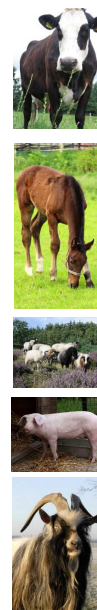




## EURC-EAB Follow-up

ERFP General Assembly, 29<sup>th</sup> August 2024  
Florence, Italy



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## Survey on status of implementation of (EU) 2016/1012 for endangered breeds

- Status of implementation of (EU) 2016/1012 among breed societies of endangered breeds
- Status of implementation of possible derogations, according to (EU) 2016/1012 for endangered breeds in breeding programmes

=> Report available on the EURC EAB website => please transfer to your breeding organisations

⇒ **SAVE THE DATE**

Two online webinars on **Monday 23 September 12.30pm** and **Wednesday 25 September 4.30pm** (CEST).



2



## On going activities in close connection with ERFP

- AHA Assessment of breeding programmes for local breeds

Christina Ligda (ERFP) and Mira Schoon, Jan ten Napel, Mirjam Spoelstra (EURC EAB)

Guidelines to be developed by the end of 2024 and further work/tool development in 2025

- AHA sanitary rules for genebanks

Fernando Tejerina (ERFP) – Sipke Hiemstra and Coralie Danchin (EURC EAB)

See specific report by F. Tejerina during the GA



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## Other actions

- Effective population size

Paper: “The significance of Effective Population Size (Ne) for monitoring genetic variability in breeding programs”

Presented and discussed during the ERFP WG (Toledo + Cyprus)

Published in August 2024, available on the EURC EAB website.

- Population differentiation indicators

Paper in process – EAAP presentation – connection with the ERFP Doc & Info WG

- Review of the indicators used to assess the breed risk status

See following slides – work to be continued in the next work program



4



# Analyse of the 2023 Survey completed by email solicitations (2024)

- Number of answers : **35 countries**

Use the breed risk classification system given by FAO	Yes	14 countries	Croatia, Czech Republic, Denmark, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Montenegro, The Netherlands, Rep. Of Cyprus, Slovenia, Sweden
	Yes but adjusted	2 countries	Norway, Portugal
	No	14 countries	Austria, Belgium, Bulgaria*, Estonia, France*, Germany, Luxembourg, Poland*, Serbia*, Slovakia, Spain*, Switzerland*, UK, Iceland
	Not specified	5 countries	Finland, Georgia, Hungary, Romania, Armenia

\* : publication or document available

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## FAO, 2013. “In vivo conservation of AnGR”

TABLE 4  
Risk categories for species with high reproductive capacity\*

Population trend and pure-breeding proportion	Males (n)	Population size (n)						
		≤80	81 - 20	121 - 800	801 - 1 200	1201 - 1 600	1601 - 2 400	>2 400
Increasing trend and >80% pure-breeding	≤5							
	6 - 20							
	21 - 35							
	>35							
Stable or decreasing trend or ≤80% pure-breeding	≤5							
	6 - 20							
	21 - 35							
	>35							

■ critical, ■ endangered, ■ vulnerable and ■ not at risk.  
\*High reproductive capacity species = pigs, rabbits, guinea pigs, dogs and all poultry species.

TABLE 3  
Risk categories according to species' reproductive capacity

Reproductive capacity	Males (n)	Breeding females (n)						
		≤100	101 - 200	201 - 1 000	1 001 - 2 000	2 001 - 3 000	3 001 - 6 000	>6 000
High*	≤5							
	6 - 20							
	21 - 35							
	>35							
Low**	≤5							
	6 - 20							
	21 - 35							
	>35							

■ critical, ■ endangered, ■ vulnerable and ■ not at risk.  
\*High reproductive capacity species = pigs, rabbits, guinea pigs, dogs and all poultry species.  
\*\*Low reproduction capacity species = horses, donkeys, cattle, yaks, buffaloes, deer, sheep, goats and camels.


TABLE 5  
Risk categories for species with low reproductive capacity\*

Population trend and pure-breeding proportion	Males (n)	Population size (n)						
		≤240	241 - 360	361 - 2 400	2 401 - 3 600	3 601 - 4 800	4 801 - 7 200	>7 200
Increasing trend and >80% pure-breeding	≤5							
	6 - 20							
	21 - 35							
	>35							
Stable or decreasing trend or ≤80% pure-breeding	≤5							
	6 - 20							
	21 - 35							
	>35							

■ critical, ■ endangered, ■ vulnerable and ■ not at risk.  
\*Low reproduction capacity species = horses, donkeys, cattle, yaks, buffaloes, deer, sheep, goats and camels.

