

Name \_\_\_\_\_ Date \_\_\_\_\_ Hour \_\_\_\_\_

**ACTIVITY 8.1**

**UNIT WORD SEARCH**

artificial insemination  
beef  
breed  
concentrates  
dam  
digestion

estrus  
feed  
finish  
forage  
lamb  
monogastric

mutton  
nutrition  
parasites  
pork  
ration  
ruminant

sire  
species  
supplement

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

**ACTIVITY 8.2**

**PLOTTING THE PLIGHT OF THE CATTLE**

**Student Materials**

Pencil

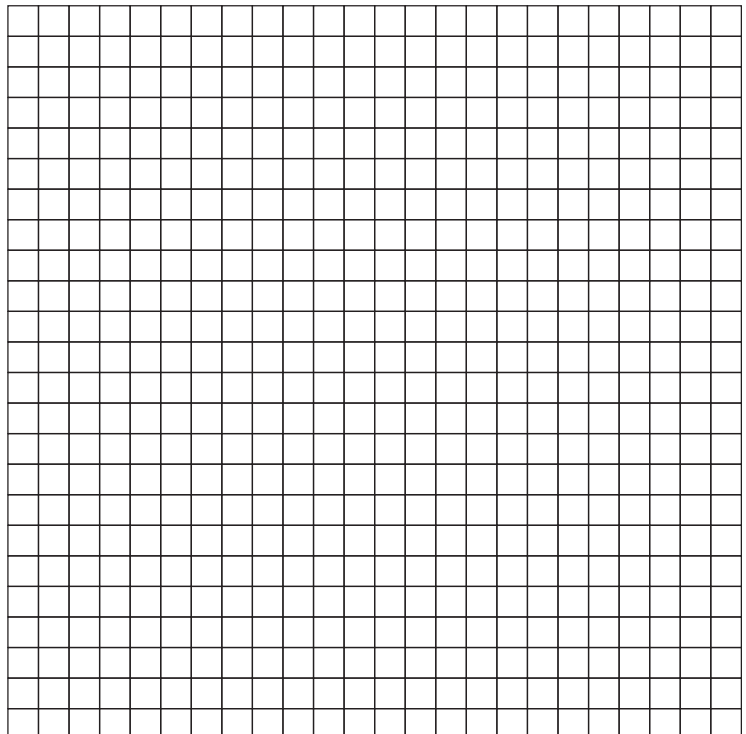
**Introduction**

Bovine spongiform encephalopathy (BSE), commonly (and erroneously) referred to as “mad cow disease,” is a rare fatal disease that affects the central nervous system of cattle. “Spongiform” refers to the spongy appearance of a brain affected by BSE, when viewed under a microscope. BSE is in the same family of diseases as scrapie in sheep and goats, chronic wasting disease in deer and elk, and Creutzfeldt-Jakob disease in humans.

Cattle get BSE by eating contaminated feed. The substance that causes BSE is found in the brain, spinal cord and retinas of cattle infected with BSE. BSE could also have originated from cattle feed contaminated with scrapie infected sheep products. In 1996, the US cattle industry voluntarily stopped the feeding practices that could spread BSE. The US Food and Drug Administration made this feed ban law in 1997.

Symptoms of BSE in cattle include aggression, nervousness, loss of balance, loss of weight, and abnormal posture. This behavior in infected cattle is what led to the name “mad cow disease.”

**Choose a country from the BSE Incidence Rate table. Using the data from the table, make a graph of the annual incidence rate (number of cases diagnosed or identified by surveillance) of BSE per million cattle over 24-months-old.**



1. Compare your graph with the rest of the class and note trends concerning BSE incidences. As a class, discuss possible reasons for the trends. Write a one paragraph summary of the discussion.

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2. Research the country you plotted on the graph to discover what their BSE surveillance methods are, how they report suspected BSE, and what they are doing to decrease or eliminate the problem of BSE in their country.

