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The Potential of User-Oriented Approaches in Phenotypic Selection to Promote Conservation of Indigenous Farm Animal Genetic Resources in Extensive Production Systems — A Case of Malawi Zebu

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Abstract

Predominantly, indigenous livestock in both smallholder farms and ranches in Malawi are reared under extensive production systems. These systems, which contribute quite substantially to sustainable livelihoods and food security, are among other things characterised by animals housed overnight and let out to feed or scavenge during the day while breeding-stock selection is based on phenotypes. During the day, animals from several kraals mix freely hence mating is uncontrolled and breeding is multi-sired. In extensive production systems, efforts to implement a genetic evaluation programme using the currently available methods, with the application of either a sire model or an animal model becomes almost impossible although the need to conserve and develop the genotypes within their environment and by exploiting their comparative advantage cannot be overemphasised. The current practice for selection in different agro-eco-cultural zones is based on phenotypic assessment. In whatever production system, the goal for genetic improvement is to estimate breeding values based on a procedure that maximises the probability of choosing the correct animals to become parents. We argue that user-oriented approaches have the potential in developing practical strategies through participatory nucleus herds by combining expert and producer knowledge in extensive production systems. ‘User Orientation’ in this context means that stakeholders are involved in the design, establishment, and operation of the programme. With specific examples of its application on Zebu cattle of Malawi, this paper discusses the framework describing the methodological principles to developing sound breeding strategies using the user-oriented approaches while dealing with existing constraints in extensive production system.

Keywords: Extensive production systems, farm animal genetic resources, phenotypic selection, user-oriented approaches