Question

Persistent infection of a bovine fetus with Bovine Viral Diarrhea (BVD) virus is most likely to occur when the non-immune dam is viremic with a non-cytopathic biotype of BVD at what stage of gestation?

- Day 151 to 280
- Day 50 to 150
- Day 0 to 40
- Never, as only the cytopathic biotype can cause persistent infection
- Any stage has an equal chance

Explanation - At 50 to 150 days gestation, the fetal immune system does not recognize the BVD virus as foreign and becomes persistently infected.

Question

When is a chorioallantoic membrane slip first palpable in a heifer?

- 90-95 days
- 20-25 days
- 50-55 days
- 30-35 days

Explanation - The correct answer is 30-35 days. This is known as the membrane slip and is considered a positive sign of pregnancy.

Question

The 35 day post-partum recumbent dairy cow in this image has normal vital parameters, appetite, and milk production but has mucous and pus running from her vulva. Speculum exam shows this material exiting the cervix. Rectal exam shows that she has an involuting uterus and normal ovaries. Which of the following treatments should be administered to help treat this condition?

- Intrauterine metronidazole
- Intrauterine penicillin
- Systemic enrofloxacin
- Intrauterine chloramphenicol
- Systemic diethylstilbestrol

Explanation - The diagnosis is endometritis. Intrauterine penicillin or tetracycline can be beneficial. The negative impact can be antibiotic residues in milk, so some prefer to use dilute povidone iodine, or uterine lavage with saline. Prostaglandins can also be given to "short cycle" the cow which will aid in treating the endometritis. The other drugs listed are not legal for use in the USA.

Question

What is the normal presentation and position at birth of a calf?

- Anterior presentation, ventro-sacral position, front limbs extended
- Anterior presentation, dorso-sacral position, front limbs extended
- Posterior presentation, dorso-sacral position, hind limbs flexed
- Anterior presentation, dorso-sacral position, front limbs flexed at shoulder

Explanation - The correct answer is anterior presentation, dorso-sacral position, front limbs extended posture. Anterior means the face is coming out first. Dorso-sacral means that the dorsum of the fetus is up against the sacrum of the mama. Legs extended implies the legs are in front and will be the first thing visible. This is the normal presentation.

Question

A dairyman's favorite cow was bred by a new bull a few weeks ago and now his cow has pyometra. What agent is most likely responsible for causing the cow's pyometra?

- Leptospirosis
- Campylobacter fetus

- Brucellosis
- Tritrichomonas foetus

Explanation - The correct answer is tritrichomonas foetus. This organism is commonly associated with a post-coital pyometra in addition to causing early embryonic death.

Campylobacter is a cause of early embryonic death but does not usually result in pyometra.

Brucella will result in late term abortion.

Leptospirosis is a cause of mid- to late-gestation abortions and not post-coital pyometras.

Question

About 1 hour after a difficult labor where the calf had to be pulled out with force, the cow goes down. She is pale and her heart rate is 100/min. What happened?

- Pelvic fracture
- Uterine tear
- Hypocalcemia
- Obturator paralysis

Explanation - The correct answer is uterine tear. With a traumatic fracture or damage to nerves, the cow would have gone down right away rather than an hour later. Hypocalcemia is possible but less likely in this case where the calf had to be forcibly extracted which can result in a uterine tear, and would be unlikely to make her pale and tachycardic.

Question

On a pregnancy check of a cow, crepitus can be felt upon palpation of the uterus, and there are no positive signs of pregnancy. What is the most likely diagnosis?

- Macerated fetus
- Ruptured uterus
- Mummified fetus
- Pyometra

Explanation - The correct answer is macerated fetus. The key to making this diagnosis is in feeling the crepitus, which is caused by bacterial degradation of the fetus.

A mummified fetus is a sterile fetus in which all fluids are resorbed, leaving a firm tarry mass.

With pyometra, the uterus will be distended with pus. Pyometras are usually seen post-partum. If you see one post-coital, consider Tritrichomonas foetus.

Question

A young bull presents for a breeding soundness exam. What is the minimum recommended percentage normal morphology of sperm?

- 70% Normal
- 80% Normal
- 60% Normal
- 90% Normal

Explanation - The correct answer is 70% normal. To be a satisfactory potential breeder, a bull must meet certain requirements including a normal physical exam, adequate scrotal circumference, sperm motility of at least 30% motile, and sperm morphology of at least 70% normal.

Question

The preferred site for PRACTICAL artificial insemination in the mare and cow is _____.

- Artificial insemination cannot be successfully performed in cows
- Intravestibular, i.e. just inside the vulva
- Intrauterine
- Intracervical, into the external os of the cervix
- Intravaginal

Explanation - Artificial insemination (AI) with frozen or fresh semen is nearly always performed intrauterine in both the mare and the cow. Conception rates are optimal, compared with intravaginal or intracervical routes of AI.

