Today’s Session

Explore the advantages of dairy foods and impact on the whole body.

Debunk common myths surrounding dairy avoidance.

Provide clients with practical disease management tips.

Create client-centered sound bites that motivate, inspire, encourage change and engagement.
About Sarah Ryan, M.S., RDN, LD

- Registered Dietitian Nutritionist
- Health and Wellness Program Coordinator in Houston
- Bachelor of Science from Stephen F. Austin State University
- Master of Science from Stephen F. Austin State University
- Joined Dairy MAX in 2015

Resources for YOU! Flash drives & milk spinners are in your conference bag.
Dairy MAX, your local dairy council

- Represent over 900 dairy farming families
- Passionate about the great taste and evidence-based health benefits of dairy
Powerful Partnerships
DIETARY GUIDELINES FOR AMERICANS
2015-2020
EIGHTH EDITION
Dairy Does the Body Good

Cardiovascular Health

Type 2 Diabetes

Skeletomuscular Health

Digestive Health

Blood Pressure
Dairy & Cardiovascular Health
Leading Cause of Death

Top 10 leading causes of death, 2015

<table>
<thead>
<tr>
<th>Rank</th>
<th>Underlying Cause of Death</th>
<th>Percent of total number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart disease</td>
<td>74.2</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
<td>23.4</td>
</tr>
<tr>
<td>3</td>
<td>CLRD</td>
<td>22.0</td>
</tr>
<tr>
<td>4</td>
<td>Unintentional injuries</td>
<td>5.7</td>
</tr>
<tr>
<td>5</td>
<td>Stroke</td>
<td>5.4</td>
</tr>
<tr>
<td>6</td>
<td>Alzheimer’s disease</td>
<td>5.2</td>
</tr>
<tr>
<td>7</td>
<td>Diabetes mellitus</td>
<td>4.1</td>
</tr>
<tr>
<td>8</td>
<td>Influenza and pneumonia</td>
<td>2.9</td>
</tr>
<tr>
<td>9</td>
<td>Nephritis, nephrotic syndrome, and nephrosis</td>
<td>2.1</td>
</tr>
<tr>
<td>10</td>
<td>Suicide</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Keys to Prevention

- Control Cholesterol
- Eat Right
- Manage Blood Pressure
- Lose Weight
- Reduce Glucose
- Stop smoking
- Get Moving

http://www.heart.org/HEARTORG/Conditions/MyLifeCheck---Lifes-Simple-7_UCM_471453_Article.jsp#Wp8M6-jwa70
Dairy’s Role in Cardiovascular Health

Dairy’s nutritional contributions are recognized in dietary guidance around the world.

“Moderate evidence also indicates that intake of milk and milk products is associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults.”

-2010 Dietary Guidelines Advisory Committee Report

“Consumption of dairy foods provides numerous health benefits, including lower risk of diabetes, metabolic syndrome, cardiovascular disease and obesity.”

-2015 Dietary Guidelines Advisory Committee Report
Current Eating Patterns in the US

![Bar chart showing current eating patterns in the US, indicating intake below recommendation or above limit, and intake at or above recommendation or below limit for various food groups and dietary components.]

- Vegetables
- Fruit
- Total Grains
- Dairy
- Protein Foods
- Oils
- Added Sugars
- Saturated Fats
- Sodium

Legend:
- Orange: Intake Below Recommendation or Above Limit
- Blue: Intake At/Above Recommendation or Below Limit

Percent of Population Below Recommendation or Limit
Percent of Population At or Above Recommendation or Limit
Missing the Mark

15% of Americans Meet the Dairy Food Group Recommendation

“Intake of saturated fats should be limited to less than 10 percent of calories per day by replacing them with unsaturated fats”

“Replacing saturated fats with unsaturated fats is associated with reduced risk of cardiovascular disease”

To meet saturated fat guidelines, the DGA recommends: “choosing low-fat or fat-free dairy foods, more milk and yogurt in place of cheese, and choosing lower fat cheese in place of regular cheese”
50+ Year History with Focus on Fat

1950’s- 1970’s
Seven Countries Research
Intake & CVD

Reduce intake of fat,
saturated fat, cholesterol
Increase intake of polyunsaturated fat
Science Evolves

“Cholesterol no longer a nutrient of concern” as outlined by the DGA
The original diet-heart paradigm reasoned that because saturated fat raises LDL ("bad") cholesterol, and LDL cholesterol raises coronary heart disease (CHD) risk, then saturated fat raises CHD risk.

