Production targets for dairy calf-to-beef systems

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There will be approximately one million calves available for beef production born on spring-calving dairy farms over coming months. Although calves will derive from a large number of breeds, the majority will be early maturing beef crossbreeds and Friesians (bulls). Calf-to-steer beef systems incorporating these breeds are our focus.

Physical performance targets

A key target is to wean at a liveweight of approximately 90kg (see Table 1). Performance during the first grazing season is 0.8 to 0.9 kg/d. Supplementation is typically provided in the early part of the grazing season, or for longer where grass supply or quality is limiting.

Target gain during the first winter is 0.7kg/d. This ensures adequate skeletal and frame development, while also facilitating optimal compensatory growth during the second grazing season. This is often a period when liveweight performance falls below target. High quality grass silage (DMD of 72% or greater) and supplementation with 1.5kg meal per day is needed to achieve target performance.

Liveweight performance of 1 kg/d throughout the second grazing season should be attainable without meal supplementation, resulting in a liveweight of 500kg at housing. A proportion of these early maturing animals will be suitable for slaughter at the end of the second grazing season, particularly earlier-born animals and/or where meal supplementation during the latter part of the grazing season is provided. Although these animals will be lighter at slaughter, the cost of the indoor finishing period will be avoided.

Target liveweight performance during the finishing period is 0.9 to 1.0 kg/d. This results in a slaughter weight of 585kg and a carcase weight of 300kg. Friesian steers are typically 40kg to 50kg liveweight heavier at slaughter, with a 20kg to 25kg carcase weight advantage.

Direct production costs

Approximate costs for early maturing crossbreds total €573 per head. Friesian breed types have a somewhat higher feed demand and will incur 5% to 10% higher costs. Feed-related costs (predominantly meal) account for up to 85% of direct costs.

The total cost of the calf rearing phase, from purchase at three weeks of age until turnout to pasture, is €125/head. Milk replacer and meal account for over 70% of total costs for the period. The growing phase includes three periods;

- Turnout as weaned calves through the first grazing season.
- The first winter.
- The second grazing season.

The total combined cost for these periods is approximately €241 per head, again, predominantly made up of feed-related costs.

The finishing period is the most costly, largely due to the need for higher levels of meal feeding to attain a commercially acceptable level of finish (predominantly fat score). In Table 1, it is assumed that steers are slaughtered at around 23 months of age, which results in a slaughter date of January to March.

Later-born animals will usually have a later slaughter date and a longer indoor feeding period, resulting in higher total costs. Likewise, Friesian steers typically require an additional four to six weeks to reach adequate fat cover for slaughter, resulting in higher finishing costs.

Overhead costs

Overhead costs are incurred regardless of whether or not any cattle are purchased. Buildings and machinery generate capital and maintenance costs, even if you have no cattle. Of course, maintenance costs do increase with cattle numbers.

These costs vary greatly from farm-to-farm and are the greatest source of variation in production costs. Take animal housing. Not only do the construction costs of animal housing vary significantly depending on the specification of the build and the level of grant-aid received, the cost per head in a given year will depend on the age of the building and the number of animals housed in that year.

For the current analysis, overhead costs are taken from the Teagasc eProfit Monitor and are therefore assumed to be €237 per animal unit. Thus, total costs including overheads and an allowance for working capital costs are approximately €845 per head for early maturing beef crossbred steers, and €908 per head for Friesian steers.

The final cost to consider is the calf purchase price. The average price of early maturing bull calves sold though livestock marts in the last three years is approximately €160/head. We can assume that Friesian bull calves are substantially less (ca. €60/head) thus, total costs per head is €1,005 for early maturing systems and €968 for Friesian systems.

Carcase output and margin

A high proportion of early maturing crossbred steers produce carcases with a conformation score of O= or greater and a fat score of 3+ or greater. Given that the quality payment scheme (QPS) operates off of a base of R=, a reduction of 18c/kg from the prevailing beef price will apply. However, a 20c/kg QA (Quality Assurance) bonus will apply and so the net price is 2c/kg above the prevailing beef price. Using the three-year average base price of €3.77/kg, the system described here results in a carcase value of €1,137 per head for early maturing crossbreds, leaving a net margin of €132 per head; any breed bonuses are extra.

Friesian genotype carcases will typically produce carcases with slightly poorer conformation (O-) and will therefore, receive a lower price based on the QPS (-24c/kg), but will also be eligible for a QA bonus of 12c/kg. So, the net price will be 12c/kg lower than the prevailing base price. Again, using a base beef price of €3.77/kg, the target Friesian system results in a carcase value of €1,168 per head, leaving a net margin of €200 per head.

Table 1: Approximate liveweight targets for early maturing crossbred calves from three weeks of age through to slaughter at the end of the second winter

Description	Value	Comment
First grazing season		
Turnout weight	90 kg	
Liveweight gain	0.8 kg/d	Typically 0.05 kg/d higher for Friesian steers
Housing weight	220 kg	Friesian steers 10 to 15 kg heavier
First winter		
Liveweight gain	0.7 kg/d	Target of 0.6 to 0.8 kg/d
Turnout weight	290 kg	Friesian steers 10 to 15 kg heavier
Second grazing season		
Liveweight gain	1.0 kg/d	
Housing weight	500 kg	Friesian steers 10 to 15 kg heavier
Finishing phase		
Liveweight gain	0.9 kg/d	Typically 0.05 to 0.1 kg/d higher for Friesian steers
Slaughter weight	585 kg	Approximately 630 kg for Friesian steers
Carcase weight	300 kg	Approximately 320 kg for Friesian steers

Table 2: Approximate costs of rearing an early maturing crossbred calf from purchase at 21 days of age through to slaughter at the end of the second winter

	€/head	Comment
Rearing phase		
Milk replacer	54	
Meal	35	
Straw and hay	10	
Vaccination	17	IBR, pneumonia, clostridia and coccidiosis.
Other	9	Dehorning, transport, vet, mortality and electrolyte.
Total	125	
Growing phase		
Grazing	88	Costs will be slightly higher for Friesian steers.
Grass silage	46	Costs will be slightly higher for Friesian steers.
Meal	68	
Vet and meds	39	Including mortality and TB test cost.
Total	241	
Finishing phase		
Silage	54	Costs will be slightly higher for Friesian steers.
Meal	119	Assumed 5 kg/d for 100 days. Friesian steers will typically require a longer feeding period.
Vet and meds	4	
Transport and levies	30	
Total	207	
Total direct costs	573	Costs typically 5% to 10% higher for Friesian steers.

Conclusion

The net margins presented represent a return to management, labour and land resources employed. Clearly, there is a very wide range in performance potential within each of the breeds and breed-types, and the range of calving dates has considerable influence on the liveweight targets at various points in the production cycle.

Research at Teagasc Grange is comparing the performance of progeny from both Angus and Friesian sires used on the dairy herd that are divergent in breeding values for carcase traits. Current indications are that the targets outlined above remain valid and that there are opportunities to further reduce production costs by incorporating a greater proportion of grazed grass into the total lifetime feed budget.