

Unit C: Animal Management

Essential Standard 5.00:
Understand management of
agriculture animals.

Objective 5.01

- Classify animal housing, facilities and waste management.

Beef Housing and Facilities

● Types of Operations

- producers should plan facilities and equipment to suit the various types of beef operation(s).

1. Cow-Calf Producers

2. Seedstock or Purebreed

3. Cattle Feeders

- Stocker Operations

- Feedlot

Types of Housing

● Confinement Barns

- Cold

- Opens to environment on one side

- Uses a pole-type building with an open-span structure to make it easier to remove waste

- Can use various solid bedded or slotted floors

Cold Confinement



This picture was taken at Cornwell Dairy in Cleveland County.

Types of Housing

● Confinement Barns

□ Warm

□ closed, insulated and kept warm.

□ Most expensive type of facility

□ Used in colder climates

□ Can use solid bedded, slotted or solid flushing floor systems

Types of Housing

- Open Feedlot
 - no buildings, just windbreak fences and sunshades to protect from wind, snow, and sun
 - Unpaved floors
 - some concrete around feeding and watering stations
 - Requires more land area
 - Floors are typically dirt, therefore drainage and runoff controls are important

Open Feedlot



Courtesy: <http://www.extension.iastate.edu/pages/communications/epc/Fall04/feedlots.html>

Types of Housing

- **Open Barn and Feedlot**
 - open front barn and feedlot.
 - Provides protection from environmental elements
 - Midwestern part of US
 - Unpaved floors
 - some concrete around feeding and watering stations
- **Feeding Barn and Lot**
 - same system as open barn and feedlot except feed bunks are located in the barn

Types of Housing

- Pasture

- typically used for cow-calf producers and requires minimal facilities

- Important to manage pastures to maximize growth potential of forages, distribute manure and control parasites

- Pasture Rotation

- cycles animals through a series of pastures.

- Strip Grazing

- providing animals with smaller sections of grass every few days

- Maximizes forage growth and land utilization

- Requires more labor

Strip Grazing



Courtesy: <http://www.luresext.edu/goats/training/pastures.html>

Beef Operation Considerations

- Number of Cattle
 - determined by the resources available and the type of operation



Beef Operation Considerations

- Amount of Land
 - varies depending on operation
 - Feedlots
 - 5 acres for every 500 head of cattle
 - Partial Confinement & Pasture
 - depends of location of facilities, pasture management, age of animals, etc.

Beef Operation Considerations

- Location and Environmental Factors
 - ❑ Easy access to roads
 - ❑ Space for expansion
 - ❑ Movement of cattle
 - ❑ Environmental Considerations- odor, wind, dust, runoff

Beef Operation Considerations

- Feed Storage and Handling
 - systems vary depending on type of facilities
- Money and Labor
 - Input costs to build and maintain facilities
 - Labor supply

Beef Cattle Equipment

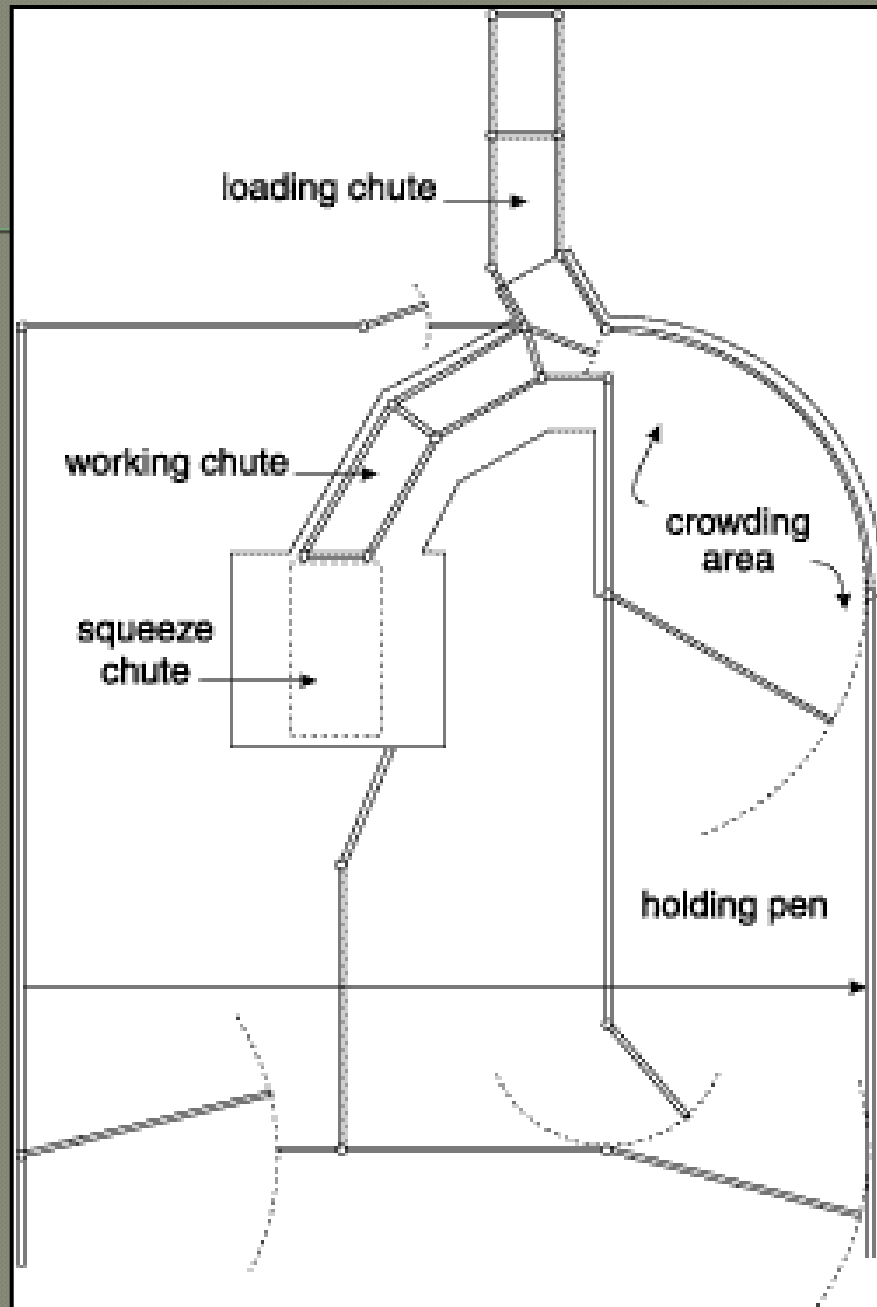
- Corrals
 - needed for all types of beef cattle enterprises

