

Carl Sandburg Home National Historic Site



Post-Visit Lesson: *Why Goat's Milk?* Grades 3-5

Lesson Length

Approximately one 90 minute lesson or two 45 minute lessons

Common Core State Standards

Reading Standard for Informational Text

- Determine the main idea of a text, recount the key details and explain how they support the main idea. CCSS.ELA-Literacy.RI.3.2
- Determine the main idea of a text and explain how it is supported by key details; summarize the text. CCSS.ELA-Literacy.RI.4.2
- Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text. CCSS.ELA-Literacy.RI.5.2

Writing Standard

- Write informative/explanatory texts to examine a topic and convey ideas and information clearly. CCSS.ELA-Literacy.W.3.2, CCSS.ELA-Literacy.W.4.2, CCSS.ELA-Literacy.W.5.2

Speaking and Listening Standard

- Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grades 3, 4 & 5 topics and texts, building on others' ideas and expressing their own clearly. CCSS.ELA-Literacy.SL.3.1, CCSS.ELA-Literacy.SL.4.1, CCSS.ELA-Literacy.SL.5.1

North Carolina Essential Standards

Science

- Understand how structures and systems of organisms (to include the human body) perform functions necessary for life. 3.L.1
- Understand body systems and organs, functions, and their care. 5.L.1

Learning Targets

- I can identify the nutrition facts in goat's milk and explain how they benefit the human body through writing an informational text.
- I can engage effectively in collaborative discussions.

Materials Needed

- Sandburg Farm information sheet (see attached)
- picture of original quart milk container (see attached)
- Goat's Milk is Healthier information (see attached)
- Activating Strategy Gist Grid (see attached)



- Template for paper quart milk container and images of goats (see attached)
- Document Camera and projector
- 11 x 17 white paper or white 8.5 x 11 stock paper
- crayons, markers, or colored pencils
- glue & scissors

Procedure

Activating Strategy

Gist, students are given the provided grid with blanks (teacher can create additional grids for future lessons by adapting the number of blanks depending on the age/level of student and the difficulty of the lesson). Students are then encouraged to record words in each blank of the grid that correspond with the lesson's focus, goat's milk. The words recorded will depict the "Gist" of the students' prior knowledge.

Teaching Strategy

1. Teacher will divide students into groups of four with each group having a high ability reader. Groups will collaborate on how the text is going to be read i.e. choral, echo or independent. Note: The high ability reader is to be used to assist with those students that might struggle with the text. Teacher will distribute a copy of The Sandburg Farm to each student. Groups will read text as determined by their particular group and identify the key details within the text.
1. Whole group, teacher directed, groups will share the key details that they identified within the text. The teacher will record student responses on the board.
2. Next display one of the pictures of the original quart containers used to sell goat's milk. Ask the students what things they notice about this milk container. Now display the second picture of a quart container used to sell goat milk.
3. Lead a discussion about the wording and pictures on the original containers; comparing and contrasting the two containers.
4. Ask the students what they would expect to find on the back of the container? (nutritional value). Teacher may elect to bring in a modern container of milk or a cereal box so that students can see the nutritional value on the modern container.
5. Ask the students to imagine they are a shopper and they see both of the pictured containers at the store. Which one would they choose to buy and why?
6. Have a discussion about advertisement and how proper packaging can increase the sales of a product.
7. Next read and distribute the following scenario to the students:

“It has been over 20 years since the Connemara Farms Goat Dairy has updated their milk containers! It will be your job to come up with a new package. The farm would like to keep the original size and shape of the milk container; however, everything else needs to change! There is a lot of competition in North Carolina with other dairy goat farms selling milk too. Therefore Connemara Farm needs you to create the best package for today’s consumers!”

8. Ask the students what they think consumers would want to know about goat’s milk. Make sure to review the things they learned from the material read earlier. As a group brainstorm what things the students feel are important to put on their new label. Guide the discussion so that it includes properties of goat’s milk, what words, images and colors they would use on their labels etc. Write their answers on the writing board so that the students can refer to it later.
9. Explain to the students that their new and improved container must include the following:
 1. The name of the farm (Connemara)
 2. The location of the farm
 3. At least one image
 4. At least one of the benefits of goat milk
 5. A nutritional chart of the backside of the container.
10. Hand out copies of the milk container template to each student. [This can be enlarged to actual quart dimensions at 129% increase.] Have students cut out their container. Allow 20-30 minutes for the students to design and color their new and improved Connemara Farm Dairy Goat milk container. After they have completed their creation they should glue the seams together so the container can stand upright.
11. Have the students present their new and improved container to the class.

Summarizing Strategy

Headline Summaries, students will write a newspaper headline that gives the main points of the lesson.

Extension

Information from the *How Goat’s Milk is Healthier* article may be shared with the class.

The Sandburg Farm

At sixteen years old Helga Sandburg wanted a pet cow, but her father convinced her that a goat would be easier to raise! Helga agreed, so she and her mom went shopping for a dairy goat. What began as two very fine dairy goat pets, grew into a large herd of over one hundred goats.

