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Background

- The Nordic countries have been working officially to secure their animal genetic resources for at least 40 years, both individually and collaboratively.
- So far, there is no compiled information on Nordic animal genetic resources.
- The Nordic Status report is a joint effort between Nordic national coordinators and Nordic Genetic Resource Center (NordGen).

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A status report on the conservation of animal genetic resources for food and agriculture in the Nordics.

The NordGen's Council for Farm Animals is gratefully acknowledged for their contribution to the preparation of the report:

DENMARK: Vivi Hunnicke Nielsen, Aarhus University & Clara Nyegaard-Signori, Ministry of Food, Agriculture and Fisheries of Denmark. THE FAROE ISLANDS: Jens Ivan í Gerðinum, The Agricultural Agency. FINLAND: Juha Kantanen, Natural resources institute Finland & Johanna Rautiainen, Lammasmaailma. ICELAND: Birna Baldusdottir, The Agricultural University of Iceland & Thorvaldur Kristjánsson, The Agricultural Advisory Center (RML). SWEDEN: Anna M. Johansson, Swedish University of Agricultural Sciences & Karin Ohlson, The Swedish Board of Agriculture. NORWAY: Cathrine Brekke, Norwegian University of Life Science & Nina Svartedal, Norwegian Genetic Resource Centre, Norwegian Institute for Bioeconomy Research (NIBIO).



1 Background

2 Positive uses of the native breeds

2.1 Social acceptance

2.1.1 Healthy and robust animals that can help maintain cultural biotopes and local biodiversity

2.2 Commercial values of unique characteristics related to production

2.2.1 Milk components

2.2.2 Meat components

2.3 Possibility to boost local economy

3 Conservation

3.1 External pressures influencing live populations

3.1.1 Economy

3.1.2 Changing climate – changing transmission patterns of diseases and influencing natural disasters

3.1.3 Natural disasters

3.2 Loss of genetic variation influencing the live populations

4 The Current status of the Nordic native breeds

4.1 Materials and Methods

4.2 The Nordic native breeds – overall status

4.3 Country-wise risk status of the Nordic native breeds

4.3.1 Denmark – native breeds, subspecies and their risk status

4.3.2 The Faroe Islands – native breeds and their risk status

4.3.3 Finland – native breeds, subspecies and their risk status

4.3.4 Iceland – native breeds and their risk status

4.3.5 Norway – native breeds, subspecies and their risk status

4.3.6 Sweden – native breeds, subspecies and their risk status

4.4 Nordic transboundary breeds

4.5 Nordic dogs and cats

4.6 The current status of estimating and recording inbreeding and effective population sizes in the Nordics

4.7 The status of cryoconservation in the North according to DAD-IS

5 Important stories of conservation

Denmark: Use of optimum contribution selection on small populations of native breeds

Finland

Iceland: “1100 years of isolation – 60 years of conservation”

The Faroe Islands: the Faroese horse

Norway: “From almost extinct to virtually saved”

Sweden

Bibliography

Supplementary information

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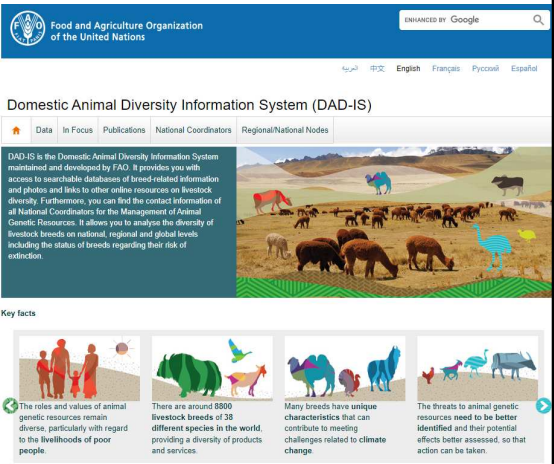
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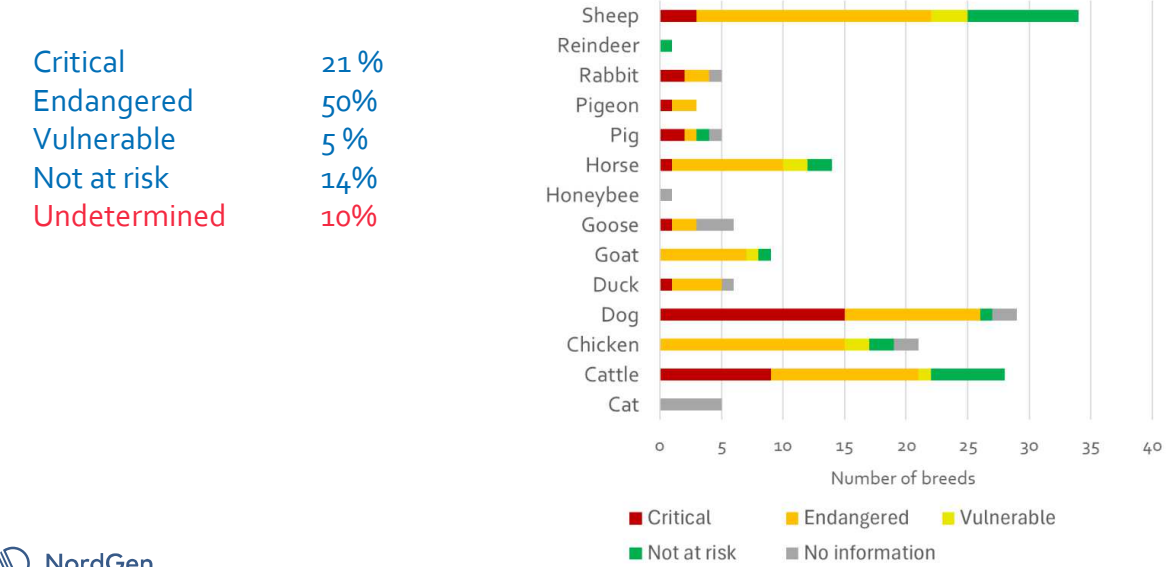
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Materials and methods

