Question

A swine farmer contacts you because almost all of his piglets < 1 week of age are dying. The older pigs are showing signs of vomiting with watery diarrhea. Which of these diseases most likely could cause these clinical signs and such a high mortality rate in young pigs?

- Hog cholera
- Isospora suis
- Transmissible gastroenteritis
- Colibacillosis

Explanation - The correct answer is transmissible gastroenteritis. There is no other disease in pigs that spreads so rapidly and causes such a high mortality in piglets. TGE is a viral disease of the small intestines causing vomiting and watery diarrhea. Mortality is 100% in piglets < 2 weeks old but they seldom die if they are > 1 month old when infected. There is no specific treatment.

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Question

What type of diet predisposes bucks to ulcerative posthitis?

- High calcium diet
- Low magnesium diet
- High protein diet
- High carbohydrate diet
- High phosphorus diet

Explanation - The correct answer is high protein diet. When an animal is fed a high-protein diet, excess proteins are catabolized to urea and excreted. If urease-producing bacteria like Corynebacterium renale are present, the urea is broken down to ammonia in the prepuce, which causes damage to the mucosal surfaces and leads to pizzle rot.

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Question

A litter of 3-week old piglets is presented for shifting leg lameness. They have warm swollen joints in all legs, a temperature of 107.0F, and are dyspneic. Necropsy of one dead animal shows fibrinopurulent pleuritis and peritonitis. What is the most likely diagnosis?

- Erysipelothrix rhusiopathiae
- Haemophilus parasuis
- Osteochondrosis
- Mycoplasma hyosynoviae

Explanation - Haemophilus parasuis causes Glasser's disease, which is usually characterized by sudden death but can often also lead to painful joints, pneumonia, and occasionally neurologic signs. Lesions show fibrinopurulent pleuritis, pericarditis, and peritonitis. Meningitis is usually responsible for the cause of neurologic signs and seizures. This disease most commonly affects piglets from 2 weeks to 4 months of age. Morbidity rate can reach up to 50-75% and mortality rate up to 10%.

Erysipelas typically occurs in grower and finisher pigs and does not result in pneumonia. Diamond-shaped skin lesions (thus the name "diamond skin disease") are pathognomonic for erysipelas. Mycoplasma hyosynoviae and osteochondrosis do not cause fever, pneumonia, or neurologic signs, and occur mainly in growers and finishers.

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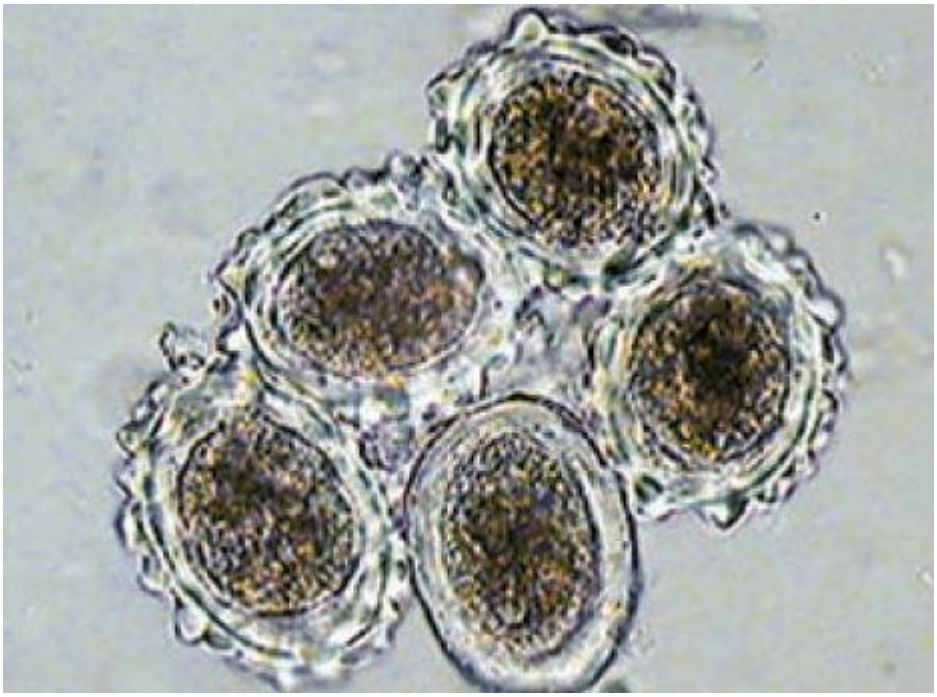
Question

The viscera from a group of 100 kg pigs are presented at a slaughter facility. The pigs were raised in a semi-outdoor management farm system with groups of 30-100 kg pigs kept on the same site. At slaughter, multifocal fibrotic lesions are seen in their livers and noticeable nematodes are present within the small intestine. You perform a fecal flotation on a fresh sample from the younger pigs. The results are shown in the image below. What treatment or management recommendation is most appropriate for this problem?



- Quarterly treatment with praziquantel
- Monthly administration of ivermectin
- Disinfect the pasture
- Examine the food sources of the pigs
- Depopulate and replace the herd

Explanation - The findings at slaughter are consistent with an infection of Ascaris suum. This is the roundworm of pigs. These worms can cause intestinal obstruction in large infestations. They can also migrate into the bile ducts and liver, causing the fibrotic liver lesions described in this case.

Antemortem diagnosis is made by fecal flotation and clinical signs. Treatment options are wide and include ivermectin, fenbendazole, pyrantel, levamisole and other ascaracides.

Endemically infected farms should employ on-going medication programs with routine benzimidazoles or ivermectins. Medication is aimed at prevention of mature intestinal infections by medicating finisher pigs at monthly intervals. In outdoor pig systems, careful attention must be paid to stock management, with field rotations, light stocking densities and regular anthelmintic treatment. Clearing sites of ascarid eggs is not practical unless floor surfaces can be flame treated. Ascaris suum eggs have thick coats and are highly stable and infectious in outdoor environments for several years.

Praziquantel is used to treat tapeworm infections but is not effective against roundworms.

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Question

Which of the following causes reproductive failure in pigs by an ascending infection of the reproductive tract?

- E. coli
- Parvovirus
- Leptospira interrogans
- Toxoplasma
- Eperythrozoon suis

Explanation - The correct answer is E. coli. Other infectious agents that ascend the reproductive tract causing a metritis and reproductive failure in pigs include Streptococci, Staphylococci, Actinomyces spp., Pseudomonas spp., etc. The other answer choices listed cause reproductive failure via systemic infections. Other systemic agents causing reproductive failure include PRRS, pseudorabies, brucellosis, etc.
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Question

Which of the following E. coli is most commonly found in post-weaning diarrhea in pigs?

- F5 (K99)
- F41
- F6 (987P)
- O157:H7
- F4 (K88)

Explanation - The correct answer is F4 (K88). Susceptibility to the different pili is dependent on the presence of receptors. These receptors change as enterocytes mature in piglets. O157:H7 is not known to be pathogenic in swine and is rarely found. F4, F5, F6, and F41 can all cause diarrhea in pre-weaning piglets (<3 weeks of age) but only F4 (K88) continues to be a problem into the post-weaning phase.
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Question

A client with a pet pot belly pig carries it into your clinic one day, cradling it lovingly against her body. The complaint is pruritus and skin lesions; she mentions that she and her boyfriend also have similar lesions. You do a skin scraping on the pig and find Sarcoptes scabiei. What treatment should you now recommend?

- No treatment is necessary, as Sarcoptes spontaneously die after 3 weeks and the animal heals
- Treat the pig for mange
- Use corticosteroids to stop the itching, as all the skin damage is due to scratching

- Dip the pig daily in toxaphene
- Treat pig for lice

Explanation - The best treatment drugs are the avermectins; two doses at 2-week intervals will be required. The mange mite completes its entire life cycle on the pig. Also advise her to see her physician for herself and boyfriend. Finally, tell her this can spread to other species of animals, and the pig must be quarantined away from all other pets and livestock.

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Question

A herd of pigs is presented for lethargy, elevated temperatures, oculonasal discharge, and coughing. You diagnose swine influenza based on clinical presentation and virus PCR detection. What do you tell the farmer?

- The mortality rate is low even with other concurrent bacterial or viral infections.
- The mortality rate is high only in older pigs that have not previously been affected.
- Uncomplicated infections usually run a short course and have a low mortality rate. Antimicrobial agents should be given for possible concurrent bacterial infections.
- Uncomplicated infections have a high morbidity rate and high mortality rate despite use of antimicrobial agents; the herd should be depopulated.

Explanation - The correct answer is uncomplicated infections usually run a short course and have a low mortality rate if there are no significant husbandry problems. Antimicrobial agents should be given for possible concurrent bacterial infections. Morbidity is high, but mortality is low with this disease if there are no other confounding factors such as concurrent disease or significant husbandry problems. Recovery takes between 1-2 weeks, and the disease causes little impact other than loss of weight and body condition during the 1-2 weeks of illness.

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Question

Which of the following diseases does NOT cause fetal loss in pigs?

- Pseudorabies
- Chronic erysipelas infection
- Toxoplasma
- Brucella spp
- Parvovirus

Explanation - The correct answer is chronic erysipelas infection. Erysipelothrix rhusiopathiae is the causative agent of diamond skin disease of pigs. In the acute stage it causes fever and red or purple cutaneous skin lesions in the shape of diamonds. The acute septicemia and fever can cause abortion in pregnant females. The chronic form of the disease is known for causing vegetative valvular endocarditis and lameness (arthritis). The chronic form is not known for causing fetal loss in pigs. Other differentials for fetal loss in pigs other than those listed as answer choices include PRRS, Mycoplasma suis (formerly known as eperythrozoonosis), acute erysipelas infection, leptospirosis, and any other severe systemic disease.

Acute severe skin form of swine erysipelas with extensive small raised pink/red lesions some developing dark scabs.

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Question

A group of 4-week old piglets presents for depression, anorexia, and lethargy. They all have brown exudative spots on the skin of their heads, axillae, and groins. Some of the lesions are brown to black crusts. What is the most likely diagnosis?

- Dermatosis vegetans
- Staphylococcus hyicus
- Pityriasis rosea
- Pediculosis

Explanation - The correct answer is Staphylococcus hyicus. S. hyicus infections in pigs are also known as exudative epidermitis or greasy pig disease. The disease affects piglets less than 8 weeks of age and seldomly adults. The clinical signs and lesions are those described in the question. Morbidity and mortality is usually high in younger pigs. There are not many other swine diseases that appear clinically like this, so diagnosis is usually based on history and clinical signs.

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Question

Which of the following is not a management measure for controlling swine colibacillosis?

- Commingle sows and gilts during breeding and up to 4 weeks before farrowing
- Commingling pigs of different ages
- Vaccination for E. coli
- Waiting until after a colibacillosis outbreak before administering iron injections

Explanation - The correct answer is commingling pigs of different ages. Pigs of different ages should not be mixed together. In addition to the options listed as answer choices, the management of swine colibacillosis includes keeping farrowing pens warm and dry, using enticing pig pumps, keeping piglets well fed with swine milk replacer, and spiking milk with porcine spray-dried plasma.

- *barrow* - a castrated male swine
- *boar* - a mature, male swine; often a wild or feral swine
- *farrow* - to give birth to piglets
- *gilt* - a female pig that has never been pregnant
- *hog* - a domestic swine, especially a fully-grown specimen
- *piglet* - a very young pig
- *sow* - a mature, female swine

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Question

You have just been called to a small outdoor swine farm. The farmer just found what appear to be 3 different litters of aborted fetuses. The sows are roaming around the pasture and it is difficult to identify which animals have aborted (there are some pregnant and non-pregnant animals in the group). There are no noticeable respiratory signs on any of the sows either. The farmer is concerned the herd is undergoing an outbreak of porcine reproductive and respiratory syndrome (PRRS) virus. What should you do next?

- Collect 6 aborted fetuses to test for PRRS antibodies
- Collect 6 aborted fetuses to test for PRRS virus via PCR
- Test 10 random sows for PRRS virus via PCR
- Test 10 random sows for PRRS antibodies

Explanation - The correct answer is to collect 6 aborted fetuses to test for PRRS virus via PCR. Because the outbreak appears to be just beginning, you are more likely to find the actual virus on any sample tested rather than antibodies. It takes 10 - 14 days after exposure for antibodies to be detected. Research has shown that during a PRRS abortion outbreak, approximately 50% of aborted fetuses will test positive for virus (i.e. 50% chance of detection). Entire fetuses or just thoracic fluid are appropriate samples for submission. By including 6 aborted fetuses you will have a 98.5% chance of finding the virus if it is there. At the start of an outbreak, disease prevalence will be very low and therefore a very large sampling size would be needed to find a single positive animal.

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Question

Which of the following is least likely to cause diarrhea in a grower or finisher pig?

- Isospora suis
- Trichuris suis
- Lawsonia intracellularis
- Brachyspira hyodysenteriae

Explanation - The correct answer is Isospora suis. Isospora mainly causes diarrhea in nursing and weaning piglets. Growers and finishers are rarely affected by Isospora suis. Brachyspira hyodysenteriae, Lawsonia intracellularis, and Trichuris suis most commonly cause diarrhea in grower and finisher pigs.

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Question

What swine disease is a major worldwide cause of fetal death without signs of illness in the sow, and is controlled mainly by vaccination?

- Rotavirus
- Swine influenza

- Porcine adenovirus
- Porcine Parvovirus
- African swine fever

Explanation - Porcine Parvovirus affects seronegative sows exposed during the first half of gestation. Affected sows may return to estrus, fail to farrow despite being anestrus, have small litters, or have a high proportion of mummies. Vaccines in the United States are inactivated.

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Question

Aural hematomas in pigs are often caused by which of the following?

- Bites inflicted by other pen mates
- Coagulopathies
- Poor nutrition
- Ear notching

Explanation - The correct answer is bites inflicted by other pen mates. Aural hematomas in pigs also commonly occur from violent head shaking. Violent head shaking is often associated with foreign debris in the ears and ectoparasites such as mites or lice.

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Question

You are out in the field and get a call from one of your partner's clients needing help in interpreting a diagnostic report she just received. Your partner is out of town on vacation and you don't have access to the report so you ask your client to read the results to you. She tells you that the 50 lb pig lung had been submitted and revealed a cranioventral to patchy, diffuse pneumonia with moderate interlobular edema. Histologic examination revealed a necrotizing bronchiolitis with fibrinous exudate in bronchi. No additional testing was done. She reports the pigs have responded very well to tetracyclines in the water but is wondering what caused the respiratory outbreak. Based on the information provided what would you report to her?

- This case is suggestive of verminous pneumonia
- This case is suggestive of swine influenza virus pneumonia
- This case is suggestive of porcine circovirus type 2 (PCV2) pneumonia
- This case is suggestive of Mycoplasma hyopneumoniae pneumonia
- This case is suggestive of a typical bacterial pneumonia

Explanation - The correct answer in this case is suggestive of swine influenza pneumonia. The gross and histologic descriptions are characteristic of swine influenza pneumonia; especially the term "necrotizing bronchiolitis" in swine is almost pathognomonic for influenza infection. Although this is a viral infection, it is almost always complicated by secondary bacterial infections which contribute to the severity of the respiratory signs. Since there are no antiviral drugs approved (or allowed to be used) in pigs, symptomatic treatment (anti-inflammatory meds/aspirin) and water antibiotics (to control secondary bacterial infections) are the treatment of choice.

