Cut to Clamp

A Volac initiative

Silage Assessment

What is Cut to Clamp?

Cut to Clamp is a new initiative intended to raise the profile of good silage as a vital part of modern farming.

The aim is to get UK farmers producing consistently better silage, using the 6 stages to good silage production.

BENEFITS OF BETTER SILAGE

- One of the most cost-effective ways to feed cows
- Reduced reliance on bought-in feed
- Improved returns from one of your farm's main assets – your grass
- Reassurance of feeding wholesome home-produced feed
- Benefits from a more forage-based diet, for example improved cow health and fertility

1. CUTTING – OPTIMISE YIELD AND QUALITY

✔ **DO:** Cut grass just before heading as it gives the best balance of yield and quality; after heading, digestibility falls by about 0.5%/day

✘ **DON'T:** Cut too low as the stem base has the lowest digestibility and you risk contaminating with 'bad' microbes, which could hinder fermentation and cause aerobic spoilage (heating)

2. WILTING – QUICKLY ACHIEVE THE RIGHT DRY MATTER

✔ **DO:** Wilt to 28-32% DM to reduce effluent and optimise fermentation

✔ **DO:** Wilt as quickly as possible as it minimises loss of sugar; use mower - conditioners and tedders to speed up wilting, but check machinery is not dragging in soil

3. HARVESTING – USING THE CORRECT CHOP LENGTH

✔ **DO:** Adjust chop length to crop DM – it is vital for good consolidation and fermentation

GRASS DM%	EXAMPLE CHOP LENGTH
>30%	15-25mm*
20-30%	25-50mm
<20%	Up to 100mm

** If being fed as part of a high maize diet, this should be increased to ensure sufficient effective fibre in the diet.*

DURING FERMENTATION, 'GOOD' BACTERIA CONVERT SOME OF THE CROP'S SUGARS INTO ACIDS, WHICH EFFECTIVELY 'PICKLE' THE FORAGE

4. TREATING – MAINTAIN CONTROL OF FERMENTATION

✔ **DO:** Look at additive results; as well as reducing DM losses, a quality bacterial additive can improve ME and D value and boost milk yield (by an average of 1.2 litres/cow/day in the case of *lactobacillus plantarum* MTD/1)

✘ **DON'T:** Leave preservation to chance; you don't know if bacteria populations on grass are sufficient for an effective fermentation; used correctly, a quality additive will supply one million 'good' bacteria per gram of forage

5. CLAMPING – KEEP AIR OUT

✔ **DO:** Consolidate properly, especially the clamp edges; trapped air reduces fermentation quality and increases risk of aerobic spoilage; grass layers 150mm deep are the maximum which can be consolidated effectively

✔ **DO:** Sheet properly to exclude air, using side sheets, an oxygen barrier film and a top sheet, with generous sheet overlaps plus good weighting all over

6. FEEDING – KEEP CLAMPS CLEAN AND TIDY

✔ **DO:** Minimise air ingress at feedout by maintaining a tidy clamp face, moving across it quickly and avoiding cutting the top sheet back too far; however, don't pull the top sheet down over the open face as it encourages aerobic spoilage

✘ **DON'T:** Allow mouldy silage to contaminate the clamp with 'bad' microbes as it reduces quality and intake

Technical silage analysis

Parameter	Units	Description	1	2	3	4
Digestibility D value	D value	This is the digestible organic matter in the DM. It indicates how much of the feed energy is available to the animal. It is related to maturity of the crop at harvest and is calculated from fibre levels.	>70	>65	>60	>60
Energy (ME)	MJ/ kgDM	The total energy available to the animal, calculated from the D value. It is mainly determined by the quality of the crop at harvest with fermentation having little effect.	>12	>11	>10	<10
Crude Protein (CP)	%DM	A crude estimate of the true protein content based on the total nitrogen content x 6.25 as it is assumed all the nitrogen in present as protein which contain approx. 16% N. This is more or less true for fresh forages but would be very wrong for silage where a significant amount of protein will have been degraded. It tells you nothing about the quality of the 'protein'.	16	14- 16	12-14	<12
Water-soluble Carbohydrates (WSC) or Sugars	%DM	Mainly glucose, fructose and sucrose but in grasses will also include fructans, the storage carbohydrate in grass. The sugar left in silage will depend on many factors, including crop variety, maturity, weather at harvest, wilting, etc. High residual levels increase palatability and provide instant energy in the rumen (higher FME) but also increase the risk of aerobic spoilage.	>5	>3	>1.5	<1.5
Fermentation Quality		Ratio of lactic acid: volatile fatty acids Lactic acid is the most desirable of the fermentation acids; it is the strongest acid so reduces pH fastest. Its production does not lead to any DM loss. A good fermentation would have at least 65% of the total acids as LA. Volatile fatty acids (VFA's) include includes acetic, propionic and butyric acid as well as a number of other that may be present in small quantities. They are all weaker than lactic acid and their production leads to DM losses. High levels indicate a poor fermentation but such silages will be more aerobically stable.	>5:1	>3:1	1:1	<1:1
Ammonia-N (NH_3N)	Total nitrogen	A good indicator of how extensive protein breakdown has been. High levels indicate a poor fermentation. Well fermented silage should have an ammonia of <10 %TN. (Note: High ammonia can also be caused by excess fertilisers)	<4	<6	<8	>8

