

Dutch gene bank for farm animals: beyond conserving genetic material

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The Centre for Genetic Resources, the Netherlands (CGN) focuses on the conservation and use of vegetable crops, farm animal breeds and autochthonous forest species. One of the main activities is cryopreservation of farm animal genetic diversity for long term conservation purposes. From the 1970s onwards, genetic material (mostly semen) has been cryopreserved and stored in the Dutch gene bank for farm animals. Nowadays, the gene bank contains just over 347k insemination doses of 8,457 donors from 139 breeds, belonging to 11 farm animal species. Main focus is on the economically most important farm animal species in the Netherlands (cattle, pig, sheep, goat, horse and chicken). The gene bank is a valuable source of genetic diversity for long term conservation, an insurance for future catastrophes and (near) extinction of breeds. At the same time, gene bank material is already used today to support breeding programmes of Dutch endangered breeds. For example, gene bank material has been and still is an important source for breeding Red and White Friesian cattle, as each year dozens of insemination doses are provided. Moreover, genetic material from old breeding lines conserved in the gene bank is used to support the Dutch Landrace pig breeding population for several years now. Without the possibility of using gene bank material, these breeds may become extinct. The gene bank also forms a unique archive of genetic diversity, representing four decades of farm animal breeding. Genomic characterization of gene bank collections shows the impact of changing breeding goals, consolidation of breeding lines, and introduction of genetic management and genomic selection methodologies. Further use of modern genomic techniques to characterize gene bank collections may result in the identification of valuable genetic variation that is no longer present in current breeding populations. The Dutch gene bank will continue to enhance its collections, creating a unique genetic diversity reservoir for future breeding and for research.