



STEMsational Ag: The Virtual Farm

MIDDLE TENNESSEE STATE UNIVERSITY



Module 7: Bacon the Pig UNIT 1: PIGS LOVE SLOP Grades 6 – 8



USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

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AND HUMAN SERVICES

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I AM *true*
BLUE
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MT
Fermentation Science

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Module 7: Bacon the Pig
UNIT 1: PIGS LOVE SLOP
Grades 6 – 8



6th – 8th Grade:

Introduction to the Unit:

In this unit, you will learn about the role of pigs in agriculture.

Pre-assessment:

- ▶ Write down as many reasons you can think of why pigs are important to consumers.
- ▶ Write down as many swine industry careers that you can think of.

Purpose:

The purpose of this lesson is to identify sources of agricultural products from swine that provide food, fuel, clothing, shelter, medical, and other non-food products for their community, state, and/or nation. Additionally, students will identify the careers in swine food production, processing, and nutrition that are essential for a healthy food supply.

Student Learning Outcomes for the Unit:

- ▶ Student will identify common vocabulary used within the swine industry



- ▶ Student will identify products from swine that provide food, fuel, clothing, shelter, medical, and other non-food products for humans
- ▶ Student will identify careers in the swine industry

National Agricultural Literacy Outcomes

Food, Health, and Lifestyle Outcomes, Theme 3

T3.6-8

- I. Identify sources of agricultural products that provide food, fuel, clothing, shelter, medical, and other non-food products for their community, state, and/or nation
- J. Identify the careers in food production, processing, and nutrition that are essential for a healthy food supply

Vocabulary Words:

- ▶ **Boar:** a mature male swine
- ▶ **Barrow:** a male swine that has been castrated
- ▶ **Farrowing:** giving birth to pigs
- ▶ **Gilt:** a young female swine that has not had a litter
- ▶ **Litter:** the young born to an animal at a single time
- ▶ **Pork:** the flesh of a pig or hog used as food
- ▶ **Sow:** a mature female swine who has given birth to piglets
- ▶ **By-product:** an incidental or secondary product made in the manufacture or synthesis of something else
- ▶ **Primal meat cuts:** the first piece of meat to be separated from the carcass of an animal during the butchering process
- ▶ **Retail meat cuts:** a cut of meat from a primal cut for direct sale to the consumer

Materials Needed:

- ▶ Writing utensil

Activity 1: Pigs and Hogs

Swine were among the first animals to be domesticated around 6,000 years ago. A domesticated animal is one that is trained to live in a human environment and be of use to humans. The Spanish explorer Hernando DeSoto brought the first swine to the New World in 1539.

Female pigs are called sows. They give birth to litters of pigs twice a year. Each litter usually has eight to 12 baby pigs. Giving birth to baby pigs is called



farrowing. Baby pigs appear very greedy when they are competing for food from their mothers. For this reason, the words “pig” and “hog” have come to be associated with greedy behavior. Despite their reputation, pigs will never overeat. Once a pig is full, it stops eating. Pigs are weaned when they are two to four weeks old. They are called “nursery pigs” until they reach 50 pounds and “growing/finishing pigs” from then until they reach about 240 pounds. After that they are called hogs. Hogs are usually taken to market when they weigh 240–280 pounds.

In the past, hogs were fed table scraps and had a reputation for eating just about anything. The meat from hogs fed that way was very high in fat. Today’s swine producers are more careful about what they feed their animals. Some of the food fed to swine are corn, wheat, and soybean meal. Vitamins and minerals are added to increase growth and improve health. Today’s hogs weigh more, but because producers plan their diets carefully, they grow more efficiently and yield more lean meat than ever before. Bacon, pork sausage, pork chops, and ham all come from hogs. In addition, swine are used in the production of non-food products like fertilizer, glass, china, floor wax, chalk, crayons, and heart valves.

Pork provides protein, B-vitamins, and thiamin to our diets. Pork has three times as much thiamin as any other food. Thiamin changes carbohydrates into energy and promotes a healthy appetite.

There are 377 breeds of pigs around the world. In Oklahoma the most common breeds are Duroc, Hampshire, Yorkshire, Poland and Spot. Duroc pigs are mostly red but can be yellow or golden yellow. They are medium in length with droopy ears. Yorkshire hogs are white. Hampshire hogs are black with a white belt. Poland hogs are black and have droopy ears. Spots are white, with black spots.

Check Your Knowledge

Answer the “Pigs and Hogs Vocabulary Questions”. The answer key is on page 17 so be sure to check your answers when you’re done to see how many you got right.

