Focus on Forage

ECOSYL™

For consistently better silage

Are you getting as much dry matter as you could be?

Feed budgeting is a challenge that every livestock farmer has to meet head on. Each time you harvest a crop for silage, you'll estimate how many tonnes of dry matter (DM) there will be to feed the cows. But are you taking into account potential DM losses?

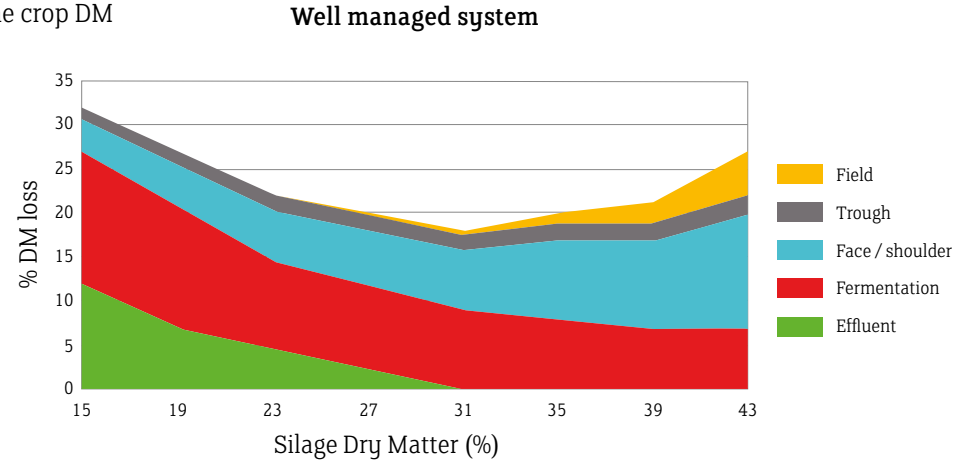
Let's say you harvest 300 tonnes of a crop for silage at 33% DM. This should mean around 100 tonnes of silage for feed. However, DM losses will occur between harvesting and consumption by livestock (Table 1) and are typically around 20-25% with clamped grass. Those losses could be worth over £3,000, and you also have just 75-80 tonnes left to feed . Losses can be as low as 10% with excellent management but over 50% if there is bad aerobic spoilage, with poorer quality silage to feed too. The extent of DM losses are often not appreciated as much of the loss is invisible. For example, 4 inches of poor silage may have started as 12 inches of good silage.

Table 1: Potential DM losses during ensiling

DM losses	Range (%)
Field (harvesting)	2-15
In silo (respiration/fermentation)	5-20
Effluent	0-5
Feed-out (aerobic spoilage)	5-30+
Total	**10-50+**

Total losses arise for a number of reasons, the relative importance of which depends on the crop DM (Figure 1), with fermentation and effluent losses being more important with wetter crops and aerobic spoilage with high DM crops. Some losses are unavoidable but good management practices at every stage of ensiling will help minimise them all.

Figure 1: DM losses in relation to the crop DM



Field (harvesting)

Some physical loss of grass left lying in the field will occur but most losses are due to plant respiration which begins immediately after cutting and continues until oxygen is no longer available. It results in a breakdown of sugars so they are no longer available for fermentation. DM losses increase as wilting time increases, especially under poor wilting conditions, or if the crop is rained on which leaches soluble nutrients..

You can reduce field losses by:

- Having appropriate harvest machinery, correctly adjusted
- Minimising the time from cutting to ensiling, ie rapid wilt

In silo (respiration & fermentation)

Respiration continues initially due to oxygen trapped during filling. Once it has all been used up, the main fermentation occurs with lactic acid bacteria converting sugars mostly to lactic acid which reduces the pH. The faster this happens, the lower the losses and the more true protein is preserved. It also inhibits undesirable microorganisms, such as clostridia associated with soil/slurry below 25% DM and soil/slurry contamination, which can turn a potentially good silage into a poor one with high DM losses.

You can reduce in silo losses by:

- Using a proven silage inoculant that applies large numbers of efficient lactic acid bacteria
- Minimising soil/slurry contamination
- Rapidly filling the clamp, rolling it well and sealing it quickly

Effluent

Effluent losses are low to negligible in silages with a dry matter content over 30%, but can be an issue with wet grass silage. Silage effluent typically has a DM of 6% and represents a loss of readily available nutrients.

You can reduce effluent losses by:

- Wilting, if the conditions are right

Feed-out (aerobic spoilage)

The largest DM losses are often from aerobic spoilage at feed-out. During this time the silage is again exposed to air, allowing aerobic microorganisms such as yeasts and moulds to become very active. The pH rises and the silage starts to heat. DM losses have been related to temperature increase for different DM crops. Research (Ref 1) has found that with a 30% DM crop there is a 0.23% loss in DM for every 1°C increase in temperature above ambient (Table 2).

Table 2: Average DM losses (%)

Increase in temperature (°C)	Days heating		
	3 days	5 days	7 days
5	3%	5%	7%
10	6%	10%	14%
15	9%	15%	21%

You can reduce feed-out losses by:

- **Ensuring good clamp management to limit exposure to air:**
  - narrow clamp face
  - good compaction
  - good sealing and weighting of clamps
  - no damage to sheeting or bale wrap
  - fast feed-out (15 cm/d winter; 30 cm/d summer)
  - twice daily feeding in hot weather
  - tidy and tight clamp face
  - clearing up fallen silage
  - keep the sheet off the open clamp face
- **Using a proven silage additive to lower the pH quickly and reduce heat**

Reference 1: Honig, H. (1990) Evaluation of aerobic stability. In Proceedings of the EUROBAC conference, 12-18 Aug 1986, Uppsala, Sweden.