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EQUINE HERPESVIRUS MYELOENCEPHALOPATHY

A GUIDE TO UNDERSTANDING THE NEUROLOGIC FORM OF EHV INFECTION

WHAT IS EQUINE HERPESVIRUS 1 (EHV-1)?

Equine herpesvirus 1 (EHV-1) is a contagious equine virus that can cause neurological disease, respiratory disease, newborn death and abortion. EHV-1 can be either neuropathic or nonneuropathic. Despite the names, both forms can cause neurologic disease.

EHV-1 is also known as rhinopneumonitis.

WHAT IS EQUINE HERPESVIRUS MYELOENCEPHALOPATHY (EHM)?

Equine herpesvirus myeloencephalopathy (EHM) refers to the neurological form of EHV-1. Horses positive for EHV-1 and show neurological signs such as incoordination and hind-end weakness are considered positive for EHM. Once a horse is positive for EHM, other horses at the facility are at an increased risk of getting EHM. EHM is often fatal and those that make a rare recovery will likely face long-term neurologic problems.

Be safe. Handling a horse with a neurological disease such as EHM can be dangerous. Your horse may lose their balance or partial control of their body, which can put you and others at risk of injury. While waiting for a veterinarian, stay a safe distance away from your horse to prevent injury.

SIGNS OF ILLNESS

If you suspect your horse has EHV-1, contact your veterinarian right away. Your veterinarian can take a nasal swab or blood sample to test your horse for EHV-1. Signs of EHV-1 include:

- Fever, which commonly precedes other clinical signs
- Respiratory disease: most common in young horses
- Fever, coughing, and clear to thick yellow nasal discharge
- Abortion: usually occurs in late pregnancy (over 8 months), but can occur as early as 4 months with no warning signs
- Neurologic disease (EHM)
    - o Hind-end weakness and incoordination
    - o Leaning against walls or fences for balance
    - o Urine dribbling or not able to urinate
    - o Down and not able to stand

Horses usually express signs of illness 4 to 6 days after exposure to the virus. This can greatly vary and may be as short as 24 hours. When EHM occurs, it typically begins 8 to 12 days after fever begins.

HOW DOES THE VIRUS SPREAD?

- The most common way to spread EHV-1 is by direct horse-to-horse contact.
- Horses can get the virus through infected air droplets or nasal discharge of infected horses.
- EHV-1-aborted foals can also act as an infection source.
- Horses can carry EHV-1 but not show signs of illness. Stress such as transportation or weaning can reactivate the virus in carriers and cause disease.
- EHV-1 can also spread indirectly through contact with physical objects contaminated with the virus. This can include grooming equipment, feed and water buckets as well as people's hands or clothing. The virus can live for a few weeks on uncleaned objects and surfaces.

TREATMENT

- Supportive care and anti-inflammatory drugs are often used.
- Antiviral medications may be used for horses with EHM.
- Sling support can help horses with severe weakness and incoordination.
- Isolating affected horses will help prevent the infection from spreading.
- Your veterinarian may prescribe antibiotics if they have concerns about secondary bacterial infection.

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PREVENTION

- Vaccinations are available to control the respiratory and abortion manifestations of EHV-1. Current vaccines don't reliably prevent development of EHM. Your veterinarian may recommend vaccinating to help reduce disease spread. Some breed associations require vaccination prior to participating in shows or events.
- Practice biosecurity to avoid spreading disease and bringing it home or to other facilities.
- Don't enter or leave a facility where a horse has tested positive for EHV-1 or EHM until a veterinarian has cleared it.
- Keep your horse home if it shows signs of illness.

ADDITIONAL RESOURCE

https://www.aphis.usda.gov/vs/nahss/equine/ehv/equine_herpesvirus_brochure_2009.pdf

SELECTING PASTURE SPECIES AND READING A SEED TAG

There are many varieties of pasture seeds, both in mixtures and on their own. Knowing how to select seed and read a seed tag are important first steps to achieving your pasture goals. Selecting seed for a new or existing pasture can be an undertaking. Keep it simple. Here are a few things to consider when selecting forage.

