

I. Animal Science: 1. _____ ion of _____ concerned with the _____ and _____ of domesticated animals for the purpose of _____ and/or _____.

H. Uses of livestock animals

A. Meat

1. Converts _____ feeds into _____ products.
- d. Example. A beef cow consumes _____ which is NOT digestible by _____ and converts that grass into a product we can _____.
- e. Allows humans to benefit from _____ found in grasses
- f. Meat products include, but are not limited to standard _____ of _____, lamb, pork, _____ and horse (only in certain countries - _____). Also includes _____ foods such as sweetbreads, _____, cow tongue, _____, etc.

B. _____/Fiber

1. _____ from sheep used for a variety of purposes: including _____, seat covers, _____, etc.
2. _____ from cattle used for furniture, _____ and leather products such as _____, boots, etc.
5. _____ from swine and horses used for _____
6. _____ from poultry used for filling _____ and blankets (down) _____
5. In the past, _____ and horses: used for _____ power for turning of _____, pumping _____, etc.
6. Horses and _____ used for pulling carts and _____
7. _____ and small ponies used for carrying _____ in and out of _____
8. _____ from animals used as _____ for heating and cooking purposes.

a. Today, _____ of world's population depends on dried manure as a _____

D. _____/fire prevention

5. _____ grazed on land deemed _____ can help to re-establish the _____
- a. _____ from the cattle break the _____ - the layer of soil that has _____ allowing for water _____

b. _____ the soil cap allows that soil to absorb more _____

c. _____ will eat the mature, _____ plants, allowing _____ more succulent _____ to grow.

d. This will bring smaller _____ sweet-ee-squirrels, _____ birds, _____, etc back into the area.

e. The _____ of smaller _____ results in the return of _____ animals such as _____, _____ and mountain lions.

f. Results in return of _____ helping to prevent _____

6. Cattle, _____ and horses will eat excess _____

7. _____ can eat some items that would usually be sent to a _____

By consuming these products, they can convert _____ to a usable form.

8. a. _____ are often used to " _____ " crop fields after the _____ has been _____

E. _____ are a source of recreation through trail riding, _____, training, raising, etc.

4. Other _____ can be raised as a source of _____ as well.

F. _____

2. Components of animals used for _____, cosmetics, sports equipment, _____ etc. See Handout- "Good Things From Cattle"

III. Occupations

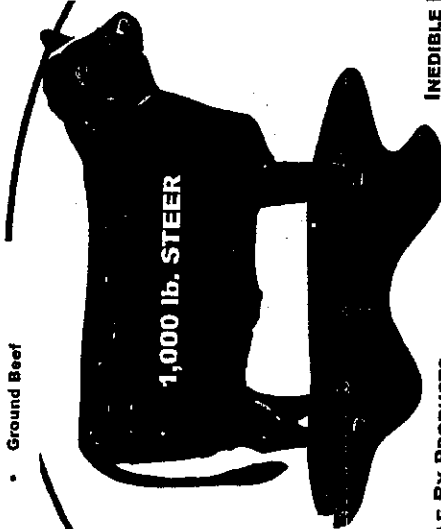
- A. _____; Farmers, _____, secretaries, managers, _____
- B. Input suppliers: _____ of farm equipment, seed, _____, and chemicals. Equipment manufacturing
- C. Processing and _____ and textile manufacturing, _____ processing, _____ goods
- D. Ag _____ and retail: employment in _____ stores and _____
- E. Indirectly: _____ food processing and textile _____

Good Things from Cattle

(Prepared by the Beef Industry Council of the Meat Board)

432 LBS. RETAIL BEEF

- Steaks
- Roasts
- Ground Beef



PHARMACEUTICALS

- Rennet
- Epinephrine
- Thrombin
- Insulin
- Heparin
- TSH
- ACTH
- Cholesterol
- Estrogen
- Thyroid Extract

VARIETY MEATS

- Liver
- Brains
- Tongue
- Ox Joints
- Kidneys
- Tripe
- Sweetbreads

EDIBLE BY-PRODUCTS

- Oleo stock
- Oleo oil
- Gelatin
- Marshmallows
- Canned meat
- Candles
- Natural sausage casings

INEDIBLE BY-PRODUCTS

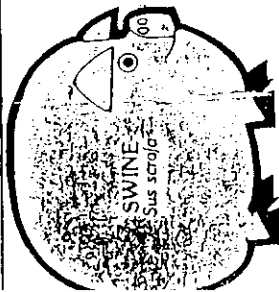
- Leather
- Sports Equipment
- Surgical Sutures
- Soap
- Cosmetics
- Buttons
- China
- Photographic Film
- Sandpaper
- Violin Strings
- "Camel hair" brushes
- Explosives

Although it's hard to attach a dollar value to the contributions of cattle by-products, the very real monetary value of these by-products helps keep the price of beef well below what it might otherwise be. The above illustrates some of the good things which come from cattle. New uses for by-products are discovered almost daily there by enriching the quality of American life far beyond the table.

Animal Lingo

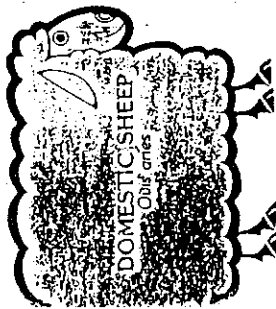
- | | |
|--------------------|--|
| 1. Bull | A. Mature female sheep capable of breeding |
| 2. Steer | B. Mature male swine capable of reproduction |
| 3. Bullock | C. Mature male turkey capable of breeding |
| 4. Cow | D. Young male goat |
| 5. Heifer | E. Mature male sheep capable of breeding |
| 6. Calf | F. Castrated male chicken or turkey |
| 7. Beef | G. Young male bovine not capable of breeding |
| 8. Ram | H. Male swine castrated post sexual maturity |
| 9. Wether | I. Mature male horse capable of reproducing |
| 10. Ram Lamb | J. Castrated male sheep |
| 11. Ewe | K. Mature female swine that has farrowed |
| 12. Ewe Lamb | L. Newborn chicken |
| 13. Lamb | M. Mature female bovine capable of breeding |
| 14. Mutton | N. Castrated male goat |
| 15. Boar | O. Young female sheep |
| 16. Shoot | P. Mature female chicken or turkey |
| 17. Barrow | Q. Cattle under one year of age |
| 18. Sow | R. Young male sheep |
| 19. Gilt | S. Chicken grown for its meat |
| 20. Pig | T. Meat from a sheep older than 1 year |
| 21. Pork | U. Newborn goat |
| 22. Cock (Rooster) | V. Mature male bovine capable of breeding |
| 23. Capon | W. Young swine |
| 24. Hen | X. Young female chicken |
| 25. Chick | Y. Male swine castrated before sexual maturity |
| 26. Pullet | Z. Castrated male horse |
| 27. Layer | AA. Young female bovine |
| 28. Broiler/Fryer | BB. Young male swine |
| 29. Tom | CC. Mature male chicken capable of breeding |
| 30. Pault | DD. Young male horse |
| 31. Billy | EE. Meat from cattle |
| 32. Wether | FF. Mature female horse |
| 33. Buck Kid | GG. Chicken used for the laying eggs |
| 34. Doe | HH. Young female swine that has not farrowed |
| 35. Doe Kid | II. Mature female goat |
| 36. Kid | JJ. Young female horse |
| 37. Stallion | KK. Castrated male bovine |
| 38. Gelding | LL. Mature male goat capable of reproducing |
| 39. Colt | MM. Very young turkey |
| 40. Mare | NN. Young sheep; meat from a young sheep |
| 41. Filly | OO. Young female goat |
| 42. Fool | PP. Meat from swine |
| 43. Stag | QQ. Young horse up to one year of age |