Pigs and Hogs Vocabulary Questions

1. What word from paragraph one means “trained to live in a human environment”?
 - a. trained
 - b. domesticated
 - c. farrowing
 - d. swine



-
2. What word from paragraph 3 means “no longer drinking milk from the mother?”
 - a. nursery
 - b. finishing
 - c. market
 - d. weaned
 3. What does the word “litter” mean, as it is used in this story?
 - a. The young born to an animal at a single time
 - b. A messy collection of things scattered about
 - c. A device used to carry an injured person
 4. What word from the story could be included in this list of synonyms? (Look in paragraph two.) Grasping, coveting, desirous, unquenchable, piggish, [fill in the blank]
 5. What word from paragraph four means “to make better?”
 6. Re-read this sentence from the story. “In the past, hogs were fed table scraps and had a reputation for eating just about anything.” What is another way to say that hogs had a reputation for eating just about anything?
 - a. Hogs were able to eat anything
 - b. Hogs were known for eating anything
 - c. Hogs refused to eat anything
 7. Which definition for “appetite” is closest to the way it is used in the last paragraph?
 - a. The need for food
 - b. A strong wish for something
 - c. Positive regard for something
-

Activity 2: Pig By-Products

When most people think of pigs, they think of pork and pork products. While pigs are responsible for many retail meat cuts that we enjoy, they also produce products many of us do not think of!

Next you will view the video screenshots and narration from a TED Talk called, “How Pig Parts Make the World Turn.”

Christien Meindertsm is the author of “Pig 05049.” In this video, she looks at the astonishing afterlife of the ordinary pig, parts of which make their way into at least 185 non-pork products from bullets to artificial hearts.



How Pig Parts Make the World Turn

Also available online at: https://www.ted.com/talks/christien_meindertsma_how_pig_parts_make_the_world_turn?language=en



CHRISTIEN MEINDERTSMA



Hello. I would like to start my talk with actually two questions, and the first one is: How many people here actually eat pig meat? Please raise your hand – oh, that’s a lot! And how many people have actually seen a live pig producing this meat? In the last year?



In the Netherlands – where I come from – you actually never see a pig, which is really strange, because, on a population of 16 million people, we have 12 million pigs. And well, of course, the Dutch can’t eat all these pigs. They eat about one-third, and the rest is exported to all kinds of countries in Europe and the rest of the world. A lot goes to the U.K., Germany.



And what I was curious about – because historically, the whole pig would be used up until the last bit so nothing would be wasted – and I was curious to find out if this was actually still the case. And I spent about three years researching.



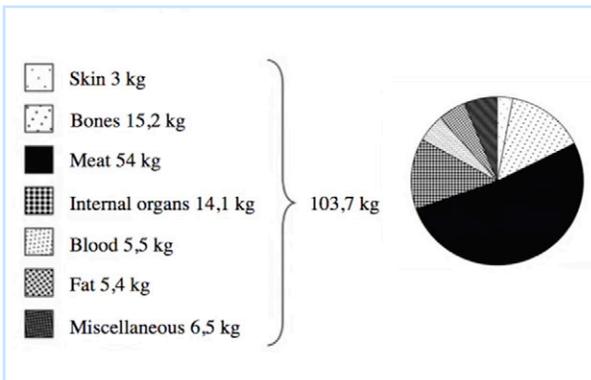
And I followed this one pig with number "05049," all the way up until the end and to what products it's made of. And in these years, I met all kinds people like, for instance, farmers and butchers, which seems logical. But I also met aluminum mold makers, ammunition producers and all kinds of people.



And what was striking to me is that the farmers actually had no clue what was made of their pigs, but the consumers – as in us – had also no idea of the pigs being in all these products.



So what I did is, I took all this research and I made it into a – well, basically it's a product catalog of this one pig, and it carries a duplicate of his ear tag on the back.



And it consists of seven chapters – the chapters are skin, bones, meat, internal organs, blood, fat and ... miscellaneous. (Laughter)

In total, they weigh 103.7 kilograms. And to show you how often you actually meet part of this pig in a regular day, I want to show you some images of the book.



You probably start the day with a shower. So, in soap, fatty acids made from boiling pork bone fat are used as a hardening agent, but also for giving it a pearl-like effect.

Then if you look around you in the bathroom, you see lots more products like shampoo, conditioner, anti-wrinkle cream, body lotion, but also ... toothpaste.



Then, so, before breakfast, you've already met the pig so many times. Then, at breakfast, the pig that I followed, the hairs off the pig or proteins from the hairs off the pig were used as an improver of dough.

