

Teagasc Green Acres Calf to Beef Fact Sheet



Silage quality and concentrate supplementation

Grass silage is an important winter feed in calf-to-beef systems. Balancing this forage with the correct quantity/quality of concentrate is key to achieving the desired winter weight gains.

Why complete a silage analysis?

- Visual assessment alone is not adequate to determine silage quality; laboratory testing is recommended.
- Provides information on silage nutritive value and preservation; informed concentrate feeding decisions can be made.
- A breakdown of dry matter (DM), dry matter digestibility (DMD), metabolisable energy (ME), UFV, UFL, pH, crude protein and other relevant information will be generated.
- Mineral profiling (macro and trace) of silage can be obtained through a wet chemistry analysis.



Correct sampling procedure

- Poorly taken silage samples often lead to inaccurate results.
- A period of 5-6 weeks should elapse between ensiling and sampling.
- A long core sampler should be used.
- 3-5 cores from well-spaced points on or between diagonals on the pit surface should be sampled.
- Core to within 0.5m of the pit floor.
- Discard the top 5 inches of each core before mixing into a composite sample.
- Alternatively sample an open pit by taking nine grab samples in a 'W' pattern across the pit face.
- Exclude air, seal well in a bag and avoid posting samples late in the week.
- When testing bales, a number of samples from each batch of bales made must be taken in order to get a representative sample. Test each batch separately.
- Use only Forage Analysis Assurance Group (FAA) accredited labs when having silage samples analysed.



Table 1: Key information provided from a silage analysis

Unit of measure	Meaning	Low	High	Target
Dry matter (%)	Feedstuff less water content	13-17	40-55	28-32
pH	Measure of acidity	3.4-3.7	4.5-5.5	3.8-4.5
Ammonia - N (% N)	Indicator of grass N content at cutting	4-7	15-25	<10
NDF (% DM)	Measure of forage fibre and intake potential	42-47	55-65	<44
DMD (%)	Measure of quality	55-65	76-80	>72
ME (MJ/kg DM)	Energy content (linked to DMD value)	8-9	11-12	>11
UFV/UFL (unit/kg DM)	Energy content (linked to DMD value)	0.6-0.7	0.89-0.96	>0.89
Crude protein (% DM)	Measures N as indicator of true protein content	7-9	15+	>13.5
Ash (% DM)	Indicator of soil contamination	5-6	12-15	<8.6

Winter weight gain requirements

Calf-to-beef systems require superior quality silage, as animals have to perform at every stage of the production system. Table 2 highlights the targeted average daily gains (ADG) of animals over the winter months for various production systems.

Table 2: Daily winter weight gain targets for spring-born calf-to-beef animals at various stages

	21 month steers	23-24 month steers	28-30 month steers	19 month heifers	U16 month bulls	20 month bulls
1st winter (kg/day)	0.6	0.6	0.6	0.5	0.85	0.70
2nd winter (kg/day)	-	1.0-1.05	0.5	-	-	-

Matching silage quality and concentrate feeding

- Concentrate supplementation provides energy and protein to an animal's diet that may be lacking in silage.
- Calf-to-beef systems require excellent quality silage (DMD of >72).
- Additional meal supplementation will be required to improve the overall energy/protein density of the diet where silage quality is sub-optimal.
- Growing and finishing animals have varying requirements for energy and protein – one concentrate will not do both.
- Ensure animals are adequately provided with minerals, either through the concentrate or additional supplementation.
- For more detailed information on balancing silage quality and concentrate feeding, contact your local Teagasc advisor.

Energy

Energy is typically the most limiting factor in beef diets. In terms of rations, weanling rations have a requirement of >0.94UFL, while >0.92UFV is necessary for finishing rations. Table 3 provides guideline daily concentrate feeding rates depending on the quality of silage (DMD) available.

Table 3: Guideline daily feeding rates based on silage quality (DMD)

Animal type	Target ADG	66 DMD	68 DMD	70DMD	72DMD	74DMD	76DMD
Weanling	0.6kg/day	1.8kg	1.5kg	1.2kg	0.9kg	0.6kg	0.4kg
Finishing steer	1kg/day	7.0kg	6.0kg	5.5kg	5.0kg	4.0kg	4.0kg
Finishing heifer	0.9kg/day	7.0kg*	6.0kg	5.5kg	5.0kg	4.0kg	4.0kg

*Ad-lib feeding should be considered

Protein

After energy, protein is the next limiting factor in the winter diet of dairy-beef animals. Always balance the protein content of the concentrate with the protein content of silage. Weanling rations should have a crude protein content of 14-16%, while 11-14% is needed for finishing rations.

Table 4: Crude Protein (%/kg fresh weight) required in concentrate feeds for grass-silage based diets

Animal type	10% CP silage	14% CP silage
Weanlings (1.0-1.5kg/day feeding rate)	20%	14-16%
Weanlings (2.5kg/day feeding rate)	16%	*
Finishing steers and heifers	14%	11-12%
Finishing bulls	11-12%	11-12%

*Silage with a crude protein value of 14% or greater tends to have a high DMD value. 2.5kg/head/day concentrate feeding rates are not recommended.

More information on the Teagasc Green Acres Programme can be found at Teagasc.ie and on AgriLand.ie.

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