IMPORTANT PHYSIOLOGICAL DATA



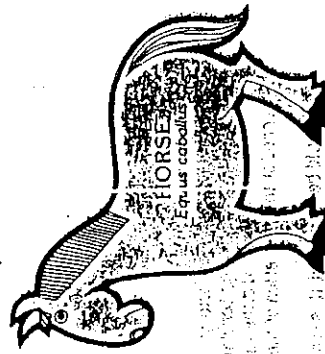
Life Span 16 years
Puberty 5-8 months
Minimum Breeding Age 6-9 months
Estrous Cycle 20-22 days
Duration of Estrus 2-3 days
Gestation Period 112-115 days
Weaning Age 4-6 weeks
Daily Food Consumption 4-8 lbs.
Daily Water Consumption 1-1.5 gallons
Daily Fecal Volume 1.5 lbs.
Daily Urine Volume 5-30 ml/kg body wt.
Chromosome # 38

Life Span 10-20 years
Puberty 6-10 months
Minimum Breeding Age 2-3 years
Estrous Cycle Polycyclic, 21 days
Duration of Estrus 9 months
Gestation Period 6 months or less
Weaning Age 16-28 lbs.
Daily Food Consumption 10-14 gallons
Daily Water Consumption 50 lbs. per 1000 lbs.
Daily Fecal Volume 17-45 ml per kg body weight
Chromosome # 60

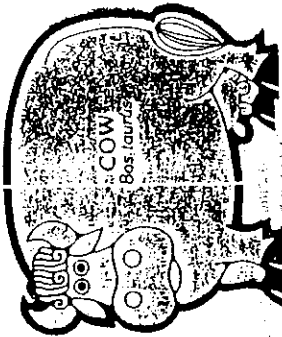


Life Span 6-11 years
Puberty 7-8 months
Minimum Breeding Age 8-10 months
Estrus Cycle 14-19 days, seasonally polycyclic except Dorset and Merino.
Duration of Estrus 1-3 days
Gestation Period 145-148 days
Weaning Age 4-5 months
Daily Food Consumption 2-4 lbs.
Daily Water Consumption 1-1.5 qts.
Daily Fecal Volume 2-6.5 lbs.
Daily Urine Volume 10-40 ml/kg body wt.
Chromosome # 54

Life Span 20-50 years
Puberty 1-2 years
Minimum Breeding Age 3-5 years
Estrus Cycle seasonally polycyclic, average 21 days
Duration of Estrus 6 days
Gestation Period 326 days
Weaning Age 4-5 months
Daily Food Consumption 17-36 lbs.
Daily Water Consumption 5-12 gallons
Daily Fecal Volume 30-50 lbs.
Daily Urine Volume 3-18 ml/kg body wt.
Chromosome # 64



Life Span 16-25 years
Puberty 1-2 years
Minimum Breeding Age 3-5 years
Estrus Cycle seasonally polycyclic, average 21 days
Duration of Estrus 6 days
Gestation Period 326 days
Weaning Age 4-5 months
Daily Food Consumption 17-36 lbs.
Daily Water Consumption 5-12 gallons
Daily Fecal Volume 30-50 lbs.
Daily Urine Volume 3-18 ml/kg body wt.
Chromosome # 64



Life Span 10-15 years
Puberty 6-12 months
Minimum Breeding Age 1-2 years
Estrus Cycle 18-24 days
Duration of Estrus 1-3 days
Gestation Period 280-285 days
Weaning Age 4-6 months
Daily Food Consumption 2-4 lbs.
Daily Water Consumption 1-1.5 qts.
Daily Fecal Volume 2-6.5 lbs.
Daily Urine Volume 10-40 ml/kg body wt.
Chromosome # 60

Beef: It's What's for Dinner

Wholesale and Retail Cuts

I. Dressing Percent

- Cattle are not all beef and not all beef is _____ carcass weight in relation to the weight of the _____ animal
- Definition: Percentage yield of _____ carcass weight in relation to the weight of the _____ animal
 - Basically: $\frac{\text{Carcass Weight}}{\text{Weight}}$
 - The remaining weight that is lost includes _____, feet, head, internal _____, and some fat trim.
- Dressing percent depends on the _____ grade of the animal (Amount of fat)
 - Prime: 62%, Choice 60%, Select 59%, Standard 57%
 - Example: A 1000 lb. choice steer has a 620 lb. chilled carcass weight.

$$\frac{620}{1000} \times 100 = \text{_____}$$

II. Wholesale vs. Retail

- Wholesale cuts are _____ cuts of meat that are shipped to grocery _____ and meat markets.
 - Today, most butchers rarely receive a "side of beef". Instead, they receive _____ beef.
- Retail cuts are the _____ size or single serving cuts that are _____ at the market.
- The wholesale cuts of beef cattle are: _____, Rib, Short Loin, _____, Round, Fore Shank, Brisket, Short Plate, and _____

Carcass Grading: Two Types

- Quality
 - Reflects the differences in the _____ quality of meat based on:
 - _____ Scores - The amount of fat interspersed in the _____ Flaking
 - _____ Scores: Reflects the _____ of the animal at slaughter
- Types of Quality Grades
 - _____ marbling, proper carcass conformation, adequate maturity
 - Found in fine restaurants - Very _____
 - Most economical and most desirable
 - Adequate _____ and carcass conformation are required

Meat: The Industry

I. Meat Consumption

- iii. _____: Is not stamped with a USDA Grade
- 1. Must have _____ marbling
- 2. Meat is inspected, but not _____ as a Prime or Choice so that it can be sold under store names
- iv. _____: Usually from Older or Thin animals
- 1. _____ marbling or below average carcass conformation
- 2. Usually entire carcass goes to _____ beef
- 3. Example: _____ cows that are culled from the dairy herd are often sold to fast food restaurants.
- v. _____: Includes Cutter, Canner, and Utility
- 1. Usually processed into _____ meats, soup, and canned meat products
- vi. _____: Not suitable for human consumption
- 1. Here Fido.....

II. Yield Grades

- a. Based on _____, or yield of boneless, trimmed retail cuts.
- b. Determined by:
 - i. _____ Carcass Weight (Weight of carcass before _____)
 - ii. _____ Fat (Measured as back Fat over the _____ rib)
 - iii. Percent Heart, kidney, and Pelvic fat (aka. _____)
 - iv. Rib Eye Area (measure of the area of a rib eye between the _____ and _____ Rib) aka _____
- c. Yield Grade _____: _____ layer of back fat over ribs, loin, and rump, slight deposits of fat in the flanks and cod/udder area, Muscle are _____ through the fat
- d. Yield Grade _____: Carcass completely _____ with fat, but muscle is visible through fat over _____, shoulder, and neck
- e. Yield Grade _____: Carcass completely covered in fat, lean visible through fat only on the _____ and round. Thick _____ layer over the loin, rib, and inside round.
- f. Yield Grade _____: Carcass completely covered with fat, muscles visible through fat only on _____ and the flank. Thick layer of _____ over loin, rib, and inside round.
- g. Yield Grade _____: _____ amount of fat, _____ REA, more KPH

