Beefing up the breeding indexes

Updates to the Replacement Index (RI) will bring down the cost of suckler cows, and the new Terminal Index (TI) will reduce feed consumption and age-at-slaughter in finishing cattle, while also raising carcase value

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Feed accounts for 75% of total costs on suckler farms.

How are the indexes calculated?

The Economic Values contained within the Replacement Index are based on a representative 'blueprint' or 'baseline' herd, which is spring-calving and has an average calving date of March 12th.

Replacements are sourced from heifer progeny bred within the herd with the remaining heifers slaughtered at 19 months at a carcase weight of 311kg; male progeny are finished as steers at 22 months, generating 390kg carcasees.

Why are the indexes being updated?

It is important that breeding indexes are regularly updated in light of market developments. There is now also a legal requirement for Ireland to reduce greenhouse gas emissions from all sectors of society.

The indexes were last updated eight years ago in 2015. In the period 2015 to 2020, input prices increased by only 2.2% as measured by the CSO Agricultural Input Price Index and therefore, the impact on Economic Values were unlikely to be significant.

However, between 2020 and 2022, prices increased by 47% and therefore updates were necessary.

The updates to the economic values for all traits in both the Terminal and Replacement indexes mean they better represent the expected profitability (considering both beef value and production costs) of beef cattle.

How much have prices increased?

There have been significant cost and price increases since 2015. Factors impacting the Economic Values included in the Replacement Index are: 13% higher beef prices; a 27% increase in the cost of concentrates; a 10% rise in the cost of each unit of nitrogen; and a 38% increase in land rental costs.

Therefore, forage costs have also risen between 2015 and 2023; grazed grass costs have increased by 11%, while silage costs are up 20%. These price increases have been included in the new Economic Values contained within the Replacement Index.

Why is this so important now?

Feed accounts for 75% of total costs on suckler farms, so we need to focus on them. Of course there are management aspects that have the greatest impact on costs on suckler farms, but genetics is also really important.

If we look at the National Farm Survey data, the cost per suckler cow unit was €1,094 in 2015. In 2022, the most recent year available, that figure had risen to about €1,546.

How many farmers will these changes affect?

Figures from the Department of Agriculture, Food and the Marine (DAFM) from December 31, 2022 show there are 46,700 suckler farmers in the country that keep only beef-breed or suckler cows. There are 13,490 farms who keep both dairy and suckler cows.

Of these herds there are 17,500 participating in the suckler cow carbon efficiency programme.

What traits are be added to the indexes?

Three new traits were included as part of the index updates: finishing age, TB resistance and carcase specifications.

Reducing finishing age of animals in the Irish cattle herd is included in the Irish Climate Action Plan and the Teagasc Marginal Abatement Cost Curve (MACC) as a cost-effective measure to reduce agricultural greenhouse gas emissions.

Including carcase weight in the breeding indexes along with age-at-slaughter ensures that the updated

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indexes are selecting for improved live weight gain of beef cattle.

Good progress has been made in lowering finishing age on farms in recent years with reductions of almost one week per year achieved between the years 2011 and 2021.

Importantly, this has been achieved with almost no reduction in carcase weight (341 kg in 2011 vs. 338 kg in 2021).

Estimates suggest that by finishing cattle two months earlier, approximately 430,000t carbon dioxide equivalents are abated annually.

The incidence of bovine tuberculosis (bTB) in Irish herds has increased in recent years.

The data used in the TB genetic evaluation include only data from herd-management groups that have several confirmed TB reactors, thus the genetic merit does not solely indicate which bulls have been used in TB hotspots.

The TB trait definition can be interpreted as the expected prevalence of TB infection in an animal's progeny where they are exposed to the TB bacterium.

The meat industry has communicated its desired specifications for beef carcasees in respect of weight (between 280 and 380 kg), conformation (greater than O=) and fatness (between 2+ and 4+). Carcase price data has shown that beef prices are lower for carcasees outside these specifications.