Intravaginal routes result in very low conception rates unless sperm numbers are greatly increased, in which case one of the main advantages of AI (ability to dilute semen from a superior male and use it on several females) is lost.
Also, sperm will have much farther to go to get to the site of fertilization (ampulla of oviduct), and won't have the advantage of being propelled towards the ampullae that sperm deposited intrauterine would have.

Given the same quality and quantity of semen/sperm, conception rates following intracervical routes of AI are higher than AI by intravaginal routes, but still much lower than when intrauterine routes are used. Sperm will have farther to go to get to the site of fertilization (ampulla of oviduct), and won't have the advantage of being propelled towards the ampullae that sperm deposited intrauterine would have.

Intravestibular (i.e., just inside the vulva) will result in very low conception rates. Many sperm will be killed by urine, and the surviving sperm will have much farther to go to get to the site of fertilization (ampulla of oviduct), and won't have the advantage of being propelled towards the ampullae that sperm deposited intrauterine would have.

Question

An owner wishes to abort a fetus in his cow which may be pregnant because it was bred by the neighbor's bull that had jumped over the fence 1 week previously. What is the best way to induce abortion?

- Give dexamethasone
- Give PGF2-alpha
- Give oxytocin
- Give estrogen

Explanation - The correct answer is to give PGF2-alpha. Remember that PGF2-alpha will lyse the corpus luteum. If it has been less than 4 months (which it likely has) the corpus luteum is still the main contributor of progesterone and destroying it will induce abortion.

After 4 months, the placenta helps contribute progesterone for a few months. However, during the last month of pregnancy the placenta does not contribute significantly to progesterone production. Therefore, just giving PGF2-alpha during the last month will also cause abortion.

To induce abortion anywhere in between you will need PGF2-alpha and dexamethasone. Additionally, to induce parturition during the last month of pregnancy, dexamethasone can be used because it will mimic the fetal rise of cortisol, followed by parturition, including production of fetal pulmonary surfactant.

Question

A 4-year old dairy cow in her third lactation presents after calving normally about 95 days ago. No one has observed her in estrus since calving. On physical exam, you find a non-pregnant heavy, fluid-filled uterus, and an apparent corpus luteum on one ovary. Assuming treatment is successful, which of the following is the most significant therapeutic effect of a single intra-muscular injection of PGF2-alpha in this patient?

- PGF2-alpha has no effect on a cow's estrus cycle
- PGF2-alpha will decrease uterine contractility
- PGF2-alpha will lyse her corpus luteum, increase uterine motility, evacuate her uterus, and bring her into estrus
- PGF2-alpha will cause the maturation and ovulation of multiple follicles (i.e., superovulation)
- PGF2-alpha will stimulate the cow's appetite
- PGF2-alpha will directly suppress uterine inflammation

Explanation - PGF2-alpha has many effects, but chief among them is its luteolytic action. Lysis of the corpus luteum will immediately reduce circulating progesterone levels, allow the final development of an ovarian follicle, and bring the cow into estrus, which is accompanied by increased uterine motility, and in this case, drainage.

PGF2-alpha will not likely stimulate the cow's appetite and would not do so by a direct therapeutic effect.

PGF2-alpha will not decrease uterine contractility. PGF2-alpha will probably increase uterine contractility, both directly (utero-tonic effects) and indirectly, through the rise of estrogen that follows PGF2-alpha-induced luteolysis.

PGF2-alpha is an inflammatory mediator. It will NOT directly suppress uterine inflammation. This cow needs an effective immune/inflammatory response to "clean up" her uterus. Anti-inflammatory therapy is not indicated.

PGF2-alpha will NOT cause the maturation and ovulation of multiple follicles (i.e., superovulation). That is achieved by an altogether different class of hormones, the gonadotropins.

Question

What is the significance of low milk progesterone levels on day 0 and high on day 21 and 24 in a cow?

- Likely not pregnant
- Likely pregnant
- Persistent corpus luteum
- There is no correlation between milk progesterone levels and pregnancy

Explanation - The correct answer is that the cow is likely to be pregnant.

If the progesterone levels were low on days 0, 21, and 24, it is almost certain she is not pregnant.

