Equine News

IN THIS ISSUE

West Nile virus update: Washington leads in number of cases for second year

For two years in a row, Washington state has led the nation with the number of horses infected with West Nile virus. The mosquito-borne neurologic disease is now present throughout the United States.

In 2008, 179 equine cases were detected in the United States, with 41 occurring in Washington. In 2009, the total number of cases in the country increased to 241, and a staggering 30 percent of those (72 horses) resided in Washington. Colorado had the second most, with 21 cases reported. The majority of cases in Washington were detected in Benton, Yakima, and Kittitas counties with Grant, Franklin, and Adams counties reporting a few as well. The first positive horses were reported in July and the last in September, which coincides with the mosquito season in these areas.

West Nile virus is maintained within the wild bird population. Birds do not typically become ill as a result of the infection, but mosquitoes that feed on infected birds can then transmit the virus to humans and horses.

Horses and humans are both considered dead-end hosts, meaning that subsequent mosquitoes that feed on people or horses do not ingest enough virus to transmit it to others.

Once an infected mosquito bites a horse, the virus enters the nervous system and causes damage to the brain and spinal cord within 3-14 days. Signs of the disease can be mild, manifested as lethargy, change in behavior, muscle twitching, hind-end weakness, or loss of coordination. Signs can be much more severe, however, and progress to paralysis, seizures, or even coma. West Nile virus kills about one-third of infected horses that display clinical signs.

There is no specific treatment for West Nile virus. With supportive care, many horses survive the infection, but some horses can have residual issues with weakness or incoordination.

"The good news about this potentially fatal disease is that it is completely preventable," said Dr. Nicki Wise, a third-year WSU equine medicine resident. "There are currently three approved West Nile virus vaccines available. When used appropriately, each of these vaccines is effective in preventing disease. These vaccines can only be administered by your veterinarian, so even if you perform routine vaccinations yourself, it is important to have your veterinarian out once a year, just prior to start of the mosquito season, to have your horse vaccinated.

"The combination vaccines that you can purchase at your local supply store do not contain West Nile virus protection," she said. "You should work with your veterinarian to decide which vaccine is best for your horse.

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West Nile *continued*

The migratory pattern of wild birds in this state makes central Washington more susceptible to this disease, but all horses in the United States should be vaccinated yearly, regardless of location."

It is unclear why case numbers continue to rise in central Washington. Data collected from the majority of the diagnosed horses in 2008 and 2009 indicates that they were not vaccinated appropriately against the virus. Beyond yearly vaccination, horse owners can further protect themselves and their horses by decreasing mosquito exposure. It helps to eliminate stagnant water sources from the property, and stable horses at dawn and dusk when mosquito activity is at its peak.

A detailed report of the cases identified within Washington and the entire United States can be found at the U.S. Department of Agriculture website at www.aphis.usda.gov/vs/nahss/equine/wnv. For more information regarding West Nile virus and how to protect your horse, contact your veterinarian or the Equine Medicine Service at WSU's Veterinary Teaching Hospital at 509-335-0711.

Recommended vaccines for adult horses

Horses are susceptible to infectious diseases, often caused by viruses and bacteria. Fortunately, owners can protect their horses against several potentially fatal diseases through vaccines that help establish immunity against them. Often, these vaccines need to be boosted annually for a horse to maintain immunity and remain protected.

In addition, many of the vaccines protect against insect-borne illnesses. As insects begin to emerge, spring is generally a good time to schedule annual vaccinations or boosters.

In general, there are standard vaccine recommendations that apply to all horses. Beyond standard recommendations, each individual animal's needs, based on risk and lifestyle, should be taken into consideration before determining what vaccine to give and how often it needs to be repeated. The goal is to minimize the number of vaccines administered to each horse while maintaining optimal protection against serious infectious diseases.

Core vaccines

The American Association of Equine Practioners (AAEP) released guidelines concerning vaccines the organization considers essential for all horses to receive every year. These are referred to as "core" vaccines. Other vaccines are considered "risk-based" and should be given to horses that are at risk for exposure to a specific disease based on their occupation or location within the United States. In general, the core vaccines offer more complete protection than the risk-based vaccines.