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Question

A number of young growing pigs on a commercial hog farm are experiencing head tilt, incoordination, reduced weight gains, and weak rear limbs. Most have normal vital signs, and you suspect a nutritional deficiency. Which of the following deficiencies might cause such clinical signs?

- Folic acid
- Vitamin A
- Vitamin D

- Sodium
- Thiamine (vitamin B1)

Explanation - A shortage of vitamin A in the diet can lead to these signs in young pigs, especially an increase in middle ear infections, as also seen in turtles. In sows it can cause embryonic mortality and congenital defects in their offspring.

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Question

A 3 month old pig is presented for an abnormal gait and lameness of both pelvic limbs. Your history reveals the pig has been gaining weight quickly and is on a high-energy diet. There is no history of trauma, although the pig is usually unsupervised outside. What is the most likely diagnosis?

- Osteochondrosis
- Hip dysplasia
- Pelvic fracture
- Immune mediated polyarthritis

Explanation - The correct answer is osteochondrosis. Osteochondrosis is a common disease in young, rapidly-growing pigs. Lesions include ulcerations or defects in articular cartilage. Lesions are often bilateral and symmetric. Common sites of the disease in pigs include the medial femoral condyle, humeral condyle, humeral head, glenoid of the scapula, distal ulna, and lumbar vertebrae.

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Question

A large commercial swine producer has hired you as a consultant to solve their problems with coughing young pigs and a high rate of condemned livers at slaughter. The livers have numerous white fibrous spots. Which of the following problems is most likely and should thus be the initial focus of your investigation?

- Trichuris suis
- Trichinella spiralis
- Strongyloides ransomi
- Ascaris suum
- Hyostrongylus rubidus

Explanation - The large (15 to 40 cm) roundworm lives in the small intestine after a migration of larvae through the liver and lung, causing pathology. The adults also reduce growth rates and feed efficiency. The kidney worm, Stephanurus dentatus, can also cause hepatic lesions.

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Question

Vesicular exanthema of swine affects swine and which other animals?

- Rodents
- Sheep
- Dogs
- Horses
- Sea lions

Explanation - The correct answer is sea lions. Vesicular exanthema of swine is called San Miguel Sea Lion Disease in sea lions. It is caused by a calicivirus and affects swine, sea lions, several types of seals, and other marine mammals. Vesicular exanthema is not present in the USA, but San Miguel Sea Lion Disease is present in marine mammals off the coast of California. The disease is reportable.

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Question

A group of 4-month old outdoor pigs are presented for icterus, failure to thrive, unthriftiness, and dyspnea. Necropsy of one of the pigs shows white spots in the liver, pulmonary edema, and many roundworms in the small intestine, stomach, and bile ducts. What is the most likely diagnosis?

- Trichuris suis
- Ascaris suum
- Metastrongylus spp.
- Fasciola hepatica
- Stephanurus dentatus

Explanation - The correct answer is Ascaris suum. Ascaris suum are found in the small intestine of pigs. If there is a large burden of the worms, they can cause obstruction of the intestine, migrate into the bile ducts and cause icterus. Migration through the liver causes fibrosis or "white spots." Pulmonary edema can also be a sequela of the larvae, causing abdominal breathing or "thumps."

Ascaris suum infections are common in outdoor swine due to high environmental contamination. Trichuris suis is a whipworm found in the cecum and large intestine. Metastrongylus is a lung worm. Stephanurus dentatus is the kidney worm of pigs. Fasciola hepatica is a liver fluke.

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Question

Which of the following is a reliable indicator of estrus in a pig?

- Increased rooting activity
- Increased vocalization
- The sow attempts to mount other herdmates
- The sow stands while being mounted by another sow
- The sow stands while being mounted by a boar

Explanation - The correct answer is the sow stands while being mounted by a boar. The sow may allow mounting by other sows or try mounting other herdmates while in proestrus, but she will only allow mounting by a boar while in estrus. Increased vocalization and rooting occur during estrus as well, but they are not as reliable as indicators.

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Question

Which of the following is true about eperythrozoonosis in pigs?

- Clinical signs in adult pigs are more severe than in younger pigs
- It is often associated with anemia, fever, icterus, and reproductive failure
- Transmission of the disease is by direct contact and aerosol
- Vaccinations in piglets are effective in preventing the disease
- Affected animals should be culled from the herd and slaughtered

Explanation - The correct answer is it is often associated with anemia, fever, icterus, and reproductive failure. Eperythrozoonosis in pigs is caused by Mycoplasma suis (previously called Eperythrozoon suis), a disease vectored by biting insects. Clinical signs include anorexia, weakness, anemia, icterus, and reproductive failure. Younger pigs are more severely affected than older pigs. The treatment of choice for the disease is tetracycline antibiotics. Vaccines are not available for the disease.

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Question

While visiting a porcine operation, the managers ask you about several pigs that have been sporadically dying. You examine several live pigs in the group and notice no immediate abnormalities other than occasional coughing.

At that point, you tell them you are unsure of the cause of sporadic death and you would like them to give you a pig for necropsy next time one of them dies. As it happens, you are delivered a pig for necropsy a week later. At the time of necropsy the most significant findings were white spots on the liver and an intestinal obstruction of large 20-40cm worms in the small intestine which were likely the cause of death (see image). With what medication should you treat the rest of the pigs?

- Sulfamethazine
- Fenbendazole
- Fluconazole
- Metronidazole
- Flumazenil

Explanation - The necropsy findings are consistent with an infection of Ascaris suum. This is the roundworm of pigs. These little worms have the ability to occasionally cause intestinal obstruction in large infestations. They can also migrate into the bile ducts and liver, causing characteristic "milk spots" on the liver.

In the A. suum life cycle, the pig ingests an egg with an L2 larva inside, which then undergoes hepatic migration (milk spots), migrates to the lungs and becomes an L3 larva, enters the alveoli and finally gets coughed up. The larval migration can sometimes cause rapid shallow breathing that many refer to as "thumps".

Diagnosis is by fecal flotation and clinical signs for the most part. Treatment options are wide and include ivermectin, fenbendazole, pyrantel, levamisole and other ascaracides.

Fenbendazole is a benzimidazole anthelmintic with a broad spectrum against many gastrointestinal parasites such as roundworms, hookworms, whipworms, pinworms, and strongyles.

Metronidazole is an antibiotic with a mainly anaerobic spectrum. It is also useful in the treatment of certain parasites such as giardia. Fluconazole is an antifungal and commonly used to treat coccidiodomycosis in small animals. Flumazenil is a reversal for benzodiazepines. Sulfamethazine is an antibiotic that has been used in the treatment of coccidiosis in pigs.

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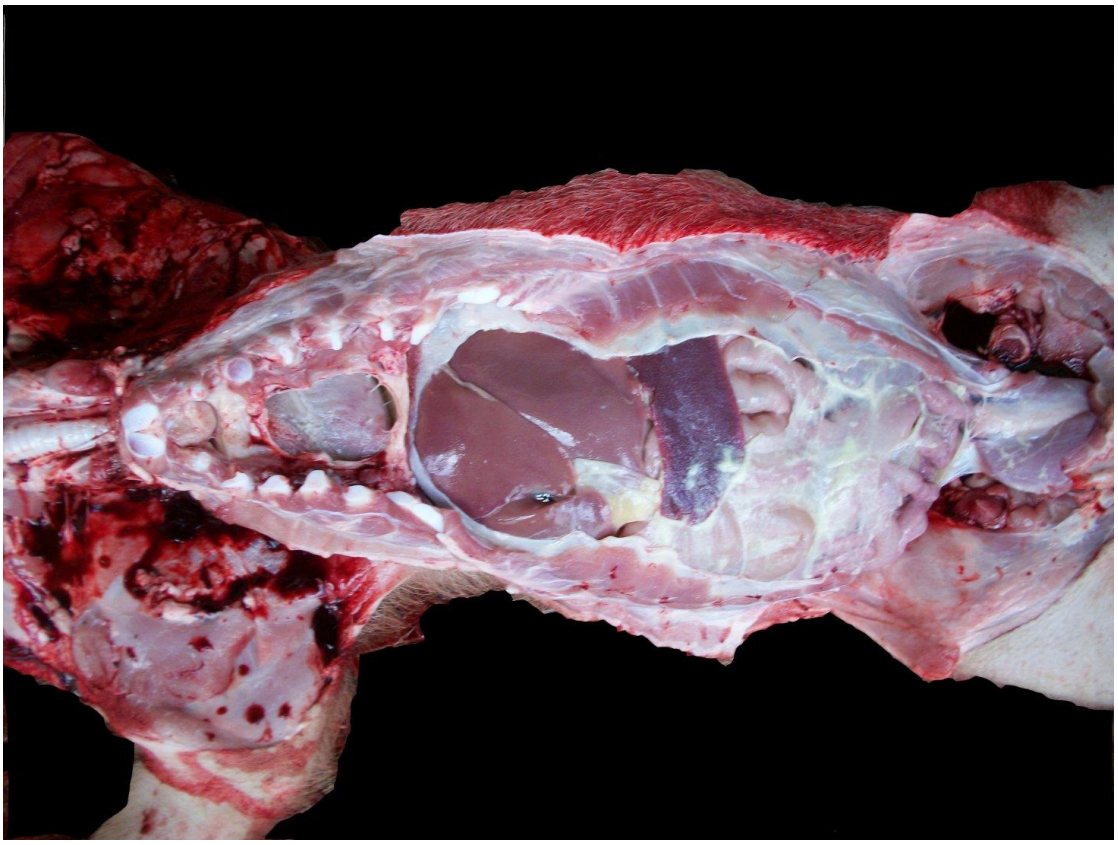
Question

You have arrived at a farm with an acute outbreak. The farmer has lost 25 pigs in the last two days. The pigs are all from the same building and are from a group of 950 four-week old pigs. The pigs arrived on the farm approximately 8 days ago. Upon arrival to the farm, you perform a necropsy on 8 out of the 20 dead pigs available. Seven of the first eight pigs you necropsy have lesions similar to those seen on the attached photo. You then perform a quick walk through of the building and do not identify any other sick pigs. What should you do next?



- Select five non-treated, acute live pigs from the rest of the group to euthanize and collect samples for a diagnostic workup
- Have the feed company add 400g per ton of chlortetracycline to the next batch of feed
- Continue performing a necropsy on the remaining 12 dead pigs
- Have the owner inject all remaining pigs in the building with ceftiofur

Explanation - The correct answer is to have the owner inject all remaining pigs in the building with ceftiofur. The photograph depicts a classical presentation for polyserositis. The top two differentials for polyserositis in four week old pigs would be Streptococcus suis and Haemophilus parasuis. Because of the high mortality in only two days, Haemophilus parasuis would be your top differential and suggests a true emergency situation. As seen in the case history, many times the rest of the pigs appear to be normal. The only way to try and stop the outbreak is to inject all pigs ASAP. Although adding 400g per ton of chlortetracycline may be effective in preventing an outbreak, it is not the correct choice at the time of an outbreak. Feed delivery may be a week away, and even if feed could be delivered that same day, it would take three or four days before the pigs would get enough antibiotic via the feed. Immediate action is critical. There is no need to necropsy additional pigs, as a pattern has already been established. It is practically impossible to find an acute live pig in cases of Haemophilus parasuis outbreaks; pigs are usually just found dead.

Question

A herd of pigs present for unthriftiness, slow growth, and occasional deaths. Some pigs show signs of posterior ataxia or paralysis. The farmer says his herd was previously infected with Stephanurus dentatus. Which of the following diagnostics is most appropriate to make the diagnosis of Stephanurus dentatus?

- Intestinal biopsy

- Fecal sedimentation
- Blood smear
- Urinalysis
- Fecal float

Explanation - The correct answer is urinalysis. Stephanurus dentatus is the kidney worm of pigs. The parasites are often in or near the kidneys, in the ureters, or in perirenal fat. Posterior ataxia or paralysis can occur due to larvae migrating along the spinal cord. Diagnosis is usually made on necropsy or by finding ova in the urine.

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Question

Regarding pigs, which one of the following disease agents is least likely to cause clinical disease in neonatal pigs, and occurs most frequently in pigs in the finishing stage (pigs >40 lbs)?

- Enteropathogenic E. coli
- Trichuris suis
- Rotavirus
- Isospora suis
- Cryptosporidium

Explanation - Whipworms occur from weaning to adulthood, and result in feces that can be pasty, diarrheic, or occasionally mucohemorrhagic.

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Question

Edema disease of pigs is caused by which agent?

- Clostridium difficile
- Enterohemorrhagic E. coli
- Enterotoxigenic E. coli
- Clostridium perfringens
- Salmonella

Explanation - The correct answer is enterotoxigenic E. coli. Edema disease is a fatal disease of rapidly growing weaned pigs. Clinical signs include subcutaneous edema, convulsions, dysphonia, diarrhea, swollen eyelids, and acute death. The disease is rarely ever seen prior to weaning and occurs in pigs that are on high-protein and high-energy diets. The disease results from a vasculitis that occurs due to an enterotoxin formed from enterotoxigenic E. coli. Gross lesions include subcutaneous and intestinal edema, pericardial effusion, pleural effusion, ascites, and hemorrhages on the epicardium and endocardium. Pigs affected by edema disease do not have a fever which helps differentiate it from Streptococcus suis infections which also commonly manifests as CNS signs and do cause pyrexia.

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Question

You are investigating a case of high mortality in 14 week old pigs. You are suspicious of Porcine circovirus associated disease (PCVAD). What sample do you need to submit to a laboratory to confirm your diagnosis?

- Whole blood for complete blood count (CBC)
- Serum sample for ELISA antibody testing
- Lymphoid tissue for histology
- Serum sample for PCR testing
- Serum sample for virus isolation

Explanation - The correct answer is lymphoid tissue for histology. A diagnosis of PCVAD requires 3 parts:

1) at least a doubling of mortality (clinical history)
2) demonstration of lymphoid depletion (histopathology)
3) high number of PCV2 antigen in the lesion (immunohistochemistry on tissue)

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Question

Swine dysentery is caused by which of the following?

- Trichuris suis
- Coronavirus
- Lawsonia intracellularis
- Brachyspira hyodysenteriae
- Isospora suis

Explanation - The correct answer is Brachyspira hyodysenteriae (formerly known as Serpulina hyodysenteriae). Swine dysentery causes mucohemorrhagic diarrhea. Fibrinonecrotic typhlitis and colitis occur, but the small intestine is unaffected. Those affected include 3 week olds to adults that were previously unexposed. Lawsonia intracellularis causes proliferative enteropathies. Trichuris suis is a whip worm. Corona virus causes porcine epidemic diarrhea and transmissible gastroenteritis.

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Question

You have been called to a farm to fix several rectal prolapses in a group of 60 lb pigs. The pigs are not coughing and you notice that several of the gilts in the group also have reddened and enlarged vulvas. What could be causing both problems?

- Salmonellosis
- Low Ca to P ratio in the feed
- Genetic predisposition
- Aflatoxins
- Zearalenone

Explanation - The correct answer is zearalenone. This estrogenic effect of this mycotoxin causes edema of the vulva and sometimes edema of the rectum predisposing to rectal prolapses. There are some suspected genetic predispositions for rectal prolapses, but not for the enlarged reddened vulvas.

