


The relevance of genebanks in the breeding and conservation programmes



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Genebanking in Europe

Results from the IMAGE survey



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Gene banks can be used for a wide range of objectives

On-farm population of a given species (*in situ*) **A**

Gene bank collections **B** **C**

**Update collections
Provide an insurance**

Restore

**Reintroduce lost variants
Increase variability
Re-orient breeding goals**

New breed

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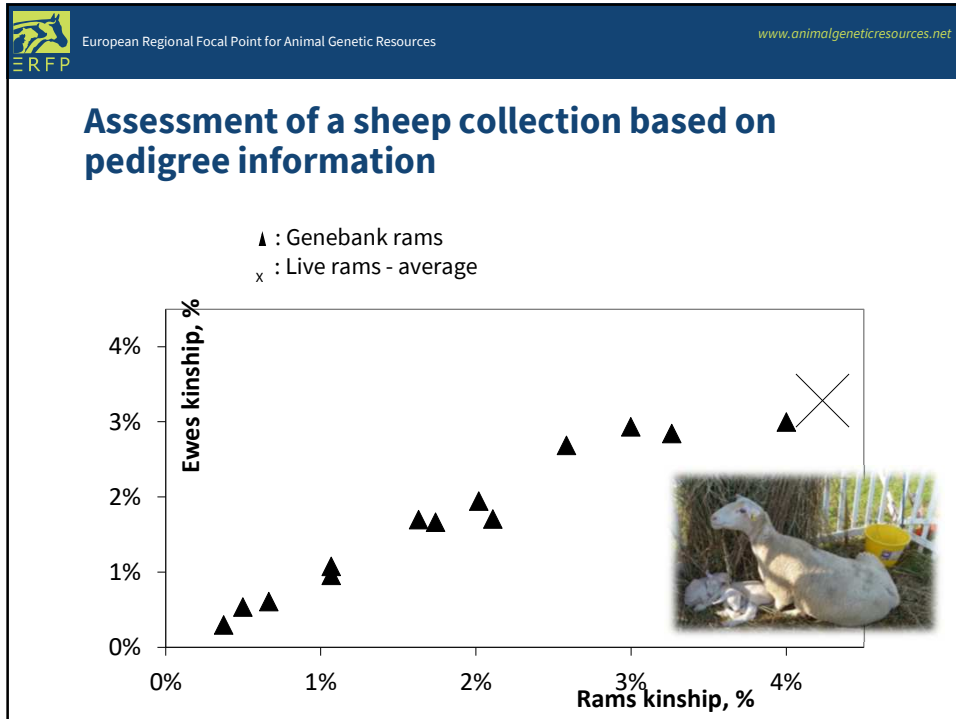
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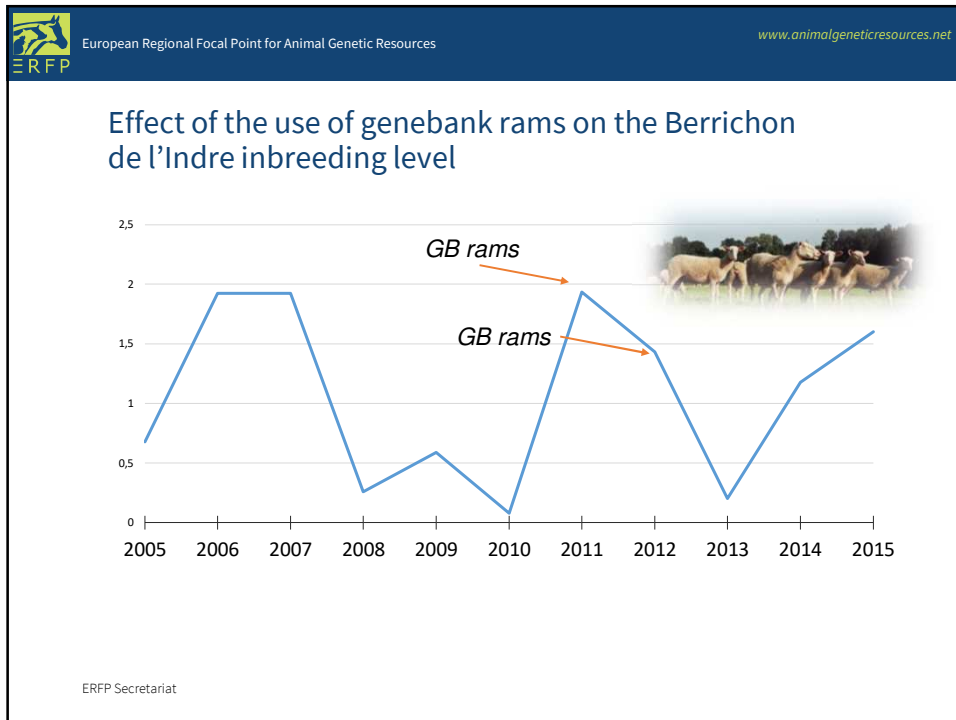
Genebanks and conservation programs

