

Technical Report

EPIC Neonatal: Foal Diarrhea Clinical Report

Can neonatal foal diarrhea (foal scours) be interrupted once introduced to a Kentucky horse farm?

Death and increased treatment cost from neonatal foal diarrhea of various etiologies represent a significant loss to the equine industry annually. Outbreaks are unpredictable and can be triggered by multiple factors. Sickness rates from infection may vary from less than twenty-five to as much as one hundred percent. Mortality rates also can be significant. In addition, complications such as joint sepsis and malabsorption syndrome may result in an individual of substantially reduced value.

Treatment for neonatal foal diarrhea infections includes intestinal protectorants, antibiotics, oral and intravenous fluids, NSAIDs and bacterial colonizing drugs. Hydration and nutrition therapy must be additionally provided regardless of etiological diagnosis. Anesthesia, radiographs, joint lavage and joint injection may be indicated in extreme cases of septicemia. Individual foal treatment costs can quickly add up to hundreds and even thousands of dollars. As in all disease complexes, prevention is much preferred over treatment for foal health, performance and well being, as well as for economic reasons.

The handling of a newborn foal in the first few hours and days of its life can have a significant impact on its health and subsequent performance as it matures and enters different segments of the performance horse industry. A foal is born with a sterile gut and respiratory system. Immediately following birth, it is exposed to both pathogenic and non-pathogenic organisms through the nose, mouth and navel. There are many factors with the potential to negatively impact neonate health. Bad weather can increase stress, and poor foaling conditions can provide increased environmental pathogen levels. Mare immunization, condition and age can also have an impact. Critical to ensuring good early health is adequate intake of quality colostrum within the first six hours. The passive immunity derived from colostrum is a foal's major defense against early disease. Unfortunately, the amount and quality of colostrum a newborn foal ingests is commonly unknown, often inadequate and difficult to assess within a time frame that allows for effective supplementation.

A commonly used practice to prevent foal diarrhea is based on increasing the mare's colostral concentration of IgG by scheduled vaccinations prior to foaling. A second method of prophylaxis and treatment commonly used is multiple oral administrations of hyper-immune plasma to the foal during the first 48 hours in an attempt to increase IgG to protective levels. The most recent technology to prevent or treat neonatal foal diarrhea is "egg protein in complexes" (EPIC). EPIC is administered orally to the newborn foal at birth and again six to eight hours after nursing.

This report chronicles the process used in managing a neonatal foal diarrhea outbreak on a large Kentucky thoroughbred horse farm.

Background

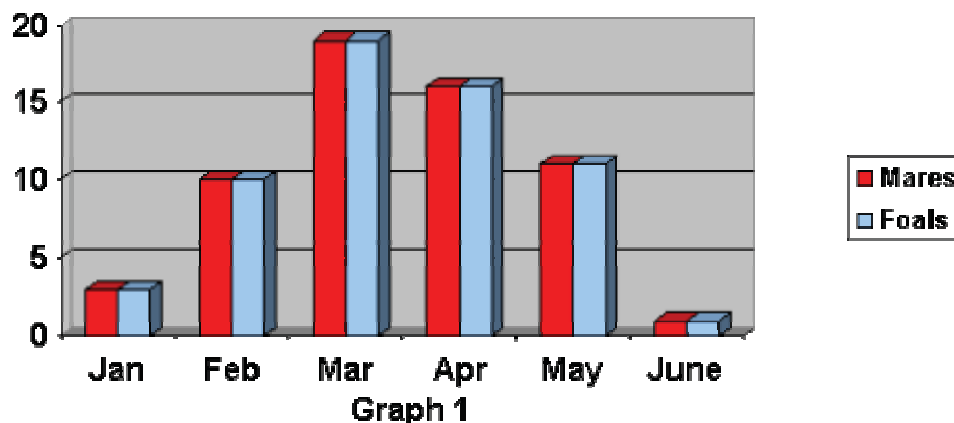
Sixty in-foal mares were boarded and foaled out at one location of the horse farm. All mares were regularly vaccinated and dewormed in accordance with commonly accepted veterinary standards and were in excellent health and condition going into and throughout the foaling season. Sixty days into the 1999 season a severe neonatal foal diarrhea outbreak occurred.

Month	Number of Mares	Number of Foals
January	3	3
February	10	10
March	19	19
April	16	16
May	11	11
June	1	1
Total	60	60

Table 1

The first foal was born January 17, 1999 and the last on June 1. The distribution of foaling dates is indicative of a well-run and successful breeding operation (Table 1). The majority of foals were born in March and April. Ninety five percent of foals were born in a four month period between February 1 and May 31 (Graph 1).

