W 1220

1-2 YEARS IN PROJECT

Veterinary Science Project Area Guide Beginner Level

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Chapter 1: Animal Husbandry

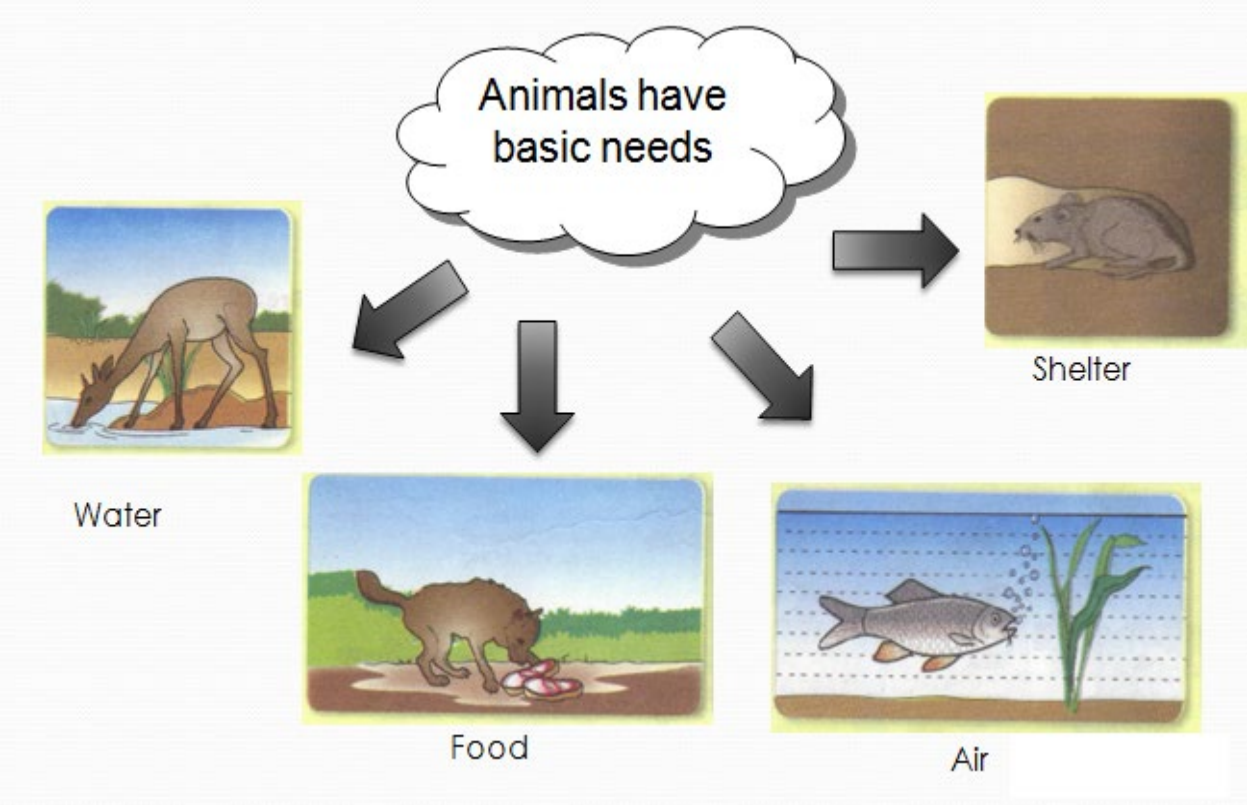
Activity 1.1

Listing Basic Needs of Animals

Project Outcome:

- Identify basic needs for adequate care of animals such as housing, feed, and water

Animals and Their Basic Needs:



Watch a short video about basic animal needs:
https://tn.pbslearningmedia.org/resource/what-do-animals-need-media-gallery/hero-elementary/

1. Food:
   Animals eat different kinds of food. They feed on varied materials that provide them with needed nutrients. Some animals eat grass, fresh fruits, vegetables, and other parts of plants. Some animals feed on insects and the flesh of other small animals. Some animals eat both plants and animals.

2. Water:
   Animals, after eating, need water to drink. Some small animals get enough water from the fleshy parts of plants they eat. Bigger animals on the other hand, need much more water, thus, they go to pools, rivers, lakes, or humans provide them with it. Drinking water replaces water lost from the body and prevents dehydration. Animals also need water for cooling effects especially during a hot summer.

3. Air:
   Animals also need air to breathe. Oxygen is the gas in air needed by animals day and night. Clean air results in a healthy life. Polluted air can cause sickness that may lead to death. It is important to have an airflow system installed where animals are housed indoors.

4. Shelter:
   Animals also need a home or shelter to protect themselves and their young from predators, and from the changing weather and climate. They need to live in a place where they can find and get food, where they can reproduce and grow, and where they can find safety and protection.

List the four basic needs of all living things and why they are important.

1. _____

2. _____

3. _____

4. _____

Summarize what you have learned by creating a poster or interactive exhibit or create a one page document explaining what animals need that you could share with new pet owners.

Answer Key

1. Food – Every animal requires food for energy
2. Water – Every animal requires water for hydration
3. Air – Every animal requires fresh, clean air to be able to breathe
4. Shelter – Animals require shelter to keep out of the elements and to raise their young

Activity 1.2

Herbivores, Carnivores, and Omnivores

Project Outcome:

- Define the terms herbivore, carnivore, and omnivore.

Herbivores:

What is an Herbivore?

An herbivore is an organism that mostly feeds on plants. Herbivores range in size from tiny insects such as aphids to large, lumbering elephants.

Herbivores often have physical features that help them eat tough, fibrous plant matter. Many herbivorous mammals have wide molars. These big teeth help them grind up leaves and grasses.

Examples of herbivores: Cow, Sheep, Horse, Caterpillar, Parrot, Kangaroo, Deer, Donkey, Giraffe, Mouse, Squirrel, Goat, Panda Bear, Termite, Beaver, Rabbit, Gorilla, Bison, Elephant

Carnivores:

What is a carnivore?

A carnivore is an organism, in most cases an animal, that eats meat. A carnivorous animal that hunts other animals is called a predator; an animal that is hunted is called prey.

Many carnivores get their energy and nutrients by eating herbivores, omnivores, and other carnivores. The animals that eat secondary consumers, like owls that eat rodents, are known as tertiary consumers. Carnivores that have no natural predators are known as apex predators; they occupy the top of the food chain.

Not all carnivores are predators. Some carnivores, known as scavengers, feed on the carcasses of already-dead animals. Vultures, for example, are scavengers.

Examples of carnivores: Cat, Bald Eagle, Lion, Wolf, Tiger, Crocodile, Spider, Snake, Polar Bear, Orca, Owl, Octopus, Bullfrog, Seal, Shark, Wolverine, Hyena, Cheetah

Omnivores:

What is an omnivore?

Some creatures can feed only on plants and prefer trees, and some favor meat. Omnivores consume a different variety of material that includes plants, animals, fungi, and even algae. There are also insects classified as omnivores, such as ants. Then there are birds, other mammals, and even reptiles. People are also omnivores.

Examples of omnivores: Dog, Pig, Bear, Raccoon, Skunk, Opossum, Bearded Dragon, Hedgehog, Box Turtles, Groundhog, Ostrich, Wild Boar, Western Gorilla, Chimpanzee, Spider Monkey

Below each picture write in whether they are an herbivore, carnivore, or omnivore:

1._____ 2._____ 3._____

4._____ 5._____ 6._____

Conduct a food chain or food web activity at your next 4-H club meeting.

You could even make a food chain or food web on rainforest animals or ocean life. Post this information on a school bulletin board sharing your knowledge with others.

