EQUUS
BLENDING NATURE AND TECHNOLOGY
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DIGESTIVE HEALTH – THE KEY TO SUCCESS

Begin 2010 with digestive health as a priority on your list of goals and witness the positive changes in your horses as well as a decrease in the overall cost of their keep.

A visit to most yards will reveal at least one but more often many supplements. These are used as cures and solutions for achieving a variety of different goals including better coats, healthy hooves, calmer behavior, improved digestion, extra energy, more muscle and sometimes simply for the undefined "magic" property which will make all things right. While many yard owners will know their feed price by heart, many more are surprised to learn that in many cases their supplements cost more per day than the correct feed and good feeding practices would. Superlative digestive health will, furthermore, usually nullify the need for any supplements, which in turn reduces overall costs while still producing healthy and tranquil, yet vibrant horses.

The old adage "you are what you eat!", is no different for horses and the best one can do for their quality of life, longevity and consistent performance, is to ensure that they are healthy on the inside. One has to look no further than the number of miserable and rejected horses from the race track to understand the dangers of the wrong diet over a period of time.

Where does digestive health start?

Yes - it really does all start with a healthy, high fibre diet combined with good feeding practice!
Horses are categorized as non-ruminant herbivores, a classification that includes other species such as rabbits and elephants, which means that they naturally derive their nutrient requirements from plant sources, the majority of which is comprised of fibrous plants such as grasses.

Over a period of more than 55 million years, horses evolved to thrive on a nomadic lifestyle which included almost continuous grazing of small quantities of forage. This means that they are therefore ill equipped to cope with the trappings of domesticity. To fully understand why general health all starts with diet, we need to take a closer look at this dependence of horses on forage.

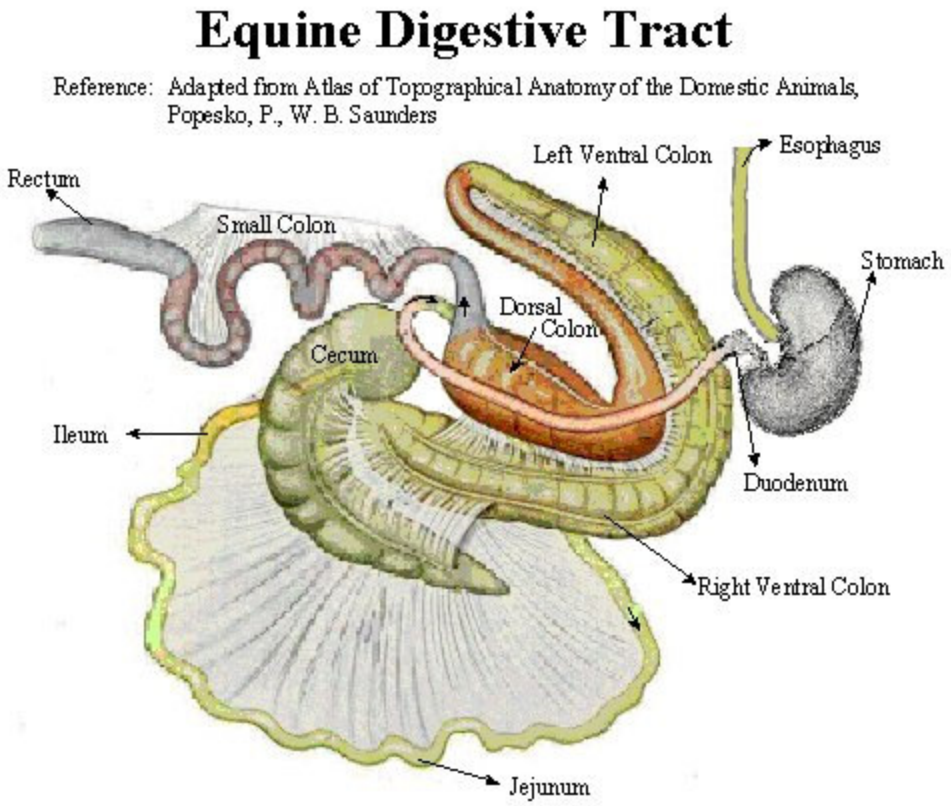
Why is fibre obtained from forage so important?

The horse's total digestive tract length is about 100 feet long. It starts with a simple stomach that is relatively small, and is followed by the small intestine, the cecum and the colon (large intestine or hindgut). The hindgut represents more than 50% of the horse's total digestive system and together with the cecum is responsible for the majority of the fibre fermentation and digestion.

While horses possess the enzymes to break down the bonds between soluble sugars, they do not possess the enzymes to break the bonds between the glucose molecules of the structural carbohydrates found in grasses.

In order to digest these insoluble carbohydrates in a fibrous roughage diet, horses have evolved a digestive tract with an enlarged pouch called the cecum, and have also developed a symbiotic relationship with hundreds of different species of microorganisms that do produce the enzymes capable of breaking this particular bond, thereby making the food available to both the "bug" and the host animal.

This concept of microbial fermentation occurs to one extent or another in any animal that eats foods of plant origin, including humans.