Beef Cattle Equipment

● Corrals Parts

- Holding Pen
- Sorting Pen
 - workers can separate cattle into smaller groups
- Working Chute
 - crowding pen that again moves cattle into a smaller group
 - moved to an “alleyway” system where they are funneled into an individual line
- Headgate
 - holds cattle

Corrals



Beef Cattle Equipment

● Advantages of corrals:

1. Easier to handle cattle
2. Reduces labor
3. Saves time
4. Safety of workers and animals
5. Reduces stress on animals

Dairy Housing and Facilities

- Types of Operations
 - Intensive Dairy Production
 - Pasture Dairy Production

Dairy Housing and Facilities

● Types of Housing

- Stall Barns

- cows confined to a stanchion or tie stall
- Structure at the front of stall usually serves as feed bunk with an automated watering system
- Waste removed in center aisle by motorized or automated equipment

Dairy Housing and Facilities

● Types of Housing

- Free Stall Barn

- cows maneuver throughout barn
- Stalls are a bedded area for cattle to rest
- Facility may be fully or partially enclosed and temperature regulated
- Floors may be dirt, solid concrete or slatted
- Waste removed by motorized equipment

Dairy Housing and Facilities

● Types of Housing

- Pasture

- Cows kept on pasture continuously or for portions of the day
- Producers often use a combination of pasture and some type of barn facility
- Replacement heifers are often raised on pasture

Dairy Housing and Facilities

- Types of Housing

- Portable Hutches

- used to house young calves

- Heifer Barns

- used to house replacement heifers after portable hutches. Animals can be grouped in pens or in individual stalls

Dairy Housing and Facilities

● Dairy Cattle Equipment

- Headlocks

- modified headgate system where larger numbers of cattle can be restrained
- typically attached to feed bunks so animals are accustomed putting head into latch system
- routine veterinary care and reproductive related procedures are usually administered

- Headgate and Working Chute

- same system as what is used for beef cattle
- used for more intensive veterinary procedures and hoof trimming

Dairy Housing and Facilities

● Dairy Cattle Equipment

• Milking Equipment

- ❑ Milking Parlors- separate room/area where cattle are milked
 - ❑ Most common method of milking cows
 - ❑ Includes a pit where workers operate equipment used to milk animals
 - ❑ Most common milking parlor design is the herringbone
- ❑ Cattle kept in stall barns may use pail, suspension or pipeline milking system or be moved to a milking parlor

Dairy Housing and Facilities

- Dairy Cattle Equipment

- Milkhouse

- room where milk is filtered, cooled and stored in stainless steel tanks



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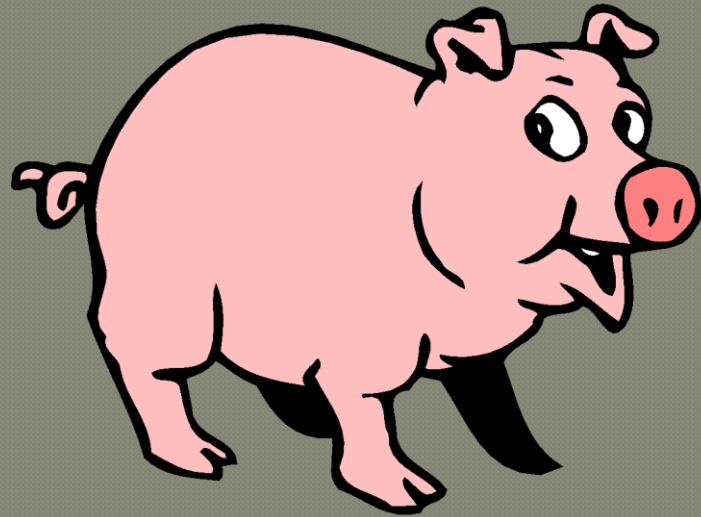
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Swine Housing and Facilities

● Types of Operations

- producers plan facilities based on type on type of operation
 - Sow
 - Nursery
 - Grow-Finish
 - Farrow-to-Finish



Swine Housing and Facilities

● Types of Housing

- Pasture or outdoor without climate controlled buildings



Swine Housing and Facilities

● Types of Housing

• Confinement Houses

Cold

- may be open on one or more sides
- used mainly for finishing hogs

Warm

- controls temperature, moisture, odor and airborne diseases through a ventilation system
- used mainly for breeding, farrowing and young pigs
- most North Carolina swine operations use warm confinement



Aerial view of Barham Farm, Zebulon, North Carolina.

http://www.cals.ncsu.edu/waste_mgt/smithfield_projects/ambient%20digester/ambientdigester.htm

Swine Housing and Facilities

● Swine Operation Considerations

- Location and Environmental Considerations
 - Odor
 - Access to roads, power and water
- Proximity
 - swine operations are highly vertically integrated
 - need to be in an area that has other operations of similar type

Swine Housing and Facilities

- Regulations
 - restriction on the construction of new facilities.
 - special waste management considerations
- Feed Storage and Handling
 - confinement facilities typically use feed/grain bins to store feed
- Money and Labor
 - Input costs to build and maintain facilities

Swine Housing and Facilities

● Swine Equipment

- Feeding and Watering Systems

- confinement swine facilities have automatic feeding and watering systems

- Automatic feeding and watering

- more expensive, but they save on labor

- Hand or non-automatic systems cost less

- require more labor



<http://www.bigdutchmanusa.com/swineproduction/>

Swine Housing and Facilities

● Swine Equipment

• Floor Types

- ❑ Solid- usually made of concrete
- ❑ Partially Slotted- a portion of the floor is slotted with another section being solid
- ❑ Totally Slotted- entire floor is slotted to allow for continuous removal of waste



