Recognizing and Preventing Failure of Passive Transfer

The best way to keep your foal healthy in the first few weeks of life is to ensure “passive transfer” is achieved at birth.

Considering the time and financial and emotional investment involved in producing a live, healthy foal, it is devastating when things go wrong in the neonatal period. One of the most important ways to avoid disappointment is to ensure your foal achieves the “passive transfer” of infection-fighting proteins called antibodies that are found in the mare’s first milk, called colostrum.

Up to 40% of foals fail to achieve passive transfer, and many of those cases are preventable.1

**WHY PASSIVE TRANSFER IS VITAL**

Unlike many other species, horses are born with no antibodies to help fight infection. Mares’ antibodies do not cross the placenta, and foals do not produce their own antibodies in utero. As a result, foals are highly susceptible to infection immediately after birth.

Normal mare’s colostrum contains a very high concentration of antibodies that help the foal fight infections; however, the mare must produce high-quality colostrum and the foal must ingest and absorb the colostrum within the first few hours of life.1

If a foal does not obtain an adequate amount of a high-enough-quality colostrum then it will not be protected from disease-causing organisms such as viruses and bacteria. When this occurs, it is referred to as failure of passive transfer (FPT).

**TIME IS OF THE ESSENCE**

The gastrointestinal tract of neonatal foals is lined with a special type of cell capable of absorbing large molecules, including antibodies. By 18-24 hours after birth, however, these cells are replaced by cells that are not capable of absorbing antibodies.2,3

The absorption of antibodies from colostrum is greatest within the first 6-8 hours of birth. After this time, absorption is greatly reduced.4

The absorption of antibodies from colostrum is greatest within the first 6-8 hours of birth. Because healthy foals have a sucking reflex within 20 minutes of birth, can stand within one hour, and suckles within two hours, this time constraint is not normally a concern.

In addition, the concentration of antibodies in colostrum decreases rapidly once the foal suckles. The first liter of colostrum contains the highest level of antibodies, and the quality of the colostrum decreases by approximately 80-85% within 6-8 hours of parturition.4

**CAUSES OF FPT**

Both mare and foal factors can contribute to FPT. If the foal is pre- or postmature, weak, orphaned, or has a limb deformity or other medical condition it might not be able to stand and suckle.1,2,4,5

Even if the foal does suckle and appears to consume to colostrum not all of the antibodies are absorbed. Healthy foals that suckle good quality colostrum only absorb about 60% of the antibodies.

On the mare’s side, production of poor-quality colostrum (that which does not contain adequate antibodies) is common. Approximately one-third of all mares produce low quality colostrum. Reasons for this include age, nutrition and body condition score, vaccination status, season, temperature, fescue toxicity, and breed (e.g., Thoroughbreds and Standardbreds reportedly have poorer quality colostrum than Arabians and Quarter Horses).1,4

The most common cause of FPT, however, is loss of the colostrum due to early lactation. This occurs in 16-22% of all mares.4 Placental infections occurring in the last trimester can also contribute to early lactation and colostrum loss. Experts advise monitoring mares late in gestation to minimize their chances of developing an infection.6

**SEQUELAE OF FPT**

Foals begin producing their own antibodies at birth but do not have significant levels until they are 1-2 months old. Without antibodies, a foal is susceptible to umbilical infections, pneumonia, diarrhea, joint infections, and sepsis, which are among the most common causes of foal deaths.2,3,5,7 Any foal showing signs of disease within the first weeks of life also needs to be examined.

**DIAGNOSIS**

Veterinarians diagnose FPT by measuring antibody levels (immunoglobulin G [IgG], in particular) in a sample of the foal’s blood. The test is easy and inexpensive, and experts recommend that all foals have this test performed as part of the standard foal examination between 12 and 24 hours of birth.6,8

Veterinarians interpret results using the following chart: 5,6,8

<table>
<thead>
<tr>
<th>Foal’s IgG (antibody) level measured 24 hours after birth</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;400 mg/dL</td>
<td>Failure of passive transfer</td>
</tr>
<tr>
<td>400-800 mg/dL</td>
<td>Partial failure of passive transfer</td>
</tr>
<tr>
<td>&gt;1,000 mg/dL</td>
<td>Successful passive transfer</td>
</tr>
</tbody>
</table>

Fast Fact

While >1,000 mg/dL is considered normal, any healthy foals have IgG blood levels >2,400 mg/dL.
**TREATMENT**

Foals diagnosed with either complete or partial FPT require antibodies. Foals <18-24 hours old can be administered fresh or frozen colostrum, commercial IgG products (e.g., powders that are mixed with water and bottle-fed to the foal), or intravenous plasma (the fluid part of blood, without the red blood cells).1,2,3,6

Older foals usually require intravenous plasma because their GI tract is no longer capable of absorbing the antibodies.

If a mare leaks colostrum prior to foaling, collect the colostrum, freeze it until the foal is born, then bottle-feed it to the foal. If another mare on the farm lost her foal during parturition her colostrum can be stripped and saved. Small amounts of colostrum (250 mL) can also be collected from another mare without affecting her foal’s passive transfer. Freeze colostrum at –4° Fahrenheit (–20° Celsius) for up to one year.10

**PROGNOSIS**

Not all foals with FPT develop life-threatening infections, and not all foals achieving passive transfer of immunity are guaranteed to be healthy. The chance of a foal recovering from a neonatal infection is highly variable (ranging from 0% to 80%), depending on the quality of care it receives from the owner/manager and veterinarian.

**PREVENTION**

Breeders can typically avoid FPT by ensuring the foal stands and nurses shortly after birth, which necessitates witnessing the birth of the foal. Some experts also suggest supplementing all foals with colostrum (either fresh, frozen, or a commercial powdered product) or plasma.6

Another way to minimize the chances of FPT is to maximize colostrum quality by ensuring mares are appropriately vaccinated (e.g., via the American Association of Equine Practitioners vaccination guidelines) and that they are not moved to a new environment in the last month of gestation.

**Key References**


By Stacey Oke, DVM, MSc; reviewed by Sarah Reuss, VMD, Dipl. ACVIM

**Plasmavacc USA Inc.**

Plasvacca USA Inc. 1535 Templeton Road, Templeton CA 93465 USA

Phone (805) 434 0321  Fax (805) 434 2720  Email usmail@plasvaccusa.com  Web www.plasvaccusa.com

**Key References**


This Fact Sheet may be reprinted and distributed in this exact form for educational purposes only in print or electronically. It may not be used for commercial purposes in print or electronically or republished on a website, forum, or blog. For more horse health information on this and other topics visit www.TheHorse.com.

Published by The Horse: Your Guide To Equine Health Care, © Copyright 2013 Blood-Horse Publications. Contact editorial@TheHorse.com.