Calcium and phosphorus balance has no effects on either of the clinical presentations described. Severe diarrhea cause by salmonellosis can lead to rectal prolapses, but diarrhea or coughing (systemic manifestations) will be common.

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Question

Which of the following is not typically a clinical sign of hog cholera?

- Paresis or paralysis
- Oral ulceration
- Coughing and sneezing
- Vomiting and diarrhea
- Oral petechiation

Explanation - The correct answer is coughing and sneezing. Hog cholera is caused by a virus from the same family (Flaviviridae)as Bovine Viral Diarrhea virus (BVD), Border Disease virus (BD), Japanese Encephalitis virus, and West Nile virus. The USA is currently free of this reportable disease. The virus affects stem cells in bone marrow causing neutropenia and thrombocytopenia. Infected pigs become immune-suppressed and are more susceptible to many enteric bacterial infections. The virus can cross the

placenta causing reproductive failure. Clinical signs include fever, anorexia, diarrhea, vomiting, shivering, paresis, paralysis, conjunctivitis, oral ulcers, and petechiation. Diagnosis is by fluorescent antibody, serum neutralization, or virus isolation.

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Question

Which of the following external parasites is considered to be the most economically important in swine?

- Haematopinus suis
- Stomoxys calcitrans
- Demodex phylloides
- Pulex irritans
- Sarcoptes scabei

Explanation - Sarcoptic mange can cause pruritus in sows (mainly hyperkeratotic ear lesions) and growing pigs, resulting in reduced weight gains and feed efficiency.

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Question

A herd of pigs is presented for a sudden onset of respiratory distress with open mouthed breathing and frothy, pink, oral and nasal discharge. The pigs are lethargic, anorexic, and have a temperature of 106.0F. Pigs less than 6 months of age are mainly affected, but a few adults are showing clinical signs as well. What is the most likely diagnosis?

- Swine influenza
- Pleuropneumonia
- Mycoplasma pneumonia
- Atrophic rhinitis

Explanation - The correct answer is pleuropneumonia. Pleuropneumonia in pigs is caused by Actinobacillus pleuropneumoniae, a gram negative coccobacillus. The clinical signs described in the question are typical of pleuropneumonia. The disease has a rapid onset and primarily affects young pigs. The pneumonia is characterized by fibrinonecrotic and hemorrhagic lung lesions. Concurrent infections with Mycoplasma, Pasteurella, porcine reproductive and respiratory syndrome virus, or swine influenza virus are common. Atrophic rhinitis is characterized by sneezing, coughing, lacrimation, and occurs most commonly in pigs 3-8 weeks of age. Mycoplasma pneumonia or enzootic pneumonia is characterized by a persistent dry cough. Swine influenza can be differentiated from pleuropneumonia because swine influenza affects pigs of all ages in the herd and does not result in discharge of blood-tinged oral and nasal froth.

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Question

A group of 3-week old pigs is experiencing lameness issues. Several pigs have slightly swollen joints. You elect to euthanize one acutely affected pig to submit for diagnostic workup. Which of the following tests would be most valuable in helping you make a diagnosis?

- Serology for Mycoplasma suis
- Serology for Mycoplasma hyopneumoniae
- PCR for Mycoplasma hyorhinis
- Anaerobic culture for Mycoplasma
- Aerobic culture for Mycoplasma

Explanation - The correct answer is PCR for Mycoplasma hyorhinis. Both M. hyorhinis and hyosynoviae can cause arthritis in swine. M. hyorhinis is found in younger pigs while M. hyosynoviae is found in in older pigs. Mycoplasmas are difficult to culture and require special media. PCR testing is a more sensitive and quicker technique. M. suis (previously known as Eperythrozoonosis suis) is associated with anemia while M. hyopneumoniae is only associated with pneumonia.

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Question

What pathogen is an important disease of pigs and aquatic fowl, which by mutating can become a major worldwide zoonotic infection of humans?

- Influenza virus
- Hendra virus
- Nipah virus
- Parapox viruses
- Rift valley fever virus

Explanation - Many of the hot strains of human influenza virus emerge from Asia as recombinants from avian influenza.

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Question

Several pigs have died at a farm. Clinical signs included star gazing, blindness, seizures, ataxia, nystagmus, and head pressing. Histologic examination of the brain demonstrates perivascular infiltration of eosinophils. What is the most likely diagnosis?

- Vitamin A deficiency
- Rabies
- Salmonella
- Salt poisoning

Explanation - The correct answer is salt poisoning. In pigs, observation of perivascular infiltration of eosinophils in the brain is a reliable indicator of salt poisoning. Additionally, the clinical signs are consistent with this diagnosis. Salmonella would not have produced the same histologic lesions, and you would expect diarrhea. Rabies is always on the differential list, but the histologic findings are not consistent with rabies. Do you recall the diagnostic lesion for rabies? Yes, it's negri bodies. Vitamin A deficiency does not cause perivascular eosinophilic infiltration either.

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Question

A farrowing house is encountering mild to moderate diarrhea in 5-day old piglets. A diagnostic workup confirms Clostridium perfringens Type C infection. What should be your next plan of action?

- Change age of castration to 10 days of age
- Treat the sow with two doses of long acting tetracycline
- Vaccinate sows pre-farrowing
- Discontinue all antibiotic use
- Change boar genetics

Explanation - The correct answer is to vaccinate sows pre-farrowing. Colostral antibodies for Clostridium perfringens Type C are highly protective. Since the diarrhea is starting so early in life, there is no time to vaccinate the baby pigs and allow enough time to get protective immunity. They must rely on colostral protection. All the other options mentioned have no effect on the bacteria or the disease.

Question

You are called to a farm to investigate some recent reproductive problems. The farmer just changed genetic companies so is farrowing a large number of gilts (first parity females). Further review of their breeding records identifies a large number of mummies and stillborns. Farrowing rate has been consistently at 87% for the past 2 years. What is your top differential?

- Brucella suis
- Parvovirus
- Pseudorabies

- Leptospirosis
- Porcine reproductive and respiratory syndrome (PRRS)

Explanation - The correct answer is parvovirus. Parvovirus causes mummies and stillborns. It does not cause abortions. Having a consistent farrowing rate of 87% suggests their rate of abortions has not increased recently. Parvovirus infections appear to be endemic in most herds. With a large number of young females (gilts) in this herd, they are at a higher risk of having problems with parvovirus. Pre-breeding vaccinations especially for gilts are helpful in preventing reproductive consequences from the virus. PRRS, leptospirosis, and pseudorabies commonly cause abortions. Brucella suis causes infertility and not mummies.

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Question

You are called to a farm that just purchased 500 head of feeder pigs averaging 55 lb. The pigs arrived 3 days ago and everything seemed fine until today. Today there are 6 pigs that are lying down on their sides and paddling and a few others that are weak and staggering. What should you do next?

- Check antibiotics used in the ration
- Check the feed for mycotoxins
- Check feed availability
- Check water availability in all pens
- Check for signs of rodent infestation

Explanation - The correct answer is to check water availability in all pens. The clinical presentation is very typical for water deprivation/salt toxicity. Water deprivation will result in acute cerebral edema due to the accumulation of sodium ions in the brain. To prevent further water damage, water must be turned back on slowly (small amounts frequently) to prevent further cerebral edema from occurring as the animals become re-hydrated.

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Question

What are the morbidity and mortality rates for an outbreak of swine influenza in a herd of pigs?

- High morbidity and low mortality
- Low morbidity and high mortality
- Low morbidity and low mortality
- High morbidity and high mortality

Explanation - The correct answer is high morbidity and low mortality. Swine influenza causes outbreaks of respiratory illness in most pigs in a herd. Clinical signs include a high fever, prostration, coughing, anorexia, conjunctivitis, oculonasal discharge. Recovery takes about 1-2 weeks. Concurrent illness with other respiratory pathogens or poor husbandry can exacerbate the disease and cause higher mortality rates.

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Question

A 2-month old pig is presented for evaluation of lesions on the ventrum. You find multiple raised circular lesions. You tell the farmer that you suspect the lesions will resolve without further treatment. 3 weeks later, he returns, thankful that his pig has gotten all better. What condition did the pig have?

- Sporothrix schenckii
- Pityriasis rosea
- Microsporum nanum

- Erysipelothrix rhusiopathiae

Explanation - The correct answer is pityriasis rosea, a disease of unknown cause. Pityriasis rosea occurs in pigs 3-14 weeks of age and is characterized by raised circular lesions on the ventral abdomen. Pityriasis rosea resolves on its own in a few weeks without any treatment.

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Question

As an international consultant, you are called to examine a group of feeder pigs on a farm in West Africa. The pigs have high fever, inappetence, and hemorrhages in the skin of the ears. Several have died acutely, and you find petechial hemorrhages on internal organs. The clinical signs and lesions look like classical swine fever or erysipelas, but there is one other disease you need to rule out which also has similar signs. What is this other disease?

- Porcine parvovirus
- African swine fever
- Leptospirosis
- Swine dysentery
- Swine influenza

Explanation - ASF acts in a similar manner to classical swine fever. It is highly virulent, carried by bush pigs and warthogs, and can also be transmitted by soft ticks.

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Question

A litter of 2-week old piglets are presented for incoordination, salivation, opisthotonos, and seizures. You suspect pseudorabies and perform virus isolation to confirm your diagnosis. How will you treat these piglets?

- Treat the piglets with penicillin for secondary bacterial infections and wait for the viral infection to clear
- No treatment is needed; the piglets will clear the infection on their own in about a week
- Vaccinate the piglets and then repeat vaccinations again 3 weeks later
- There is no treatment for these piglets; herd needs to be depopulated.

Explanation - The correct answer is there is no treatment for these piglets; herd needs to be depopulated. Currently, all commercial US swine production is free of pseudorabies and therefore a confirmed diagnosis would require the immediate depopulation of the herd. Mortality in piglets this young with pseudorabies is near 100%. Piglets less than 3 weeks of age infected with pseudorabies often die in 1-3 days. Clinical signs include fever, anorexia, vomiting, blindness, convulsions, and neurologic signs. Pigs 3-9 weeks old have similar signs but their mortality rate is much lower. They also commonly show respiratory signs such as sneezing, nasal discharge, and coughing. Pigs older than 10 weeks infected with pseudorabies are more commonly affected with respiratory signs but may show CNS signs. Most of these pigs will recover in 7-10 days. Pregnant sows infected with the virus have reproductive failure including abortion, fetal resorption, and fetal mummification.

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Question

You are called to a farm to check some pigs that have severe respiratory problems and are not responsive to antibiotic treatment. These pigs are housed in an outdoor facility and are about 9 to 10 weeks old. The pigs have been vaccinated for PCV2 and Mycoplasma hyopneumoniae. What should be one of your top differentials?

- Ascaris suum
- Oesophagostomum dentatum
- Porcine reproductive and respiratory syndrome (PRRS)
- Trichuris suis
- Stephanurus dentatus

Explanation - The correct answer is Ascaris suum or the swine roundworm. A. suum larvae travel through the liver and into the lungs causing verminous pneumonia which is usually not responsive to antibiotics as the worm larvae continue to do significant lung damage. Raising pigs outdoors is a significant risk factor for roundworm infestation. PRRS does cause respiratory problems, but usually the secondary bacterial infections are controlled with antibiotics. None of the other parasites listed cause pneumonia. Trichuris suis is the pig whipworm, Oesophagostomum dentatum is the nodular worm, and Stephanurus dentatus is the kidney worm.

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Question

Multiple pigs from a herd are presented for lameness. After taking a history and performing physical exams, you determine the cause of the lameness to be osteochondrosis dissecans. What should you tell the owner?

- Cross-breeding the pigs will not necessarily change the incidence of disease in the herd. The farmer should consider culling the affected animals and replacing them
- Osteochondrosis dissecans in pigs is rare, and the farmer is unlucky in coincidentally having multiple affected pigs
- The affected pigs most likely are undernourished; to eliminate the problem, the pigs should be fed more so they gain more weight and muscle in a shorter amount of time
- The lame pigs should be bred with non-lame pigs to eliminate the occurrence of the disease

Explanation - The correct answer is cross-breeding the pigs will not necessarily change the incidence of disease in the herd. The farmer should consider culling the affected animals and replacing them. OCD commonly occurs in all major breeds of commercial pigs so cross-breeding does not eliminate the occurrence of the disease. Fast growing, well-muscled, larger pigs seem to be affected more commonly. Clinical lameness usually occurs after 4-8 months of age. Drugs may alleviate clinical signs but will only mask the incidence of the disease.

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Question

You are called to a sow farm to investigate an abortion outbreak. The owner has 600 sows and is concerned because 5 sows aborted overnight. Upon arrival you find that all 5 sows that aborted were at least 95 days pregnant. Everyone seemed fine 2 days ago but yesterday a few sows started to cough and were off feed. Today there are a lot more sows coughing. The aborted sows all have temperatures of 105.0 - 106.5F. Which of the following samples is most important in helping you confirm your diagnosis?

- Collect 2 aborted fetuses from each sow
- Collect blood samples from aborted sows only
- Collect nasal swabs from all aborted sows
- Collect a random sample of blood samples from sows (aborted and not aborted)
- Euthanize a sow and collect a complete set of tissues

Explanation - The correct answer is collect nasal swabs from all aborted sows. In this case, the sudden onset of coughing that is highly contagious is highly suggestive of swine influenza virus. Swine influenza virus does not go systemic. It causes abortion by creating a systemic illness (fever), but the virus does not spread via the blood. The virus is not found in the blood or the aborted fetuses. A necropsy of an affected sow is not necessary to confirm the diagnosis as nasal swabs of acutely affected animals are great diagnostic specimens.

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Question
A swine farmer has recently noticed that young pigs are growing poorly and seem to develop all sorts of minor disease problems. You do a postmortem on two of the worst and note subacute hepatic necrosis and fibrosis. Which of the following steps should you now pursue to make a diagnosis?

- Analyze feed for aflatoxin
- Run a battery of immune function tests on several pigs
- Test feed for zearalenone
- Analyze feed for ergot alkaloids
- Examine feed for visual signs of fungi

Explanation - Aflatoxins are one of the mycotoxins, and cause damage to hepatocytes. The clinical signs can be vague, but the lesions are fairly specific (although pyrrolizidine alkaloid toxicosis must also be considered).

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Question

You have diagnosed a hemolytic E. coli in a group of 350 three-week old pigs. Which of the following treatments would be your best recommendation for the farmer?

- Treat sick pigs with ceftiofur and use gentamycin in the water
- Neomycin in the feed
- Treat sick pigs with an injection of gentamycin
- Gentamycin in the water and neomycin in the feed
- Gentamycin in the water
- Treat sick pigs with an injection of ceftiofur

Explanation - The correct answer is to treat sick pigs with ceftiofur and use gentamycin in the water. Gentamycin is approved for use in young pigs. Because of the large size of the molecule, it is poorly absorbed. In this case we are targeting the E. coli in the intestines and are not concerned about systemic absorption of the antibiotic. Although injection of young pigs with gentamycin is legal, it has a voluntary long withdrawal period and can be nephrotoxic, especially in dehydrated patients. Water antibiotics can be very effective against enteric pathogens, but it does take about two days for pigs to start getting enough antibiotic in the water to start having an effect.