Answer Key:

1. **Bear** = Omnivore
2. **Lion** = Carnivore
3. **Deer** = Herbivore
4. **Cat** = Carnivore
5. **Panda** = Herbivore
6. **Monkey** = Omnivore

Activity 1.3

Habitats

Project Outcome:

- Draw and describe the habitats and needs for each of the following: herbivore, carnivore, and omnivore.

Directions: With permission, find credible online sources to research different habitats for herbivores, carnivores, and omnivores. Use .gov, .edu, or .org for credible sources. For each, draw and describe a typical habitat.

Herbivore

Directions: With permission, find credible online sources to research different habitats for herbivores, carnivores, and omnivores. Use .gov, .edu, or .org for credible sources. For each, draw and describe a typical habitat.

Carnivore

Directions: With permission, find credible online sources to research different habitats for herbivores, carnivores, and omnivores. Use .gov, .edu, or .org for credible sources. For each, draw and describe a typical habitat.

Omnivore

Activity 1.4

What is a Care Plan?

Project outcome:

- Define what a care plan is and why it is important.

Basic Care Plans for Animals: A basic care plan is essentially a daily checklist used to ensure full, proper care of an animal. The plan should include daily care routines, including feeding, cleaning and handling, regular inspection of animals, at least daily and specific individual needs of animals. A basic care plan is important because it ensures that every need of an animal is met daily. There are many variations of basic care plans for different types of animals. Every species requires different things and so a basic care plan checklist is important especially if you have multiple species to take care of.

What type of things would you put on your basic care plan for a dog?

_____

_____

_____

What type of things would you put on your basic care plan for a cat?

_____

_____

_____

What type of things would you put on your basic care plan for a horse?

_____

_____

Activity 1.5

Creating a Basic Care Plan

Project outcome:

- Successfully create a basic care plan for an animal of your choosing using the template below

A full assessment of a patient is usually carried out when admitting them to a practice. It includes a full history, reason for admission, and the veterinary procedures that are expected to be carried out at that time. In addition, information on the animal's normal routines, known allergies, temperament and reproductive status should be noted.

Once admitted, this process continues by the addition of baseline physiological parameters such as weight, blood results, heart rate, respiratory rate, hydration status and other parameters indicated by the animal's presenting complaint.

This information should allow you to begin to assess any special adaptations that may be necessary to allow the patient to be more comfortable given their disease or the surgical process that they are about to undergo, The assessment should extend beyond the search to reach a medical diagnosis and instigate treatment for the condition diagnosed; factors such as the patient's environment can be included in the assessment of a patient's needs, and an attempt at prioritizing the care required begins at this stage.

Name of Animal: Age:

Date treatment begins: Weight:

Blood pressure (if you do not know how to take the blood pressure of a dog, skip this):

Heart rate: Respiratory Rate:

Hydration status: Animal's behavior:

Any other notes:

Care plan going forward:

Another way to learn more may be to visit with your veterinarian and ask him or her about expanding your knowledge more on things that should be in your animal care plan.

Activity 1.6

Animals in our Society

Project outcome:

- Explain uses and roles of various types of animals in society.

Animals are used for transportation, sport, recreation, and companionship. Some animals are used for work, such as police dogs, police horses, draft horses for use on the farm, and zoo ambassadors. Animals are also used to learn more about living things and about the illnesses that affect human beings and other animals. By studying animals through research, it is possible to obtain information that cannot be learned in any other way.

Watch this video: https://www.youtube.com/watch?v=hCjQL9sBSQA

Briefly explain what each animal below is used for:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Answer Key

1. Companionship
2. Sport
3. Transportation
4. Research
5. Work
6. Transportation

List three types of animals and how they are used in society:

Research how animals in different societies look different in other countries. How does this compare to the culture of animals in the United States?

Chapter 2

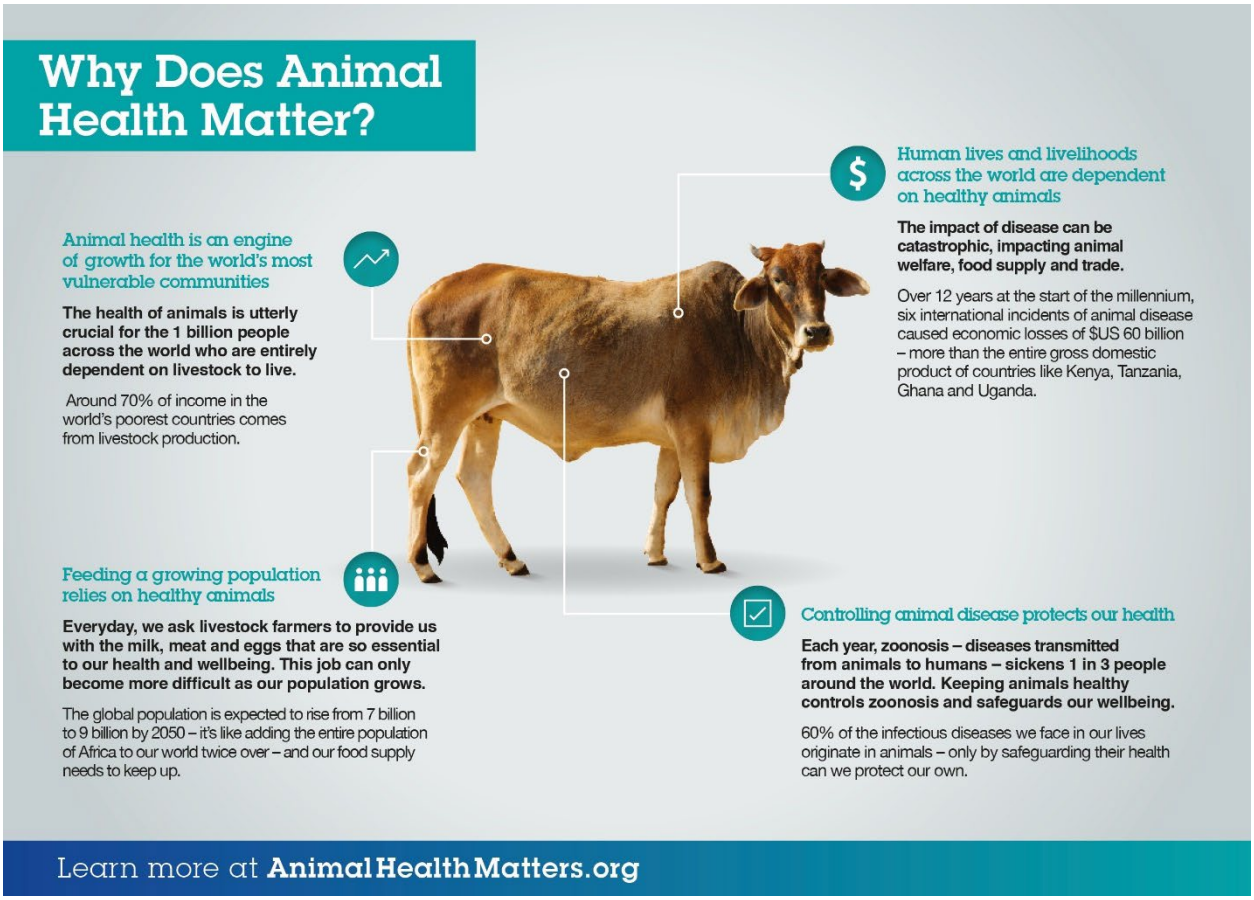
Animal Health and Disease

Activity 2.1

Animal Health

Project outcome:

- Identify the signs various types of animals display during times of health and disease



Just as we do, animals get sick. And like us, they deserve the right care and treatment to recover.

Disease is one of the most common threats to animal wellbeing. It's estimated that one in five farm animals are lost due to diseases each year, while many more animals suffer the effects of illness.

Animal health products help protect, diagnose, and treat animals against disease. Medicines alleviate the suffering of the animal, boost healthy productivity, and ensure fewer animals are lost to disease.

