

High quality silage is vital to promote high intake and increase milk yield

by Shirley Heron, Ecosyl Products Ltd, Roseberry Court, Ellerbeck Way, Stokesley, North Yorkshire TS9 5QT, UK.

In the UK, recent figures from the Kingshay Farming Trust Dairy Manager show trends over the past 10 years (Table 1). Not surprisingly, there has been a steady increase in herd size and milk yield but that increased yield has been through buying ever more expensive concentrates with milk from forage actually decreasing.

Yet cows are ruminants so they are designed to eat forage and at least 60% of the cow's energy should come from forages or fibrous concentrates. However, this move towards concentrates has meant that the forage:concentrate ratio has changed from 60:40 to 40:60, with purchased feeds now accounting for 60% of variable costs and 26% of income compared to 12% 10 years ago. This is a worrying trend in view of the potential problems of over-feeding concentrates in terms of rumen digestion and animal health and fertility. Kingshay figures show a 30% increase in cell counts and an increase in culling for health reasons from 30 to 42%. The UK's fertility indices also continue to decline with calving interval now nearly 430 days.

While a bigger milk cheque is certainly one way to increase income, it is perhaps not the best approach if part of that extra income is being eaten away by increased vet's bills and culling costs.

There is also increasing public concern about animal welfare. Figures from various recorded herd schemes, including Kingshay's, have consistently shown that it is the herds making the most of their for-

age that are most profitable. Silage quality must be very good in order to promote the high intakes required these days to achieve high milk yields and will be influenced by many factors (Table 2), most of which are in your control to a greater or lesser extent. It is well worth the effort to be sure you are getting the management side right.

It only takes a few days to harvest all your forage for the year but any mistakes and you will suffer the consequences for a lot longer.

Good management is essential for good silage but a proven inoculant can turn this into even better silage with a cost effective increase in production.

Stage	Influencing factor
Pre-harvest	Crop variety Slurry/fertiliser
Harvesting	Weather Crop maturity Chop length Wilting Soil contamination Additive
Ensiling	Speed Compaction Sealing
Feedout	Rate Face management

Table 2. Factors influencing silage outcome.

Without an inoculant, fermentation relies on the lactic acid bacteria (LAB) already on the crop which are present in low numbers and mostly heterofermenters, not the best type.

They usually convert crop sugars into a mixture of different acids and alcohols with a significant loss of DM. The slower fermentation

Fermentation	Substrate	End products	% DM loss
Homolactic	Glucose/fructose	Lactic acid	0
Heterolactic	Glucose	Lactic acid, ethanol, CO ₂	24
	Fructose	Lactic acid, acetic acid, mannitol, CO ₂	5
Clostridial	Sugars/lactic acid	Butyric acid, CO ₂	51
	Amino acids	Carboxylic acids, amines, ammonia, CO ₂	Variable and high

Table 3. Fermentation pathways.

allows even less desirable bacteria to be active longer, wasting more sugars, the worst case scenario being when clostridia bacteria get a hold, as their activities will result in an unpalatable, high pH silage with very high DM losses.

The best type of LAB (homofermenters) produce only lactic acid, the strongest acid found in silage, with no loss of DM. Silage inoculants apply large numbers of such bacteria to the crop to ensure they dominate the fermentation, making the most efficient use of available sugars and bringing about the fastest pH fall with least DM losses.

Getting a good fermentation is important but is no guarantee of improved performance. Only a few inoculants have shown conclusively that they can also deliver more milk, one of these being the MTD/I strain of *Lactobacillus plantarum*.

With a total of 15 dairy trials

behind it, MTD/I has been shown to increase milk yield by an average 1.2 litres/cow/day (Fig. 1).

This is believed to be mainly due to higher intake, increased silage digestibility and a greater retention of true protein in the silage leading to more efficient nitrogen utilisation in the rumen and greater microbial biomass production.

It is no good having excellent silage if you do not have enough of it and here too an inoculant can play an important role in reducing fermentation DM losses from over 10% to less than 5%. But the biggest potential losses by far occur during feed-out, losses of over 20% being common and 50% not unheard of. With good management, these can be greatly reduced but sometimes, for practical reasons, management cannot deal with all the issues and an additive is necessary. Chemical and biological options are available. ■

Table 1. Kingshay Farming Trust Dairy Manager – changes in the past 10 years.

	2000	2009	% change
Herd size	120	151	+26
Milk yield per cow (litres)	6,786	7,845	+16
Milk from forage (litres)	2,865	2,168	-24
Conc. per cow (kg)	1794	2491	+39
Purchased feed costs (pence per litre)	3.3	6.8	+106

Fig. 1. Regression analysis of 15 independent dairy trials shows MTD/I consistently produces more milk over a wide range of crop types and DMs.

