Economic impact of superior genetic Nellore bulls from Geneplus-Embrapa Program in natural breeding systems

Pereira, M. A. *[1], Rosa, A. N. F. [1], Costa, F. P. [1]
*Researcher, Embrapa Gado de Corte, Av. Radio Maia, 830, Campo Grande/MS 79106-550 Brazil
[1] Embrapa Gado de Corte, Campo Grande/MS
*mariana.pereira@embrapa.br

Since 1996, the Geneplus-Embrapa Program has assisted beef cattle seedstock farmers in decision-making for genetic selection and breeding, through the provision of genetic evaluation of bulls, cows and their products. Amongst the 3.6 million registered animals in the Program, 2.3 million (about 64%) are of the Nellore breed. The economic impact of superior genetic Nellore bulls from the Program was assessed based on their positive Expected Progeny Difference (EPD) on weaning weight, restricted to natural breeding systems. The Method of Economic Surplus was employed, according to which, the net economic benefits account for additional benefits and costs of the introduction of an innovation in comparison to a previous technology. In this study, the net benefits were estimated based on the additional weight of weaned calves resulting from superior Nellore bulls in comparison to the average weight of weaned calves from common commercial bulls, less additional costs. Market prices of 2015 were used for inputs and outputs. The analysis considered male and female calves born in 2014 and weaned in 2015, resulting from 156,693 superior Nellore bulls from the Program, possibly active in 2013/2014 breeding season. This figure includes all superior genetic Nellore bulls starting their reproduction life in 2008, considering five years of life cycle. These animals' EPD for weaning weight was 3.86 kg. While the average weight at weaning for the Nellore seedstock herds from the Program was 199 kg, the average for commercial herds was 157 kg, resulting in a gap of 42 kg. Half of this gap was considered an environmental effect and half genetic effects from selection. Since bulls respond for 50% of the genetic heritage, the figure was reduced by half, resulting 10.5 Kg. Considering the positive average EPD (+ 3.86 kg) from superior bulls from the Program, the total estimated weight was, therefore, 14.3 kg/weaned calf. At the average price of R$ 6.16/kg of calf liveweight, the economic benefit was R$ 88.09/calf. Considering a bull/cow ratio of 1:30 and a weaning rate of 75%, one bull produces 23 calves. Thus, 156,693 bulls produced about 3.5 million weaned calves in 2015. The difference in depreciation costs between superior and common bulls (R$ 1,017.46) was shared by their 23 calves, resulting an additional cost of R$ 44.24/calf. Accounting for this cost, the use of superior Nellore bulls generated net benefits of R$ 43.84/calf, which amplified by the total number of weaned calves resulted in aggregated net benefits of 153 million Reais only in 2015. Although this figure is possibly underestimated for not contemplating the animals slaughter weight and other related genetic gains, it is significant and demonstrates the importance of using superior genetic bulls.

Keywords: animal genetic improvement, beef cattle, economic analysis, genetic selection program