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Global Exchange of Sheep Genetic Resources

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Abstract

Exchange of animal genetic resources has taken place since domestication of livestock. However, advantages and disadvantages of gene flow regarding food security and poverty reduction have not yet been assessed. The study attempts to understand the historical development and current status of gene flow in sheep and is an excerpt of the study "Gene flow in animal genetic resources — A Study on Status, Impact, Trends" commissioned by the BMZ/GTZ and FAO. Data were obtained from the Eurostat statistic database, from ten FAO Country Reports on the State of Animal Genetic Resources and from contacts to six breeding organisations and 21 experts from 12 countries. Additional information came from publications. The influence of domestication, breed formation, human migration, and breeding methods on diversification of sheep were studied. The current status was indicated by export and import of genetic material, and influence of foreign genetic material in existing breeds.

It was shown that ancient historical gene flow resulted in the characteristic diversification of sheep. Demand for superior breeds promoted gene flow and existed throughout time. Need for improvement of productivity resulted in an intensive global exchange of genetic stock and caused the increasing diversification of many sheep populations. A current influx of genetic material into many regions of the world was generally based on breeds coming from developed countries. Access to improved breeds took place by developed and developing countries. Impact of introduced breeds depends on their suitability to prevailing production systems. Gene flow from developing countries occasionally took place when a superior genetic resource was available without preceded systematic improvement processes. Gene flow globally contributes to the diversification of national sheep populations. If the suitability for prevailing production systems is given, gene flow of improved breeds contribute to poverty reduction and replacement of local breeds in developing countries. If it is not given, the economic situation of smallholders deteriorates through dilution and replacement of their indigenous genetic resources. This has occurred in single cases. However, the global gene flow of sheep genetic resources has not led to a threat of extinction of most local sheep breeds, namely in developing countries.

Keywords: Animal genetic resources, breeding stock, dissemination, gene flow, hair sheep, Merino, sheep, transfer

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