

Bacteria and foal health

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We share this planet with an inconceivable number and incredible variety of bacteria and other micro-organisms. Rather than seeing them as our enemies, a more healthy perspective is to view microbes as we do the larger organisms: as co-inhabitants and some even as collaborators. We need these tiny organisms for our health and well-being. They could survive very well without us; but we need them for our very survival.

I was at first amused but am now alarmed by the degree of germophobia that has developed in our society in recent years. OK; so bacteria can kill us. But so can water. The truth is that we need both to survive. It's all a matter of balance; too much or too little can kill us.

The bacteria that are normally found in and on our bodies (the normal microflora) help protect us from infection by microbes that have greater potential to cause us harm (the pathogens). They do that by competing with the pathogens for nutrients, and in some cases by releasing substances which kill or inhibit the replication of pathogenic organisms. Kill off those "good bugs" with antibacterial cleansers or repeated use of antibiotics and we're much more vulnerable to infection with the really bad bugs.

In addition to protecting us from more pathogenic bacteria, the bacteria which make up the normal microflora of our digestive tracts are important for healthy digestion and for normal immune system development and function. Without them, our digestion and then our general health become disordered.

(The more we learn about the gut barrier—the way in which the intestinal lining acts as a gate-keeper, an intelligent and discriminating boundary between "outside" and "inside"—the more we understand the essential part our intestinal microflora play in our health.)

The funny thing is that we need bacteria for healthy immune system function, but we need a healthy immune system to protect us from being overwhelmed by bacteria. It's all a matter of balance.

Newborn foals

We're born with no bacteria of our own. We start acquiring our normal microflora from the moment of birth, from our mother's skin and from all the things we subsequently taste and touch. The same is true for horses. Foals are born essentially sterile. From the moment they exit their mother's womb, they start acquiring bacteria and other microbes which will comprise the normal microflora of their skin, upper airways, lower urogenital tract, and digestive tract.

Foals are born with a competent immune system. Even so, they are highly vulnerable to bacterial invasion. Although the newborn foal's immune system is competent, it is naïve, having never been exposed to any potentially harmful microbes before. It has no library of information on which to base a protective immune response, so it must start from scratch, learning bit by bit about the world into which it was born.

Foals also are born with no circulating antibodies to speak of, so they must rely on interim protection from their mother's colostrum. (Colostrum is the sticky, antibody-rich milk the mother produces around the time of birth.) Antibodies, or immunoglobulins, from the mare's colostrum are essential for the foal's survival. These immune proteins are produced by the mare specifically

against potentially harmful microbes she has encountered in her environment—the environment into which her foal will be born.

Healthy foaling practices

Given that foals are born into a bacteria-laden environment, with no protection of their own at first, hygiene is very important during the foaling process. The now-standard practice of dipping the newborn foal's umbilical stump (navel) with concentrated antiseptic solution has dramatically lowered the incidence of severe bacterial infections in foals. Iodine solution (e.g. Betadine) is commonly used. Chlorhexidine (brand names Nolvasan, Chlorhex, Hibiclens, and several others) may be better, though, as it has a superior antibacterial profile to iodine.

You'd think that the practice of giving all newborn foals a dose or two of antibiotic would be equally, if not more, protective, right? Wrong; it has proven to be *ineffective* at reducing the incidence of neonatal infections. And it may even be harmful. Widespread use of antibiotics on a farm accelerates the development of antibiotic resistance in the resident bacteria, potentially creating "superbugs." (We're already seeing an alarming increase in these multidrug-resistant pathogens in equine practice, paralleling the situation in human medicine.)

One simple, safe, and inexpensive foaling practice that *has* proven to be effective at lowering the incidence of bacterial infections in newborn foals is to wash the mare thoroughly just before she foals. That's because one of the primary routes of bacterial infection in newborn foals is the mouth.

If you've watched a newborn foal go looking for his mother's udder, you'll have noticed that he pretty much vacuums her sides, legs, buttocks, tail, and anything else that looks promising before he finally lands on her udder and latches onto a teat. In the days and hours before the mare foals, she will likely have spent some time lying down and may well have lain in some manure at some point. Even her udder, tucked in between her hind legs as it is, can be contaminated with bacteria from her manure. So, before he gets a good stomachful of colostrum, the foal will likely have sucked in a good many bacteria, some of which are potential pathogens.

In washing down the mare before foaling, there is no need to use an antibacterial soap or antiseptic solution; regular shampoo will do. The point is simply to reduce the amount of dirt (and thus bacteria) on her coat and skin before the foal arrives; not to sterilize her. Be sure to include her udder and the skin around her vulva. (And towel her dry before you finish.)

Also keep the foaling stall or pasture scrupulously clean. Trying not to disturb her, pick up the manure every time you go out to check on the mare. If you do it every time, she'll quickly become used to it, and your quiet presence picking up the manure shouldn't upset her. (Anxious watching does disturb most foaling mares; quiet industry generally does not, as long as the mare knows and trusts you.)

Beyond day one

Provided that the mare produced plenty of high-quality (thick and somewhat sticky) colostrum and the foal drank her fill in the critical first 8–12 hours of life, there should be no need for any treatment, such as supplemental immunoglobulins, probiotics, or antibiotics. Unless there has been a persistent problem with infection on that farm, all that is required from here is a clean environment, fresh air and water, sunshine, good nutrition, good company, and plenty of room to play. Nature will take care of the rest.

Once they've survived their vulnerable first few hours of life, there is good reason to let foals be foals. Let them explore their environments, deal with their "foal heat" scours on their own if they can, have the sniffles, and heal their own cuts and scrapes.

Of course, we must be ready to step in if it becomes clear that the foal is not able to mount an effective immune response and recover unaided. But we should not be too quick with the antiseptic or the antibiotics; wait and see if her little body can deal with the problem on its own. After all, that's what our bodies are designed to do: encounter, overcome, learn, adapt, self-repair, and self-protect. If we keep jumping in and "rescuing" foals from banal foalhood illnesses, we may be helping them in the short term but doing more harm than good in the long term.

A recent study in children found that kids who were not overly protected from dirt and germs when they were babies were at *less risk* for asthma and other allergies when they got older than the kids who were coddled and overprotected. Along the same lines, kids who are subjected to course after course of antibiotics tend to have chronic health problems through childhood, adolescence, and into adulthood.

It turns out that playing in the dirt when we were little actually helped our immune systems develop normally. Encountering bacteria in this way helps the immature immune system learn to distinguish between things that might harm us and things that are benign or even beneficial (such as our own cells, and food). It's also one of the ways we acquire our normal microflora.

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