HEAL *with* FOOD

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HEAL
HOLISTIC EQUINE ACADEMY OF LYMPHEDEMA

Why Probiotics are Good for Your Horse

A Dakota Frost

When I got Dakota as a young colt, I wanted to do "everything right." As I reflect upon the events that occurred, I came to realize I didn't do anything right.

Dakota had an accident at the age of 5, and I believe that was the beginning of his demise. We followed conventional protocol, and he couldn't get back on his feet for any length of time before he was sick again. Once his health was compromised, it was difficult to heal because every system is codependent upon one another. It would be inappropriate for me to say the cause of his passing was the protocol used, but I do believe it played a critical role in his early departure.

Dakota taught me many things. Above all he led me to a passionate journey of healing and holistic alternatives. It wasn't easy! Because of him I became a supporter of being my own health advocate. It paid big dividends for myself and my family.

A Dakota Frost, 2011
This was the best he looked in years!

Dakota's teachings are shared in this chapter. It is through sharing and education that lives change. It was his gift to me, and now it is my gift to you. I can only encourage you to open your heart and mind and explore different avenues. This is what HEAL WITH FOOD is all about! Come and join me in the wonderful world of holistic alternatives and healing.

Probiotics

In this excerpt, we will review the role of probiotics and why they are a critical player to maintaining the health of your horse (and you).

What's the hype about friendly bacteria (probiotics)?

Hippocrates realized the power of food in relation to disease over 2300 years ago, when he said, "Let food be thy medicine and medicine be thy food." However, this advice was mostly ignored until very recently.

Over 10,000 scientific articles pertaining to probiotics have been published since the year 2000, according to PubMed. It is estimated there are 1800 microbes within the family species. There is an estimated 15,000 to 36,000 diverse microbe species that are responsible for metabolic processes. In other words, the study of probiotics is very, very complex, and it may be years before we know all the species, if ever, and the roles they play.

For centuries people consumed fermented foods such as yogurt and uncooked sauerkraut (foods that contain live bacteria).Today, these live bacteria are known as friendly bacteria. Even beer can contain these friendly bacteria, depending upon how it is processed. The significant role friendly bacteria plays in maintaining optimal health and longevity in humans and animals has been known for a very, very long time, but was ignored and not well understood.

Fermentation is a process in which enzymes and/or organisms break down energy-rich compounds. For example, fermentation breaks down carbohydrates to glucose, which then supplies energy to cells.

Although friendly bacteria can be acquired through food, they are also available as supplements and additives to our food. You see commercials, advertisements, and labels for food products that contain probiotics, or friendly bacteria, and its potential benefits. In 1989 Dr. Roy Fuller modified the definition of the word 'probiotic' to read "live microbial feed supplement which beneficially affects the host animal by improving its intestinal microbial balance."[i]

What are microbes, probiotics, and pathogens, and how are they related?

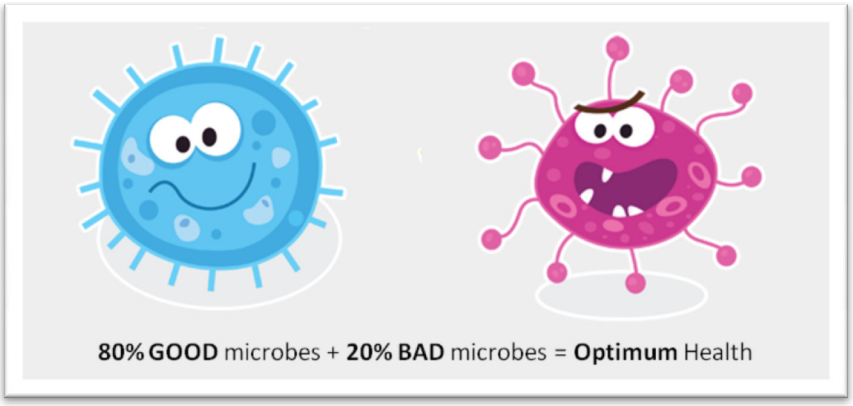
Microbes are the oldest form of life on earth. They are single-cell organisms so tiny that millions can fit onto the head of a pin. There are good microbes and bad microbes.

