Research Update - Microchip Identification

The inflammatory process during insertion and occurrence of migration are major concerns of horse owners when determining the usefulness of microchip identification. The objectives of a study conducted at Pennsylvania State University were to characterize the inflammatory response after microchip insertion, evaluate pain response and swelling at the microchip insertion site, and measure migration of the microchips.

Eighteen mature Quarter Horse mares were assigned randomly to three treatment groups. The microchip group (n = 7) had microchips inserted using a sterile needle and syringe; the “sham” group (n = 7) had a needle inserted but no microchip; and the control group (n = 4) had no insertion. The insertion site was visually determined by a veterinarian to be within the nuchal ligament on the left side of the horse, with a transverse position halfway between withers and poll, and dorsal position several centimeters below the crest of the neck (Figure 1).

For the migration component of the study, radiographs of the seven microchipped horses were taken over 6 months after insertion. These radiographs allowed measurement between a select vertebral point and the microchip.

The microchip and sham insertion did not cause a detectable increase in temperature. Algometer readings, used to quantify pressure necessary to induce a pain threshold response, indicated that microchip insertion area was more sensitive than sham insertion at 2 hours on day 1, and day 3 post insertion. Visible swelling began 2 hours post-insertion and resolved by day 3. SAA concentrations were affected by day following insertion, but not by treatment group. Increases in SAA concentration could not be matched with local insertion reactions. Migration was not detected in any of the horses during the 6 months.

Microchip identification is a viable alternative form of identification for equids. It does not cause excessive inflammation or continued tissue irritation after insertion. It also does not migrate if implanted within the nuchal ligament on the left side of the horse halfway between the withers and poll.

However, it may be important to continue to assess the microchips for migration in young growing animals. For some breed registries, identification has to be obtained on registration, so microchip insertion will have to be performed at less than 1 year of age. Although the microchip may not actually be moving, the development of the tissues around the microchip could put it in a different position than anticipated. Future studies should investigate ideal location as affected by age for microchip insertion. Summarized by Krischna Martinson, PhD, University of Minnesota.

Figure 1. Microchip insertion.

The inflammatory response was measured over a 2-week period by measuring dermal temperature, response to pressure and swelling at the insertion site, and plasma serum amyloid A (SAA). SAA is expressed in response to inflammatory stimuli.
Ask the Expert: Mud Management in Horse Pens  
By: K. Martinson, U of MN

Q: I recently built three 14’ x 65’ drylots for my horses. The soil in my area is heavy, mucky clay. What do you recommend using as footing to ensure proper drainage and as little mud as possible?

R: Unfortunately, with heavy clay soil, drainage and mud is going to be a continued problem unless the drylot is renovated. The below system, called a high traffic pad, has proven to work (tested at the Universities of Kentucky and Vermont) and will dramatically decrease mud problems in drylots.

To install a high traffic pad:
- Remove the 8’ of top soil
- Install drainpipe to direct water out of the pen. The pipe must be sloped towards an outlet.
- Add 4” of crushed limestone (usually 1 ½ to 1 ¾ in diameter).
- Add second layer of geotextile fabric.
- Add 4” of dirty pea stone (small gravel)
- Refresh the top layer as needed; usually once every year or two.

The estimated cost for installing a high traffic pad is about $0.80 per square foot. In one of your 14’ x 65’ drylots, the cost to renovate the entire paddock will cost just under $800. To lessen the investment, renovate one drylot per year.

The University of Kentucky has a factsheet further outlining the process. It is available online at www.ca.uky.edu/agc/pubs/id/id164/id164.pdf

Forage Alternative Continued  
By: K. Martinson, PhD and M. Hathaway, PhD, Univ. of Minn.

Horses have evolved on diets composed entirely of forage. Therefore, forage (hay and pasture) should be the primary component of a horse’s diet and fed at a minimum of 1% body weight (BW) each day; most horses consume 2% BW in feed (hay plus grain) each day. For most horse owners, unlike other livestock owners, there are few options other than forages to meet their horse’s nutritional requirements. However, there are a few alternatives to forage that can help horse owners ride out high feed prices.

Beet pulp is a good source of energy and protein. Most horses can consume 5 to 10 pounds of beet pulp each day. However, an appropriate minerals supplement will be necessary in order to achieve the recommended calcium to phosphorus ratio of 2:1.

Complete feeds offer a balanced diet and are good hay extenders. Some complete feeds are meant to be fed with forage, while some can be substituted for forage. However, some complete feeds may not have enough total fiber, can be eaten quickly, will need to be divided up into several small meals, and can be expensive.

Feeding hay cubes usually result in little waste, are easily handled and transported, and are a good baled hay extenders or replacements. However, hay cubes are not true forage alternatives, but are actually processed forage and might reflect forage prices and scarcity.

Unlike other livestock, horses should not be fed straw, corn stalks, or haylage. Corn stalks and straw provide very little nutrition, and corn stalks and haylage can have mold and botulism issues, posing severe problems for sensitive horses.

Before feeding an "alternative" feed to your horse, consult your veterinarian or an equine nutritionist. Any change in diet should be done slowly to allow horses time to acclimate to the new diet. Constantly changing diets can lead to horse health problems, specifically colic.

Neurologic Disease in Horses: Part II  
By: Carrie Finno, DVM, PhD, Univ. of Minn.

The 4 major causes of spinal ataxia in the horse are:
- Trauma
- Infection with equine herpes virus type-1 (equine herpes myeloencephalopathy) can cause clinical signs that resemble these conditions, but the onset is usually acute (fast) and other clinical signs (fever, urine dribbling) and history (recent travel to an event) will help your veterinarian determine if EHV-1 should be considered in your horse.
- West Nile Virus (WNV) is also a cause for sensory ataxia in the horse and highly accurate diagnostic tests are available to test for WNV. Additionally, vaccination programs have greatly reduced the incidence of WNV.
- Next month we’ll discuss NAD/EDM in detail.
- Neuroaxonal Dystrophy/Equine Degenerative Myeloencephalopathy (NAD/EDM)
- Equine Protozoal Myeloencephalitis (EPM)