(Laughter) Well, that's what the producer says: it's "improving the dough, of course."



In low-fat butter, or actually in many low-fat products, when you take the fat out, you actually take the taste and the texture out. So what they do is they put gelatin back in, in order to retain the texture.

Well, when you're off to work, under the road or under the buildings that you see, there might very well be cellular concrete, which is a very light kind of concrete that's actually got proteins from bones inside and it's also fully reusable. In the train brakes – at least in the German train brakes – there's this part of the brake that's made of bone ash.



And in cheesecake and all kinds of desserts, like chocolate mousse, tiramisu, vanilla pudding, everything that's cooled in the supermarket, there's gelatin to make it look good.

Fine bone china – this is a real classic. Of course, the bone in fine-bone china gives it its translucency and also its strength, in order to make these really fine shapes, like this deer.

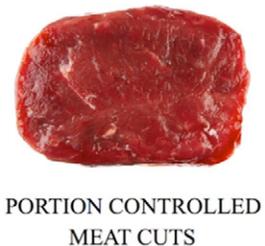




In interior decorating, the pig's actually quite there. It's used in paint for the texture, but also for the glossiness. In sandpaper, bone glue is actually the glue between the sand and the paper. And then in paintbrushes, hairs are used because, apparently, they're very suitable for making paintbrushes because of their hard-wearing nature.



I was not planning on showing you any meat because, of course, half the book's meat and you probably all know what meats they are. But I didn't want you to miss out on this one, because this, well, it's called "portion-controlled meat cuts." And this is actually sold in the frozen area of the supermarket.



And what it is – it's actually steak. So, this is sold as cow, but what happens when you slaughter a cow – at least in industrial factory farming – they have all these little bits of steak left that they can't actually sell as steak, so what they do is they glue them all together with fibrin from pig blood into this really large sausage, then freeze the sausage, cut it in little slices and sell those as steak again. And this also actually happens with tuna and scallops.



So, with the steak, you might drink a beer. In the brewing process, there's lots of cloudy elements in the beer, so to get rid of these cloudy elements, what some companies do is they pour the beer through a sort of gelatin sieve in order to get rid of that cloudiness. This actually also goes for wine as well as fruit juice.



There's actually a company in Greece that produces these cigarettes that actually contain hemoglobin from pigs in the filter. And according to them, this creates an artificial lung in the filter. (Laughter) So, this is actually a "healthier" cigarette. (Laughter)



CIGARETTE



Injectable collagen – or, since the '70s, collagen from pigs – has been used for injecting into wrinkles. And the reason for this is that pigs are actually quite close to human beings, so the collagen is as well.



INJECTABLE COLLAGEN



BULLET

Well, this must be the strangest thing I found. This is a bullet coming from a very large ammunition company in the United States. And while I was making the book, I contacted all the producers of products because I wanted them to send me the real samples and the real specimens. So I sent this company an email saying, "Hello. I'm Christien. I'm doing this research. And can you send me a bullet?" (Laughter) And well, I didn't expect them to even answer my email. But they answered and they said, "Why, thank you for your email. What an interesting story. Are you in anyway related to the Dutch government?" I thought that was really weird, as if the Dutch government sends emails to anyone. (Laughter)





HEART VALVE

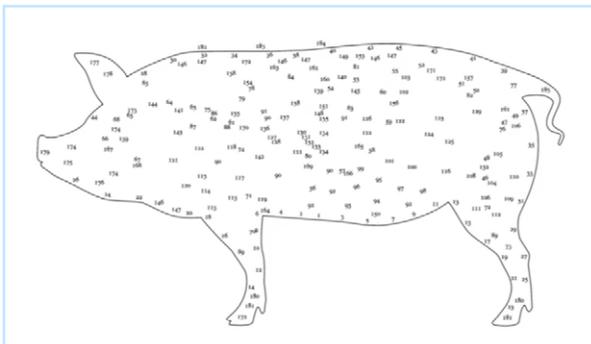
So, the most beautiful thing I found – at least what I think is the most beautiful – in the book, is this heart valve. It’s actually a very low-tech and very high-tech product at the same time. The low-tech bit is that it’s literally a pig’s heart valve mounted in the high-tech bit, which is a memory metal casing. And what happens is this can be implanted into a human heart without open heart surgery. And once it’s in the right spot, they remove the outer shell, and the heart valve, well, it gets this shape and at that moment it starts beating, instantly. It’s really a sort of magical moment.