"It is important to know when buying vaccines which diseases are included in the combination vaccines, like the '4-Way' or '5-Way,' because each brand is different and not being informed may leave your horse unprotected," said Dr. Nicki Wise, a third-year WSU equine medicine resident. "The core vaccines offer excellent protection against the potentially fatal diseases of tetanus, Eastern and Western Equine Encephalitis Virus (EEE and WEE), West Nile virus, and rabies."

Tetanus is a neurologic disease caused by toxins from the bacteria *Clostridium tetani*. Horses most commonly contract this disease through contaminated wounds. Although humans only need a tetanus vaccine every 10 years, horses require a booster every year. The vaccine is considered very safe and effective in preventing disease.

Vaccines for EEE and WEE are generally found in combination, although EEE is far more common in the United States. The closely related Venezuelan Equine Encephalitis (VEE) virus is only found in South America, but may also be included with EEE and WEE vaccines. Each of these viral neurologic diseases is transmitted by insects and carries a high fatality rate. These vaccines are considered very safe and effective in preventing disease when given once a year before the start of the insect season, usually early summer.

"When purchasing vaccines, tetanus will often be combined with EEE/WEE (and VEE)," said Dr. Wise. "There are two more core vaccines, one for West Nile virus and another for rabies. These vaccines cannot be purchased at your local supply store. West Nile virus and rabies vaccines must be administered once a year by a veterinarian. West Nile virus vaccination is essential for protection of horses in this area. In 2009, Washington led the nation in the number of West Nile virus equine cases, with the most cases reported in central Washington. Horse rabies is considered to be rare in Washington, but given that the vaccine is inexpensive, safe, and very effective, it is considered a core vaccine for all horses in the United States."

Risk-based vaccines

Risk-based vaccines include Equine Herpesvirus (Rhinopnuemonitis), influenza, strangles, Equine Viral Arteritis (EVA), botulism, and Potomac Horse Fever. EVA is a disease that is only relevant for horses used for breeding purposes, especially stallions. This vaccine can only be administered by a veterinarian, and consultation is necessary for owners that believe their horse may require protection against EVA. Botulism and Potomac Horse Fever are only a significant threat in certain parts of the United States and are not considered necessary in the Pacific Northwest.

Equine herpesviruses (EHV) can cause several different disease syndromes in horses, but the available vaccines are only labeled to reduce clinical signs associated with the respiratory form of the virus and aid in prevention of late-term abortion. This vaccine is considered very important for pregnant mares. A vaccine is also available for equine influenza virus, but much like the flu vaccine for humans, it does not completely prevent signs of the flu. The vaccine can help decrease the severity and duration of clinical signs and reduce viral shedding by infected individuals. Horses that travel or are exposed to new horses may benefit from the EHV and equine influenza vaccines. They are available in both intramuscular and intranasal forms, and each form is considered safe.

Strangles is the common term for lymph node abscesses that develop as a result of an infection with the bacteria *Streptococcus equi*. Horses that travel to shows and are frequently exposed to

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Vaccines *continued*

other horses will often be vaccinated for this disease. The vaccines available for strangles have been known to cause some serious side-effects, including a condition called purpura hemmorrhagica. This complication causes an abnormal immune response that can result in severe systemic illness often characterized by lethargy, edema of the abdomen and limbs, and bleeding tendencies in which the blood does not clot appropriately. A strangles vaccine can only be administered by a veterinarian.

"When in doubt about which vaccines your horse may need, it is always a good idea to check with your veterinarian," Dr. Wise said. "This is especially true for vaccination of foals and adult horses with no known previous vaccine history. A series of appropriately timed boosters are needed to fully protect these animals to avoid incomplete protection. Recent research has shown that there are differences in the way younger and older horses respond to vaccination but all older horses should continue to receive the core vaccines yearly.

"Owners that choose to vaccinate their horses must very carefully follow the label directions," she said. "Vaccines will lose their efficacy if stored incorrectly and it is never acceptable to give an intramuscular vaccine intranasally and vice versa. This mistake could result in serious complications. Always use brand new, clean needles for each vaccine in each horse. Even though most vaccines are safe, there is always a risk of reaction, especially at the site of injection. Be sure to make note of where the injections were given so that if a reaction occurs, you will be able to recognize it."

For more information on vaccines, visit the AAEP website at www.aaep.org and review the "Guidelines" section, or call the WSU Veterinary Teaching Hospital at 509-335-0711.

