PRIMARY INDUSTRIES AND RESOURCES SA

Alternative feeds for Dairy Cows

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In times of low feed reserves and high feed prices producers often look to unconventional feeds to plug gaps. “Waste” feeds may appear attractive due to a lower purchase price but there are issues to consider. Often they should be treated as a judicious supplement to accompany hay and grain and not as a sole feed. Your own QA system (quality assurance) should have a requirement to produce milk free from taints and chemical residues and to keep good records of feed purchases. Check your reference manual or phone your company if in doubt.

Things to consider about alternative feeds include

- How much real food value does it contain?
- How does the cost compare with more conventional feeds?
- Are there any health problems associated with feeding it ?
- Is there any risk of tainting milk ?
- Are there any chemical residue risks?

It is important to determine whether your needs are for energy or additional protein to meet your herd’s requirements.

Food value

When assessing the feed value of an alternative feed, first compare the energy levels. Energy is the most critical limiting factor when fodder is scarce.

Compare feeds on a dry matter basis so that one feed can be compared with another. Many alternative feeds have a very high water content. Although the purchase price may be low, do you really want to buy and freight water? For example:

- onions are about 10% dry matter. For every tonne of fresh onions, you are buying 900 kg of water.
- potatoes are about 20% dry matter. For every tonne of potatoes you are buying 800 kg of water.

Comparing the Cost

The only way to make a comparison between different price options is to compare the landed cost (purchase price plus freight) on an available energy per kilogram basis. Available energy depends chiefly on dry matter and digestibility. Remember that when balancing the whole ration that protein and mineral levels must be adequate. Growing heifers, late pregnancy and lactation increases protein requirements.

Energy and Crude Protein Content of some alternative fodder crops compared to some conventional fodders.

Fodder	Metabolisable Energy content (MJ / kg) dry matter basis	Metabolisable Energy content (MJ / kg) fresh (as fed) basis	Crude Protein (%) dry matter basis
Barley	12.5	11.3	12
Oaten hay	9.0	8.1	8.5
Lucerne hay	9.5	8.6	14
Straw (good)	6.0	5.4	4
Pumpkins	12.3	1.2	10
Grape marc (wet)	9	5.2	12
Whole potatoes	12.7	2.7	3 to 6
Carrots	12.8	1.7	8.5
Brewers Grain	9.7	2.4	22
Citrus pulp	13	1.8	8.5
Onions	15	1.5	11.2
Bread day old	10.4	7.8	8

Health problems

Some products or feeding practices can be harmful. If in doubt check with your local nutrition specialist or vet. Examples include:

Grain poisoning

When bail feeding twice a day, 6 kg a head a day (as fed) is considered a very safe level (ie 3 kg per milking); 8 kg a head a day requires more attention with adequate mineral and fibre buffering to prevent acidosis, lameness etc. Cows at Flaxley Research Centre are adapted to 10 kg per day but this requires very good management .

Start cows on 3.0 kg (as fed) a head a day (1.5 kg per head per milking) for about a week before increasing to 6 kg a head a day.

When supplementary paddock feeding, add 0.5 % to 1% bicarbonate for the initial period. Be sure to allow plenty of trough length to avoid bullying and consequent over feeding by some individuals. Allow extra hay during cold weather.

Maize, sorghum and oats are the safest grains followed by barley and triticales while wheat is the most risky. Finely cracked grain is a higher risk. Bicarbonate and calcium are normal additions.

For dry stock or growing heifers start at 0.5 to 1.0 kg (as fed) a head a day with access to hay. Increase by 0.5 kg per head every second to third day. Do not exceed 3.0 kg a head a day in one feed.

Potatoes can also cause grain poisoning due to their very high starch content.

Annual Rye Grass Toxicity (ARGT)

Although ARGT has not been a significant problem across SA for several years, conditions are now favourable for development of the disease. The biggest risk is probably from crop stubbles with ryegrass, including ryegrass along fence lines. Some crops may be cut for hay, especially if there is significant ryegrass content. Such hay should be tested before being fed out. Bales can be sampled by coring. Around 15% of bales should be core sampled, including the outside row (if known).

Plant poisoning

Hungry stock are less discriminating and may graze weeds previously ignored, such as young Bracken fronds. It is a good idea to feed out any bought in hay in easily remembered spots so that they can be checked later to prevent a new weed infestation on your property.

Onion poisoning has occurred when cattle have not had access to other fodder. A maximum safe limit of 20% of the diet (on a dry matter basis) is recommended for onions.