Probiotics are friendly bacteria that support life and are considered a good microbe. Pathogens that cause disease (organisms such bacteria, fungi, protozoa and viruses) are bad microbes.

The term 'direct-fed microbial (DFM)' and microbe are used interchangeably with the word probiotics. These are all good guys.

The word 'pathogen' is derived from the Greek word 'patho,' which means "disease like" and the suffix 'gen' meaning "something produces." These are the bad guys.

You need 80% good microbes and 20% bad microbes in the gut for optimum health. The probiotics (good microbes) keep the pathogens (bad microbes) in check. If the body has more pathogens than microbes, it is not healthy. Here is an example… Both L. acidophilus (a good bacteria) and D lactic acid (a bad bacteria) are in the same family of lactic-acid producing bacteria. We associate D with tying up (rhabdomyolysis), and L with health benefits. I like to think of the 'L' as life and the 'D' as death.



How does a body acquire friendly bacteria?

Humans, livestock, and domestic animals are born with a sterile gut. As soon as we are born, however, our body is exposed to the microbes in the air and surrounding environment.

Humans pick up good bacteria from the vaginal canal during the birth process. As the baby is pushed from the canal mucous is ingested and provides bacteria; however, the majority of bacteria comes from breast milk.

The Canadian Healthy Infant Longitudinal Development (CHILD) study indicates babies born via C-section are missing a specific type of good bacteria compared to babies born vaginally. C-section babies appear to be more vulnerable to asthma, food allergies, and obesity. Findings indicate there may be a relationship with the gut microbes and the ability

to digest food or absorb nutrients from the intestinal wall. There are indications that autism and some other spectrum disorders may be linked to the gut microbial imbalance. More research is need in this area. The study also noticed formula-fed babies have a particular pathogen in their diarrhea, unlike those who are breast fed.

Foals and other animals are born via the birth canal so, like humans, they pick up the friendly bacteria during birth. And most animals born this way generally nurse directly from their mother. However, they are immediately exposed to a field or a non-clean environment, including the air. It is critical to establish a newborn animal's gut with friendly bacteria before the pathogens have the ability to establish themselves in the intestinal track. A well-known and successful dairy farmer in my area gives a shot of antibiotics as soon as the calf is born. Many animal breeders experience diarrhea in a newborn animal, which could cause death and financial loss. Prenatal care is just as important for an animal as it is for a human, especially when the animal is an investment. Numerous dairy farmers, including this successful farmer, have told me over and over the cows are just not what they used to be. Their lifespan is much shorter than it was 20 years ago. Whether a newborn puppy, kitten, goat, sheep, pig, cow or foal, the establishment of good bacteria at birth may help maintain a healthy animal and reduce loss.

How does a body maintain friendly bacteria?

There are specific friendly bacteria that are indigenous to the human gut, or they are transient. Remember microbes can be good or bad! We want the good guys. If healthy food (vegetables and a raw diet) is consumed then healthier microbes are created.

Friendly bacteria that are transient are only useful as they pass through the gastrointestinal tract. They must be replenished. We maintain a healthy gut with daily supplementation of probiotics and by consuming high amounts of raw vegetables. Vegetarians, who consume a plant-based diet, produce higher amounts of the good lactic-acid in their intestines.

Non-healthy food is also fermented but creates unhealthy microbes and pathogens. Here is an example: Many people eat an excess of carbohydrates such as bread, pizza, processed cookies and pastries. They have the potential to develop a condition known as Candida Albicans, or Candida Overgrowth Syndrome, where there is an overgrowth of yeast (bad). This puts the bad guys in control, while the good guys struggle for survival.