Foals Born by Month



Sequence of Events and Treatments

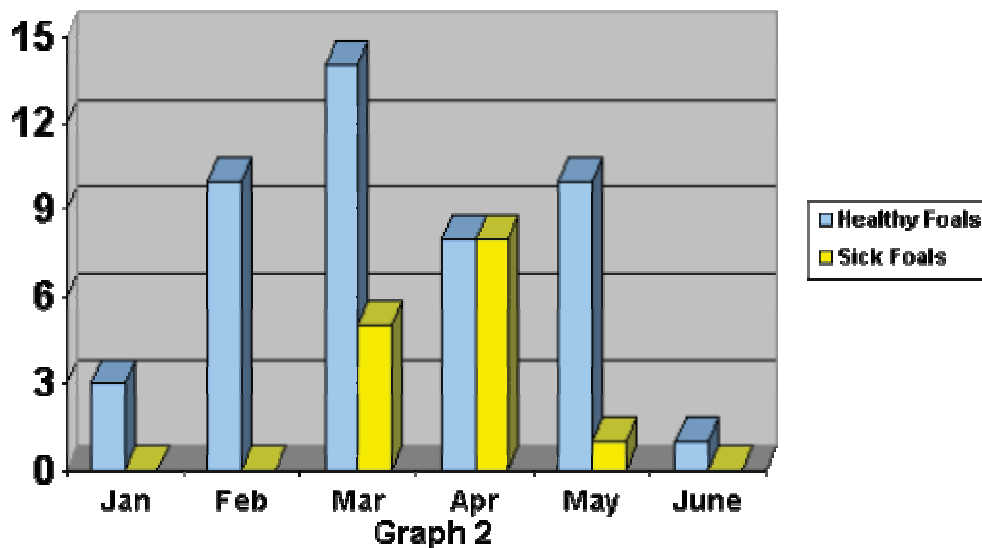
The first thirteen foals born in January and February were born healthy, received no treatment for foal scours and never became sick. The outbreak of neonatal foal scours started mid-March. Shipping records indicate possible introduction of the disease could have been by outside mares introduced to the farm and placed in the isolation area several days prior to the first foal's illness.

In the 45 days from March 15 through April 30, 13 out of 23 foals developed diarrhea and required treatment (Table 2 and Graph 2). This represented a morbidity of 57 percent.

Month	Number of Foals	Number of Healthy Foals	Number of Sick Foals
January	3	3	0
February	10	10	0
March	19	14	5
April	16	8	8
May	11	10	1
June	1	1	0
Total	60	47	13

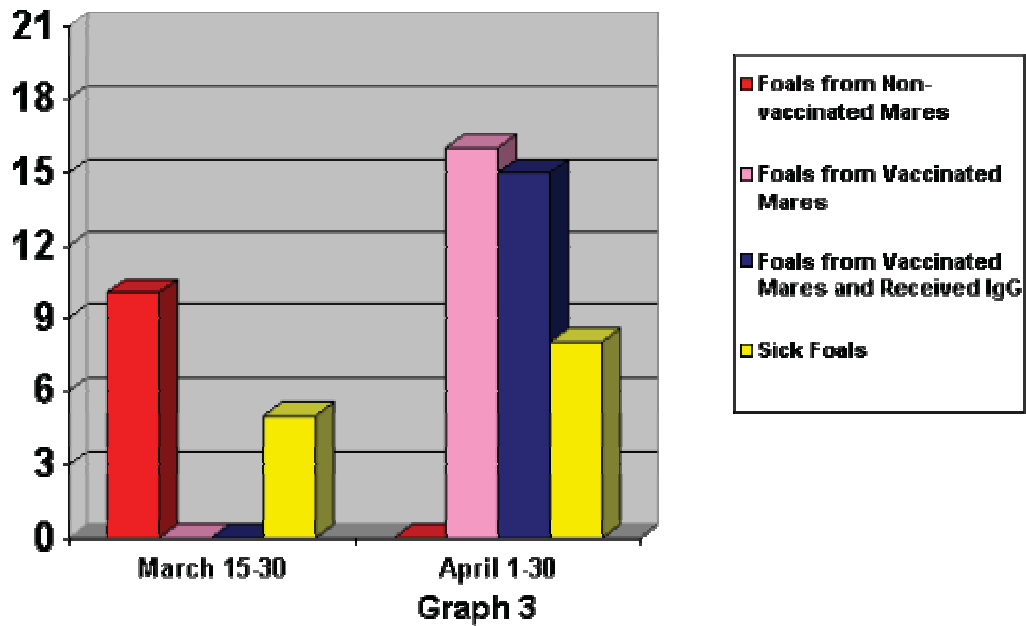
Table 2

Healthy vs Sick Foals by Month



A fifty-percent incidence of diarrhea in foals born the last half of March led to an aggressive management change in the foal health program. On the last day of March all mares still in-foal were vaccinated against Equine Rotavirus and boosted two weeks later in an attempt to protect subsequent foals from disease. Additionally, after April 6 all newborns were given oral IgG plasma four times per day for five days. Even with these preventive measures, the sickness rate in foals remained at fifty percent (eight sick foals out of sixteen births) through April (Graph 3).

