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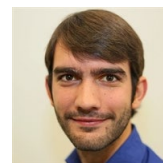
New insights into the value of Dutch gene bank for cattle breeds

October 2, 2018

The Dutch gene bank collection for cattle breeds was set up in 1993 and is managed by the Centre for Genetic Resources, the Netherlands (CGN) of Wageningen University & Research. The collection consists of genetic material (semen) of rare Dutch cattle breeds, as well as a representative sample of the breeding programs of Holstein Friesian (HF) and Meuse-Rhine-Yssel (MRY) of the last decennia. Researchers of Wageningen University & Research showed that the stored material of HF and MRY is valuable for conservation of genetic diversity and potentially for future genetic improvement if substantial changes in breeding goal occur.

Genetic diversity and breeding programs

Genetic diversity in livestock populations changes over time due to selection and chance effects. Because of genetic diversity, traits may change and breeds can adapt to changing environments. Breeding programs aim to improve breeds genetically, while maintaining genetic diversity. In two case studies, it was investigated if the HF and MRY gene bank collections could contribute to the current breeding populations in terms of genetic merit and genetic diversity.

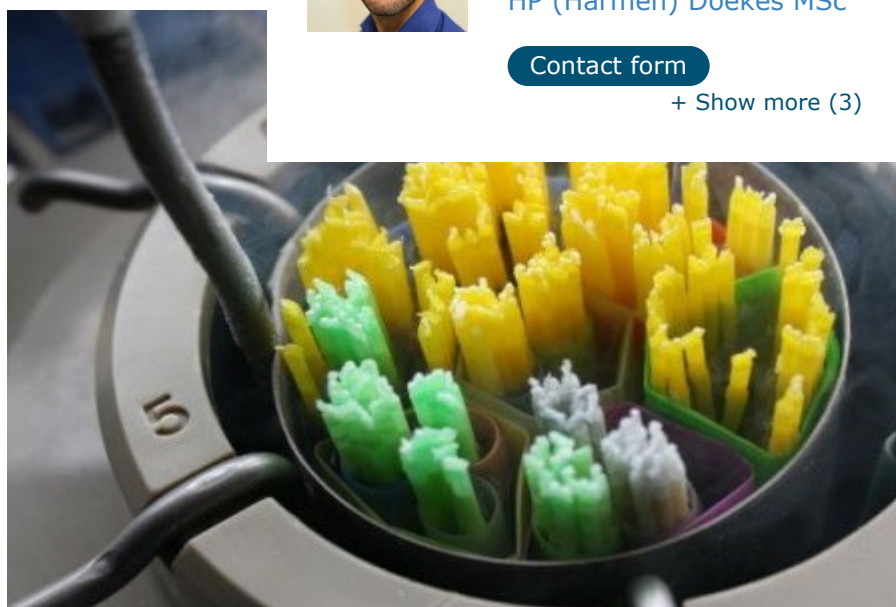


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Value of gene bank bulls: balancing genetic merit and diversity

The case studies showed that when selection is performed to improve the Dutch-Flemish total merit index (NVI), an index in which various traits are combined, bulls from the gene bank do not contribute anything to the current population of selected bulls. Gene bank bulls, however, may be used to increase genetic diversity, without causing a strong decrease in the average NVI. This additional value of gene bank bulls is higher when more emphasis is put on diversity and when substantial changes in breeding goal would occur.

Use of gene bank bulls in practice

It is not realistic that farmers will now start actively using HF gene bank bulls. There is still a wide range of bulls available in the international market and the number of straws in the gene bank is too limited to be used on a large scale. Gene bank material, however, may be used in breeding programs in future when needed.

Conclusion

The Dutch gene bank collections of HF and MRY harbour valuable material for conservation of genetic diversity and potentially for genetic improvement in future if substantial changes in breeding goal occur.

More information

More information about the HF study can be found in [this paper](#) in Journal of Dairy Science.

More information about the MRY study can be found in [this paper](#) in Journal of Animal Breeding and Genetics.

This research was largely conducted as part of the European consortium IMAGE (Innovative Management of Animal Genetic Resources). Data were provided by cooperation CRV.

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