The latest evidence indicates that the real story may be more complex.
Sat Fat ≠ CVD Risk?

2010; 21 observational studies 347,747 participants

Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease\(^1,2,3,4,5\)

“there is no significant evidence for concluding that dietary saturated fat is associated with an increased risk of CHD or CVD.”

2014; 32 observational studies 530,525 participants

Annals of Internal Medicine

Association of Dietary, Circulating, and Supplement Fatty Acids With Coronary Risk
A Systematic Review and Meta-analysis

“Current evidence does not clearly support cardiovascular guidelines that encourage high consumption of polyunsaturated fatty acids and low consumption of total saturated fats.”

2015; 3-12 observational studies 90,501-339,090 participants

the bmj

Intake of saturated and trans unsaturated fatty acids and risk of all cause mortality, cardiovascular disease, and type 2 diabetes: systematic review and meta-analysis of observational studies

“Saturated fats are not associated with all cause mortality, CVD, CHD, ischemic stroke or type 2 diabetes...”

2016; 15 prospective studies 476,569 participants

Neurological Sciences

Can dietary saturated fat be beneficial in prevention of stroke risk? A meta-analysis

“...higher saturated fatty acid intake is inversely associated with risk of stroke morbidity and mortality with race, sex and BMI as key factors influencing risk...”
Not All Fat is Created Equal

• Dairy’s saturated fat is unique
• May play important role in reducing the absorption of fat during digestion
  – Power of calcium
• Cheese matrix
  – Protein, calcium, CLA or fermentation?
Dairy Fat is Unique & Complex

- Saturated Fat (~2/3)
  - Palmitic acid
  - Stearic acid
  - Myristic acid
  - Lauric acid
  - Capric acid
  - Caprylic acid
  - Cuproic acid
  - Butyric acid

- Mono and Polyunsaturated Fat (~1/3)
Dairy & Type 2 Diabetes
Dairy & Lower Risk of T2DM

<table>
<thead>
<tr>
<th>Type of Studies</th>
<th>Total # of Studies (2005-2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meta-Analysis</td>
<td>√√√√√</td>
</tr>
<tr>
<td>Prospective Cohort Trials</td>
<td>√√√√√√√√√√√√√√</td>
</tr>
</tbody>
</table>

Meta-analyses show consistent beneficial associations:
• Total dairy associated with 3% -14% risk reduction
• Yogurt intake associated with 14 –17% risk reduction

Whole Milk Dairy & Reduced Risk of T2DM

“Higher proportions of pentadecanoic acid (15:0) and heptadecanoic acid (17:0) in blood were associated with a lower risk of diabetes”

Krachler et al., Nutr Metab Cardiovas Dis. 2008;18:503-510

“Circulating trans-palmitoleate is associated with lower insulin resistance, presence of atherogenic dyslipidemia, and incident diabetes”


“Circulating trans-palmitoleate associated with ≈62% reduced risk of type 2 diabetes in a multiethnic US cohort”


“Data support the hypothesis that dairy fat improves glucose tolerance, possibly through a mechanism involving improved hepatic and systemic insulin sensitivity and reduced liver fat”


Malmö Diet and Cancer cohort:
“Decreased T2D risk at high intake of high- but not of low-fat dairy products suggests that dairy fat partly could have contributed to previously observed protective associations between dairy intake and T2D”
Joslin’s New Recommendations