The Sandburg goat herd was called the *Chikaming Herd*. Chikaming was an Indian word meaning *by the waters*. At the time the Sandburgs were living on the shores of Lake Michigan so the name seemed perfect! They moved (the family AND the goats) to a beautiful farm with lots of pastureland in Flat Rock, NC in 1945 and called the dairy Connemara Farms Goat Dairy.

They raised three breeds of goats at the farm: Saanens, Nubians, and Toggenburgs.

Mrs. Sandburg scientifically bred her goats to produce the most milk and the best milk possible. She believed too many goat breeders bred goats without a plan. Mrs. Sandburg's Toggenburg goat, Jennifer II, produced twice as much milk as any other Toggenburg goat in the world! Mrs. Sandburg held the world record for twenty years!

The Sandburg family enjoyed drinking goat's milk which they found to be sweet tasting. The Sandburgs were well aware that goat's milk contains a lot of healthy benefits!

In fact here are some of the benefits of goat's milk:

Goat's milk has:

- 13% more calcium
- 25% more vitamin B6
- 47% more vitamin A
- 134% more potassium
- 350% more niacin

Many people who are sensitive to cow's milk and cannot drink it find out that they are able to drink goat's milk because it is easier to digest!

Also goat's milk is 88% water and 12% solid substance. Water is good for the body and the various solid substances are also good for you! Here is what they are and what they do for you:

<u>Type of Substance</u>	<u>Percentage</u>	<u>What it Does for You?</u>
Fat	3.8%	warmth
Protein	3.0%	growth and muscles
Lactose	4.1%	energy
Minerals	1.8%	general well-being



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How Goat's Milk Is Healthier Than Cow's Milk

Based on current research, listed below are some of the differences between goat and cow milk, which make goat milk generally the healthier choice:

- **Composition of Fat globules:** One of the more significant differences from cow milk is found in the composition and structure of fat in goat milk. The fat globules are 1/5th the size of those in cow's milk. These smaller sized fat globules provide a better dispersion, and a more homogeneous mixture of fat in the milk
- **Higher Amount of shorter-chain fatty acids** in the milk fat of goats: Furthermore, glycerol ethers are much higher in goat than in cow milk which appears to be important for the nutrition of the nursing newborn.
- **Alkalinity vs. Acidity:** The reaction of goat milk is alkaline, the same as Mother's milk. Cow milk produces an acid reaction. An acid environment promotes the growth of bacteria, fungi, and virus.
- **Goat milk protein is more easily digested than cow milk protein:**
 - The curd in goat milk is small and light, hence easily digested. The curd in cow milk is large and dense. Goat milk is 2% curd (which precipitates in the stomach) as compared with 10% curd in Cow milk.
 - This difference in curd tension is attributed to the low levels of alpha-s1-casein in goat milk, compared to cow milk. This is a key reason why goat milk is considered more easily digestible than cow milk. A softer casein curd with smaller flakes could be expected to result in more rapid digestion of milk proteins, and this was confirmed in vitro by Jasinka (1995). Human casein was completely hydrolysed, compared with 96% of goat casein and 76-90% of cow casein. This was attributed to the greater level of beta-casein, and lower level of alpha-s1-casein, in human and goat milk casein. These results are not surprising when the impact of alpha-s1-casein is considered on cheese manufacture. A firmer curd is required for cheese manufacture in order to achieve desired consistency and yields, as with cow milk and its high level of alpha-s1-casein.
- **Goat Milk Protein reduces the chances of contracting diabetes and other health problems:** Goat milk contains A2 Beta-Casein, not the A1 Beta-Casein that cow's milk contains. Recent research published in February, 2003 has implicated the protein A1 beta-casein as a trigger for Type 1 diabetes and other health issues (Elliott et al, 1999). Commercial efforts are now being made to select and farm cows which only contain A2 beta-casein, which is considered the safe variant of beta-casein. Goat milk only contains the A2 variant of beta-casein, and is therefore a natural choice for those seeking to avoid A1 beta-casein
- **Natural Homogenization:** Goat milk is already homogenized: The natural homogenization of goat milk is, from a human health standpoint, much better than the mechanically homogenized cow milk product. It appears that when fat globules are forcibly broken up by mechanical means, it allows an enzyme associated with milk fat, known as xanthine oxidase to become free and penetrate the intestinal wall. Once xanthine oxidase gets through the intestinal wall and into the bloodstream, it is capable of creating scar damage to the heart and arteries, which in turn may stimulate the body to release cholesterol into the blood in an attempt to lay a protective fatty material on the scarred areas. This can lead to arteriosclerosis. It should be noted that this effect is

not a problem with natural (unhomogenized) cow milk

- **Superior micronutrient absorption** compared with cow milk. Aliaga et al (in a study in 2000) compared the influence of goat and cow milk on digestion and utilisation of calcium in rats. They found that goat milk enhanced calcium content of femure, sternum and Longissimus dorsi muscle over cow milk. In addition, they found a beneficial effect of goat milk on iron uptake. Similarly, Park et al (1986) showed that anemic rats fed goat milk had higher liver weights and efficiency of hemaglobin regeneration than those given cow milk, consistent with the greater bioavailability of iron in goat milk. Barrionuevo et al (2002) showed that goat milk increased the absorption and utilisation of both iron and copper. They suggested that the higher levels of MCT's (medium chain triglycerides) in goat milk could account for the improved absorption of iron, and that the higher levels of amino acids cysteine and lysine could also be a factor

Sources:

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Prosser C et al (2003). Digestion of milk proteins from cow or goat milk infant formula. Abstract and poster paper presented at the New Zealand Pediatric Conference, Queenstown, August 2003.

