Dry Matter Losses

written by Trish Lewis

Maize silage harvest time will be coming up soon for some of you so you may be looking at the crop and wondering how many tonnes of dry matter you will have to feed the cows. The question is, are you looking at tonnes in the paddock or tonnes in the silage stack, and have you allowed for dry matter losses?

It is easy to assume that if you harvest 300 tonnes of maize silage at 33-34% dry matter, you will have 100 tonnes dry matter of silage to feed to your stock. In reality you never will, because of the dry matter losses which occur between cutting and consumption by the cows. These usually range from 10-20%, so you would be left with 80-90 tonnes of dry matter to feed in the above example.

So what are these dry matter losses, and what can be done to reduce them? The table below shows the range of losses usually seen in silage. Respiration losses occur from cutting until air has been removed from the stack or used up. During this phase sugars are broken down to carbon dioxide and water, heat is produced and energy and dry matter are lost. Minimising time from cutting to ensiling, and doing a good job of packing and sealing the stack will reduce respiration losses.

Fermentation losses occur once the stack is sealed and fermentation has started. These losses can vary considerably depending on the bacterial population in the crop and the buffering capacity (resistance to a drop in pH) of the crop. This affects how quickly the pH drops. Maize silage has a low buffering capacity so the fermentation can be fast with the right bacteria, resulting in low fermentation losses. This is one of the areas where a good silage inoculant, such as Sil-All, can help. A good inoculant applies large numbers of efficient lactic acid bacteria to swiftly convert sugars into lactic acid with minimum losses. It will also minimise protein breakdown, important in a low protein crop like maize.

Potential Losses During Ensiling	**%**
Respiration	1 - 2
Fermentation	3 - 8
Effluent	0 - 7
Wilting	2 - 5
Surface Wastage	1 -10
Aerobic Deterioration	1 -10
Total Losses	**8 - 30+**

Effluent losses are usually low to negligible in maize silage because dry matter is normally over 30%. Wilting losses are also not an issue for maize, as the crop is direct cut. Surface wastage, usually seen on the top and shoulders of a stack, can certainly result in losses, some of which are quite visible. Good compaction, right to the last load, and good sealing will reduce these losses. Tyres should be touching all the way across the stack. Some farmers have used salt to reduce top and shoulder wastage, applied at 3kg/m2 to the top and 6kg/m2 at the shoulders.

Aerobic deterioration is one of the major causes of dry matter losses in maize silage. It occurs once the stack has been opened up and the face is exposed to air. Bacteria and yeasts which thrive in the presence of air start consuming soluble sugars in the silage. The pH rises, the silage starts to heat and nutrients are lost. Planning the stack size and shape so that the face moves back by at least 30cm a day during feedout will help minimise aerobic deterioration. Applying a good silage inoculant will also help to reduce aerobic breakdown, by improving the stability of the silage and it's resistance to an increase in pH when exposed to air. Consolidate the stack well so air will not penetrate as far in from the face, and disturb the face as little as possible when removing silage to feed out. Don't drop the sheet over the face overnight, as this creates a warm, moist environment between the sheet and the face which speeds up deterioration. Put the silage out as close as possible to when the cows are going to eat it.

Overall, fermentation losses and aerobic deterioration are the two big enemies for maize silage. If you want to be feeding out 90 tonnes dry matter for every 100 tonnes dry matter you cut, rather than 80 tonnes, then focus on stack sizing, consolidation and sealing, and face management during feedout. Remember to make sure your contractor is using a good quality inoculant which has been proven to reduce fermentation losses and aerobic deterioration. For more information on minimising dry matter losses, contact your local Nutritech Area Manager or ring Nutritech **Toll Free on 0800 736 339**.

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