IDENTIFICATION OF BREEDING OBJECTIVES FOR A BEEF CATTLE PRODUCTION SYSTEM IN URUGUAY USING A BIOECONOMIC MODEL

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The objectives of this study were to identify the main economically relevant traits (ERTs) that establish the breeding objectives for a standard beef cattle system in Uruguay, and to estimate the economic values (EV) for the ERTs through a bioeconomic model. The bioeconomic model was developed in MS-Excel® and included performance parameters (weights, daily gains, death, pregnancy and replacements rates), and economic prices. The system was defined as a cow-calf operation of 100 Hereford cows with a finishing component, which annually sells 24 and 26 month old steers, non-pregnant cows and surplus replacement heifers. Feed requirements were calculated for pasture grazing animals. Alterations in requirements caused by changes in the system were supplied by buying food from outside. Economic profit for the Base Model (B0) was simulated as total revenues less total costs. Biological traits affecting profit were identified as ERTs. EVs of each one were calculated by simulation, comparing the economic profit of B0 and the perturbed model (B1) that result by an increment in one unit in one of the ERT, with the other traits held constant. EVs were adjusted using the discounted gene flow method, which accounts for frequency and time of the expressions. Sensitive analyses were realized to evaluate the effect of average parameters and prices used. The ERTs identified were calving rate (CR), carcass weight (CW), calving ease (CE), dry matter intake (DM), and direct and maternal weaning weight (WWd, WWm). CR had an EV of US$ 96.0, followed by the CW (US$ 21.4 and 2.5 for heifers and cows respectively), DM (US$ -0.7, -0.5, -0.7 for steers, heifers and cows respectively), WWd and WWm (US$ -1.1 and -3.8) and calving ease (US$ 20.4). When EVs were corrected by their additive standard deviations, reproductive traits were three times more important than growth and feed intake traits. Sensitive analyses showed that EVs depend on the average performance assumed, but the relative importance is still the same. When costs of DM were zero, the relative importance of CR increased. According this results more emphasis should be placed to select animals with improved reproductive behaviour. steers with heavier carcass and animals that consume less DM intake per kg live weight produced. Some of the most important ERTs identified here do not have a clear EPD to allow for selection, so greater efforts should be made to generate this information.

Keywords: Breeding objectives, ERT