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FIBRE-BEET MASH TECHNICAL UPDATE

Fibre-Beet Mash has proven its worth in the market as a high quality, conditioning feed utilising Beet Pulp and Lucerne in an ideal combination. Built on the success of **Speedi-Beet™** there has been a research based review on the components of Fibre-Beet Mash and how they may interact to provide a higher energy fibre product.

One of the benefits of feeding beet based products is the highly effective degradability (ED) of beet pulp. As the majority of energy comes from hindgut fermentation, digestibility is not a technically accurate term, whilst effective degradability describes the proportion of nutrients that are both fermented, digested and absorbed. But, within this, is the profile of nutrients, especially the slow release energy generated from fibre fermentation.

Fibre fermentation produces a range of end products that can be absorbed and metabolised for energy (slow release energy), the three major being Propionic, Acetic and Butyric Acid – the volatile fatty acids (VFA) – as well as some others. One of these – lactic acid, also produced by sugar fermentation – has negative effects in the hindgut, opening spaces between the cells of the intestinal wall and potentially allowing endotoxins to be absorbed. Of the VFA, propionic can be metabolised to glucose (by-passing an insulin response and so a "safe" source of sugar), while butyric is preferentially utilised by the cells of the hindgut wall, both as an energy source and a promoter of tight spaces, combatting endotoxin absorption.

Past research has shown that the major components of Fibre-Beet Mash – beet pulp as Speedi-Beet and alfalfa/Lucerne have high effective degradability and beneficial proportions of both propionic and butyric acids, compared to other fibre sources:

Nutrient	Alfalfa	Sugar Beet Pulp	Soya Hulls	Grass (Dehydrated)	Copra Meal
% Protein	16.5	8.0	12.0	15.0	22.0
% Oil	3.0	1.0	2.5	3.1	8.5
% Ash	10.0	6.5	5.0	7.8	6.5
% Sugars + Starch	8.0	6.5	8.0	10.0	13.5
% Crude Fibre	26.0	17.3	35.0	23.3	13.0
% Cellulose	14.0	19.5	40.0	24.0	5.4
% Hemicellulose	13.0	20.0	25.0	21.0	23.0
% Pectines etc	18.0	40.0	10.0	7.5	15.0
% Soluble: Insoluble Fibre	25:75	50:50	30:70	20:80	10:90
VFA Proportions Acetate:Propionate:Butyrate	70:20:10	60:30:10	70:15:15	75:20:5	
Lactate Production (mmol^{-1} 8 hours after meal)		0.06		0.25	
% Effective Degradability (60 hours)	54	74	55	45	55

Although the ED of alfalfa is not exceptional past research has shown that it is significantly improved when fed with beet pulp – a prebiotic effect observed with all fibre sources, but particularly alfalfa. As Fibre-Beet Mash includes both Speedi-Beet and alfalfa, a supplemental effect on ED could be expected.

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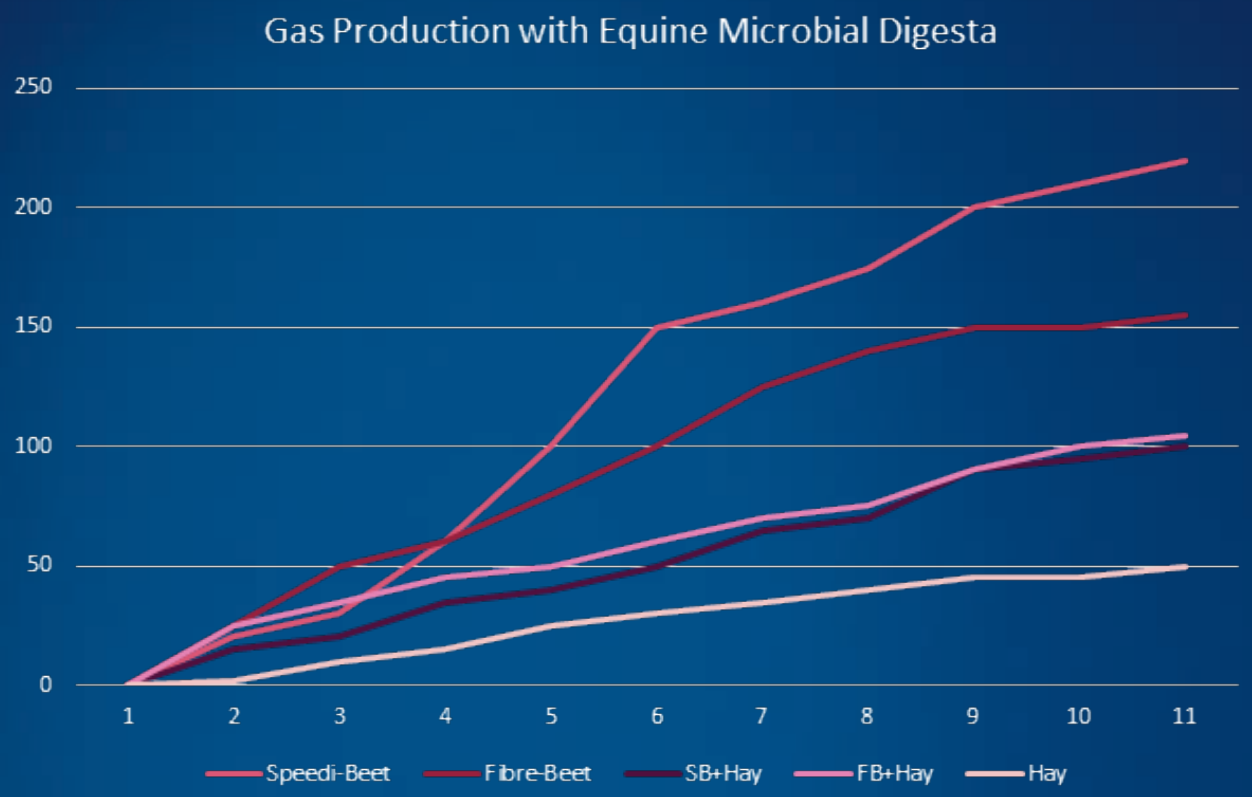
British Horse Feeds, in partnership with the College of Medical, Veterinary and Life Sciences, University of Glasgow, are conducting extensive trial work on nutritional aspects. Initial work is studying in vitro fermentation (gas generation) of Speedi-Beet and Fibre-Beet Mash, both as individual materials and combined with hay.