	1	2	3	4	Notes
Digestability (D value)					
Energy (ME)					
Protein (CP)					
Sugar Water-soluble carbohydrates (WSC)					
Fermentation quality (pH, lactic acid:VFA ratio)					
Ammonia-N (NH_3N)					

>Greater than **<Less than**

1 = Excellent **4 = Poor**

Practical silage assesment criteria

Smell

Score	Smell	Probable Cause	Management Issues
1	No/little smell or mild, pleasantly acidic, sour milk or yoghurt	Excellent lactate fermentation (LA itself has almost no smell)	
	Slightly sweet	Associated with heavily wilted silages where fermentation very restricted.	
2	Sweet acid	Heterolactic fermentation with yeast fermentation (ethanol)	
	Acetic acid (vinegar)	Heterolactic fermentation slows pH fall with higher DM losses. Common in low DM, low sugar crops.	Will be aerobically stable but may be unpalatable.
3	Sweet, fruity alcoholic or yeasty/ bready	High yeast activity during the fermentation so expect high ethanol.	Aerobically unstable.
	Sweet caramel /tobacco/ molasses/ burnt	Excessive heating due to prolonged aeration at filling. Tastes of burnt sugar and dark brown in colour.	Possible protein binding, make it indigestible – check acid-detergent insoluble nitrogen (ADIN). Highly palatable with poor nutritional value.
4	Rancid butter, faecal/ putrid/ decaying/fishy	High DM/nutrient losses and elevated pH, due to clostridial fermentation. Silage will be 'wet' and sometimes slimy.	Aerobically stable but unpalatable. Possible health and fertility problems.Dilute with good silage. Use flavourings to improve palatability.
	Earthy	Bacillus growth – high pH.	Likely to be aerobically unstable.
	Musty/mouldy	Aerobic spoilage occurring with high DM/ nutrient losses. Will be heating.	Unpalatable. Feed out faster and discard visibly mouldy silage.

Dry matter

Score	Description
1	Ball retains its shape but no free juice DM 28-32%
2	Ball retains its shape and some free juice DM 24-28% or ball slowly falls apart DM 32-40%
3	Ball rapidly falls apart DM 40-50%
4	Very dry DM over 50% or very wet DM less than 20%

Clamp condition

Score	Description
1	Well sealed clamp, correctly weighted, covered. Flat face no air pockets visible?
2	Covered well no side sheet
3	Covered but lacks adequate weight on top
4	Poorly covered

Crop maturity

Score	Description
1	Very leafy no stem visible
2	Leafy some stem present
3	Moderately leafy with some flowering stems
4	Stemmy – grasses at flowering and post-flowering stage

Aerobic stability (mould)

Score	Description
1	Cold clamp with no signs of any heat being produced
2	Clamp mostly cool, warm to touch in corners. Start's to heat at feedout if left in feed bunker after one day
3	Warm to the touch, small traces of yeast (White Powder)
4	Steam rising when silage removed from clamp. Visible Yeast and Mould

Colour

Score	Colour	Reason
1	Dark olive green/brown	Normal for wilted legumes.
	Light green to green/brown	Normal for grass, cereal and maize silages
2	Pale green / straw yellow	Normal for wilted grass silages. Heavily wilted silages with a restricted fermentation tend to be greener.
	Light amber brown	Typical for late-cut grass and cereal silages. Can occur with low DM silages and weather-damaged grass silages. Bottom layer of wet silage can be yellow with a fruity smell.
3	Brown	Some heating has occurred during storage or feedout. Likely to be some loss of digestibility and heat damage to proteins. More common with wilted silages.
	Bright orange spots	Nitric acid formation due to excess nitrates at harvest
4	Very dark olive green	Weather damaged and/or very wet silage with a poor fermentation. Usually smells sour or putrid. Often high legume content or immature grass that has received a high level of N fertiliser.
	Dark brown	Extensive heating. Possibly black patches on the surface. Significant loss of digestibility and heat damage to protein, make it unavailable. Caused by slow filling / delayed sealing, poor compaction. Typically visible mouldy silage.

Notes

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www.cuttoclamp.com

For more details: **Freephone 0800 919808 (UK)**
or 00800 86522522 (Ireland)

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