<http://www.bigdutchmanusa.com/swineproduction/>

Swine Housing and Facilities

● Swine Equipment

- Farrowing hog enterprises require small equipment such as castrating knives, ear notchers, and needle teeth clippers



Swine Housing and Facilities

- Gestation Crates/Stalls
 - animals spend 24 hours a day in crate during gestation period
 - meet specific nutritional needs of each animal
 - removes potential for injury from other aggressive sows
 - very controversial method of housing pregnant animals
 - many larger companies are phasing out
 - moving to a group housing system where animals can go into individual pens if they choose, but can also come out to move and socialize with other females

Swine Housing and Facilities

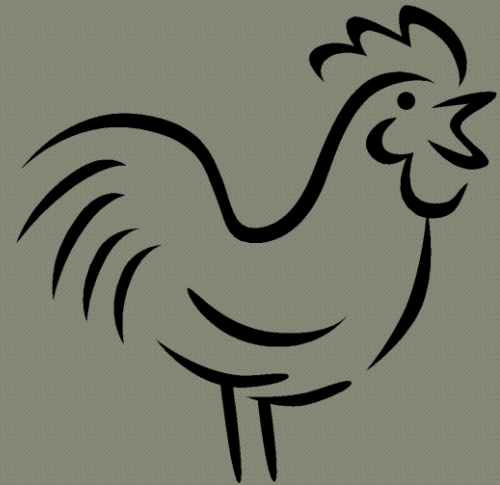
- Farrowing Crates
 - ❑ Animals moved into crates a few days prior to farrowing
 - ❑ Reduces the number of piglets injured or killed



Poultry Housing and Facilities

● Types of Operations

- Egg Production
- Broiler Production
- Replacement Pullet Production
- Egg Hatcheries



Poultry Housing and Facilities

● Confinement Houses

- clear span structure with insulated ceiling and walls to prevent heat stress
- ventilation is a key consideration in building design

Poultry Housing and Facilities

● Broilers and Turkeys

- Usually have dirt floors covered with wood shavings or straw
- Lights are on 24 hours a day

Poultry Housing and Facilities

● Laying Flocks

- Use wire cages
 - save space
 - cleaner eggs
- Artificial light
 - controlled by timers
 - laying hens require at least 14 hours of light per day



Poultry Housing and Facilities

● Replacement Pullets

- Laying pullets
 - raised in cages for brooding or until moved to laying houses
- Broiler breeder pullets
 - raised in confinement houses on dirt floors
- Lights are controlled to regulate sexual maturity and egg production

Range or Outside Structures

- Popular method of housing poultry raised by small scale or niche producers
- Commercial trend is moving away from this method
 - land requirements
 - diseases
 - predators
 - Weather

Egg Hatcheries

- located separately from production facilities
- include large scale incubators to hatch eggs
- equipment to process, sort and transport chicks
- shipment to a production facility

<https://www.youtube.com/watch?v=fkZpXgxmVFO>

https://www.youtube.com/watch?v=LJ_Z-ib5iLk

Poultry Operation Considerations

- Location and Environmental Considerations
 - Access to roads, electricity, water
 - Odor, waste management and mortality management
- Proximity
 - poultry operations are highly vertically integrated
 - need to be in an area that has other operations of similar type in order to secure a contract with a company

Poultry Operation Considerations

- **Feed Storage and Handling**
 - confinement facilities typically use feed/grain bins to store feed.
- **Money and Labor**
 - Input costs to build and maintain facilities

Poultry Equipment

● Brooders

- using infrared heat lamps to keep young chicks at optimal temperature
- typically brooded on the floor in a section of the poultry house
 - hover guard to keep chicks from wandering away from heat source
 - 90-95 degrees Fahrenheit
 - reduced 5 degrees per week until reaches 70-75 degrees Fahrenheit
 - Take temperature 3" from floor