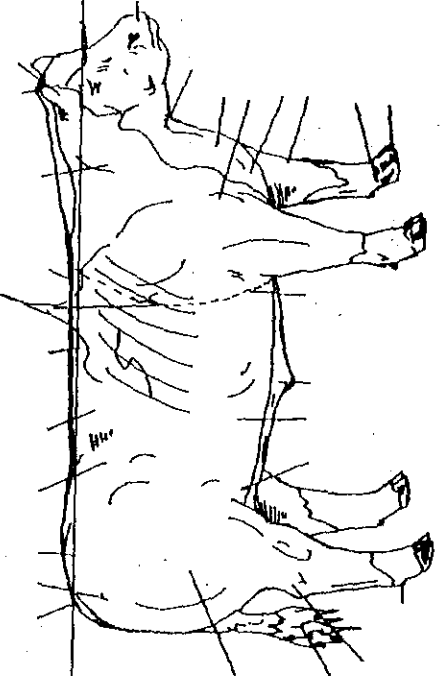
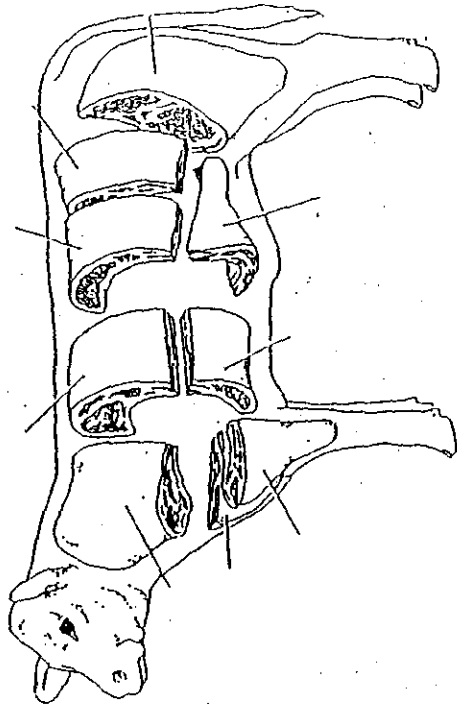
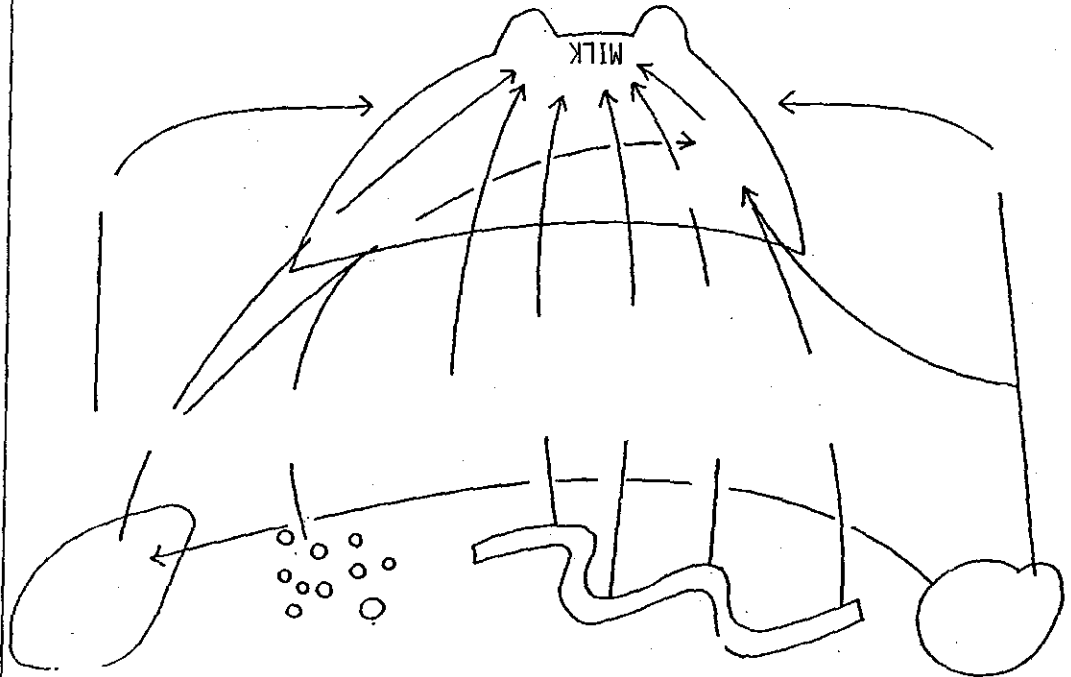
- a. _____ is the main product of the animal industry
- b. Meat consumption varies with _____/economy, _____ trends, religious holidays, etc
- c. Beef is number one choice, but _____ continues to decline
 - i. Recent diets, such as Atkins, have caused beef demand to _____
- d. Health concerns over _____ and high cost of beef have caused poultry and pork demand to increase
- e. Lamb considered a " _____ " meat
 - i. Consumed mainly by high income families and certain _____ groups.
 - ii. For example: Lamb consumption is high in the _____ United States due to ethnic population (i.e. Greek)
- f. Current trend in meat consumption is _____
 - i. Consumer want a product that is _____ and easy to prepare!

II.

Geographic Influences on Meat Consumption

- a. Large Meat consuming countries tend to have _____ incomes and low feed costs
- b. Red meat consumption highest in _____ U.S. due to high concentration of cattle, sheep, and swine
- c. Factors effecting geographic location of livestock:
 - i. _____ Availability: Most grain is grown in the central U.S., therefore it is cheaper to finish-off animals there.
 - ii. Cost of _____
 - iii. _____ levels (Higher cuts of animals go to higher income areas)

Elements of Milk Development in Ruminant Mammals





DAIRY
MATCHING GAME

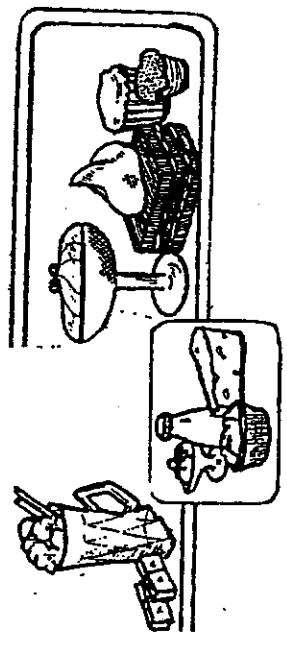
Popular dairy food
 Largest dairy breed
 Young dairy animal
 Group of dairy cattle
 Breed from Scotland
 Breed with highest % butterfat
 Word for hay and silage
 Milk contains
 Cows are usually large and all brown
 Most common hay in Iowa
 Dry feed fed to dairy animals
 Breed comes from Isle of Guernsey

Guernsey
 Alfalfa
 Brown Swiss
 Grain or Concentrate
 Forage
 Calf
 Ice Cream
 Herd
 Proteins & Minerals
 Holstein
 Ayrshire
 Jersey

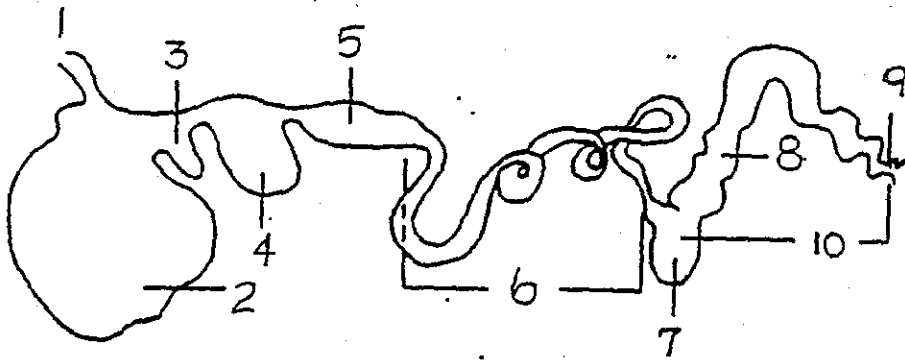
DAIRY FOODS MATCHING GAME

Number cups of milk in quart
 Mineral found in milk
 Lbs. milk per gallon
 Glasses milk needed per day
 Dairy food that is cultured
 Calories in glass of whole milk
 Nature's most nearly perfect food
 Product often imitated but never duplicated
 Dairy products are high in
 Vitamin usually added to processed milk
 Skim milk has had what removed
 Process of butterfat distribution in milk

