



Species Specific Byproducts

Middle School Food and Agricultural Literacy Curriculum

Precepts

- C. Vision
- C4. Adapt to opportunities and obstacles

National Standards

- AS.01.01.01.a. Identify the origin, significance, distribution and domestication of animal species.
- CS.01.03.03.c. Conduct a self-evaluation for personal reactions to new experiences.
- NL-ENG.K-12.5 – Communication Strategies

Student Learning Objectives

- As a result of this **unit** the students will...
- Identify byproducts generated from the animal industry.
- As a result of this **lesson** the students will ...
- Define species specific byproducts.

Content Outline

- I. **Define byproduct, edible, inedible, and species (share one example for each)**
 - A. **Byproducts** – products of considerably less value than the major product (hide or pelt)
 - B. **Edible** – fit to be eaten by humans (tallow or lard)
 - C. **Inedible** – not edible; unfit to be eaten by humans (cosmetics)
 - D. **Species** – a class of animals having some common characteristics or qualities; distinct sort or kind (swine)
- II. **Specific byproducts from different species**
 - A. Beef/Dairy – tripe, surgical sutures, and gelatin
 - B. Sheep – book bindings, bandage strips, and shampoo
 - C. Swine – ears, skin for skin grafts, and heart valves
 - D. Goat – handbags, clothing (sweaters), and soap
 - E. Poultry – fertilizer, feather meal, and brushes

Time

Instruction time for this lesson: 45 minutes.

Resources

Field, T. G., & Taylor, R. E. (2008). Scientific farm animal production: An introduction to animal science (9th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Gillespie, J. R. (2002). Modern livestock and poultry production (6th ed.). Albany, NY: Delmar Thompson Learning, Inc. — Kentucky State Fair Board. (2001). North American International Livestock Exposition education curriculum. Retrieved August 14, 2009, from <http://www.livestockexpo.org/docs/shoolTours/Beef.pdf> — National FFA Organization. (2003). LifeKnowledge Precepts and Signs of Success. — National FFA Organization. (2009). LifeKnowledge Online. Retrieved July 19, 2009, from <http://agedlearning.org> — species. (n.d.). The American Heritage® New dictionary of cultural literacy (3rd ed.). Retrieved July 10, 2009, from Dictionary.com website: <http://dictionary.reference.com/browse/species/>

Tools, Equipment, and Supplies

Overhead projector/transparencies
Baseball (or a picture)
Baseball glove (or a picture)
Basketball (or a picture)
Soccer ball (or a picture)
Pair of leather shoes (or a picture)
MS.AS.3.1.AS.A – one per student
MS.AS.3.1.TM.A – one per teacher
MS.AS.3.1.TM.B – one per teacher
MS.AS.3.1.TM.C – one per teacher
Five pieces of flip chart paper – labeled with the headings Beef/Dairy, Sheep, Swine, Goats, and Poultry and hung prior to class
Markers – one marker per pair of students
MS.AS.3.1.ASSESS.A – one per student

Key Terms

The following terms are presented in this lesson and appear in **bold italics**:

Byproducts

Edible

Inedible

Species

Interest Approach

Before students arrive place a baseball, soccer ball, basketball, baseball glove, and a pair of leather shoes in the front of the classroom for all students to see.



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Summary of Content and Teaching Strategies

Objective 1. Define **byproduct**, **edible**, **inedible**, and **species**

Give each student a copy of **MS.AS.3.1.AS.A**. One side of the activity sheet will be blank and the other will have the matrix on it. Begin by sharing the definitions on **MS.AS.3.1.TM.A** with students to make sure that everyone understands the key terms that will be used during the session. Have students write the definitions on the blank side of the **MS.AS.3.1.AS.A**.

On the blank side of your activity sheet write a title that says "Animal **Byproducts**." After the title write the following definitions and the example so that we are all on the same page with key terms throughout the session.

