



# SILAGE QUALITY

## Are we stuck in gear?

Follow these steps to get silage as good as the machines making it

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**A** further casualty of the COVID-19 epidemic will be the vintage silage making displays which have become a fixture on the summer agri-events calendar in many parts of the country. On these days, young and old gather (hence,

the likely ban) to watch single-chop and double-chop harvesters, and all manner of early self-propelled machines put through their paces in heavy June meadows.

Seeing the old silage kit at work demonstrates the significant rate of development in grass-harvesting technology over the last few decades. But have the new mind-blowingly efficient machines delivered in terms of improved feed quality on the ground?

A quick look at the numbers (Table 1) suggests that despite all the improvements in equipment, national average silage quality remains stubbornly in the lower ranges.

For example, dry matter digestibility (DMD), which determines the intake, weight gain and milk yield

potential of the crop, has not really moved in over 40 years. National average quality silage of 63% to 65% DMD is suitable only for suckler cows requiring weight loss in the winter period.

This level of quality will not repair body condition score (BCS) on dry dairy cows; it will not put weight on weanlings; and will certainly not finish cattle or put milk in the tank. You could conclude that as an industry we have just got faster at making bad silage, but not better at making good silage.

With all that said, there are many excellent beef and dairy farms that year-after-year make high yields of good-quality grass silage at first and subsequent cuts. There seems to be a formula, based on good science, good timing, and attention to detail. So what do you need to do to match the performance of these high performers?

**Table 1:** National average grass silage quality from mid 1970s until 2014 (Source: Teagasc Grange)

	DM %	pH	DMD %	Cr Pro %
1970-81 (Wheeler et al 1983)	21.7	4.3	63	12.7
1985-88 (Wilson et al 1990)	19.7	4.1	65	14.9
1990-92 (Keating et al 1993)	22.1	4.1	67	15.3
1993-96 (Keating et al 1997)	22.4	4.1	67	14.3
2012-14 (McElhinney et al 2016)	27.0	4.2	61	12.3



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**1 Understand the meaning and value of feed quality:** setting out with the objective of making quality feed is probably the most important factor, as every management decision can fit into place after that. The importance of having quality silage has been demonstrated in countless experiments and real farm situations. Table 2, for example, shows the effect of higher DMD on growth rate in Angus/Hereford cattle – the difference in growth rate from 20 May to 15 June silage would total over 45kg per head in a standard four-month winter. Making up that difference with concentrate for growing or finishing cattle would be expensive indeed. The requirement for high DMD with regard to milking cows is self-evident.

**2 Accept that delaying harvest will spoil a good silage crop:** grass silage is like a perishable food in terms of quality. Every day past heading date can reduce DMD by up to 0.5 units. Ten days' delay from late May into early June can turn your main winter forage from high quality to maintenance-only feed.

Different types of stock require different levels of silage quality within a system – beef cows 66 to 68 DMD, but growing cattle 72+ DMD – so the problem is often that one single date does not suit all stock on the farm.

The best operators tend to focus on securing the best silage needed first. They are generally ready to harvest grass for quality silage in mid-May, and plan for some lower-quality material – if needed – to be taken later in June or as part of a second cut.

This can easily be done in a baling system or by using both pits and bales. One big cut for convenience will not deliver the right quality.

**3 Get the balance right between yield and quality:** crop DM yield at harvest remains the single most important factor determining the cost per tonne of silage in the pit. Fixed costs per hectare (e.g. contractors' fees) are diluted to some extent by the extra tonnage, and so too are some costs associated with fertiliser and slurry.

The drive to secure adequate stocks for winter has meant many farms have largely abandoned any consideration of feed quality when making first-cut silage. Later, bulky, cuts have become the norm.



But does this approach actually work? Firstly, the dilution of contractor fees is surprisingly small. A 10-day delay into June (assuming 80kg DM growth) will reduce contractor cost by about €1.55/t fresh silage. Would you pay €1.55 more per tonne for 74 DMD versus 69 DMD silage? You certainly should.

Based on differences in cattle performance, it is more than justified. If it's a bale system you're operating, the difference in cost per tonne is even less.

Secondly, it is vital to consider the yield of forage DM across the year as a whole, not just from a single cut.

There is no advantage in total DM production to delaying first cut due to poor yield at the second harvest. Delaying second cut further for the later first-cut swards would reduce availability of autumn after-grass and negate any silage yield benefit.

It has been clear from recent fodder crises that farms which fail to cut first cut by early June, at the latest, were more likely to run short of silage in a bad year due to poor annual yields and problems salvaging second cut crops later in the year.

Those farms routinely producing high-quality silage are usually less likely to run short despite making earlier first cuts – silage yields are maximised by increasing growth rate



in spring (through better management), not by simply delaying first cut harvest.

**4 Treat soil fertility and fertiliser as a year-round project:** grass silage removes a lot of NPK nutrient from the field without any slurry recycling by animals as happens in a grazing situation. The fertiliser requirements for grass silage crops are well established and widely available. Getting these correct will ensure that high yields of first and subsequent crops are ready to cut before quality declines.

Farms producing high-quality silage recognise the value of meeting the crop's nutrient needs. This is treated as a year-round process, involving soil testing, targeted use of slurry, build-up of P and K through the year, and liming at the correct time. The "one-size fits all" approach of spread-



**DIFFERENT TIMES, SAME RESULT:** Silage quality has largely remained unchanged over decades in Ireland (above and left).

ing some slurry plus three bags of silage-cut type products performs poorly in comparison

**5 Keep the sward fresh:** old permanent pasture with low perennial ryegrass content is less responsive to fertiliser nutrients for first-cut crops, leading to delayed harvest and poor DMD. Lower sugar content makes preservation more difficult. The decision to reseed should be based on sward composition and performance.

A good rule of thumb is that silage ground should be reseeded every eight to 10 years (five to six years for multiple cut systems). This can be difficult especially if silage ground is on short-term lease.

Silage-making technology has come a long way, but the fundamentals of good swards, good soil fertility and cutting at the right growth stage have remained constant over time.

There is much work to do to improve feed quality by looking again at these basic principles. There are enough good examples on working farms to see the benefits of excellent sward management.

**Table 2: Beef cattle (weight gain)**

**Silage quality**

DMD	75	70	65	60
Harvest date	20 May	2 Jun	15 Jun	28 Jun
Silage tDM per ha	4.6	6.0	7.0	7.7
Intake (kg day)	9.0	8.3	7.6	7.0
Liveweight gain	0.83	0.66	0.49	0.31

**Table 3: Soil index**

DMD	1	2	3	4
P required kg/ha	40	30	20	0
K required kg/ha	175 (90 in spring)	155 (90 in spring)	125 (90 in spring)	0
N required kg/ha	125 (100 in older swards)			
Sulphur kg/ha	12-14 (10% of N applied)			



It is vital to consider the yield of forage DM across the year as a whole, not just from a single cut

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