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UNDERSTANDING FIBRE

There are so many nutritional buzz words these days and it can be tricky to keep track of all of them all, and this is particularly true for fibre. Crude fibre, soluble, insoluble, total dietary fibre the list goes on. With different descriptions on packaging it can be difficult to know just how much fibre your horse is getting in their diet. Given the fibre component of your horses' diet gives them about 70% of their energy needs, and helps support gut health and natural grazing behaviours it is important to understand how much and which types of fibre are in your horses' diet.

Crude Fibre

Crude fibre is one of the oldest methods of estimating the fibre content, and represents the portion of plant carbohydrates in a feed that are not digestible by the horse but can undergo fermentation in the hindgut. Despite Crude Fibre being a label requirement, it always underestimates the fibre due to not including cell wall components.

It is measured by chemical digestion of the feed, in the process that mimics an equines digestive system. This process breaks down feed components, leaving behind fibrous material, which is then measured.

When analysing crude fibre levels there is often some loss of the fibrous components such as cellulose, hemicellulose, and lignin, which often means the result underestimate the fibre content of the feed. For example, Beet pulp is approx. 17% crude fibre but 47% cell wall and Lucerne is approx 27% crude fibre and 45% cell wall. As a result, more advanced techniques are preferred for an accurate fibre analysis.

Digestible Fibre & Total Dietary Fibre

Total dietary fibre is the sum of all the indigestible components of a horse's diet, including both soluble and insoluble fibers.

Soluble fibre dissolves in water, and includes plant pectin and gums. Insoluble fibre does not dissolve in water, and includes plant cellulose and hemicellulose. Most plants contain both soluble and insoluble fibre in different amounts, and both are important in your horses' diet.

While total dietary fibre provides a fairly accurate approximation of fibre in equine diets, it is more often used in human nutrition.

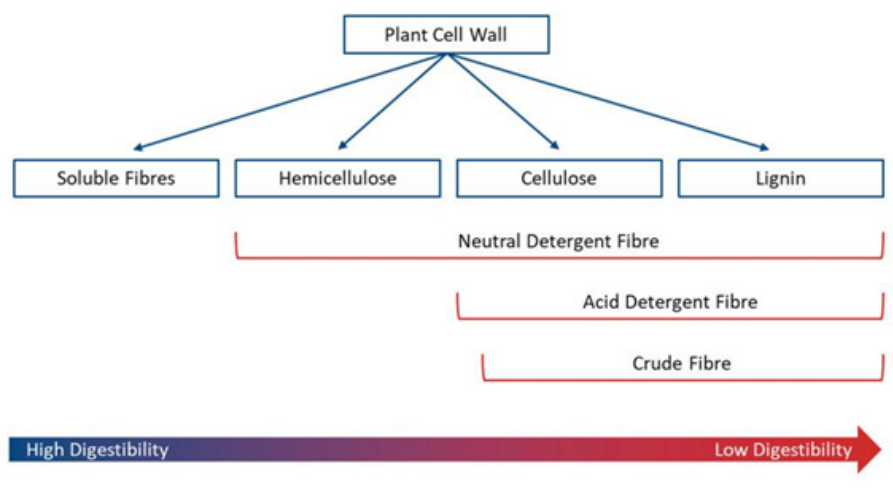

Image credit: Feeding Fiber in the Equine Diet: Sources & Nutrition Review; Dr Chrisine Latham, ph.D

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Digestible Fibre is the combination of various fibers, including:

- **Cellulose** - Cellulose is a polysaccharide made up of long chains of glucose and makes up a large percent of plant mass, particularly autumn and winter pasture (50 – 60% cellulose on a dry matter basis). Cellulose is an insoluble fibre, and therefore isn't directly digestible by the horse. Instead, cellulose adds bulk to the digestive contents, aiding in the movement of food through the digestive tract.
- **Hemicellulose** – similar to cellulose, hemicellulose makes up a large proportion of plants, particularly cool season pastures (30 – 50% hemicellulose on a dry matter basis). Hemicellulose is also an insoluble fibre.
- **Lignin -** Lignin is part of the plant cell wall that has a ring-like structure that inhibits the digestion of carbohydrates. This makes it indigestible for both horses and microbes.
- **Pectin -** Pectins are structural carbohydrates, made of simple sugar units, that help to bind plant cells together. Pectins are soluble fibers and are therefore quickly fermented in the hindgut.
- Other soluble fibres such as **gums** and **mucilages.**

Neutral Detergent Fibre

Neutral Detergent Fibre (NDF) is a common measure of cell wall components and is a good approximation of fibre in the diet. Its components include;

- Cellulose
- Hemicellulose
- Lignin

Acid Detergent Fibre

Acid Detergent Fibre (ADF) is a measure of the highly indigestible components of feed, its analysis includes;

- Cellulose
- Lignin
- Acid detergent insoluble Nitrogen
- Acid soluble ash
- Silica

As its analysis doesn't include the hemicellulose portion of the diet, it is not an accurate representation of the fibre content in the diet.

Effective Degradability (ED)

Effective Degradability is a term used to explain how much of the feed is broken down and available for absorption by the intestinal flora. High ED, therefore, indicates greater nutrient availability, and improved protein and energy intake and absorption.

Digestibility

Digestibility is a measure of how much nutrition a feed provides in a given volume. It indicates how much of the food is absorbed by the digestive system into the bloodstream. It is the difference between what your horse feed input and their faecal output.

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About Barastoc Fibre-Beet Mash

Barastoc Fibre-Beet Mash combines Lucerne and Speedi-Beet™ (unmolassed beet pulp) together into one easy feed and offers an excellent source of highly digestible fibre. Barastoc Fibre-Beet Mash is more than its ingredients.... where Barastoc Fibre-Beet Mash really comes into its own is its interaction between the different components. The effective degradability (ED) of beet pulp is high providing superior absorption and nutrient availability, it is suggested there is a 25% boost to lucerne ED when combined with beet pulp, as well as a general improvement of digestibility of nutrients fed alongside. Further independent studies have shown the digestibility of beet pulp is 75%, with Speedibeet boosting a 10% advantage over beet – giving a total digestibility value of 80-82%.

References

1. National Research Council Chapter 10: Feed Analysis. Nutrient Requirements of Horses. 2007.

2. Geor, R.J. et al. Chapter 8: Carbohydrates. Equine Applied and Clinical Nutrition: Health, Welfare and Performance. 2013.

3. Longland, A.C. et al. . Proceedings of the British Society of Animal Science. 1995.