Brooder



Poultry Equipment

● Feeding and Watering Systems

- highly automated in all types of poultry houses



Poultry Housing and Equipment



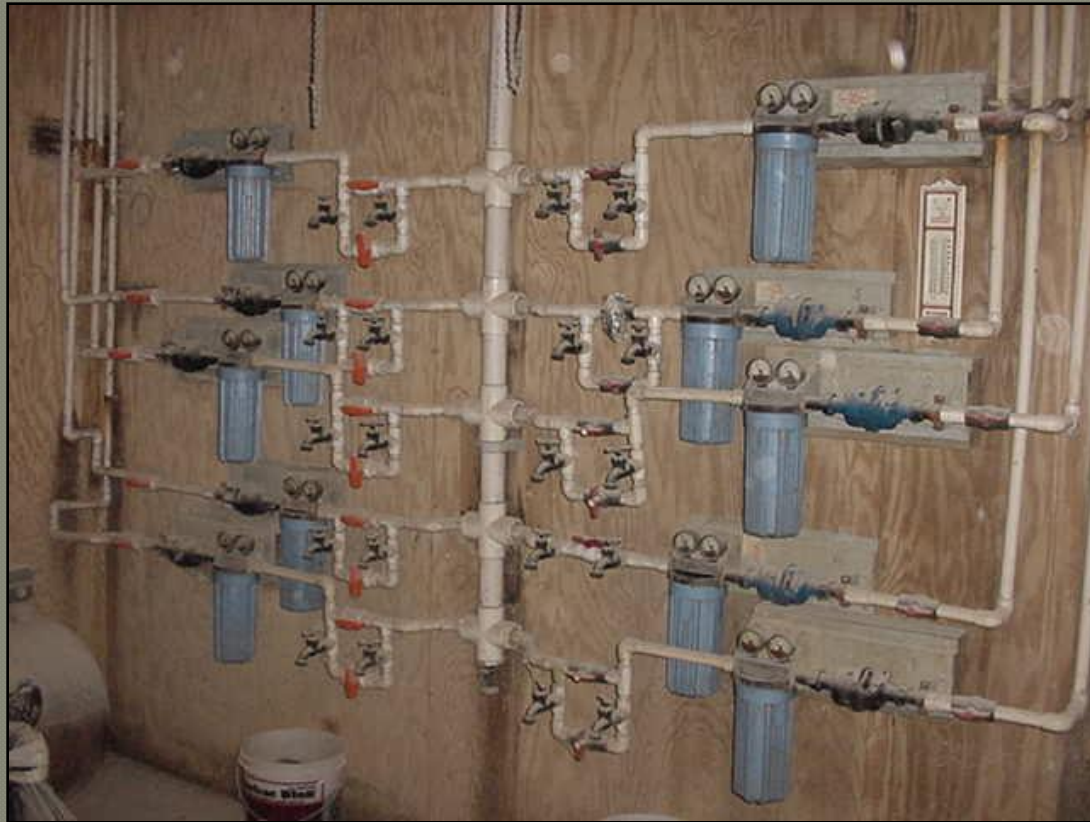
Poultry Housing and Equipment



Poultry Housing and Equipment



Poultry Housing and Equipment



Poultry Housing and Equipment



Poultry Housing and Equipment



Poultry Housing Bio-security



Poultry Housing and Equipment



Poultry Housing and Equipment



Poultry Housing and Equipment



Video

- See the video on Willamette Egg Farms:
 - <https://www.youtube.com/watch?v=bXf240jpTI8>

Animal Waste Management Regulations

- **Confined Animal Feeding Operations (CAFO)**
 - used to describe operations that raise large numbers of animals in a confined setting

Animal Waste Management Regulations

- It is a violation of state law for waste to reach surface water
 - A \$10,000 per day penalty may be assessed if there is a man-made conveyance such as a pipe or a ditch to route waste away from a holding pit or lagoon even if no waste is actually discharged
- It is against the law for anyone to cause a water quality standard violation

Animal Waste Management Regulations

● Senate Bill 1217

- mandates the number of animals that require a waste management plan and permit
 - 250 or more swine
 - 100 or more confined cattle
 - 75 or more horses
 - 1,000 or more sheep
 - 30,000 or more confined poultry

Animal Waste Management Regulations

- Animal waste management system operators must be certified.
- In addition to state regulations, local county and city regulations such as zoning and facility locations also apply.
- In addition to fines and lawsuits brought by governmental agencies, third-party lawsuits can be brought by individuals or organizations against livestock and poultry operations.
- It is easier to prevent animal waste problems than to correct them.

Animal Waste Management Regulations

● Types of Waste Management Systems

- Type A Systems- primarily rely on anaerobic lagoon and soil/plant systems for the treatment of animal wastes with low fiber such as swine and poultry.
- Type B Systems- primarily rely on soil/plant systems for the treatment of animal waste with high-fiber such as cattle, horses, and sheep.

Animal Waste Management Regulations

- Components of a North Carolina Animal Waste Management Plan
 1. Odor Control
 - from decomposing manure, feed, and carcasses
 2. Insect Control
 - eliminates or reduces causes of insects and uses approved materials to control.
 3. Animal Mortality
 - approved methods to quickly dispose of dead animals.
 4. Riparian Buffers
 - vegetative buffers.
 5. Waste and Soil Testing
 - both the animal waste and the soil on which it is applied must be tested.
 6. Record Keeping
 - must be done to include soil and waste analysis reports as well as land application dates and rates for each application site.
 7. Waste Application Rates
 - follow the waste utilization plan.
 8. Emergency Management
 - plan to manage disasters from flood, fire, disease, etc.

Animal Waste Management Regulations

- Components of a Waste Utilization Plan
 - Source of nutrients
 - Amount of nutrients
 - Placement of nutrients
 - Timing of nutrient applications

Animal Waste Management Regulations

● Best Management Practices

- methods that reduce the loss of nutrients thereby reducing the potential for negative environmental impact. Examples:
 - Buffers
 - distances from streams, homes, or property lines
 - Grassed Waterways
 - natural or constructed water runoff
 - helps control erosion
 - Conservation Tillage
 - using a no till drill so soil surface is not disturbed

Animal Waste Management Regulations

● Best Management Practices

Strip Cropping

- growing alternating crops in strips that follow the contour of the land

Contour Planting

- planting across a slope while following the contour of the land

Crop Residue Management

- any tillage method that leaves crop residue.

Coastal Bermuda grass

- removes high amounts of nutrients from the soil as well as controls erosion

Video

- See the video on using swine waste for energy production.
 - <https://www.youtube.com/watch?v=DxjPcU10kVo>

Objective 5.02

- Classify diseases of animals and preventative maintenance procedures.

Preventative Maintenance

- Every production farm (swine, cattle, poultry, or sheep) should establish a preventative maintenance schedule that is followed year after year
 - It will vary depending on the type of animals you are raising

Preventative Maintenance Includes

- **Sanitation**

- prevents a wide variety of diseases and issues associated with raising livestock
 - More effective method of preventing disease compared to treating animals once they are sick
 - Isolation of new animals to prevent spread of disease

- **Biosecurity**

- protection from biological harm from living things including diseases, parasites and bioterrorism

- **Record Keeping**

- keep accurate breeding records, health protocols, production records, vaccinations schedules, etc.

- **Feeding Practices**

- provide adequate nutrition to meet the needs of the individual animals

Preventative Maintenance Includes

- **General Management Techniques**
 - used to control potential injuries and problems to the animals and/or workers
- **Vaccination and Immunization**
 - used to control a variety of diseases associated with livestock animals

Preventative Maintenance Includes

- **External Parasite Identification and Control**
 - prevent excessive infestation, illness and potential death of livestock animals
- **Internal Parasite Identification and Control**
 - prevent excessive infestation, illness and potential death of livestock animals

Dehorning

- Prevent injury to cattle, people and facilities
- Perform when the animal is young
 - Reduces shock and is easier to do
 - Older animals tend to bleed more
 - Fall is the best weather for dehorning

Dehorning

● Methods:

- Chemical

- liquid or pastes

- Mechanical

- Spoons, cup or tube type

- a circular blade is pushed into the skin around the horn bud and then turned to remove horn.