Because of this delay in the effectiveness of water antibiotics, it is important that we start treating sick pigs immediately. Three week old scouring pigs are very susceptible to dehydration, making a quick recovery critical. Because **enteric hemolytic E. coli is highly contagious**, water antibiotics will be necessary in helping prevent other pigs from becoming infected. Feed grade antibiotics can be effective against enteric pathogens but are not a good choice for treatment. Feed delivery may be a week away, and even if feed could be delivered that same day, it would take three or four days before pigs get enough antibiotic via the feed. Immediate action is crucial.

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Question

Several litters of 2 to 3 day old pigs have recently died rapidly with hemorrhagic enteritis. Post mortem lesions include mucosal hemorrhage, necrosis and emphysema in the small intestines. What pathogen is most likely to cause these signs?

- Enterotoxigenic E. coli
- Haemophilus parasuis
- Erysipelothrix rhusiopathiae

- Salmonella choleraesuis
- Clostridium perfringens type C

Explanation - The age of these affected pigs along with the rapid course of hemorrhagic and necrotic enteritis help you come to this conclusion. As with many Clostridial diseases, vaccination is the most effective means of control. Other important clostridial diseases of swine include C. perfringens type A, C. difficile, C. tetani, C. botulinum, C. novyi, C. septicum, and C. chauvoei.

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Question

This 2-year old pot belly pig in the picture presents for eating a box of cooking salt. It is very thirsty at presentation, but otherwise clinically normal. Its blood sodium concentration is 175 mEq/dl. What is the best treatment for this pig?

- Give unlimited amounts of drinking water
- Give a bolus of 50ml/kg of D5W (5% dextrose in sterile water) as an intravenous infusion to quickly lower the blood sodium concentration
- Send the pig home and have the owner bring the pig back if it starts to show neurologic signs
- Give Normosol R IV slowly to decrease the blood sodium concentration
- Give IV diazepam to suppress seizures and wait for the excess salt to be excreted by the kidneys

Explanation - The correct answer is to administer Normosol R IV slowly to decrease the blood sodium concentration. Salt poisoning in pigs occurs as a consequence of water deprivation (reduced amount of free water in the animal), or too much salt intake. When the blood sodium concentration is too high, water from the brain diffuses into the vasculature. The brain responds by forming hyperosmolar (idiogenic osmoles) particles to draw water back into the brain to prevent dehydration of its cells. Giving large amounts of free water in the form of drinking water or as a bolus of D5W intravenously will quickly drop the blood sodium concentration, causing a large amount of water to diffuse into the brain cells due to the hyperosmolar particles formed. Cerebral edema then ensues and neurologic signs result. Treatment should be aimed at slowly decreasing blood sodium concentration by about 1 meq/hr to prevent cerebral edema. This is best done by using a replacement fluid that approximates normal levels of sodium so as to not create too large of an osmotic gradient. Pigs showing clinical signs of brain disease usually die despite treatment.

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Question

Which of the following infections is not a differential for lameness in a young pig?

- Erysipelothrix rhusiopathiae
- Haemophilus parasuis
- Brachyspira hyodysenteriae
- Streptococcus suis
- Mycoplasma hyorhinis

Explanation - The correct answer is Brachyspira hyodysenteriae (formerly known as Serpulina hyodysenteriae). B. hyodysenteriae is the agent for swine dysentery in pigs. It can cause mucohemorrhagic diarrhea from the age of 3 weeks to adulthood if previously unexposed. The other listed infectious agents are common causes for arthritis in young pigs.

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Question

Which dermatophyte is most commonly associated with ringworm in the domestic pig?

- Trichophyton equinum
- Microsporum canis
- Microsporum nanum
- Trichophyton mentagrophytes

Explanation - The correct answer is Microsporum nanum which primarily affects pigs. T verrucosum can also be found in pigs. M. canis and M. gypseum most commonly affect dogs and cats. T. mentagrophytes and T verrucosum affect cattle and most commonly goats.

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Question

A large swine herd has recently been experiencing coughing in the feeder pigs and a few sows. A few have fevers and inappetence but most remain normal in appearance, however the weight gains in the feeder pigs have slowed and the owner is concerned. A post-mortem reveals purple to gray areas of consolidation in the cranio-ventral lungs, with a catarrhal exudate in the airways and enlarged regional lymph nodes. You isolate Mycoplasma hyopneumoniae from the lungs. What is the most cost effective approach to controlling this agent?

- Vaccination against M. hyopneumoniae
- Cull all pigs and start over with specific pathogen free pigs
- Eliminate carriers by test and slaughter
- Treat all pigs with tetracycline, 5mg/kg IM, for 3 days
- Improve biosecurity, as this agent is brought in by rodents

Explanation - Vaccines are effective and widely used in the US to control this disease. Air quality, ambient temperature, and ventilation must also be addressed.

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Question

Testing for Classical Swine Fever can be complicated by the presence of which of the following viruses in swine?

- Porcine Reproductive and Respiratory Syndrome virus (PRRS)
- Influenza type A virus
- Bovine Viral Diarrhea (BVD)
- Vesicular Stomatitis virus
- Porcine Circovirus Type 2 (PCV2)

Explanation - The correct answer is Bovine Viral Diarrhea (BVD). Although BVD virus does not usually cause disease in pigs, pigs do get exposed to the virus and seroconvert. Both BVD and CSF are Pestiviruses from the family Flaviviridae. Antibody production in pigs to BVD can cross react with some CSF assays. This can create some problems because CSF is considered a foreign animal disease in the U.S.

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Question

A group of swine have pyrexia, inappetence, dyspnea, swollen painful joints and lameness. You have tentatively diagnosed Glasser`s Disease caused by Haemophilus parasuis. Which of the following treatments should you use?

- Metronidazole
- Penicillin
- Ceftiofur
- Furazolidone
- Chloramphenicol

Explanation - The organism is usually susceptible to ampicillin, ceftiofur, enrofloxacin, florphenicol, spectinomycin, tetracyclines, tiamulin, tilmicosin, and potentiated sulfas. Today, many strains of Haemophilus parasuis are resistant to penicillin (penicillin used to be the drug of choice) and all other choices are not permitted for use in food animals in the USA.

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Question

Several swine on a large commercial confinement farm have recently shown mucous membrane pallor and dark feces. Today there is a dead finisher (about 5 months old), and on postmortem you find large amounts of clotted blood in the stomach and duodenum. Which of the following causes is most likely?

- Gastric ulcer
- NSAID toxicity
- Salmonellosis
- Mycotoxicosis
- Stomach worms

Explanation - Gastric ulcers in growing swine are common. They occur mainly in the pars esophagea portion of the stomach. Factors such as housing stress, finely ground feed and events that make pigs go off feed (feed delivery problems, respiratory disease outbreak, etc.) need to be investigated and problems corrected.

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Question

A swine producer is having problems with Isospora suis causing diarrhea in his nursing piglets. Which of the following is currently the most effective method of control in the US?

- Vaccination
- Medicated feed
- Improved sanitation especially in the farrowing house
- Feeding intestines of affected pigs to sows
- Early weaning

Explanation – The answer is improved sanitation especially in the farrowing house. Currently there are no swine approved drugs in the US against coccidiosis. Many practitoners are using ponazuril which is an FDA-approved equine protozoal myeloencephalitis (EPM) treatment. Today, the main area of exposure for swine to coccidia is in the farrowing house. There are currently no vaccines against coccidia.

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Question

A pig infected with Trichuris suis will show which of the following clinical signs?

- Mucoid diarrhea
- Dyspnea
- Evidence of liver disease
- Productive cough
- Head tilt

Explanation - The correct answer is mucoid diarrhea. Trichuris suis is the whipworm of pigs. It typically affects older, weaned pigs. It penetrates the mucosa and submucosa of the cecum and colon, causing a large bowel diarrhea, sometimes with blood. Diagnosis can be made by finding the worms on necropsy or by finding the ova on fecal flotation. The disease can be controlled well by keeping pigs off pasture, or by avoiding exposure to contaminated pastures. Anthelmintic drugs are effective.

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Question

What is the most common cause of stillbirths in pigs?

- PRRS
- Hog cholera

- Brucella suis
- Pseudorabies

Explanation - The correct answer is PRRS. This enveloped RNA viral disease can result in an increase of stillbirths by greater than 20%. Clinical signs include fever, abortion, stillbirth, and mummies. There is no effective treatment. A vaccine is available for prevention.

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Question

Several sows from a herd present for abortions. This is a smaller outdoor production system located in Texas. The owner reported seeing some wild boars roaming around the past few weeks. Most of the placentas and aborted fetuses have no gross lesions. The sows otherwise appear healthy and are not running a fever. Which of the following is the most likely diagnosis?

- Porcine reproductive and respiratory syndrome (PRRS)
- Parvovirus infection
- Brucellosis
- Hog cholera

Explanation - The correct answer is brucellosis. Although currently all 50 states in the US are free of swine brucellosis in commercial herds, feral swine have tested positive for Brucella suis. Texas is known to have a large population of feral swine. Brucellosis in swine often occurs in healthy appearing animals. Abortions occur at any stage in gestation. There are usually few fetal or placental lesions, but the fetus may be autolyzed. This disease is highly pathogenic in humans!

Hog cholera has been eradicated from the US and typically causes severe systemic illness in the sow along with abortion. PRRS causes fever and besides abortions, can also cause respiratory signs, vasculitis, and is seen with other concurrent disease in the herd. Porcine parvovirus is usually characterized by an early return to heat of bred sows or finding large numbers of mummified fetuses at farrowing, not abortions.

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Question

Two weeks ago, the owner of a small swine farm performed castrations on several litters of unvaccinated piglets. Now he calls you with the complaint that a number of pigs are walking very stiffly and two are unable to stand. On examination, you note erect ears, tail held straight out, elevated head, and a visible nictitating membrane on the stiff pigs. There are similar signs plus muscle rigidity in the down pigs. When touched, the pigs worsen and muscle spasms occur. What disease is this most likely to be?

- Selenium deficiency
- Clostridium tetani infection
- Hypomagnesemia
- Cerebellar hypoplasia
- Aspergillus infection

Explanation - The best prevention for all Clostridial diseases is vaccination. These pigs should be treated with penicillin, muscle relaxants, tranquilizers, tetanus antitoxin and vaccinated with tetanus toxoid. If the owner has the time, feeding these pigs orally with glucose solutions may also help survival (this is rarely done on commercial pig farms). Those surviving will need to be revaccinated in 4 weeks. You should also advise this owner on ways to castrate more effectively to avoid this problem.

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Question

You are examining a 200 lb replacement gilt (she is to become part of the breeding herd) with a crooked nose. There are no external signs of trauma. Her respiratory rate is normal and has a rectal temperature of 102.2 F. You suspect atrophic rhinitis. What should you do next?

- Recommend culling her from the herd

- Vaccinate for Mycoplasma hyorhinis
- Inject with flunixin meglumine
- Inject with long acting tetracycline
- Examine nasal turbinates for atrophy

Explanation - The correct answer is to recommend culling her from the herd. Atrophic rhinitis (AR) is caused by **Bordetella bronchiseptica** and **Pasteurella multocida type D**. Pigs become infected from the sow shortly after birth. The best way to control/eliminate AR is to select breeding stock that is negative for AR. Antibiotic treatment and flunixin meglumine will not reverse the condition and will probably not have any effects at this stage of the disease. Mycoplasma hyorhinis does not cause nasal deviation. Examination of nasal turbinates is not practical and does not provide useful information.

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Question

Which of the following is the most effective way of synchronizing lactating pigs?

- Introduce a new male
- Use an MGA (megestrol acetate) implant
- 2 shots of PGF2-alpha 11-14 days apart
- Batch wean at 3-4 weeks

Explanation - The correct answer is to batch wean the pigs in 3-4 weeks. This results in estrus 4-6 days later. As long as a pig is lactating she will not ovulate so you need to stop lactation by weaning the piglets.

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Question

You receive a report from your diagnostic submission on a pig with diarrhea that reveals serotype B Salmonella. Which of the following Salmonella would you be concern of?

- Salmonella Typhimurium
- Salmonella Dublin
- Salmonella Newport
- Salmonella Enteritidis
- Salmonella Choleraesuis

Explanation - The correct answer is Salmonella Typhimurium. It is important to know serotypes as actual speciation of Salmonella usually requires submission to the national veterinary laboratory and takes several weeks to complete. Knowing serotypes allows you to start considering the possible significance of the isolate. The serotypes for the other Salmonella are as follows: Dublin and Enteritidis (D), Choleraesuis (C1), and Newport (C2). Salmonella Enteritidis is specific to poultry.

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Question

You necropsy a pig that had a history of persistent hemorrhagic diarrhea and find a severely thickened and inflamed ileum. What is the likely diagnosis?

- Salmonella infection
- Rotavirus infection
- Clostridium perfringens infection
- Isospora suis infection
- Lawsonia intracellularis infection

Explanation - The correct answer is Lawsonia intracellularis infection. Lawsonia intracellularis is an intracellular gram negative bacillus anaerobe that causes soft buttery stool in some and acute hemorrhagic diarrhea in others. This disease most commonly occurs in weaned and older pigs. Weight loss is the most consistent sign, and the lesions are as described in the question. This disease is considered to be similar to Johne's disease in cows. The other answer choices all more commonly cause diarrhea in unweaned and/or young piglets (early nursery). Gross lesions on necropsy included proliferative ileitis and edematous mesentery with mesenteric lymphadenopathy.

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Question

Which of the following is true of Trichuris suis?

- It is a thread worm in pigs found in the cecum
- It is a whipworm that causes mucohemorrhagic diarrhea in pigs of all ages
- It is a kidney worm in pigs that causes renal failure
- It is a roundworm found in pig stomachs causing vomiting
- It is a roundworm that is found in the lungs of pigs and causes coughing

Explanation - The correct answer is it is a whipworm that causes mucohemorrhagic diarrhea in pigs of all ages. Trichuris suis occurs most commonly in pigs less than 6 months of age but can affect any age group. Clinical signs include dehydration, anorexia, mucohemorrhagic diarrhea, and sometimes death. The worms are found in the cecum and colon. Controlling the disease includes treating sows with anthelmintics a week or two before farrowing and moving them to a clean pasture. Raising swine off soil also helps control the disease.

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Question

A litter of 2-day old piglets are presented for hemorrhagic diarrhea. Necropsy of one dead piglet reveals dark red small intestines filled with hemorrhagic fluid. What is the most likely diagnosis?

- Swine dysentery
- Enteric colibacillosis
- Transmissible gastroenteritis
- Rotavirus enteritis
- Clostridium perfringens type C enteritis

Explanation - The correct answer is Clostridium perfringens type C enteritis. C. perfringens type C causes acute hemorrhagic diarrhea and death in piglets 1-7 days old. Enteric colibacillosis (enterotoxogenic E. coli) causes diarrhea in piglets up to 2 weeks of age, but does not usually cause hemorrhagic diarrhea or death. Rotavirus enteritis does not usually cause hemorrhagic diarrhea or death. TGE (a coronavirus) affects all age groups and causes nearly 100% mortality in piglets less than 2 weeks of age. It also sometimes causes vomiting but does not cause hemorrhagic diarrhea. Swine dysentery (Brachyspira hyodysenteriae) causes bloody diarrhea and death typically in grower and finisher pigs.