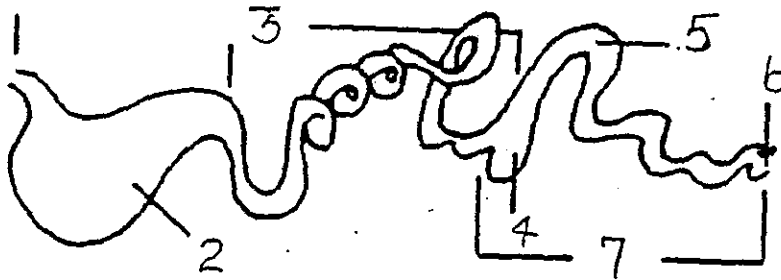
Butterfat
 Milk
 D
 Homogenization
 Butter
 8.6
 Cheese
 3
 Calcium
 Four
 Protein
 165



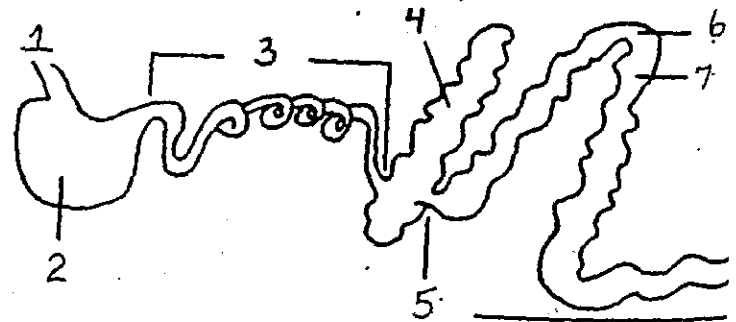
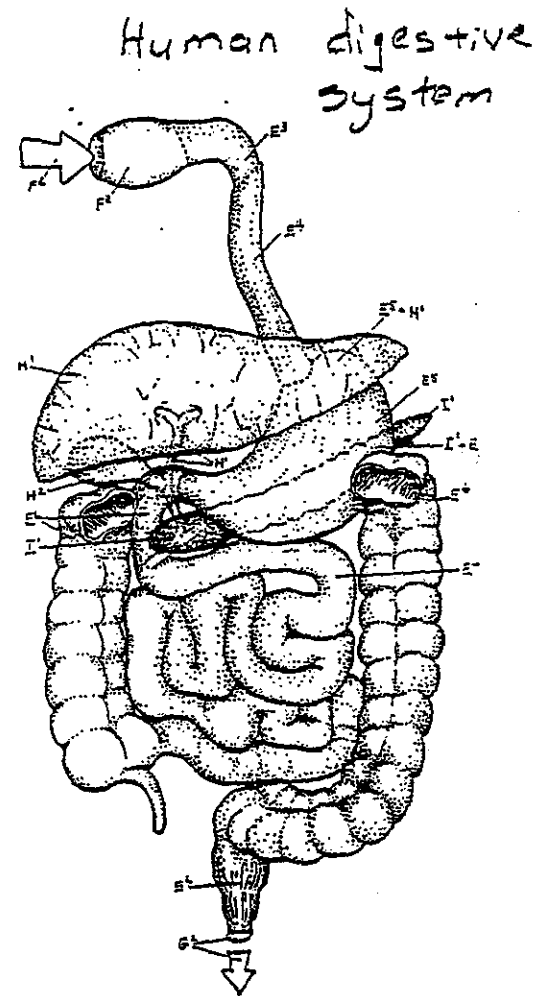
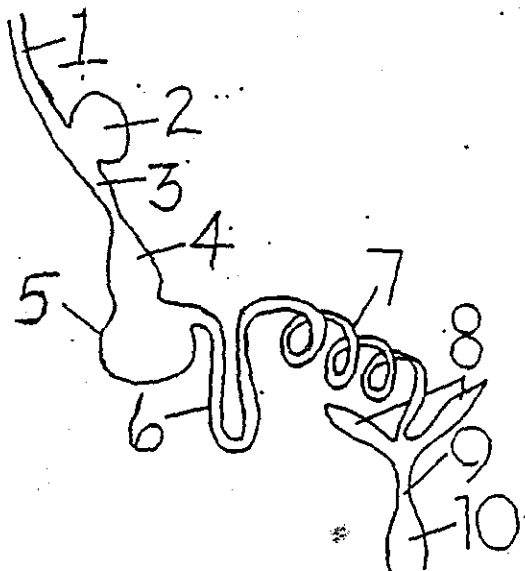
Cow (Ruminant) Digestive System



Swine (Non-Ruminant) Digestive System



Chicken Digestive Tract



Horse Digestive System

The simple digestive system

(Pig Pluck Lab)

Purposes

Digestive System and Digestive Glands

1. Esophagus
2. Stomach
3. Small Intestine
4. Pancreas
5. Liver
6. Gall bladder
7. Spleen
8. Colon
9. Rectum

Respiratory and Circulatory Systems

10. Trachea
11. Lung
12. Heart

Digestion

What is it?

- ❖ Digestion is the breaking down of _____ particles so that the body can absorb and use the _____.

How is this done?

- ❖ Each organ in the digestive tract is responsible for a specific job in the _____ and _____ of food particles

Who has a digestive tract?

- ❖ All vertebrates and some invertebrates have some type of _____ tract.
- ❖ In most organisms, the digestive tract is one continuous _____ that has only one opening (mouth) and one exit (anus). This is known as the _____.
- ❖ Digestive tracts vary depending on the _____ habits of the organism
 - Herbivores are those animals that only eat _____ (i.e. cattle)
 - Carnivores are those animals that only eat _____ (i.e. Lions)
 - Omnivores are capable of consuming both _____ and _____ (i.e. Humans)

What are the two types of digestive tracts in livestock?

- ❖ _____ : Contains a single compartment stomach.
- ❖ _____ : Contains a four compartment stomach; capable of breaking down cellulose
 - Examples: Cattle, _____, deer.

How is food broken down in the digestive tract?

- ❖ _____ Processes: Chewing, churning movement of the stomach
- ❖ _____ process: Digestive juices found in the stomach of the monogastric and microbes found in the rumen of the ruminant.

The Monogastric

Picture a pig eating a large bowl of Showtime feed. Let's follow that Showtime feed through the digestive tract of a pig to see how the pig is able to use it.

Start: The Mouth

- ❖ Prehension is the process of bringing food to and placing food in the _____.
- ❖ Some animals, like humans, can bring food to their mouths with their _____.
- ❖ Others, like swine or horses, use their _____, or teeth to grab the food material.