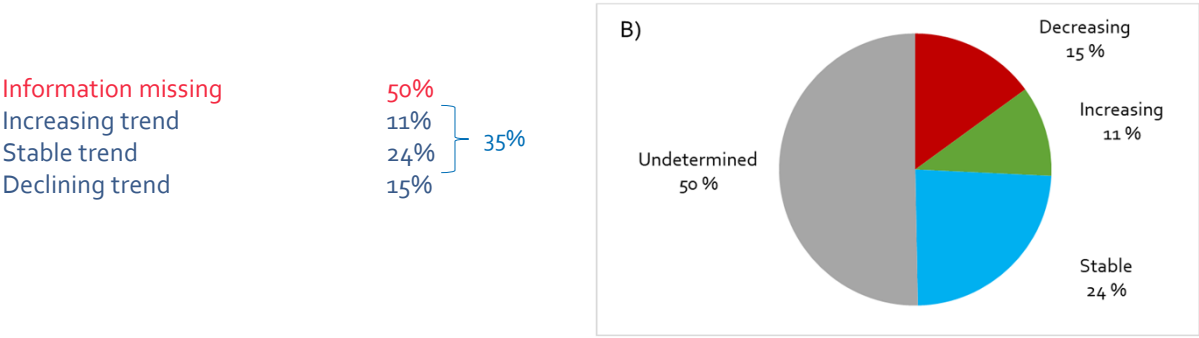
- The data was extracted on June 4, 2024, covering population data from 2004 to 2024.
- The data included population size and current risk status.
- Alternative data sources was supplemented if information was unavailable or outdated in DAD-IS.
 - We used sources such as breeding organizations, national reports, online databases, and scientific articles.



The risk status of the Nordic native breeds

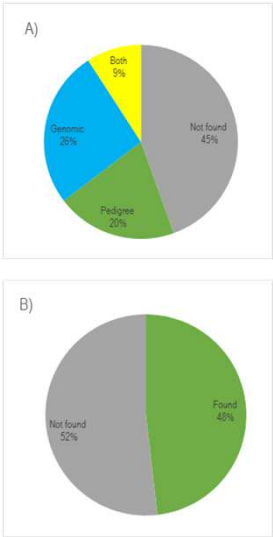


Population development trends in Nordic native breeds



Inbreeding and effective population estimates

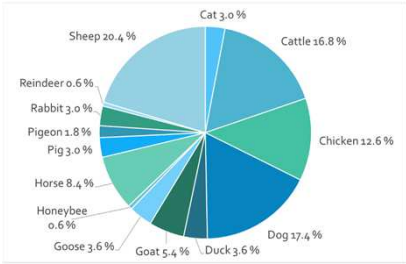
- A literature search for inbreeding estimates
 - Information found for 55% of the breeds (91).
- Effective population size estimate (N_e) was found for 48% of the breeds (79).
- However, due to variations in the methods used to calculate the estimates, comparing these values is not feasible.
- The information can be considered indicative and a valuable addition.



Conclusions (1)

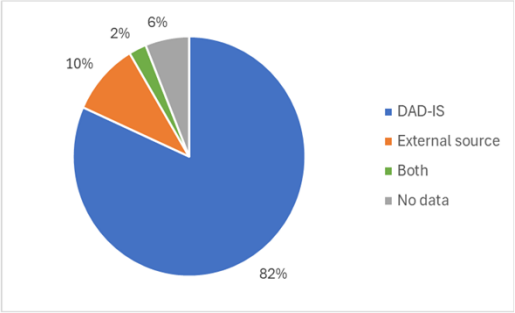
Today, there are 167 native breeds in the Nordic countries.

- Of which 14 % are not at risk.
- 10 % of the breeds are classified as “undetermined” conservation status
- 21% of the breeds are categories as a critical endangered.
- One third (1/3) of the populations show an increasing or stable trend and 15 % are decreasing.
- No information of trends available for 50%.



Conclusions (2)

- National reporting to the DAD-IS database has improved considerably in recent years.
- Today DAD-IS contains information about 84% of the Nordic breeds, and in the past three years, 71% of the breeds have updated data.



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Conclusions on ex situ

- Only 19 breeds have a sufficient number of donors and doses
=> About 12% of Nordic breeds are considered safe.
- Nearly all (99.87%) of ex situ samples reported to DAD-IS is male reproductive material.
- Just over half (57%) of endangered breeds have some of their genetic material in gene banks.
- In the Nordic region, *ex situ* activities are focused cattle and sheep breeds.



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Conclusions (4)

- Awareness of the value of Nordic breeds has increased, e.g., thanks to research, which has increased public interest in their conservation.
- Characterization studies have provided valuable insights and future opportunities for developing local niche products and activities.
- The report contains success stories from each country.



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