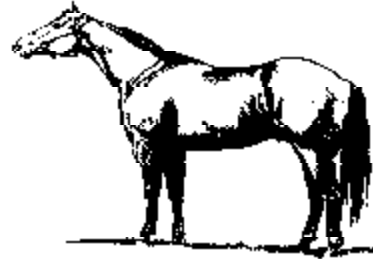


Animal Science Horse Information Series

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A HORSE GENETIC DISEASE--HYPP

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Periodically, we read that researchers have discovered a gene that is responsible for or associated with “such-and-such” a disease.

This is also true in horses. Researchers have discovered the gene responsible for the disease commonly called Hyperkalemic Periodic Paralysis (HYPP), an inherited muscular disorder due to a genetic mutation that is similar to a human condition.

It is a genetic defective disease inherited from the sire, dam or both. In fact, all horses know to have this disease genetically trace to one Quarter Horse stallion, Impressive. So, the disease is found in the Quarter Horse, Appaloosa and Paint breeds.

The disease is characterized by intermittent, uncontrollable muscle tremors, which usually start in the face, neck and barrel of the horse. These may be generalized or localized to

one or a few muscles. Affected horses may become weak, sway from side-to-side, stagger, assume a sitting-dog position, collapse and die. Horses that die have heart or respiratory failure. Affected horses may make a noise when breathing.

The muscle ripples have been described as “snakes under the skin” or “jumping muscles.” The bouts may be mild and infrequent or may not even be noticed. On the other-hand, they may be frequent, severe and long-lasting.

Most horses recover after a 15-60 minute bout. Most bouts occur at rest and are triggered by stress: such as transportation, illness, even feed changes or increased potassium in the blood.

HYPP horses have a defective sodium ion channel in the muscle cell membrane. The normal flow of sodium ions in and out of the muscle cell is disrupted, resulting in muscle tremors.

Warning signs are restlessness, dullness, depression, frequent urination and/or defecation, prolapse of the third eyelid, sweating and stiffness of lips that make a horse appear to be grinning.

Horses with these defective genes are usually normal until they are two-year-olds. But, some foals show signs also.

HYPP horses require special management. Keep them in large pastures rather than stalls. Feed small amounts, two, three or more times daily and exercise regularly. Avoid rapid feed changes, and reduce their potassium intake.

If diet does not control the attacks, other measures must be used. Contact your

veterinarian.

A DNA test can determine if a horse has HYPP, and whether it is a homozygous (H/H) or a heterozygous (N/H) condition. In homozygous individuals, both genes are defective (H/H). H is dominant to N, the normal gene. So N/H individuals are HYPP. A homozygous sire or dam will transmit a H gene to each offspring, so they will be HYPP. A heterozygous parent may also transmit a H gene to an offspring. However, not all offspring will acquire the H gene from a heterozygous sire or dam.

Horses with HYPP have it for life and may, at any time, exhibit signs of the disease. As noted, there are management considerations that these individuals require and may improve their usefulness.

Proper genetic selection against this detrimental gene will reduce its frequency in the affected breeds and finally eliminate HYPP. If only N/N individuals were used, HYPP would disappear in the next breeding generation.

Mares with Impressive pedigrees should be tested. If they have one or two HYPP genes, they should not be used for mating. Owners breeding their mares to stallions of this bloodline should use only stallions that have been tested and are not carriers of the gene.

Management of a genetic disease, such as HYPP, is a poor alternative since proper genetic selection can prevent the continual perpetuation of this defective gene.

Since horses can collapse when they have a muscular tremor bout, they may be at risk when ridden.

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Peer reviewed by Dr. Bill Backus and Dr. Arnold Saxton.