

STOP YOUR SPRING FEED PINCH BECOMING A PUNCH: WHAT ARE THE FEED ALTERNATIVES AND HOW DO THEY COMPARE?

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Spring 2004, more than a surprise

A lot of farmers in New Zealand will remember the spring of 2004 for quite a while. It started raining and it never seemed to stop. Especially hard hit were the southern half of the South Island and the West Coast. Some farm owners, sharemilkers and farm staff who came from other parts of the country decided to go back to Taranaki, Waikato, etc. Besides having a depressing effect on stock and people, the rain halved pasture growth rates and at the same time reduced pasture utilisation. Normal grazing rotations could not be maintained, due to major pugging problems. This scenario led to a far larger and prolonged spring feed gap than anyone had accounted for in their feed budget.

What are the options?

First of all we are dealing with a feed shortage in the sense of kg DM available to feed per cow per day. Applying extra nitrogen after 3-4 weeks of rains, waterlogged soils and a soil temperature of 7-8 degrees Celsius is not going to solve the problem.

The amount of pasture silage available on farm is in most cases only sufficient to fill an “average” spring feed gap. In any pasture-based situation having an accurate and up to date feed budget allows you to make timely and informed decisions. My experience is that people who don't have this in place often make decisions 2-3 weeks too late, which can be a costly exercise.

Besides silage & hay farmers have had access to grain (barley and wheat), pelleted feed and molasses for a long time. Recently other feed supplements like palm kernel expeller meal (PKE) and copra expeller meal are imported into New Zealand together with products such as canola and soya extraction meal. In the following paragraphs I will outline the nutritional strengths and weaknesses of each feed and how they can be used on farm.

In considering the types of feed to use it is important to see what feeding options you have on farm, e.g. do you feed only in the paddock or do you have feed troughs, a feed pad or an in shed feeding system?

Feed characteristics and composition

Energy is the major limiting factor in 90% of pasture based diets (Kolver, 2000, Kuperus, 2002) certainly during a wet spring when pasture intakes are low. Cost per ME consumed (i.e. down the throat) is a key decision in which feed to buy in. First calculate the feed cost to per kg DM and then divide by the MJ ME per kg DM. Do not forget to factor in the wastage during storing and feeding out in your situation. Feed composition e.g. % dry matter, soluble starch and sugars, fibre, protein and minerals determine how well the feed complements the pasture and meets the cows nutritional demands. Palatability is paramount and important for good utilisation and cows taking to the feed quickly. Consider the physical form of the feed: powder, pellets, liquid, chopped/long fibre material. Risks: does the feed have any potential risk, e.g. for acidosis, mycotoxin contamination?

Table 1 gives an overview of the composition of the most commonly used concentrate feedstuffs beside silage and hay.

Table 1: Composition of most commonly used concentrate feedstuffs in the South Island

	PKE	Copra	Barley	Wheat	Molasses
Dry matter (%)	91	91	87	86	74
ME (MJ/kg DM)	11.5	13	13	13.5	11
Crude Protein (%)	11.5	22	12	13	6
Crude Fat (%)	9	9	2	1.5	0
ADF (%)	42	28	6	3.5	0
Neutral Detergent Fibre (%)	67	53	16	11	0
Starch & sugars (%)	2.5	13	58	71	60
Ash (%)	4.5	6.5	2.5	2	10
Ca	2.6	0.8	0.7	0.6	9.7
P	5.6	5.6	3.9	3.5	0.7
Mg	2.6	3.2	1.1	1	4
K	6.8	21.2	5.2	4.6	53.1
Na	0.1	0.6	0.1	0.1	2.4

Palm Kernel Expeller meal (PKE)

- PKE is the remainder of the palm kernel (in the palm fruit) after the majority of the oil has been extracted by a mechanical expeller.
- PKE contains moderate levels of ME and protein (see Table 1) and high levels of slow digesting fibre. This means that there is no risk of rumen acidosis with this product.
- PKE meal is less palatable than most other feeds; therefore it takes cows longer to get started on it.
- PKE can be feed on the feed pad, via a trailer (small herds), and via some feed systems in the shed. If you feed it in the paddock with a feed out wagon it needs to be mixed with chopped silage.
- PKE can vary in composition and can contain fungi and/or mycotoxins (e.g aflatoxins). Check with your supplier and ask to see a full feed analysis of the boat load you are receiving from. Aflatoxins are produced by moulds. They can make cows sick and contaminate milk.

