

Farmers look to molasses to bring feed rations up to scratch

Looking more closely at dietary sugars will help unlock the value in this year's silages. British Dairying investigates how farmers and nutritionists can promote more efficient rumen function and hedge against variable forage quality this autumn and winter.

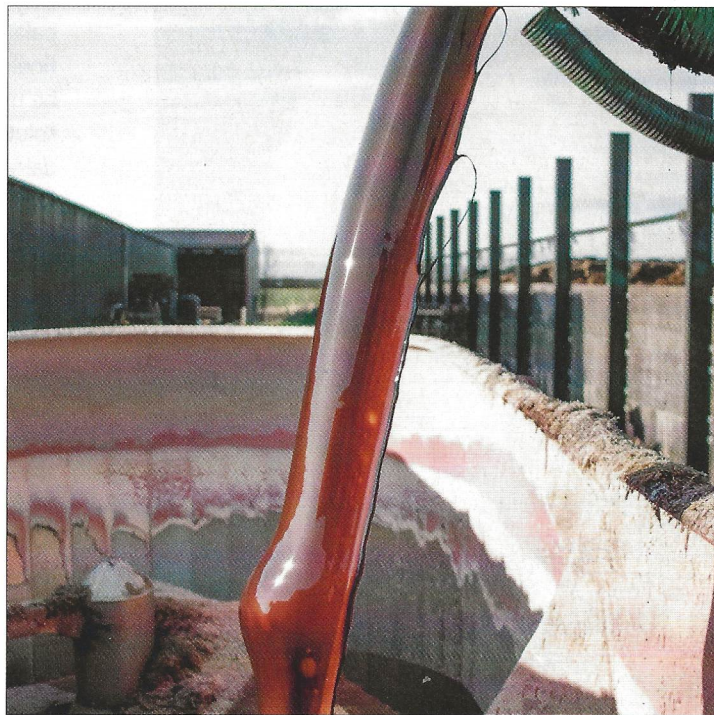
As cows begin to be housed onto winter diets, farmers and nutritionists are facing up to some specific challenges. Rations are having to be formulated to make the most of variable quality grass silages, although quantities appear to be good.

Feed ingredients markets look likely to remain volatile, fuelled by the continuing events in Ukraine and the poorer UK grain harvesting conditions. Finally, milk prices seem unlikely to improve over the winter months, putting downward pressure on margins.

"There is no doubt that rations will need careful balancing to ensure cows can maximise forage intakes and then get the most from that forage," comments Georgina Chapman at molasses blend specialist ED&F Man. "The good news is that we know enough to help tackle the specific characteristics of this year's forages and build effective diets."

Data from Trouw Nutrition shows that grass silages are reasonable quality but reflect the mild winter, with a higher proportion of over-wintered grass (figure one). Second cuts were affected by the wet summer, leading to a proportion of more mature crops.

Overall energy levels are slightly reduced and sugar levels are significantly lower. Lignin levels are higher, which will affect digestibility, while



Molasses help to improve fibre digestibility and palatability of the diet

rumen fermentable carbohydrates and proteins are also reduced. "Many of the challenges when feeding this year's silages can be tackled by looking closely at the sugar levels in the diet," says Georgina. "Adding sugars, in the form of a molasses blend can help improve fibre digestion, which will release more of the nutrients

in forage, while also improving the palatability of the ration to stimulate intakes.

"Sugars will also stimulate microbial production and supply rumen fermentable carbohydrates without the risk of sub-acute rumen acidosis (SARA), and can increase dry matter intake without causing rumen fill,

due to the unique low substitution effect of a liquid feed." Most UK diets are typically around 2% sugars in the dry matter, but this is significantly below requirements. Early lactation cows require 6% sugars, while cows at peak require 8%. Even late lactation animals need 6% sugar in the diet, she notes.

"Filling this sugar gap provides cows with valuable rumen fermentable carbohydrates to fuel the rumen micro-organisms, which will encourage better feed efficiency."

Fibre is a crucial source of energy but when lignin and neutral detergent fibre levels are high, this energy is more difficult to extract. Any fibre that is undigested is excreted, wasting potential energy. "By stimulating the rumen micro-organisms, sugars fuel higher levels of fibre digestion."

The photo (below right) compares dung sieving from a herd where dietary sugar level was increased from 3% to 6% by adding a molasses blend to the diet. After six weeks, the outcome was a 17% increase in fibre digestion with significantly less in the top sieves, a clear sign that the cows are using the diet better.

