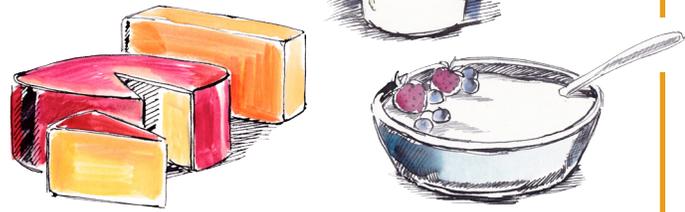


Dairy



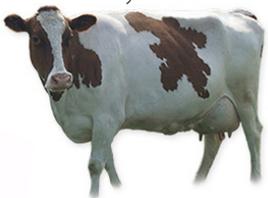
Holstein



Brown Swiss



Ayrshire



Guernsey



Jersey



Milking Shorthorn



Did You Know

- All dairy products are derived from mammal milk. Although milk most commonly comes from cows, Montana also has goat and sheep milk producers. People also consume milk from different animals including donkeys, horses, oxen, buffaloes, and camels.
- There are six main dairy cattle breeds in the United States, including: Holstein, Ayrshire, Brown Swiss, Milking Shorthorn, Guernsey, and Jersey. The Holstein cow produces the most milk of all breeds, about nine gallons of milk per day! Each cow produces an average of six to seven gallons per day, which is 2,500 gallons of milk annually. Besides the amount of milk produced, different breeds produce varying amounts of milk fat, making them more or less suitable for making dairy products like cheese.
- In 2015, Montana was home to approximately 13,000 dairy cows on nearly 65 dairy farms. The average herd size was about 210 cows in Montana.
- Cheese varieties are classified based on a number of characteristics, but most commonly according to firmness and moisture content. Moisture content may be as low as 30% in firm cheese, while soft or fresh cheese may be as high as 80%. Common cheese varieties include: fresh or un-ripened (mozzarella), soft ripened (Brie), semi-hard (cheddar), hard (Parmesan), blue-veined (Gorgonzola), processed (American), and cheese substitute.

Agriculture & Processing

The dairy supply chain starts with growing feed for the dairy cows, such as alfalfa hay. Dairy cows are housed on farms, fed high quality feed, and milked on average two times a day. The milk is then transported from the farm to one of several Montana dairy processing plants where it is pasteurized. The pasteurization process heats milk to a very high temperature (just below boiling) and then rapidly chills it, which destroys bacteria and extends the shelf life of the milk. Milk is then either packaged or turned into dairy products such as cheese, yogurt, or sour cream. After packaging, the milk and dairy products are distributed to grocers, schools, and other markets in refrigerated trucks, then stored in refrigeration.

Yogurt is milk that is fermented with lactic bacteria; once there is enough lactic acid produced, the milk begins to thicken. Cheese is created from the coagulation (thickening) and draining of milk, cream, or both. Similar to making yogurt, cheesemaking requires lactic acid produced by enzymes, acid, or a combination of heat and acid that will cause milk solids (curds) to form. The firm cheese texture is developed by separating and draining the curds from the whey (liquid) proteins. Cheese is then salted and aged (stored at different temperatures, humidity levels, and lengths of time) to develop different textures and flavors. Of the 72 varieties of cheeses, most age for at least 60 days, but fresh cheeses like ricotta, feta, or cottage cheese do not get aged or preserved.

Selection

Dairy products include milk, yogurt, cheese, ice cream, butter, and other products. Milk is perishable, so use the sell by dates to select milk that is fresh.

Razzle Dazzle Smoothie

HACCP Process: 1 – No Cook 2 – Cook & Same Day Serve 3 – Cook, Cool, Reheat, Serve 4 – SOP Controlled

Ingredients	25 Servings	50 Servings	Directions
Fat-free milk	6 1/4 cups	12 1/2 cups	1. Collect and measure all ingredients. 2. Add the fruit and yogurt to the blender. 3. Pour the milk into the blender. 4. Blend for about 30-45 seconds until smooth. 5. Hold for cold service at 41°F. Serve within 2 days.*
Vanilla yogurt, low-fat	12 1/2 cups	25 cups	
Mixed berries, frozen	6 1/4 cups	12 1/2 cups	
Banana, frozen	5	10	

Serving Size: 1 Cup | **Yield:** 25 or 50 servings

Oven Temperature & Baking Time	Temperature	Minutes
Conventional		
Convection		
Pan Size		

Nutrition Analysis

Calories (kcal)	130
Protein (g)	7.56
Carbohydrate (g)	20.18
Total Fat (g)	2.29
Saturated Fat (g)	1.41
Calories from Total Fat (%)	15.4%
Vitamin A (IU)	243.77
Vitamin C (mg)	7.75
Iron (mg)	0.17
Calcium (mg)	257.4
Sodium (mg)	107.08
Dietary Fiber (g)	1.61

Meal Component Fulfillment *(Based on Serving Size)*

1 Serving Provides:

1 oz meat/meat alternate, 3/8 cup fruit

Notes

* These can also be made ahead of time and frozen. Thaw overnight in the refrigerator for a quick breakfast.