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Sources: Centers for Disease Control, USDA Food Safety and Inspection Service, World Health Organization, The National Creutzfeldt-Jakob Disease Surveillance Unit



## BSE Incidence Rate (per million)

Country/Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2.1
Belgium	0	0	0	0	0	0	0	0	0.6	3.7	1.8	5.5	28.2	25.8	10.5	7.9	1.4
Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.1	0.1
Czech Rep	0	0	0	0	0	0	0	0	0	0	0	0	2.9	2.5	5.8	10.3	12
Denmark	0	0	0	0	0	0	0	0	0	0	0	1.1	6.8	3.4	2.4	1.3	1.3
Finland	0	0	0	0	0	0	0	0	0	0	0	0	2.4	0	0	0	0
France	0	0	0.5	0	0.1	0.3	1.1	0.5	0.5	1.6	2.8	14.7	19.7	21	12	4.7	2.7
Germany	0	0	0	0	0	0	0	0	0	0	0	1.1	20	17	8.7	10.9	5
Greece	0	0	0	0	0	0	0	0	0	0	0	0	3.3	0	0	0	0
Ireland	4.4	4.1	5	5.1	4.6	5.4	4.6	20.3	21.4	20.8	22.8	38.2	61.8	88.4	57.8	43.3	24
Israel	0	0	0	0	0	0	0	0	0	0	0	0	0	6.3	0	0	0
Italy	0	0	0	0	0	0	0	0	0	0	0	0	14.1	10.6	9.9	2.3	2.4
Japan	0	0	0	0	0	0	0	0	0	0	0	0	1.4	1	2	2.5	3.6
Luxembourg	0	0	0	0	0	0	0	0	10	0	0	0	0	14.5	0	*	10.9
Netherlands	0	0	0	0	0	0	0	0	1	1	1	1.1	10.3	13.2	10.9	3.4	0.8
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	1.5	3.6	*
Portugal	0	0	0	0	0	15.1	18.8	38.9	37.6	159.4	199.5	187	137.9	107.8	137.2	94.9	53
Slovakia	0	0	0	0	0	0	0	0	0	0	0	0	18.3	18.7	6.7	24.6	43.4
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0	4.3	4.4	4.4	9.2	4.6
Spain	0	0	0	0	0	0	0	0	0	0	0	0.6	24.2	38	46.3	38.9	27.8
Switzerland	0	1	9.2	15.5	30.3	67.6	73.6	48.5	45.4	16	58.7	40.6	49.1	27.9	24.9	3.8	3.7
U.K.	1264.1	2507	4467.2	6636.1	6264.1	4277.8	2582	1416.8	794.4	585.7	416.4	270.6	232.8	228.2	122.3	68.8	45.7
U.S.A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



**ACTIVITY 8.3****THEY DON'T EAT JUST GRASS****Student Materials**

Pencil

**Introduction**

Animals receive nutrients from a variety of feeds. The net energy for maintenance and percentage of fat varies in each feed.

**Net Energy for Maintenance Table**

NEm = Net energy for maintenance, expressed in megacalories (Mcal) per 100 pounds (cwt) of feed; energy used to work muscles, maintain and repair tissue, keep a steady temperature, maintain homeostasis (a steady internal environment) but not grow or produce milk.

**Roughage**

Type of Feed	NEm (Mcal/cwt)	% fat in feed
alfalfa hay, early bloom	59	2.9
alfalfa hay, full bloom	52	2.3
alfalfa cubes	55	2.0
bermuda hay, early bloom	49	1.9
bermuda hay, full bloom	39	1.8
corn silage	77	3.1
cotton seed hulls	45	1.9
fescue hay, early bloom	55	4.8
fescue hay, full bloom	52	3.5
peanut hulls	36	1.5
prairie hay	50	2.0
rice hulls	35	3.9
sorghum silage	58	2.7
sunflower seed hulls	42	2.2
wheat straw	43	1.8

