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Suitability of a Greenhouse Gas Emission Indicator in a Beef Cattle Improvement Programme

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Abstract

There is a growing discussion on the use of environmental performance indices for beef cattle genetic improvement programmes, especially in Brazil, where general herd based improvement programs are expanding at fast pace. Current indicators in use for animal improvement are based on animal traits. Market demands are still focused on animal performance and not on production systems efficiency. There is a stated interest from the scientific community to develop economic and environmental indicators to be incorporated into cattle improvement programs. For commercial cattle husbandry, one important environmental indicator is greenhouse gas (GHG) emissions, which could have potential use as an index component in animal improvement programs. One of its advantages would be having relatively uniform assessment methods worldwide, even considering a broad range of production systems.

The proposed work uses a web-calculator specifically developed by Embrapa for scientifically estimating GHG emissions from different cattle systems (E-Missions). The calculator allows fast data processing for a large number of farms. A group of farms with different production intensity already participating in a cattle improvement programme in Brazil (Geneplus) is being selected and their data are collected and processed. From the results obtained from the GHG calculator, a genetic improvement index will be proposed to be tested. This index will be incorporated into a simulated analysis based on groups of beef cattle already evaluated by the Geneplus programme using the traditional method, which does not incorporate any environmental component. Differences in animal ranking in both evaluations will be explored and analysed to check the suitability and applicability of the proposed indicator. The null hypothesis of the work is that incorporating total GHG emissions as a trait into a beef cattle selection programme does not change the position of the top animals ranked by traditional breeding programmes.

Keywords: Beef cattle, genetic improvement, sustainability indicators