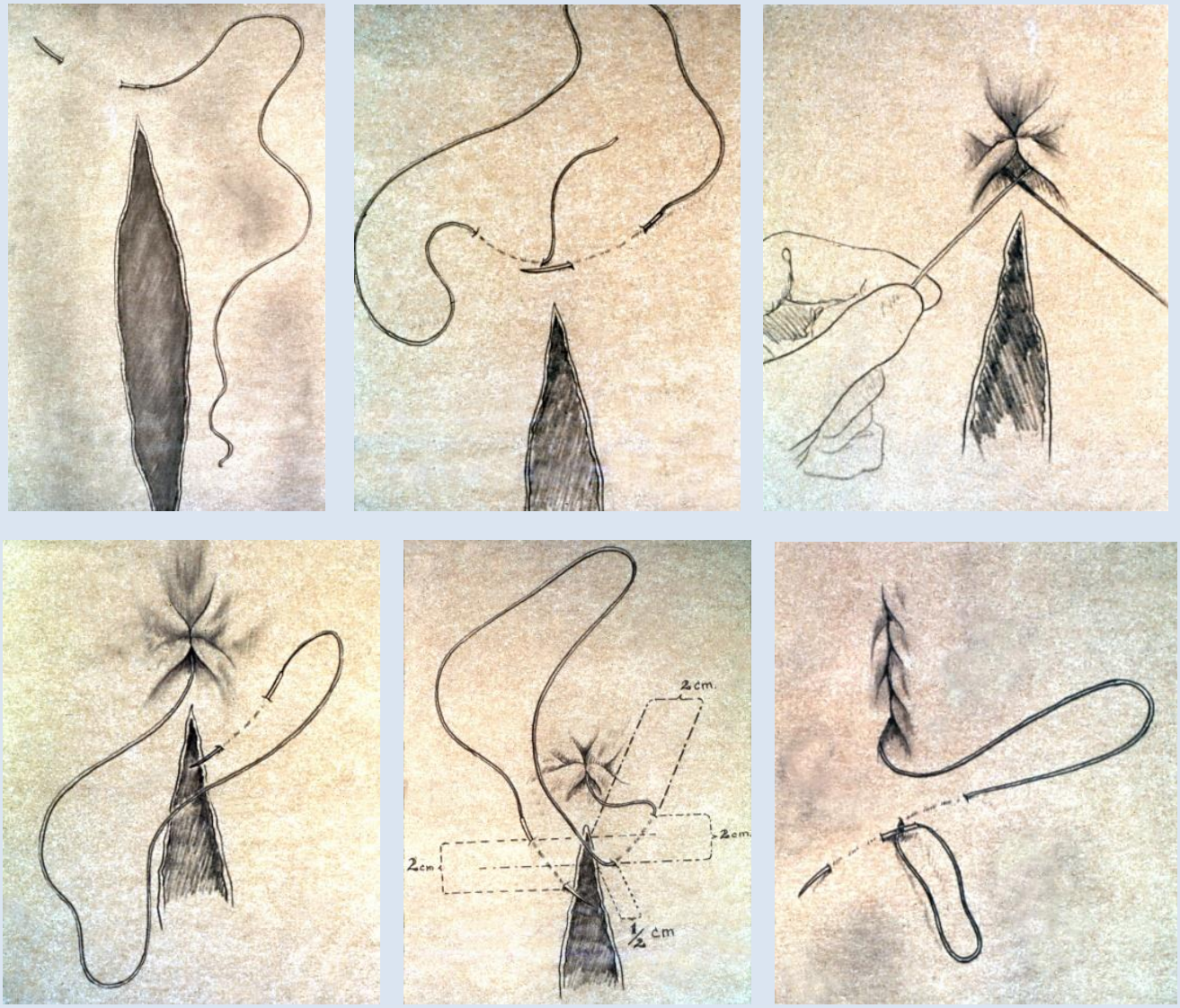
High progesterone levels throughout may indicate that she has been pregnant or that she has a persistent corpus luteum. In this scenario, with low levels initially at day 0 but high at day 21 and 24, this cow should be pregnant.

Question

Pick the ideal suture pattern for a uterus after a Caesarian section in a cow.

- Simple interrupted
- Near-far-far-near
- Horizontal mattress
- Utrecht pattern

Explanation - The correct answer is the Utrecht pattern. This pattern achieves a nice mucosal and serosal seal when done correctly. Additionally, the exposure of suture to the serosa is minimized with this type of pattern, so adhesions of uterus to surrounding structures is minimized.



Question

If trying to abort a cow between 5-8 months of gestation, what will work best?

- PGF2-alpha and dexamethasone
- PGF2-alpha
- GnRH
- Dexamethasone

Explanation - The correct answer is PGF2-alpha and dexamethasone. This is because at this point (5 to 8 months), both the CL and the fetus are involved in maintaining the pregnancy.

Question

The majority of abortions in cattle infected with Neospora occur in the early second trimester. You have diagnosed neospora abortion on a California dairy and the owner asks you where it comes from?