- Barnes type

- hinged tool placed over the horn that slices through skin and under the horn

- Hot irons

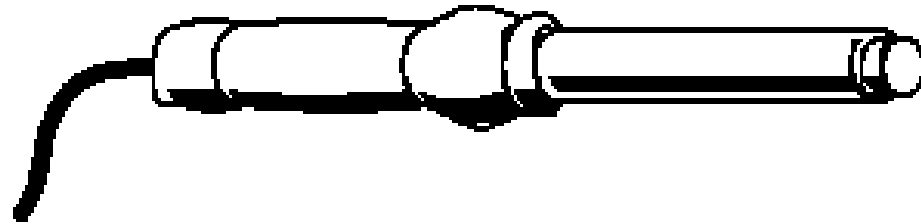
- a heated tool is held to horn bud to destroy horn producing cells
- Bloodless method only used in button stage

- Saws

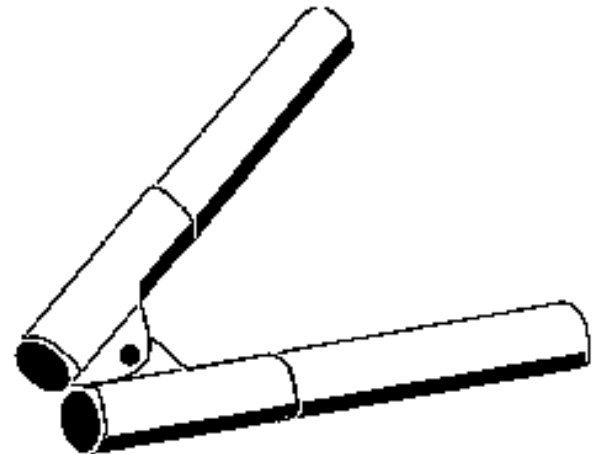
- a hand saw or obstetrical wire is used to saw through horn

Dehorning

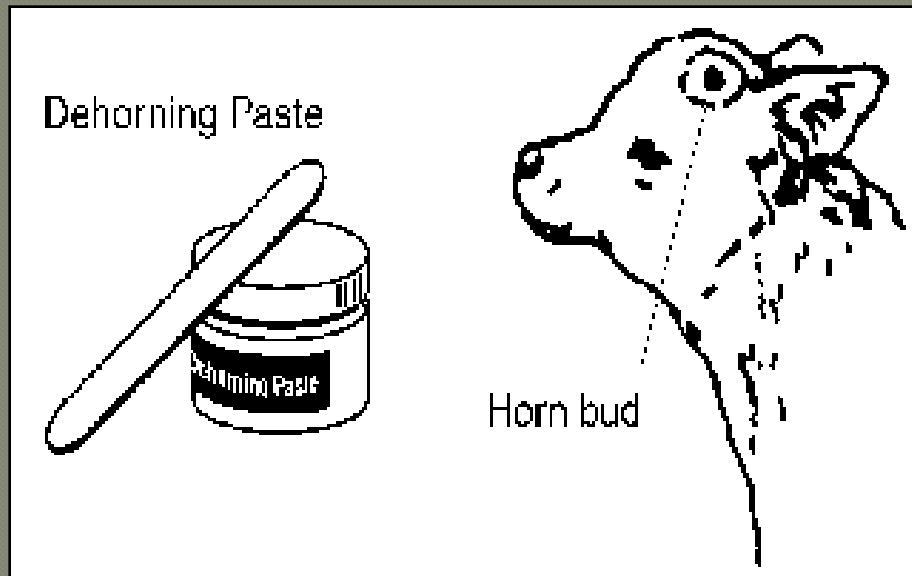
Electric hot iron dehorner



Barnes-type dehorner



Dehorning



Tube calf dehorner



Castration

- Removing testicles of male animals
 1. Prevents unplanned breeding
 2. Improves ability and ease to manage animals
 3. Castrate young animals to reduce stress
 4. Castration performed on all livestock species

Castration

● Methods

- Surgical

- involves splitting or removing the lower third of the scrotum and extracting the testicles by severing the spermatic cord

- Tools used include a surgical knife, emasculator, or Henderson castrating tool

- Bloodless

- Burdizzio or elastrator

- cuts off blood supply to the testicles

Beak Trimming Poultry

- Removing $\frac{1}{2}$ to $\frac{1}{3}$ of the beak
 - Performed to prevent cannibalism
 - Poultry in range systems should not be debeaked
- Methods
 - Hot iron tool
 - Infrared tool

Clipping Needle Teeth

- Removal of sharp side teeth on piglets
 - Prevents injury to sow during nursing and littermates.
- Method
 - Disinfected clippers

Docking

- Removal of a portion of the tail
 - Performed on sheep, pigs and sometimes dairy cattle
- Sheep and Cattle
 - Improves overall sanitation especially during reproductive procedures and parturition
 - Methods
 - Knife
 - Elastrator
 - Burdizzo
 - Emasculator
 - Electric docker
 - Hot iron docker

Docking

● Swine

- Prevents tail biting.
- Methods
 - Side-cutting pliers
 - Hot iron dockers

Vaccination and Immunization

- The purpose of vaccinations is to develop immunity to diseases

Vaccination and Immunization

● Types of Disease

- Non-Infectious

- caused by environmental or nutrition factors rather than a specific microorganism

- typically not contagious

- Examples:

- faulty nutrition

- trauma

- toxic substances

- congenital defects

- metabolic disorders

Vaccination and Immunization

● Types of Disease

• Infectious

- caused by a specific disease causing microorganism and/or pathogen
- may or may not be contagious
- Examples:
 - Virus
 - single celled eukaryotic organism
 - has characteristics of both living and nonliving material, but cannot grow and reproduce outside of a living cell
 - antibiotics are not effective in treating viruses
 - Bacteria
 - single celled prokaryotic organism
 - survive in various conditions and invade the cells of an animal's body
 - Protozoa
 - microorganism that causes disease

Vaccination and Immunization

● Immunity

- resistance to developing a disease
- types of Immunity:

□ Active

- immunity that is acquired naturally due to exposure to substance that stimulates antibody production

- vaccination

□ Passive

- antibodies that are transferred from mother to baby or injected into an animal from an animal that is already immune

- colostrum

Vaccination and Immunization

● Vaccines

- substances that develop resistance to disease (immunity)
- Types of Vaccines
 - Modified Live
 - vaccines that are alive but are weakened and have lost their disease causing ability
 - Killed
 - vaccines that do not contain pathogens, but still stimulate immune response