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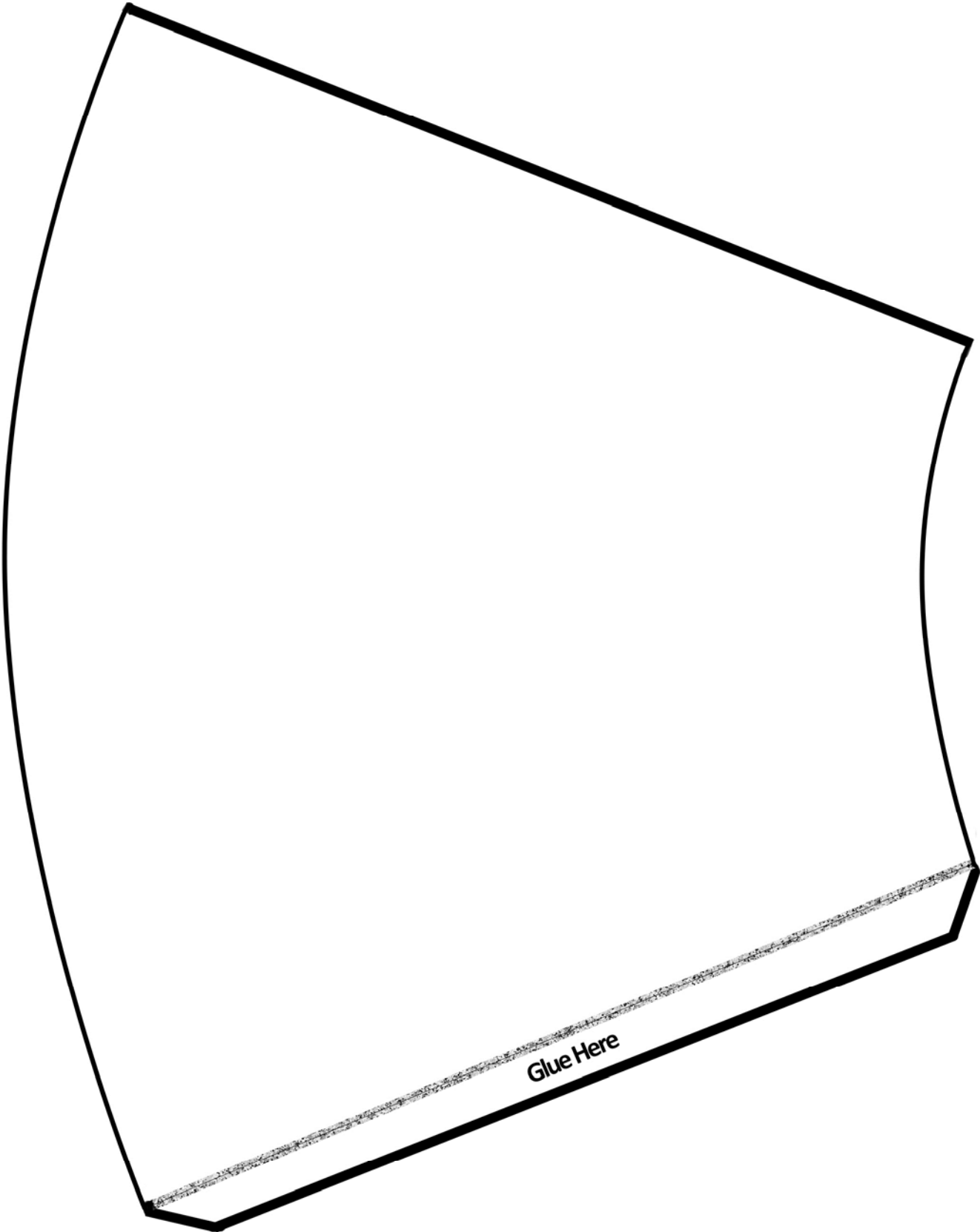
Barrionuevo M, Alferez MJ, Lopez AI, Sanz SM, Campos MS (2002), Beneficial effect of goat milk on nutritive utilization of iron and copper in malabsorption syndrome. J Dairy Sci 85:657-664.

From: <http://www.gardenharvest.org/milkbenefits.htm>

Activating Strategy Gist Grid

Paper Milk Container Template

(increase copy to 129% for actual quart dimensions)



Images of goats

(Teachers may elect to photocopy these images for students to use on their milk containers)