But there is still more to do. The 20 percent of animals lost to preventable disease is a great challenge for farmers, veterinarians, and animal medicine providers. As well as encouraging more vaccination and preventative treatments, we must also be vigilant against new and emerging diseases. This means continually developing new medicines and innovative treatments to stay one step ahead.

Diseases are in a state of constant change, and new, innovative medicines will be needed to counter each new threat to animal wellbeing.

Farmers and veterinarians across the world avoid losing animals every day. These medicines work alongside farmers' own careful husbandry and the expertise of veterinarians to support the wellbeing of the animals in their care.

What are some common signs of a healthy animal?

_____

_____

_____

What are some common signs and symptoms of a sick animal?

_____

_____

_____

SEE WORD BANK ON NEXT PAGE

Word Bank

Bright Eyes
Away From the Herd
Vomiting
Formed Stool
Diarrhea
Healthy Appetite
Decreased Appetite
With the Herd
Chronic Itching
Straining to Urinate/Defecate
Running and Playing
Redness of the Eyes
Shiny Coat and Smooth Skin
Limping
Discharge from Eyes/Nose
Happy to See You
Bloating of the Abdomen
Clean Ears

Activity 2.2

Animal Diseases

Project outcome:

- List the five most common diseases in each of the following: cattle, horses, swine, and small ruminant animals.

Read the content in this chapter. Then you will complete a chart with the disease name that affects most of the species, and how it can be treated. You can then upload the chart to your e-portfolio.

Common Diseases in Cattle

Bovine Respiratory Disease: Bovine respiratory disease (BRD) is the most costly disease of beef cattle in North America. It is multi-factorial, with a variety of physical and physiological stressors combining to predispose cattle to pneumonia.

Clinical signs that would lead you to suspect bovine respiratory disease include the following:

- depression and loss of interest in surroundings
- lethargy and unwillingness to move
- extended head
- droopy ears
- discharge from the eyes, nose, and mouth
- coughing
- rapid, shallow breathing

Bovine Viral Diarrhea: Bovine Viral Diarrhea (BVD) is a disease of cattle caused by the Bovine Viral Diarrhea Virus (BVDV). The virus is widespread, and most herds are at risk for infection. In the susceptible herd, BVD can be a serious, costly disease.

The signs of BVD vary, depending on the immune status of the exposed animals, and the strain of the infecting virus. The incubation period is about three to five days. If susceptible (non-vaccinated) animals are infected with a virulent strain of the virus, the disease will likely appear as an acute, severe sickness, with bloody diarrhea, high fever (105–107 ºF), off- feed, mouth ulcers, and often pneumonia. Some infected animals may die, while others will recover, usually within one or two weeks. Occasionally an animal will die very quickly before other signs are apparent. Since BVD is a viral disease, antibiotics are ineffective.

Brucellosis: Brucellosis is a contagious, infectious, and communicable disease, primarily affecting cattle, bison, and swine, and is caused by bacteria of the genus *Brucella. Brucella abortus (B. abortus)* primarily affects bovine species; however, goats, sheep, and horses are also susceptible. It is also a zoonotic disease which means humans can catch the disease from infected animals.

(Goats have *B. melentensis* and sheep are affected with *B. ovis.* Horses can be infected with *B. abortus* and it is called fistulus withers.)

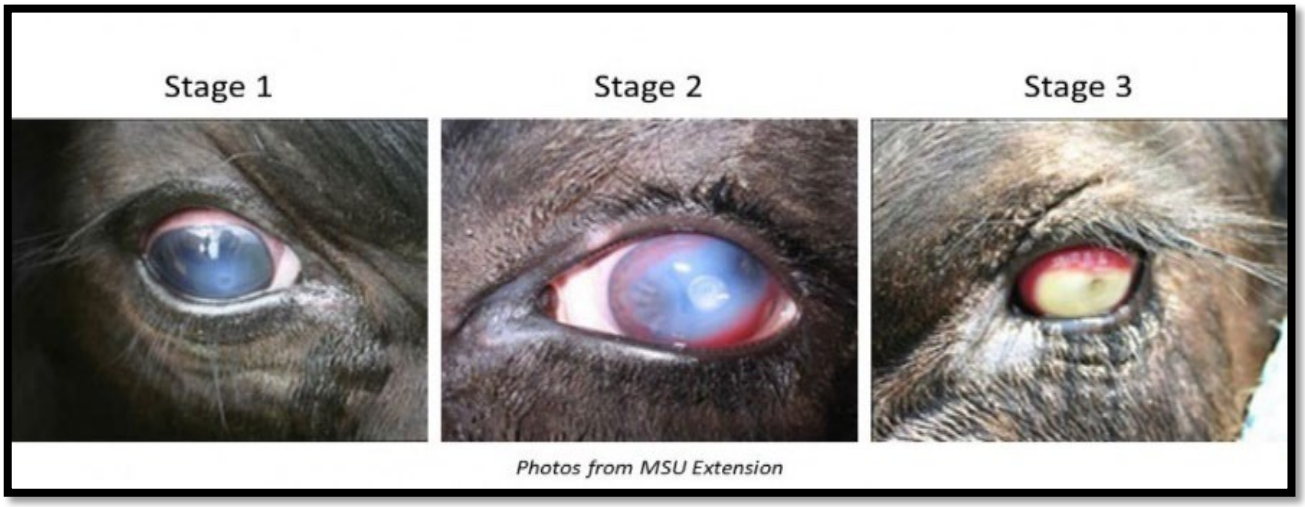
In its principle animal hosts, brucellosis causes loss of young through spontaneous abortion or birth of weak offspring, reduced milk production, and infertility. It can affect both animals and humans. Brucellosis is transmitted from animals by direct contact with infected blood, placentas, fetuses, or uterine secretions, or through the consumption of infected and raw animal products (especially milk and milk products). There is no economically feasible treatment for brucellosis in livestock.

Scours: Plain and simple, scours is diarrhea. The cattle industry has routinely used the term scours to refer to diarrhea in young animals for as long as anyone can remember. Scours causes dehydration in calves and is the leading cause of death in calves under one month of age.

- 95% of infectious calf scours is caused by rotavirus, coronavirus, or *Cryptosporidium*.
- Dehydration is what kills calves, and correcting with supplemental electrolytes is the most crucial part of any treatment protocol.
- DO NOT prevent scouring calves from nursing. Calves need the nutritional value of the milk to help fight off the disease.
- In general, feed calves a minimum of 8 quarts (2 gallons) per day of either whole milk or high-quality milk replacer (26:20).
- To prevent calf scours, use a system-wide approach that includes, cow health, colostrum management, calf nutrition, cleaning and sanitizing, and vaccination.

Mastitis: Mastitis in cows is one of the most common diseases plaguing the dairy industry. Bovine mastitis is an inflammation of the mammary gland caused from trauma or an infection, leading to abnormal and decreased milk production. The key to control mastitis is proper miking procedure and sanitation of a cow's environment.

Pinkeye: Pinkeye is a painful, debilitating condition that can severely affect animal productivity. Pinkeye (infectious bovine kerato-conjunctivitis, or IBK) is a bacterial infection of the eye that causes inflammation and, in severe cases, temporary or permanent blindness. Most cattle producers will be familiar with pinkeye but may not know how best to treat it and minimize its spread within a herd. When both eyes are affected, cattle may die from starvation, thirst, and accidents. Occasionally, damage to the eye can be severe enough for blindness to be permanent. It is poor management and unacceptable from a welfare standpoint to allow severe cases to progress to this stage without treatment. The infection can spread very rapidly and the economic impact due to weight loss and lowered milk production can be considerable.



Photos from MSU Extension

Common Diseases in Horses

West Nile Virus: West Nile Virus (WNV) is a mosquito-borne virus that affects humans and other animals, of which horses represent 96.9% of reported non-human cases. Introduced to the United States in 1999, WNV is now found in all the contiguous 48 states.