Adult Horse Core Vaccines (Yearly)

Tetanus
EEE/WEE
West Nile Virus
Rabies

Common Risk-based Vaccines (2-3 times a year)

Herpes (Rhino)
Influenza
Strangles

Although there are other vaccines available for horses, there are no other vaccines the Equine Medicine Service at Washington State University's College of Veterinary Medicine considers both safe and effective for routine administration for horses in eastern Washington and the surrounding area.

Facts and myths about Equine Hypothyroidism

True primary hypothyroidism in adult horses is an extremely rare condition that some would argue is non-existent. Congenital hypothyroidism is possible in newborn foals.

Many in the equine world are under the misconception that it is a common problem in adult horses because it is often confused with Equine Cushing's Disease or Equine Metabolic Syndrome. Signs of these conditions, such as a pendulous (sagging) abdomen, abnormal fat deposits, and abnormal hair growth, have historically been attributed to hypothyroidism, when in fact experimentally-induced hypothyroidism causes none of these signs. In fact, removal of the thyroid gland results in weight loss, lethargy, cold intolerance, and decreased growth rate.

"It is impossible to say what the actual clinical signs of a true clinical case of hypothyroidism would be because no one has ever definitively diagnosed it in a horse," said Dr. Siddra Hines, a WSU equine medicine resident. "The existence of true hypothyroidism in adult horses cannot be proven or demonstrated in any clinical case. In research, all studies that have tried to prove the existence of hypothyroidism in horses have not been successful."

Veterinarians can assess thyroid hormones with a blood test, but this method has been shown to be extremely inaccurate. In addition, low thyroid hormone levels do not mean necessarily that the horse has true hypothyroidism. Instead, the low levels are a likely result of some other illness or issue. This most commonly occurs as a result of other medical problems, dietary issues, or administration of common medications like phenylbutazone. As a response to illness, the body may lower production of thyroid hormones to protect itself against excessive metabolism in order to prevent consumption of nutrients that are needed to fight disease.

"If unnecessary supplemental thyroid hormones are given in an effort to 'treat' hypothyroidism, this can have negative effects, such as weight loss, nervousness, decreased bone density, and serious heart problems," Dr. Hines said. "It is necessary to treat the primary problem, after which the low thyroid hormone levels will normalize."

A foal with mandibular prognathism, a common developmental abnormality in foals with congenital hypothyroidism. This condition goes away with time.

"Hypothyroidism is very difficult to diagnose, especially because there are no reliable tests for horses that are not confounded by other medical problems," she said. "Strictly evaluating thyroid hormones does not test the actual function of the thyroid gland. That would require a thyroid stimulation test like they have for dogs, and that is not available for horses. We generally recommend looking for all other possible problems, because even if low hormone levels are assessed, that does not diagnose hypothyroidism. It cannot be ruled out by normal thyroid hormone levels, either."

It is important that horses suspected of having hypothyroidism be tested for Equine Cushing's Disease. Unfortunately, there is no test to rule out equine metabolic syndrome.

"Sometimes veterinarians mistakenly diagnose hypothyroidism because they test thyroid hormone levels in a horse with a vague disease or suspicious clinical signs," Dr. Hines said. "The treatment of choice for hypothyroidism is levothyroxine, which is synthetic thyroid hormone commercially known as Thyro-L®. Often

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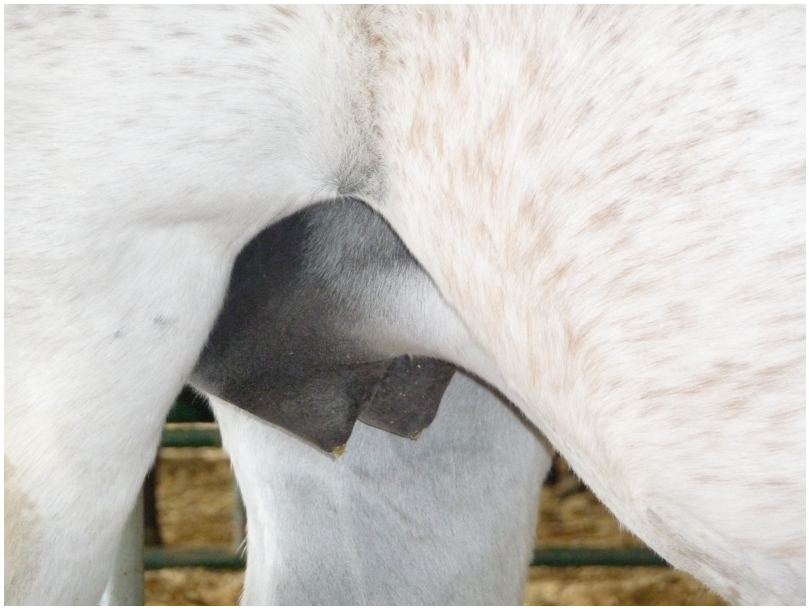
Late gestation problems in mares are often serious medical issues