- Cats defecate in the feed and spread the oocysts.
- Dogs (and coyotes) are the definitive hosts of Neospora caninum
- Pigeons are the source. Shoot and trap all pigeons.
- The disease is venereally transmitted, so all bulls must be tested.

Explanation - Neospora abortions usually occur around 4-6 months, but can occur throughout gestation. Calves with neurologic deficits may also result. Dogs ingest infected tissues from fetus or placenta and pass oocysts in feces, which are ingested by cows.

Other causes of abortion tend to occur later in gestation (such as Brucella, Listeria, and leptospirosis). A confirmed diagnosis of N caninum is based on histologic lesions which are found in the brain (and also other organs) and consist of scattered foci of nonsuppurative cellular infiltrates with occasional foci of necrosis.

Most neosporosis abortions occur in mid to late gestation. Congenitally infected calves may be born weak or with neurologic deficits. However, most congenital infections are subclinical.

In dogs, subclinical infection is the rule, although there are a greater variety of exceptions. Litters or individual puppies may develop progressive hindlimb paresis associated with polyradiculoneuritis, myositis, and muscle atrophy. Adult dogs may have encephalomyelitis, focal cutaneous nodules or ulcers, pneumonia, peritonitis, hepatitis, or myocarditis with use of immunosuppressive drugs

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Question

You are asked to evaluate the breeding soundness of a 1-year old, 675 lb Brown Swiss bull. Vital parameters and your general physical examination are unremarkable. You collect semen via electro-ejaculation and note an acceptable semen quantity and quality. Scrotal circumference is 33 cm. You note 2 small penile warts near the tip of the penis that have a broad head and narrow stalk. There are no warts detected elsewhere on the bull and no other abnormalities associated with the penis. What should you recommend to the owner?

- Warts are not contagious but the bull has a very small scrotal circumference and is not considered a good breeding animal
- You suggest surgical removal and sexual rest for 2-3 weeks
- You suggest vaccination with an autogenous vaccine
- The bull should not be bred because he has not yet reached puberty. Warts should be re-evaluated when the bull reaches puberty.
- The bull should not be bred until at least 6 months after regression of all warts

Explanation - Penile warts in young bulls are quite common and are caused by bovine papilloma virus-1 (BPV-1) which can also cause warts on the nose or teats. Warts are very contagious and primarily spread by contamination of facility equipment but also spread directly from bull to bull. BPV-1 infection is not associated with other health problems. The treatment of choice for penile warts is surgical removal. Surgical damage to the warts frequently stimulates an immune response against BPV-1. Healing is usually complete within 2-3 weeks.

Autogenous vaccines have been used to treat penile warts but this is rarely practiced now due to cost and risk of severe reactions and relatively little benefit compared to surgical removal. It is not necessary to wait 6 months before breeding. Bulls typically reach puberty at 9-11 months of age depending on breed. Scrotal circumference of a 1 year-old bull also varies by breed but >30 cm is typically recommended for breeding at this age.

Question

You are called out early in the morning to examine a recumbent 7-year-old Friesian cow which calved at some stage during the night and is now unable to rise with the abnormality seen in the picture. What should you do?

- Administer epidural anesthetic and excise the extruded tissue
- Administer epidural anesthetic, reduce and retain the rectum with a purse-string suture that is loose enough to allow 2 fingers into the opening, administer fecal softeners
- Administer epidural anesthetic, remove attached fetal membranes, clean and lubricate the uterus and replace in normal position, then administer oxytocin and calcium gluconate

- Administer epidural anesthetic, empty the bladder if necessary, lubricate the vagina and replace in normal position, place a Buhner suture around the vestibule at the point at which the initial eversion of the vaginal wall occurred

Explanation - Administer epidural anesthetic, remove attached fetal membranes, clean and lubricate the uterus and replace in normal position, then administer oxytocin and calcium gluconate. This is a case of uterine prolapse. Because images may sometimes be difficult to differentiate uterine versus other prolapses, the clinical history can be useful in helping differentiate which type of prolapse is likely. Uterine prolapse occurs immediately or within hours of parturition. Vaginal prolapse occurs primarily in late pregnancy. Rectal prolapse is typically associated with straining to defecate. Although not mentioned in any of the answer choices, administration of an antibiotic (i.e. oxytetracycline) may be useful to reduce metritis.

Question

Fusion of fetal membranes between a male and female set of beef cow twins will cause a _____.

- Freemartin
- Mummification
- Feminization of male twin
- Death to one of the twins

Explanation - The correct answer is freemartin. A freemartin results from exposure of the female to Mullerian inhibiting hormone which is being secreted by the male. She is exposed as a result of anastomosis between the two fetus's chorioallantoic vessels. Clinical signs include an abnormal ano-genital distance and an enlarged clitoris.

Question

A beef cow presents for palpation at approximately 30 days gestation. Which positive sign of pregnancy will be present?