Wild birds are the natural hosts for WNV. Humans and horses are considered dead end hosts. The virus is only transmitted through mosquitoes; humans and horses cannot give it to each other.

Many horses that become infected with WNV do not show signs of illness, but some develop neurologic disease. Through a bite from an infected mosquito, the virus enters the bloodstream, where it multiplies. If the virus crosses the blood-brain barrier, it can cause inflammation of the brain and possibly death.

Equine Infectious Anemia: Equine Infectious Anemia (EIA) is a viral disease affecting only members of the Equidae family (horses, ponies, zebras, mules, and donkeys). There is no vaccine or treatment for the disease. Infection is often not apparent and results in a lifelong carrier state if the horse survives the acute phase of the infection. EIA is found widely throughout the world. There is no evidence that EIA is a threat to human health. EIA is a reportable animal disease in all states.

The clinical signs are often nonspecific and of variable severity. Clinical signs in an acute case can range from fever and decreased appetite to severe anemia and sudden death. It is often difficult to differentiate EIA from other diseases. Incubation period is a week to 60 days or longer. Additional clinical signs in an acute case can include:

- Jaundice (yellow discoloration of mucous membranes)
- rapid breathing, rapid heart rate
- swelling of limbs
- bleeding from the nose, or red/purple spots on mucous membranes
- blood-stained feces

Horses that survive the acute phase of the disease become chronic, in-apparent carriers. Some carriers may develop recurrent flare-ups, often following another stress, such as illness or strenuous work. While donkeys and mules can contract this virus, most remain non-clinical.

Strangles: Strangles is a highly contagious disease of the equine upper respiratory tract caused by the bacterium *Streptococcus equi* subspecies *equi* (*S. equi*). The bacteria cross mucous membranes in the nose and mouth to infect lymph nodes where they cause abscesses that can eventually rupture. The infected lymph nodes become swollen, which can compress the upper respiratory tract (hence, the name strangles).

The disease occurs worldwide and is the most common infectious agent identified in horses 6 to 10 years of age. Horses become infected through inhalation or ingestion of the bacterium. This can occur through horse-to-horse contact, drinking contaminated water, or contacting infected material or equipment. Disease severity varies and is dependent upon the horse's immune status and the dose and strain of the bacteria. Younger horses often exhibit more severe clinical signs, whereas older horses are less severely affected.

Tetanus: Tetanus is a potentially fatal disease characterized by muscular spasms caused by a neurotoxin produced by the bacterium *Clostridium tetani*. These organisms, and their spores, are found in the intestinal tract of horses and other species and are abundant in the soil, where they can survive for many years. The spores can enter open wounds, particularly puncture wounds, where they proliferate under the right conditions. When the spores die, they release the tetanospasmin neurotoxin that is responsible for clinical signs. The size of the wound does not correlate to risk of developing tetanus. Even superficial wounds have been associated with clinical cases.

Clinical signs of tetanus usually include history of a wound (typically within the preceding month) and stiffness, lameness, or colic. These signs generally progress quickly to an abnormal gait, trembling, and muscle spasm. An inability to open the mouth, known as “lockjaw”, may occur. Horses can exhibit profuse sweating, saliva accumulation in the mouth, and may aspirate feed material. Excitement, including loud sounds or bright light, often exacerbates clinical signs. Horses may become very sensitive to touch. Stiffness in the leg muscles may result in a characteristic “sawhorse” stance. Affected horses can progress to severe muscle rigidity, making it difficult to rise, urinate, or defecate. Respiratory failure can occur.

Equine Influenza: Equine influenza is a highly contagious respiratory disease of horses and other equidae. It is caused by two subtypes of the influenza A virus, which are related to, but distinct from, influenza viruses in other species. Equine influenza virus spreads easily through contact with infected horses and via contact with infected clothing, equipment, brushes, tack, etc. Some horses do not show any outward signs of infection but can shed the virus and infect susceptible horses. Outbreaks result in significant economic losses to the equine industry and are more likely to occur where large groups of horses gather, such as shows, races and events. Increased transportation of horses across state lines and between countries facilitates the spread of the virus.

Rhinopneumonitis/Equine Herpesvirus: Equine Herpes Virus-1 can cause three different forms of disease that include: a respiratory disease (rhinopneumonitis, or sometimes called just rhino) which affects mostly young horses, abortions in pregnant mares, and neurologic disease (equine herpesvirus myeloencephalopathy).

Like herpes viruses in other species, equine herpes can lay dormant as a latent infection. This allows the virus to continually reside within the horse, and at any time it can become an active viral infection, especially if the horse is stressed. Equine herpesvirus affects only equids and does not pose a health risk to people or other animals.

Most commonly, this virus manifests itself as a respiratory disease in young horses. Abortion storms also occur in unvaccinated pregnant mares.

To expand your knowledge on horses, contact your 4-H agent and ask about participating in Horse Bowl and Hippology.

Common Diseases in Swine

African Swine Fever: African swine fever is a highly contagious and deadly viral disease affecting both domestic and feral swine of all ages. ASF is not a threat to human health and cannot be transmitted from pigs to humans. It is not a food safety issue.

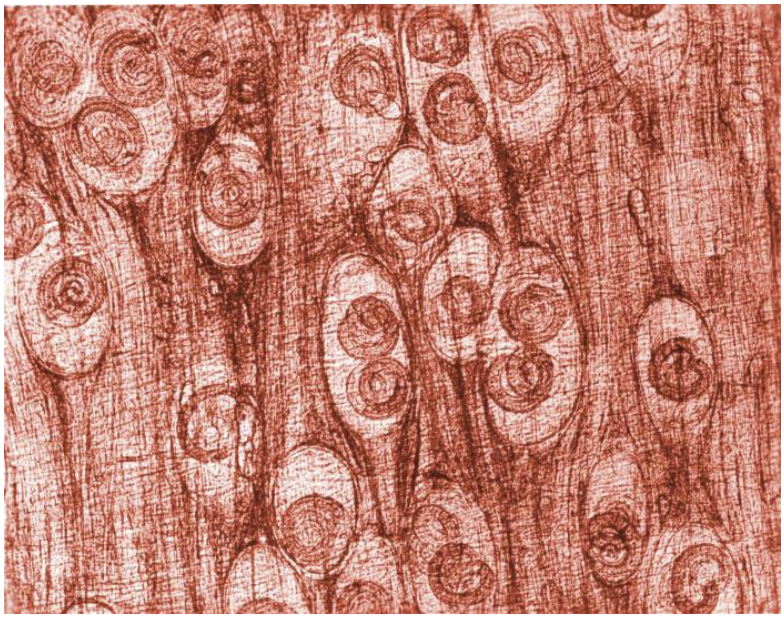
ASF is found in countries around the world. More recently, it has spread to the Dominican Republic and Haiti. ASF has also spread through China, Mongolia, and Vietnam, as well as within parts of the European Union. It has never been found in the United States – and we want to keep it that way.

USDA's African swine fever program, Protect Our Pigs, provides the tools and resources you need to make sure that you are doing everything possible to keep swine healthy and reduce the risk of spreading ASF.

Trichinellosis: *Trichinella spiralis* is a parasite that infects swine, other carnivorous animals, and people. The parasites are usually ingested through consumption of infected meat.

Most carnivorous, warm-blooded animals can become infected with the parasite. Infected animals of special importance in human trichinellosis include animals whose flesh is consumed raw or incompletely cooked (feral pigs, bears, several sea mammals, and horses). Species of particular importance, as sources of infection for swine, include previously infected pigs, rodents, and scavenged wildlife carcasses. Meat scraps from infected, slaughtered animals in uncooked garbage can remain infectious and may end up being a source of infection for commercial swine in some countries.