Be creative! Add any fresh or frozen fruit to the smoothie. If using only fresh fruit, add a few ice cubes before blending. Be sure to wash fresh fruit before using.

Source: Create-a-Smoothie, New England Dairy and Food Council

Baked Mac and Cheese with Broccoli

HACCP Process: _____ 1 – No Cook 2 – Cook & Same Day Serve _____ 3 – Cook, Cool, Reheat, Serve _____ 4 – SOP Controlled

Ingredients	25 Servings	50 Servings	Directions
Whole grain elbow macaroni	1 lb 10 oz	3 lbs 4 oz	<ol style="list-style-type: none"> Boil pasta in 3 quarts water per pound. Be careful to not overcook as pasta will get mushy. Drain well, and rinse with cold water. Pour cooked pasta into a hotel pan. The pasta can be cooked the day before and chilled in a hotel pan. Heat the oil. Add the onion and garlic and cook over medium heat, stirring occasionally until softened but not brown, about 5-7 minutes. Add the milk and continue cooking, do not bring to a boil. DO NOT add the milk that is dedicated for the "thickener" until step 4. Thoroughly whisk the cornstarch into the remaining cold milk to make the thickener. Add the thickening mixture to the boiling milk, stirring frequently, about 5 minutes. Reduce heat to low and add the cheddar cheese, paprika, mustard, salt, and pepper, stirring constantly until cheese melts, about 1 minute. Chop the broccoli crowns. If you are using the stems, discard the bottom 1-2 inches, peel the stems with a sharp knife, and slice thinly. Steam the chopped broccoli, with stems if using, in a steamer or in a large pot with 2 inches of boiling water, covered, over high heat, until bright green and softened but not mushy, 5-7 minutes. Drain broccoli. Combine cheese sauce, broccoli, and pasta. Equally divide broccoli and cheese sauce between hotel pans, adding salt and pepper, as necessary. For each hotel pan: blend bread and parmesan in a food processor until the breadcrumbs are fine. Evenly distribute on top of each hotel pan. Bake until cheese is bubbling and crust browns, covering with aluminum foil if it gets too dark. CCP: Heat to 165°F or higher. Convection oven: 300°F about 20-25 minutes. Conventional oven: 325°F about 30-35 minutes. CCP: Hold for hot service at 140°F or higher.
Oil	2 Tbsp	1/4 cup	
Onion, <i>diced</i>	3 1/4 cups	6 1/2 cups	
Garlic, <i>fresh, minced</i>	1 Tbsp	2 Tbsp	
Milk, <i>skim or low-fat</i>	1 qt 1 3/4 cups	2 qt 3 1/2 cups	
Corn starch	1/2 cup	1 cup	
Milk, <i>skim or low-fat (for thickener)</i>	1/2 cup	1 cup	
Cheddar cheese, <i>shredded</i>	4 3/4 cups	9 2/3 cups	
Paprika	1 Tbsp	2 Tbsp	
Mustard, <i>dry</i>	2 tsp	4 tsp	
Salt	1 tsp	2 1/4 tsp	
Pepper, <i>black</i>	1/4 tsp	1/2 tsp	
Broccoli	2 lbs 4 oz	4 lbs 8 oz	
For Bread Crumb Topping:			
Whole wheat bread, <i>crusts on</i>	5 oz, <i>about 8 slices</i>	10 oz	
Parmesan cheese, <i>grated</i>	1/2 cup	1 cup	

Serving Size: 1 Cup | **Yield:** 25 or 50 servings

Oven Temperature & Baking Time	Temperature	Minutes
Conventional	325°F	30-35 min
Convection	325°F	20-25 min
Pan Size	Hotel pan	

Nutrition Analysis	
Calories (kcal)	270
Protein (g)	14.94
Carbohydrate (g)	32.98
Total Fat (g)	10.63
Saturated Fat (g)	5.44
Calories from Total Fat (%)	35.25%
Vitamin A (IU)	1621.65
Vitamin C (mg)	39.59
Iron (mg)	1.76
Calcium (mg)	292.91
Sodium (mg)	198.62
Dietary Fiber (g)	4.66

Meal Component Fulfillment *(Based on Serving Size)*

1 Serving Provides:

1 1/4 oz grain, 1/2 oz meat/meat alternate, 1/8 cup dark green, 1/8 cup other vegetable

Source: Fresh From the Farm: The Massachusetts Farm to School Cookbook

Storage

Dairy products should be refrigerated at or below 40°F and not be left at room temperature for more than two hours. Avoid storing milk in a refrigerator door where the temperature may fluctuate.