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Analyse of the 2023 Survey

completed by email solicitations (2024)

- Countries who use the FAO system for risk assessment but adjusted (2 countries)


Norway : Simplification

Critically  
Endangered  
Vulnerable

Nf < 300 (100 if high reproductive capacity)  
Nf 300-3000 (100-1000),  
Nf 3000-6000 (1000-2000)

Portugal : only 2 threat levels (for period 2023-2027)

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Analyse of the 2023 Survey

completed by email solicitations (2024)


- Countries who stated that they do not use the FAO system (14 countries)

Country	Pop size	Pop size evolution	Ne	Nm	Nf	Replacement rate	Others criteria
Austria	X	X	X				
Belgium		X	X	X	X		
Bulgaria		X	X		X		X
Estonia				X	X		
France		X	X		X		X
Germany			X				
Luxembourg							X
Poland			X		X		X
Serbia			X				
Slovakia			X				
Spain				X	X	X	X
Switzerland			X				X
UK					X		
Iceland	X	X	X				

- 10 countries are using **Ne** (generally computed from Nf and Nm)
- 7 countries are using **number of female breeding animals**
- 5 countries are using **population size evolution**
- 3 countries are using **number of male breeding animals**
- 2 countries are using **population size**

→ Most countries use **several criteria**

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Analyse of the 2023 Survey  
completed by email solicitations (2024)

The « other criteria »

Country	For what ?	The other criteria
Bulgaria	To adjust thresholds	geographic concentration; number of farms; relative size of farms; cryo-preserved reproductive material in gene banks; market for products and services related to the breed; economic importance for the country; economic importance for the region
France	To adjust thresholds	trend Nf ; proportion of females bred as pure; effective population size; health risk; breeding organisation capacity; economic and social support
Poland	To compute risk status	geographical concentration; demographic trend within the last 5 years; cultural value; chain of custody (DNA testing); ex situ conservation ; anthropogenic factors (existence of breeders' organisations, financial support, activity and age of breeders).
Spain	To allow a change of status, on an exceptional basis	inbreeding rate, socio-economic technical criteria (geographic distribution, population trend, number of farms, material stored in a germplasm bank) or other sectoral or socio-economic factors
Switzerland	To compute risk status	<b>GENMON WebGIS platform</b> computes the risk status by agregation of indices (pedigree information, introgression, geographic distribution, cryo conservation plan and socio-economic and environmental information) into one final score. Different scenario can be tested.

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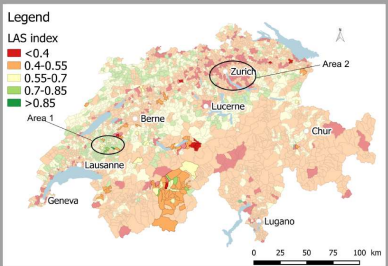
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A WebGIS platform for the monitoring of Farm Animal Genetic Resources (GENMON)

Available for countries

« Easy-to-use », multi-criteria, BUT need available and suffiscent data

Under dvt to used marker-based genetic information



1. Data source

Geographic borders  
From swisstopo

2. Inputs to the Web-Portal

A) ZIP-code polygons  
B) Municipality polygons  
C) Animal ID  
D) Breed information  
E) Statistics by municipality  
F) Land use

3. Criteria Computation

Pedigree Analysis with PopRep  
GIS using A)  
Mean inbreeding Coefficient over last GI  
Effective population size  
Pedigree completeness  
Trend # of males  
Trend # of males  
Mean introgression over last GI  
Animal concentration (minimum radius Containing at least 75% of animals)  
Cryo-conservation score  
Trend # of farms  
Cultural importance  
Agriculture sustainability In the regions of the breed  
Demographic balance  
% < 19 years old  
% > 65 years old  
% jobs in agriculture  
% jobs (total)  
% surface used for grazing  
Evolution jobs in agriculture  
Projected loss of agricultural land  
Sum per Municipality using B)

4. Criteria

Mean inbreeding Coefficient over last GI  
Effective population size  
Pedigree completeness  
Trend # of males  
Trend # of males  
Mean introgression over last GI  
Animal concentration (minimum radius Containing at least 75% of animals)  
Cryo-conservation score  
Trend # of farms  
Cultural importance  
Agriculture sustainability In the regions of the breed  
Demographic balance  
% < 19 years old  
% > 65 years old  
% jobs in agriculture  
% jobs (total)  
% surface used for grazing  
Evolution jobs in agriculture  
Projected loss of agricultural land  
Sum per Municipality using B)

5. Criteria Aggregation (using MACBETH)

Aggregation at the breed level  
Pedig- index  
Intro- index  
Geog- index  
Cryo- index  
Breed Agriculture Sustainability (BAS)-index  
Aggregation at the breed level  
Average over the region of the breed using 1, A) and B)  
Local Agriculture Sustainability (LAS)-index  
Aggregation at the municipality level

6. Ranking

Global- index

Fig 2. Overall GENMON Process. The process starts with data input followed by criteria processing, integration and aggregation. GI: generation interval, GIS: Geographic Information System, Pedig-Index: index accounting for pedigrees and genetic diversity, Intro-Index: Introgression index, LAS/BAS Index: Local/Breed Agriculture Sustainability indices, accounting for socio-economic and environmental sustainability of breeding conditions; swisstopo is the Swiss Federal Office of Topography (<http://www.swisstopo.admin.ch>), WSL is the Swiss Federal Institute for Forest, Snow and Landscape Research.

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## New EURC-EAB work program 2025-2027

- As all the other EU (DG SANTE) reference labs/centers (up to 15 in total), the EURC EAB consortium was asked to submit and implement a follow up work program for a 3 years' period (2025/2027)
- Draft is being finalised, follow-up of previous actions, still in connection with ERFP, including:
  - ✓ Implementation of a tool for (self) assesment of a breeding program (AHA follow up)
  - ✓ Harmonisation of breed risk (endangerment) status indicators (Doc Info + In situ WG)
  - ✓ Guidance on definition and breeding programs of transboundary versus local breeds. ((Doc Info )
  - ✓ Examples of complementary in situ and ex situ strategies (Ex Situ / In Situ WG)

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