**Grazed Forage**

Type of Feed	NEm (Mcal/cwt)	% fat in feed
native range, Jan-Mar	42	1.7
native range, Apr-Jun	74	3.2
native range, Jul-Aug	65	3.0
native range, Sept-Oct	58	2.5
native range, Nov-Dec	52	2.2

**By-Product Feeds**

distillers grains w/soluble corn	104	10.6
soybean hulls	84	2.6
wheat bran	74	4.5

**Feed Grains**

Corn grain, whole	99	4.3
Corn grain, steam flaked	106	4.1
Milo, cracked, rolled or ground	74	4.5
Milo, steam flaked	102	3.1

**High Protein Meals/Seed**

Cottonseed, whole	108	17.8
Soybean meal, 48%	98	1.2
Soybeans, whole	106	18.8
Sunflower seeds, high oil	142	42.0



Use the “Net Energy for Maintenance Table” to answer the following questions.

1. Which category of feedstuffs (roughage, feed grains, etc.) have the highest NEm?

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2. Which category of feedstuffs have the highest percentage of fat?

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3. For the hays and forages, does the season or cutting (early versus late bloom) affect the amount of energy and fat available?

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4. Should it take more energy to produce meat, milk, etc., than to maintain weight?

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What is a possible reason for your answer?

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5. How might this feed information be used by a producer?

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6. If hay costs were the same and you had a herd of horses that were in good condition and didn't need to gain weight, which hay would you buy? Why?

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7. The NEm is calculated on a “dry matter” basis. In other words, the samples are dehydrated first and then the megacalories are determined. Why do you suppose it is done that way?

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8. Is there a direct correlation between the amount of NEm in a feed and the percentage of fat in the feed? Why or why not?

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**ACTIVITY 8.4**

**GENETICS: A LIST OF TRAITS**

**Student Materials**

Pencil

Coins for flipping

Heredity is the passing on of traits from parents to offspring. Most plants and animals have two of every kind of gene, one from their mother and one from their father. Only one gene from each parent is passed to each offspring for a particular trait.

**Use the flip of a coin to determine which sex chromosomes and which genes your offspring will carry. Flip a coin to determine which sex chromosome and which genetic traits each parent will pass on to the offspring. If the coin lands on heads, select the dominant trait. If the coin lands on tails, select the recessive trait.**

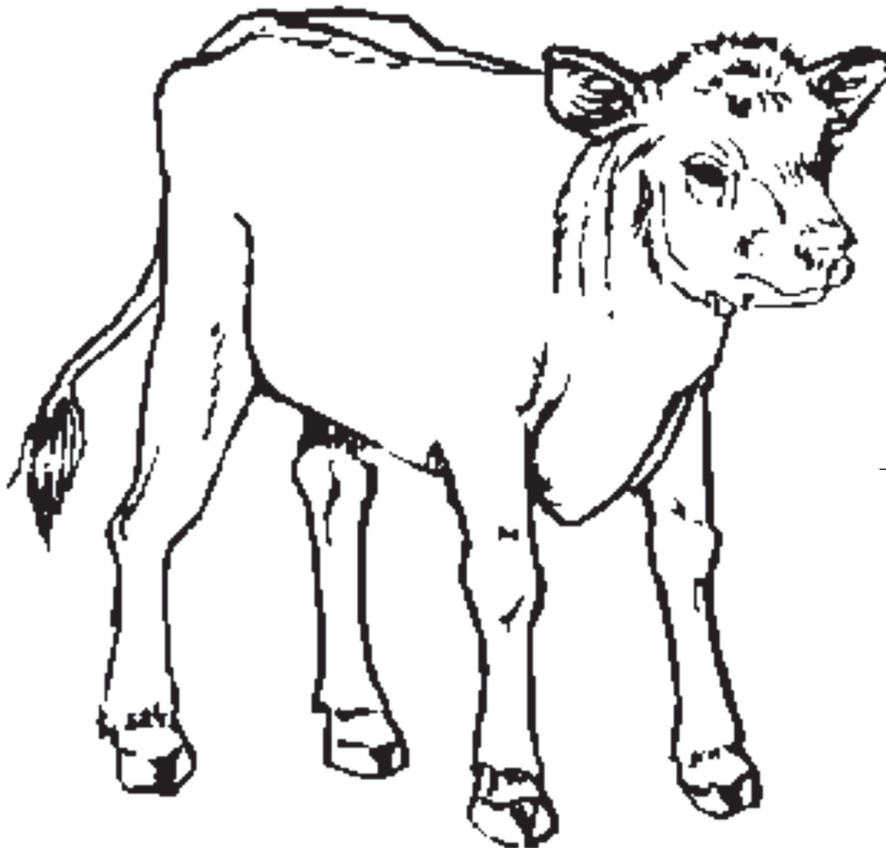
Mother's Traits			Father's Traits		
	heads dominate	tails recessive		heads dominate	tails recessive
1. male/female	X	X	1. male/female	X	X
2. polled/horned	P	p	2. polled/horned	P	p
3. black coat/red coat	B	b	3. black coat/red coat	B	b
4. solid coat/spotted coat	S	s	4. solid coat/spotted coat	S	s
5. white face/black face	F	f	5. white face/black face	F	f
6. solid tail/striped tail	T	t	6. solid tail/striped tail	T	t
7. solid legs/stocking legs	L	l	7. solid legs/stocking legs	L	l





