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## Why Colostrum Transfer is Critical to a Foal's First Weeks of Life

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Posted by [SBS](#) in [Foal and Neonate Care](#)

**Foaling season is officially upon us and right about now equine veterinarians have little else on the brain but colostrum.** That's how important colostrum is to a newborn foal; it can literally mean the difference between life and death. In this article the members of FullBucket, a company providing veterinary strength supplements for horses and dogs, discuss the foal's immune system, why colostrum is such an important factor in the their first hours of life, and what you can do to ensure their life starts right.

### A Foal's Immune System

Although a foal is born with an immune system intact, it has not yet received any antibodies from the dam's bloodstream while in utero. This is because the mare's placenta has six layers, and these layers do now allow the large immunoglobulins (antibodies) to pass through. And so the foal is born without any circulating antibodies and its immune system sits there like a car with no gas, unable to do much of anything. This makes newborn foals kind of like sitting ducks as they encounter all sorts of bacteria and viruses in their environment.

Foals only have ONE chance to start out strong and healthy...ONE! If we miss the opportunity it's gone. A slight infection in the gut of a foal can affect it for life. It can be the slight difference between a supreme athlete and just a competitor.

### The Threat of Infection from the Immediate Environment



E. coli, Salmonella and other bacteria or viruses are normally in a foal's immediate environment, and as they look for colostrum they can inevitably ingest these harmful things. When they do - disease is going to be a likely outcome.

The number one route for infection is through the foal's gut, which is an open and porous structure at birth. It has to be to allow the foal to absorb antibodies from the colostrum. But the flip-side is that it also allows bacteria and viruses to invade – and we'll see the resulting diarrhea often. For more information please read our blog article, [Foal Diarrhea - Avoiding it Altogether](#).

Bacteria can also be absorbed into the foal's bloodstream leading to bacteremia. Almost all foals will develop

bacteremia during their first day of life. Under normal circumstances and with adequate passive transfer of

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antibodies from the mare, the bacteremia is self-limiting and taken care of. But in some circumstances, that bacteremia can turn to sepsis, one of the leading killers of foals.

Sepsis can also lead to joint ill, which happens when bacteria in the bloodstream lodges in lining of joints causing a painful joint infection. The bacteria can even get lodged in the growth plates and the ends of bones often in the stifle and fetlock leading to osteomyelitis.

These are some of the most common diseases that threaten foals in the first weeks of their life and why colostrum transfer is critical.

### Got Colostrum?

Colostrum is a concentrated source of antibodies that's prepared by the mare at the end of pregnancy and is suckled by the foal during the first day of life. The milk is thick and yellow and very sticky, and is very different from the whiter, thinner milk she will produce later. The colostrum will protect the foal from disease for the first few months or so of life while its own immune system is fully developing (it will be fully developed around 4 or 5 months of age).

### How Vets Monitor Mares and Foals

Prior to foaling, we'll make sure the mare has waxed over and has not leaked any milk. Immediately after foaling we'll use the same refractometer used in wine and beer making to measure alcohol, only we'll use it to identifying if the mare's colostrum is adequate or not, so I guess you could say what "proof" her colostrum is.

Over 23% Brix is excellent colostrum

Above 21% is marginal

19% or below is low quality colostrum

[Refractometers](#) are affordable and easy to find.

If it's low or marginal, many breeders go to a banked source of colostrum where they've retained a little colostrum (normally a pint) after another foal has suckled and they froze that. They'll get this into the foal either via a baby bottle or have a vet administer using a stomach tube. It doesn't really matter how they get it in, it's just really important to get this colostrum in, period.

At 18 hours of age we'll perform a blood test called an IgG to measure the amount of gamma immunoglobulins (antibodies) that are in the foal's blood. Greater than 800 mg/dl is considered adequate (many normal foals will have levels >1500-2000 mg/dl, so 800 is just passable) passive transfer of maternal antibodies and typically corresponds to a foal that will not develop any neonatal diseases because of hygiene or a disease outbreak.

If the IgG level is low (<800 mg/dl) we'll give the foal a plasma transfusion (1-2 liters of plasma intravenously) to get the number back up. A second dose may be required. It's easy to overdo plasma and raise the foal's blood pressure, so we try to keep it to 2 liters of infusion per day to avoid hypertension. But even with plasma transfusions an infection can occur.

### Ways We Can Increase Antibody Concentration in Mares

The French have found the probiotic *S. boulardii* does cause increased antibody concentration in mares' colostrum when fed to the mare during her last trimester, while University of Florida researchers determined that certain prebiotics can also improve the quality of the mare's colostrum. Last, Vitamin E supplementation as well as corn oil supplementation may also be beneficial to the mare's production and even be passed on to the foal. It's also really important to cover the mare's increasing caloric needs – so increase the feed because of her last trimester energy and post foaling lactation demands.

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## Avian-Derived Immunoglobulin

Although there's no substitute for colostrum, either from the mare or a banked source, there are antibodies that can be loaded into the foal's gut at birth that can sometimes be beneficial if there is a high challenge load in the environment of infectious bacteria or viruses, or if the colostrum intake is delayed or inadequate, and that's avian-derived immunoglobulins. These come from hens who have been vaccinated against infectious agents such as:

- Salmonella
- E. coli
- Clostridium
- Rotavirus
- Coronavirus
- Lawsonia

The hens make antibodies against these pathogens and we can take those antibodies and load them into the foal's gut. FullBucket makes something called [Foal Kick Start Paste](#) which contains a rich source of these egg immunoglobulins.

## Optimize the GI Tract

Once the foal's gut is closed, we like to give a potent source of probiotics to keep the gut nice and healthy. There are no healthy bacteria or yeast in the foal's GI tract at birth. They can only get these from their environment, but there's good and bad bacteria in their environment, so we like to put the foal at an advantage by loading up its intestines with healthy bacteria that will help prevent colonization of bad bacteria or viruses in what could be a sterile, blank slate type of environment.

Probiotics and prebiotics actually stimulate the immune system in the foal's gut, 70% of the immune system is located in the intestinal tract, so we like to keep them on probiotics for the entire first week to keep a nice healthy level of beneficial bacteria and yeast and cut down on disease outbreaks.

Concerned horse owners who want to avoid the damage caused by raging pathogens will pay special attention immediately after the foal is born and during the first week of the foal's life to ensure it develops properly and reaches its full genetic and economic potential.

## Steps to Improved Colostrum

1. Feed your mare prior to foaling: increased energy needs in last trimester
2. Add Vitamin E, Corn oil, Probiotics and Prebiotics for best colostrum
3. Check colostrum at birth using Brix refractometer
4. Check IgG at 18 hours of age
5. Supplement with colostrum if Brix reading is low; Administer plasma if IgG reading is low



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Rob Franklin, DVM, DACVIM, Keith Latson, DVM, DACVS and Robo Hendrickson are the founders behind [FullBucket](#) veterinary strength supplements for horses and dogs. FullBucket is a line of animal GI healthcare products that are used by the top veterinary clinics and Universities in the U.S. as a protocol to help fight GI disease and related problems. They are also the people behind the idea of "Be Good & Do Good" which is their movement to get the animal healthcare community involved in helping animals in need worldwide. Learn more about their mission to make the world a better place [here](#).

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