Late-term pregnancy loss is a considerable problem for the equine breeding industry. An estimated 8-10 percent of broodmares lose their pregnancy before term. Many late-term pregnancy problems are serious and can result in the loss of the mare, the foal, or both. In addition, mares that survive often have a lower conception rate during the following breeding season.

It is important to monitor mares as they get closer to giving birth, especially those that have had any problems with past pregnancies or those that have had any problems during their current pregnancy. These mares are determined to be "high-risk" and include those that have had surgeries, signs of colic during pregnancy, history of dystocia (a slow or difficult labor or delivery), twins, premature foals, retained placenta, and placental inflammation (placentitis).

Several factors that may contribute to pregnancy loss (abortion) include infectious agents like bacteria, viruses, and fungi; twin pregnancies; fetal or placental abnormalities; and systemic illness such as colic, endotoxemia, and uterine torsion.

Major clinical signs that indicate problems during a current pregnancy include premature lactation, premature udder development, often referred to as "bagging up," vulvar discharge, and signs of colic.



A mare with premature mammary gland development is the most common late-term pregnancy abnormality. This "waxing," or the production of thick mammary secretions, should not occur before foaling. If it happens before this time, it is indicative that an abortion may be impending.

"If any of these signs are present, an attending veterinarian should be called immediately as these signs are considered emergency situations, and the mare will require special medical attention," said Dr. Jacobo Rodriquez, a WSU equine theriogenology (reproduction) resident. "Owners should be ready to provide their veterinarian with a complete history of the mare, breeding management, vaccination dates, nutritional information, and any other relevant information concerning previous reproductive problems, such as uterine infections, problems with previous foals, dystocias, or twins."

Early mammary gland development and premature lactation are the most common late-term pregnancy abnormalities noticed in mares. Normal udder development occurs 2-4 weeks prior to foaling, but waxing, or the production of thick mammary secretions, and the production of milk should not occur until 2-3 days before foaling. Waxing and milk leakage before this time signals a severe compromise of placental function and is the most common sign of an impending abortion. Problems affecting placental function are primarily due to twin pregnancies, placentitis, or death of the fetus.

Placentitis

If placentitis (an inflammation of the placenta) was the cause of an abortion, it is often traced to a bacterial or fungal infection. These infectious organisms can gain access to the uterus and placenta through the vagina and cervix, which would be termed ascending placentitis, or spread via the blood, called hematogenous placentitis.

If an abortion occurs, owners should do their best to find out why because it may have been the result of a serious medical condition or fertility issue. Owners that see their horse in the process of an abortion should call a veterinarian immediately. The veterinarian can collect samples for diagnosis at such places as the Washington Animal Disease Diagnostic Laboratory (WADDL) at WSU in Pullman.

"Ascending placental infections are the most common and are often seen in older, thin mares and mares with poor perineal conformation," Dr. Rodriguez said. "Mucopurulent discharge (material containing mucus and pus) may also be present in these cases. Some causes of placentitis are found regionally, too. Two main causes of severe placentitis are bacterial infections called leptospiriosis and noncardioform placentitis. These presentations are more common in some regions of the United States like Kentucky and Florida."

There are some good treatments available to medically manage a mare with placentitis and save a foal with placentitis if a diagnosis is made early and therapy is started as soon as possible. Diagnosis and medical management is based on evaluating and monitoring placental function and fetal activity and viability. Placental function is determined by evaluating hormone levels of estrogen and progesterone, as well as the thickness of the interface between the placenta and uterus, which is increased in cases of placentitis. If vaginal discharge is present, bacterial culture from the cervix is also taken in order to better target the treatment.

"Treatment for placentitis is based on reducing inflammation of the uterus, combating the infection with antimicrobial drugs, reducing uterine contractions, and helping the fetus to get better oxygenation with special medications," Dr. Rodriguez said.

