***Application***

The new economic values highlight the key traits driving profitability on Irish sheep farms and will allow for the national breeding index, the Euro-Star index, to be updated to reflect the importance of these key traits within the Terminal and Replacement indexes.

***Introduction***

An economic value is defined as the value of a unit change in an individual trait while all other traits are held constant (Hazel and Lush, 1942). Since its inception in 2019, the Teagasc Lamb Production Model (TLPM) has been used to calculate the economic values used in the current Irish sheep breeding objectives, called the Euro-Star index (Bohan et al., 2019). This stochastic whole-farm bio-economic model is used to calculate economic values across four broad animal characteristics, namely: maternal, lambing, production and health. Variable costs such as concentrates, fertiliser and veterinary costs that were used in the model have not been updated since 2017 (Bohan et al., 2019), however, across all Irish farms production costs have increased, an increase of 8% in 2023 (Teagasc NFS, 2024). Therefore, to ensure the economic values, and thus the national breeding objective, reflects current farm management practices both input and output costs used within the model required updating. The objective of this study, therefore, was to update all relevant costs and prices used within the TLPM and to recalculate the economic values for key traits within the Irish sheep breeding index. Of particular interest also was the impact of these changes on the national breeding objectives, particularly the relative emphasis placed on each trait.

***Materials and Methods***

The TLPM as described by Bohan et al. (2016) is a stochastic budgetary bio-economic model that describes an Irish lowland sheep production system. The model simulates the 12 month production cycle commencing at mating. The default scenario modelled, presenting a national average Irish lowland flock, contained 107 ewes, with a farm size of 13.27 ha, had a mean lambing date in early March, stocked at 7.5 ewes per hectare and weaning 1.5 lambs per ewe joined to the ram. All variable costs including fertiliser, concentrates, reseeding, silage making and veterinary costs were based on the average industry prices from 2021 to 2023. Monthly cull ewe price was based on historical data from 2021 to 2023, while monthly lamb price was based off future projections by the European Commission for 2025 to 2030 (EC, 2023). Economic values were simulated by modelling a one unit increase in each individual trait independently while holding all other traits constant. The difference in net profit between the changed (i.e., one unit increase per trait) and default scenario was used to calculate the economic values. An economic value was generated for a total of 14 traits, representing all the traits currently included in the national breeding objectives. Some of the key traits presented here include: maternal traits - number of lambs born and ewe mature weight, lambing - lamb survival, production –days to slaughter and pre-weaning weight, representing ewe milk yield, health - ewe and lamb lameness.

***Results***

All economic values increased from the previous versions reported by Bohan et al. (2019). The economic value for the number of lambs born was €56.72 per additional lamb born. Increasing number of lambs born increased lamb sales by €3,691 while also increasing variable costs such as concentrates (€385) and veterinary costs (€217). Ewe mature weight was calculated using three separate components including cull value (€0.16 per kg), maintenance (-€0.59 per kg) and replacement (-€0.09 per kg). Ewe cull weight was solely driven by the increase in cull sales (€170), while increasing ewe maintenance weight resulted in a €633 increase in variable costs. Increasing ewe replacement weight resulted in an increase in the cost of concentrate of €0.75 per ewe joined to the ram. The value of one additional lamb surviving past 24 hours was €81.90. This increased lamb sales by €239. Increasing days to slaughter by one additional day resulted in an economic value of -€0.39. Increasing days to slaughter resulted in an increase in concentrate costs, veterinary costs and the cost of depreciation of the shed used to finish the lambs by €8.20, €0.14 and €4.96 per lamb killed, respectively. Increasing lamb pre-weaning weight by one additional kilogram equated to an economic value of €2.99. This was achieved through a 4% increase in the milk yield of the ewes, resulting in a reduction of 14 day reduction in days to slaughter and an increased profit from surplus grass sold as baled silage while reducing veterinary and depreciation costs of the shed used to finish lambs. Lameness was calculated as a separate trait for both ewes and lambs, with economic values of -€0.31 and -€0.10 for ewes and lambs per one percent increase in lameness, respectively. Both traits resulted in increased labour and use of veterinary products.

***Conclusions***

Results from this study show that all of the economic values have increased from 2019 which can be explained by the increasing production costs and increased yearly lamb price over the last four years. These results will allow for the economic values within the current national breeding index to be updated while highlighting the new key traits driving profitability of Irish sheep farms.

***References***

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