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FIBRE-BEET MASH DIGESTABILITY

One of the drawbacks of any compounded feed is the inability to calculate its digestibility. Unless there are feeding trials, collecting faecal and urinary samples, for each and every compounded feed available, the relative digestibility between them is somewhat a matter of guesswork. Even if those trials were ongoing, the data would be itemised into the component parts, with a possible inaccurate overview of the result. As this would be a measurement of faecal loss against intake there would have to be a "calculation" of the microbial faction of faeces, and this would lead to inaccuracies.

In the case of energy, things appear simpler. There are many formulae based on nutrient profile of the feed, some that are specific to different species, whether they are fore- or hind- gut fermenters, and the broad definition of the feed (e.g. forage vs. concentrate). For the horse, for example, the NRC Nutrient Requirements of Horses quote 5 equations for calculating digestible energy, based on the feed's protein and fibre (or some components), and dependent on their being forage or high energy/protein supplements. Within this were provisos that some calculations would be underestimations if high fat or highly fermentable fibre was included.

This leaves us with a slightly dissatisfying result. And also the question: How can we assess the quality of a composite feed, and why is it necessary?

Most commercial feeds are bought on the basis of their analysis, and the marketing description provided by the vendor. Although useful, they do not allow direct comparisons; different feeds may have similar analyses but have different ingredients. In the case of fibre this can lead to different profiles (and the declaration on the label does not show this), as can protein, oils and carbohydrates, all of which can influence the quality of the feed.

So how can a manufacturer of a compounded feed qualify claims of high quality, digestible, slow release, highly fermentable... or other terms of "quality"?

Barastoc and British Horse Feeds have taken the decision to work alongside top UK research facilities to help answer these questions, so terms like quality and digestibility can be qualified.

These help us quantify the digestive parameters o single feedstuffs – such as Speedi-Beet, and extrapolate to multi-ingredient feeds such as Fibre-Beet Mash.

Speedi-Beet is a hydrothermally treated beet pulp. Unmolassed beet pulp has been the subject of various digestibility determinations in the technical journals. Hyslop (2006), partitioned the breakdown of beet pulp between the small and large intestines (caecum & colon) in a ratio of 3:10 and gave a value of ~70% degradability. In vitro work by Moore-Collyeret al (2002) gave an effective degradability vale of 74%.

However, one pf the projected properties of the micronization process, in the manufacture of Speedi-Beet, is an improvement of digestibility; the infra red treatment shatters cell wall material enabling increased enzyme penetration and microbial activity.

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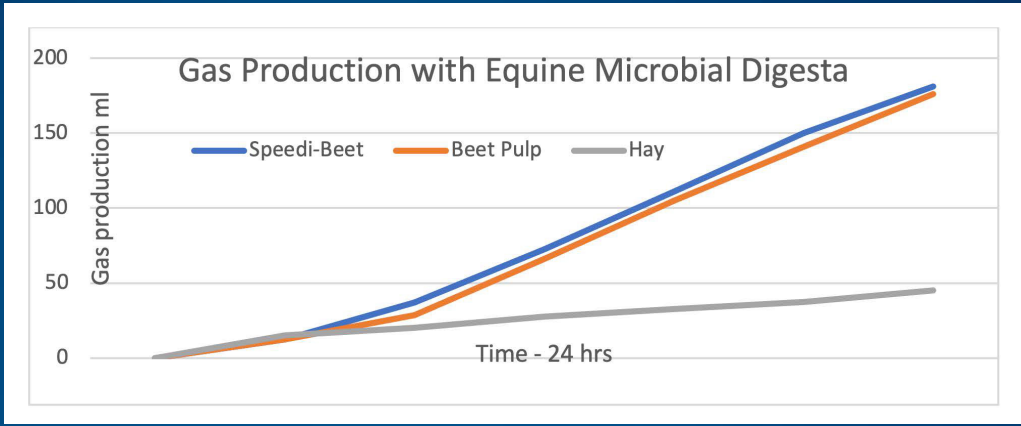
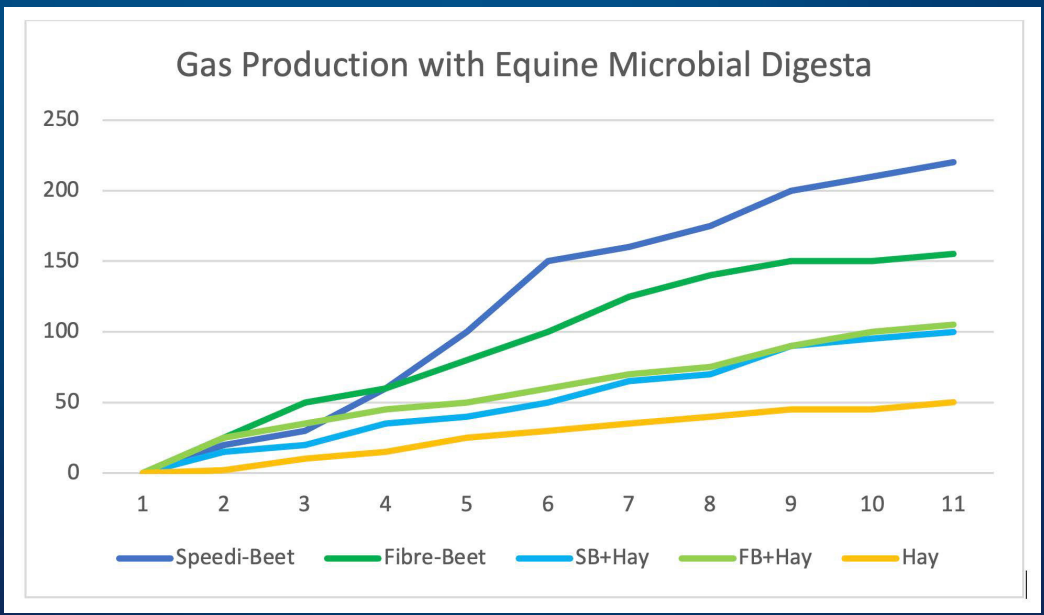
Using in vitro techniques, gas production with equine faecal digesta showed an enhanced response of Speedi-Beet over unmolassed beet pulp (University of Glasgow, 2017), an improvement of, on average, 10% (figure 1 below).



Using the same techniques, alfalfa/beet pulp combination gave gas production at around 80% that of beet pulp, whilst that of alfalfa on its own was in the region of 50%. This implies an additive effect, theorised to be a prebiotic effect of beet pulp, increasing the effective degradability of alfalfa by as much as 20% (Murray et al., 2006). It was also shown that this effect can also encompass other components of the gut contents, such as forage (Moore-Colyer & Longland, 2001)

The third component of Fibre-Beet Mash, oat fibre, has effective degradability figures of around 45%. Incorporating these figures on a purely mathematical basis, Fibre-Beet is projected to have an effective degradability of about 65%. This value has been confirmed by gas production work at the University of Glasgow (2017, 2018), as shown by figure 2 below.



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Within the same trial, the gas production of a 80:20 hay to Fibre-Beet Mash ratio was investigated. This would be a more realistic dietary level, and shows that output is almost identical to the Speedi-Beet/hay combination. This fits in with the observed prebiotic effect.

In summary, therefore, although digestibility figures for compounded materials are generally unavailable, ongoing research at British Horse Feeds have given realistic values for both Speedi-Beet & Fibre-Beet Mash; when fed as part of a fibre rich diet, both products have a digestibility value of ~ 80%.

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