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Question

What is the causative agent of transmissible gastroenteritis (TGE) in swine?

- Brachyspira hyodysenteriae
- Parvovirus
- Lawsonia intracellularis
- Isospora suis
- Coronavirus

Explanation - The correct answer is coronavirus. TGE is a viral disease of the small intestines causing vomiting and watery diarrhea. Mortality is 100% in piglets < 10 days old, but they seldom die if they are > 1 month old when infected. There is no specific treatment.

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Question

A litter of 4 day old piglets presents for bloody diarrhea. Necropsy of one dead piglet reveals hemorrhagic and necrotic enteritis. There are many large gram positive rods in mucosal smears indicative of a

Clostridium perfringens infection. What are the morbidity and mortality rates of Clostridium perfringens type C in piglets?

- High morbidity and low mortality
- High morbidity and high mortality
- Low morbidity and low mortality
- Low morbidity and high mortality

Explanation - The correct answer is high morbidity and high mortality. Clostridium perfringens type C enteritis usually occurs in neonatal piglets less than 7 days old. The disease causes bloody diarrhea and is usually fatal. In acute outbreaks, some piglets may be found dead even before developing hemorrhagic diarrhea. The signalment, history, and clinical signs are suggestive of a diagnosis. Clostridium perfringens type C enteritis also occurs in neonatal lambs, calves, foals, and poultry.

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Question

You have been called to a pig farm to investigate an acute outbreak with high mortalities. The farm has one large confinement with 1,050 pigs. Pigs currently weigh around 50 lbs. This is the same producer who had stopped at your clinic just a few days ago to purchase some neomycin for the water to treat these pigs for salmonella. The pigs are currently on day 3 of the 5 day water medication regime. The health of the pigs has gotten worse. The pigs are cyanotic and are piling up.

The farmer lost 2 pigs before he started the water medication, 6 pigs yesterday, and 45 today for a total of 53 or just over 5% mortality. He informs you that he is very concerned that there was a feed mix up that occurred 3 weeks ago while he was away on a hunting trip in Africa.

As you necropsy the first 5 pigs you notice markedly enlarged spleens (two with splenic infarcts), hemorrhagic lymph nodes, pinpoint hemorrhages on kidney capsules, generalized pulmonary edema, and some fibrin over the heart and lungs. What should you do next?

- Contact the Food and Drug Administration (FDA)
- Collect 60 blood samples from affected pigs
- Collect a 1 pound sample of feed in a paper bag
- Contact the state veterinary authorities
- Stop the administration of neomycin immediately

Explanation - The correct answer is to contact the state veterinary authorities immediately. This could be a case of African Swine Fever (ASF). The very high mortality, pigs with fevers (pigs piling), septicemia (cyanosis, hemorrhages on multiple organs) and enlarged spleens with infarcts are all suggestive of a highly infectious disease. The history of the farmer returning from hunting also indicates foreign travel (Africa). Warthogs are known reservoirs of ASF virus and usually do not show any clinical signs of infection. The incubation period for ASF varies from 5 - 15 days (fits the time frame of this scenario). Domestic pigs are highly susceptible with high mortalities.

The neomycin is not contributing to the problem. It is simply not effective against a viral infection. There is no need to call the FDA either. Although a feed mix-up occurred, that was 3 weeks earlier so taking a feed sample today does not address what may have been in the feed earlier. There is no need to collect blood samples at this time. Once a Foreign Animal Disease investigation is initiated, the authorities will determine what samples (whole blood or serum) and how many samples if any are needed. Besides, with a high morbidity and mortality (i.e. high prevalence), there would be no need to sample that many animals anyway.

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Question

The pot bellied pig in the picture is infected with Trichinella spiralis. How is this parasite in pigs transmitted?

- Ingestion of earthworms, the intermediate host
- Ingestion of encysted larvae in feces
- Ingestion of encysted larvae in urine
- Ingestion of encysted larvae in muscle
- Ingestion of snails, the intermediate host

Explanation - The correct answer is ingestion of encysted larvae in muscle. Trichinella spiralis is a worm that can infect most mammals. It commonly affects wildlife, including bears, horses, rats, marine mammals, and of course, pigs. Infection in pigs is often due to ingestion of rodents, raw garbage, or cannibalism of meat infected with the cysts. Humans can get the infection by eating inadequately cooked pork. Control in pigs is to prevent them from cannibalizing the dead, prevent them from eating rodents, and by cooking the garbage that is fed to them.

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Question

You are called to an outdoor production facility that is having health challenges in their pigs starting at 150 lbs. Pigs have a normal respiratory rate and there is no significant coughing but pigs are very thin and their stools are loose. Stools do have some mucous and every so often some blood is noted. Pigs are routinely dewormed with avermectin injections as well as piperazine in the water. What should be one of your top differentials?

- Ascaris suum
- Haematopinus suis
- Strongyloides ransomi
- Trichuris suis
- Oesophagostomum spp

Explanation - The correct answer is Trichuris suis. The swine whipworm can cause a hemorrhagic to mucohemorrhagic enteritis and is primarily located in the cecum. T. suis are not susceptible to avermectin or piperazine. Ascaris suum (roundworm), Oesophagostomum spp (nodular worm), and Strongyloides ransomi (threadworm) are all susceptible to avermectin with the first two also being susceptible to piperazine. Haematopinus suis is the pig louse.

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Question

Which type of mycobacterium is most often incriminated as a cause of tuberculosis in swine in the US?

- Mycobacterium avium
- Mycobacterium suis
- Mycobacterium tuberculosis
- Mycobacterium bovis
- Mycobacterium hyodysenteriae

Explanation - M. avium complex often includes M. intracellulare. The incidence is low (it was down to 0.21% of carcasses in 1995) but it may have public health implications. M. bovis can occur in pigs but is now rare in the US. M. suis and M. hyodysenteriae do not exist.

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Question

A group of 20 farm pigs are being raised because the owner has extra barley and he is feeding the pigs from weaning to finish mainly on barley and table scraps. The pigs are housed outside and now approaching 150 lbs. He calls you because this week several pigs have not been able to get up. You examine three down pigs and find that they have a normal TPR but all appear to have pelvic and femoral fractures. What is the most likely diagnosis, based on this history and findings?

- Bone fractures due to nutritional imbalance
- Bone fractures due to Vitamin D deficiency
- Botulism
- Mycoplasma arthritis
- White muscle disease due to selenium deficiency

Explanation - The high dietary phosphorus and lack of calcium can result in bone resorption and spontaneous fractures. Vitamin D3 could also be inadequate, but this is less likely if the animals are housed where they can get some sunlight.

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Question

Your office manager calls to tell you that 2 of your technicians have called in sick after a 3 day weekend. You think this is strange because they both seemed quite happy and healthy at the office 4th of July party that weekend.

You call to check on them and the first technician tells you that she has severe abdominal pain and a fever. Her doctor told her to go the emergency room as he suspected appendicitis and she may need emergency surgery. You are alarmed to find out that the other technician has similar symptoms.

It strikes you as unlikely for 2 employees to develop appendicitis simultaneously and you consider other possibilities. You then remember that they both ate pork sandwiches at the Fourth of July party. While you know you cannot make a diagnosis, you tell them to mention this to their doctor. Which of the following is a foodborne infection that typically causes these signs?

- Yersinia enterocolitica
- Clostridium botulinum
- Hepatitis A
- Ascaris suum
- Listeria monocytogenes

Explanation - These signs are most consistent with Yersinia enterocolitica infection. Also consider Trichinella spiralis which can cause similar signs but can take longer to show signs.

Listeria is probably the second best choice as it can cause fever and muscle aches, but it only sometimes causes gastrointestinal signs such as nausea and diarrhea and should not cause this sort of acute abdominal pain.

Clostridium botulinum causes primarily nervous system signs.

Hepatitis A virus typically causes mild signs but can cause liver damage, fatigue, and jaundice.

Ascaris suum is a parasitic roundworm of pigs. Infection in humans is very rare and signs are neurologic or hematologic.

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Question

Which of the following vesicular diseases that can affect swine is currently found in the U.S.?

- Swine vesicular disease
- Foot and mouth disease (FMD)
- Vesicular exanthema of swine
- Vesicular stomatitis

Explanation - The correct answer is vesicular stomatitis. All other vesicular diseases are foreign animal diseases. Because clinical presentation cannot distinguish between all of these viruses, any time vesicles are present in pigs, federal authorities need to be contacted immediately to ensure it is not a new introduction of a foreign animal disease.

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Question

A group of 3 month old pigs presents for soft yellow diarrhea in some and hemorrhagic diarrhea in others. They continue to eat well, but they are losing weight and are lethargic. Necropsy of one animal shows thickened intestines and curved bacteria inside enterocytes. What is the most likely diagnosis?

- Rotavirus infection
- E. coli infection
- Lawsonia intracellularis infection
- Isospora suis infection
- Clostridium perfringens type C infection

Explanation - The correct answer is Lawsonia intracellularis infection. Lawsonia intracellularis is an intracellular Gram-negative bacillus anaerobe that causes soft buttery stool in some and acute hemorrhagic diarrhea in others. This disease most commonly occurs in weaned and older pigs. Weight loss is the most consistent sign, and the lesions are as described in the question. This disease is considered to be similar to Johne's disease in cows. The other answer choices all more commonly cause diarrhea in unweaned and young piglets.

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Question

You are called to a farm that is experiencing sudden death in a group of pigs that are scheduled to go to market in 10 days. Upon performing a necropsy, you find large amounts of blood in the small intestine and spiral colon. The blood is red and clotted. There is no gross thickening of the intestinal mucosa. Your diagnosis is which of the following?

- Hemorrhagic bowel syndrome
- Erysipelas rhusiopathiae
- Intestinal torsion
- Proliferative hemorrhagic enteropathy
- Stomach ulcer

Explanation - The correct answer is proliferative hemorrhagic enteropathy or PHE. Acute ileitis or PHE is caused by Lawsonia intracellularis. The name PHE can be deceiving as its acute nature does not always allow for gross evidence of proliferation. Lesion location in the small intestines as well as indications of red

clotted blood is almost pathognomonic for the condition. Hemorrhagic bowel syndrome and intestinal torsion are not associated with intraluminal coagulated blood on necropsy. Digested blood is a sequelae to stomach ulcers. Erysipelas does not cause enteric pathology.

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Question

A herd of pigs is presented for various reasons; some pigs have been found suddenly dead with no other apparent clinical signs. Some animals are febrile, lethargic, unable to rise, and have multifocal diamond-shaped skin lesions over their bodies. Some animals have swollen, painful hocks and carpi. What is the most likely causative agent/diagnosis?

- Swine pox
- E. coli
- Mycoplasma hyosynoviae
- Erysipelothrix rhusiopathiae
- Lawsonia intracellularis

Explanation - The correct answer is Erysipelothrix rhusiopathiae. There are 3 forms of erysipelas. In the peracute form, pigs are found suddenly dead with no other clinical signs. In the acute form, the pigs become lethargic, painful in their joints, anorexic, and develop diamond-shaped skin lesions. In the chronic form, the arthritis progresses to the vertebral joints and the limb joints may fuse. All three forms of the disease can appear in a herd, particularly if there is noncompliance of vaccination of the herd and if treatment is delayed. The diamond-shaped skin lesions are pathognomonic for the disease.

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Question

Leptospirosis is usually observed when livestock come into contact with urine from an infected maintenance host. Which of the following is the most important maintenance host of L. interrogans serovar Pomona?

- Rats
- Cattle
- Dogs
- Cats
- Swine

Explanation – Correct answer is swine.

- Pomona- swine, opossums, skunks and racoons
- Canicola- dogs
- Icterohemorrhagiae- rats
- Hardjo- cattle
- Grippotyphosa-mice, muskrats and squirrels

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Question

You identify a pig with skin lesions characteristic of Pityriasis rosea. What should you do next?

- Give it an injection of avermectin
- Segregate the pig from others
- Euthanize the pig
- Do nothing
- Give it an injection of penicillin

Explanation - The correct answer is to do nothing. Pityriasis rosea is a skin condition in pigs of unknown etiology. It is not a contagious condition and therefore pigs do not need to be separated from the rest of the herd. It is non-pruritic and resolves on itself with time. Almost all pigs fully recover with no effects on health or growth performance.

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Question

Which of the following is the most important problem associated with leptospirosis in pigs?

- Abiotrophy of the spleen
- Reproductive failure
- Chronic kidney disease
- Purple extremities due to vasculitis

Explanation - The correct answer is reproductive failure. Acute leptospirosis in young pigs causes fever, anorexia, hemolytic anemia, hemoglobinuria, jaundice, and failure to grow. Chronic infections in dams cause reproductive failure as late term abortions, mummies, or weak piglets that die in a few days. Dams usually recover, conceive again, and carry their litters to full term.

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Question

You are visiting a swine farm in Oklahoma with no other known swine farms located within a 5 mile radius. The pigs weigh about 100kg. They are from a sow farm that has been testing negative for PRRS for the past 2 years. The pigs were doing quite well until 3 days ago when they started coughing. Today, over 90% of the pigs seem to be coughing. You take rectal temperatures of 5 clinically affected pigs and they all have temperatures greater than 105 degrees F (normal temperature is 101.0-103.0 F). There is some sneezing and you note nasal discharge in over 60% of the pigs. This nasal discharge varies from clear to thick and white. What should you recommend?

- Vaccinate for swine influenza using a commercial killed vaccine
- Vaccinate for PRRS using a commercial MLV vaccine
- Treat all pigs with oral antibiotics for 5 days
- Vaccinate for swine influenza using an autogenous killed vaccine
- Nothing since it is most likely a viral infection and there are no antivirals approved for pigs
- Vaccinate for PRRS using an autogenous killed vaccine

Explanation - The correct recommendation is to treat all pigs with oral antibiotics for 5 days. The rapid spread of the disease (90+% in just 3 days) and the high fevers are the classic clinical presentation of a **swine influenza** outbreak. Although antibiotics do not treat the viral infection, secondary bacterial infections almost always occur in conjunction with swine viral respiratory infections (porcine respiratory disease complex; PRDC). Prompt treatment for secondary bacterial infections is critical, and with 90+% animal affected, all animals need to be treated. The white nasal discharges support a bacterial component.

It is unlikely that PRRS is involved, since the pigs are from a negative sow farm and are well isolated from other pigs. Vaccination is not a good option at this time because all pigs are already affected (already naturally vaccinated). It is also important to note these pigs are large (220 lbs) and some pigs will be going to market in just 2 to 3 weeks, thus there is concern with vaccine slaughter withdrawal (usually at least 21 days for vaccines) as well as minimal time for any vaccine benefit.

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Question

Rectal strictures are a common sequela to which of the following diseases in pigs?

- Salmonellosis
- Clostridium perfringens type C enteritis
- Swine dysentery
- Trichuris suis infection

- Transmissible gastroenteritis

Explanation - The correct answer is salmonellosis. Although not common today, pigs with chronic cases of intestinal salmonellosis may have rectal strictures and "button" ulcers in the large intestine as sequelae. The disease is more commonly found in weaners and growers. The other answer choices all cause diarrhea, but only intestinal salmonellosis causes rectal strictures.

