

Nutritional and financial benefits of highly digestible varieties

To maximise the energy density of their maize silage, dairy farmers should be selecting varieties which can deliver both high starch and improved fibre digestibility. Varieties which offer good levels of both these energy types are suitable across all feeding situations and can be beneficial in reducing the risk of acidosis and displaced abomasums (DAs), says Francis Dunne of Field Options.

The new 2012 NIAB Descriptive List for forage maize now contains information on the cell wall digestibility (CWD) of each variety enabling growers to identify whether a variety's energy content is derived predominantly from its starch or its fibre digestibility, or both.

"Where maize silage is included at high levels in dairy rations, the nutrient profile of the maize variety used becomes more important," explains Francis Dunne of Field Options.

"This is because there is a

very high risk of acidosis when the overall starch content of dairy rations rises above 25%. For example, a ration which contains 80% maize silage of a starch content of over 35% could be too high if other starch sources are included, and predispose animals to acidosis and its consequences—DAs and depressed production.

"This is a particular danger in herds fed to produce yields above 7,000 litres/cow/year."

This is also the opinion of XLVets' Matthew Pugh of Belmont Veterinary Practice in Hereford:



For high maize inclusions diets, varieties with a high fibre digestibility are recommended by the Danish Cattle Federation.

"High yielding cows are on a tightrope between production and good rumen health. Feeding high levels of starch and protein will drive milk production but too much starch and too little fibre will cause acid-loading. This leads to sub-clinical and clinical acidosis, which predisposes cows to ketosis and DAs. Longer term, a higher risk diet may lead to increased involuntary culling rates.

"Cows most at risk from acidosis are those in early lactation receiving a lot of starchy concentrate in the parlour, and cows which are 50-150 days into lactation with high DM intakes. During the year, another risk time is when opening up the maize clamp and changing the forages in the ration."

Mr Pugh says the warning signs for acidosis include:

- Fluctuating intakes and milk yields.
- Depressed butterfat levels where milk yields are maintained.
- Tail swishing and flank soiling as cows are less 'comfortable'.
- Variable dung consistency.
- Mucus red material in the dung.
- Displaced abomasums.

Danish recommendations

In Denmark, dairy farmers are used to considering not only the starch content of maize varieties but also their digestibility values.

Most dairy cows are housed all year round. In rations, maize

silage is a key ingredient, and the Danish Cattle Federation has produced recommendations on maize characteristics, according to its inclusion level in the ration. (See table)

Mr Dunne explains: "The energy density—as measured by ME content—is determined by the starch content and fibre digestibility of the maize silage. A high ME is always the aim, regardless of how the ration is formulated. For every 0.1MJ/kg DM of ME in maize silage, an extra £5 worth of milk per tonne of dry matter is produced. On a field basis, this equates to roughly an extra £30 of milk per acre for each 0.1 MJ increase.

"Depending on maize inclusion levels, the relative importance of starch level and fibre digestibility will, however, change. In situations where maize is included in the ration at low levels—less than 35% of the forage component—then selecting varieties with a high starch content is the priority as this is a more cost-effective source of starch than bought-in concentrate.



Francis Dunne from Field Options.

It's the same when buffer feeding cows at grass, a high starch maize silage is preferable.

Cell wall digestibility

"By contrast, in high maize diets, there will already be a good level of starch due to the quantity of maize fed. So in these cases, and to reduce the risk of acidosis, it's the cell wall digestibility (CWD) of the

silage that's important.

"Two factors influence CWD values—as the plant becomes more mature, fibre digestibility falls, hence the Danish recommendations for harvesting earlier in high maize diets. However the genetics of a variety also dictate digestibility levels, so attention to variety selection is another way to ensure higher levels of digestible energy."

In Denmark, the early maturing LG variety Adept has proven popular thanks to both a good starch content and very high cell wall digestibility, combining to produce exceptional metabolisable energy content.

In the UK, Adept has the highest ME content on the 2012 NIAB Less Favourable List of 11.6 MJ/kg DM, a consequence of a high cell wall digestibility of 58% and high starch content of 35.4%.

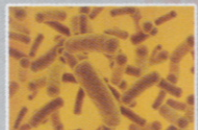
Mr Dunne explains: "Compared with the lowest ME content on the NIAB List of 10.7 MJ/kg DM, the nutritional quality of Adept confers an extra £275 per acre in extra milk production potential. Getting good levels of both starch and fibre into dairy rations is a balancing act, but maize growers can select from varieties like Adept, which offer farmers both. Moreover, varieties with a high CWD are never a disadvantage nutritionally, because sources of starch are straightforward to include into the diet to balance the range of energy sources in the cow's rumen."



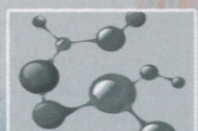
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Recommendations for maize according to ration inclusion level

Low maize inclusion—maize: grass—less than 65:35	High maize inclusion—maize: grass—greater than 65:35
Harvest at 32% to 33%	Harvest at 29% to 30%
High ME	High ME
High starch variety	High fibre digestibility variety
Chop length 9mm to 10mm	Chop length 15mm to 17mm

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