- Placentomes are palpable
- Chorioallantoic membrane slip
- Palpable uterine artery fremitus
- Fetus is palpable

Explanation - The correct answer is chorioallantoic membrane slip. Placentomes will be palpable starting between 75-90 days of gestation. The fetus itself will be palpable beginning at approximately 60 days gestation, but may be out of reach between months 4-7 of gestation. Uterine artery fremitus will be evident on the ipsilateral pregnant horn at about 120 days of gestation. From 7 months on, you can feel the fremitus bilaterally. Fremitus does not necessarily always indicate a viable pregnancy.

Question

While performing a routine pregnancy exam on a cow, it is noted that placentomes and bilateral uterine artery fremitus are present. At what point in gestation is the fetus?

- Approximately 1 month
- Approximately 6 months
- At least 7 months
- Approximately 4 months

Explanation - The correct answer is at least 7 months. Placentomes will be palpable starting between 75-90 days of gestation. The fetus itself will be palpable beginning at approximately 60 days gestation, but may be out of reach between months 4-7 of gestation. Uterine artery fremitus will be evident on the ipsilateral pregnant horn at about 120 days of gestation. From 7 months on, the fremitus can be felt bilaterally.

Question

How soon after administration of a dose of dexamethasone for induction of parturition in a cow do you expect parturition?

- 8 days
- 48 hours
- 12 hours
- 24 hours

Explanation - The correct answer is 48 hours. Parturition may occur anytime between 2 and 7 days but on average it occurs on the second day. A dose of 25-30 mg IM is sufficient.

Question

You recently helped deliver twins on a dairy farm where one of the twins was male and one was female. Which of the following is the common outcome of mixed sex twins in cattle?

- The heifer is intersex, infertile with masculinized behavior, non-functioning ovaries, and is genetically female (XX); the bull is phenotypically normal
- Both animals are intersex, infertile, with non-functioning sexual organs; they are genetically distinct with the heifer XX and the bull XY
- The bull is intersex, infertile with feminized behavior and non-functioning testes, and is genetically male (XY); the heifer is phenotypically normal
- The bull is intersex, infertile with feminized behavior and non-functioning testes, and is genetically chimeric (XX/XY); the heifer is phenotypically normal
- The heifer is intersex, infertile with masculinized behavior, non-functioning ovaries, and is genetically chimeric (XX/XY); the bull is phenotypically normal

Explanation - The heifer is intersex, infertile with masculinized behavior, non-functioning ovaries, and is genetically chimeric (XX/XY); the bull is phenotypically normal. Freemartinism is the normal result of mixed-sex twins in cattle. This occurs due to shared circulation of chorionic blood vessels in utero. This allows antimullerian duct hormone and testosterone from the male fetus to inhibit development of the female tract resulting in a short vagina that ends blindly without communication to the uterus. The heifer also frequently shows masculinized behavior. Cytogenetic examination of freemartins reveals both XX and XY chromosome patterns.

Interestingly, although some bulls born as mixed-sex twins show the presence of XX cells, they have normal conformation and external genitalia and are fertile.

Question

You are vaccinating a herd of heifers for protection against brucellosis with the RB51 strain of vaccine. You inadvertently puncture your index finger with a vaccine syringe. Which of the following measures should you take?

- See a physician and request a 3 week prescription of rifampin
- Inform the state veterinarian
- See a physician and request a 3 week prescription of doxycycline
- Clean the wound with soap and water, no further action is necessary

Explanation - The RB51 strain of vaccine is the vaccine that is most widely used currently for Brucellosis. Exposure is associated with local and systemic adverse events. The RB51 vaccine is considered much safer than the previous vaccine (known as Strain 19) to humans who are accidentally stuck or have spray exposure to the conjunctiva or open wounds. It remains undetermined if the RB51 vaccine can cause systemic brucellosis in humans. Therefore, it is recommended that individuals receive a 3-week course of doxycycline after suspected exposure. Rifampin was recommended in addition to doxycycline for exposure to the Strain 19 vaccine but RB51 is rifampin and penicillin resistant.

Question

At what day in gestation can pregnancy be first confirmed via ultrasound in cattle?

- 60 days
- 42 days
- 15 days
- 28 days

Explanation - The correct answer is 28 days. Veterinarians can determine the fetal gender at approximately 58-90 days of gestation.

Question

You are presented with a pair of aborted bovine twins and their fetal membranes, at about 8 months gestational age. The tissue is fresh and there are no gross or histologic lesions in any internal organs including the brain; likewise, the placentae are free of lesions.

A test for serum immunoglobulins in both fetuses is negative. While a definitive diagnosis is probably not likely from this description, which of the following diagnoses is most compatible?