Briefly discuss that byproducts were probably considered waste and an obstacle to dispose of in the animal industry at one time. But people thought about alternative uses for all the items and they are now a valuable part of the industry. We are often faced with obstacles in life but if we adapt our thinking and look at these items as potential opportunities, valuable outcomes can occur.

When we think about it, the **byproducts** from animals were probably considered waste to the animal industry originally. People who had the product they wanted from the animal were creative and looked for alternative uses for "the other stuff" they didn't want.

Rather than those items going to waste, they became valuable byproducts. Just like in life when we are faced with obstacles, rather than giving up we need to adapt and be creative. When we do that, often those obstacles can become opportunities.

Take 30 seconds and think of a time when you had to be creative to get around an obstacle.

Allow students to think of examples. Share an example of your own and then have students share their examples.

That was an example of a time I had to be creative. Let's share some of the examples that came to your minds.

If you do not have the actual items, pictures may be used instead. Begin by telling students that these items could all be considered a byproduct made from a cowhide. Have students guess how many of each item could be made out of one cowhide.

Thank you for being here today and ready to learn. Put on your best thinking cap and prepare to stretch your brain. There are five items located at the front of the room. Each of these items is made from a byproduct from an animal. Who can tell me the type of animal or guess the name of the byproduct that is used for all of these objects?

Student response should be "the hide from a beef animal".

If we were to take one cowhide and make as many pairs of leather shoes out of it as we could, how many pairs of shoes would we have?

Allow for students to guess. Correct answer is 18.

How many basketballs do you think we could make out of one hide?

Allow for students to guess. Correct answer is 12.

If we had one cowhide and made as many soccer balls out of it as we could, how many soccer balls would we have?

Allow for students to guess. Correct answer is 18.

How many baseball gloves do you think we could make out of the one hide?

Allow for students to guess. Correct answer is 12.

If we had one cowhide and made as many baseballs out of it as we could, how many baseballs would we have?

Allow for students to guess. Correct answer is 144.

That is a lot of items that can be made out of one hide from a beef animal. We are surrounded by items that are **byproducts** of the animal industry all the time. Today we are going to talk about some of those products and discover what **species** of animals they come from. Keep that thinking cap on tight as we find out what really is around us.



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Allow students to share.

Thank you for sharing. Those are examples of times we had to think creatively and turned obstacles into opportunities.

Objective 2. Specific **byproducts** from different **species**

Use the five sheets of flip chart paper around the room with the headings Beef/Dairy, Sheep, Swine, Goats, and Poultry. Display **MS.AS.3.1.TM.B** titled, "Example Animal Byproducts."

Have students work in pairs. Each group should have a marker and write down the byproducts they think derives from each species on the appropriate flip chart/poster. Example might be that they write "ears" on the flip chart paper titled "Swine" or "feather meal" on the paper titled "Poultry." They should only write each byproduct down once.

Display **MS.AS.3.1.TM.B**.

Let's focus our attention on these items. This is a list of animal **byproducts** that come from the five different **species** you see posted around the room on the chart paper.

Your task is to match the **byproduct** with the **species**. When I say CHART IT, you will have four minutes to find a partner, a marker, and write the **byproduct** on the paper that you think matches the **species**. You may only write each **byproduct** once, so choose carefully and strategically. What questions do you have? CHART IT.

When students have completed the task, move around the room to narrow down their answers to the three specific items listed on **MS.AS.3.1.TM.C**. Have students fill out the matrix on **MS.AS.3.1.AS.A** as you are narrowing down their guesses.

It appears you have several thoughts about where these different items come from. Let's narrow down your answers and find out which **byproducts** come from each **species**.

Record the information as we go along in the matrix on your activity sheet. Feel free to ask questions as we go along if you have curiosity or wonder.

Work through each flip chart paper.

