ADDING VALUE TO KENTUCKY PRODUCTS

Background: Value-added is a popular term in Kentucky. It means to take a raw product and add something to it, change it, process it, put it in some form that consumers may want or need. They may want to purchase the finished product because it is more convenient. Adding value to Kentucky's agricultural products creates many jobs in processing for Kentuckyns.

Example: bread is a value-added product made from wheat. The major raw products produced in Kentucky are: corn, soybeans, hay, and oats. Some value-added intermediate products are produced using some of these raw products. These are: cattle, hogs, turkeys, chickens, and sheep.

Many agricultural products raised in Kentucky become food for us to eat. We don't eat cattle or hogs; we eat beef and pork. Many products are used in manufacture or processing of other food products. Sometimes it is hard to identify that the end product contains corn, soybeans or even meat. That's where label reading helps.

Procedure: List the four major Kentucky crops Kentucky produces (corn, soybean, oats, alfalfa) on the board or overhead, or have students list them on paper. Ask them if they buy these products at home. Do they buy corn and make their own corn flakes or corn chips? No. They may buy oatmeal and cook their own cereal, but the oatmeal has been minimally processed. They often buy products that are further processed or have added value because it saves the family time or work.

How else might they use these products? Another way is that these grains are often fed to livestock so that we can eat meat, poultry, eggs, or drink milk. This is another way to add value to the farm crops. The animals farmers raise are livestock for food. They are not raised to be pets. List the major livestock Kentucky raises.

Have students identify the major foods we get from each product.

Corn – may be used in corn meal, cornstarch, corn oil, corn sweetener (fructose), some corn chips, and tortillas. Field corn is different than sweet corn; Kentucky raise some sweet corn for processing. More than half of our corn grown in Kentucky is fed to livestock. Some is also processed into industrial products like ethanol.

Soybeans – like corn, much of our soybean crop is fed to livestock. We may eat tofu, or soy oil, soy flour, soymilk, soy protein that are found in prepared foods. Soybeans may also be processed into industrial products like soy ink or soy diesel.

Oats – regular oatmeal in the box, or instant oatmeal, which is further processed. Oatmeal may be used in cookies, breads, other breakfast cereals, etc.

Hay – is a major crop, but is fed only to livestock. Humans cannot digest hay.

Beef Cattle – produce beef. Beef may be eaten fresh like steaks and ground beef or may be frozen dinners, pizza, canned meat products, or beef jerky.

Hogs – produce pork. We eat pork chops, sausage, ham, and bacon. Pork may also be used in pizza, canned meat products, soups, and frozen dinners.

Sheep – produce lamb. We eat lamb as lamb chops, lamb burgers and ground lamb. Sheep provide wool to be made into clothing, blankets and many other products.

Dairy Cattle – produce milk which is used in many other products: whole and skim milk, cheese, yogurt, ice cream, dry milk, lactose, butter, whey. Dairy cattle also provide beef.

Chickens – most of Kentucky chickens are raised to produce eggs. Eggs may also be found in many food products labeled as egg yolk and egg white. Some of Kentucky's chickens are processed into soups, frozen dinners, etc.

Turkeys – we eat turkey, not only at Thanksgiving as a whole bird, but in deli meats hot dogs, frozen dinners and canned soups.

Practice reading food labels. Show students where the list of ingredients is located. Also note where the location of the manufacturer is on the label.

Assign students (individually or as a cooperative learning group) to search through cupboards or refrigerators at home to find items made from these Kentucky-grown products. Students may compile a list to see which student/group found the most items. Have students make graphs and pie charts depicting the results. Students may also bring labels or actual products to make a display. Have students look for products manufactured in one of Kentucky's processing plants.

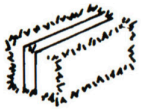
Make Value-Added Agriculture Products into a transparency or copy for students. Show how crops are fed to cattle and then turned into value-added products. Students will note that many of the products are food, but something is made from every part of the animal. The livestock industry calls these non-meat items "by-products" or those products made after the primary use of the animal, which is meat. Other groups may call these products "co-products" or value-added products.

Have students choose one product from their list above, either a crop or livestock. Have students make a similar diagram by researching the kinds of value-added products that may be made.

Digging Deeper: Hypothesize what process or processes are involved in turning the raw product into the end product. Using a time line format, have students trace a finished product from its beginning to present state (cattle to hamburger; corn to carbonated beverage).