As a result a new trait, carcase specification has been included in the revised indexes **(Table 2**). The specifications imposed relate to carcase weight, conformation and fat score. A new minimum (and maximum) carcase fat specification in the index replaces the previously used carcase fat trait.

Why is carbon being included in the indexes?

Carbon traits have been included within the Terminal and Replacement Index. The impact of a change in these traits on greenhouse gas emissions is quantified: for example, heifers that calve earlier produce less emissions up until their first calving.

Putting a monetary value on this helps promote the production of more carbon efficient animals.

In addition, GHG emissions are a loss in efficiency, i.e. a cost, on cattle farms. Carbon traits have already been introduced to the Economic Breeding Index (EBI) and Dairy Beef Index (DBI).

But bear in mind that, although it is important, only 13% of the Economic Values are due to carbon costs; in other words, the Economic Values are overwhelmingly based on market prices such as the cost of fertiliser, the cost of contractor, the cost of feed.

The inclusion of carbon moves us in the right direction, but it is certainly very much the minor player in terms of the current Economic Values.

What are the key changes to the Replacement Index?

The Replacement Index is comprised of the cow's own traits, and traits relevant to her calf. Each trait is given a weighting within the overall index to generate the Replacement Index euro value for each cow or replacement heifer.

These traits are: age at first calving; maternal calving difficulty; maternal weaning weight; calving interval; survival; heifer feed intake; cow feed intake; cow docility; cull cow weight; and TB, which is a new addition to the index.

In addition, due to the inclusion of new traits such as carbon, age of slaughter and TB, the relative emphasis of the Replacement Index is also set to change.

Cow traits represented 62% of the relative emphasis of the previous

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index; this has now been reduced slightly to 59%.

Meanwhile, in terms of the traits pertinent to the calf, these traits – such as beef merit and calving to name just two – will represent 41% of the updated Replacement Index – up slightly in the Replacement Index which was in play from 2015 to November 2023.

Figure 1 illustrates the relative emphasis of the Replacement Index

What impact will these changes have?

A key consideration for suckler farmers is the choice of sire and dam for breeding cattle for finishing or for breeding females as suckler cows. It is important to select sires that are ranked highly on either the Terminal or Replacement Index depending on the intended use of the resulting progeny.

Given that most farmers have a breed preference, it is important that there is a wide availability of sires across breeds that meet these criteria.

Figure 2 focuses on the Replacement Index, and indicates that, although there is some change in the percentage of sires for the main breeds achieving four- and five-star status, there is still a wide choice of sires for each breed.

Limousin and Aberdeen Angus remain the most numerous four-and five-star sire breeds, followed by Charolais, Hereford and Simmental.

Will the indexes change again?

Breeding indexes need to continually evolve – otherwise they become irrelevant. So, as market, policy and technology changes occur, indexes need to change too.

Including carbon in the breeding indexes has a relatively modest impact on the Economic Values and on the relative emphasis of traits; however, it creates an additional focus for the index

In future, it is likely that direct methane emissions will be included in the indexes once the data collected is sufficient to capture the full range of animal types (growing and finishing animals, suckler cows) and diets whether grass or TMR.

On balance the new indexes are taking into account crucial climate priorities while keeping profitability firmly in focus.

