

Securing a reserve of quality forage on dairy farms

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Summary

- Optimally stocked dairy farms match feed demand to annual pasture growth, allowing at least 5.5 t DM grass growth per cow equivalent on the whole farm. Overstocked farms are most at risk of forage shortages, not heavily stocked farms *per se*.
- Adverse weather effects on dairy farms can be mitigated by securing a forage reserve of 500–800 kg DM/cow, depending on the potential extent of weather impact. Good storage facilities are required.
- Forage reserves typically cost €150–210/t DM depending on yield and other factors. Though expensive to build, feed reserves improve system security and add to farm stock inventory value.

Introduction

Adverse weather has always been understood as more an inevitability than a risk in farming. Nonetheless each recurrence of prolonged poor weather brings acute challenges to workload, grazing management, feed supplies and costs. As the structure of dairy farming in Ireland moves to increased herd scale, there is a growing need for better contingency for such weather events. Having good grazing infrastructure and appropriate facilities are clear strategies to improve resilience. Equally important but less readily defined perhaps, are the questions of optimal stocking rate and adequate feed reserves. These have come under renewed focus in recent seasons due to various weather-related forage supply issues.

Defining optimum stocking rate

Calculating stocking rate (SR) as simply livestock units (LU) per ha has obvious limitations as a management metric, because it takes no account of variation in feed supply (annual pasture growth per ha) or demand (feed intake per cow). The situation is further complicated where dairy herd expansion on a limited milking platform results in a progressive displacement of silage production and greater dependence on external land blocks to balance silage budgets. This is illustrated in Table 1. As herds expand in these circumstances, there may be greater disparity between milking platform SR and whole-farm SR.

Table 1. Effect of grazing stocking rate on feed budget per cow

Feed per cow	Milking platform ¹ stocking rate (cows/ha)						
	2.2	2.5	2.8	3.1	3.4	3.8	4.2
Silage made kg DM	2,000	1,490	1,100	790	540	179	140
Silage balance kg DM	598	82	-306	-658	-1,023	-1,414	-1,538
Concentrate kg	670	720	810	950	1,041	1,159	1,320

¹Assuming 15.5 t DM grown per ha; budgets change depending on annual growth

Nonetheless, a useful guideline is that a typical dairy cow fed 0.5 t concentrate annually requires at least 5.5 tonnes DM grass grown to meet total forage (grass plus silage) demand.

Mean (2014–17) annual tonnage recorded by dairy farms on PastureBase Ireland was 13.9 t DM/ha, capable of supporting 2.52 LU per farm ha. The bottom 10% of farms recorded 10.2 t DM/ha growth, or a potential farm SR of 1.82 LU/ha. Stocking the farm in excess of 5-year average growth capacity creates reliance on bought-in feed, even before allowance is made for weather shocks.

Building forage reserves-costs and options

Optimising SR creates a long-term balance between forage utilisation and controlling feed cost. A separate provision is needed to insulate against poor growth conditions within year however. The cumulative effect of weather events in 2018 was a grass growth reduction of almost 3.0 t DM/ha in the worst affected regions. This is an estimated 1 t DM deficit/cow, which is instructive as to potential scale of reserves required for future events. A practical guideline would be to carry at least 50–80% of this figure (500–800 kg DM/cow) as feed surplus above the normal stocks needed to balance the system. This would be built up over time and vary with degree of risk per farm. Some key considerations are:

- Increasing forage grown per ha currently farmed is usually the cheapest means of building forage reserves. This is a priority.
- Typical market cost of purchased forage options is €150–210/ t DM for grass silage, wholecrop and maize silage.
- Yield variation has a huge effect on unit feed cost. (Table 2). Buy single-cut crops on a DM yield rather than per ha basis.
- Forage reserves by definition will be fed to fill pasture deficits - 100% of stocks should be of high feed quality.
- Feed quality (energy, protein, and digestibility) varies greatly within crop types - set minimum criteria before purchase.
- Seek to establish feed reserves in good growth years. This has the dual benefit of better quality crops and reduced market cost.
- Good facilities are essential for longer term forage storage.

Table 2. Wholecrop silage yield and cost per ha versus feed cost per t DM

Field cost per ha	Yield t DM per ha	Feed cost per t DM
€1,970 (€800/acre)	12.5	€158
€2,470 (€1,000/acre)		€198
€1,970 (€800/acre)	9.5	€207
€2,470 (€1,000/acre)		€260

Establishing feed reserves does not come cheap. At recommended volumes and moderate costs of €160–180/t DM, herds would need to invest €80–120/cow for no increase in milk revenue. However unlike purchased feed utilised within-year, the reserve is retained as inventory and so is largely profit-neutral. Finally, the cost of building a feed reserve highlights a need to closely examine the economics of increasing herd scale based on conserved forage and concentrates.