- "Physiological abortion" attributable to twinning
- Abortion due to Neosporum caninum
- Abortion due to Listeria monocytogenes
- Abortion due to Infectious Bovine Rhinotracheitis (IBR) virus
- Abortion due to Brucella abortus

Explanation - In cattle, twinning is a significant risk factor for abortion.

Brucella abortus can cause abortion, but there are typically signs of severe inflammation, including placentitis.

IBR virus can quickly kill a bovine fetus, but as with Herpes viruses in many hosts, there are signs of severe inflammation throughout the fetus.

Listeria monocytogenes can cause abortion, but the fetus is usually autolyzed to a significant extent, and there are often brain micro-abscesses present.

Neosporum caninum can cause epidemic or enzootic patterns of abortion, but typically abortions occur earlier than 8 months and there is autolysis of tissues. Frequently, there are granulomas in the brain.

Question

What is the effect of PGF2-alpha during anestrus in cattle?

- Causes the lysis of the corpus luteum
- There is no effect
- Induces FSH release
- Induces an LH surge

Explanation - The correct answer is that there is no effect when the cow is in anestrus. That is the problem with using PGF2-alpha to synchronize estrus cycles in cows. A mature corpus luteum is needed so that PGF2-alpha can lyse it; the cow goes back into estrus in about 2-5 days.

Question

Regarding normal reproductive physiology, the cow differs from the sow, the mare, the ewe, and the nanny/doe in which of the following ways?

- Only the cow does not have an epithelio-chorial placenta
- Only the cow ovulates after the end of estrus
- Only the cow has an epithelio-chorial placenta
- Only the cow normally ovulates a single oocyte per cycle
- Only the cow is normally in estrus for fewer than 5 days
- Only the cow is a seasonal ovulatory

Explanation - An unusual feature of bovine reproductive physiology is the fact that the cow ovulates after she goes "out" of estrus. The practical implication of this is that one can successfully breed by artificial insemination later, relative to estrus.

The mare, the ewe, and the nanny/doe are all seasonal breeders, but generally, the cow is not.

All the animal species listed in the question have an epithelio-chorial placenta.

Although twin births do occur in a minority of cows, the cow normally ovulates a single oocyte per cycle, as does the mare. Sheep and goats have been selected for fecundity, with the result that multiple ovulations/cycle are the rule, rather than the exception. Litter-bearing pigs ovulate large numbers of oocytes per estrous cycle.

The sheep and goat are in estrus for only 1.5-3 days; the pig is similar. Only the mare, of the species listed, is physiologically in estrus for 5 days or more.

Question

You are called out to a dairy herd that has recently been experiencing reproductive problems. The dairyman reports that several cows have had late abortions (6-7 months gestation) and weak or stillborn calves in the past year and he's never had this problem before. Several of the cows that had abortions developed placental retention and/or metritis. None of the younger pre-pubescent heifers are displaying any clinical signs. You perform a necropsy on two recently aborted fetuses and find lung consolidation in one but no other obvious abnormalities. Which of the following should you recommend?

- Search the pasture for Ponderosa Pine and remove any that are found
- Serologic testing for Brucellosis
- Serologic testing for Neospora
- Search the pasture for Veratrum californicum and remove any that are found

Explanation - You should be most suspicious of Brucellosis based on the assortment of signs (abortions, retained placenta, metritis and lack of signs in younger animals), the timing of abortions (last half of pregnancy), and the relatively normal appearance of the examined fetuses. Pine needle abortion typically occurs in the last trimester and abortion is characterized by a hemorrhagic condition of the placenta and fetus. Veratrum californicum is associated with the cyclops condition in sheep. Neospora causes abortion from 3-8 months gestation and typically results in an autolyzed fetus; there are usually no retained fetal membranes or metritis.

Question

You perform an exam on a calf that was born with a twin. The calf has an enlarged clitoris and an abnormally small ano-genital distance. What is your diagnosis?

- Negative energy balance
- Lupine toxicosis
- Ponderosa pine needle toxicosis
- Freemartin

Explanation - The correct answer is that this calf is a freemartin. This is evident by the clinical signs provided. A freemartin results from exposure of the female to Mullerian inhibiting hormone being secreted by the male. She is exposed as a result of anastomosis between the two fetus' chorioallantoic vessels. Lupine will result in arthrogryposis if ingested, and ponderosa pine needle is known for its ability to induce late abortion if consumed.

Question

A necropsy of an aborted bovine fetus shows enlarged lymph nodes and spleen, destructive lesions to the thymus, and evidence of chronic granulomatous infection. What is the most likely cause of this abortion?