Mouldy hay. Moulds produce dangerous toxins and can result in serious health issues and death of stock.

Gut obstructions. Whole vegetables or very fibrous hay can sometimes result in a blockage, as can baling twine or plastic.

Choke deaths. Potatoes, carrots, onions, radishes etc should be fed from ground level to minimise choke deaths.

Unfamiliar grains. Check with your nutritionist. For example, whole cottonseed can be very toxic and should not be fed at more than 1% of body weight or up to about 4.5 kg per head per day.

Botulism Is caused by feeding fodders contaminated with dead birds and animals and has been reported from feeding very old grain kept under poor conditions.

Sorghum and Canola Hays

Cutting height for sorghum hay is critical to avoid prussic acid poisoning. The recommended height is 45 cm (18 inches); do not exceed 60 cm (24 inches). Although the newer varieties are considered to be a lot safer, if the crop is drought stressed fibre levels increase substantially so the lower height should be used. The taller cutting height (up to 60 cm) is more suited to irrigated crops.

Canola is not designed for animal consumption as hay; there are also serious herbicide and pesticide concerns. Canola hay is potentially toxic and is not recommended under any circumstances.

Tainting the milk

Citrus pulp or peel, onions and Chou Moellier can taint milk. It is very difficult to quantify the amounts that can be safely fed so these are best used for dry cows. Hungry stock will also graze weeds which can be poisonous or taint milk or meat.

Chemical residue risks

A major pesticide residue concern is organochloride residue (eg Endosulphan). Carrots, potatoes, onions, pumpkin, citrus pulp or peel waste and apple pomace are considered low risk for organochloride contamination. All major packing sheds and vegetable processors have QA (Quality Assurance) systems in place which minimises the risk of pesticide contamination. Most growers supplying large sheds comply with strict quality assurance programs. It is important that the vendor clearly understands the type of stock you intend feeding.

Glasshouse and field grown squash, zucchini, cucumber, lettuce, cabbage and cauliflower crops should be treated with caution.

The onus is on the vendor not to sell contaminated product for stock feed and the purchaser should ask for a “commodity vendor declaration “ to be filled out.

Additional Information

Acceptability

Palatability of feed is usually an indication of the energy content. If it's unpalatable its likely to be very low in feed value. Milking dairy cows rarely get hungry enough to eat unpalatable feeds. Acceptance for dry stock (ie coarse stemmy hay) can be improved by adding grain, molasses (which is expensive) and salt. Hungry stock are less selective and may eat fodder and weeds normally ignored.

Problems are more likely to be caused by feeding palatable rations in limited areas and quantities, which can result in cattle chasing vehicles and bossy behaviour. Less dominant animals or smaller first calf heifers may miss out . If heavily hand feeding it can be good practice to draft off a second group according to condition score.

Potatoes

Whole potatoes and potato waste mix are very similar in composition; potato liquid / peel mixes are lower in dry matter (12% and 20%). Raw potatoes may cause palatability and digestive upsets and should be introduced gradually over 3 weeks. Green potatoes can cause toxicity problems due to an alkaloid Solanidine. Potatoes are also low in magnesium and can accumulate the heavy metal cadmium. Do not exceed 20 to 25% of the diet on a dry matter basis.

Introduce potatoes to dairy cows beginning with 2.0 kg a head increasing to a maximum of 10 kg a head a day. Up to 15 kg a head have been successfully fed but must be given as two separate feeds.

Potatoes have been fed to heifers over four months of age at about 3 kg per 100 kg live weight in conjunction with good pasture hay. Exceeding these amounts can cause scouring.

Onions

Onions have been associated with health problems and deaths, do not exceed 20% dry matter of the diet

Grape Marc

Grape marc (about 38% dry matter) is usually fed fresh or "wet" ad lib from a large heap. Stock will burrow in to the pile to expose fresh material as the surface dries. No meat or milk taint has been noted in limited experience feeding over several weeks. Mould on the outer crust can occur following rain but has not been reported to cause health problems since stock ignore the dried outer crust.

Dried marc is unpalatable but has been trialed in mixed rations / pellets. Dried marc is usually sold as a mulch / organic manure.

Another product, fresh stems and stalks, may also be available for short periods of time direct from winery crushers. Due to its higher moisture and sugar content this product moulds rapidly and needs to be transported and fed out very quickly - preferably within 24 hours, as a trail.

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