There are two main conclusions to be made from this. Firstly, the ED of Fibre-Beet Mash (expressed as gas production) is greater than the proportional components of beet and alfalfa; running at 75% of Speedi-Beet, Fibre-Beet Mash ED is greater than the sum of its parts. This demonstrates the theorised prebiotic effect of beet pulp and gives a boost to the hindgut fermentation of Fibre-Beet Mash about 15-20% greater than expected.

As a second observation, when combined with hay – 20% product, 80% hay – the ED of the combination is twice that of hay alone, with no real difference between Speedi-Beet and Fibre-Beet Mash.

This data, although needs investigating further, does show that Fibre-Beet Mash is a high energy super fibre whose sum is greater than its parts.

However, it is not simply as a superior nutritional provider that Fibre-Beet Mash has a role to play.

Recent attention on the role of feedstuffs in maintaining gut health has shown that there are certain factors that can help support gastric physiology, avoiding extremes that may lead to situations that cause ulceration. In the presence of emulsifiers pectin can be incorporated into stomach mucus secretions helping maintain barriers against stomach acid degradation of the stomach lining; and alfalfa has been shown to buffer the stomach environment reducing overall acidity and so helping maintain correct physiology. As Fibre-Beet Mash contains all these elements – pectin, emulsifiers and alfalfa – its properties in the gastric environment has been investigated.

In vitro work at Glasgow University, presented as a poster at the European Equine Health & Nutrition Congress (2017) in Antwerp, demonstrated the effect of Fibre-Beet Mash in buffering stomach acid. As the data portrays, across simulations of different areas of the stomach, Fibre-Beet Mash does help reduce the acidity in the stomach, especially as a soaked product.

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FIBRE-BEET MASH
TECHNICAL UPDATE

University of Glasgow | School of Veterinary Medicine

British Horse Feeds

The effect of Fibre-Beet on equine gastric pH investigated using an *in vitro* model

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Introduction

- Equine gastric ulceration syndrome (EGUS) has been associated with incorrect feeding and management practices.
- The horse has evolved to ingest diets high in fibre and low in starch.
- Modern management practices increase the risk of development of a poorly buffered acidic gastric environment that may cause EGUS.
- EGUS is one of the most common reasons for reduction of training efficiency in performance horses.
- Identification of feedstuffs with protective attributes from EGUS is highly desirable.

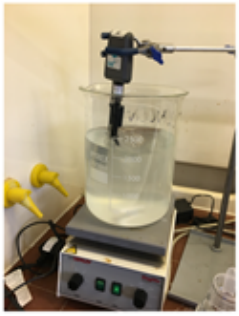
Aim of the Study

To investigate the effects of Fibre-Beet (FB) on gastric pH using an *in vitro* gastric model developed for horses.

Materials and Methods

***In vitro* technique:**

- *In vitro* simulated equine gastric system used to compare mature grass hay and Fibre-Beet
- Developed by Moore-Colyer and Jiang (2016)* to simulate 3 regions of the stomach:
  - Mid-fundic region
  - Fundic pyloric region
  - Lower pyloric region
- Measures alternations in pH
- Substrates incubated at 37 °C
- pH recorded for 6 hours
- Mixed every 10 minutes
- Anaerobic conditions



Substrates investigated:

Chopped mature grass hay (CH)
Soaked Fibre-Beet (SF)
Ground mature grass hay (GH)
Ground Fibre-Beet (GF)

*Moore-Colyer and Jiang (2016). Proceedings of the 8th European Workshop on Equine Nutrition, 68-69.