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Gestation *continued*

Nutritional issues

Meeting the nutritional needs of a pregnant mare is another important aspect for normal fetal development. The average equine pregnancy lasts about 340 days. During the last trimester of pregnancy, a mare's nutritional intake should increase by about 20 percent. Owners should make sure their mare is eating quality feed and that she is eating the amount actually provided. Special attention should also be given to minerals and trace elements in feed, as there are some striking regional differences. A veterinarian can guide owners as to supplements or feeds that may be appropriate for their particular area.

"Owners should also know that pregnant mares with poor body condition will not be able to supply the needs of the foal, and in severe cases, may produce a dysmature foal," Dr. Rodriquez said. "These foals are slow to stand, have a poor suckling reflex, poor muscle development, laxity of the flexor tendons, and poor maternal recognition. They have floppy ears with fine haircoat, a lower than normal body temperature (hypothermia), and many of them are also born dehydrated, which can be a reflection of placental insufficiency or uterus infections. The prognosis of these foals, without professional critical care, is poor."

There are also multiple toxic plants that can have a negative effect on late pregnancies. One of the most common is the consumption of fescue grass. Fescue grass may be infected with fungi called endophytes. It is safest to assume that fescue has endophytes in it and should be considered toxic unless proven otherwise. If an owner has fescue on their farm, it is best to remove pregnant mares from it at least four months before the mare is due to give birth. If ingested, pregnant mares may experience prolonged pregnancies, lack of milk production, premature placental separation referred to as "red bag," and placental insufficiency resulting in dystocia, abortion, stillborn or weak foals, and poor reproductive performance postpartum. If a particular area or ranch is known to have this problem, mares should be thoroughly examined toward the end of pregnancy and treated for prevention of this syndrome.

"A similar problem may exist with mustard toxicity, and may result in foals with congenital hypothyroid dysmaturity syndrome, resulting in limb deformities and enlarged thyroid," Dr. Rodriguez said.

Colic

The presence of any sign of colic during pregnancy should be considered very carefully. It is important to find out if the signs of colic in a pregnant mare are related to gastrointestinal problems or genital issues.

"I highly recommend that owners not start any horse on medication for colic until consulting with a veterinarian, particularly in the case of pregnant mares," Dr. Rodriguez said. "Mares with gastrointestinal colic can be managed, but their placental and fetal health will need to be monitored and managed in the same manner as for placentitis, particularly if surgery is needed."

The most common cause of colic with genital origin is the uterine torsion. This situation is diagnosed by careful transrectal palpation and, depending on the case, may be resolved with surgery. One study has shown that both the mare and foal have a better chance of survival if the uterine torsion occurred before 320 days of gestation (97 percent and 72 percent respectively), than if the torsion occurred after that time (65 percent and 32 percent respectively).

Prenatal and postpartum care

Once a mare becomes pregnant, a disease prevention, exercise, and nutritional plan should be discussed with a veterinarian, including an appropriate deworming schedule and vaccination schedule to protect against diseases such as Equine herpes virus, Encephalitis, tetanus, and West Nile virus. Vaccination programs should be tailored for an individual horse's needs, the region, and the farm it came from. An emergency plan can also be developed to help an owner respond in case a serious problem like colic, premature lactation, abnormal vaginal discharge, and abnormal development of the abdomen.

"An early pregnancy diagnosis should be performed to avoid problems with twins, as early reduction of the pregnancy is highly successful," Dr. Rodriguez said. "All mares should benefit from at least two more pregnancy evaluations at 45-60 days and at four months. Additional pregnancy evaluations may also be required depending on the results of prior exams, and mares treated for any late-gestation problem should be closely monitored until giving birth.

"As foaling nears, it is important that foaling prediction tests based on mammary gland changes are not used for mares that had premature udder development and lactation," he said. "Video surveillance and the use of electronic devices such as Foalalert® are better in order to attend foaling. Once the delivery is complete, the placenta should be saved in a plastic bag and refrigerated until a veterinarian can examine it and the foal, generally within 24 hours of the birth. The mare also needs to be examined at that time for any postpartum problems."