- ❖ Mastication is the _____ and crushing of food in preparation for swallowing
- ❖ Salivary glands release _____ into the mouth
 - _____ food for easy swallowing
 - Begin digestion of _____

Step 2: The Pharynx

- ❖ A short, funnel shaped area between the mouth and the _____

Step 3: The Esophagus

- ❖ Tube that transport food particles from mouth to _____
- ❖ _____ contractions move food down tube



Step 4: The Stomach

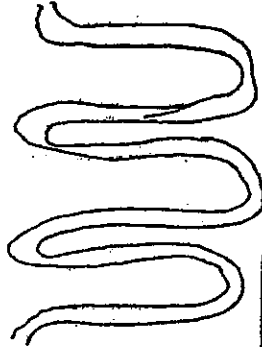


- ❖ Divided into _____ into _____ regions:
 - Cardiac (top), fundus (middle), and pylorus (bottom)

- ❖ Physical Digestion through _____ contractions
- ❖ Chemical Digestion through secretion of digestive juices which begin to break down _____

◦ _____ Juices break down protein in the stomach

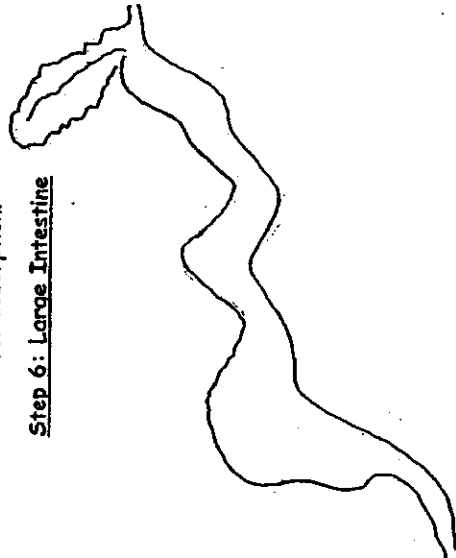
Step 5: Small Intestine



- ❖ Food moves through the tube through _____ contractions, or peristaltic movement.
- ❖ Remainder of nutrients are broken down and _____ by body
 - Liver and pancreatic juices break down _____
 - Other juices break down _____

- ❖ Wall contains _____ or "little fingers" that increase the surface area for absorption.

Step 6: Large Intestine



- ❖ Includes the cecum, _____ and rectum
- ❖ Absorbs _____ feces, or waste becomes solid.
- ❖ Absorption of some _____ and minerals, very little nutrient absorption.

The End: The Anus

- ❖ All nutrients not used by the body are _____ from the body through the anus.

Accessory Organs:

- ❖ Pancreas: secretes enzymes which emulsify (break down) _____ And helps with carbohydrates
- ❖ Liver: Secretes _____ to help digest fat
- ❖ Gall bladder: _____ bile



The Ruminant

Picture a cow eating a flake of hay. Lets follow this hay through the digestive tract of the cow to see how it is digested.

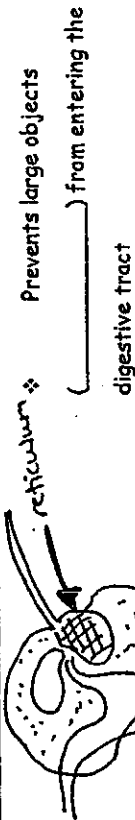
Start: The Mouth

Step 2: The Pharynx

Step 3: The Esophagus

- ❖ The ruminant stomach is divided into _____ compartments and is located on the _____ side of the abdominal cavity.

Step 4: Reticulum (the honeycomb):



Step 5: Rumen

- ❖ The _____ compartment
- ❖ Contains _____ (bacteria) which help break down the _____ found in cell walls of plant matter
- ❖ This is done through _____
- ❖ Food stays here for a _____ time

Step 6: Omasum (the book):



Step 7: Abomasum (The True Stomach)

- ❖ Normal break of food through _____ juices.
- ❖ Most break down occurred in _____

Ever herd of a cow "chewing her cud?"

- ❖ Ruminants go through a process known as _____

- ❖ Includes _____ (spitting-up), remastication (re-chewing), resalivation (production of saliva), and reswallowing of food.
- ❖ Occurs before the food passes from the reticulum to the _____
- ❖ This is to allow further _____ and break down of those hard to digest feeds.
- ❖ Allows for more _____ area for the bacteria in the rumen to work on
- ❖ Provide _____ needed for rumen/bacteria action

A very special case: The Horse

- ❖ Although horses are _____, they have the ability to eat hard to digest plant material
- ❖ They have an unusually large _____ (located between the small and large intestine). This sac contains _____ which act in the same way as the microbes found in the rumen of a ruminant.
- ❖ Microbes break down _____ of cell walls, thus allowing horses to be able to digest such feeds as hay.

So what is so special about ruminants?

- ❖ Ruminants allow us humans to _____ from those feeds we are unable to digest.
- ❖ For example, our simple stomachs _____ break down the cellulose of alfalfa hay.
- ❖ However, we could definitely use _____ found in alfalfa.
- ❖ Cattle are able to digest the hay, _____ its nutrients into its body.

- ❖ The nutrients in the hay are now available to us is a digestible form: _____

Green Beans as a Calcium Source

By Theresa Oliveira, Managing Editor

Ask most people what are good calcium sources and they will say dairy products, but what many do not realize is that vegetables can also be good sources of calcium. Certain vegetables are higher in calcium than others. Researchers have recently found that some green beans in particular beat others as a calcium source.

This is good news for the vegetable industry, especially since consumption of vegetables isn't as high as it should be. In fact, most people do not get enough calcium from the food in their diet. When it comes to getting calcium from the diet, the age group most likely to be deficient is teenagers, especially teenage girls.

In the last 20 years, soda and snack foods have increased at an alarming rate among teenage girls, while consumption of dairy products and vegetables has dramatically decreased. Unfortunately, this trend has teenagers consuming calcium levels way below the daily requirement of 1300 mg.

Scientists at the Children's Nutrition Research Center in Houston, Texas have conducted studies on calcium sources including six different varieties of green beans. After comparing the calcium content, they found the top performer to be Hystyle, a green bean that required little water. Interestingly, those green beans with a higher calcium content required less water to grow and produce than other varieties.

The study shows that the Hystyle green bean variety has a higher calcium content than other particular varieties called Emerald and Entice at first were a big battle as to why the difference was so significant.

They discovered that the Hystyle variety is more efficient at conserving water than other varieties studied. Plant

physiologists Michael Grusak and Kirk Pomper explained how the Hystyle is able to conserve water and why the calcium content is higher than other varieties.

The scientists noted that water dilutes calcium as it moves through a bean plant, therefore, reducing the amount that reaches the pods. Water entering and leaving the plant is controlled by tiny pores called stomates, which open and close to control the rate at which water flows through the plant.

According to Grusak and Pomper, this activity is both genetically and environmentally controlled. From the research gathered, it appears that there is a direct link between transpiration and calcium content. Overall transpiration in the Hystyle green bean variety was about half that of Labrador.

The lower the transpiration, the higher the calcium content. This was true of Hystyle's xylem stream. The xylem, which is responsible for transporting liquid and mineral nutrients from a plant's root system to its shoots, works similarly as arteries do in humans. Just as arteries carry oxygen-rich blood throughout the body, a plant's xylem carries essential nutrients.

In the case of green beans, calcium is one of those important nutrients that is carried throughout the plant system—the end result being a good source of calcium when consumed as a part of a healthy diet.

