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Decoding Dairy: Understanding the Milk Label

USE THIS DOCUMENT TO ACCESS A VIDEO GUIDED WORKSHEET TO TEACH YOUR STUDENTS ONLINE, OR IN THE CLASSROOM.

Grade Level

9th – 12th grade

Estimated Time

45 minutes

Objectives

- Learn the process and reasons milk is pasteurized, homogenized, and fortified.
- Understand why the milk label has a statement referencing artificial growth hormones.
- Learn to fact check claims you may see on social media surrounding milk nutrition.

Materials and Links

- Student led worksheet
 - [Microsoft Word](#) (You must download for the formatting to be correct.)
 - [PDF](#)
- [Online Video Lesson](#)

Vocabulary

Pasteurization: using heat to destroy harmful bacteria in milk without changing the taste or nutritional value of the milk. Pasteurization also increases the shelf life of milk.

Ultra-High Temperature (UHT) Pasteurization: heating the milk to 293 degrees °F for just a few seconds. Milk processed by UHT does not require refrigeration until it is opened.

Homogenization: the process of breaking down the fat globules in milk so they will evenly disperse throughout the liquid. This helps the cream to no longer rise to the top.

Fortification: adding additional vitamins and minerals to a food product in order to increase its nutritional value.



Skimming: to standardize milk into specific fat percentages (1%, 2%, and fat free) some of the fat is skimmed off the top to make it the appropriate fat percentage; it's possible to leave only 0.5% fat in the milk (skim).

Vitamin A: a fat-soluble vitamin in the active form (retinol, retinal, and retinoic acid) functions in vision, epithelial cell maintenance, and gene expression; deficiency causes blindness.

Vitamin D: a fat-soluble vitamin that is synthesized in the body from cholesterol and plays a role in the mineralization of bone by regulating calcium and phosphorus; deficiency causes rickets and osteomalacia.

How to use the Online Lesson

1. Make sure to post the student worksheet which includes the link to the video, as well as the questions students will answer while watching the video.
2. Students will view the video lesson and take breaks as prompted to answer the questions below.
3. Use the key to check the student worksheet (answers highlighted in yellow).

Student Worksheet with Answer Key

1. Begin the Online Module. You will be introduced to the lesson and instructed on how the lesson is formatted.
 - a. Lesson link [HERE](#).
2. Pause the video and fill out the following questions while looking at the milk label.
 - a. What do you notice is written on the label?
 - b. Is there anything that sticks out to you?
 - c. What are the ingredients? **Reduced fat milk, Vitamin A Palmitate, Vitamin D3**
 - d. What nutrients does milk contain? **Fat, cholesterol, sodium, carbohydrates, protein, Vitamin D, Calcium, Potassium, and Vitamin A**
3. Resume the video once you complete the questions.
4. You will start by researching pasteurization on your own to answer the three questions below. The sources linked here contain all the information you'll need to answer the questions.

[Article written by the Food and Drug Administration \(FDA\)](#)

[Article written by the Center for Disease Control \(CDC\)](#)

[Article written by the Academy of Nutrition and Dietetics](#)

- a. What is the definition of pasteurization? **Using heat to destroy harmful bacteria in milk without changing the taste or nutritional value of the milk. Pasteurization also increases the shelf life of milk.^{1,2}**
- b. Is there a nutritional difference between raw and pasteurized milk? **This does not decrease the nutritional value of milk. It still has all the same essential nutrients as raw milk.^{1,2}**
- c. Why is milk pasteurized? **This process helps to eliminate all the harmful bacteria in milk that would get people sick.^{1,2,3}**



5. Once you have completed the pasteurization questions, resume the video.
6. While you are listening to the video and presentation fill out the below questions about homogenization. You may need pause or rewind the video to give yourself time to answer the questions.
 - a. What is the definition of homogenization? The process of breaking down the fat globules in milk so they will evenly disperse throughout the liquid.⁴
 - b. Why is milk homogenized? This helps the cream to no longer rise to the top, and the milk to have a more consistent texture.⁴
7. Once you have completed the homogenization questions, resume the video.
8. While listening to the lesson answer the following questions about fortification. You may need to pause or rewind the video to give yourself time to answer the questions.
 - a. What is the definition of fortification? Adding additional vitamins and minerals to a food product in order to increase its nutritional value.⁵
 - b. What nutrients are fortified in milk? Usually vitamins A & D.⁵
 - c. Why is milk fortified? Milk is fortified with these nutrients because our population is commonly deficient in these two vitamins. We use milk as a way to help more people get an adequate amount of the vitamins.^{5,6}
9. Once you have completed the fortification questions, resume the video.
10. While listening to the lesson answer the following questions about hormones. You may need to pause or rewind the video to give yourself time to answer the questions.
 - a. What is the definition of a hormone? An organic substance in plants, animals, and humans that help to regulate physiological activities.⁷
 - b. Write down the full statement noted by the asterisk on the milk label when it refers to hormones. No significant difference has been shown in milk from cows treated with the artificial growth hormone rBST and non-rBST treated cows.
 - c. Does the rBST hormone in milk have a physiological response in humans? Explain why it does or does not cause a response. There is no physiological response initiated by rBST in the human body because humans do not have the correct lock, or receptor to begin a response. Instead the body digests the hormone because it recognizes it as a protein since it is a protein-derived hormone.⁸
11. Once you've completed the hormone questions, resume the video.
12. Use some time to review this social media post. Either list the false statements below or circle the false statements in the images below.
 - a. What statements were false? Answers are circled in red below.





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**Once you've completed all the questions turn your worksheet in to your teacher.
Great job learning more about dairy and the milk label today!**

Resources

1. [The Dangers of Raw Milk: Unpasteurized Milk Can Pose a Serious Health Risk. FDA. 2018](#)
2. [Raw Milk Questions and Answers. CDC. 2017](#)
3. [The Realities of Raw Milk. Academy of Nutrition and Dietetics. 2020](#)
4. [Homogenization of Milk and Milk Products. The Dairy Science and Technology eBook](#)
5. [Questions and Answers on FDA's Fortification Policy Guidance for Industry. FDA. 2015](#)
6. [Vitamin D Deficiency in Kids. Academy of Nutrition and Dietetics. 2020](#)
7. [Hormone. Biology Dictionary. 2018](#)
8. [Report on the Food and Drug Administration's Review of the Safety of Recombinant Bovine Somatotropin. FDA. 2009](#)