Copra meal

Copra expeller meal is the flesh inside the nut after the coconut oil has been extracted. Normally the oil gets extracted by steam and mechanical rollers. Sometimes a second expeller is used which results in a lower fat content and higher protein percentage than mentioned in Table 1.

Copra is higher in ME and protein than PKE, being less fibrous and of a higher digestibility. As with PKE there is no risk of rumen acidosis.

Copra has a nice smell and stock take to the feed very quickly. This is one of the reasons why feedmills like to include it in their stock feeds.

Copra can be fed out in similar ways as PKE, although the ad lib trailer scenario is not suitable due to the high palatability of the feed.

Sometimes the copra is pelleted which reduces the amount of dust and losses.

Copra can vary in composition and contain fungi or mycotoxins. Check with your supplier and ask for a copy of the feed analysis certificate.

Grain

Wheat is on average slightly higher in ME and Protein content than barley. Don't forget that the quality differences between good and poor barley are far greater (e.g 11 versus 13.5 MJ ME per kg DM)

Both grains are high in starch and need to be introduced slowly to prevent acidosis.

Feeding through the shed is the best option, with the least wastage. For example start with 0.5 kg twice a day and then increase this after 4-5 days to 1 kg per milking.

Buy quality: a lot of the barley harvested during summer 2005 contained 10-30% small grains and screenings. A product with a low price per tonne, might still be expensive for the ME utilised. A lot of pinched grain does not get processed by the roller mill and therefore ends up undigested in the faeces.

The mixing of ingredients with rolled grain in feed is quite hit and miss. The fine powdery additives separate out from the rolled grain. In these cases it is better to use a complete pellet feed or mix in small mineral pellets.

Molasses

- The ME of molasses is not as high as many farmers think, partly due to the high ash content (see table 1). When people say it is high in energy they actually mean it is high in sugars, which are a good energy source for rumen microbes.
- Molasses has been around a long time and farmers like to use it because stock love it and it is quite easy to feed. The reduction in molasses prices in New Zealand has made it a more economic alternative.
- Molasses in troughs near the dairy shed can be hit and miss and cause acidosis through the high sugar content with some of the cows. The lick-ball system in the dairy shed is cheap and does limit intakes effectively. Therefore ME intakes in the shed are lower than with feeds like copra, grain and pellets.
- 200-300 ml molasses as a palatant and anti-dust factor in the feed troughs of rotary dairy sheds works well.
- Molasses can be used as a vehicle for rumen modifiers and minerals as well, but this will restrain the maximum daily amount you can feed the cows.

Meal and pelleted feed

- The feedmills' pelleted feeds are mainly grain based, with other products like copra, peas and molasses added. The hammer milling and pelleting process ensures all the ingredients are processed and there is no wastage via fine particles or dust. Added minerals, trace-elements, rumen modifiers, bypass fats, etc. are evenly distributed through the pellets, ensuring each cow gets the right amount every day. Another advantage is that you only need to have one silo and pay for the product when you need it.
- During periods of wet weather feeding minerals via pelleted feed is far more effective than via drinking water.
- The easiest way is to feed in the shed. If you decide to feed in the paddock contact the feed mill and ask them to make nuts of 10 mm diameter or more, to reduce wastage.

In summary

We have looked at some options outside grass and whole crop silage to fill the spring feed gap. My experience is that the costs of silage expressed as ME eaten (including the ME and DM losses) by the cow is often a lot higher than expected and over half the silages are still below 10 MJ ME per kg DM.

Therefore it is worthwhile to do the homework on other supplements as discussed in this paper. Check out the quality and price (landed, ex GST) for your farm and discuss with your advisor/nutritionist how to fit it into your system of feeding. High utilisation and prevention of acidosis are key factors, to ensure ME's bought in are converted into profit.

References

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