Vaccination and Immunization

● Routes of Injection

- Vaccine Injections

- Subcutaneous

- under the skin

- angled approximately 45 degrees

- Intramuscular

- into the muscle

- 90 degree angle

- Intranasal

- into the nose

- no needle used

- vaccine is deposited through small tube into the nasal cavity

Vaccination and Immunization

● Routes of Injection

- Medication Injections

- Subcutaneous

- Intramuscular

- Intravenous

- into the vein

- angled approximately 25 degrees

- jugular vein is most common vein used but caution must be taken to not hit carotid artery

- Intradermal

- into the epidermal layer of the skin

- angled approximately 10-15 degrees

Common Diseases of Cattle

- **Brucellosis**
 - microorganism that causes abortion during last half of pregnancy, afterbirth retention or sterility
 - must be slaughtered and disposed of properly
 - **Prevention**
 - vaccinating breeding females
 - testing animals
 - purchasing from brucellosis free producers

Common Diseases of Cattle

- Shipping Fever
 - disease complex with many symptoms
 - closed eyes
 - Fever
 - Coughing
 - Diarrhea
 - discharge from nose
 - more common in young cattle during times of stress
 - Treatment
 - antibiotics and sulfa drugs

Common Diseases of Cattle

- Blackleg
 - bacterial disease that lives in soils and infects animals through wounds
 - Sudden death
 - Lameness
 - swollen muscles
 - high fever
 - Prevention
 - vaccination

Common Diseases of Cattle

- Mastitis
 - bacterial infection that causes inflammation in mammary glands
 - more common in dairy industry
 - Prevention
 - sanitation and proper milking procedures

- Many others diseases
 - as pinkeye, mastitis, leptospirosis, foot rot, and scours

Common Diseases of Swine

- Transmissible Gastroenteritis (TGE)
 - Very contagious
 - Virus
 - Symptoms
 - Vomiting
 - diarrhea with white, yellow or green feces
 - kills almost 100% of baby pigs
 - Treatment
 - Drugs and vaccines are not effective in controlling and treating TGE in swine

Common Diseases of Swine

- Swine Dysentery
 - bacterial disease
 - bloody scours
 - Treatment
 - use of one of the several recommended drugs in the drinking water

Common Diseases of Swine

- Mycoplasmal Pneumonia
 - chronic disease
 - coughing in young pigs
 - reduces feed intake and causes reduced gains
 - Mortality is low
 - Prevention
 - vaccination and sanitation

Common Diseases of Swine

- Porcine Reproductive and Respiratory Syndrome (PRRS)
 - viral disease
 - late term fetal death
 - abortion
 - weak pigs
 - respiratory disease in young pigs
- No effective treatment
- Prevention includes vaccination

- Others include:
 - swine cholera (now eradicated in U.S.), leptospirosis, and SMEDI

Common Diseases of Poultry

- Newcastle Disease
 - Virus
 - Symptoms
 - gasping for air
 - Sneezing
 - breathing difficulties
 - tremors and paralysis
 - No known treatment

Common Diseases of Poultry

- Avian Pox (Fowl Pox)
- Virus
- Symptoms
 - yellow cankers in the mouth and eyes
 - scabs around the head
- No known treatment

Common Diseases of Poultry

- Coccidiosis

- protozoan parasites

- Symptoms:

- bloody diarrhea

- weight loss

- droopiness

- Affects numerous livestock species

- Treatment and prevention

- coccidiostats

Common Diseases of Poultry

- **Aspergillosis (Brooder Pneumonia)**
 - fungus or mold
 - **Symptoms:**
 - loss of appetite
 - Gaspings
 - Sleepiness
 - Convulsions
 - Death
 - **Prevention**
 - using mold free litter
 - **Treatment**
 - None
- **Others including**
 - blackhead, fowl cholera and erysipelas

Common Diseases of Sheep and Goats

- Tetanus (Lockjaw)

- bacteria that lives in the soil

- enters the animal's body through a wound

- All livestock animals can contract tetanus

- Animals who receive preventative maintenance procedures such as castration or docking should be vaccinated

Common Diseases of Sheep and Goats

- Enterotoxemia (Overeating Disease)
 - bacterial disease
 - causes sudden death of animals.
 - Prevention
 - Vaccination

Common Diseases of Sheep and Goats

- **Foot Rot**
 - extremely contagious bacterial infection
 - causes lameness
 - weight loss due to limited mobility is major problem
 - **Treatment**
 - footbath solution
 - **Prevention**
 - Sanitation
 - regular hoof trimming
 - This disease found in all livestock animals.

Common Diseases of Sheep and Goats

- Sore Mouth
 - Virus
 - blisters on the mouth lips and nose
 - Zoonotic
 - Prevention
 - vaccination

Common Diseases of Sheep and Goats

● Caseous Lymphadenitis (CL)

- Bacteria
- spread from animal to animal
 - contact with material from subcutaneous abscesses (pus) or fomites (inanimate objects) contaminated with abscess material
- can survive several months in the soil and environment
- Treatment
 - None recommended

Common Diseases of Sheep and Goats

● Caprine arthritis encephalitis (CAE)

- Virus
- may lead to chronic disease of the joints
- associated with white blood cells; therefore, any body secretions which contain blood cells are potential sources of virus to other goats in the herd.
- not all goats that become infected with CAE virus progress to disease, it is important to test goats routinely for infection by means of a serology test which detects viral antibodies in the serum

Disease Treatment and Prevention

- Prevention is the best way to control diseases
 - Vaccination
- Biosecurity Measures
 1. Cleanliness
 2. Quarantine sick
 3. Avoid exposure to disease
 4. Isolate new animals
- New feeder cattle should be vaccinated as soon as they come off the truck at the farm
- Poultry, flock treatments
 - cause less stress than individual bird
 - medicine in water, sprays or dusts

Internal Parasite Identification and Control

● Common Internal Parasites

- Roundworms/Ascarids- stomach worms, pinworms, lungworms.
- Tapeworms- broad tapeworm, beef or pork tapeworm.
- Flukes- liver fluke.
- Protozoa- coccidia.

