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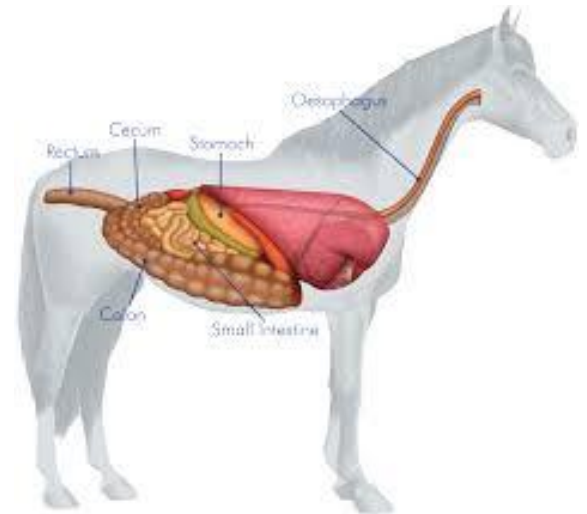
Do Equine Probiotics Work?

By: Mike Black

This month our focus is on equine nutrition, specifically on supplements falling under the umbrella of probiotics and prebiotics. Different formulations of these supplements have been around for a long time, but not much scientific based research has been completed to completely understand how they work and if they benefit horses. Recently there has been a resurgence of interest in these products and some scientific research has been completed to help us begin to understand how they work and how they could benefit horses. This article will briefly touch on some of this new research.

Introduction to Digestion

The digestion of feedstuff in the equine intestinal tract is a very complex and dynamic process. It begins with the horse chewing and grinding feed between the teeth. This chewed material, mixed with different enzymes within the mouth is then swallowed. The bolus of food then reaches the stomach and is mixed further with digestive enzymes which help break down the material into nutrition components the body can absorb and use as energy. From the stomach it passes into the small intestine.



Traveling through the small intestine most of the starches and sugars are absorbed from the feed into the body. Following the passage through the small intestine the remaining material enters the ceacum and large intestine. It is within these organs that the remaining fibers present in the feedstuff are digested. In order to digest this type of material it must be broken down by fermentation which relies on a multitude of microorganisms (bacteria, protozoa, and fungi) living within the large intestine. These microorganisms break this material down and the by-products of this process are nutrients which the horse's body can absorb and use for energy. The microorganism population within each individual horse's large intestine differs in type and number present. In the ideal world each horse would always be in balance and have the perfect number of each different microbe present to digest feed in the most

efficient way, thus getting all the nutrients available to grow or perform at optimum levels.

This ideal balance is not always present and often disrupted by many factors such as improper feeds, feeding programs or routines, stress, parasites, and a multitude of other factors. Therefore, probiotics and prebiotics are dietary supplements intended to help balance the microbial population within the horse's ceacum and large intestine and promote a healthier microbial population. Following the large colon the remaining feed products travel through the small colon and eventually are passed as manure.

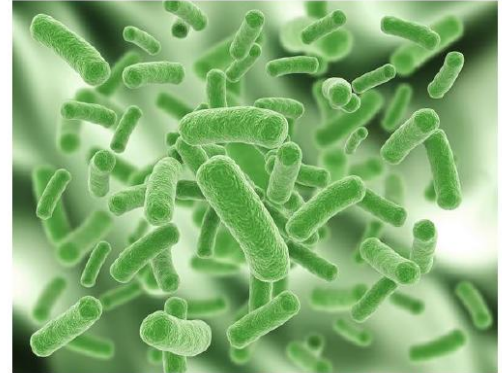
Probiotics

The world health organization defines probiotics as *'live microorganisms that when administered orally at adequate concentrations, provide a beneficial effect beyond that of their nutritional value.'* This means we are feeding horses specific bacterial cultures, yeast cultures or combination of both in an attempt to change the microbial population within the large intestine in a positive manner.

In order for this to work multiple things have to occur. The organisms within the probiotic must be carefully selected to possess characteristics capable of influencing the microbial population in a positive manner, they must be able to pass through the stomach and small intestine reaching the large intestine alive and viable, be able to colonize once within the large intestine thus increasing their numbers. Microbes which are given as probiotics which do not survive passage through the stomach and small intestine could potentially still have some benefit effects by providing nutrients, mostly from their cell walls, other bacteria could use to increase their population numbers.

Once these organisms are within the large intestine what are they capable of doing? Research has demonstrated they have benefits beyond their ability to increase feed digestion efficiency. It is believed they can have a profound influence on the horse's immune system and its ability to fight off diseases. Probiotics have been shown to be beneficial by:

- Reducing or preventing pathogenic (disease-causing) organisms from adhering to enterocytes (cells lining the intestinal tract) via specific secreted factors
- Preventing pathogenic organisms from adhering to enterocytes via competitive colonization
- Secreting microbial compounds
- Secreting products that degrade bacterial toxins



The bacteria in the horse's intestinal tract play a major role in health and fermentation of fiber

- Stimulating immune responses through interaction with immune cells in the GI tract
- Enhancing GI barrier functions

These benefits could definitely improve the over-all health of horses. But the problem at this point is developing products that would consistently provide these benefits to horses in all different types of environmental conditions. There are so many different variables between different horses, thus standardizing a product to adapt to these different circumstances is difficult.

Prebiotics

Prebiotics are non-digestible food ingredients that produce health benefits by promoting the growth of beneficial bacteria in the intestine. These ingredients are usually simple sugars called oligosaccharides. Examples include inulin, lactulose, and oligofructose. Prebiotics differ from probiotics in that they do not contain live bacteria. Instead, they work with existing bacteria, either by providing them with food or by improving the environment in the gut to their benefit. The basic theory is to promote more “good” bacteria in the digestive tract by providing substances they need to replicate.

Adverse Effects of Probiotics and Prebiotics

Generally, these products are considered to be safe with very limited adverse effects. As with any supplement they should be used as indicated and according to labeled instructions. There is potential to have an adverse reaction but it is rare.



Quality Control of Commercial Products

Quality control of these products is currently a problem. They are not labeled as a “drug” thus the FDA has no regulatory authority. They are sold as an over-the-counter product needing no prescription from a veterinarian. Therefore, this type of product is often misrepresented. Studies have shown that many commercially available products do not contain what is claimed on the label. Many are sold just to sell a product, many being counterfeit. As a consumer one must be cautious of which products to purchase and do your homework choosing a reputable company.

Conclusion

In general probiotics and prebiotics are considered safe to use. They are poorly understood on their specific mechanisms of action or how they work exactly. There is limited scientific evidence of their efficacy (more studies are becoming published which

should help our understanding). There is some clinical evidence of them being effective. It would be difficult to say that one product alone would be effective in treating multiple anomalies effecting horses. There are multiple products available to purchase with many being misrepresented. We believe probiotics and prebiotics have a place when dealing with gastrointestinal issues. They should be used under the direction of a veterinarian who has knowledge of the different products available and how they may influence that individual horse. There is a definite difference between different products and their ability to effect the microbial population within the GI tract.