• “Recent evidence demonstrates saturated fat from dairy foods (milk, yogurt, cheese) may be acceptable within the total daily caloric intake”

• Yogurt and dairy products are referred to as:
  – “Foods shown to be associated with a reduced risk of developing type 2 diabetes in some studies”

Joslin’s New Recommendations

- <40% total dietary fat
- Broader recs for dairy
- Milk + yogurt listed as recommended source of carb

Dairy & Blood Pressure
Prevalence of Hypertension

Prevalence of Hypertension, 2011
U.S. Adults Ages 20 and Older (Percentage)

Age-Adjusted
Prevalence
(Percentage)  Number
of States
25.2 - 27.9  11
28.0 - 29.1  10
29.2 - 31.0  10
31.1 - 32.9  10
33.0 - 38.9  10

Data Source: BRFSS - Behavioral Risk Factor Surveillance System, CDC.

Self-report: “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” Excludes women who reported being told only during pregnancy and respondents who reported they had been told that their blood pressure was borderline high or pre-hypertensive.
Landmark DASH Study

• Instead of looking at what to avoid or specific nutrients, the study sought to determine the effects of certain dietary patterns on blood pressure
  – Wholesome, inexpensive foods that support good health

• Dietary Approaches to Stop Hypertension

• Landmark clinical trial in 1997 published in *New England Journal of Medicine*

Landmark DASH Study

Results found in subjects with or without hypertension, a combination diet reduced blood pressure more than fruits and vegetables or the control diet alone.

**Systolic blood pressure**
↓ by 5.5 mm Hg more than control diet

**Diastolic blood pressure**
↓ by 3.0 mm Hg more than control diet
Study concluded:

• Certain dietary patterns can have a favorable effect on blood pressure, especially one that is:
  – Rich in fruits and vegetables and low-fat dairy
  – Reduced in saturated and total fat

• Reduction in blood pressure began within 2 weeks and maintained over next 6 weeks
  – Pattern of reduction similar between genders and ethnicities

• DASH trial can be broadly applied to the U.S. population
In 1997, it is known that obesity, sodium intake, and alcohol consumption influence blood pressure.

~43 million people (24% US adults) have high blood pressure.

Dietary guidelines at the time:
- Weight control
- Reduced sodium intake
- Reduced alcohol consumption
- Possibly increased potassium intake
Developing DASH: Food First

• Vegetarians tend to have lower blood pressures than non-vegetarians. Diets featured:
  – High amounts of fiber
  – Calcium
  – Magnesium
  – Potassium

• In observational studies, significant inverse associations of blood pressure are seen with:
  – High amounts of fiber
  – Calcium
  – Magnesium
  – Potassium
  – Protein

Not all forms of nutrient delivery were beneficial. Dietary supplements didn’t have the same affects as the food.

In clinical trials where individuals were given single nutrients, often as dietary supplements, the reduction in blood pressure was typically small and inconsistent.

DASH was developed as a trial of dietary patterns rather than individual nutrients.

DASH tested the combined effects of nutrients that occur together in food.

Modified DASH to Include Full-Fat Dairy

• Compared to standard DASH, the modified high-fat DASH diet:
  – Similar benefit of lowering blood pressure
  – Reduced blood triglyceride levels
  – No difference in total, LDL-C
  – Did not reduce the blood HDL-C levels

• Full-fat dairy foods can be incorporated into a healthy dietary pattern

<table>
<thead>
<tr>
<th>Diet Composition</th>
<th>DASH</th>
<th>HF-DASH</th>
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</thead>
<tbody>
<tr>
<td>Total Fat (% energy)</td>
<td>27</td>
<td>40</td>
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<tr>
<td>Sat Fat (% energy)</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>CHO (% energy)</td>
<td>55</td>
<td>43</td>
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<tr>
<td>Protein (% energy)</td>
<td>17</td>
<td>18</td>
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</tbody>
</table>