Let's talk about our horses. Horses prefer a raw diet of forage, which supports their natural digestive process. Ideally, access to a healthy pasture and to be able to eat all day long (from 16-18 hrs) every day is what our horses need. Since we have limited space and less pastures for grazing, we found a solution by building barns and stalls. This may have solved one problem, but it created another problem. We altered the way our horses live in the

environment, which caused other types of stress. To counter that, we developed commercial feed. Over the years there has been concern about the manufacturing process and the role of carbohydrates in our commercial feed and its impact to our horses' health. Only recently did the commercial manufacturers begin to add probiotics to their product. This is a key component of our horses' nutritional profile.

What are the different types of friendly bacteria?

Friendly bacteria (probiotics) are categorized as

- Lactic-acid producing bacteria (LAB)
- Non lactic-acid producing bacteria
- Non-pathogenic yeast

Lactic–acid producing bacteria (LAB) probiotics

The four most common LABs are:

1. Lactobacillus (example: lacto acidophilus)
2. Bifidobacterium (resides predominantly in the large intestine)
3. Streptococcus
4. Enterococcus

Most lactic-acid producing probiotics are transient and are only valuable when consumed on a regular basis. The following are other common species that are beneficial to our health and the health of our horses. These lactic-acid probiotics are what you may see on a label:

Lactic-acid producing probiotics	
Lactobacillus	Bifidobacterium
L. acidophilus	B. adolescentis
L. brevis	B. animalis
L.bulgaricus	B. bifidum
L. casei	B. breve
L. reuteri	B. longum
L. rhamnosus	

These probiotics, specifically high amounts of bifidobacterium, have been associated with health benefits. Yet, it is estimated 25 percent of individuals who consume a western diet have NO lactobacillus populations in their gut!

When we hear the word streptococcus, we think of a pathogen, and it can be. But there is also a good streptococcus species. Streptococcus thermophilus is considered to promote health and is found in yogurt. When it is combined with other friendly members of the LAB, it is known to reduce the presence of pathogenic streptococcus in the nasal cavities.

Enterococcus faecium is another variety of LAB. It has been known to help manage diarrhea and helps keep the pathogens in check.

Nonlactic acid-producing bacteria

A common non-lactic acid producing bacteria is known as bacillus, or bacillus subtilis. It's found in dirt, water, air and decomposing plant material, and has the ability to survive in harsh environments such as heat, drought, humidity and acidity. Studies suggest it aids in decreasing the symptoms of irritable bowel syndrome. Its strong attributes retard the growth of destructive pathogens, strengthen the mucous lining and supports the growth of other lactobacillus species in the gut. There are other types of bacillus species but they won't be discussed at this time.

Nonpathogenic (good) yeast bacteria

These yeast bacteria are known as saccharomyces. You may recognize it as S. boulardii or S. cerevisiae, which is the predominate strain in the species. This is a good yeast product, and is present in the entire gastrointestinal tract. Pathogenic yeast, such as Candida Albican, are bad bacteria that cause infections such as vaginal yeast infections.

The three types of friendly bacteria, or probiotics, are present throughout the body. In addition, there are various species and strains that have specific functions and live in specific locations in the body. They are instrumental in destroying pathogens, reducing inflammation, protecting the lining of the intestines and stimulating the immune response. The point is they all play a critical—and complicated—role in maintaining our health and the health of our horses.

Check with your health care provider (for yourself) or your vet (for your horse), about any conditions you have concerns about.

How are probiotics measured?

The amount of live (viable) microbes in a sample of bacteria is measured and listed as 'colony forming units' or CFU. These can be designated by weight or by volume depending upon the sample.