- Try to select forages that grow well in your region and are preferred by horses.
- Seeding a mixture can help to provide forage during different parts of the grazing season.
- Consider the lifespan of the forage. Annuals will only live for one season, and short-lived perennials like timothy may not last as long as the more dominant forages like tall fescue or Kentucky bluegrass.
- Select seed that is free of noxious weeds. The cleaner the seed, the better. Select seed that contains little crop and weed seed contamination.
- Each additional year after the original seed harvest will reduce the germination rate of the seeds. Watch the test date on the tag and ask the company for a new tag with an updated germination rate for bags older than a year. Most seed stores will provide updated tags or will stock seed from the same year. Lower germination rates will increase the pounds of seed applied per acre to achieve the same amount of emergence as higher germination eates.
- Recommended seeding rates are often for establishing new pastures. Interseeding pastures will often require less seed per acre.

Once you have an idea of the type of forage you want to plant, you can begin your search for the right seed. Below is an example of a generic pasture seed tag with a mixture of seeds. A typical seed tag includes the following:

1. SEED OR MIXTURE NAME: a name for the seed or seed mixture specific to the company

2. PURITY: percent of desired seed by weight for a given variety

3. VARIETY: forage type; often accompanied by a specific cultivar name

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4. GERMINATION: the percent of seeds expected to germinate by variety

5. ORIGIN: where the seed was grown

6. ADDITIONAL CONTENTS

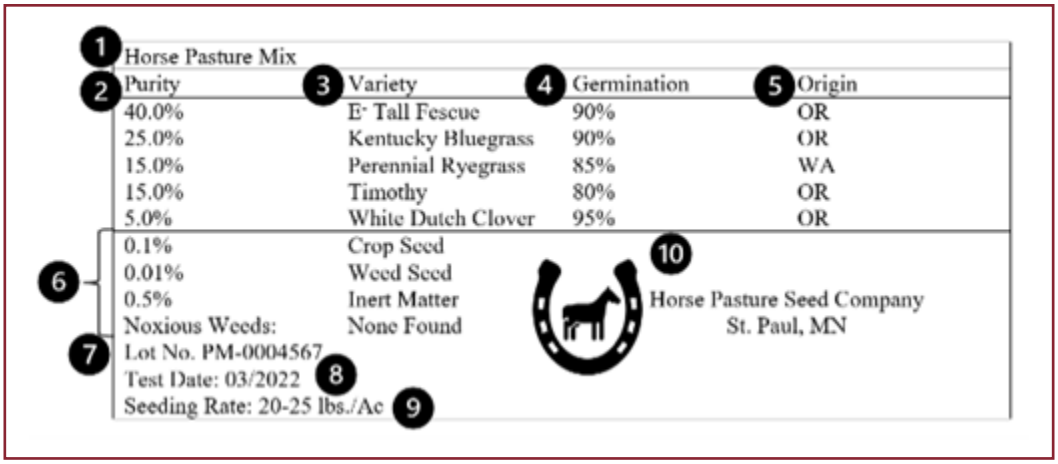
- o Crop seed: the percent of seed by weight expected to be from a crop species other than the varieties listed (often a different forage)
- o Weed seed: the percent of seed by weight expected to be from weeds
- o Inert matter: the percent of weight comprised of non-seed products like mulch
- o Noxious weeds: number of noxious weeds identified in the mixture, which can vary by state

7. LOT NUMBER: specific batch that the bag of seed was derived from

8. TEST DATE: month and year that the seed was tested for germination and composition

9. SEEDING RATE: recommended pounds of seed needed per acre for establishment

10. COMPANY LOGO: address and contact information for the seed company



FEEDING YOUNG HORSES: GRADUATING TO A GROWN-UP DIET

CONSIDER GROWTH RATE AND NUTRIENT BALANCE WHEN DECIDING WHAT TO FEED YOUNG HORSES

While perusing shelves of dog food at your local pet store, you'll likely see designations on bags and cans denoting specific formulations: adult, senior, small breed, large breed. This degree of nutritional precision also applies to horses. Foals, weanlings, adults, and seniors need different amounts of protein, energy, and minerals.

Mare's milk and solid food provide excellent nutrition and make feeding fairly simple before a youngster reaches weaning age. Questions arise when he's on the cusp of the next age bracket. How do you select the right diet for a young horse that is maturing into an adult?

