A dairy-beef index (DBI) to rank beef bulls on profitability for use on dairy females

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Summary

- The dairy-beef index (DBI) ranks beef bulls for use on dairy females based on their estimated genetic potential to produce high quality profitable cattle, with minimal impact on dairy cow performance.
- Traits included in the DBI relate to: 1) calving performance, 2) carcass traits, 3) feed intake, 4) docility, and 5) polledness.
- Research is on-going on the inclusion of additional traits such as calf health, meat quality and environmental traits.

Introduction

The expanding dairy herd, coupled with improving cow fertility, imply that a greater quantity of beef in Ireland will originate from dairy herds. This requires a tool that sorts beef bulls based on suitability for use on dairy females. This ranking system should ideally rank bulls on estimated genetic potential for a high-value carcass produced in an efficient manner with minimal repercussions on the dairy cow in terms of milk, health and reproductive performance. With this in mind, the DBI was launched in January 2019 by the ICBF.

Construction of the Dairy Beef index

Traits included of the DBI are listed in Table 1. The contribution of genetics to the variability in these traits is also outlined in Table 1, as is their relative emphasis within the DBI. The relative emphasis on each trait within the DBI is a function of the costs and prices experienced by dairy and beef farmers. Example, 53% of the relative emphasis is placed on calving difficulty as calving difficulty can have a large impact in terms of labour requirements and also on the welfare and subsequent performance of dairy cows. Research is on-going on other traits that may be considered for inclusion in the DBI including, amongst others, calf vigour and health, life-time methane emissions, novel measures of meat quality and nutritive value, as well as saleable red meat yield.

Table 1. List of traits and their sub-indexes included in the DBI

Sub-index	Trait	% under genetic control	Relative emphasis in DBI
Calving	Calving difficulty	10%	53%
	Gestation length	35%	10%
	Calf mortality	2%	1%
Efficiency	Feed intake	33%	5%
Carcass	Carcass weight	35%	17%
	Carcass conformation	35%	6%
	Carcass fat	35%	1%
	Carcass bonus		3%
Societal	Docility	20%	1%
	Polled	100%	3%

Benefits of the DBI

To illustrate the benefit of the Dairy-beef index to both dairy and beef farmers, the performance of progeny from the top five beef bulls ranked on the DBI active bull list was compared to the performance of progeny from the five most commonly used beef bulls in Irish dairy herds between the years 2015 and 2018 (Table 2). The results showed that the top five DBI beef bulls were easier calved on dairy cows (1 percentage unit easier) and generated a higher calf price (€18 more) compared to the five most used beef bulls on the dairy herd. The five most used beef bulls were, however, easier calved on dairy heifers (1 percentage unit easier) and had a slightly shorter gestation length (1 day). In economic terms, however, the additional benefits in calf price and easier calving in the top five DBI bulls would offset this and would result in the generation of a greater profit for the dairy farmer of €9.67 per calf produced. Based on the beef traits, the top five DBI beef bulls generated progeny that produced heavier carcasses (17 kg heavier) and had superior conformation scores (one grade higher), which would result in the generation of an additional €104.54 profit to the finisher. Hence, the total benefit arising from using the top DBI bulls over the most used beef bulls was €114.21.

Table 2. Mean performance of the progeny from the top five DBI versus the five most used beef bulls in dairy herds

Benefit	Trait	Top DBI bulls	Most used beef bulls
	DBI (€)	100	43
Dairy	Gestation length (days)	284	283
	Calving difference heifers (%)	9	8
	Calving difference cows (%)	3	4
	Calf mortality (%)	2	2
	Calf price (€)	242	224
Finisher	Carcass weight (kg)	330	313
	Carcass conf.(grade)	R-	O+
	Carcass fat (class)	4-	4-

Conclusions

The DBI is a new selection tool available to help improve the beef quality of calves from the dairy herd with minimal repercussions on cow performance.