Internal Parasite Identification and Control

- Life Cycle- important to understand the typical life cycle to effectively control internal parasites.
 - Adult female parasite lays eggs inside the host animal that pass out of the animal in feces.
 - Eggs hatch and larvae climb onto blades of grass.
 - Animal ingests larvae when grass is consumed.
 - Larvae develop into adult parasites in host organ; stomach, lungs, intestines, etc. Adult larvae deprive animals of nutrients and/or blood.

Internal Parasite Identification and Control

● Controlling Internal Parasites

- **Most effective is prevention**

- **Control Methods**

- Chemical**

- substances used to kill parasites

- administered orally or topically

- Problems with resistance to chemicals can occur.

- Test individual animals using a fecal egg count

- Treat animals with parasite issues

- Use the same de-wormer (anthelmintic) until it is no longer effective

- Sheep and goat industry have major resistance issues

- Barber pole worm

- causes blood loss, anemia and death

Internal Parasite Identification and Control

● Controlling Internal Parasites

□ Mechanical

- complete or partial removal of parasite
 - Removing or breaking up contaminated manure

□ Biological

- non-chemical methods of controlling parasites
 - Feeding forages such as lespedeza hay that contains higher levels of tannins

□ Cultural/Environmental

- modifies the growing environment of the parasite
 - pasture rotation

Internal Parasite Identification and Control

● Major Problems and Recommendations

1. Other than death, the most costly result of internal parasites in cattle, swine and poultry is weight loss or reduced gains
2. The major internal parasites of poultry are several types of worms and coccidia
3. Roundworms cause the most damage of any internal parasites for hogs
4. Deworming pregnant sows and gilts about a week before farrowing kills the worms and prevents baby pigs from getting worms from their mother's manure

External Parasites Identification and Control

● Common External Parasites

- Ticks- bloodsuckers
- Lice- bloodsuckers and biting
- Mites- cause mange
- Blowfly- screwworm in larval stage
- Heel Fly- cattle grub in larval stage
- Horn Fly- smallest, bloodsucking species
- Other kinds of flies including horsefly, housefly and stable fly

External Parasites Identification and Control

● Controlling External Parasites

- The most effective method of control is prevention
- Control Methods
 - Chemical
 - most common method of controlling external parasites
 - Systemic insecticides
 - absorbed through the animal's skin
 - oral ingestion also used to control some external parasites
 - Mechanical
 - Biological
 - Cultural/Environmental

External Parasites Identification and Control

● Major Problems and Recommendations

- Most external parasites of birds or poultry lower production by sucking blood
- The external parasite causing the greatest financial loss in beef cattle is the larva of the Heel Fly or cattle grubs because they lower rate of gain and damage hides and meat
- The major external parasites of swine are lice and mites
- Mites, bedbugs and fowl ticks hide in cracks and crevices in poultry houses during daylight, and those places must be sprayed with approved chemicals during daylight to kill those external parasites

Objective 5.03

- Exemplify reproductive management practices.

Livestock Reproductive Management Practices

● Timing

- Size of Animal- most important consideration
 - Breeding heifers that are sexually mature should weigh 550-750 pounds
 - Breeding gilts who are sexually mature should weigh between 250-200 pounds

Livestock Reproductive Management Practices

- Age of Animal- second consideration.
 - Heifers can reach puberty between 4-12 months of age although 6-8 months is more common
 - Producers should manage herds to prevent accidental breeding
 - Heifers should be bred so the calve at two years of age.
 - Breed animals so calving in the herd occurs during a 40 to 60 day period

Livestock Reproductive Management Practices

- ❑ Gilts can experience delayed puberty based on breed, inherited traits and the time of year
 - ❑ Gilts raised in confinement are more likely to experience delayed puberty
 - ❑ Producers can reduce the number of days by exposing gilts to boars
 - ❑ Producers should breed gilts during their second heat period to increase litter size and improve conception rates

Livestock Reproductive Management Practices

● Body Condition Scoring

- Uses a scale to evaluate the amount of fat on the animals
- Important because body condition affects the animal's ability to conceive
 - Goal is to have each cow give birth and wean a calf every year.
 - Underconditioned or thin cows are the major cause of all reproductive problems.
- Body condition should be evaluated periodically, but especially important prior to breeding animals
- Body condition scoring systems vary depending on species you are evaluating: swine, beef cattle, and dairy cattle

Livestock Reproductive Management Practices

● Swine Body Condition Scoring

- Uses a scale of 1-5 where 1 is excessively thin, while 5 is excessively fat
- An animal with a score of 3 is considered ideal
- Evaluates the following areas for the presence of fat:
 - Shoulder Blades
 - Spine
 - Hip Bones
 - Tail Head
 - Top Shape
 - Between Legs- seam of hams

Livestock Reproductive Management Practices

● Dairy Cattle Body Condition Scoring

- Uses a scale of 1-5
- Evaluates the following areas:
 - Depression around the tailhead
 - Amount of fat covering the pin and pelvic bones
 - Amount of fat covering the loin

<https://www.youtube.com/watch?v=FC0u1j06y5Y>

Livestock Reproductive Management Practices

● Beef Cattle Body Condition Scoring

- Uses a scale of 1-9.
- Evaluates the following areas:
 - Brisket
 - Ribs
 - Back
 - Hip Bone
 - Tailhead
 - Pin Bone

Livestock Reproductive Management Practices

● Rectal Palpation

- the process of diagnosing pregnancy or checking fetal development by feeling the reproductive tract of a cow
 - Experience is necessary for accuracy
 - compares the feel and the size of different parts of the reproductive tract and/or fetus to determine pregnancy and the stage of pregnancy
- the person doing the palpation must insert the hand and arm into the rectum of the cow
 - plastic sleeves and lubricants
- Breeding records
 - important because they give the palpator a good idea of how long the cow has been bred and what to check for during palpation

Livestock Reproductive Management Practices

● Ultrasound

- using high frequency sound waves to reflect off body organs
 - visual detection of ova development and pregnancy
 - more commonly in commercial swine and dairy operations

Livestock Reproductive Management Practices

● Heat Detection

- process of observing signs of heat
 - animals should be observed multiple times a day to observe signs of heat
 - signs of heat vary for livestock species
 - accurate heat detection improves artificial insemination conception rates
 - producers can use marker indicators that change color after animals have been mounted to assist in detecting heat