Active, live (viable) bacteria versus freeze dried bacteria

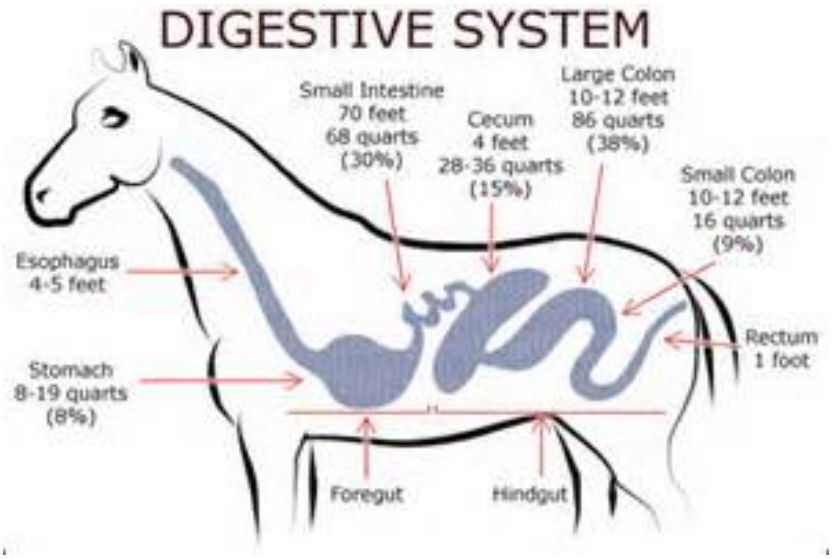
Live (viable) bacteria are just that—live and senstive to the environment, such as heat and mositure. The freeze dried is also live bacteria but has been processed to preserve the live bacteria until it is consumed and actived by the body. It is more stable than the live.

What makes a good probiotic?

Diversity! The probiotics are codependent upon one another. One strain generally isn't adequate to address a particular issue, and you may not achieve your desired results. Make sure to choose a product that has more than one category of bacteria for optimum results. You will want to know how many CFU are listed for each probiotic. An honest manufacturer will list every strain and include the number of CFU for each on the label. See *What to Look For on a Label*.

Understanding the Equine Digestive System

Elie Metchnikoff, a Ukrainian zoologist and Nobel Laureate (1908), best known for his pioneering research into the immune system, stated, "Death begins in the colon." As horse lovers, we know this is a true statement!



Mouth	Saliva activates the enzymes that promote digestion. Drinking a lot of water helps to maintain saliva in the mouth. Water also helps maintain proper pH in the gut.
	Foregut. The foregut includes the esophagus, stomach, and small intestine. Lined with mucous membranes, the foregut is where digestion occurs. Enzymes and other metabolic agents break down the food.
Esophagus	Known as the food pipe, the esophagus is 4-5 ft. long and carries food, liquids and saliva from the mouth to the stomach.

Stomach	Small food passes within 15 minutes when 2/3 full by constantly producing hydrochloric acid. Pepsin and hydrochloric acid play a critical role in breaking down food for absorption and creating bacteria fermentation to produce lactic acid. During the normal digestion process, fermentation will stop. If the normal process is disrupted, undigested food will ferment and cause gas.
Small intestine	The intestine is about 70 ft. long and contains Peyer Patches. Its job is to absorb nutrients. Just about all of the amino acids and most of the carbohydrates are broken down in small intestine.
	Hindgut. The hindgut includes the cecum, large colon and small colon. The hindgut is lined with mucous membranes and is responsible for the majority of digestion, which is predominantly microbial and not enzymatic. It is here that microbes break down fiber and create fermentation. Toxins are often a hindgut issue.
Cecum	(4 ft.) Fiber breaks down Cecum is like a sack. Microbial count is directly related to the food that is being digested. It can take a few weeks for the microbes to adjust to a new diet, so take it slow when introducing a new feed program for your horse. Content can remain in the cecum up to 7 hours, which allows the bacteria to ferment the feed. Microbes produce Vitamin K, B complex vitamins, proteins and fatty acids.
Large colon	(10 to 12 ft.) The large colon breaks down large amounts of fiber, and the fermentation process continues. Vitamin K and B complex, along with trace minerals and phosphorus, are absorbed.
Small colon	(10 to 12 ft.) The small colon is smaller in width than the large colon and has a transverse and a descending portion. Its function is to absorb moisture. This is where the fecal manure balls (a combination of digested and indigestible contents) are produced.
Rectum and Anus	(1 foot) Fecal balls are passed to the rectum and eliminated through the anus.