The incidence of infection in swine is low in countries that routinely inspect meat for *T. spiralis*. In the United States, food safety and eradication efforts have resulted in a prevalence so low that it is nearly undetectable with current diagnostic tests.

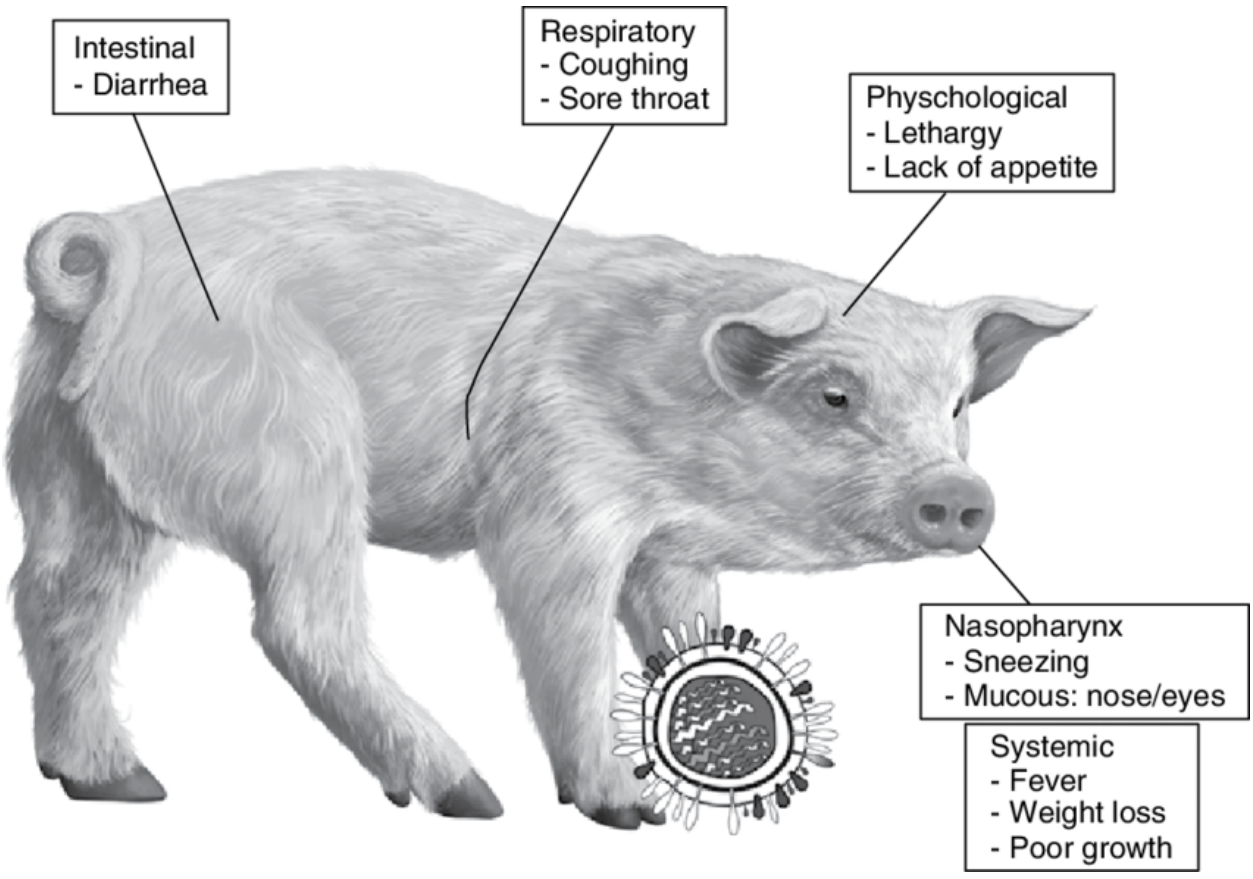


Swine Influenza: Swine influenza is a highly contagious viral infection of pigs. The disease usually spreads very quickly within swine units, even though all infected pigs might not demonstrate clinical signs of infection, followed by a rapid recovery of the infected animals.

Swine influenza is caused by influenza A viruses, which are further characterized by subtypes. The most common subtypes are H1N1, H1N2 and H3N2.

Morbidity rates can reach 100% with swine influenza infections, while mortality rates are generally low. The primary economic impact is related to retarded weight gain resulting in an increase in the number of days to reach market weight.

Swine influenza viruses are found mainly in pigs, but they have also been found in other species including humans, turkeys, and ducks. Infected pigs may begin excreting swine influenza viruses within 24 hours of infection, and typically shed the viruses for 7-10 days.



Leptospirosis: Leptospirosis can be a serious reproductive disease of pigs that can also cause major (non-reproductive) illness in humans.

It causes abortion, stillborn and weak piglets, and deaths soon after birth.

Vaccination is strongly recommended.

Treated, recovered animals are a source of infection.

A strict program based on vaccination and medication will eradicate the disease.

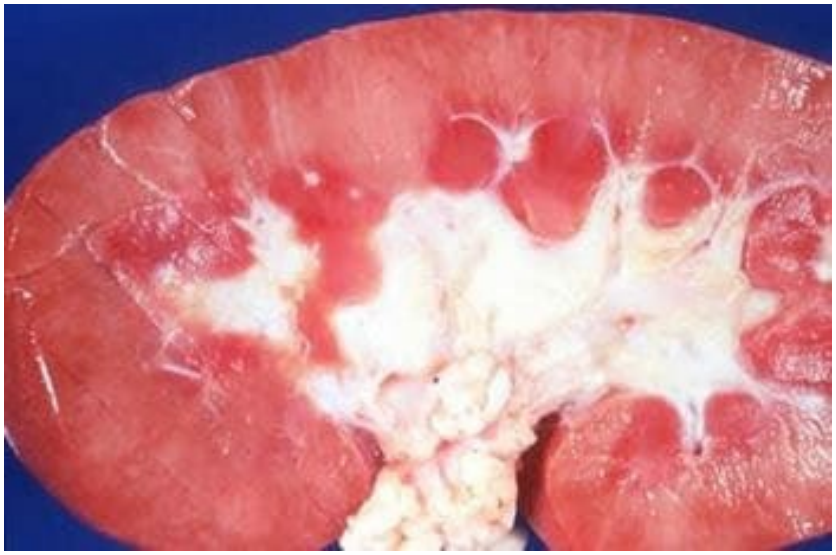
The disease is caused by *Leptospira* bacteria.

Serovar Pomona causes abortions, fetal deaths, premature farrowing, stillbirths and the birth of feeble piglets, which grow poorly or do not survive. Serovar Bratislava is linked to stillbirths.

Non-immune pigs become infected when bacteria enter their bodies through the mouth, nose, or eyes or through breaks in the skin.

The bacteria multiply in the kidney and are then shed in the urine at rates of up to 1 billion per liter.

