

### Purpose:

The dairy industry is incredibly important to Colorado. In fact, dairy products are Colorado's second largest agriculture product. Milk and milk products provide essential nutrients for a healthy body and most Americans do not get enough foods from the dairy group. Through this *Colorado Reader*, students will explore the Colorado dairy industry including breeds of dairy cattle, the journey of milk from farm to table, nutrition, cheesemaking and types of cheese, plus meet a Colorado dairy farmer!

### Cross Curricular Connections and Colorado Academic Standards:

#### 4th & 5th Grade Reading, Writing, and Communicating:

- Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes. (CCSS: RL.5.4)
- Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (CCSS: RL.4.1)
- By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range. (CCSS: RI.4.10)

#### 4th Grade Social Studies: History

- The historical eras, individuals, groups, ideas, and themes in Colorado history and their relationship to key events in the United States within the same historical period. (GLE 1.2)

#### 5th Grade Social Studies: History

- Analyze primary and secondary sources from multiple points of view to develop an understanding of early United States history. (GLE 1.1)

#### 4th Grade Comprehensive Health: Physical and Personal Wellness

- Describe the connection between food intake and physical health. (GLE 2.2)

#### 5th Grade Comprehensive Health: Physical and Personal Wellness

- Demonstrate the ability to make good decisions about healthy eating behaviors. (GLE 2.1)

**More standard connections, particularly in science, can be met by using any of the suggestion lessons to go with this Reader.**

### How to use:

Pass out one copy of the *Colorado Reader* to each student. Another option is to send these items home with your students (or include in homework/enrichment packets) to complete at home on virtual learning days. Or use during substitute days. Ask students to read the

*Colorado Reader*, completing the activities within the *Reader* as they go. Answers to the activities in the *Reader* are included, should you desire to collect and score responses. To further enhance learning, incorporate any of the additional lessons from the Curriculum Matrix that are identified on the back or utilize any of the Additional Resources.

### Guest Speaker Experience:

Individuals within the Colorado dairy community are available for classroom guest speaker experiences to talk to your students. If you would like to request a dairy expert to visit your classroom (most likely virtually), please complete this online request form: [bit.ly/3uosZ5a](https://bit.ly/3uosZ5a) or scan the QR code.



### Vocabulary

**breed:** a group of animals or plants within a species having a distinctive appearance and typically having been developed by deliberate selection

**casein:** a protein that makes up about 80% of milk

**cheese:** a food made from pressed curds of milk

**coagulate:** to change to a solid or semi-solid state

**culture:** beneficial bacteria in the cheese making process that changes lactose into lactic acid, helps coagulate (set) milk, and helps the whey to drain

**curd:** clumps of casein (coagulated protein) that separates from the liquid when milk coagulates

**dairy farmer:** a farmer who specializes in raising dairy cattle, specifically for milk and/or cheese products

**enzyme:** protein catalyst, which speeds up a specific chemical reaction

**lactose:** a disaccharide sugar present in milk which contains glucose and galactose units

**nutrient:** a substance that provides nourishment essential for growth and the maintenance of life

**pasteurization:** the act or process of heating a beverage or other food, such as milk, to a specific temperature for a specific period of time in order to kill microorganisms that could cause disease, spoilage, or undesired fermentation

**processing plant:** a facility that pasteurizes and packages milk that comes directly from dairy farms; processing plants also make and package dairy products such as cheese, yogurt, ice cream, whey products, etc.

**rennet:** a complex set of enzymes produced in the stomach of young ruminant animals

**udder:** the part of a cow's body where milk is produced

**whey:** liquid that drains from the curd of clotted milk; contains lactose, proteins, water-soluble vitamins, and some minerals

## Lesson Plans to go with this Reader

The Agricultural Literacy Curriculum Matrix is an online, searchable, and standards-based database for K-12 teachers. The Matrix contextualizes national education standards in science, social studies, and nutritional education with relevant instructional resources linked to Common Core Standards. Below are a few lesson plans that could be used in conjunction with this *Colorado Reader*. Go to [www.GrowingYourFuture.com](http://www.GrowingYourFuture.com) and click on Curriculum Matrix (on the Home Page or under the Educator's Tab), search each title within the Curriculum Matrix to find these lesson plans.