The Baylor College of Medicine and the Agricultural Research Service worked together to form the Children's Nutrition Research Center in Houston, Texas. The Center focuses on children and new mothers' health and how foods can provide essential nutrients. Scientists at the center said they urge new mothers to eat a well-balanced diet that

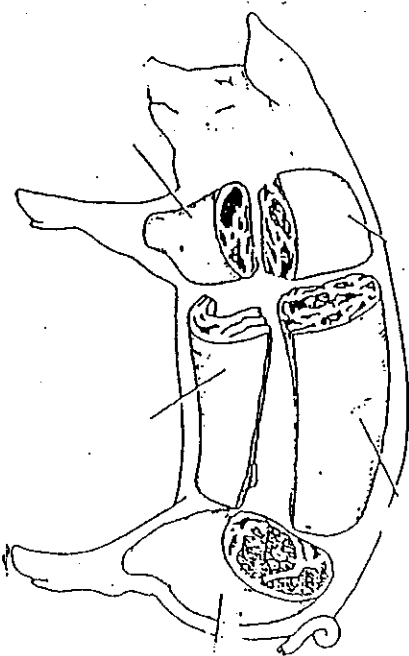
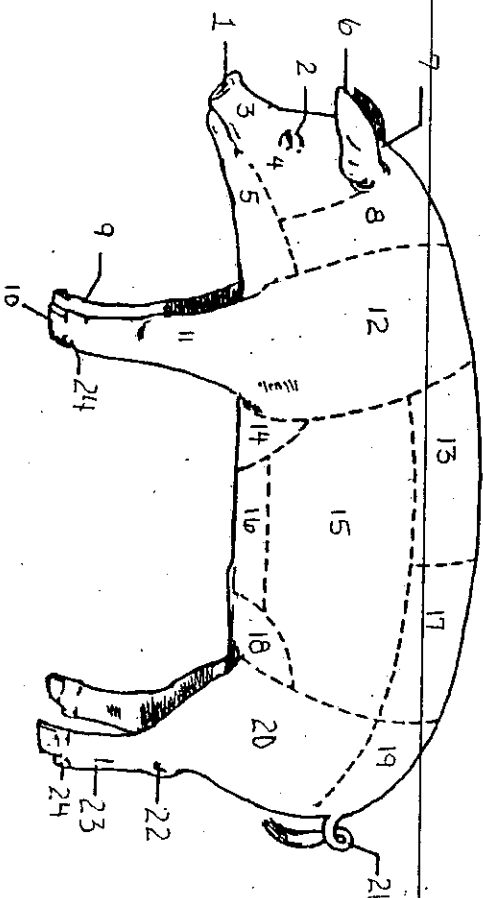


includes vegetables such as green beans, which are high in calcium.

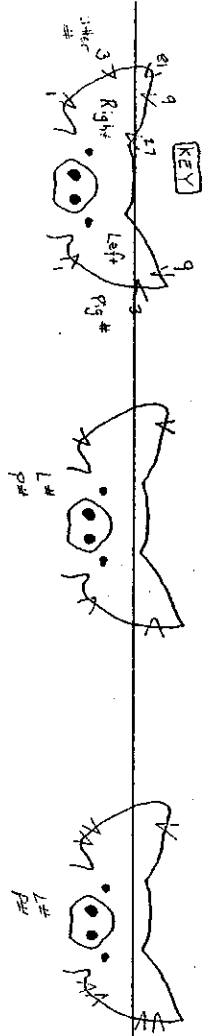
According to researchers, although overall consumption of certain vegetables may have dropped in the last 20 years, there is a growing trend toward healthy eating. This research showing that green beans are a good source of calcium may just be what the industry needs to boost consumption.

Calcium is especially important for children as they are growing to help them build strong bones. Unfortunately, many children aren't receiving the calcium they need in their diet. While dairy products are excellent sources of calcium, some children may not like them and others may be unable to tolerate milk sugar. Whatever the reason, children aren't getting enough calcium, but this can change. The first place to start is the diet. Researchers noted that beans and other vegetables could also provide a portion of the calcium requirements along with other important nutrients.

With this in mind, plant breeders are working on developing varieties that can efficiently utilize water with the hope that their calcium content and perhaps other nutrients will be higher. So, when it comes to getting calcium from the diet, dairy products are an excellent source, but don't forget the green beans.



Universal farrowing system



Name: _____

Cal Poly Swine Operation

Introduction: Cal Poly State University, San Luis Obispo, operates a small swine operation for the purpose of student learning. The attached information is taken from their Introduction to Swine Production Lab Manual. Please use this information to answer the following questions regarding how this particular facility is operated. The purpose of this exercise is to visualize how an actual swine facility is managed and operated. Please use a separate piece of paper.

- The Cal Poly Swine Unit is a semi-_____ operation managed on an all-_____ farrow-to-_____ basis. OK, what does this mean? (you may need to refer to your book/notes)
- The three Foundation Breeds are: _____, _____ and _____
- What two boar breeds are used to generate crossbred replacements or terminal stock?
- What is the goal of the breeding program?
- How many females are maintained in the breeding herd?
- How many groups of females does this produce?
- How many boars of each breed do they require?
- Gills and non-lactating sows are kept in _____ lots for breeding and _____
- In these lots, what are provided for protection against the weather and for feeding?
- While dirt lots provide exercise and fresh air, what are some disadvantages?

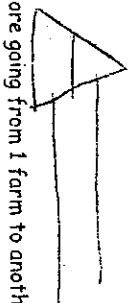
- Describe the "free stalls" in the farrowing barn.
- When do sows enter the farrowing barn?
- At weaning, the pigs:
 - Are _____ days old
 - Weigh _____ lbs.
 - Gain _____ while on the mother
- Pigs stay in the nursery for _____ days.
- When leaving the nursery, pigs:
 - Weigh _____ lbs.
 - Gain _____ lb. per day.
- Describe the grower barn and its stalls.
- How is food delivered to the grower pigs?
- What constant challenge do these pigs present?
- How long do the pigs stay in the grower barn?
- When pigs leave the grower barn, they:
 - Weigh _____ lbs.
 - Gain _____ lb. per day
- Describe the finishing barns, including waste disposal, watering systems, and feeders.
- Why is it best to have two finishing barns?
- Describe the boars' pens.
- What is the purpose of the dirt area near the boar pens?
- Approximately 2 weeks prior to farrowing, where are the females moved to? Why?
- What do you think is the benefit of having the sorting pens, electric scale, and loading chutes together in one spot between the grower and finisher barn?

NAME _____

SWINE PRODUCTION VIDEO WORKSHEET

1. To what states will they market their hogs?

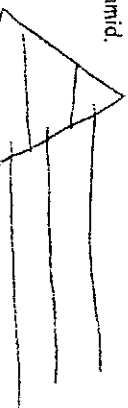
2. Fill in the health pyramid.



How long must a person wait before going from 1 farm to another?

From another facility, how long must a person wait before being allowed to enter the top facility?

3. Fill in the commercial pyramid.



What is the waiting period to go from 1 area to another?