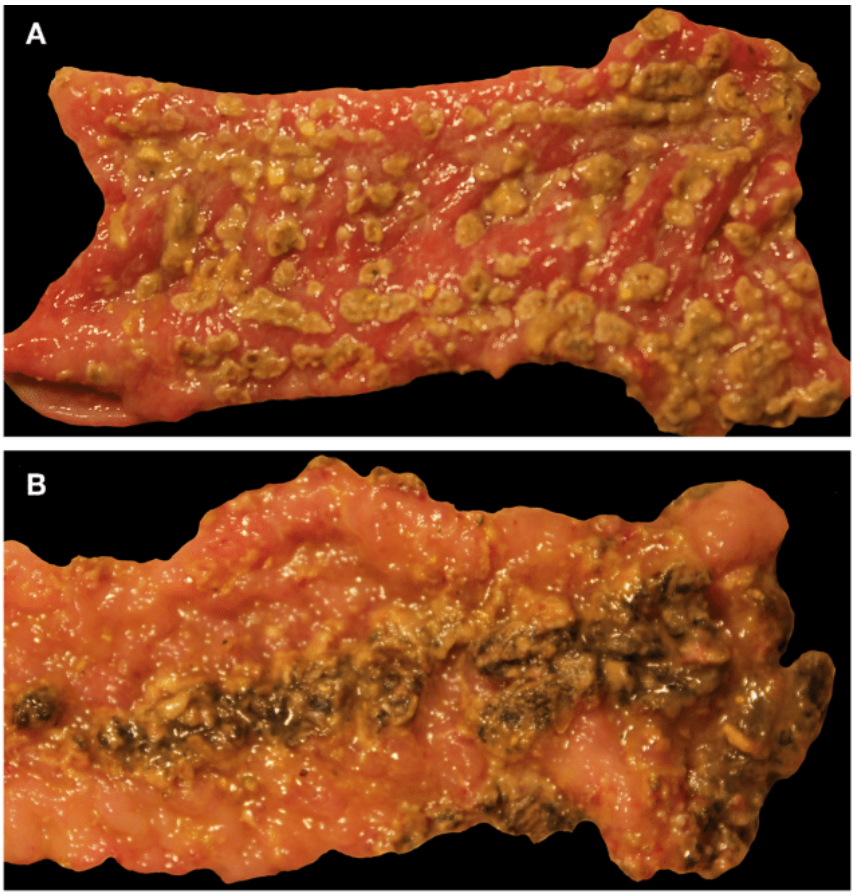
Peak infection occurs in pigs 12-16 weeks old.



Salmonellosis: *Salmonella* is a well-known genus of bacteria, mostly because it is a zoonosis that causes food poisoning outbreaks, widely reported by the media. Among the 2,400 Salmonella serotypes, three infect pigs: *Salmonella choleraesuis*, *Salmonella typhimurium* and *Salmonella derby* and among those only *Salmonella typhimurium* commonly causes clinical signs in humans.

The main route of transmission is fecal-oral since the pigs start shedding the bacteria within minutes from infection and can continue to shed up to 5 months after recovery from the illness. Salmonella also infects the tonsil of the animal and can be shed in oral fluids leading to nose-to-nose transmission. More rarely, piglets can get infected by the sow. Salmonella is quite resistant in the environment and can be carried in the intestinal tract of birds and rodents, leading to indirect transmission of the pathogen. Identifying the source of the introduction in a herd is a challenge. Feed ingredients of animal origin, contaminated environment, and introduction of a positive animal are all plausible causes.

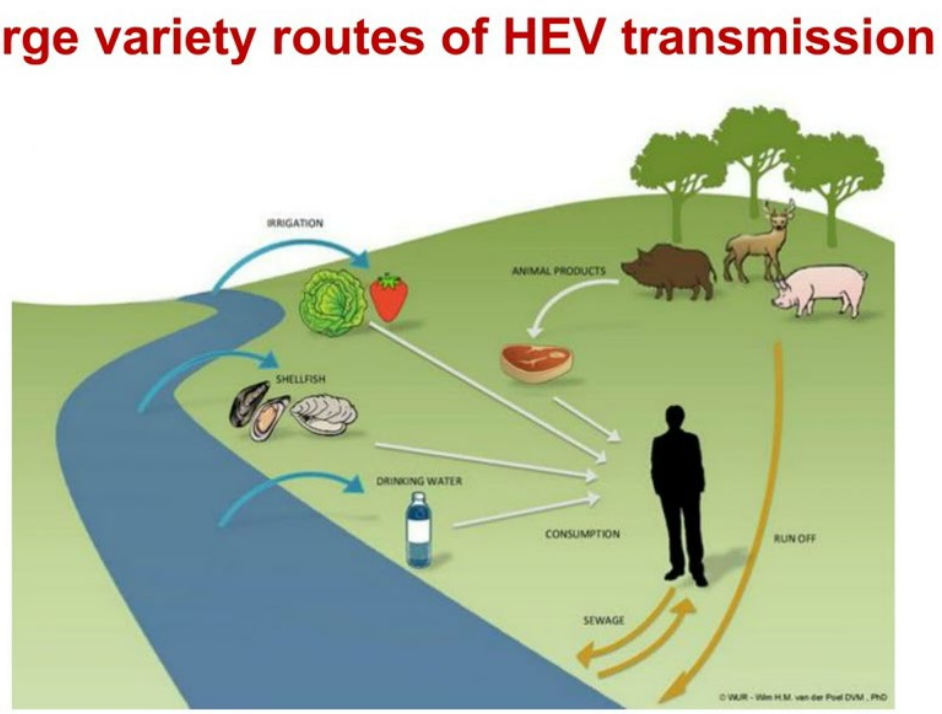
The main symptom of salmonellosis is a yellowish diarrhea affecting pigs from mid-nursery all the way to market. Dehydration and anorexia are commonly seen among affected pigs. The initial episode does not last much longer than a week, but re-infection is common within the next 3 to 4 weeks. Mortality is rare and the majority of the pigs will completely recover. However, some individuals can remain carriers and sources of infection for up to 5 months after recovery. Some cases of rectal strictures have been reported after clinical salmonellosis. In this case, pigs cannot



defecate, and intestinal contents remain trapped in the abdomen, creating a severe distension.

Hepatitis E Virus: In pigs, swine hepatitis E causes microscopic lesions in the liver without any clinical presentation. It is considered important, being a zoonotic disease. Humans can be infected by exposure to infected pigs or by consuming improperly cooked meat. Hepatitis E virus is prevalent in pigs worldwide. Two-month-old pigs appear negative on serology, but most are positive after 3 months of age. The suspected route of transmission is via feces.

- There is no effective treatment
- No vaccines are available
- The virus is ubiquitous (meaning widespread)



Common Diseases in Small Ruminant Animals:

Foot and Mouth Disease: Foot-and-mouth disease (FMD, hoof-and-mouth disease) is a severe, highly communicable viral disease of cattle and swine. It also affects sheep and goats and other cloven-hoofed animals. The disease is characterized by fever and blister-like lesions followed by erosions on the tongue and lips, in the mouth, on the teats, and between the hooves.

While many affected animals do recover, the disease results in a weakened state, loss of weight, and reduced production of milk and meat. Foot-and-mouth disease in adult sheep and goats is frequently mild or unapparent but can cause high mortality in young animals. Sheep and goats are sometimes the reservoir of infection. The disease is virtually never harmful to humans but is highly contagious among those animals which are vulnerable to this virus.

FMD is a foreign animal disease (FAD) and the United States has been free from foot-and-mouth disease since 1929. There are many diseases which can look like Foot and Mouth Disease. Due to the highly contagiousness of this disease and its potential impact on the cattle industry, any signs of FMD should be reported to your veterinarian ASAP for it to be ruled out.

Foot Rot: Foot rot and foot scald are among the costliest diseases for sheep and goat producers. These diseases cause stress to the animals, affect reproductive weight rates, and decrease milk and wool production. Controlling and eliminating foot rot and foot scald in an infected herd or flock requires intensive labor and may be expensive for producers.

Foot rot is a contagious disease of the hooves in goats and sheep. This disease is prevalent in the Southern region of the United States due to the wet and humid climate. Foot rot is primarily caused by the microorganisms, *Dichelobacter nodosus,* which can be found in contaminated soil, and *Fusobacterium necrophorum.*

Foot scald, also known as benign foot rot or interdigital dermatitis, is inflammation between the toes caused by *Fusobacterium necrophorum*. Persistent moisture on the skin between the toes can increase susceptibility to foot scald. However, foot scald does not seem to be contagious. A significant proportion of the herd will likely show signs of this disease under ideal environmental conditions. Foot scald often leads to hoof rot.

