

Neonatal isoerythrolysis

By Meredith Hodges



Mule breeders need to know that there is a condition that can occur more often breeding jacks to mares than it does when breeding strictly horses; this condition is called neonatal isoerythrolysis (N.I.). It is comparable to the R.H. incompatibility that can occur between a human mother and her child. As in humans, if the foal's blood type is the same as the mare, then there is no problem. However, when the jack, or stallion, and the mare have different blood types, and the foal possesses the jack's blood type, there is potential for this problem to occur.

On the surface of the mare's red cells are antigens that will stimulate the production of antibody against the incompatible red blood cells (R.B.C.'s) of the foal if some of the foal's red cells get into her system. There are basically two ways that these cells can get into her system:

- 1) If the foal's R.B.C.'s enter the mare's circulation via the placenta during pregnancy, or at delivery. Unlike in humans, the foal does not receive antibody across the placenta, so if he doesn't nurse, then there is no problem.
- 2) If the mare obtains these incompatible cells during a blood transfusion.

If neither of these conditions occurs, the mare can carry, birth, and nurse her foal with no problem. If the incompatible red cells do get into her system somehow, she will begin making antibody against those cells which, in turn, will be passed into the foal's system via the mare's first milk, or colostrum. It would seem that the foal would be unable to nurse from his natural mother at all, except for the following two facts:

- 1) That the level of antibody is only high in the mare's first milk, or colostrum, which is most potent with antibody in the first six hours after which it begins to decrease gradually over about 24 to 36 hours, and
- 2) That the foal will not absorb these antibodies from the intestine after approximately his first 24 hours. After 24 hours, the antibodies would be digested in the intestinal tract of the foal rather than absorbed intact.

The mare can be tested ahead of time to determine if she has a different blood type than the jack, or stallion, but this does not identify the problem of N.I., just the possibility for occurrence. Blood samples from the mare and jack need to be taken two to four weeks before the mare is due to foal to determine if she is producing antibody to the foal's red cells. If the test is positive, then precautions must be taken to save the foal at birth. In order to save the foal, he must be prevented from nursing his dam for the first 24 to 36 hours. The foal should be muzzled and bottle-fed colostrum from a mare that has not produced this antibody and is compatible with the foal; and to be absolutely safe, the colostrum should be from a mare that has never had a mule foal.

A mare with no R.B.C. antibodies should have colostrum collected in the first six hours for the best results in building the foal's immune system; she does not need to be

the same blood type as the foal as this would limit potential sources of colostrum but she must not have antibody to the foal's R.B.C.'s. The amount fed will vary with the quality of the colostrum. Initially the foal should be given 2-3 feedings of colostrum, then give milk for energy for the first 24-36 hours; goat's milk is best. After 24 to 36 hours, the foal can be returned to his dam's milk safely. The foal whose dam has not been checked may seem normal at birth, but will soon become lethargic, then pale, or jaundiced by the end of 1 to 3 days and may die. Sometimes, if you can catch them early enough they can be transfused with blood and live, but this procedure has inherent risk and there are no guarantees.

Research on neonatal isoerythrolysis (N.I.) has been done over some years on Thoroughbred horses; statistics indicate that 20% have incompatibilities between dam and sire, yet only 1% of foals develop this condition. The incidence in mule breeding suggests that the rate is higher. The University of California at Davis and Louisiana State University are 2 places that have a laboratory set up to do this initial testing of mares for N.I. Your vet can contact them for information about how to collect and ship samples for testing.

Out of concern for future mule offspring, the Lucky Three Ranch, with the assistance of our veterinarian Kent M, Knebel, ID.V.M. Colorado State University researcher, Josie Traub-Dargatz, D.V.M., M.S., and Louisiana State researcher, Jill McClure, D.V.M., M.S. began thorough testing of our stock with particular attention to Little Jack Horner is R.B.C. factor (Red blood cell) contributing to the N.I. condition. It was discovered by Dr. Jill McClure of Louisiana State University that Little Jack Horner's red cells were resulting in an unidentifiable antibody in the horse mares who carried his foals, unlike other identifiable test cases. The mares sampled had antibody present but Dr. McClure was unable to type it.

The next step was to immunize some research horses at L.S.U. with Little Jack Horner's R.B.C.'s; if they make antibody, she will have a more readily available source of antibody for further research, She also sampled some burros from another L.S.U. project and discovered that they, too, had the same R.B.C's factor as Little Jack Horner, but the antibody produced in the mare is still unidentified. There is a lot we already know about N.I. that can help us use some preventative medicine. However, this discovery of a new antibody stimulated by the Jack and produced by the mare proves that there is still a lot more that we do not know and need to learn. All Little Jack Horner's tests showed him to be of a compatible blood type if he were a stallion horse sire, and yet this unknown antibody is being produced. Perhaps future research will hold the answer to this puzzle.

We owe a debt of gratitude to veterinarians like Dr. Kent Knebel who will take time out of their busy schedules to collect samples for this re- search; also, to ardent researchers like Dr. Josis Traub-Dargatz and Dr. Jill McClure who are putting their hearts and souls into this important research, working long and tedious hours for the benefit of our mule industry, Their research will have a terrific impact on mule breeding programs all over the world!