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Results

Chopped hay and soaked Fibre-Beet (Figure 1)

- pH levels in the mid-fundic region were higher for CH compared to SF.
- pH values were lower for CH in the pyloric region compared to SF.

Figure 1: *In vitro* pH profiles for chopped hay (CH) and soaked Fibre-beet (SF)

Ground hay and ground Fibre-Beet (Figure2)

- GH and GF had similar pH profiles over 6 h period.
- GF maintained a higher pH in the pyloric region compared to GH.

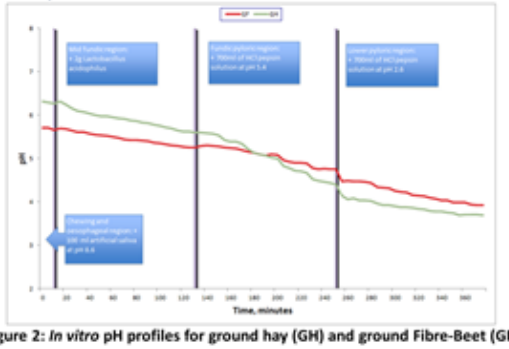

Figure 2: *In vitro* pH profiles for ground hay (GH) and ground Fibre-Beet (GF)

Conclusion

- Fibre-Beet maintained higher pH levels *in vitro* compared to grass hay.
- Fibre-Beet may have potential to guard against the development of EGUS.
- *In vivo* validation of these findings is required.

horses come first

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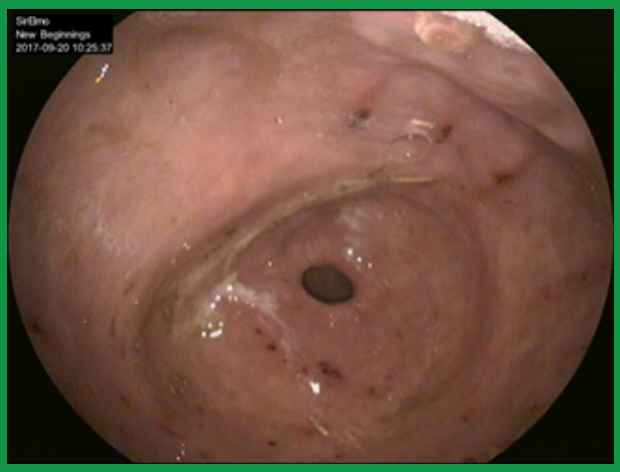
FIBRE-BEET MASH TECHNICAL UPDATE

British Horse Feeds, in partnership with New Beginnings – a charity dedicated to rehoming retire racehorses, are investigating the practical aspects of maintaining gastric integrity. A programme of scoping horses that are thought to have EGUS has recently begun.

Early results show an 8yr old thoroughbred, taken in with a very poor body score of around 1.5 (Pics 1 & 2)

Under a regime of good quality grazing and a fibre pellet New Beginnings brought his condition score up to a healthier, survival level, after which it was scoped.

Specialist vets came to New Beginnings to pass an endoscope into the horse's stomach. Despite his initial improvement there was significant ulceration in the glandular region, with evidence of bleeding in the pyloric antrum (Pics 3& 4, below)



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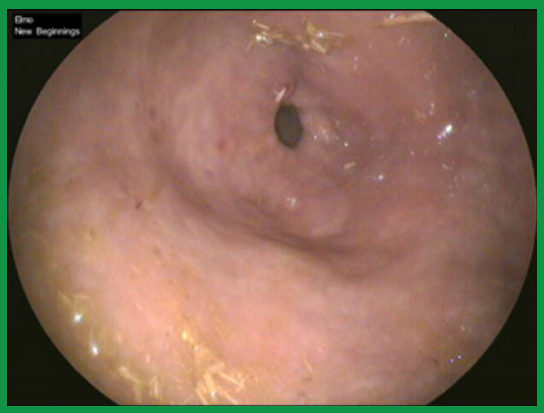
FIBRE-BEET MASH TECHNICAL UPDATE

After the consult, and on the recommendation of the veterinary surgeons, the gelding had Fibre-Beet Mash added to his diet. After 5 weeks, the horse was rescoped and the damaged areas investigated (Pics 5 & 6), below)



It was immediately obvious that almost total improvement had occurred. A slight reddening in the glandular region was noted on the official report, and significant improvement in the atrium. In short, the ulcers had all but disappeared, the only husbandry change being the introduction of Fibre-Beet Mash.

Although one scoping is insufficient to be anything than an observation, it is part of the ongoing research and BHF is confident that our continuing research partnerships will explain the benefits of feeding super fibres such as **Fibre-Beet Mash and Speedi-Beet™**

SOCIAL SCENE

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