Cooking

Blend. In a blender, mix plain low-fat or fat-free yogurt with fresh berries, fruit, and/or vegetables to make a smoothie for a healthy breakfast, snack, or dessert.

Breakfast. Combine plain low-fat or fat-free yogurt and granola for a delicious breakfast, snack, or dessert. Add fresh berries and fruit to hot or cold cereals with low-fat or fat-free milk. Substitute milk for water to prepare hot cereals, such as oatmeal.

Cook. When heating milk in a recipe, be sure to heat slowly and stir often to ensure that the milk does not burn.

Dip. Use low-fat or fat-free yogurt with herbs, seasonings, or peanut butter as a dip for fruits or vegetables.

Freeze. Hard cheeses, including cheddar, may be frozen for up to four months. Cream cheese, cottage cheese, and some creams may not freeze well. Frozen dairy is often best used for cooking and should be thawed in the refrigerator prior to use.

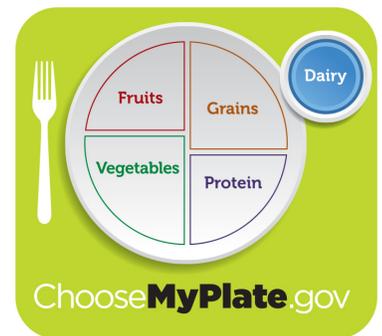
Snack. Enjoy milk, yogurt, or cheese for a calcium-rich snack.

Substitute. Use plain low-fat or fat-free yogurt instead of sour cream for a low-fat option.

Top. Shredded low-fat or fat-free cheese adds nutrients to casseroles, soups, stews, or vegetables.

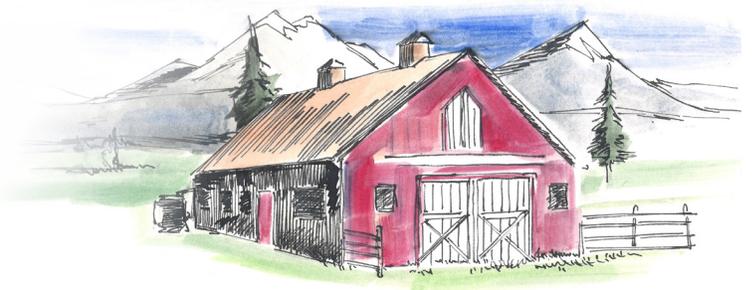
Nutrition Information

Dairy products are rich in calcium, potassium, B vitamins, and protein, and are often fortified with vitamin D. Not many foods contain vitamin D, as our bodies are designed to produce it with the help of sunlight. Vitamin D promotes calcium absorption and bone growth. Calcium is necessary to maintain healthy bones and to carry out other body functions. Dairy products such as milk, yogurt, and cheese are excellent sources of calcium and constitute a majority of Americans' calcium intake. The Dietary Guidelines for Americans recommend choosing low-fat and fat-free dairy foods most often. Some individuals are lactose intolerant. This means they do not produce enough lactase, a digestive enzyme used to break down the milk sugar lactose. Individuals with lactose intolerance can try alternatives such as fortified lactose-free yogurt or milk. Fluid milk and other dairy-rich products are perfect for school nutrition programs as they can credit as the fluid milk or meat/meat alternate components.



Dig Deeper

For sources and photo credits along with more recipes, lessons, quick activities, resources, and guides, visit: www.montana.edu/mtharvestofthemoth.



4 Montana Harvest of the Month: Dairy



The Montana Harvest of the Month program showcases Montana grown foods in Montana communities. This program is a collaboration between Montana Farm to School, Office of Public Instruction, Montana Team Nutrition Program, National Center for Appropriate Technology, Montana State University Extension, Gallatin Valley Farm to School, FoodCorps Montana, and Montana Department of Agriculture. More information and resources are available at: www.montana.edu/mtharvestofthemoth.

Funds were provided in part by USDA Team Nutrition Training grants and Dairy MAX. USDA is an equal opportunity provider and employer. The Montana State University Extension Service is an ADA/EO/AA/Veteran's Preference Employer and Provider of Educational Outreach. This publication was supported by the Grants or Cooperative Agreements Numbers, 6 U58DP004818-03-01 & 5 U58DP004818-03-00.