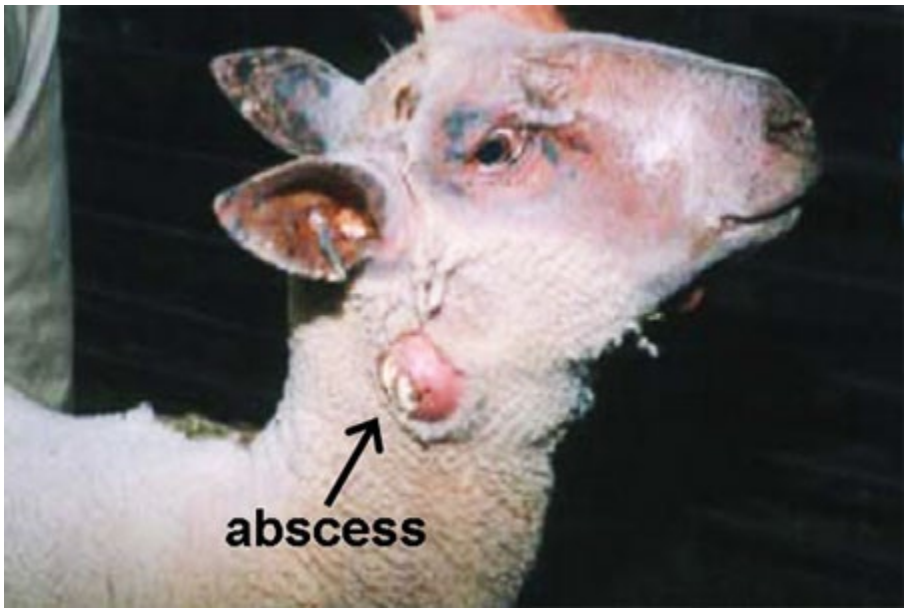
Pneumonia: Pneumonia is an infection of the lung tissue with multiple causes. It is an important medical problem of sheep and goats of all ages. In younger animals, various bacteria, viruses, and parasites of the upper and lower respiratory tract are often involved in the development of pneumonia. In adults, these same diseases – causing agents can create pneumonia.

In sheep, a systemic virus known as Ovine Progressive Pneumonia Virus (OPPV) can play an important role.

In goats, a similar systemic virus, the Caprine Arthritis and Encephalitis Virus (CAEV), can cause pneumonia, but typically causes encephalomyelitis (infected around the brain) and lameness

The word “systemic” means that OPPV and CAEV are viruses that can affect multiple organs, including the lungs. These viruses can also affect the brain, udder, and the joints. In certain climates, parasites (worms) can travel from the gastrointestinal tract to the lungs, causing pneumonia.

Caseous Lymphadenitis: Caseous lymphadenitis (CL) is a chronic, contagious disease caused by the bacterium *Corynebacterium pseudotuberculosis*. Although prevalence of CL varies by region and country, it is found worldwide and is of major concern for small ruminant producers in North America. The disease is characterized by abscess formation in or near major peripheral lymph nodes (external form) or within internal organs and lymph nodes (internal form). Although both the external and internal forms of CL occur in sheep and goats, the external form is more common in goats, and the internal form is more common in sheep.



Contagious Ecthyma: Contagious ecthyma is a zoonotic viral, pustular dermatitis of young sheep and goats. Lesions usually involve the lips but can involve other cutaneous junctions such as the coronet and can extend onto the face and ears as well. Diagnosis is confirmed by PCR assay. Affected animals go off feed, fail to gain weight, and may develop serious secondary infections at the lesion sites, all of which result in production losses.

Contagious ecthyma is found worldwide and is common in young lambs reared artificially and in older lambs during late summer, fall, and winter on pasture, and during winter in feedlots.

Haemonchosis: *Haemonchus contortus* is the most economically significant parasite of sheep and goats throughout much of the United States and the world, due to the severity of the parasitism and the emerging anthelmintic resistance. Haemonchosis also affects New World camelids. It is a common cause of death in all these species, and often takes the practitioner and owner by surprise, as clinical signs can be subtle. Rapid diagnosis, strategic prevention, and pasture management, along with a thorough understanding of the pathophysiology of haemonchosis facilitates the development of herd health protocols to control this deadly disease.

Haemonchus contortus favors warm moist climates; however, it has adapted successfully to most of the United States. Optimum conditions for *H. contortus* exist from May through September in Urbana, Illinois; the season is even longer in the Southeast. In the winter, larvae become metabolically inactive, undergoing hypobiosis. Most animals succumb to haemonchosis in the spring, due to the combined assault of larvae emerging from hypobiosis and the immunosuppression of late pregnancy. This results in the periparturient rise in egg shedding, resulting in numerous infective larvae on pasture at the time when young animals are most susceptible. Although all ages of sheep and goats are susceptible to haemonchosis, recently weaned animals are usually the most vulnerable. Besides age, other factors that increase susceptibility include overgrazing, dense stocking rates, and inadequate nutrition, particularly protein intake.

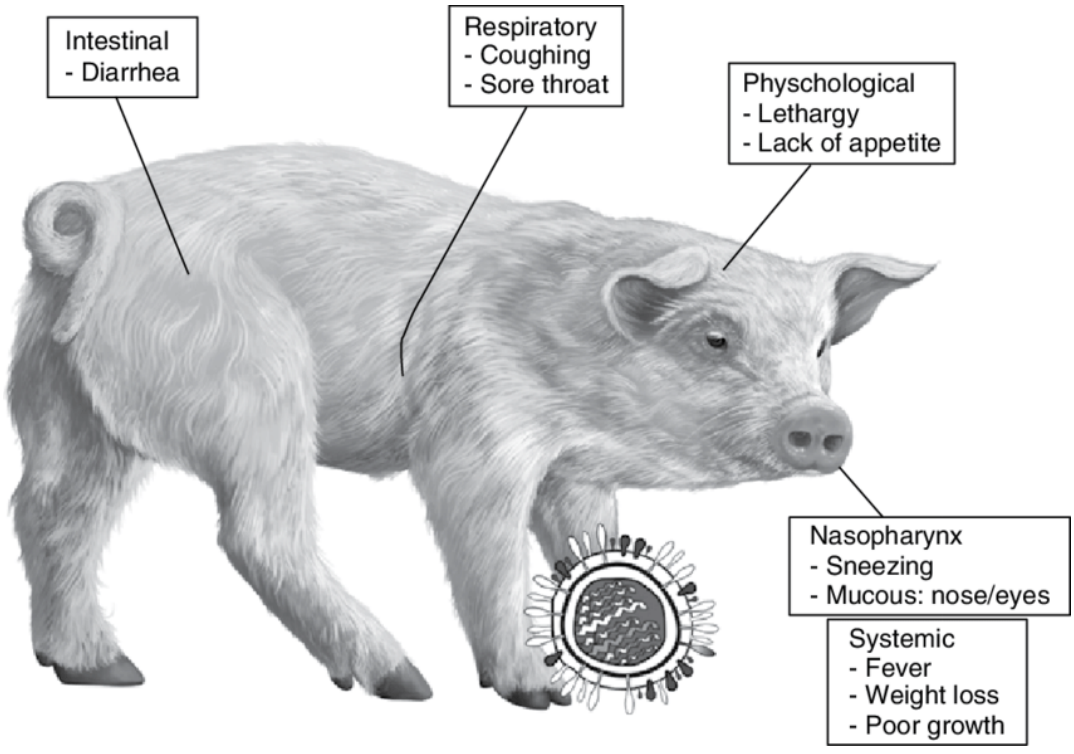
The most common clinical signs are failure to thrive and weight loss. As worm burdens increase, more severe signs, such as anemia, hypoproteinemia, submandibular edema (bottle jaw), weakness, and collapse, may develop. Unlike other gastrointestinal nematodes, *H. contortus* does not usually cause diarrhea. Due to the nonspecific signs and lack of diarrhea, haemonchosis is often undiagnosed until death. The death can appear sudden, even though the course of infection may have been prolonged.