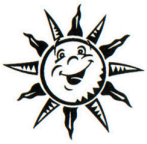
Raw Products


grass


hay


corn

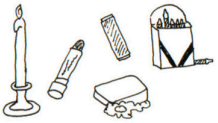

water


sun

Value-Added Products

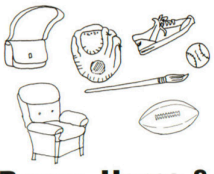
Beef: roast, steaks, hamburger

Fats help make:



- crayons
- soap
- chewing gum
- lipstick
- candles

Hide & Hair help make:



- football
- baseball glove
- wallet or purse
- shoe
- paint brush
- leather furniture

Bones, Horns & Hooves help make:

- camera film
- glue & pet food
- fertilizer
- gelatin
- marshmallows
- china dishes

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I DIDN'T KNOW THAT CAME FROM CATTLE!

Directions: We all know that cattle provide us with delicious beef to eat. You may not have known that the parts of the animal that are not used for food are used to make a wide range of other products such as leathers, sports equipment, soaps, film, buttons, and china dishes. Using what you learned in "My Cheeseburger Began on the Farm" unscramble these clue words to find some other items that come from cattle.

LIFM
8

CIE RAECM
4

SCONYAR
5 14

ETP OFOD
3 20 16

LUGE
10 13 1

SMETACH
19 7 15 12

NIPAT
9

GTOUYR
24 18

MIENEDCI
23 11 22

TIESR
6

HSSEO
21 25

LASBABLE EOGVL
2

1	2	3	4	5	6	7	8	9	10
				11	12		13	14	15	16
				17	18	19		20	21	22
							23	24	25	!

Copy the letters in the numbered spaces to these spaces with the same number to get the message

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LIFM	F	I	L	M																					
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CIE RAECM	I	C	E		C	R	E	A	M																
					4																				
SCONYAR	C	R	A	Y	O	N	S																		
				5			14																		
ETP OFOD	P	E	T		F	O	O	D																	
		3	20					16																	
LUGE	G	L	U	E																					
	10		13	1																					
SMETACH	M	A	T	C	H	E	S																		
			19		7	15	12																		
NIPAT	P	A	I	N	T																				
				9																					
GTOUYR	Y	O	G	U	R	T																			
		24		18																					
MIENEDCI	M	E	D	I	C	I	N	E																	
	23			11			22																		
TIESR	T	I	R	E	S																				
	6																								
HSSEO	S	H	O	E	S																				
			21	25																					
LASBABLE EOGVL	B	A	S	E	B	A	L	L		G	L	O	V	E											
	17												2												

E	V	E	R	Y	T	H	I	N	G
1	2	3	4	5	6	7	8	9	10
			I	S		U	S	E	D
			11	12		13	14	15	16
			B	U	T		T	H	E
			17	18	19		20	21	22
						M	O	O	!
						23	24	25	

Copy the letters in the numbered spaces to these spaces with the same number to get the message

KEY

THE CHEESEBURGER CONNECTION

Background: There are a lot of connections in agriculture; it takes many people and different jobs to provide food for us. The farmer is the beginning of the process and the consumer is at the end. All of the people involved in helping the farmer produce food, process it, transport it, sell it are involved in agriculture.

Format: Students will create webs to make agricultural connections. This can be done by cutting the pictures on the next page and pasting the picture in sequence on the Cheese Burger Connection page. Or students could make a bulletin board showing the process of a calf from birth to meat on the table. Additional pictures can be drawn or cut from magazines and newspapers.

Have students create their webs, to see who can come up with the most connections between the beef animal and the hamburger bun. How many jobs are involved?

Teacher Note:

The number of connections is almost endless. It might help to divide the connections into parts. For example:

1. Inputs to the farmer to help him/her produce food: seed sales, fertilizer, pest and weed control sales, veterinarian, feed sales, animal health product sales, animal nutritionist, extension agents, university professors and other experts providing technical information and training.

2. Inputs into other parts of the burger, such as wheat farmers who produce flour for buns, or vegetable farmers who produce lettuce, tomatoes, onions, cucumbers, (pickles) and dairy farmers who produce milk for cheese.

3. Parts of the web radiating out from the farmer could include farm broadcasters who report on markets, buyers who purchase cattle, truckers who take the cattle to market, auctioneers who sell the cattle, processors who make ground beef food wholesalers who sell to stores and restaurants, buyers for food chains like McDonald's, those who help write advertising, those who prepare food in supermarkets and restaurant, wait-staff. Other connections to the hamburger could be bakeries that make buns, ketchup and mustard manufacturers, etc. This list is endless!