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Take home messages from the IMAGE project

- ✓ You need to collect breeds *before* they are extremely endangered => focus on regional breeds !
 - Logistic issues (animals availability – km / AI centers – sanitary requirements)
 - Fertility issues
- ✓ Collections characterization = great way to increase users and depositors interest
- ✓ Close attention is needed to follow-up the use of N+2 generations onward

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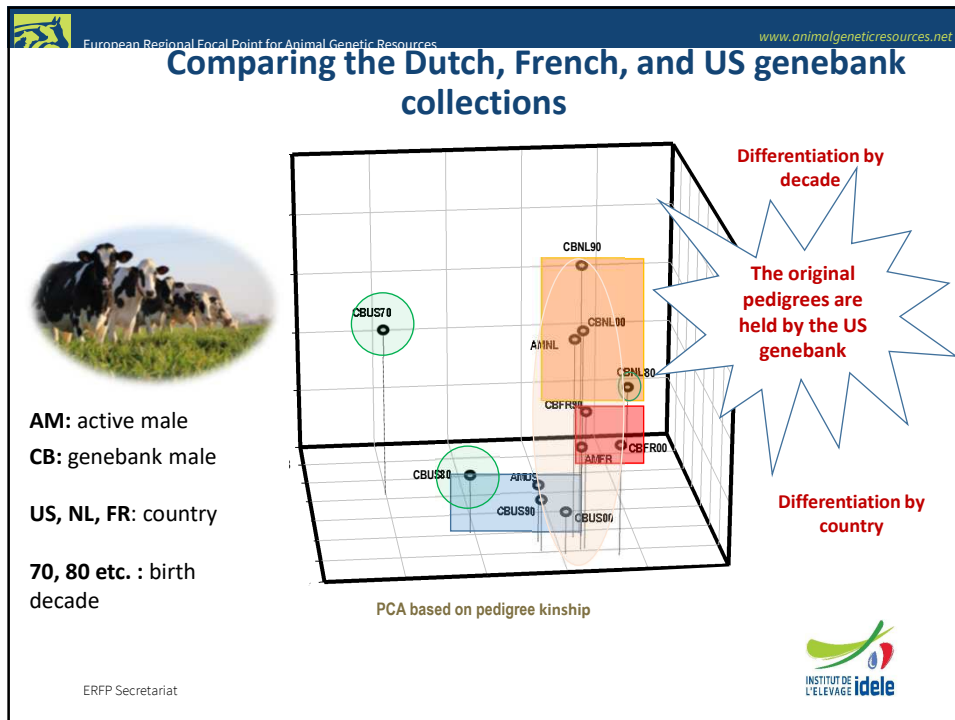


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Reconstitution and modernization of lost Holstein male lineages using samples from US gene bank

>99% of Holstein AI sires born > 2009 are traced to:

- Round Oak Rag Apple **Elevation**
- Pawnee Farm Arlinda **Chief** (Chief)

=> Restoration of two new males' lineages

- Netherland Prince, separated from all known US lineages
- Second lineage separated from US Holstein since 1888

Semen from the bulls commercially available from Select Sires

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Gene banking should be a mandatory component of any breeding program

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graph LR; A[Gene banking steps] --> B[Sample germplasm]; A --> C[Sample blood, Tissues, DNA]; B --> D[Preserve & use genetic diversity]; C --> E[Characterize monitor trends]; D --> F[Sustainable breeding programs]; E --> F;
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The flowchart illustrates the process of gene banking. It starts with 'Gene banking steps' (yellow box), which branches into 'Sample germplasm' (green box) and 'Sample blood, Tissues, DNA' (green box). 'Sample germplasm' leads to 'Preserve & use genetic diversity' (white box), and 'Sample blood, Tissues, DNA' leads to 'Characterize monitor trends' (blue box). Both 'Preserve & use genetic diversity' and 'Characterize monitor trends' lead to 'Sustainable breeding programs' (yellow oval).

Take-home messages

- Gene banking should not wait for local breeds to be endangered
- Use of genebank in breeding programs needs to be more documented
=> “grey” literature, GENRES journal
- Coordination between countries should be promoted at a regional scale

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