Note: A hungry horse with an empty stomach has too much acid, which can lead to ulcers and other digestive issues. By grazing 16-18 hours per day, a horse's stomach is constantly full; however, many of our horses don't have access to constant grazing and only eat twice a day. There are various estimates on the percentage of horses with ulcers in U.S. One estimate states 50% of foals and 1/3 of horses that live in stalls may have mild ulcers, while 60% of show horses and 90% of racehorses have moderate to severe ulcers. This causes digestive upset and can be very dangerous. If the digestive track is impaired, it can't properly remove toxins and pathogens.

The Gut's Role in Our Health

Hippocrates said (over 2300 years ago!) "Death sits in the bowels and bad digestion is the root of all evil." We now know that the gut plays a *significant* role in our overall health and that of our horse. Why? Because …

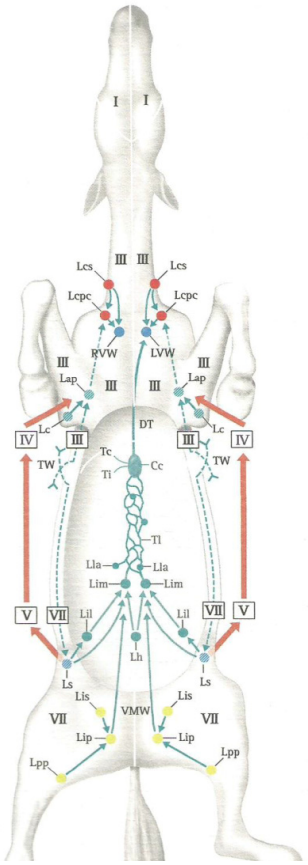
70% of the immune system is in the gut!

If we and our horses are to remain healthy, it is critical we maintain a "healthy gut"! A majority (60%) of the 8,000 lymph nodes in the horse live in the gut!

Humans have between 600 and 700 lymph nodes, depending upon genetics and, just like the horse, the majority of these reside in the digestive track.

Most chronic disease in humans and animals can be traced to an impaired gut! The obvious ones are any kind of digestive issue such as Crohn's disease or irritable bowel syndrome. The one that may not be so obvious is cardiovascular disease such as atheros-clerosis, also known as "hardening of the arteries." Research suggests that plaque-clogged arteries can be a result of an impaired gut. Other health conditions such as allergies, sinus and respiratory infections, and Alzheimer's have associated links to various kinds of bacteria, including oral bacteria, and impaired gut.

Science has discovered the gut has its own "brain" and communicates with our main brain. They are referring to what we call 'intuition' or 'gut feeling.' Our brain sends messages to the "gut" and the gut in turn send messages to the main brain. This is another reason to maintain good gut health!



An abdominal view of the lymph nodes in a horse.

Diarrhea and Probiotics

Research has indicated probiotics can be of value in reducing or preventing four (4) types of diarrhea, all of which can impact both people and horses.

- Antibiotic-associated diarrhea is a response to medication used to treat bacterial infections.
- Clostridium Difficile-associated diarrhea, known as C-Diff, is generally seen in hospitals and nursing facilities. It is highly contagious and dangerous, causing severe dehydration.
- Rotavirus-associated diarrhea impacts mostly foals and children.
- Infectious diarrhea is mostly caused by gastrointestinal *infections.*

Friendly bacteria and pharmacologic agents are not compatible! These pharmacologic agents will destroy the friendly bacteria in the gut and cause diarrhea. Any human or horse that has been treated with a pharmacologic agent such as an antibiotic, regardless of the reason, should also be on a probiotic. The question is, do you administer them at the same time or do you wait until the treatment cycle has ended? To determine what you should do, check with your physician or vet and the manufacturer of the probiotic you want to use. The manufacturer will be able to provide guidelines as to the best way to administer the probiotic.

The non-pathogenic yeasts such as saccharomyces boulardii or s. cerevisiae have been known to be effective in managing diarrhea in general.

Food for Thought

What if, for every time a doctor/vet administered an antibiotic, they instead administered a probiotic specific to your condition? What do you think the results would be?