#LEARNTHEYARDS

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WORD SEARCH

AGRICULTURE
BARN
BULL
CALF
CATTLE
CORN
COW
FARMER
FEED
FERTILIZER
GRAIN
GRASS
HAY
HEIFER
LEATHER
OMASUM
PASTURE
RUMINANT
STEER
VETERINARIAN
WATER

N	O	M	A	S	U	M	E	R	C	A	R
R	A	L	C	O	R	N	R	U	O	G	E
Y	E	I	L	A	B	E	U	M	W	R	T
E	A	Z	R	U	L	F	T	I	N	I	A
U	P	H	I	A	B	F	S	N	I	C	W
D	E	E	F	L	N	Y	A	A	A	U	O
B	A	R	N	U	I	I	P	N	R	L	S
F	A	R	M	E	R	T	R	T	G	T	S
L	E	A	T	H	E	R	R	E	R	U	A
L	I	E	L	T	T	A	C	E	T	R	R
R	E	F	I	E	H	F	E	I	F	E	G
J	Y	S	S	T	H	H	R	Q	Z	S	V

Use the remaining letters from the puzzle to fill in these spaces and find a correct message from Kentucky Beef Council.

☐☐☐☐ ☐☐ ☐☐☐☐ ☐☐☐☐

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WORD SEARCH

AGRICULTURE
BARN
BULL
CALF
CATTLE
CORN
COW
FARMER
FEED
FERTILIZER
GRAIN
GRASS
HAY
HEIFER
LEATHER
OMASUM
PASTURE
RUMINANT
STEER
VETERINARIAN
WATER

N	O	M	A	S	U	M	E	R	C	A	R
R	A	L	G	O	R	N	R	U	O	G	E
Y	E	I	L	A	B	E	U	M	W	R	T
E	A	Z	R	U	L	F	T	I	N	I	A
U	P	H	I	A	B	F	S	N	I	C	W
D	E	E	F	L	N	Y	A	A	A	U	O
B	A	R	N	U	I	I	P	N	R	L	S
F	A	R	M	E	R	T	R	T	G	T	S
L	E	A	T	H	E	R	R	E	R	U	A
L	I	E	L	T	T	A	C	E	T	R	R
R	E	F	I	E	H	F	E	I	F	E	G
J	Y	S	S	T	E	E	R	Q	Z	S	V

KEY

Use the remaining letters from the puzzle to fill in these spaces and find a correct message from Kentucky Beef Council.

B E E F U P Y O U R L I F E

JOKES AND FUN FACTS

Jokes

Knock-knock
Who's there?
Cow's go…
Cow's go WHO?
Cows go MOO, not who!

Q: What do you call a cow that has just had a baby?
A: De-calf-inated!

Q: What do you call sleeping male cattle?
A: Bull-dozers!

Q: What does a cow ride when her car is broken?
A: A COW-asaki MOO-torcycle!

Q: Where do cows go on their space vacation?
A: The Moooon!

Q: What is a cow's favorite party game?
A: MOO-sical chairs

Q: How does a cow do math?
A: A COW-culator!

Q: What do cows read at the breakfast table?
A: The moospaper!

Q: Where do cows go on dates?
A: The moovies!

Q: What would you hear at a cow concert?
A: Moosic!

Fun Websites

http://www.burgertown.com
http://www.campsilos.org/
http://www.agclassroom.org/kids/
http://www.wooket.com/cartoon.htm

Fun Facts

When animals graze in the pasture, they have to tear the grass by moving their heads. Cattle don't have any cutting teeth in the front of their upper jaw, so they can't just bite the grass off.

The rumen can hold 40 gallons – that is as big as a bathtub!

What sport uses a pigskin? Football. Many footballs are made out of cowhide, not pig skin!

Beef by-products allow us to use 99% of every beef animal.

Cattle use their tails as fly swatters.

Cattle came to America with Christopher Columbus.

Cattle spend 6 hours a day eating and 8 hours a day chewing cud.

A cow stands up and sits down about 14 times a day.

A cow drinks about 30 gallons of water per day.

Cattle can detect odors up to five miles away

Adult cattle have 32 teeth. Many people do, too.

Cow's milk has a pH of about 6.

Cattle can see color.

A cow's heart beats 60 – 70 times per minute.

A cow's average body temperature is 101.5º F

Hay ranks third, behind pasture and corn, as the most popular livestock feed.

There are 207 bones in a cow's body.

