

# Effective physical nutrition to safeguard rumen health

Dairy farmers need to pay close attention to the physical make up of their rations this winter as Hugh Kerr, international nutrition development manager with Keenan explains.

You won't need telling it has been a difficult forage season and this, coupled with high purchased feed prices will make feeding cows an interesting exercise. Diets will need careful construction and equally careful monitoring.

The good news is that there is plenty of advice around about how to formulate diets to compensate for variable silage quantities and qualities and ensure a ration delivers the theoretical required levels of energy and protein with the appropriate balance of energy sources.

But little has been said about the challenge of ensuring the diet is the right physical shape to de-



*This winter's dairy rations will need careful formulation says Hugh Kerr.*

liver effective digestion and good rumen health. And quite simply, if you don't feed the diet in the correct physical form then cows won't milk as expected and digestion efficiency will be reduced.

The rumen requires a mix of different particle sizes to work effectively. If the diet contains too much long material then the rumen becomes congested and actually slows down. Cows have problems digesting the diet in sufficient quantities. Conversely, too many small particles lead to an over-vigorous fermentation and problems with acidosis.

Feeding less forage or a different mix of silages will affect the physical structure of the diet and influence the forage:concentrate ratio. For example, many farmers will be short of grass and maize silage but will have wholecrop. The properties of these forages are different and will affect the physical presentation of the diet.

Increasing concentrates or adding other feeds to offset the lower forage quality that is being widely reported as energy and protein levels will also affect the physical structure. Finally, many farmers will be tempted to try a wider range of ingredients, be they concentrates, bulks or liquids to try and reduce the overall ration cost and each will have different

physical properties and represent a different challenge to the rumen.

A good example of the importance of the physical structure is to consider how starch levels will be balanced if, as maize silage is predicted to be low in starch this winter, possibly as low as 22% compared with a more typical 32%. Making a TMR to a desired starch level without upsetting the rumen will be a challenge.

Chemically we can make up the difference pretty comfortably on the formulation, an additional 1.2kg cracked wheat or 1.5kg of crimped maize would balance the shortfall. Alternatively, feeds such as bread waste and stockfeed potatoes could be considered. But care must be taken as different starch sources will affect the physical presentation of the diet and rumen health, none of which appears on the formulation.

If the option is to add wholecrop silage then we will be adding a feed with good physical characteristics which will help ensure effective rumen fermentation and cudging. But many of the starch sources are concentrates, and they will affect the forage:concentrate ratio and may leave the rumen short of fibre.

Rolled cereals for example increase the supply of rapidly fermented starch and have very small particle sizes which can lead to an increase in fermentation rates resulting in more acid production in the rumen and a risk of acidosis. Bread waste and others fall into the same category.

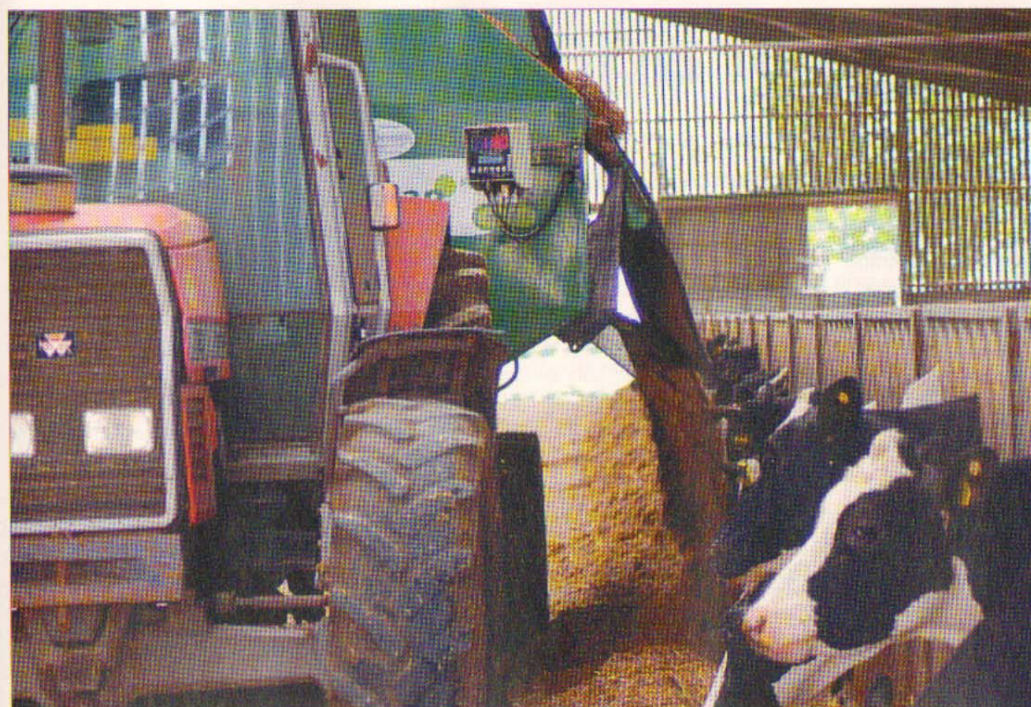
With starch sources such as these it will be important to supply effective fibre sources with appropriate length particles to compensate and help encourage saliva production to buffer any additional acid.

There may also be problems with grass silage which is typically around 3% sugar, but this year we are seeing levels below 1.5%. Sugars are an essential rumen energy

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source so this shortfall needs to be made up, and the obvious solution is to use a molasses based product. For a cow getting 10kg DM of grass silage, it will take an extra 600g of cane molasses to make up

the shortfall.

Molasses, or any liquid feed, will usually improve the physical nature of the ration, provided it is added and mixed in correctly. Get it right and the molasses will help

bind concentrates and forages and improve palatability. However, get the physical addition of molasses wrong and concentrates will bind together and fail to blend evenly with added forages or

moist feeds, leading to selection of the feed along the feed face.

Every time you change the ingredients in the diet you potentially change how the rumen will digest the ration, and it can take at least two weeks to adjust. This period will be elongated if the physical nature of the diet is changed, for example when a ground, processed starch source is added in place of a less processed feed. Make sure the chemical and physical nature of the diet is balanced when adding new or novel ingredients.

In the end the cows will tell you how good your diet is physically. If the diet is adequate cows will eat along the full length of the trough with no evidence of sorting. They will have good rumen fill scores and dung will be consistent in appearance, texture and smell. If you spot anything different, it is time to take a close look at the physical nature of the diet.

The cow will always be judge and jury, and monitoring input against output is the only true ration test.