- Epizootic bovine abortion
- Tritrichomonas foetus
- Brucellosis
- Infectious bovine rhinotracheitis

Explanation - The correct answer is epizootic bovine abortion (EBA), also called foothill abortion. This is an important disease of heifers and newly introduced cows in California foothills. The lesions are consistent with this diagnosis. The etiologic agent of EBA has yet to be identified, however we know that the vector is a tick, Ornithodoros coriaceus.

T. foetus is involved with early embryonic death.

Brucellosis abortions are pretty rare since it has virtually been eradicated from the U.S., but lesions include autolysis, placentitis, and bronchopneumonia.

IBR causes rapid fetal death, therefore there is essentially no time for fetal response, so you are likely to see autolysis and focal necrosis of the organs.

Question

You are examining a herd of cattle in Montana and note that several of the animals have tattoos and tags on their right ear. You look more closely at one and see it is an orange metal eartag on the right ear. The tattoo reads "R V 1" with the V inside of a shield logo. The eartag imprint is "46VAS1997". What can you conclude about this animal?

- The animal is under quarantine for rabies
- The animal was vaccinated against rabies

- The animal is under quarantine for bovine spongiform encephalopathy
- The animal was vaccinated against Brucellosis
- The animal tested as a reactor against Brucellosis

Explanation - Tattoos and ear tags on the right ear are used to indicate animals vaccinated for brucellosis. The first letter of the tattoo indicates the type of vaccine; in this case, RB51. The USDA "V shield" indicates vaccination. The number indicates the last number of the year of vaccination. The information on the ear tag identifies the state by the first two numbers and then the remaining characters are a specific identifier for the animal so that it can be traced if necessary.

Question

An owner suspects that he has trichomoniasis in his cattle herd. What clinical signs can you tell him to look for?

- Cows will have metritis
- Abortion
- The bulls will have a thick preputial discharge
- Poor calving percentage

Explanation - The correct answer is that they are usually asymptomatic, but by the time calving occurs there is likely to be a poor calving percentage. Neither the cow nor bull appear to be remarkably clinically affected. Rarely, one may see a very mild discharge from the cow after early embryonic death, and if there is a pyometra at the time of pregnancy check one could be suspicious. Abortion is not the correct answer because cows don't really abort anything, they just return to heat at an extended interval after being bred.

Question

You are collecting a sample from the bulk tank for a periodic milk ring test for Brucella at a dairy herd of 300 lactating cows. The farmer asks you what the test entails and what happens if it comes back positive. You explain that a suspension of killed Brucella organisms is added to the stored sample to screen for antibodies to the organism. If samples are positive, a bluish ring forms at the cream line as the cream rises (positive test) which is how the test gets its name. He asks what happens if there is a positive test. What should you tell him?

- It is reported to state and all of his cows will be serologically tested within 30 days, reactors will be slaughtered
- He will be asked to submit a second sample for verification. If positive, he will need to have his cows be serologically tested within 30 days
- He will be informed that he must test all animals within 30 days and treat reactors with rifampin
- He will receive a notice to voluntarily test all animals within 30 days, slaughter all reactors and vaccinate remaining animals with RB51 vaccine

Explanation - It is reported to state and all of his cows will be serologically tested within 30 days, reactors will be slaughtered. Brucellosis is a reportable disease and is promptly reported to the appropriate agency in the state. Positive animals should be slaughtered, not treated.

Brucella surveillance consists primarily of two processes. The milk ring test (MRT) also known as the Brucella ring test (BRT) is as described in this case; it is typically performed on bulk tank milk samples and if positive, all cows on the farm are serologically tested individually with reactors slaughtered. The second process is identification and blood testing of animals at slaughter. Animals that test positive at slaughter prompt testing of the remaining cattle at the farm of origin for identification and slaughter.

Question

A 2-year old Holstein bovine female calved 14 days ago with a difficult dystocia. Her ears are erect and she seems to over-react to external stimuli. In response to your clapping, her third eyelids partially cover her eyes, and then eventually retract. The signs in this patient are all compatible with which of the following?

- A systemic infection with Clostridium difficile
- A systemic infection with Clostridium septicum
- A uterine infection with Clostridium difficile
- A uterine infection with Clostridium tetani
- A uterine infection with Clostridium botulinum
- A uterine infection with Arcanobacter pyogenes

Explanation - The clinical signs and history are all very characteristic for a cow with tetanus. The causative agent is Clostridium tetani.

C. botulinum is responsible for a flaccid paralysis and rapid death, not the hyper-alert signs shown here.

C. difficile is notorious for bowel infections, especially in horses.

Systemic infection with C. septicum will result in massive necrosis of damaged tissues, but would not show the hyper-excitability seen in the cow in question.

A uterine infection with Arcanobacter pyogenes would result in endometritis or at worst, pyometra, but would not cause any overt signs as seen in this question.