Review/Summary

Utilize a *Mother Goose e-Moment®* to have the students review the content from the day. Begin by having students brainstorm common nursery rhymes. Record those on a writing surface where all students can see the nursery rhymes. Then have students work with their teammate from before to re-write the words of the nursery rhyme using the newly learned content. Students must include the terms byproduct, edible, and inedible. They should also include the name of the species they are describing and the three specific examples of byproducts associated with that species.

We have all heard numerous nursery rhymes during our lifetimes. What are some of the nursery rhymes that you have heard?

Write the names of the nursery rhymes mentioned on a writing surface for everyone to see.

This is quite a list you will have to pick from.

When you hear the word CREATE, you are to pick one of the nursery rhymes listed and change the words. Change the words to incorporate the terms you have learned today. Your newly written rhyme should include the words **byproduct**, **edible**, and **inedible**.

The rhyme should also include the name of one **species** and the specific **byproducts** from that animal that we have discussed today. You will have ten minutes to work with your teammate from before to author this new nursery rhyme. What questions do you have? CREATE.

Allow students to share their new nursery rhymes with the entire class or in small groups. Close by thanking students for their engagement during the session.

Thank you for sharing your newly developed nursery rhymes based on your newly developed knowledge with respect to animal byproducts. Give yourselves a hand.

Lead applause.

Thank you for keeping your thinking hat on throughout the session today and remember we are surrounded each day by many items that are byproducts from animals.



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Application

Extended classroom activity:

Have students build an inventory of items they have in their homes that are animal byproducts. Then challenge the students to determine which species those items may have been derived from.

FFA activity:

Have students develop a poster that shows the byproducts that come from a specific species. Design the poster in a way that it could be displayed at a community event or used in an agricultural awareness presentation.

SAE activity:

Have students write a letter to a business that utilizes animal byproducts. Ask the business to explain the role that the animal industry plays in their business. Have students then present the information in a written report that describes how the business and the careers associated with the business relate to agriculture.

Evaluation

MS.AS.3.1.ASSESS.A.

Answers to Evaluation

1. Byproducts – products of considerably less value than the major product
2. E
3. C
4. A
5. B
6. A
7. E
8. D
9. C
10. D
11. B



Species	Byproduct	Byproduct	Byproduct
Beef/Dairy			
Sheep			
Swine			
Goats			
Poultry			



Animal Byproducts

- A. Byproducts** – products of considerably less value than the major product (example: a hide or pelt)
- B. Edible** – fit to be eaten by humans (example: tallow or lard)
- C. Inedible** – not edible; unfit to be eaten by humans (example: cosmetics)
- D. Species** – a class of animals having some common characteristics or qualities; distinct sort or kind (example: swine)



Example Animal Byproducts

Feather meal	Surgical Sutures
Shampoo	Heart Valves
Tripe	Ears
Gelatin	Clothing (sweaters)
Book Bindings	Brushes
Handbags	Fertilizer
Soap	Bandage Strips
Skin for Skin Grafts	



Species	Byproduct	Byproduct	Byproduct
Beef/Dairy	Tripe	Surgical Sutures	Gelatin
Sheep	Book Bindings	Bandage Strips	Shampoo
Swine	Ears	Skin for Skin Grafts	Heart Valves
Goats	Handbags	Clothing (sweaters)	Soap
Poultry	Fertilizer	Feather Meal	Brushes



Animal Byproducts

Name: _____

Answer the following question in complete sentences.

1. Define byproduct.

Write the letter for the correct species in the space that the byproduct comes from that we discussed in class. Each species will be used twice.

A. Beef/Dairy	B. Sheep	C. Swine	D. Goat	E. Poultry
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_____ **2. Fertilizer**

_____ **3. Skin for skin grafts**

_____ **4. Tripe**

_____ **5. Bandage strips**

_____ **6. Surgical sutures**

_____ **7. Feather meal**

_____ **8. Clothing (sweaters)**

_____ **9. Heart valves**

_____ **10. Soap**

_____ **11. Book bindings**