Sick Foals in March and April

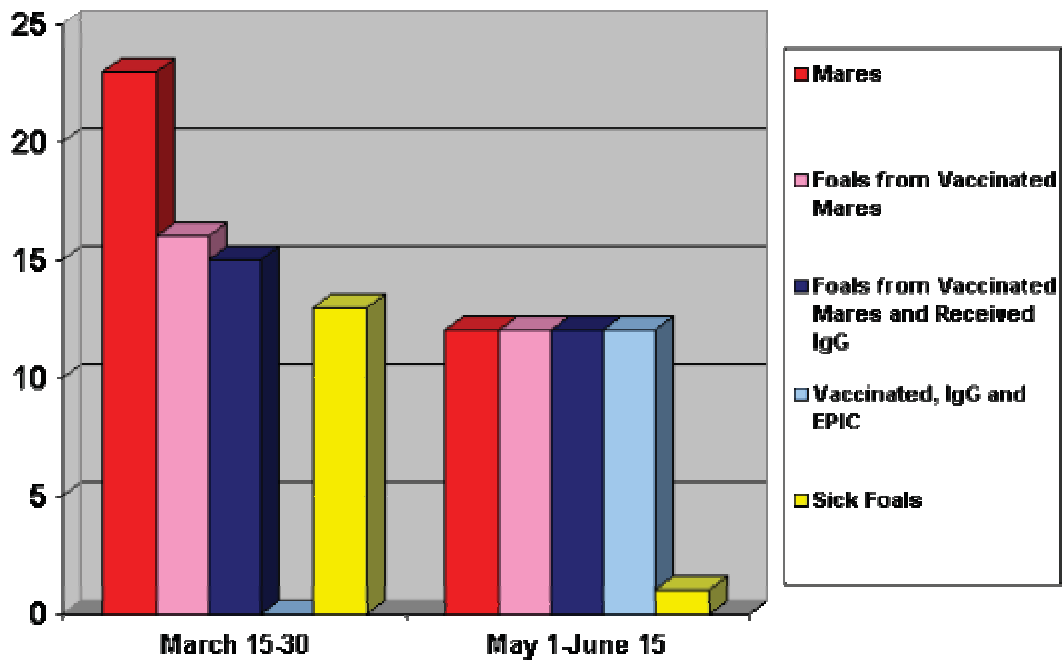


Vaccination of mares in the face of the outbreak and administration of oral plasma did not impact morbidity. Subsequently, on May 1 a third prophylactic approach was initiated. Each newborn was given EPIC (egg protein in complexes from BIONICHE Animal Health Research, Inc.) immediately after foaling and again six hours after nursing. EPIC was suspended in vegetable oil and administered orally. Of the twelve foals born in May and June, only one required treatment for foal diarrhea (Table 3 and Graph 4).

Month	Number of Mares	Number of Mares Vaccinated	Number of IgG Treated Foals	Number of EPIC Treated Foals	Number of Sick Foals
Jan	3	0	0	0	0
Feb	10	0	0	0	0
Mar	19	0	0	0	5
Apr	16	16	13	0	7
May	11	11	11	11	1
June	1	1	1	1	0
Total	60	28	25	12	13

Table 3

Summary of Treatments and Impact on Foal Health



Graph 4

Discussion

In an attempt to stop an outbreak of neonatal foal diarrhea on this Kentucky horse farm treatments were given sequentially and their effectiveness evaluated. Rotavirus vaccination thirty days prior to foaling resulted in little or no effect since there was inadequate time for the mares to mount a strong immune response. Rotavirus vaccine is reported to be effective when used according to label directions, however vaccine effectiveness may be compromised when used in the face of an outbreak.

The use of oral hyper-immune plasma did not decrease the incidence of clinical diarrhea. Supplementation with oral IgG plasma showed no effect on preventing or stopping foal diarrhea irrespective of measured IgG levels between 8 and 24 hours of age (nine out of thirteen sick foals had IgG levels of >1000 at birth).

It was not until the addition of EPIC that the neonatal foal diarrhea problem was virtually eliminated. Only one out of twelve foals receiving EPIC needed treatment for diarrhea, (this case of diarrhea was atypical and coincided with foal heat).

An economic evaluation of treatment costs for sick foals demonstrates the value of prevention versus treatment in health management. Treatments for the thirteen scouring foals ranged from \$148 to \$8,150 and totaled \$26,043. The average treatment cost per foal was \$2,003.

Based on this clinical field situation, EPIC proved to be of significant value when used in the face of an outbreak of neonatal foal diarrhea or for routine prophylactic use.

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