Question

A pregnant cow has a uterine torsion. Which of these therapeutic interventions should you attempt if the torsion is clockwise?

- Push forward on the vagina while rolling the cow clockwise
- Perform uterine surgery to relieve the torsion

- Push forward on the vagina while rolling the cow counterclockwise
- Administer oxytocin

Explanation - The correct answer is push forward on the vagina while rolling the cow clockwise, which may seem counter-intuitive. By stabilizing the uterus and rotating the cow around it, you can attempt to relieve the torsion.

Question

Which of the following is true of bovine trichomoniasis?

- It is primarily a gastrointestinal pathogen
- Once infected, a cow typically becomes a permanent carrier
- It is typically first suspected by the discovery of preputial discharges from infected bulls
- The mature bull is commonly the reservoir of infection for a herd
- It is carried by the male, especially young, immunologically naive bulls
- It is caused by the flagellated protozoan, Trichinella spiralis

Explanation - The mature bull is commonly the reservoir of infection for a herd. Trichomoniasis, caused by the protozoan Tritrichomonas foetus, is typically a temporary infection in the female. She characteristically eliminates the infection in 2-4 months. The bull, however, becomes a chronic carrier as he ages, since aging is associated with increased depth of epithelial crypts of a bull's glans penis and prepuce, thus increasing the availability of the "niche" where the organism thrives.

Once infected, a cow typically clears the infection from the reproductive tract in 2-4 months and regains her fertility.

Young bulls are rarely infected chronically, probably because they have shallow penile and preputial crypts, which are thought to provide poor niches for chronic infection.

Trichomoniasis typically manifests no visible signs in either the male or female.

Question

A cow about one month from term goes off feed and rapidly develops an enlarged, rounded, abdominal shape. She is now uncomfortable and reluctant to move. You examine the cow and note marked accumulation of watery fluid in the uterus. You perform a brief ultrasound and confirm the large volume of fluid in the uterus and a thickened placenta. What should you tell the farmer about this condition?

- Hydrops allantois (hydroallantois) is a disorder of the fetus and can be treated by induction of parturition or Caesarian section and in most cases if the fetus is close to term, the calf will survive and the cow will be fertile

- Hydrops amnion (hydramnios) is a disorder of the placenta and the fetus is likely to survive but the cow will likely be infertile
- Hydrops allantois (hydroallantois) is a disorder of the placenta and the prognosis for life of the fetus and fertility of the cow is poor
- Hydrops amnion (hydramnios) is a disorder of the fetus and although the fetus is unlikely to survive, the cow should be okay

Explanation - The clinical description is most consistent with hydroallantois because of the rapid accumulation of fluid and the clinical signs of the cow. Hydramnios is a reasonable differential although it more typically involves gradual accumulation of fluid and the cow is usually clinically unaffected.

Hydroallantois is a disorder of the placenta (chorio-allantois) that results in rapid accumulation of 100-200 liters of watery, clear fluid during the last trimester. The cow develops a rounded appearance to the abdomen and it is usually not possible to palpate the fetus or placentomes. The cow often becomes sick with anorexia, decreased rumen motility, dehydration and weakness. She may go down or rupture the prepubic tendon. The prognosis for the fetus is guarded and even with treatment, the cow will likely be infertile. Induction of parturition or C-section are treatment options but the majority of calves are not viable and the dam rarely has normal colostrum. If the pregnancy is terminated, it is unlikely that the cow will have a productive milk cycle. Usually salvage for slaughter is the preferred option unless the fetus is considered valuable and the cow is near term.

Hydramnios is a disorder of the fetus, and the placenta itself is normal. The condition is typically characterized by gradual accumulation of thick viscous fluid during the later part of gestation. The cow develops a pear shaped caudal view. The fetus and placentomes are usually palpable and the cow is usually clinically well. Pregnancy usually goes to term and a small, deformed fetus is delivered. The cow has a fair to good prognosis for life and fertility. The cow may be induced or allowed to go to term depending on her condition.

Question

A dairy has experienced an increase in abortions from midterm to term, as well as the birth of weak calves with neurologic signs. Based upon histopathologic lesions and herd serology, you have diagnosed Neospora caninum. Which of the following steps to help control the disease is most correct?

- Depopulate and bring in clean seronegative cows
- Keep raccoons away from cows and cow feed
- Keep dogs and coyotes away from cows and cow feed
- Treat all cows in the herd with long acting tetracycline
- Keep cats away from cows and cow feed

Explanation - The canine is the definitive host and sheds oocysts in the feces, which cause the disease when consumed by cattle. Like cattle, deer may also be infected as intermediate hosts. The dogs are initially infected by eating infected tissues from the cattle, most commonly an aborted fetus.
