C.O.W – Cow's Own Worth

A rapid and accurate way to identify which cows to cull

Problem

Most candidate cows for culling are not readily identifiable, especially in large herds. This is because a whole range of cow characteristics influences her future productive potential.

Solution

A decision support tool is required which ranks cows on expected lifetime productivity. This can be in monetary or carbon units. The ranking index must exploit the range of different data sources available and so be useable in real-time.

Outcome

A web-based real-time decision support tool to rank all cows in a herd on expected remaining lifetime profitability, thus facilitating a more accurate and rapid detection of culling candidates.

Practical recommendations

- All data on the individual animals should be inputted into the national database to ensure the most accurate ranking; data such as milk test-day yield and calving dates automatically exist in the database, as do inseminations if undertaken by a service providor.

- The algorithm should be executed on the national database which draws on all the relevant cow-level data stored within the database; all cows in the herd are ranked by expected remaining lifetime profitability.

- Examine all cows predicted to have a negative remaining lifetime profit and, if possible, agree with the synopsis. If the prediction is queried, then delve deeper into the available phenotypic data underpinning the model outcome to convince yourself as to the rational.

- Decide which cows to cull but ensure first you have sufficient replacements to enable such a culling rate.
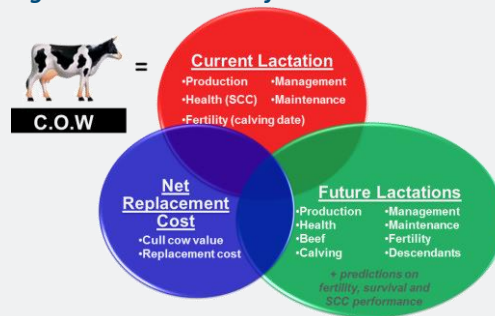
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Input variables for model

- Cow ID
- Parity number
- Calving date
- Somatic cell count
- Measures of additive genetic merit
- Heterosis merit
- Permanent environmental effects
- Insemination records
- Pregnancy diagnoses
- Health records
- Cow live-weight

Illustrations

Figure 1 Construction of the COW index

On-farm application

System approach

- The tool can be used in farmer discussion groups to help understand why some cows are deemed culling candidates more than others. The system also strongly encourages data recording. Only farmers participating in milk recording are eligible to use the system. The data are then available for use in national genetic evaluations, which in turn improve the accuracy of the index

Evaluation

- Quantitative: >3000 farmer users in 12 months

Photo 1 Grazing dairy heifers (Photo: Margie Egan, Teagasc, Donagh Berry).
Photo 2 Dissemination of how to use the COW index to 10,000 farmers (Photo: Margie Egan, Teagasc, Donagh Berry)