The Benefits of a Healthy, Balanced Gut

- Prevents pathogens from penetrating the gut and traveling throughout the body.
- Destroys harmful bacteria
- Stabilizes pH
- Produces antibodies
- Protects the gut from antibiotics and other medicines such as bute (phenylbutazone).
- Assists in weight management
- Metabolizes food, including glucose, in a more efficient manner
- Helps maintain good hair or coat
- Assists in keeping hoofs healthy, and may help reduce soft soles and cracks
- Better attitude: Remember when you feel better, you perform better!
- Aids in increasing absorption
- Produces less manure, less smell, less flies (observation)
- Protects against dangerous pathogens such a viruses
- Protection against cancer
- Reduces/eliminates diarrhea
- May assist in parasite reduction
- Natural detoxifier
- Ability to tolerate weather extremes
- Associated with longevity

As you see, there are many benefits in maintaining a healthy gut. It supports the entire body!

When Will I See Results?

Every person and horse is different depending upon how badly their body is compromised. Since most of the friendly bacteria are transient and need to be replaced every day, probiotics should be part of a daily routine. As the gut heals, you will be able to observe the improvements over time. That is the best testimony of all…your experience!

How the FDA Defines Probiotics and Their Position on Health Claims.

The FDA defines direct fed microbials as "products purported to contain live (viable) microorganisms (bacteria and/or yeast). We are forbidden to make health claims! At this time these are not consider drugs, and we don't want them to be considered drugs.

The information in this document serves as a guideline. It is up to you to do your own research and make an informed decision regarding your health or the health of your horse.

What to Look For on a Label

Diversity. A good probiotic should include ALL of the following categories:

- Lactic acid-producing bacteria (LAB)
- Nonlactic acid-producing bacteria
- Nonpathogenic yeast

Lactic acid-producing bacteria	
Lactobacillus	Bifidobacterium
L. acidophilus	B. adolescentis
L. brevis	B. animalis
L.bulgaricus	B. bifidum
L. casei	B. breve
L. reuteri	B. longum
L. rhamnosus	
Streptococcus thermophilus	Enterococcus faecium
Nonlactic acid-producing bacteria	
Bacillus subtilis	
Nonpathogenic yeast	
Saccharomyces boulardii or S. cerevisiae	

Good supplements generally contain a prebiotic, which feeds the probiotics. Check the label for probiotics. Chicory root is an excellent source of a prebiotic. If you're unsure, contact the manufacturer.

The number of CFU. It is estimated a product should have at least 1 billion CFU per serving to be beneficial. If the label says *live (viable)* microorganisms, it must indicate the amount. *Example:* The label for Conklin Equine Gel states that the product has 1.25 billion CFU per ml. If you give four milliliters, that's 4 x 1.25, or 5 billion CFU.

- ⚠ If it states 'live and active *cultures'* (as in yogurt), it does not have to provide a CFU. Here you would not know if the product meets the requirement of 1 billion per serving.
- ⚠ If the company labels the CFU by weight such as grams, as opposed to milliliters, it may be difficult to evaluate. The number listed may not reflect the number of actual live (viable) bacteria in the supplement.
- ⚠ Manufacturer labels may be deceiving.

Storage Information. The label should indicate how the product should be stored. Because heat destroys bacteria, most probiotics should be kept in a dark, cool or refrigerated facility to prevent bacterial growth in the package.

Manufacture Date. Manufacturers are trending toward putting a 'manufacture' date verses a 'use by' or 'expiration' date. The amount of CFU in the product may not be the same as the date it was manufactured due to exposure to the elements or improper storage conditions.

Conclusion

The purpose of this document was to raise awareness and to take you from thought to action. We hope you found it informative and feel empowered to make decisions that are appropriate for you and your horse!

If you would like more information about equine nutritional supplements, please email us at horses4hay@gmail.com or visit www.horsesandhay.com.

And please email us if you have a story to share about probiotics and how they've helped you or your horse. We would love to hear your story.

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We will close with a Chinese Proverb:

"When someone shares something of value with you, and you benefit from it, you have a moral obligation to share it with others."

[i] http://www.old-herborn-university.de/publications/books/OHUni_book_8_article_1.pdf