Quiz on Common Diseases

Identify the following diseases based on the pictures provided:

Photos from MSU Extension

1._____



2. _____

3. _____

4. _____

5. _____

6. _____

1-2 YEARS IN PROJECT

Research and learn how your local community deals with animal diseases. You could even organize a visit to a local farm and talk with a farmer about how they handle sick animals.

Answer Key:

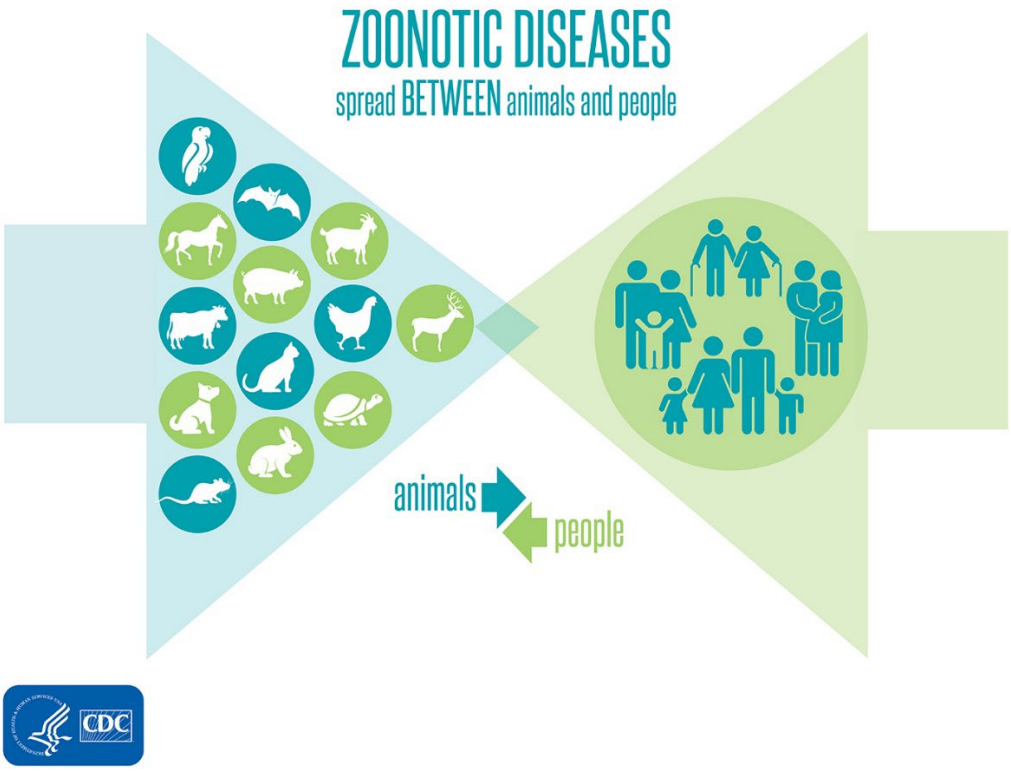
1. Pinkeye
2. Swine Influenza
3. Rhinopneumonitis/Equine Herpesvirus
4. Contagious Ecthyma (ORF)
5. Bovine Respiratory Disease (BRD)
6. Foot Rot

Activity 2.3

Zoonotic Disease

Project outcome:

- Define what a zoonotic disease is and list some common zoonotic diseases



Zoonosis

Say: zo-OH-no-sis

Zoonosis means a disease that people can get from animals. Zoonoses include **ringworm**, ***Salmonella* infection**, Influenza, Soremouth, and **rabies**. You can help prevent zoonoses by keeping your pet healthy, staying away from wild animals, and always **washing your hands** after touching animals. You probably saw the word "zoo" in "zoonosis" — and now you know why!

Visit the Centers for Disease Control's website for further information at: https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html

Activity 2.4

Zoonotic Disease

List some common zoonotic diseases that you learned about and then provide an in-depth description of one disease of your choice:

Chapter 3

Jobs Working with Animals

Activity 3.1

Careers Working with Animals

Project outcome:

- List five careers working with animals other than a veterinarian.

Can you think of at least five careers working with animals other than a veterinarian?

_____

_____

_____

_____

_____

If you cannot come up with any careers, watch this video to get an idea of how you can work with animals:

https://www.youtube.com/watch?v=k5LGDo2OwY8

After watching that video, now can you list five jobs working with animals other than being a veterinarian?

_____

_____

_____

_____

_____

Organize an animal industry discussion for the next Honor Club meeting in your county.

Activity 3.2

Career Requirements

Project Outcome:

- Describe the educational requirements for each job that you listed

Refer to the last video you watched and fill in the blanks below:

Job:_____

Educational Requirements:

_____

_____

Job:_____

Educational Requirements:

_____

_____

Job:_____

Educational Requirements:

_____

_____

Activity 3.3

Job Description

Project Outcome:

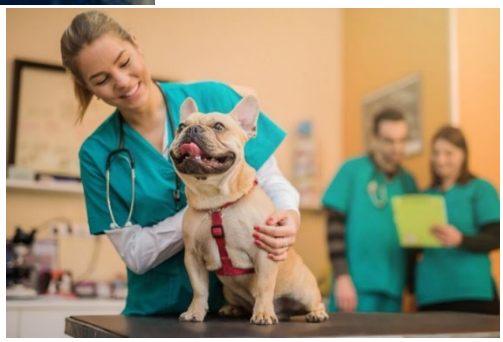
- Pick one job that you found the most interesting and give a brief job description

You may Google any animal related job and find out what the job description is and enter, in your own words, the description below:

Give a speech about careers working with animals for your county's public speaking contest.

Chapter 4

Veterinary Roles



Activity 4.1

Veterinarian Daily Routine

Project Outcome:

- List the common day-to-day activities performed by veterinarians

Click the following link to learn all about veterinarians and their job outlook according to the Bureau of Labor Statistics. Click each tab at the top of the page to learn more.

https://www.bls.gov/ooh/healthcare/veterinarians.htm#tab-2

You may use examples from the website, but please use some of your own personal knowledge in listing what veterinarians do on a day-to-day basis:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Create an ongoing list of all the animals a veterinarian is trained to assist.

Activity 4.2

Interview a Veterinarian

Project Outcome:

- Interview a veterinarian about the diversity of roles veterinarians have in your community.

Watch the following video of a young man shadowing a veterinarian for a day. He asks lots of interview questions during the video:
https://www.youtube.com/watch?v=5XrzUiCLw3A

Below, come up with a list of a minimum of five questions that you would like to ask a veterinarian during your interview with them.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Now, take your interview questions and go interview a local veterinarian. When you return from your interview, write an article that you could submit to

a local newspaper or your county's 4-H newsletter. You can also upload the article to your e-portfolio showcase.

Write an article about the interview.

Write in information about who the person is, what do they do, what their educational background is, where their workplace is located? How should someone in the community get in touch with this veterinarian? Is there a website where they can find pertinent information?

Activity 4.3

Veterinarian's Education

Project Outcome:

- Explain the education needed to become a veterinarian

Go back to the Bureau of Labor Statistics website and describe the type of education required to become a licensed veterinarian.

https://www.bls.gov/ooh/healthcare/veterinarians.htm#tab-4

Now take the information you have learned from this project area guide and create an activity book to teach others.

Congratulations!

You have now completed the Beginner Vet Science curriculum.

If you are interested in furthering your project work in the Vet Science project area, consider joining the Virtual Vet Science Project Group. Recordings from previous Virtual Vet Science club meetings can be found at https://4h.tennessee.edu/virtual-vet-science/.

Other opportunities to further your education regarding Vet Science include arranging a behind the scenes tour at a vet hospital or a local zoo.

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