**A Day Without Dairy (3-5):** Students create, read, and interpret graphs relating to the economic importance of the dairy industry and are challenged to understand the economic consequences of a day without dairy. <https://agclassroom.org/matrix/lesson/255/>

**Cowabunga! All About Dairy Breeds (3-5):** Students explore breed characteristics and countries of origin for five different breeds of dairy cattle and discover why dairy farmers choose individual breeds for specific purposes. <https://agclassroom.org/matrix/lesson/248/>

### Answers:

#### Page 2 - Cowabunga! Activity

See chart below

1. Brown Swiss; 2. Brown Swiss, Ayrshire; 3. Ayrshire, Guernsey; 4. Guernsey; 5. Milking Shorthorn; 6. Holstein, Jersey, Milking Shorthorn; 7. Brown Swiss, Ayrshire; 8. Jersey; 9. Ayrshire; 10. Jersey; 11. Ayrshire; 12. Brown Swiss; 13. Guernsey;

14. Milking Shorthorn.

#### Page 5 - Milk is Incredible!

1. Calcium; Vitamin D; Iodine; Phosphorus
2. Calcium
3. Ages 2-8: 2 cups/Older: 3 cups
4. Riboflavin and Pantothenic Acid
5. Iodine, Vitamin B12
6. C. Zinc
7. True

Breed	Country of Origin	Physical Description	Weight	Other Unique Characteristics
Holstein	The Netherlands	All white with black spots, largest breed	1,500 lbs.	Makes more milk than other breeds, 10 gallons per day
Brown Swiss	Switzerland	Athletic, strong feet and legs, brown	1,500 lbs.	Milk high in lactose, used for cheese, likes hot and cold climates
Ayshire	Scotland	Red and white	1,200 lbs.	Milk used for butter and cheese, healthy udders, withstanding cold weather
Guernsey	Guernsey	Gold and white	1,150 lbs.	Makes golden milk, lives a long time
Jersey	Jersey	Honey-brown, small, "pretty"	900 lbs.	Second most common, high quantity of milk
Milking Shorthorn	England	Roan, red, red and white, or white	1,450 lbs.	Can be raised for milk or beef, produces large volumes of milk, calves are spunky and grow rapidly

**Cheesemaking (K-12):** Students make fresh mozzarella cheese and discover the science (changing a liquid to a solid), art, and craft involved in the development of specialty cheese.. <https://agclassroom.org/matrix/lesson/813/>

**Cheesemaking Kit (K-12):** Order a mozzarella cheese kit for only \$10 from [AgClassroomStore.com](http://AgClassroomStore.com).

Use the search word "dairy" at [www.AgClassroom.org/Matrix](http://www.AgClassroom.org/Matrix) for additional free lessons and classroom activities or scan the QR code.



### Additional Resources

**DairyMAX.org:** Dairy MAX is a nonprofit Dairy Council representing more than 900 dairy farm families across eight states, including Colorado. They have a wealth of tremendous resources and programs for schools and students including [DairyTour360.com](http://DairyTour360.com); [DairyDiscoveryZone.com](http://DairyDiscoveryZone.com); Fuel Up to Play 60; Milk in Schools, lessons for K-3 students and so much more. To learn more about dairy education and nutrition programs for your school, contact Sara Rose Foreman, Dairy MAX School Wellness Consultant, at [foremans@dairymax.org](mailto:foremans@dairymax.org) or call 800-332-4790.

**Video Playlist:** The DairyTour360 videos

as well as several cheesemaking videos have been added to a YouTube playlist on the Colorado Foundation for Agriculture channel: <https://bit.ly/3VtKCwz> or scan the QR code.



### Teacher Evaluation:

To help us assess the quality of this *Reader* and to evaluate your students' knowledge, please take a few minutes to complete this online evaluation (time to complete is less than 5 minutes). Everyone who completes the evaluation will be entered into a **drawing to receive a \$100 gift certificate to the Ag Classroom Store**. To complete the evaluation, use this link: [bit.ly/3gXkLhg](http://bit.ly/3gXkLhg) or scan the QR code.



### Answers:

#### Page 7 - Types of Cheese Activity

1. Mozzarella; 2. Blue; 3. Cheddar; 4. Swiss; 5. Ricotta; 6. Brie; 7. Colby Jack; 8. Parmesan; 9. Provolone; 10. Gouda; 11. Muenster; 12. Pepper Jack