GROWTH RATES

Karen Davison, PhD, an equine nutritionist and director of equine technical solutions for Purina Animal Nutrition, in Gray Summit, Missouri, is well-

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versed in the complexities of feeding horses of all ages. She shares considerations for transitioning young horses to adult feed:

"The level of nutrition, protein, vitamins, and minerals relative to calorie requirements is much higher for a growing horse than for a mature horse," she says. "As the horse ages, there is a shift from nutrition needed to develop tissue and grow, to more nutrition devoted to maintaining the body."

Based on National Research Council estimates, an average 1,000-pound horse is 64% of his mature height at 12 months, 77% at 18 months, and 86% at 24 months.

"Breed type modifies specifics on how to feed, mostly due to differences in rate of growth and age at maturity," says Davison. "All horses continue to mature and get heavier for a couple of years following the end of growth in height."

Kathleen Crandell, PhD, is an equine nutritionist at Kentucky Equine Research, in Versailles, with a special interest in feeding growing horses for athletic development. "Research demonstrates that we can influence growth rate with the amount of energy supplied in the diet, as long as all other nutrients are supplied in adequate amounts," she says. "What we cannot change is the final mature size of an individual beyond its genetic potential."

WHEN IS IT TIME FOR A DIET CHANGE?

Once a young horse reaches 65-70% of its mature weight—usually around a year of age—growth slows and your nutritional strategies need to change. Yearlings should generally consume 50% forage (hay and pasture) and 50% concentrate or a "junior" supplement by weight. (For the purposes of this article, "concentrate" or "supplement" refer to a manufactured, balanced feed combining forage and grain, often called a complete feed. "Grain" refers to corn, oats, and/or barley.)

Horses younger than 2 might develop a hay belly when ingesting more than 50% forage, says Davison. "This isn't necessarily body fat but indicates a youngster's less-efficient forage digestion," she says. "Support lean tissue development in the youngster while not overfeeding. Body condition scoring is a great management tool to monitor growth and fat deposition." Ideally, keep your growing horse's body condition score around 5 or 6 on the 1-9 Henneke scale.

The proper forage-to-concentrate ratio depends on your forage quality. This is where you might want to have your hay analyzed to determine its nutrient content. As growth rate slows, a horse voluntarily consumes more forage. Because a young horse typically won't eat enough forage to meet his protein, vitamin, and mineral requirements without getting too fat, Davison recommends feeding a ration balancer, which provides concentrated levels of protein, vitamins, and minerals without too many additional calories.

By about age 2, a horse has reached nearly 90% of his mature weight and can transition from the 50% hay and 50% supplement diet to free-choice quality hay and however much supplement or ration balancer he needs to maintain an appropriate body condition score.

MUST-HAVES: MINERALS AND VITAMINS

Horses need a balance of specific minerals—particularly calcium and phosphorus—for bone and cartilage development. Our sources suggest ensuring horses get as much calcium as phosphorus, ideally with a calcium-to-phosphorus ratio of 1.1-1.25. In areas where horses subsist primarily on calcium-rich alfalfa-based diets, Crandell suggests supplementing at least 0.6% dietary phosphorus.

Researchers have found that calcium-to-phosphorus ratios as high as 6:1 don't cause developmental orthopedic disease (DOD), provided the horse receives adequate amounts of both minerals.

Trying to compensate for imbalances by adding minerals has its limitations. "Adding calcium to a calcium-deficient diet likely reduces the incidence of DOD, but adding more calcium to a diet that already contains adequate calcium is not likely to prevent DOD," Davison says.

FEED FAT OVER CARBS

Nutritionists consider fat to be "safer" than carbohydrates to feed young horses. This is because blood glucose levels don't

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tend to rise following the ingestion of fat calories as much as they do after carbohydrate (grain) calorie consumption.

"Added dietary fat, such as vegetable oil, is a concentrated source of energy, providing 2.5-3 times the calories as similar weight of grain," says Crandell. "However, there is a limit to how much fat can be fed—an excess of 12% of the total diet risks disruption to the intestinal microbial ecosystem. Most total diets—forage and concentrates/supplements—rarely exceed 6% fat."