Chiu et al. AJCN 2016
Dairy’s Trio of Nutrients

- Calcium
- Potassium
- Magnesium
Dairy & Obesity
A Growing Problem

Obesity prevalence in children and adolescents in the US (2011-2014)

Obesity prevalence in adults ≥20 years of age in the US (2011-2014)

Data from: Heart Disease and Stroke Statistics—2017 Update: A Report From the American Heart Association. Circulation. 2017;135:00–00
## Whole Milk Dairy & Obesity

<table>
<thead>
<tr>
<th>Study</th>
<th># participants</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swedish Mammography Cohort(^1)</td>
<td>N=19,352 women 8.8 years of follow-up</td>
<td>Consumption of ≥1 serving/d of cheese, whole milk or fermented milk associated with less gain weight.</td>
</tr>
<tr>
<td>The Hoorn Study(^2)</td>
<td>n= 2064 men and women</td>
<td>Consumption of high-fat dairy is inversely associated with BMI and waist circumference</td>
</tr>
<tr>
<td>Avon Longitudinal Study of Parents and Children(^3)</td>
<td>Kids: ages 10-13 years; n=2455</td>
<td>Adolescents with highest consumption (≥ 2.3 serv/d) of full-fat dairy had the smallest change in BMI over 3 years</td>
</tr>
<tr>
<td>Luxembourg Study(^4)</td>
<td>n=1352 men and women</td>
<td>Whole-fat dairy foods consumption (≥ 3 serv/d) is inversely associated with global (BMI) and abdominal (Waist circumference) obesity prevalence</td>
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</tbody>
</table>

### Whole Milk Dairy & Obesity (cont.)

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Type</th>
<th>FA marker?</th>
<th>Country</th>
<th>Adiposity</th>
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<tr>
<td>Smedman et al.</td>
<td>1999</td>
<td>Cross-sectional</td>
<td>Yes</td>
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<tr>
<td>Pereira et al.</td>
<td>2003</td>
<td>Prospective</td>
<td>No</td>
<td>USA</td>
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<tr>
<td>Phillips et al.</td>
<td>2003</td>
<td>Prospective</td>
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<td>Rosell et al.</td>
<td>2004</td>
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<td>Warensjo et al.</td>
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<td>Barba et al.</td>
<td>2005</td>
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<td>Berkey et al.</td>
<td>2005</td>
<td>Prospective</td>
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<td>Rajpathak et al.</td>
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<td>Rosell et al.</td>
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<td>Snijder et al.</td>
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<td>Beydoun et al.</td>
<td>2008</td>
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<td>USA</td>
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<td>Mozaffarian et al.</td>
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<td>Warensjo et al.</td>
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<td>Duffey et al.</td>
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<td>Te Velde et al.</td>
<td>2011</td>
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<td>Noel et al.</td>
<td>2011</td>
<td>Prospective</td>
<td>No</td>
<td>England</td>
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</table>

“The observational evidence does not support the hypothesis that dairy fat or high-fat dairy foods contribute to obesity, and suggests that high-fat dairy consumption within typical dietary patterns is inversely associated with obesity risk”

• Under most conditions, eating protein is more satiating than eating the same calorie amount of carbohydrate or fat.

• A modest increase in protein, at the expense of the carbohydrate or fat, may promote satiety and help weight loss through reduced energy consumption.

• Increased satiety from protein has been observed in studies focus on a single meal or over 24 hours.

Nutrient Powerhouse

An 8-ounce serving of milk, flavored or not, gives kids as much:

- **Vitamin A** as 2 hard boiled eggs
- **Riboflavin** as 1/3 cup of whole almonds
- **Phosphorus** as 1 cup of kidney beans
- **Vitamin D** as 3/4 ounce of cooked salmon
- **Calcium** as 10 cups of raw spinach
- **Potassium** as one small banana
Flavored Milk & Children

• Flavored milk not linked to increased body weight in children
• Children who consume flavored milk meet dairy recommendations
• Milk is #1 food source of 9 essential nutrients for children and adolescents
• Flavored milk only represents 3% of added sugar in American diet
  – Soft drinks are 40%