So this is actually a Dutch company, so I called them up, and I asked, “Can I borrow a heart valve from you?” And the makers of this thing were really enthusiastic. So they were like, “Okay, we’ll put it in a jar for you with formalin, and you can borrow it.” Great – and then I didn’t hear from them for weeks, so I called, and I asked, “What’s going on with the heart valve?” And they said, “Well the director of the company decided not to let you borrow this heart valve, because want his product to be associated with pigs.” (Laughter)



RENEWABLE ENERGY

Well, the last product from the book that I’m showing you is renewable energy – actually, to show that my first question, if pigs are still used up until the last bit, was still true. Well it is, because everything that can’t be used for anything else is made into a fuel that can be used as renewable energy source.



In total, I found 185 products. And what they showed me is that, well, firstly, it’s at least to say odd that we don’t treat these pigs as absolute kings and queens. And the second, is that we actually don’t have a clue of what all these products that surround us are made of.



And you might think I'm very fond of pigs, but actually – well, I am a little bit – but I'm more fond of raw materials in general. And I think that, in order to take better care of what's behind our products – so, the livestock, the crops, the plants, the non-renewable materials, but also the people that produce these products – the first step would actually be to know that they are there.



Thank you very much.

(Applause)



Activity 3: Pig By-Products

Pigs give us many by-products that we don't always think about. Farm Credit offers excellent resources about by-products from pigs. In this activity, you will have access to the "Everything but the Oink" infographic (below) and the worksheet on the next page. Study the infographic to help you to complete the worksheet. You can check your answers at the end of the lesson by viewing the "Everything but the Oink Answer Key" on page 17.

Everything But the *Oink*

By-Products from Pigs

From Blood...

- Medicines
- Sticking agent
- Leather treating agent
- Plywood Adhesive
- Protein source in feeds
- Fabric printing and dyeing

From Brain...

- Cholesterol
- Other medicines

From Internal Organs...

- Insulin
- A variety of medicines
- Surgical sutures
- Heart valves

From Hair...

- Artist's brushes
- Insulation
- Upholstery

From Skin...

- Gelatin
- Footballs
- Porcine Burn Dressings
- Luggage, purses
- Gloves and shoes
- Pigskin garmets

From Bones...

- Glue
- Buttons
- Bone China
- Bone Meal
- Minerals for feed
- Fertilizer
- Porcelain enamel
- Glass
- Water filters

From Meat Scraps...

- Commercial feeds
- Pet food

From Fatty Acids and Glycerine...

- Insecticides
- Weed killers
- Lubricants
- Oil polishes
- Rubber
- Cosmetics

- Antifreeze
- Nitroglycerine
- Plastics
- Plasticizers
- Printing rollers
- Cellophane
- Floor waxes
- Cement
- Waterproofing agents
- Fiber softeners
- Crayons
- Chalk
- Phonograph records
- Matches
- Putty
- Insulation
- Linoleum

AND OF COURSE: bacon, ham, sausage, pork chops, ribs, BBQ and more!

So many products come from pigs that we really do use everything but the oink!

www.FarmCreditKnowledgeCenter.com



Everything But the Oink.....

Pig By-Products Worksheet

Name: _____

True or False?

Do the products listed below come from pigs? Write true next to the products you think come from pigs and false after the ones that you don't think come from pigs.

- | | | | |
|----------|--------------|-----------|------------------|
| _____ 1. | Footballs | _____ 8. | Lumber |
| _____ 2. | Bacon | _____ 9. | Yarn |
| _____ 3. | Carrots | _____ 10. | Bone China |
| _____ 4. | Insecticides | _____ 11. | Insulin |
| _____ 5. | Heart Valves | _____ 12. | Pork Chops |
| _____ 6. | Paper | _____ 13. | Artists' brushes |
| _____ 7. | Crayons | _____ 14. | Drum heads |