4. PRODUCTION GOALS INCLUDE:

Sows

_____ Pigs marketed per year

_____ Pigs marketed per sow

_____ Pigs per litter per sow

_____ Litters per sow per year

Less than _____ % death loss

5. The breeding facility utilizes _____ mating.

6. Each boar is used approximately _____ a week.

7. Records help monitor _____ of the farm

8. Sows have their own _____ ration and are fed _____ a day and watered _____ a day.

9. Sows are pregnancy tested at _____ of gestation.

10. The _____ tone of the machine indicates pregnancy. The machine is testing the amount of _____ in the uterus.

11. If not pregnant, the sow _____

12. Each group of pregnant sows is moved to the _____ barn.

13. The temp in the barn is controlled by a _____ and the air moves at _____ over the animals at all times.

14. Sows are kept in the gestation barn from _____ post breeding until just prior to _____, about _____ weeks.

15. A couple days before moving the sows the _____ and _____ are thoroughly washed and disinfected.

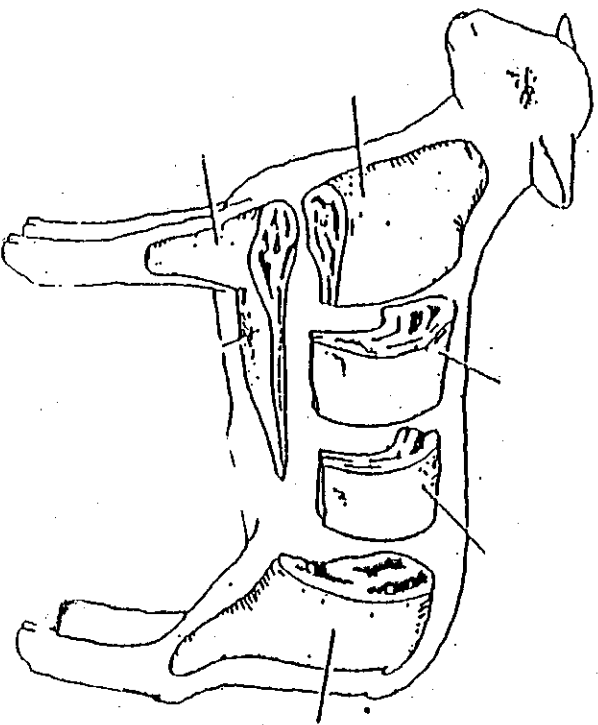
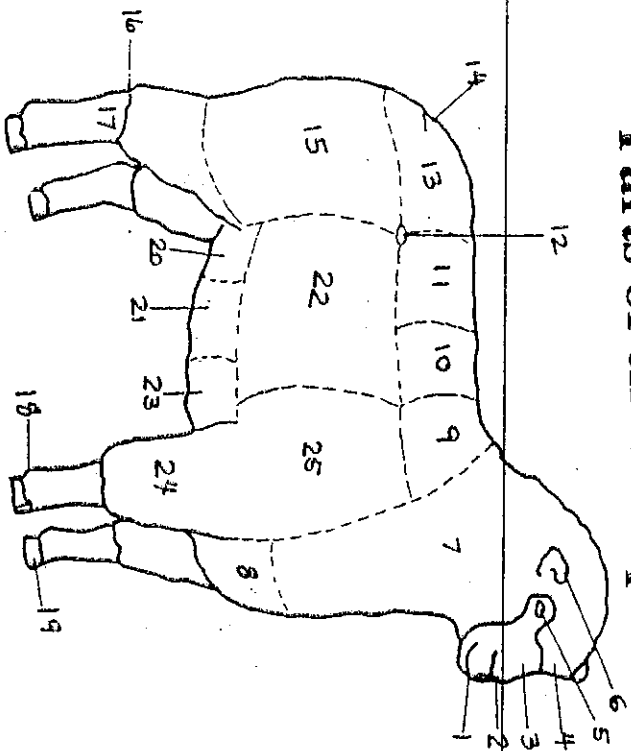
16. Sows are fed _____ a day.

17. There are _____ rooms with _____ crates in each room.

18. _____ employees are responsible for all _____ of piglets.

19. Each sow is _____ with her permanent ID #.
20. Average gestation for hogs is _____ days.
21. Because they use _____, they know within 1 day of farrowing date.
22. Processing includes _____
23. _____ is used to prevent infection.
24. Baby pigs are given an _____ shot.
25. Piglets are weaned in _____ days.
26. The sow will eat _____ lbs of feed per day.
27. Rooms are _____ and _____ after moving each group of pigs.
28. The nursery is the _____ stage.
28. There are _____ nursery barns that house about _____ head in each.
30. All pigs in the same pen are with in _____ of age of each other.
31. Pigs stay for _____ in the nursery barn and the entire building is moved at one time.
32. The _____ takes pigs from the farrowing barn to the nursery.
33. The trailer is _____ and _____ each _____ not after each load.
34. Pigs are sorted by _____ and will stay together until _____
34. Pigs are fed a _____ feed for 1 week until they are used to the feed.
36. Transported to the grower/finisher barn in a _____
37. Gilts from the grandparent farm will be _____
38. If a hog is given medicine, they are treated for _____ days.
39. Feeds are _____ after the nursery barn.
40. Feeders are kept full _____ a day in the grower barn.
41. Death loss should be below _____ and is actually _____ right now.
42. Temperature in the barns _____ as the pigs get older. For every week, the temp is _____ by _____ degrees.
43. After 6 weeks. The pigs are changed from a _____ ration, _____ to _____
44. Feed conversion is _____ lbs of feed to _____ lb of gain with an average daily gain of _____
45. The finishing barns hold approximately _____ head.
46. The key goal is to raise _____ animals by controlling _____

Parts of the Sheep



47. _____ are used to keep the pigs cool.
48. Pigs will be marketed between the _____ and _____ weeks after arriving in the finishing barn.
49. The producer utilizes a 3 step feed program _____.
50. Pigs are slaughtered at _____ to _____ lbs.
51. Employees check the pigs daily for _____ and _____.
52. The storage bins hold _____ tons of feed a peice.
53. The extractor separates the _____ from the _____.
54. The removed water is used on _____.
55. The solids are put on _____, grass growth, and _____ to build up the _____.

THEN CAME SPEEDY

Shepherd Eduardo Estrella knelt in the growing darkness to examine the torn body of yet another bear-killed lamb. Over a dozen of them, lambs and ewes, lay strewn about the mountain meadow where they had fallen.

The attack had come at dusk, a quarter-hour earlier, when a black bear sow and her two grown cubs had charged from the forest, slashing with teeth and claws, killing or maiming every animal within reach and scattering the great flock.

By Terry Hodges

The sheep dogs had sounded the alarm, and Eduardo had come running with his rifle. His warning shots had driven the bears away, but not before they had taken a dreadful toll on the sheep. And he knew, with growing dread, that they would return. He looked to the east where a cold, three-quarter moon was rising, and suddenly he felt more alone than ever before in his life.

But he was not alone and feeling a soft brush against his leg, he bent down to stroke the soft-furred head and neck of Speedy, the sheep dog, a border collie mix. The dog peered up at him with bright eyes alight with intelligence and affection.

"Gracias, mi amigo," said Eduardo softly, regarding the loyal companion he had learned to love, the friend who responded instantly to commands in either Spanish or English, who anticipated most commands before given and who regarded the sheep as his personal responsibility.

Behind them loomed the higher peaks of the Sierra Nevada, dark bastions against a cobalt sky. Far below, to the east, gleamed the cluster of distant lights of some small town. Eduardo drew in a deep draught of cool air, spiced with high-country sage and the pungent smell of sheep. It was an aroma as common to him as breath itself, and if he closed his eyes, it would carry him back to the rugged slopes of the Peruvian Andes, to the tiny village where he had been born and raised.

There had always been sheep. His earliest memories were of sheep, tended in the mountain camps by his father. He had learned at an early age to care for sheep, to doctor them, to assist them at birth, to apply the lessons learned by his ancestors over centuries of sheep raising, the bits and pieces of hard-earned knowledge that would keep the flocks healthy and productive. Now at age 35, Eduardo knew all that was practical to know about sheep, and it was this knowledge and experience, along with his willingness to live the lonely life of a shepherd, that had been sought by a sheep rancher in America.

Fred Fulstone was a second-generation sheep rancher in Western Nevada. ... was active and capable at age 80, and he knew the sheep ... inside out. He had known for years

that the best available shepherders came from Chile and Peru, and he had arranged a visa for Eduardo and had sent him a one-way plane ticket to the U.S. Eduardo had arrived, anxious to begin his three-year contract, anxious to begin earning seven times the pay he could earn in Peru.