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Question

You have diagnosed proliferative enteritis in a swine herd and the owners wish to undertake a control program. Which of the following is most effective at controlling the disease?

- Vaccination against Lawsonia intracellularis
- Vaccination against Salmonella choleraesuis
- Vaccination against Brachyspira pilosicoli
- Cull entire herd and start over with specific pathogen-free pigs
- Identify and cull carriers of Lawsonia intracellularis

Explanation - Proliferative enteritis, also called proliferative ileitis, is caused by L intracellularis. A modified live Lawsonia intracellularis vaccine is marketed in the US and has proven to be effective. Treatment with tiamulin or tylosin for 14 days in the water or feed is also helpful.

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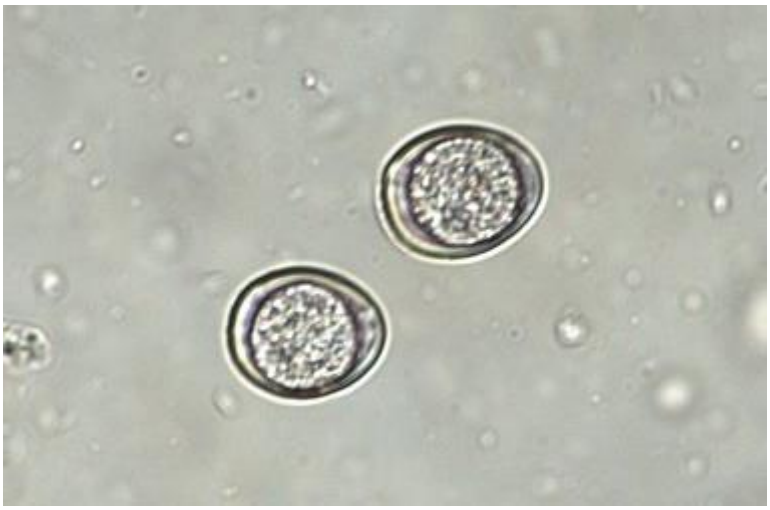
Question

You identify the organism shown in the image below from the feces of a 13 day old piglet having diarrhea (image taken at 40X, organism is approximately 20 x 20 um). Which of the following is an appropriate treatment option?



- Doxycycline
- Ponazuril
- Ivermectin
- Fenbendazole

Explanation - This is an image of Isospora suis, the cause of coccidiosis in pigs.

There are several anti-coccidial agents that can be considered in pigs although efficacy may vary. Ponazuril is an antiprotozoal drug approved for equine protozoal myeloencephalitis (EPM) that is active against the developmental stages of coccidia. Sulfamethazine, amprolium, and decoquinate are other anti-coccidial drugs. These agents reduce parasite burdens and shedding, but are frequently not completely effective at eradicating the parasite.

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Question

You are called to an organic swine farm to address a problem with piglet performance. The owner reports he is losing a large number of pigs due to wasting. The pigs seem to do fine for about 3 weeks and then will start losing weight. Pigs are left on the sow for 4-5 weeks before they are weaned. Many of the pigs are in such bad shape by the time they are weaned they are not able to recover in the nursery phase. As you visit the farm you find one dead piglet. It appears to weigh just over 10 lbs. You perform a necropsy and notice the small intestines to be extremely thickened. The owner thinks the pig is about 4 weeks old. As you look for other pigs you find 40% of them are thinner than expected. Several of them have a loose stool. No blood is noted on any stools. Sows seem to be eating well. All pigs are vaccinated for ileitis. What question should you ask the owner?

- Have there been any new additions to the herd in the past 3 months?
- When are pigs vaccinated for ileitis?
- Do you remove all antibiotics from the feed 3 days before and 3 days after vaccinating for ileitis?
- What is the PRRS status of the herd?
- Are pigs vaccinated against PCV2?

Explanation - Your next question for the farmer should be "When are pigs vaccinated for ileitis?" The clinical presentation of diarrhea, extremely thickened small intestines, and wasting pigs is highly suggestive of Lawsonia intracellularis infection, commonly called ileitis. In modern pig production, ileitis vaccine is usually administered in the mid-to-late nursery stage (6 - 8 weeks of age) as clinically the disease becomes apparent when pigs are >12 weeks of age. In this case, because the farmer raised the pigs without antibiotics and most likely they are outdoors (organic production), the thus pigs are exposed to heavy doses of Lawsonia intracellularis organisms very early in life. This results in clinically affected pigs even as early as 3 weeks of age. Since the farmer is using a vaccine it is important to know right away if the timing of the vaccine is appropriate (at least 3 weeks before clinical signs are noted).

In this case, there is no need to ask about antibiotic use around vaccination as the farmer produces organic pigs and thus no antibiotics are allowed. PRRS does not cause thickening of intestines. PCV2 can cause wasting of pigs, but clinically affects pigs in the finishing phase (usually > 12 weeks of age). Ileitis is endemic in most, if not all, farms and therefore herd additions would not be a significant contributor to an acute outbreak.

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Question

Which of the following is true about hernias in swine?

- Inguinal hernias in pigs occur more commonly in females than males
- Inguinal hernias are always bilateral
- Umbilical hernias in pigs occur more commonly in males than females
- Inguinal hernias in pigs is heritable

Explanation - The correct answer is inguinal hernias in pigs is heritable. Both inguinal and umbilical hernias occur commonly in pigs. Inguinal hernias occur more commonly in males than females, particularly after castration. They can be unilateral or bilateral and occur more commonly on the left side. Umbilical hernias occur in both sexes but are slightly more common in females.

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Question

You have been called to a large farm with 60 dead pigs. You decide to perform some necropsies to get a better feel for what is going on. How many of the pigs should you necropsy?

- Keep necropsying pigs until you see a pattern
- Dead pigs have no value, go directly to the barn and look at the other pigs
- Necropsy all 60 pigs
- Randomly select 30 pigs

- Select the 10 worst pigs for necropsy

Explanation - The correct answer is to keep necropsying pigs until you see a pattern. When dealing with large populations of animals you must be able to differentiate individual pig problems from population problems. It is not efficient to necropsy all pigs or even just select 30 head. Doing only 10 head may or may not provide you with a true picture of what is going on in the whole herd.

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Question

Which of the following cells is the primary target for porcine reproductive and respiratory syndrome (PRRS) virus infection?

- Type I pneumocytes
- Type II pneumocytes
- Alveolar macrophages
- Ciliary epithelium

Explanation - The correct answer is alveolar macrophages. PRRS virus has a high affinity for macrophages especially those in the lung. This is part of the reason the porcine immune system is compromised when infected with PRRS making them more susceptible to other pathogens.

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Question

You have arrived at a farm with a history of acute outbreak of sudden death. Pigs average 80 lbs and the producer has lost 25 pigs out of 1,150 in the last 2 days. Several of the dead pigs have blood tinged fluid coming out of their noses. Which of the following is your top differential?

- Rodenticide poisoning
- Mycoplasma hyopneumoniae
- Vitamin D deficiency
- Actinobacillus pleuropneumoniae
- Porcine reproductive and respiratory syndrome (PPRS)

Explanation - The correct answer is Actinobacillus pleuropneumoniae (APP). The virulence of APP is due to exotoxin production by the bacteria which causes a vasculitis and hemolysis, especially in the lungs.

Rodenticide poisoning of an entire group of pigs is extremely rare as it would require large amounts of poison mixed in the feed. Mycoplasma hyopneumoniae is a slow growing organism and is not associated with an acute outbreak with sudden death. Porcine reproductive and respiratory syndrome is a common cause of respiratory outbreaks in pigs but usually does not cause high mortality by itself (co-infections are the culprit). Vitamin D deficiency alters calcium and phosphorus homeostasis.

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Question

In the U.S., swine tuberculosis is most commonly associated with exposure to materials (feed, water, bedding) contaminated by what animals?

- Birds
- Feral swine
- Domestic swine
- Dairy cows

Explanation - The correct answer is birds. Swine TB is very rare in the U.S. due to modern hog production practices. Bovine TB is still present but is not very common either. Deer can serve as a source to contaminate water but is not as common. Most cases of TB in swine today is cause by avian TB. Most swine outbreaks today are traced back to contaminated water (use of surface water such as ponds or lakes) or bedding.

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Question

Which of the following is a common cause for diarrhea in growing and finishing pigs?

- Rotavirus
- E. coli
- Clostridium perfringens type C
- Salmonella
- Isospora suis

Explanation - The correct answer is Salmonella. Salmonellosis occurs most commonly in grower and finisher pigs. Adults and nursing or weaning pigs are uncommonly affected by Salmonellosis. E. coli, Clostridium perfringens type C, Isospora suis, and rotavirus infections all commonly cause diarrhea in young nursing piglets, but uncommonly in growers and finishers.

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Question

You are called to consult on a large pig farm in South America where piglets are developing anorexia, listlessness, ataxia, and convulsions a day after birth. Piglets a few days of age are showing trembling, hypersalivation, incoordination, ataxia, nystagmus, and seizures before dying. Mortality in piglets a few days of age in the last few days has approached 100%. What disease is this most likely to be?

- Porcine cytomegalovirus
- Pseudorabies
- Porcine parvovirus
- Classical swine fever
- Porcine adenovirus

Explanation - Also known as Aujeszky`s Disease, this disease can devastate a non-immune herd. The disease has been eradicated from pigs in the USA, but persists in South America, Europe and Asia.

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Question

Which of the following is true of gastrointestinal obstructions of swine?

- Colonic torsions are common causes for obstruction
- Intussusceptions can occur in pigs infected with strongyles
- Treatment of choice for intestinal obstructions in pigs include antibiotics, stool softeners, and enemas
- Clinical signs of obstruction include vomiting and diarrhea

Explanation - The correct answer is intussusceptions can occur in pigs infected with strongyles. Pigs with intestinal obstructions usually have vomiting as a clinical sign, but no diarrhea. Usually, the obstructed pigs have no stool. They are usually tachycardic, restless, and show signs of colic.

Common causes of obstruction include peach pits lodged in the jejunum of pot bellied pigs, fibrous rings around the spiral colon or small intestine, and intussusception in pigs with strongyle (especially oesophagostomum) infections. Colonic torsions are rare. The treatment of choice for obstruction is surgery, otherwise ensure proper deworming protocols for the rest of the herd.

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Question

You have been called to a swine farm with 2400 pigs weighing around 150 lbs because of sudden onset of respiratory signs. Upon arrival you find over 50% of the pigs are coughing. They are off feed and lethargic. The owner reports the coughing just started 2 days ago. The pigs have been vaccinated for porcine reproductive and respiratory syndrome virus (PRRS), Mycoplasma hyopneumoniae, porcine circovirus type 2 (PCV2), and swine influenza. What is your top differential?

- Streptococcus suis
- Swine influenza
- Porcine circovirus type 2 (PCV2)
- Classical swine fever
- Mycoplasma hyopneumoniae
- Porcine reproductive and respiratory syndrome virus (PRRS)

Explanation - The correct answer is swine influenza. The rapid spread within a population (>50% in just 2 days) is characteristic for swine influenza. Although this group of pigs had been vaccinated for swine influenza, the great diversity in the virus (especially due to antigenic shift) does not guarantee that the particular vaccine used will contain influenza strains that match or cross protect against the specific virus the herd has been exposed to. PRRS and PCV2 viruses both can cause respiratory problems in pigs, but they tend to move very slowly within a population. Mycoplasma hyopneumoniae clinically presents as a more chronic problem. Strep. suis can cause pneumonia but usually is more of a problem for an individual or small group of pigs. Classical swine fever is currently not present in the US and manifests as a systemic and enteric problem in pigs and not associated with pneumonia.

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Question

Which of the following is the most common mode of transmission for Strongyloides ransomi in pigs?

- Fecal oral
- Transcolostrally
- Cutaneously
- Via eating earthworms, the intermediate host

Explanation - The correct answer is transcolostrally. Strongyloides ransomi are threadworms of pigs. They reside in the small intestine of suckling piglets. Pigs may not show any clinical signs with only light infections. Heavy infections can cause diarrhea, anemia, emaciation, and death. Diagnosis can be made by fecal flotation, by an intestinal mucosal scraping, or on necropsy. Benzimidazoles and ivermectin are effective in treating these worms. (Earthworms are the intermediate hosts of the kidney worm of pigs, Stephanurus dentatus, and the lungworm of pigs, Metastrongylus spp.)

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Question

A herd of pigs is presented for multiple 1-2 cm round papules, pustules, vesicles, and scabs on their ventral abdomens. Young and growing pigs are most severely affected. What is the most likely diagnosis?

- Greasy pig disease
- Swine pox
- Erysipelas
- Pseudorabies

Explanation - The correct answer is swine pox. The disease is caused by a pox virus that causes the skin lesions described in the question. All ages can be affected, but it is more commonly seen in young and growing pigs. The disease is often transmitted by biting insects, particularly lice. The disease usually does not require treatment, unless the lesions become secondarily infected. Broad-spectrum antibiotics may be helpful in this situation. Hog lice and insect vectors should be investigated and eliminated to help control swine pox.
Erysipelas causes diamond-shaped skin lesions and necrosis of the ears and tail.
Greasy pig disease or exudative epidermitis is caused by Staphylococcus hyicus. It causes dark, greasy, brown skin lesions in the axilla, groin, head, and face.
Pseudorabies affects the CNS, respiratory system, and causes reproductive failure.

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Question

Which infectious agent causes the clinical presentation of pigs most similar to Haemophilus parasuis (Glasser's disease)?

- Erysipelothrix rhusiopathiae
- Fusobacterium necrophorum
- Mycoplasma hyosynoviae
- Streptococcus suis

Explanation - The correct answer is Streptococcus suis. Streptococcus suis and H. parasuis both cause **polyarthritis**, **polyserositis**, **fever**, and **pneumonia** in **young piglets** up to several weeks of age. Both can cause fibrinopurulent inflammation as well as **meningitis** and convulsions.

Erysipelas and M. hyosynoviae typically occur in grower and finisher pigs and do not result in pneumonia. Diamond-shaped skin lesions (thus the name "diamond skin disease") are pathognomonic for Erysipelas. Fusobacterium necrophorum causes lameness via footrot or laminitis.

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Question

Several weaner pigs have developed anorexia, followed by diarrhea and edema of the eyelids, forehead and lips. The pigs also have dyspnea and are open mouth breathing. Some are weak and circling. What pathogen is the most likely cause?

- Enterotoxogenic E. coli
- Clostridium tetani
- Transmissible gastroenteritis virus
- Salmonella typhimurium
- Porcine Parvovirus

Explanation - The edema disease producing E. coli produce a heat stable toxin called Stx2e (Shiga toxin 2e). When absorbed into the blood, this toxin destroys endothelial cells in small vessels, resulting in blood clots, hemorrhage, ischemic necrosis, and edema in vital organs, including the brain.

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Question

A group of 3-day old piglets are huddled together in the farrowing house shivering. What disease should you suspect?