Equine Digestive Tract - Function

Type	Fore Gut	Capacity	% of Gastrointestinal System
Enzymatic Digestion	Stomach	8 - 15 litres	8%
	Duodenum, Jejunum, Ileum (70 ft. or 21 meters)	68 litres	30%
Type	**Hind Gut**	**Capacity**	**% of Gastrointestinal System**
Microbial Digestion	Cecum (4 ft. or 1.2 meters)	28 - 36 litres	15%
	Large Colon (Right Ventral, Left Ventral and Dorsal Colons) (10 - 12 ft. or 3 - 3.6 meters)	86 litres	38%
	Small Colon (10 - 12 ft. or 3 - 3.6 meters)	16 litres	9%

Omnivores like baboons, pigs and humans still have some of the equipment for fibre digestion but don't rely on it as heavily. The human appendix is actually the last vestiges of a cecum, but microbial fiber breakdown still occurs to a small extent in the large colon.

Horses have evolved, however, specifically to accommodate a very favorable symbiotic relationship particularly with the type of microorganisms found in a diet high in roughage.

A typical horse's digestive system harbors more than 500 distinct species of microorganisms, representing dozens of different lifestyles and capabilities. The composition and distribution of this menagerie varies with age, state of health and diet.

Even on a natural diet of grass only, we find considerable variations in the pH throughout the digestive system (it can vary from 5.5 to over 7). The hundreds of different species of microorganisms choose their specific habitat (stomach, small intestine or maybe colon) based on the pH and also the substrate (nutrients) available in that section. Provided the pH and available nutrients remain the same, they will proliferate and fulfill their part of the symbiotic relationship with the host animal.

They are, however, extremely sensitive to changes in pH and any abrupt change in diet will cause a population shift.

How does this population shift affect digestive health?

At the very least, shifts in the population can affect digestive efficiency. At worst, large die-offs of certain species of micro organisms due to change in pH and available substrate, can release endotoxins, which may in turn contribute to colic, enteritis or laminitis.

A typical chain reaction of events can be described as follows:
A horse which is fed 2kg of concentrate per feeding twice a day and hay *ad lib,* has a microbial population which has adapted and stabilized itself to this diet. The horse gets out one night and tears open a bag of grain and gobbles up a great big feast of it. The grain hits the small intestine, where some of the soluble carbohydrates are absorbed directly, but a lot of the undigested grain keeps going and lands in the cecum. Some species of micro organisms, usually Lactobacillus species, like this kind of food better than anything else and they begin proliferating.

As they digest the grain, they excrete the lactic acid into the cecum and large colon. Being bacteria, they multiply dramatically in order to take advantage of these favorable conditions. Their population explodes, which in turn releases more and more lactic acid, so the pH of the environment begins to drop (become more acidic). The pH drops below what some of the other species of micro organisms can tolerate, and they start to die off.
This has several simultaneous effects. Firstly, there is an unbalanced microbial population, so overall efficiency is upset. Secondly, as some species (such as *Clostridia* species) start to die off, they release endotoxins ("poison from inside"). The intestinal mucosa attempts to absorb and metabolize this toxin, but is damaged itself by the toxin. The toxin is absorbed into the bloodstream and begins causing a chain of nasty problems.
The example above illustrates a typical chain of events in an acute situation which can have serious consequences, but it is important to know that even small changes such as new lush spring grass, an extra scoop of bran or an additional helping of the horse's normal concentrate before a big event could all contribute to a shift in the microbial population with less than desirable effects if not dealt with carefully!

Conclusion

It is cardinal to your horse's health, as well as ultimately more economical, to use a concentrate designed specifically to ensure a healthy digestive environment (see next newsletter) …… in the meantime, it is imperative to keep your horse's diet as consistent as possible and, if changing feed, to plan for a gradual change over at least 10 days from one diet to another!

See next month's issue for more on Digestive Health…

In our Next Issue

- ***How this situation can result in colic and laminitis***
- ***Why is it difficult for the modern horse to maintain good digestive health?***
- ***What the pitfalls are to avoid in rations for horses***
- ***Good management practices which assist in maintaining good digestive health***

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PARROT'S STORY

Parrot literally fell out of the horse box when she arrived at our yard in mid August. She had contracted E-Coli at her previous yard and had suffered from chronic diarrhoea for 3 months. Despite numerous veterinary visits, antibiotics, de-wormers and trying every brand of feed available we just couldn't get her to pick up weight or have a solid bowel movement.

In late October we were about to have her humanely euthanized. Just then, the CEO of Equus arrived at our yard to visit our horses and offered to sponsor Parrot with 4kgs of Cool 'n Perform 15 a day for 2 months. She still had a heavy winter coat and was dull and listless, but with huge scepticism we decided to give it a try. Since our entire yard changed to Equus products we have stopped using all supplements and additions and just enjoy healthy and vibrant horses, but Parrot was probably in the worst shape I have ever seen a horse.

Well, within 3 weeks she was a different horse who started shedding her winter coat and did a little buck and jog in the mornings on the way to her camp. What used to be an ugly backbone suddenly turned into a topline. She suddenly developed muscles where there was just sagging skin before. We are still astounded at the remarkable changes and my entire yard will testify to the miracle change because that is what it was.

The photographs illustrate this genuine case study which started on 1 November and finished 31 December 2009.

Parrot – 1 November 2009

Parrot – 31 December 2009

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