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"Bridging the gap between increasing knowledge and decreasing resources"

Environmental Efficiency Indexes for Cattle Improvement

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Abstract

This is a discussion paper on use of environmental performance indexes for beef cattle improvement programs. Indicators in use for animal improvement are mostly based on animal characteristics. Market demands are still focused on animal performance and not on production systems efficiency. There are several environmental indicators directly linked to production efficiency that could be used in genetic selection and improvement programs for beef. The major global impacts related to commercial cattle husbandry are related to land use and greenhouse gases (GHG) emissions. Indicators related to such impacts have potential for use in animal improvement programs. They have relatively uniform assessment methods worldwide, even considering a broad range of production systems. The use of such indicators could facilitated by adoption of a methodology based on the ecological footprint concept, developed for beef cattle, comparing land-use and GHG emissions for systems with different levels of intensification. In this method, besides land used, direct and indirect emissions are converted into a virtual area called "shadow area" that corresponds to an additional area necessary for exclusively sequestering emissions from that system. In the case of beef cattle improvement, for instance, index measured should be total area used to produce one unit beef in a given period. In this method, total area necessary for each animal is calculated for the production system or the whole herd, being therefore, proportionally smaller per unit beef produced by animals with higher daily gain rates for example. This aspect indirectly reflects desirable animal characteristics, like feed conversion rates. Conventional beef cattle improvement programs, indirectly, have been promoting increments on environmental efficiency through such criteria that lead to better use of natural and manufactured production inputs. However, it is important that environmental aspects are formally incorporated into animal breeding programs through indexes, for example, like production footprint for cattle. Finally, using environmental indicators will surely strengthen beef value chain, responding to higher demands on sustainable products from society.

Keywords: Beef cattle, emission sequestration, environmental efficiency, virtual production area

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