THE REMARKABLE RUMINANT

The Role of Cattle in the Miraculous Chain of Sun to Grass to Human Food

Cattle production is really a study in efficient utilization of solar energy as well as a prime example of the incredible efficiencies of modern American agriculture.

The development and evolution of agricultural techniques and the application of modern technology have led to phenomenal gains in food productivity. America is unique in the world – less than 2% of the population feeds all of the nation's population, produces substantial surpluses for export, and, at the same time, keeps food costs, as a percentage of disposable income, at the lowest level in the world.

The history of civilization and the development of modern agriculture include the evolution of ruminant (four –part stomach) animals as a major food source. Ruminant animals are unique because they can digest plant cell carbohydrates (cellulose), which humans can't digest. Cattle, one of the ruminant species, have played a key role as energy converters and "nutrition reservoirs" in food production systems throughout the world.

Solar energy is basic to cattle production. The sun's rays, striking millions of acres of pasture and range land, provide energy for grass and other forages to grow. Cattle then harvest this renewable resource, which would otherwise be of no food value to people, and convert it into flavorful, healthful food – beef. Beef is described by nutritionists as nutrient-dense, providing consumers with large amounts of their daily requirements for protein, vitamin B-12, iron, zinc and other essential nutrients.

At least 85% of the nutrients consumed by cattle come from grass, roughage, food processing by-products and other feedstuffs not edible by people. Of the 1.2 billion acres of agricultural land in the U.S., only one-third can be used for crop production. Utilization of the balance of this land for food production requires grazing by ruminant animals.

Grasslands and grazing livestock are naturally compatible. Ruminant animals, with their unique digestive system, evolved as consumers of grass and other leafy vegetation, and the plant life on our rangelands evolved under grazing by buffalo and other ruminant wildlife. Now, a good way to maintain and improve those grasslands, to the benefit of wildlife as well as livestock, is through scientific grazing management.

Solar energy is basic to cattle production…

Cattle are excellent natural recyclers of organic wastes from the production and processing of grains, fruits, vegetables, and other foods. Man can eat less than half the dry matter produced by crops. Most of the remaining roughage and other material are fed to cattle and other farm animals and thus do not present a disposal problem. Some 25% of all by-products from food processing are used as sources of protein and other nutrients for livestock.

Thus, it can be seen, cattle enhance man's ability to feed a growing population. Without ruminants, the solar energy reaching the more than 800 million acres of range and pastureland would be of no food value to this country.

Cattle production isn't just about solar energy use; it's also about people, the farm and ranch families who oversee the incredible chain of sun to forage to cattle to food. The nation's 1 million cattle producers own or manage more land in America than any other group. Cattle and calves are produced in more states and regions than any other farm commodity.

The cattle industry is the largest segment of agriculture, accounting for almost one-fourth of all farm marketings. The annual sales of $40 billion worth of cattle and calves are vital to thousands of rural communities, and those sales generate millions of jobs – from farm and ranches, to local stores, to processing plants, to supermarkets and restaurants.

Cattle production is a way of life as well as a business. The land sustains the cattle, and hence the cattleman and his family, is more than likely the same land that was owned and cared for by the cattleman's father and grandfather. More than half of all cattle operations in the U.S. have been in the same family for more than 50 years, and more than 10% have been in the same family for more than 100 years.

Part of a cattleman's legacy is a responsibility to care for the animals and resources which he inherits. His family's livelihood, and the livelihoods of future generations, depends on it. Recognizing their obligation to be good stewards of the land, cattleman live by the saying, "We don't inherit the land from our forefathers; we borrow it from our children."