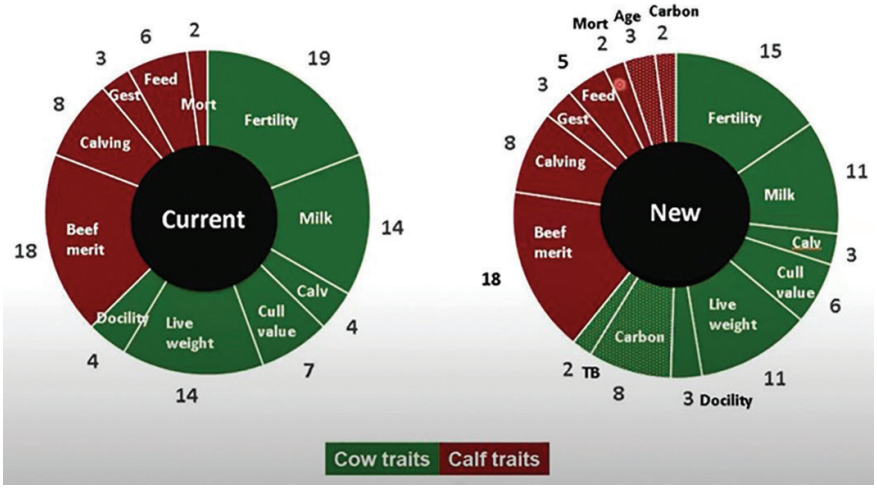

Figure 1: Relative emphasis of the Replacement Index

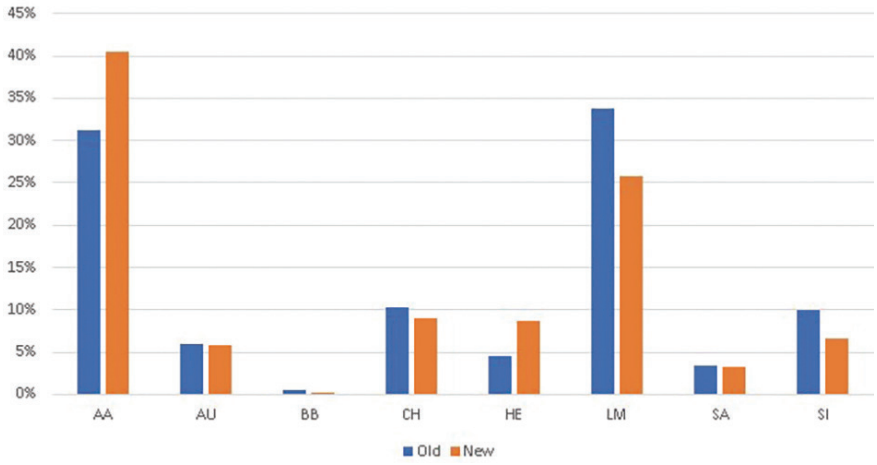

Figure 2. The percentage of male breeding animals by breed which are four- and five-star on the Replacement Index based on the current formulation ("Old") and after the updates presented in this paper ("New") are implemented.

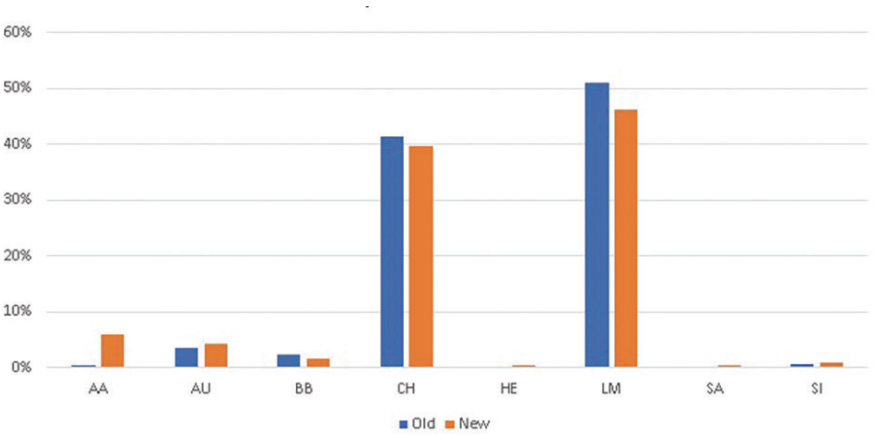

Figure 3. The percentage of male breeding animals which are four- and five-star across-breed on the Terminal Index based on the current formulation ("Old") and after the updates presented in this paper ("New") are implemented