Rice bran is a popular fat source. However, Davison notes its potential issues: "While the fat and nutrients in rice bran keep a horse shiny, its high phosphorus content is problematic and could contribute to poor skeletal development due to an inverted calcium-to-phosphorus ratio."

Crandell says fat should not replace all calories from starch; otherwise, growth and maturation could slow. On the other hand, if oversupplied, especially when necessary nutrients are missing, fat calories accelerate fat deposition.

PREVENTING DOD

Dietary imbalances, management, and genetics make growing horses prone to DODs, which include physitis, angular limb and flexural deformities, osteochondrosis, and vertebral malformations.

Davison says that when a population of young horses has been fed a poorly balanced diet or excessive calories, or if they've been overfed after a period of improper feeding, subsequent accelerated growth rates can lead to a higher-than-normal incidence of DOD. "Significant time in confinement is also deleterious to the growing skeleton," she says. "Correcting these issues likely reduces the incidence of DOD in young horses." That said, she points out that DOD can still show up in youngsters despite excellent management and diet.

"Cutting back on protein, vitamins, and minerals slows growth rate without interrupting growth," she continues. "Deficiencies in important nutrients potentially lead to delayed onset of DOD. Steady and proper growth can be optimized by controlling calories, providing properly balanced nutrition and adequate free-choice exercise."

"Excess weight on bones and joints of a growing horse is more detrimental than being underweight," says Crandell. "Use of a ration balancer provides a low-calorie option to balance out the forage for the easy keeper."

A low-starch, high-fat concentrate with a ration balancer might benefit horses with specific growth or metabolic issues, says Crandell. Always offer free-choice salt, as well.

PREVENTING GASTRIC ULCER SYNDROME

The equine gastrointestinal tract evolved to handle small frequent meals throughout the day. Equine gastric ulcer syndrome (EGUS) can result when any age horse consumes abundant carbohydrates (grain products) and/or is subject to long periods of fasting between meals. Providing steady access to forage is an important strategy for lowering a horse's risk of developing EGUS.

"Feeding free-choice hay to any age horse is appropriate when they're working hard enough to burn calories and don't exceed body condition scores of 5-6," says Davison.

Crandell refers to a 2011 study of young Standardbreds to illustrate the importance of forage type in the growing horse's diet: "Youngsters that had been on a pasture-only diet at the start of the study were tested on two diets high in concentrate—the ulcer scores worsened. The first diet was 50% hay cubes and 50% commercial grain concentrate. The second diet used the same ingredients but ground into a complete pelleted feed. Ulcer scores were highest with the complete pelleted feed, even though it had the exact same ingredients as the cube and concentrate diet."

She says this is probably due to horses' decreased chewing and saliva production when consuming a complete pelleted diet, as well as the interval without feed because horses consume pellets quickly.

Feeding recommendations to prevent EGUS in adult horses are relevant to the growing horse, says Crandell:

Provide smaller, more frequent meals when feeding large amounts of concentrate or grain;

Limit starch content to less than 1 gram of starch per kg body weight per feeding. For example, a 450-kg (1,000-pound) horse should receive no more than 5 pounds of grain or concentrate per feeding;

Provide free-choice access to forage if possible, or offer at least 1.5% of the horse's body weight in daily forage;

Maximize chewing time using slow feeder hay bags or bale boxes that allow for periodic eating without overconsumption;

Add alfalfa to the diet to help reduce ulcer scores.

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TAKE-HOME MESSAGE

Dietary decisions aren't necessarily about good or bad feeds, calorie sources, or ingredients, says Davison. Rather, they're based on the total diet's balance. Proper feeding management and nutrition should support growth without overfeeding and fattening the young horse.

"Successful transitioning depends on the individual horse and its rate of maturation," says Crandell. "Transitioning a horse is more an art than a science. As the old saying goes, 'It is the eye of the master that fattens the calf.'"

Practice good husbandry and feeding to maintain a steady growth rate. Provide appropriate amounts of correctly balanced, lower-starch rations intended for growing horses, and weigh and measure horses regularly during their growth period.

The Horse