NHANES Data from: Dairy Research Institute. NHANES 2007-2010.
Dairy & Musculoskeletal Health
Building Strong Bones

Best evidence (grade A) for positive effects of calcium intake and physical activity

Good evidence for the role of vitamin D and dairy consumption

Highest score awarded for any nutrient, food or lifestyle factor

Weaver et al Osteoporosis Int. 2016
Better Body Composition in Women

- 12 weeks resistance training with post-exercise milk consumption promotes greater lean mass gains in young women.
- In the face of excess energy, milk promoted greater fat loss in young women.
- In the face of excess energy and lifting weights, 5 days a week with dairy promoted no changes in body weight, but improved body composition.
- Improving Diet, Exercise and Lifestyle (IDEAL) found during weight loss diets higher in dairy protein results in greater fat loss and lean mass gain when combined with exercise.

## Spotlight on Whey

<table>
<thead>
<tr>
<th>Short Term</th>
<th>Long Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whey protein increases muscle protein synthesis at higher rate than soy and casein products following resistance exercise</td>
<td>Whey supplementation resulted in greater lean body mass after resistance training in young adults compared to soy protein or carbohydrate</td>
</tr>
</tbody>
</table>


Healthy Aging with High Quality Protein

In combo with resistance exercise:

• Increasing whey dosage enhances protein synthesis in men

• Dairy protein supplementation (whey or MPC) increases muscle strength and function in older adults

No exercise involved:

• Dairy proteins to enhance protein intake at breakfast and lunch to preserve lean tissue and muscle function among aging adults

Yang et al. Nutr & Metab 2012, 9: 57
Chale et al., 2012, J of Gerontology
Tieland et al., JAMDA. 2012 Oct;13(8):720-6
There’s Protein Power in Milk

When it comes to meeting your family’s protein needs, not all foods are created equal. One 8-ounce glass of milk contains 8 grams of high quality protein. Compare this to an 8-ounce glass of almond milk that contains only 1 gram of protein.
Make it a Goal: Protein at Every Meal
Dairy & Digestive Health
## Lactose Intolerance vs. Milk Allergy

<table>
<thead>
<tr>
<th>Lactose Intolerance</th>
<th>Milk Allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea</td>
<td>Diarrhea, vomiting, abdominal cramping</td>
</tr>
<tr>
<td>Nausea</td>
<td>Angioedema or swelling</td>
</tr>
<tr>
<td>Abdominal cramping</td>
<td>Hives, or red, itchy skin</td>
</tr>
<tr>
<td>Bloating, fullness, gas</td>
<td>Stuffy or itchy nose, sneezing or itchy, teary eyes</td>
</tr>
<tr>
<td>Causes temporary discomfort</td>
<td>Can be life threatening (anaphylaxis)</td>
</tr>
<tr>
<td>Gastrointestinal track involved</td>
<td>Immune system involved</td>
</tr>
<tr>
<td>Reaction to carbohydrate in milk (lactose)</td>
<td>Reaction to protein in milk (whey and/or casein)</td>
</tr>
</tbody>
</table>
Lactose Intolerance Barrier to Dairy

• More than 80 percent of pediatricians and dietitians agree that lactose intolerance is a major reason people avoid dairy.
• Lactose intolerance is the No. 1 barrier to health professionals recommending dairy.
# Amount of Lactose in Dairy Foods

