (2.5%); 80% outgrow by 16 years	Rare in young children
<b>Mechanism</b>	Reaction to milk protein (i.e., casein)	Intolerance to milk sugar (lactose)
<b>Symptoms May Include</b>	Mild or severe symptoms involving skin, mouth, lungs, heart, gut and brain	Abdominal pain, flatulence, bloating and/or diarrhea
<b>System Impacted</b>	Response triggered by the immune system	Gastrointestinal (GI) response from an inadequate supply of lactase enzyme, which breaks down lactose
<b>Management</b>	Individuals should <b>avoid milk and milk products</b> (unless allergy is outgrown)	Find management strategies that work for them like inclusion of low lactose dairy foods and lactose-free milk.

Allergy and Asthma Foundation <https://www.usdairy.com/news-articles/kids-lactose-intolerance-what-you-need-to-know>

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### A look at lactose in dairy foods

Dairy Food	Serving Size	Lactose (g)*	Did You Know?
Low-fat and fat free milk	8 oz	12g	Try small amounts of milk in smoothies, on cereal or with meals. Having milk with solid foods helps slow digestion which can mean better tolerance.
Lactose-free cow's milk	8 oz	0g	Lactose-free cow's milk is real milk – just without the lactose.
Ultra-filtered milk	8 oz	0g**	Most ultra-filtered milks have lactase enzyme to lower the lactose. Double check with the manufacturer.
Fat-free plain Greek yogurt	1 cup	6.5g	There is less lactose in Greek yogurt because the straining process removes some of the lactose
Mozzarella cheese***	1.5 oz.	0.3g	Due to the steps in cheese making and natural aging, natural cheese contains minimal amounts of lactose.
Cheddar cheese	1.5 oz	1.25g	Processing milk to make cheese lowers the lactose content
Processed American cheese	2 oz	1.4g	American cheese, which is made from natural cheese, does not contain much lactose.
Ricotta cheese	½ c	<1-6g	Ricotta cheese - a soft, natural cheese can contain minimal amounts of lactose.
Ice cream	½ c	14g	There are lactose-free cow's ice creams available.
Cream	1 Tbsp	<1g	Cream for coffee has minimal lactose.

\*Food Data Central database; <https://fdc.nal.usda.gov/>  
 \*\*Some ultra-filtered milk may contain lactose.  
 \*\*\*low moisture, part skim, (FDC 329370)

Lactose Intolerant? Love Dairy? Try These 12 Tips | U.S. Dairy ([usdairy.com](https://www.usdairy.com))

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## Case study: Feared Milk Bothered Her Stomach



### STATS

- **Weight Lost:** 70 lbs
- **Timeframe:** 1.5 years
- **Body Composition:** Lost 14% body fat
- **Muscular Strength:** Is able to do step ups with 10 lbs
- Started incorporating dairy and plants
- Decreased fiber from 65 g to 25 g

Client testimonials have approved with Jim White Fitness Inc. to showcase their success stories for all and any presentation materials.

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### Super restrictive diets

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### Elimination of dairy = benefits lost

Dairy delivers protein along with great taste		
Dairy Food	Protein	Leucine
Low-fat Cheddar Cheese (1 oz)	7 g	0.61 g
Low-fat Milk (regular or lactose-free dairy milk) (8 oz)	8.5 g	0.8 g
Low-fat Cottage Cheese (4 oz)	14 g	1.44 g
Low-fat Greek Yogurt (8 oz)	18.5 g	1 g
Whey Protein Isolate Powder (unflavored) (1 scoop, 28 g)	24 g	3.2 g

**87% WATER**      **13% SOLIDS**

■ Macro nutrients  
■ Minerals  
■ Vitamins  
■ Bioactives

Milk is a good or excellent source of 13 essential nutrients.  
 \*\* Vitamin A naturally occurring in whole milk unrelated to reduced fat, low fat and fat free milk.  
 ††† Daily Value (DV) for potassium: 4700 mg is based on a 2000 DRI recommendation. In 2015, National Academy of Sciences (NAS) report based on the 2011 DRI, a quantity of only potassium: 3500 of the DRI. DRI (re-estimating) is needed to update this value for the purpose of food labeling.

Nutrition information obtained from: USDA FoodData Central:  
 Low-fat Cheddar Cheese (173458) Low-fat milk (170873) Cottage cheese (173417) Strawberry Greek yogurt (171300)  
<https://fdc.nal.usda.gov/fdcapp.html>  
 Whey Protein Powder\*\*Stephan Van Vliet, et al. "The Skeletal Muscle Anabolic Response to Plant- versus Animal-Based Protein Consumption." Journal of Nutrition. 2015.

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### #HaveAPlantWithDairy

- Cheese + apple
- Yogurt + blueberries + nuts
- Milk + fruit
- Cottage cheese + cucumbers
- Grilled halloumi and veggie skewers
- Veggie grain bowl with cheese
- Veggies + ranch-style Greek yogurt dressing
- Fruit smoothie w/spinach

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### Anti-inflammatory meal plan

- **Breakfast:** Plain yogurt, handful of nuts, handful of blueberries, coffee
- **Snack:** Avocado toast with smoked salmon, cucumber, tomato, tea
- **Lunch:** Salad with chicken, topped with cheese + Greek yogurt dressing
- **Snack:** Almond butter + apple
- **Dinner:** Fish, veggie + brown rice bowl

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## Take home messages

- 3 servings dairy a day
- Limit inflammatory foods and habits
- Don't forget improving lifestyle habits
- Include anti-inflammatory foods
- However, we can enjoy ALL foods!



Jim White Nutrition & Fitness Studios, 2021.

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# DAIRY

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