- Lawsonia intracellularis
- Transmissible gastroenteritis
- Escherichia coli
- Rotavirus
- Salmonella

Explanation - The correct answer is Escherichia coli. This question may seem vague but this is the kind of information you need to know. E. coli is most likely to occur at less than 5 days of age and sometimes from 7-14 days. Rotavirus often occurs in association with E. coli. TGE is a severe disease in piglets with 100% mortality in pigs less than 2 weeks of age; the most striking feature is the wet and dirty appearance of the litter due to profuse diarrhea. Salmonella is uncommon in piglets due to passive immunity from colostrum. Lawsonia is a slow growing organism and affects mostly older pigs and usually causes gradual wasting and diarrhea.

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Question

Fusobacterium necrophorum commonly contributes to which of the following diseases in young pigs?

- Necrotic rhinitis
- Hepatic abscesses
- Gastroenteritis
- Pleuropneumonia
- Metritis

Explanation - The correct answer is necrotic rhinitis. Fusobacterium necrophorum is a gram negative anaerobe that causes hepatic abscesses in cows, gastroenteritis in ruminants, foot rot in pigs and ruminants, and metritis in cows. Pleuropneumonia in pigs is caused by Actinobacillus pleuropneumoniae. Necrotic rhinitis is a sporadic disease of young pigs in which they undergo necrosis of the snout when F. necrophorum enters a wound in the nasal or oral mucosa.

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Question

What is the approximate gestation length of pigs?

- 115 days
- 183 days
- 145 days
- 88 days

Explanation - The correct answer is 115 days. A useful way to remember this is "3 months, 3 weeks, 3 days"

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Question

Water deprivation followed by unlimited access to water can cause which of the following signs in pigs?

- Head pressing
- Sneezing
- Diarrhea
- Coughing
- Shifting leg lameness

Explanation - The correct answer is head pressing. Water deprivation causes dehydration and an elevation in blood sodium concentration, which is one way sodium toxicity, or salt poisoning, can occur. When blood sodium concentration is elevated, the osmolarity of the blood increases and water from the brain diffuses into the vasculature. The brain responds by forming hyperosmolar particles to draw water back into the brain to prevent dehydration of its cells. Giving large amounts of free water in the form of drinking water or as a bolus of hyposmolar IV fluids will quickly drop the blood sodium concentration causing a large amount of water to diffuse into the brain cells due to preformed hyperosmolar particles. Cerebral edema then ensues and neurologic signs such as head pressing results. Treatment should be aimed at slowly decreasing blood sodium concentration by about 1 meq/hr to prevent cerebral edema. Pigs showing clinical signs of brain disease usually die despite treatment.

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Question

Which of the following statements is true about pseudorabies in pigs?

- Neonatal piglets affected with pseudorabies do not show neurologic signs
- Older pigs with the disease show respiratory clinical signs such as sneezing, nasal discharge, and coughing
- Older pigs with the disease usually show neurologic signs such as prostration, paddling, and convulsions
- Pseudorabies does not affect pregnant sows

Explanation - The correct answer is older pigs with the disease show respiratory clinical signs such as sneezing, nasal discharge, and coughing. Pseudorabies in young nursing piglets tends to cause neurologic signs such as incoordination, tremors, blindness, paddling, coma, and death. Weaned pigs may have both neurologic signs and respiratory signs such as sneezing, nasal discharge, and coughing. Older pigs tend to only have respiratory signs. Pregnant sows affected with the virus often have reproductive failure.

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Question

You are asked to examine a group of pigs that have just arrived from a sow farm. The pigs are 24 days old and approximately 2% of the pigs have crusty lesions over their body especially in the face area. Some pigs have lesions covering their entire body. What should be your recommendation for plan of action?

- Immediately call federal authorities
- Euthanize all affected pigs
- Separate affected pigs and treat with injectable antibiotics
- Nothing, pigs will grow out of the condition
- Treat all pigs with a topical insecticide effective against lice

Explanation - The crusty lesions all over the body, especially on the face in pigs of this age are highly suggestive of "greasy pig" disease caused by Staphylococcus hyicus. The bacterial pyoderma is contagious so it is helpful to segregate affected pigs. As pigs grow, their immune system does a better job in controlling the infection, but with a history of having some pigs with lesions all over the body, antibiotic treatment is necessary to prevent the condition from worsening in these young pigs which can lead to dehydration and/or systemic spread. There is no need to call federal authorities, since no vesicular lesions are noted.

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Question

Which of the following agents is most likely the cause of mild diarrhea in a 3 day old pig?

- Coccidiosis
- Transmissible gastroenteritis virus (TGE)
- Whipworms
- Porcine parvovirus
- Rotavirus

Explanation - The correct answer is rotavirus infections. TGE infections in pigs less than 2 weeks old usually result in death. Porcine parvovirus is associated with reproductive problems and not diarrhea in pigs. Pigs have to be at least 5 days old to be affected by coccidiosis. Whipworm infections are extremely rare in baby pigs.

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Question

You are called to a pig farm where a group of 130 lb pigs are experiencing sudden death. Upon arrival you notice several pigs with purple skin lesions all over their bodies. The lesions are flat and not pruritic. What is your clinical diagnosis?

- Vesicular stomatitis
- Swine pox
- Erysipelas rhusiopathiae
- Foot and mouth disease
- Mange

Explanation - The correct answer is Erysipelas rhusiopathiae or diamond skin disease. Swine pox, FMD and vesicular stomatitis all cause vesicular lesions (lesions not flat). Mange is a pruritic condition caused by mites.

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Question

Which of the following is the primary host for pseudorabies?

- Horses
- Goats
- Sheep
- Swine
- Cattle

Explanation - The correct answer is swine. The infection is frequently asymptomatic in swine. In ruminants, clinical signs are usually acute to peracute. When the progression is slower, the first clinical signs are often paresthesia (mad-itch) at the site of inoculation. Signs include ataxia, proprioceptive deficits, circling, nystagmus, and strabismus. Sometimes aggression is seen, but usually the animals become depressed. This disease must be differentiated from rabies, polioencephalomalacia, salt poisoning, lead poisoning, hypomagnesemia, and meningitis. Currently the US commercial swine is free of pseudorabies.

Pseudorabies – Herpesvirus. Affects all farm animals except horse, affects spp differently. Pigs are 1° host and only reservoir. Can be insidious in pigs and go undetected. Secrete virus in saliva and nasal secretions. Virus travels to brain and respiratory system.

- Clinical findings –
  - Pigs: In older pigs, URD and repro failure, usu recover and are carriers. Young pigs, see CNS signs. Highly fatal. "Shaker pigs".
  - Cows: Undergo excitement phase, aggressiveness. Pruritus causing severe self-mutilation. Convulsions, coma, death.
- Diagnosis - History and clinical signs. VI from tonsil, brain, liver, spleen, lung. Serology. Histopath – intranuclear inclusion bodies.
- Treatment – Test and remove. Monoclonal antibody for swine. No tx for ruminants.
- Control - Vaccination.

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Question

You are asked to examine some feeder pigs that have stopped eating yesterday. The group is lying down and seems lethargic. They have fevers of 105-106F, firm dry feces, and the skin has rhomboid-shaped red blotches scattered on it. What treatment should be recommended?

- Metronidazole
- Penicillin
- Streptomycin
- Gentamicin
- Chloramphenicol

Explanation - Erysipelas is susceptible to penicillins, as well as tetracyclines (usually), lincomycin and tylosin. Chloramphenicol and nitroimidazoles (including metronidazole) are not approved for food animal use.

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Question

What is the morbidity rate and mortality rate of piglets with coccidiosis?

- Low morbidity and high mortality
- High morbidity and low to moderate mortality
- Moderate to high morbidity and high mortality
- Low morbidity and low to moderate mortality

Explanation - The correct answer is high morbidity and low to moderate mortality. Coccidiosis in piglets is usually caused by Isospora suis, and less often by Eimeria spp. The disease usually affects confinement

raised, 1-3 week old, nursing piglets. Diagnosis can be made by identification of oocysts in feces or more reliably, identification of coccidia in mucosal smears or histologic sections. Clinical signs include watery diarrhea, ill thrift, failure to gain weight, and dehydration. The disease is sometimes confused with colibacillosis (diarrhea caused by E. coli), but affected animals do not respond to antibiotics.

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Question

You are called to a swine breeding herd that is experiencing some abortions. On arrival you find out that there are 285 sows in the herd and 5 of them aborted overnight. Two days ago 2 other sows aborted. You are suspicious of Porcine reproductive and respiratory syndrome (PRRS). The herd has not used any PRRS vaccines for the past 18 months. All aborted fetuses have been discarded by the time you arrive. What diagnostic workup should you do?

- No testing can be done since the fetuses have been discarded
- Test 30 random sows in the herd for PRRS antibodies via serum ELISA
- Only test the 7 aborted sows for PRRS virus via serum PCR
- Test 30 random sows in the herd for PRRS virus via serum PCR
- Only test the 7 aborted sows for PRRS antibodies via serum ELISA

Explanation - The correct answer is to only test the 7 aborted sows for PRRS virus via serum PCR. PRRS causes abortions shortly after infection and therefore the sows should still be viremic at the time of the abortion. Your testing should be focused on the sick (aborted) animals. Random sampling is used when establishing the herd's status; in this case you are focused specifically on the status of the aborted animals. Antibody production takes time and therefore is most likely not present in the sows at the time of the abortion.

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Question

What is an appropriate treatment for coccidiosis in pigs?

- Doxycycline
- Ivermectin
- Fenbendazole
- Amprolium

Explanation - The correct answer is amprolium. Coccidiosis in pigs is caused exclusively by Isospora suis. Amprolium is a thiamine analogue that is coccidiostatic. It prevents the incorporation of thiamine into the coccidia.

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Question

Ascaris suum affects this part of the carcass in a pig.

- Kidney
- Liver
- Skin
- Spleen
- Heart

Explanation - The correct answer is liver. The roundworm may migrate through the liver and cause characteristic "milk spots" as a result of inducing fibrosis and hemorrhage.

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Question

Transmission of brucellosis in pigs is often via which of the following routes?

- Fecal-oral transmission

- Venereal transmission, and through aborted fetuses
- Vectored by biting insects
- Aerosol transmission

Explanation - The correct answer is venereal transmission, and through aborted fetuses. Pigs are often infected by ingestion of infected aborted fetuses, fetal membranes, and fluids discharged during abortion. Infection can also occur through infected semen via natural breeding, or poorly planned artificial insemination. Transmission is also possible through broken skin and mucous membranes.

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Question

You visit a farm with outdoor facilities and find a group of 200 lb pigs that are constantly rubbing their necks against fence posts. You are suspicious of mange and decide to do a skin scraping. On what area of the pig should you do your scraping to increase your chances of finding the mites?

- Neck area
- Between the shoulders
- Ear canal
- Jowl area
- Behind the shoulders

Explanation - The correct answer is the ear canal. Sarcoptes scabiei mites are commonly found in the **ear canal of pigs**. A second location to try is just behind the ears.

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Question

You arrive at a farm where the farmer has lost 2 pigs in the past 2 days. He has 450 pigs which are currently weighing 200 lbs. The pigs seemed to be doing quite well and all appear to be eating. They all look healthy (no respiratory or enteric signs noted) and there has not been a diet change for at least 2 weeks. On arrival to the farm you find the latest mortality. The pig just died over night and is in excellent body condition. It seems to be one of the biggest pigs from the group. The abdomen is quite distended. As you perform the necropsy you find the following gross lesions (photo). No intestinal torsion/volvulus is noted. What should you do next?

- Check intestinal content for clotted blood
- Immediately treat all remaining pigs with ceftiofur
- Treat all pigs with tylosin in the water
- Collect two feed samples (one from affected group and one from non-affected group)
- Immediately vaccinate remaining pigs for salmonella

Explanation - Your next step should be to check intestinal content for clotted blood. Your top two differentials at this time are acute ileitis or hemorrhagic bowel syndrome. Both present as sudden death and on necropsy both appear grossly as distended intestines with diffuse hemorrhagic tissue. In the case of acute ileitis, the intestinal content will be hemorrhagic and clotted. For hemorrhagic bowel syndrome (HBS) or intestinal volvulus, the intestinal content will be hemorrhagic and liquid; non-clotted. Making the correct diagnosis is critical as in the case of acute ileitis, immediate treatment of all pigs with tylosin would be warranted. For HBS, the etiology is unknown, and there are no effective treatments.

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Question

Which of the following is not true about porcine reproductive and respiratory syndrome (PRRS)?

- It is characterized by a high pre-weaning mortality rate
- It is characterized by respiratory signs, such as coughing and dyspnea in affected animals
- There is currently no vaccine available for PRRS
- Infection may be inapparent in some herds
- It is characterized by reproductive failure in breeding sows

Explanation - The correct answer is there is currently no vaccine available for PRRS. There currently ARE vaccines available for PRRS. The disease is characterized by 3 overlapping syndromes: 1) reproductive impairment or failure, 2) respiratory disease, 3) high pre-weaning mortality.

Infections may be latent in some herds. The disease is caused by an arterivirus and affects pigs of all ages. Affected neonatal pigs experience diarrhea and recurrent fevers. Weaned pigs may become anorexic, develop a cough, dyspnea (or "thumps"), and purple ear tips and tails due to vasculitis. Gestating sows have reproductive failure in the form of abortions, mummies, and early embryonic death. Boars may be infertile due to interference with spermatogenesis. Treatment of a herd may involve depopulating the herd, or closing the herd for several months and following titers. Those animals whose titers do not drop should be removed from the herd.

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Question

Which organ system is typically LEAST affected by pseudorabies in pigs?

- Central nervous system
- Respiratory system
- Gastrointestinal system
- Reproductive system

Explanation - The correct answer is gastrointestinal system. Pseudorabies in pigs is caused by a herpes virus. Clinical signs vary in pigs of different age groups. Young neonates usually show CNS signs including anorexia, tremors, incoordination, blindness, paddling, etc. Morbidity and mortality of this age group can reach up to 100%. Weaned pigs may have similar signs, but will also show respiratory signs such as coughing and dyspnea. Mortality in this age group is much lower. Grower and finisher pigs predominantly show respiratory signs such as coughing, sneezing, and nasal discharge. Older pigs at breeding age show respiratory signs and may have reproductive failure. They do not show CNS signs.

There is no effective treatment for those infected with pseudorabies, but older pigs often recover on their own. Vaccines are available for this disease. This disease has currently been eradicated from all commercial swine in the USA.

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Question

Which of the following is important about the pork tapeworm, Taenia solium?

- Ingestion by humans can cause cysticercosis
- Ingestion by pigs causes severe diarrhea and weight loss
- Ingestion by pigs causes severe neurologic signs
- Ingestion by humans causes hydatid cyst disease

Explanation - The correct answer is ingestion by humans can cause cysticercosis. Pigs act as intermediate hosts and become infected by ingesting infected human feces. Cysticerci then form in the pig's cardiac and skeletal muscle. Infection of humans occurs with ingestion of infected pork that is inadequately cooked containing cysticerci. The cysticerci evaginate and attach to the small intestine. Adult tapeworms then develop. This is the only way they can complete their life cycle. The tapeworms shed eggs which can be consumed by humans but those eggs cannot complete their life cycle until they are consumed in the cyst form (undercooked infected pork). In humans, cysticercosis as well as development of the adult tapeworm can be pathogenic. This disease is not pathogenic in pigs.

……..