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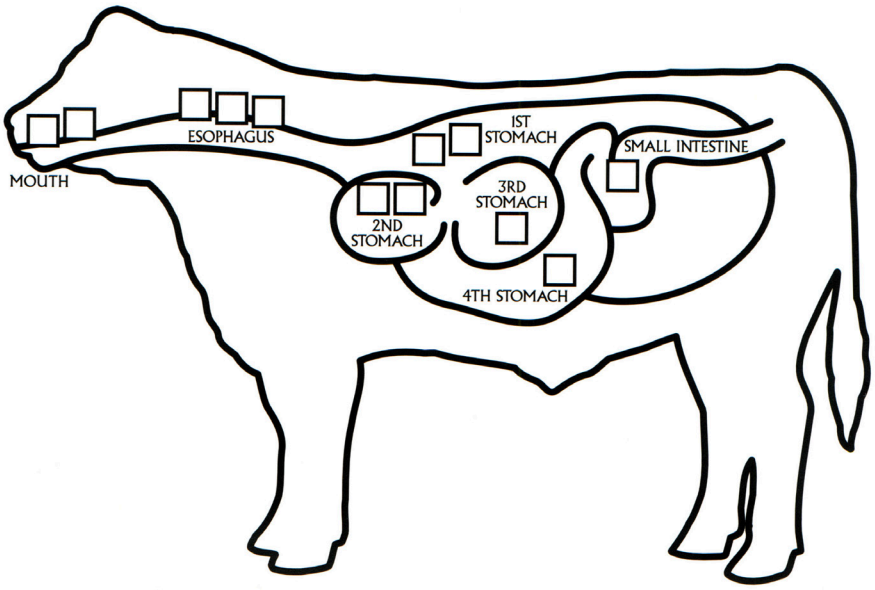
RUMINANTS RECYCLE AND CONSERVE

Cattle and other ruminants are nature's models for food energy conservation. Ruminants have unique stomachs with four cavities that allow them to eat products that other animals find inedible.

Directions: Read the information below and then follow the path of food as it moves through the ruminant stomach by writing the step numbers in the boxes on the diagram below. Some of the numbers will be used more than once.

RUMINANT STOMACH

1. Teeth tear and chew food in mouth
2. Food travels down esophagus
3. Cud (swallowed food) mixes and softens in stomachs 1 and 2
4. Cud returns to mouth for more chewing by rear molars
5. Cud passes through stomachs 1,2,3, and 4 as it is digested and nutrients absorbed
6. Waste materials pass through intestines and exit body as manure



FIND OUT: What other animals are ruminants?

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MORE ABOUT RUMINANTS

Directions: Examine the information on this page and underline information that is new to you.

Almost half of the land in the United States is classified as pasture and range land. Most of that land cannot be used for farming or growing because it is to high, too rough, too dry, or too wet. Grass from these lands contains cellulose, which is indigestible by humans. Because they are ruminants, cattle can eat grasses and convert them to beef and dairy products that humans can eat.

Cattle producers are responsible for managing cattle and land in ways that will protect the environment. This is in the producers best interests, since caring for the land will allow the land to care for the cattle on which they depend. About 85% of nutrients consumed by cattle come from sources not suitable as food for humans. Many beef cattle go from grazing lands to feedlots. There they are fed roughage and grains for about 100 days. Feedlots help to keep supplies of beef constant, making beef available year-round and keeping prices stable. Cattle producers also use their animals as recyclers by feeding them food-processing by-products that would otherwise be shipped to landfills.More than half of the by-products of fruit, vegetable and grain processing go into livestock feed. Foods from cattle provide high-quality protein, calcium, and vitamins such as iron, zinc, and B-vitamins that humans need to maintain a healthy diet. Equally important are the other products from cattle that humans use everyday.

Cattle eat:

almond hulls
barley or hops hulls
cereal by-products
citrus pulp
corn and other grains
corn gluten
corn stalks
cotton seed husks
culled vegetables
grasses
molasses
potato peels
soy hulls
sugar beet pulp
shrubs
weeds

Explain in your own words how cattle are nature's model for environmental conservation

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Products from cattle:

butter
cheese
hamburgers
hot dogs
ice cream
milk
roast beef
steaks
cosmetics
glue
leather: shoes, gloves, coats
some medicines
soap
sports equipment
pet foods
fertilizer

List items you can conserve. Place a check mark next to those you currently conserve or recycle. Circle those items you plan to start conserving. Write an explanation next to those things you don't plan to reuse, recycle, or reduce.

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WASTES ARE FOOD TOO!

INFORMATION FOR THE TEACHER

Background: Cattle can turn wastes into food resources that would otherwise go to waste by humans. Cattle help ease our landfill problems. Cattle recycle in many ways, including eating the by-products of our food processing system. An example is potato peels. Think of all the French Fries Americans eat. What do you think happens to all the potato peels? Have you ever heard of Ore-Ida French Fries? In Oregon and Idaho there are cattle feedlots where the cattle eat the potato peels as part of their daily diet.