He had begun in the spring, driving nearly 2000 head of ewes and lambs west from Fulstone's ranch in Wellington, Nevada, across miles of sage and juniper flats, into California. He had walked with the sheep the whole way, six to eight miles per day, his ears tuned to the continuous bleating and bawling and the tummy tinkling of bells which hung from the necks of one of every 200 of the sheep. His tent, camping gear and food were packed on a single burro.

They had crossed Highway 395, stopping traffic as the sea of woolly boddles flowed across, and the occupants of the cars and trucks had marveled over a sight from a different age. They had continued on, gaining altitude, continuing west, ever higher, until reaching the alpine meadows and the sweet summer grasses of the eastern Sierra Nevada. And the sheep had thrived under his care.

Always nearby was faithful Speedy, restlessly patrolling the trailing edge of the huge flock as they traveled. His coat, a mottled black and white, appeared as a gray blur as he raced first one way, then another, nipping at the heels of any foolish animal that would wander off course.

There were other dogs on the drive as well, for dogs were essential to shepherding. There were two all-business Australian shepherds, and a third one, little more than a pup, learning the trade from his elders. And there was a huge Great Pyrenees, the guard dog of the flock, whose job it was to keep marauding coyotes at bay. But it was Speedy who had adopted Eduardo for his own, and the others kept their distance.

The first year had gone well, but now, as summer of the second year was upon him, he was troubled. Black bears were becoming more numerous and more aggressive. It was a problem new to him, for he had never encountered bears in the Andes. Bears were fast, powerful predators, and they could kill many sheep in a short time. He brooded over the problem, longing to seek the wise guidance of Fred Fulstone. At last he was comforted to know that Julio Cortiz, Fulstone's camp tender, was due in a day or so to bring him supplies. He could discuss the matter with Julio.

As he crawled with his sleeping bag that night inside his tent, with Speedy bedded down nearby, he couldn't help but mourn the loss of the murdered sheep. But then he turned his mind to happier things, and as sleep came over him, his last thoughts were of the smiling faces of his wife and children a half a world away.

It was just before dawn when it happened. He was prepar

to cook his breakfast, when a sudden cacophony of noise brought him up short. It was the frantic barking of the burro and the other dogs accompanied by the baying of the burro and the loud, combined dissonant voices of almost 2,000 frightened sheep. Eduardo grabbed his battered 30.30 rifle and hurried toward the commotion.

The eastern sky had begun to lighten, and there was just enough gray light for Eduardo to see the flock of sheep surging first one way, then another, and parting as large, dark shapes charged among them. He hurried closer, to within rock-throwing range of the bears, then threw his rifle to his shoulder and fired a shot. He then fired again, his aim being to frighten, not kill, and three of the bears immediately fled for the forest. But a fourth one, a large male, was unmoved by the shooting and struck down and killed a lamb right before Eduardo's eyes. Eduardo felt no choice. He jacked another live round into the chamber of his rifle, took aim in the dim light and fired.

The bear bellowed with rage, spinning circles as though chasing whatever it was that had struck him. Eduardo doubted that he had made a killing shot on the animal and attempted to shoot again. But he had forgotten to reload the night before, and there was just the metallic snap of the firing pin striking an empty chamber.

At that instant, Speedy dashed in, snapping at the bear's heels, and the bear, with astounding swiftness, turned and swiped at the dog, hooked him with his great claws and drew him to his chest. Speedy screamed as the huge teeth sunk into his body, and Eduardo, horrified, charged in, clubbing the bear with his rifle. Once, twice, three times he swung with all his might, shattering the weapon over the bear's skull. The bear now dropped Speedy and turned on Eduardo. It was on him like an avalanche, driving him to the ground, biting, tearing, grunting savagely, his hot, putrid breath engulfing him.

In the midst of this nightmare, Eduardo closed his eyes and tried to protect his throat and face, and when the bear lunged for his throat, it got his forearm instead, the great canine teeth sinking deep into his flesh. The bear then shook him violently, and when Eduardo opened his eyes briefly, he found himself staring straight into the fierce, pig-like eyes of the animal, mere inches away.

Eduardo lay drenched in blood, a mixture of his and the bear's, and he turned to his faith and prayed, convinced he was about to die. But then the violence of the bear's attack began to slow. It was as though it were succumbing to some drug. It moved slower and slower, its labored breath slowing, until it simply stopped. The great weight of the animal then settled onto Eduardo, who found himself pinned beneath 300 pounds of dead bear.

Using all his strength, Eduardo rolled the dead animal aside but found that his forearm was still locked in the death grip of the animal's jaws. With his free hand, he tried to force the large jaws apart, but to no avail. Then, using the back of his good hand, he wiped blood from his eyes, looked around and spotted the broken Winchester. He was just able to reach it, and he used its barrel to pry the bear's jaws open enough to withdraw his mutilated arm. He then collapsed on his back, heart

pounding, his breath coming in ragged gasps.

It was the presence of Speedy that brought him back to his senses, the little dog hurt and bleeding, but alive. Speedy had leaped to him and was sticking his face. Eduardo raised a shaking hand and patted him.

Eduardo rose painfully to a sitting position and assessed his own injuries. They were many. He had cooing puncture wounds and ripped flesh all over his body, but surprisingly he could detect no broken bones. Being in shock, he felt very little pain, but he knew this to be a temporary condition. He therefore forced himself to rise, found he could stand, then he and Speedy staggered back to the tent. There, using rolls of gauze from the first aid kit that Fulstone insisted his herders carry, Eduardo bound, as best he could, his and Speedy's wounds.

By the greatest of good fortune, Julio arrived shortly thereafter. Eduardo and the sheep had not yet reached the isolation of the really high country, and there was still the isolation of a dirt road on which Julio was able to drive a pickup. Julio was shocked to see Eduardo in battered, bloody clothing, roughly bandaged and he wasted no time in getting the injured man loaded into the pickup. Eduardo, however, wouldn't leave without Speedy, so Julio gently lifted the dog onto the seat and slid in after him. Julio now slipped the pickup into gear, and Eduardo's pain began in earnest.

At the hospital in Bridgeport, 80 miles to the south, doctors worked for hours on him, cleaning, stitching, and pumping him full of antibiotics. Only then was he being released. But would spend three days there before finally being released. But even then, Fulstone would have to drive him the 120-mile round trip to Bridgeport every other day or so to get his dressings changed. It would be a full month before Eduardo would be able to move without substantial pain.

In the meantime, Speedy had been treated and was making his own recovery, and it was a happy reunion when Eduardo finally saw him again. The dog seemed to understand perfectly that he owed his life to the quiet man who had rushed to his aid and had paid so dearly for it.

When fall arrived, Eduardo was able to work again, mainly around the ranch in Wellington. But he was able to help with the sheep in October, when the lambs were driven down from the high country to be grain fed and readied for market, and he cared for the ewes in November, when they were trailed down to the high-desert flats near the ranch.

One brisk November day, as Eduardo was out on the flats watching over a large flock of ewes, a green fish and game patrol vehicle drove his way from the ranch headquarters. When it arrived, out stepped one of the largest men he had ever seen. Lt. Art Lawrence, who stood a bevy six-foot-four, was indeed an imposing figure, particularly in uniform as he was on this day. Lawrence supervised the game wardens in Inyo and Mono counties, and he took his mission of protecting the state wildlife very seriously.

Lawrence had heard, from Nevada game wardens, the stor of the Peruvian sheep herder who had been mauled by