<table>
<thead>
<tr>
<th>Product</th>
<th>Lactose (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole, 2%, 1%, Skim Dairy Milk (1 cup)</td>
<td>12 g</td>
</tr>
<tr>
<td>LACTAID® Milk, low-fat, lactose-free (1 cup)</td>
<td>0 g</td>
</tr>
<tr>
<td>Whey Protein Isolate (20 grams)</td>
<td>0.1 g</td>
</tr>
<tr>
<td>Cottage Cheese, low-fat, 2% milkfat (1/2 cup)</td>
<td>3 g</td>
</tr>
<tr>
<td>Cheddar Cheese, sharp (1 oz)</td>
<td>&lt;0.1 g</td>
</tr>
<tr>
<td>Swiss Cheese (1 oz)</td>
<td>&lt;0.1 g</td>
</tr>
<tr>
<td>Mozzarella (1 oz)</td>
<td>&lt;0.1 g</td>
</tr>
<tr>
<td>American Cheese, pasteurized, processed (1 oz)</td>
<td>1 g</td>
</tr>
<tr>
<td>Yogurt, low-fat (6 oz)</td>
<td>13 g</td>
</tr>
<tr>
<td>Yogurt, Greek-style (6 oz)</td>
<td>4 g</td>
</tr>
<tr>
<td>Ice Cream (1/2 cup)</td>
<td>4 g</td>
</tr>
</tbody>
</table>

Note: these averages are supplied by the USDA. Lactose content varies by product and the lactose content of a specific product would need to be verified by a vendor.
Simple Strategies to Manage Lactose Intolerance

- Sip it: Introduce dairy slowly
- Try it: Opt for lactose free
- Stir it: Mix with other foods
- Slice it: Choose natural cheese
- Spoon it: Try easy-to-digest yogurt
The Microbiome

10 x more bacteria than cells of the body

Reduced diversity associated with:
- Enterocolitis
- Eczema
- Asthma
- IBD
- Obesity
- DM
Pro & Prebiotics - What's the Difference?

**Probiotics**
- Live microbes
- Grow, metabolize, interact with gut
- Influence immune system

**Prebiotics**
- Impact composition/activity of microbiota
- Increase levels of beneficial bacteria
- Increase signaling molecules important for health
Yes to Yogurt: A Solution for LI

• Yogurt cultures produce the enzyme lactase, breaking down lactose and reducing the overall lactose content of the finished product.

• Strained yogurts (i.e. Greek- or Icelandic-style yogurts) are lower in lactose than unstrained options.

• Lactose-free yogurt varieties are also available.
Recommend Three Servings of Dairy Each Day
Milk’s Essential Nutrients Can Be Hard to Replace

"...similar amounts of calcium can be obtained from fortified rice, soy and almond milks, and fortified juices, but absorption of calcium is less efficient from plant beverages... Vitamin D and potassium amounts vary across these milk alternatives“ (DGAC 2015)

Milk’s essential nutrients can be difficult to replace in a healthy dietary pattern. Three 8-ounce cups provides as much of each nutrient as:

- **Protein**: 50% DV (4 hardboiled eggs)
- **Calcium**: 90% DV (36 ½ cups of kale (about 7 bunches))
- **Phosphorus**: 70% DV (2 ½ cups kidney beans)
- **Potassium**: 29% DV (3 small bananas)
- **Vitamin D**: 90% DV (6.6 oz. of sardines (about 15 sardines))
- **Riboflavin**: 80% DV (1 cup of almonds)
- **Vitamin B12**: 60% DV (1 lb. pork chops, broiled (about 2 6-oz. chops))
- **Vitamin A**: 30% DV (2 cups of cooked green beans)

*The 2010 Dietary Guidelines for Americans (DGA) recommends 3 servings of milk or milk products each day.*

Part of a Healthy & Delicious Diet

**Bottom Line:**
Eating dairy foods, regardless of fat content, are associated with improved bone health, especially in children and teens, and reduced risk of cardiovascular disease, Type 2 diabetes and lower blood pressure in adults.
Online Nutrition Education Channels

TWO OUTLETS

DairyDiscoveryZone.com
- Consumer audience
- Blogs

DairyMAX.org
- Expert audiences – schools, health professionals, etc.
Sarah Ryan, M.S., RDN, LD  
Program Coordinator,  
Health and Wellness  
Email: ryans@dairymax.org  
Cell: 281.702.4049

www.dairymax.org  
www.dairydiscoveryzone.com

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