**Genetic Trait**

Sample trait	Mother's Traits	Father's Traits	Possible Trait Combinations circle appropriate trait		
			Black coat BB	Black coat Bb	Red coat bb
1. male/female	B	b	Male XY	Female XX	n/a
2. polled/horned			Polled PP	Polled Pp	Norned pp
3. black coat/red coat			Black coat BB	Black coat Bb	Red coat bb
4. solid/spotted			Solid SS	Solid Ss	Spotted ss
5. face color			White FF	White Ff	Black ff
6. solid tail/striped tail			Solid TT	Solid Tt	Striped tt
7. solid legs/stocking legs			Solid LL	Solid Ll	Stocking ll



**Calf's Name**

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Name \_\_\_\_\_ Date \_\_\_\_\_ Hour \_\_\_\_\_

**ACTIVITY 8.5**

## **LIVESTOCK BY THE NUMBERS**

### **Student Materials**

Pencil

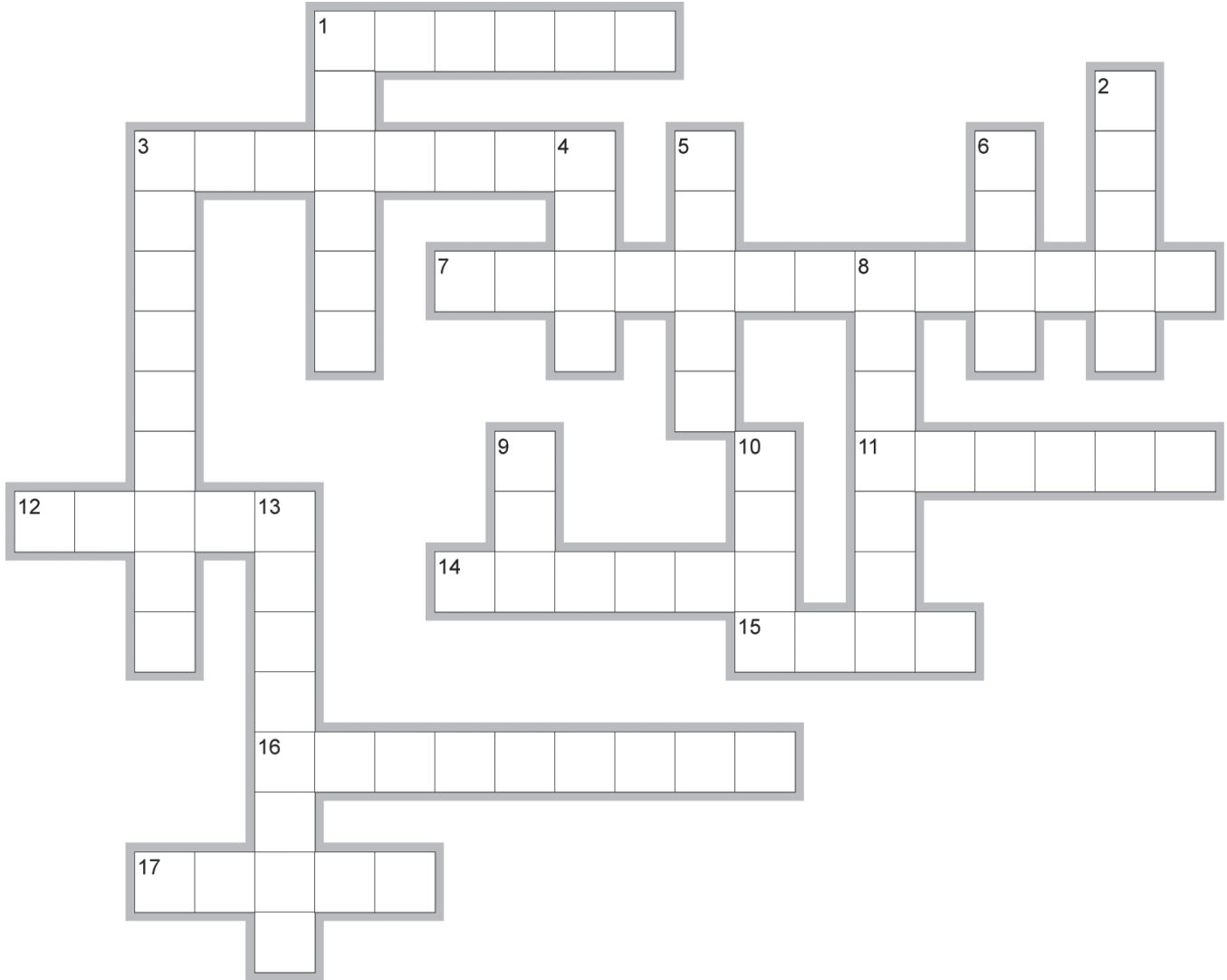
1. A group of four heifer calves weigh a total of 1,994 pounds. If three of the calves weigh 538 pounds, 428 pounds and 507 pounds, determine the weight of the fourth heifer.
  
2. A litter of 8 pigs weighed 165 pounds. After 10 days, the litter weighs 195 pounds. Determine the weight gain per pig.
  
3. A market lamb weighed 125 pounds. A week later, it weighed 135 pounds. What is the lamb's average daily gain?
  
4. A rancher purchased goat feed for \$212.50, dewormer for \$35.50 and ear tags for \$12.95. What was the total cost of the items purchased?



Name \_\_\_\_\_ Date \_\_\_\_\_ Hour \_\_\_\_\_

**ACTIVITY 8.6**

**UNIT REVIEW CROSSWORD**



EclipseCrossword.com

**Across**

1. hogs sent to slaughter when they weigh 220 to 260 pounds
3. important in the development and maintenance of muscles
7. Animal rations are about 75% \_\_\_\_.
11. system of moral principles that defines right and wrong
12. essential for sustaining life
14. by-products used for food
15. food eaten by livestock
16. process by which an animal uses the components of food to live
17. measurement of horses

**Down**

1. meat that comes from a sheep over a year old
2. group of animals with like characteristics
3. organisms that live on or in another organism
4. male parent
5. genetically identical to another living organism
6. The \_\_\_\_ industry is rapidly expanding in the US.
8. any deviation from a normal state of health
9. offspring of a goat
10. meat from cattle
13. multiple stomach compartments