Question

A pig farmer believes that his specific pathogen-free (SPF) herd is free of both Bordetella bronchiseptica and toxigenic Pasteurella multocida, but several young pigs have recently begun to sneeze and snuffle and have a serous to mucopurulent nasal discharge. The affected pigs appear to be falling behind in growth rate. What disease is this farmer concerned about?

- Exudative epidermitis
- Porcine stress syndrome
- Swine dysentery
- Pleuropneumonia
- Atrophic rhinitis

Explanation - Non-progressive atrophic rhinitis is caused by B. bronchiseptica, and progressive atrophic rhinitis is caused by toxigenic P. multocida type D. They may result in loss of turbinates, facial distortion and poor weight gains.

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Question

Which of the following mycotoxins can cause hyperestrogenism and pseudopregnancy in pigs?

- Ochratoxin
- Aflatoxin
- Fumonisin
- Ergot
- Zearalenone

Explanation - Zearalenone is a potent estrogenic metabolite produced by some Fusarium species. Young gilts will be most affected. Young boars will also have reduced libido.

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Question

Which of the following diseases commonly causes anemia in pigs?

- Sarcoptes scabiei
- Transmissible gastroenteritis virus (TGE)
- Mycoplasma suis
- Ascaris suum
- Porcine Circovirus Type 2 (PCV2)

Explanation - The correct answer is Mycoplasma suis. M. suis was previously known as Eperythrozoonosis suis. The organism primarily lives on the surface of erythrocytes and causes anemia in pigs of all ages. None of the other pathogens listed are known to cause anemia.

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Question

How do you prevent pregnancy when using boars for heat identification in sows?

- Castration
- Allow the boar to mount the sow without allowing penetration of the penis into the vagina
- Surgical vasectomy
- Remove boar immediately after mounting

Explanation - The correct answer is surgical vasectomy. The most reliable way to detect a sow in heat is if she stands for a boar trying to mount her. To prevent pregnancy of the sow, and to prevent injury to the herdsmen, the boar is vasectomized or epididymectomized. Castration would eliminate sex hormones that would motivate the boar to mount the sow.

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Question

What is the causative agent of blue eye in swine?

- Picronavirus
- Adenovirus
- Rotavirus
- Paramyxovirus

Explanation - The correct answer is blue eye paramyxovirus or rubulavirus.

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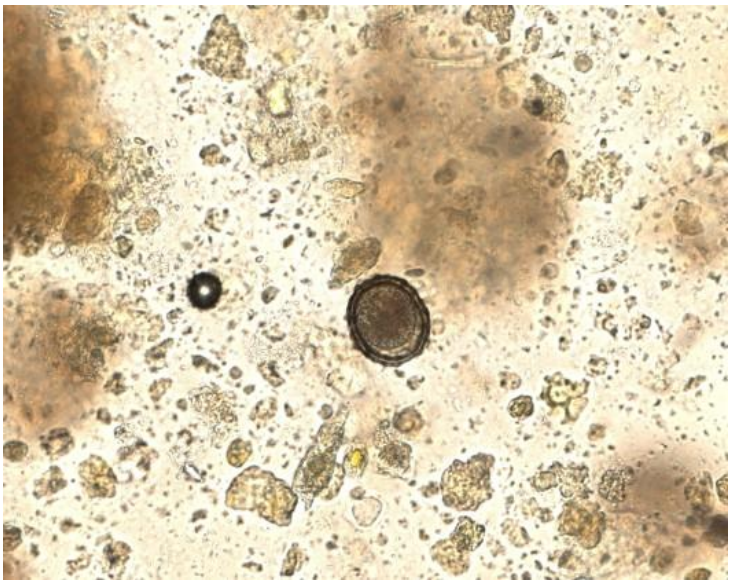
Question

While working as a meat inspector you encounter a pig liver with several "milk spots". This is grounds for condemnation of the liver, which can be of substantial economic impact. After asking around, you are able to obtain a fresh fecal sample from a live pig. You perform a fecal flotation (see image). What is your diagnosis?



- Strongyloides ransomi
- Isospora suis

- Trichuris suis
- Ascaris suum

Explanation - The correct answer is Ascaris suum. This is a round worm and as part of its life cycle, it will migrate through the liver and cause characteristic "milk spots" which appear as subcapsular white spots on the liver.

Trichuris suis is a whipworm and has a characteristic double-operculated egg appearance. Isospora suis is responsible for coccidiosis in young piglets. Strongyloides ransomi is known as the thread worm in pigs and infects the pig by entering through the mucosa of the mouth. Lesions may be seen in the liver but are typically more prominent in the lungs.

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Question

Which of the following E. coli is associated with edema disease in swine?

- F6 (987P)
- F41
- F18
- F5 (K99)

Explanation - The correct answer is F18. Edema disease occurs in piglets post-weaning. Post-weaning diarrhea is associated with toxin production by F18 and sometimes F4 (K88) E. coli. These enterotoxins cause systemic vasculitis leading to edema. A key point is that edema disease is a systemic condition.

……

Question

Which of the following is one of the most common causes for diarrhea in a nursing piglet?

- Lawsonia intracellularis
- Trichuris suis
- Brachyspira hyodysenteriae
- E. coli
- Salmonella

Explanation - The correct answer is E. coli. Enterotoxogenic strains of E. coli cause enteric colibacillosis. It occurs commonly in nursing and weanling piglets and causes watery diarrhea, dehydration, acidosis, and death. Salmonellosis, swine dysentery (Brachyspira hyodysenteriae), proliferative enteropathies (Lawsonia intracellularis), and whipworm infections (Trichuris suis) cause diarrhea most commonly in growing, finishing, or breeding pigs.

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Question

The newly weaned piglets of a swine farm are presented for snorting, sneezing, ocular discharge, and epistaxis. Necropsy of one affected animal showed atrophy of the nasal turbinates. The owner reports that he has never seen this happen in his herd before, but he also recently acquired several new sows with unknown histories. Which of the following would you most likely find if you were to culture the nasal passages of the affected pigs?

- Actinobacillus pleuropneumoniae or swine influenza virus
- Mycoplasma hyopneumoniae or Arcanobacterium pyogenes
- Haemophilus parasuis or Actinobacillus pleuropneumoniae
- Pasteurella multocida or Bordetella bronchiseptica

Explanation - The correct answer is Pasteurella multocida or Bordetella bronchiseptica. The piglets most likely have atrophic rhinitis which typically causes the clinical signs described. Facial deformity is rare but upward or lateral deviation of the snout may be seen. All pigs more than one week old are susceptible to showing clinical signs of the disease, but there may be unaffected carriers as well. It is an old disease that used to be found in herds and can be vaccinated against with bacterin vaccines. Antibiotics are used to

treat the disease; however, if the problem is severe throughout the herd, depopulation and restocking the herd is also an option. All of today's large suppliers of genetic stock are free of atrophic rhinitis.

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Question

You are assisting with a farrowing operation and are advising about care of the newborn piglets. Which of the following should piglets receive within the first few days of life?

- Tetanus vaccine
- Iron dextran injection
- Vitamin B-12 injection
- Ivermectin injection

Explanation - Sow's milk has a very low iron content and piglets usually suffer from insufficient iron concentrations to maintain satisfactory hemoglobin blood levels until weaning. Therefore, piglets should receive an iron dextran injection within the first 3 days of life.

Rarely, iron toxicosis in piglets can occur following injection. This may be related to low vitamin E and selenium status of the sow. If this is the case, piglets may have been born deficient in vitamin E or selenium or the colostrum was not be able to provide adequate amounts of these nutrients. Supplementing the sow's diet with vitamin E and selenium will improve the status of the sow and help to prevent iron toxicity in the piglets.

……

Question

You are visiting a swine farm in Oklahoma with no other known swine farms located within a 5 mile radius. The pigs are weighing 220 pounds (100kg) and were doing quite well until 4 days ago when they started coughing. Today, approximately over 80% of the pigs seem to be affected to some extent. Clinical signs include mostly coughing, fever of greater than 105.0 degrees F (normal is 101.0-103.0F), and clear nasal discharge. No loose stools are noted and there have been no mortalities for the past 3 weeks. What is the most likely diagnosis?

- Porcine reproductive and respiratory syndrome virus (PRRS)
- Pasteurella multocida
- Swine influenza virus (SIV)
- Haemophilus parasuis
- Bordetella bronchiseptica

Explanation - The correct answer is swine influenza virus infection. The rapid spread of the disease (80+% in just 3 days) and the high fevers and nasal discharge are the classic clinical presentation of a swine influenza outbreak.

It is unlikely that porcine reproductive and respiratory syndrome virus (PRRS) is involved as this virus does not spread through a farm this quickly, and these pigs are well isolated from other pigs. With high virulent PRRS strains high mortalities are expected very quickly. With low virulent PRRS strains, morbidity and mortality will be low or even sub-clinical.

Pasteurella multocida and Haemophilus parasuis will probably be involved but they are secondary to the viral infection. Bordetella bronchiseptica is usually associated with atrophic rhinitis and rarely is found in pneumonia.

……

Question

You have just diagnosed an outbreak of acute Actinobacillus pleuropneumoniae (APP) in a group of 150 lb pigs. There are 1,270 pigs in the group and 2% of the pigs have died in the last 24 hours. What should you do next?

- Inject all pigs with enrofloxacin
- Vaccinate all pigs with an APP bacterin
- Start medicating with penicillin in the water

- Inject sick pigs with florfenicol
- Add chlortetracycline to the feed

Explanation - The correct answer is to inject all pigs with enrofloxacin. There are several antibiotics which are effective against APP including ceftiofur, enrofloxacin, florfenicol, tiamulin, and tilmicosin. The key point is that ALL pigs need to be treated immediately as the exotoxins produced by APP can cause death within just a few hours. By the time clinical signs are present in a pig, treatment success is dramatically decreased. The respiratory system can be affected with severe congestion very quickly; therefore, there is no time to wait for water or feed antibiotics to start taking effect.

Water medication may be started in conjunction with whole herd injection but it takes 24 to 36 hours for pigs to start getting their first full dose of medication. Penicillin is not a good drug of choice due to common resistance found in APP isolates. Current APP vaccines have not been very effective in controlling an outbreak.

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Question

Which of the following is a method of control to prevent infection of Metastrongylus lung worms in pigs?

- Raise pigs strictly on soil pasture
- Prevent access to soil containing snails
- Supply a clean water supply
- Prevent access to soil containing earthworms

Explanation - The correct answer is to prevent access to soil containing earthworms. Earthworms are the intermediate host often involved in transmission of Metastrongylus lungworms in pigs. Direct transmission without the intermediate host can occur as well. Clinical signs include coughing and unthriftiness. If a secondary pneumonia occurs, dyspnea and abdominal breathing or "thumps" may occur. Affected pigs that are raised on pastures are often affected with both lungworms as well as ascarids.

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Question

When working to control porcine reproductive and respiratory syndrome (PRRS) virus in a herd, what is the proper order for the different steps needed to achieve this goal?

- Diagnose -> Close -> Homogenize
- Close -> Homogenize -> Diagnose
- Homogenize -> Close -> Diagnose
- Diagnose -> Homogenize -> Close
- Close -> Diagnose -> Homogenize
- Homogenize -> Diagnose -> Close

Explanation - The correct answer is Diagnose -> Close -> Homogenize. The first part in any control program is to have the correct diagnosis. Once the correct diagnosis is confirmed then the next step is to close the herd to new introductions. By closing the herd we minimize the introduction of new susceptible animals which can then be exposed to the virus. This is like adding new wood to a fire. The final stage is to homogenize the herd. Here the goal is to get all animals on the farm to be exposed to the virus at the same time. The PRRS virus does not appear to move very quickly within a herd (low contagiousness). By having a homogenous population we prevent having susceptible animals left in the population and thus the virus is likely to die out on its own (no new hosts available).

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Question

Which of the following is the most effective treatment for a leptospira infection in a growing pig?

- Euthanizing the pig or depopulating the herd
- Fluoroquinolones

- Vaccination with multivalent bacterins
- Tetracyclines

Explanation - The correct answer is long term use of tetracyclines. Vaccinations are usually only used in the breeding herd where bacterins, containing the appropriate serovar, can reduce the prevalence of infection and leptospirosis-induced abortions. Depopulation or euthanasia is not necessary as in growing pigs the clinical signs are not life threatening (leptospirosis-induced abortions is not a concern). Fluoroquinolone antibiotics are not useful against leptospirosis. Besides tetracycline antibiotics, other effective antibiotics include tylosin, erythromycin, and penicillins.

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Question

You receive a call from a local farmer who is having trouble with a gilt farrowing. This is a small producer with just 20 sows. This is the last gilt to farrow in the group. No other gilts have had any problems. The gilt started farrowing 3 hours ago. So far she has had 8 pigs born alive and 1 stillborn. The gilt seems to be straining for the past 15-30 minutes but nothing has come out. He performed a vaginal exam and "armed" her and is not able to feel anything in the birth canal. No fetal membranes have been passed. What should you tell the farmer to do next?

- Do nothing
- Go to the farm and perform a C-section
- Give prostaglandins and recheck in 10 minutes
- Give oxytocin and recheck the gilt in 20 minutes
- Go to the farm and manually extract pigs from birth canal

Explanation - The correct answer is to give oxytocin and recheck the gilt in 20 minutes. The normal duration of farrowing ranges from 1.5 - 4.5 hours with an average interval between pigs of 15 - 20 min.

In this case the fact that the farmer did a vaginal exam and "armed" her tells you there are no pigs in the birth canal and thus manual extraction is not possible at this time.

Prostaglandins causes luteolysis of the corpora lutea and release of relaxin, which causes relaxation of the birth canal and cervix and is primarily used to induce parturition, not to assist in dystocia. The indications that the gilt has been straining with no fetal membranes passed suggest she is not done.

Gilts traditionally have smaller litter sizes than sows. Her current numbers of 8 born alive and 1 stillborn make it difficult to know if there are any more pigs left in her or not. On average sows today will have 11 - 13 pigs born alive per farrowing. The gilt has been farrowing for only 3 hours and there are no pigs stuck in the birth canal so there are no indications that a C-section is necessary at this time. Oxytocin is very effective in creating uterine contractions. The best option at this time is to administer the oxytocin and recheck the gilt in 20 minutes.

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Question

Which of the following is not often caused by Streptococcus suis infections in pigs?

- Meningitis
- Polyarthritis
- Septicemia
- Colitis
- Bronchopneumonia

Explanation - The correct answer is colitis. Streptococcus suis infections usually affect nursing or recently weaned pigs. Clinical signs can be seen associated with polyarthritis, bronchopneumonia, sepsis, or meningitis. Morbidity and mortality vary greatly and are improved with treatment.

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Question

Which of the following swine pathogens is known to attach to and disrupt the pulmonary mucociliary apparatus?

- Actinobacillus pleuropneumoniae
- Porcine circovirus type 2 (PCV2)
- Mycoplasma hyopneumoniae
- Salmonella choleraesuis
- Porcine reproductive and respiratory syndrome virus (PRRSv)

Explanation - The correct answer is Mycoplasma hyopneumoniae. The bacteria attach to the pulmonary mucociliary apparatus and thus prevent it from functioning properly. This in turn makes the lungs much more susceptible to other bacterial infections.
…….