Format: What other products can cattle eat? Where do they come from? Have your students find where these products are grown in the United States and mark them on their map. The U.S. Department of Agriculture National Agricultural Statistics Service is a useful resource. http://www.usda.gov/nass/

Copy these eight products onto the chalkboard or on a transparency:

Almond (nut) Hulls	Red
Apple peels and cores	Orange
Bakery Waste	Yellow
Candy and Cookies	Green
Corn Gluten	Blue
Cornstalks	Purple
Grape peels	Pink
Orange peels and pulp	Brown
Rice	Black

Let students research the states that these products are grown in. Students could research products individually, work in groups, or do a special report on just one product. The accompanying map may be used for students to identify the states. Have them place a colored dot to signify each product. A bulletin board may be used for students to draw the food product and enlarge the student's discoveries.

Teacher Notes: These food wastes contain energy and nutrition through protein, carbohydrates, and fiber that cattle can use. Some are ground up and added to their corn/hay mix. There are many other foods that beef cattle can consume and gain energy from. There are many more states that are involved in the production of these foods; let students add to this list.

Almond (nut) hulls – Almond hulls are a good source of digestible fibers and sugars. They are very digestible for cattle and affordable. Found mostly in California. http://www.ahpa.net/hullinfo.htm

Apple peels and cores – Apple peels and cores from the production of apple juice, applesauce, apple pies, and other apple products are sold to feedlots in the state of California, Michigan, New York, North Carolina, Virginia, Washington (Washington Apples), West Virginia, and the New England states.

Bakery waste – Many bakeries across the United States sell bakery dough that cannot be used at the end of the day. For example, there are 63 Wonder Bread & Hostess factories in the United States. They are mostly located in the Midwest, in states like Illinois, Indiana, Iowa, Kansas, Missouri. Also located in California, Florida, and Ohio.

Candy and Cookies – Candy and cookies that are misshapen or packaged incorrectly will not be sold by the manufacturer. This candy can be sold to feedlots to feed to cattle. Palmer Candy Company in Sioux City, Iowa, sells discarded candy to local farmers.

Corn Gluten – Corn gluten is produced from the wet corn milling process; it is ground up and added to feed rations to make a feed product. It is becoming available in more market areas due to the increasing demand for ethanol, corn starch and corn sweeteners. Corn gluten offers energy, crude protein, digestible fiber, and minerals. Corn gluten can help beef producers reduce feed costs. Corn gluten is milled in California, Florida, Illinois, Iowa, Kentucky, Minnesota, Missouri, Nebraska, New Mexico, New York, North Dakota, South Dakota Tennessee, and Wisconsin.

Cornstalks – After corn is harvested from the fields in the fall, cattle can graze the cornstalks which are left in the field to protect the soil from blowing away over the winter months. They eat the stalks because of their ruminant stomach and also eat some corn. Cornstalks can be found in Indiana, Illinois, Iowa, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin.

Grape peels – Grapes are produced for wine and grape juice production. Some states involved in grape production are California, Florida, New York, and Washington.

Orange peels and pulp – Oranges are most commonly grown in the warmth of the south. Arizona, California, Florida and Georgia are large orange producing states.

Rice – Products from rice, such as rice hulls, rice bran, rice polishings, and broken rice are nutritious, providing energy and minerals to a ruminant animal. Rice producing states are Texas, Louisiana, Arkansas, Missouri, Mississippi, and California.

Teacher Notes: What other food might cattle eat that humans consider "wastes?"

barley or hops hulls, cereal by-products, citrus pulp, cotton seed husks, culled vegetables, grasses, molasses, soy hulls, sugar beet pulp, shrubs, weeds

Most of these "wastes" are fed regionally due to transportation costs. What foods are grown in similar climates?

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THE YARDS

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1. What is a male beef animal called?

2. What is a mature, female beef animal called?

3. What is the difference between dairy and beef animals?

4. What is a baby beef animal called?

5. What is a male, neutered beef animal called?

6. What is a female beef animal which has had no babies, called?

7. What is weaning?

8. What do cattle producers do for their animals?

9. What is a pasture?

10. What is hay?

11. Explain what it means for cattle to be ruminants.

12. List three things cattle eat.

13. What do cattle eat in the spring and summer seasons? How does this differ from what they eat in the fall and winter?

14. How does grazing cattle help the environment?

15. How do cattle help recycle?

16. The production of beef for people to eat utilizes natural and renewable resources. Outline the process that cattle contribute to.

sun and soil → rain

17. Complete the following timeline to estimate the length of time an animal

Gestation →	Birth →	Weaning →	Market →	Cheeseburger
Months	Months	Months	Months	**Total Time**

18. Name five by-products you use that come from beef.

19. What nutrients can humans get by eating beef? (Hint: ZIP)

20. List as many foods made with beef as you can