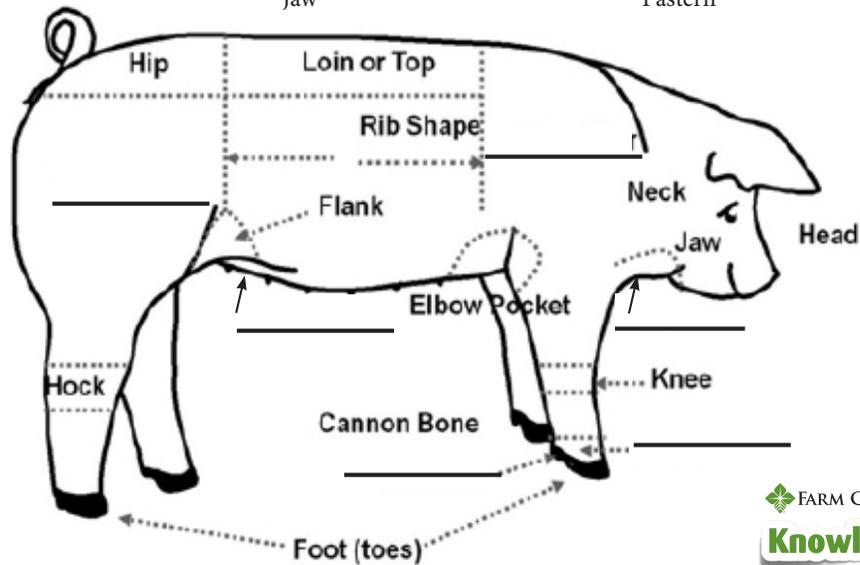
Label

Using the word bank below, label the missing parts of the pig. Not all words will be used.

Ham
Hock
Foot
Dewclaw
Hip

Loin
Flank
Shoulder
Jowl
Jaw

Head
Underline
Neck
Knee
Pastern





Activity 4: A Career in SWINE is Fine

According to the 2020 Iowa Pork Industry Report, hog farming alone contributes \$11.9 billion in value-added economic activity for Iowa and nearly one-third of the nation's hogs are raised in Iowa. Iowa is the number one pork producing state in the U.S. and the top state for pork exports. With those numbers, jobs in the swine field are abundant. Below are some of the jobs available in the swine industry in Iowa and across the United States.

Production:

- ▶ Barn Worker
- ▶ Pork Production Technician
- ▶ Sow Manager
- ▶ Farm Manager
- ▶ Quality Control Inspector

Nutrition:

- ▶ Feed Mill Manager
- ▶ Nutritionist

Health:

- ▶ Pharmaceutical Lab Technician
- ▶ Veterinarian
- ▶ Animal Research Technician
- ▶ Education and Communication
- ▶ Extension agent/educator/specialist
- ▶ Pork Checkoff Communications
- ▶ Pork Checkoff Industry Relations

Sales and Marketing:

- ▶ Pharmaceutical Sales
- ▶ Feed Sales
- ▶ Territory Sales Manager

Reproduction:

- ▶ Boar Stud Manager
- ▶ Breeding Manager
- ▶ Geneticist
- ▶ A.I. Technician



Activity

- ▶ Choose one of the career options on the previous page and create a poster, PowerPoint, flier, or other informational element
- ▶ Include the following details:
 - Name of career
 - Job responsibilities
 - Training required
 - Average salary
 - Helpful experiences for success

Post-Assessment

Directions: Respond to the prompt and one of the three activity options below

Prompt:

- ▶ Type two reasons why pigs are important to consumers.

Activity Option 1: Create a video

- ▶ Create a video that describes your completed activity from Activity 4 this lesson (i.e., A Career in Swine)
- ▶ If you are not able to create a video, talk to a friend or family member about your completed activity

Activity Option 2: Scavenger Hunt

- ▶ Go through your house and see how many products you can identify that come from pigs
- ▶ Make a list and share it with a family member to show them how many products come from swine

Activity Option 3: Write a Letter

- ▶ Write a letter to friend or family member summarizing five things you learned in this lesson
- ▶ Include why pigs are important to all consumers
- ▶ Name one additional piece of information you would like to learn about the swine industry



Answer Keys

Activity 1: Pigs and Hogs Answer Key

1. B
2. D
3. A
4. Greedy
5. Improve
6. B
7. A

Activity 3: Everything but the Oink Answer Key

True or False?

Do the products listed below come from pigs? Write true next to the products you think come from pigs and false after the ones that you don't think come from pigs.

- | | | | | | |
|--------------|----|--------------|--------------|-----|------------------|
| <u>True</u> | 1. | Footballs | <u>False</u> | 8. | Lumber |
| <u>True</u> | 2. | Bacon | <u>False</u> | 9. | Yarn |
| <u>False</u> | 3. | Carrots | <u>True</u> | 10. | Bone China |
| <u>True</u> | 4. | Insecticides | <u>True</u> | 11. | Insulin |
| <u>True</u> | 5. | Heart Valves | <u>True</u> | 12. | Pork Chops |
| <u>False</u> | 6. | Paper | <u>True</u> | 13. | Artists' brushes |
| <u>True</u> | 7. | Crayons | <u>True</u> | 14. | Drum heads |

Label

Using the word bank below, label the missing parts of the pig. Not all words will be used.