"Adding the optimal level of sugars in the diet also influences rumen fermentation in two significant ways. The first is that they contribute

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FIGURE ONE: 2023 GRASS SILAGE AVERAGE ANALYSES TO AUGUST 1 (source: TNGB)

	First cut	Second cut
Dry matter (DM %)	31.2	35.4
D value (%)	70.2	69.1
Crude protein (% DM)	14.3	14.2
Metabolisable energy (MJ/kg DM)	11.2	11.1
NDF (% DM)	44.7	44.3
Lignin (g/kg DM)	40.7	40.2
Rapidly fermentable carbohydrates (g/kg DM)	195.4	195.9
Total fermentable carbohydrates (g/kg DM)	421.5	425.2
Rapidly fermentable protein (g/kg DM)	91.9	89.5
Total fermentable protein (g/kg DM)	103.8	102.8
Sugars (% DM)	1.6	1.8

Figure two: A molasses blend can reduce diet costs

Ingredients (kg freshweight)	Diet no molasses	Diet with molasses
Grass silage	35	40
Barley	3	3
Brewers' grains	10	10
Molassed sugar beet	2	2
Soya hulls	0.5	
Rapeseed	1.2	0.5
Hipro soya	1.0	
16% dairy cake	3	3
Regumaize 44		1.3
DMI (kg)	22.6	23.1
ME supplied (MJ)	270	272
Crude protein (%)	17.9	17.0
Sugar (%)	4.6	6.1
Diet cost (£/day)	3.27	3.13

to increased microbial protein production, which is the most important protein source for ruminants, as well as being the most economic," says Georgina.

"With volatile protein prices, optimising microbial production will be especially important this year. Sugars are more rapidly fermented than starches and fibres, providing the instant energy boost to promote more microbial protein synthesis."

Although rapidly fermented, sugars do not contribute to issues with SARA, commonly seen when cereals are increased in diets. Fermentation of cereals can cause an accumulation of lactic acid in the rumen, while sugars favour fermentation to butyric acid, she explains.

"Lactic acid is 10 times more acidic than typical volatile fatty acids in the rumen and can predispose cows to SARA. This winter it may be tempting to increase cereals in the diet to provide more rumen fermentable carbohydrates, especially if more cereals enter the feed market due to reduced milling and malting quality.

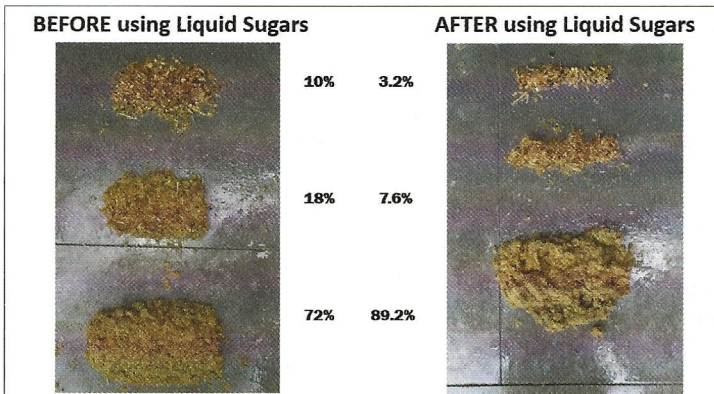
"From a rumen health standpoint, increasing sugars is likely to be the better option." Molasses blends offer an ideal combination of rumen fermentable carbohydrates along with

regulated release proteins to compensate for reduced fermentable proteins in silages. They can be tailored to suit any combination of forages. "With good silage stocks, feeding a molasses blend could stimulate better silage intakes, to increase nutrients from forage while allowing a reduction in more expensive protein sources."

Figure two compares two diets, both formulated to produce maintenance +35 litres. By adding 1.3 litres of Regumaize 44, a molasses blend with 55% sugar and 44% crude protein from regulated release urea, it is possible to increase grass silage intake by 5kg/cow per day, and to reduce soya by 1kg, soya hulls by 0.5kg and rape by 0.7kg/day.

"The diet with Regumaize 44 contains 6.1% sugars while the other diet contains insufficient sugar at 4.6%. The diets are identical for overall energy but dry matter intakes, driven by the extra silage, are higher in the Regumaize diet. Diet cost is reduced by 14p/cow per day, resulting in better margins.

"Faced with this winter's silage and milk price: feed price ratios it will make sense to see how molasses blends can be added to diets to promote a more efficient rumen to make better use of forages."



Dung sieving showed that molasses increased fibre digestion by 17%



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