To ensure adequate passive immunity for a foal, colostrum banking is an important strategy any time a breeder is dealing with a high-risk pregnancy. This is particularly true for mares with premature lactation or poor mammary gland development. Banking is best done at the beginning of foaling season. A veterinarian can obtain colostrum from another owner or farm, but there are places where it can be bought as well, including online. Colostrum from a proxy mare should be tested for quality and compatibility and frozen appropriately, such as in a non-defrost freezer (one that performs a cyclical defrost, refreezing technique) or better yet, a scientific freezer. After the birth, the colostrum should be adequately thawed in warm water and fed to the foal in sufficient amounts within the first 8-12 hours of life. A microwave should not be used for thawing as that may destroy the antibodies in it. The average foal typically requires 1-2 litters of colostrum. A veterinarian can help administer the colostrum, and help with any other issues the foal or mare is having after birth.

For more information about equine pregnancy issues or managing a mare with a high-risk pregnancy, contact the theriogenology service at WSU's Veterinary Teaching Hospital at 509-335-0711. For more information about submitting samples in the case of an equine abortion, contact the Washington Animal Disease Diagnostic Laboratory at 509-335-9696 or www.vetmed.wsu.edu/depts_waddl.

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Hypothyroidism *continued*

veterinarians will prescribe medication to treat hypothyroidism based on low levels of thyroid hormone, and horses appear to improve because thyroid hormone gives them more energy and may help them lose weight. This 'response to treatment,' however, is not a result of treating true hypothyroidism. Even a perfectly healthy animal or person taking thyroid hormones will respond to administration of supplementary hormone.

"There can be negative effects of treating with synthetic thyroid hormone, especially if it is not needed, so it should be administered only if it will truly be beneficial," she said. "The only time I would recommend treating a horse with thyroid hormone is for those that have Cushing's or Equine Metabolic Syndrome with significant laminitis or lameness that cannot be ridden or worked as a part of their treatment for the condition. Levothyroxine can help them to lose weight and decrease their problems with insulin resistance."

If a horse is treated with levothyroxine for any reason, a veterinarian will need to monitor levels of the drug in the blood stream so that treatment can be tailored to that specific animal and to avoid toxic levels of hormone. In addition, treatment cannot be abruptly halted. Treated animals must be weaned off the medication. This is because administration of synthetic hormone decreases the activity of the horse's own thyroid gland. If abruptly taken off the medication, the thyroid gland cannot produce enough thyroid hormone on its own and the horse will become acutely hypothyroid. If the horse is gradually taken off the medication, the thyroid gland can gradually return to normal function as the levels of synthetic hormone decrease.

Congenital hypothyroidism

Congenital hypothyroidism in newborn foals is the only recognized form of true hypothyroidism in horses. This is generally thought to be related to inadequate vitamin or mineral supplementation in a pregnant mare, or if the mare grazed on mustard plants or plants containing nitrates while pregnant. Congenital hypothyroidism occurs most commonly in western Canada and the Pacific Northwest. The disease ranges in severity from mild to severe contracture (shortening or distortion) of the flexor tendons to problems with bone development in the knees and hocks that can cause crippling lameness. Foals are usually born later in gestation than normal, but exhibit signs that are typical of a premature foal, such as a soft, silky hair coat, floppy ears, and a dome-shaped head.

Assessing levels of thyroid hormones is not diagnostic for congenital hypothyroidism, as levels of circulating hormones are often normal. Diagnosis is generally based on the presence of classic clinical signs, although a biopsy of the thyroid gland will be abnormal as well.

"Treatment with levothyroxine is not recommended, as a foal's thyroid gland just needs time to mature and produce its own hormones," Dr. Hines said. "If an owner believes their foal may be affected by this condition, he or she should contact their veterinarian immediately because often these foals require supportive veterinary care. Consideration must also be made for the care of pregnant mares in the future, because this problem often occurs repeatedly in succeeding years."

For more information about low thyroid hormone levels in horses, or congenital hypothyroidism in foals, contact the Equine Medicine Service at WSU's Veterinary Teaching Hospital at 509-335-0711.

WSU Veterinary Teaching Hospital Switchboard

Main Hospital Switchboard and Emergencies	509-335-0711
Equine Appointments	509-335-0711
Agricultural Animal Appointments (Non-Theriogenology)	509-335-5377
Theriogenology (Equine and Ag Animal)	509-335-0741
Small Animal Appointments	509-335-0711
Dean's Office	509-335-9515
VTH Fax Number	509-335-3330
Billing	509-335-0711
Pharmacy	509-335-0736
Pet Partnership Program	509-335-7347
Pet Loss Hotline	509-335-5704

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