Livestock Reproductive Management Practices

● Artificial Insemination

- placing sperm in the female reproductive tract using other than natural procedures
- used extensively with swine and dairy cattle

Livestock Reproductive Management Practices

- **Cattle Artificial Insemination Procedure**
 1. External genitalia are cleaned
 2. Hand of the person doing the inseminating is inserted into the cow's rectum to grasp the cervix using gloves and lubricant
 3. Inseminating tube or rod is inserted through vulva, into vagina and through the cervix
 4. Bull semen is deposited into the body of the uterus

Livestock Reproductive Management Practices

- **Swine Artificial Insemination Procedure**
 1. Clean external genitalia
 2. Stimulate female by allowing her to have contact with boar through a fence or pen system
 3. Insert corkscrew shaped insemination rod into vulva, vagina and cervix
 4. Semen is pulled into uterus through uterine contractions

Livestock Reproductive Management Practices

- **Advantages**

- Wider variety of superior animals can be used
- Increases number of females that can be bred to superior males
- Reduces the spread of diseases

- **Disadvantages**

- Requires a trained inseminator
- Requires more time and herd supervision

Livestock Reproductive Management Practices

● Synchronization of Estrus

- use of hormones to cause all the females in a herd to come into heat
 - reduce the breeding and calving seasons

Livestock Reproductive Management Practices

● Advantages

- ❑ Shortens time frame to re-breed cows after calving
- ❑ Allows producer to breed heifers earlier than mature cow herd
- ❑ Increases profit potential through a more uniform calf crop

● Disadvantages

- ❑ Requires increased management and recordkeeping
- ❑ Cost

Livestock Reproductive Management Practices

● Multiple Farrowing

- arranging the breeding program so that groups of sows farrow at regular intervals throughout the year.
 - The number in the group should match farrowing facilities as closely as possible
 - Because the producer needs to make maximum use of farrowing facility capacity, it is very important that conception rates and litter sizes be the best possible
 - Disease prevention and control, proper boar to sow ratio and breeding each sow at least twice during each heat period (multiple breedings) are practices that increase conception rates

Livestock Reproductive Management Practices

● Multiple Farrowing

- Advantages

- Higher average prices for hogs sold because sales are spread throughout the year
- Spreading income throughout the year- cash flow.
- More efficient use of facilities

- Disadvantages (may turn into advantages depending upon the situation)

- Requires better management
- Requires a year-round labor supply

Reproduction Practices in Poultry

- Artificial insemination is used for large, heavy breeds of turkeys
 - because of low fertility rates and the large size of males (toms)
- Reproduction efficiency involves:
 1. Eggs being fertile
 2. Incubations process
 3. Control of diseases
- In breeding flocks
 - eggs are gathered several times each day
 - packed with the large end up to protect the air cell
- Hatching eggs
 - fumigated with formaldehyde or other chemicals
 - help prevent the spread of egg-borne diseases (diseases spread on eggs)

Objective 5.04

- Understand biotechnology in livestock animals.

Biotechnology and Ethical Issues

● Biotechnology

- technology concerning the application of biological and engineering techniques to microorganisms, plants and animals
- greatest advances in the 1970's
 - scientists began identifying and manipulating deoxyribonucleic acid (DNA)

Biotechnology and Ethical Issues

● Greatest concern

- new advances with genetic engineering of plants and animals

● Regulated in the United States

- to ensure the safety of products
- regulatory agencies include
 - United State Department of Agriculture (USDA)
 - Food and Drug Administration (FDA)
 - Environmental Protection Agency (EPA)
- some people are still opposed
 - Personal beliefs and values affect how people feel
 - **Fear of the unknown**

Biotechnology Improvements

- **Monoclonal Antibody Diagnostic Testing**
 - fast and accurate method of testing for diseases such as brucellosis and diagnosing pregnancy
- **Disease Treatment**
 - improved treatment for diseases and disorders such as scours, parasites, shipping fever and diseases caused by viruses and bacteria
- **Genetically Engineered Vaccines**
 - pure and safe substances that control animal diseases. Cannot cause the disease because they are not live disease causing agents as are traditional vaccines
- **Transgenic Animals**
 - animals that have a recombinant gene in all their cells that can be used to produce medicine for humans
- **Bovine Somatotrophin (bsT)**
 - genetically engineered bovine somatotrophin that helps cattle increase milk production

Biotechnology Improvements

- **Porcine Somatotrophin (pST)**
 - genetically engineered porcine somatotrophin that increases feed efficiency and reduces fat
- **Embryo Transfer**
 - removing and implanting embryos into surrogate animals. The technology that opened the door for biotechnology to be used in animal reproduction
- **Cloning**
 - makes animals with identical genetics
- **Gene Transfer**
 - produces transgenic animals
- **Genomics**
 - the study of all the genes of an organism
 - evaluates specific DNA sequences of individual animals to predict their genetic merit and future productivity.

Embryo Transfer

● Procedure

- Superovulation of donor with hormones.
- Artificial insemination.
- Flush embryos and remove with catheter.
- Isolate and classify embryos.
- Store embryos in liquid nitrogen.
- Transfer embryos to recipient cows
- Diagnose pregnancy 1 to 3 months later.
- Birth 9 months after transfer of embryos.

● Advantages

- Genes of the female (dam) can be passed to more offspring faster than natural breeding.
- Extend the productive life a female that can no longer carry offspring.

● Disadvantages

- Cost.
- Requires intensive management.

Cloning Cattle Using Nuclear Transfer

● Procedure

1. Flush and remove embryos with catheter same as regular embryo transfer.
2. Filter the flushed liquid to remove embryos.
3. Remove genetic material from recipient oocytes.
4. The nuclei are removed through microsurgery.
5. The nuclei are separated and each one is transferred to an unfertilized egg cell that has had its nucleus removed, thus the term nuclear transfer
6. Plugs with three or four embryos are placed in oviducts of sheep for five to six days to develop to the 32 to 64- cell stage.
7. Embryos are removed and placed into surrogate mothers, frozen for long term storage or used to produce another generation of cloned embryos.

● Advantages

- Increase herd uniformity
- Increase herd quality
- Produce genetically identical animals

● Disadvantages

- Lower conception rates
- \$\$\$\$
- Not currently practical for producers, but still used in research