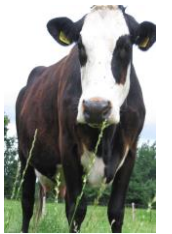


# Developing guidelines for transboundary breeding programmes to preserve endangered breeds in the European Union

20<sup>th</sup> May 2026 – Mira Schoon

European Union Reference Centre for Endangered Animal Breeds (EURC-EAB)

R. Bonifazi, L. Buttgen, J. ten Napel, M.A. Schoon, M. Spoelstra, L. Balzar, H. Göderz, S.J. Hiemstra



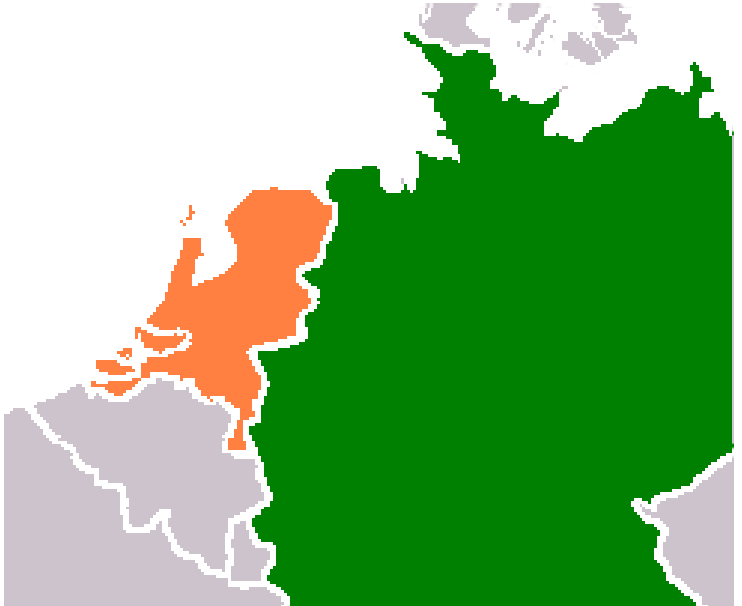
# European Union Reference Centre for Endangered Animal Breeds

EU Breeding regulation 2016/1012, scope:

- Bovine, Porcine, Ovine, Caprine, Equine species
- EURC-EAB works on **endangered breeds** of those animal species only
- European Union member states

Responsible for the **scientific and technical contribution** to the establishment and **harmonisation of methods** for the **preservation of endangered breeds**, and the preservation of the genetic diversity existing within those breeds

# Endangered Animal Breeds: Local or Transboundary?



# Guidelines for Breeding Programmes of Transboundary Breeds

## Main Objective

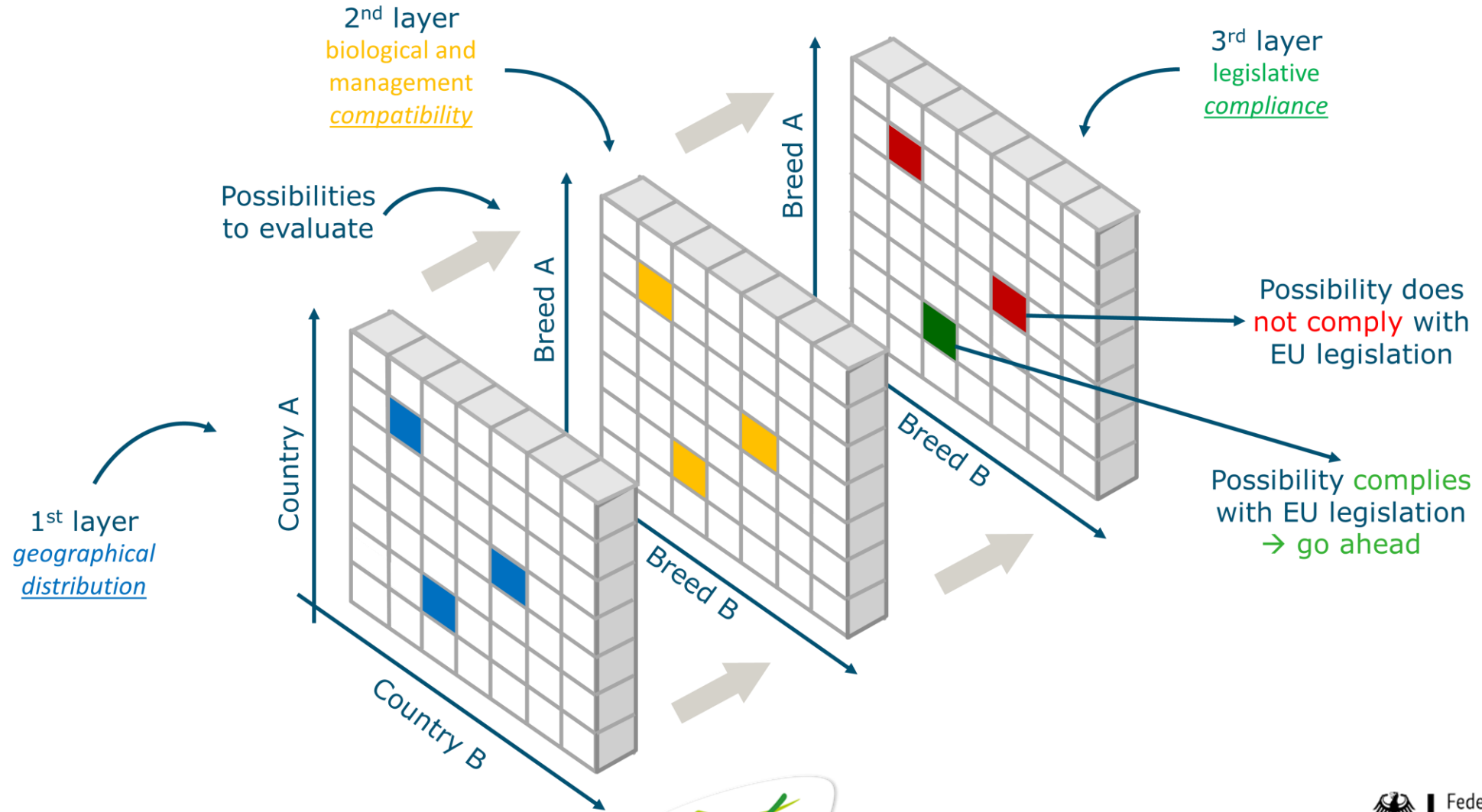
- **Develop guidelines** for breed societies and National Competent Authorities (NCA) to support **breeding programmes for endangered breeds in a transboundary context**
- Enable breeds to **benefit from subpopulations or closely-related population** in other EU countries
- **Combine efforts** at EU level

## Scope

- Focus on endangered breeds with EU-approved breeding programmes
- Cover cattle, pigs, sheep, goats, and equids
- Provide framework tailored to different type of transboundary collaboration



# Framework 3-layers



# Framework 1st layer: Geographical Distribution

Classify breeds as **local** or **transboundary** breed, level of **exchange** in breeding animals and **risk status**

Support decision making by NCA/breed society:

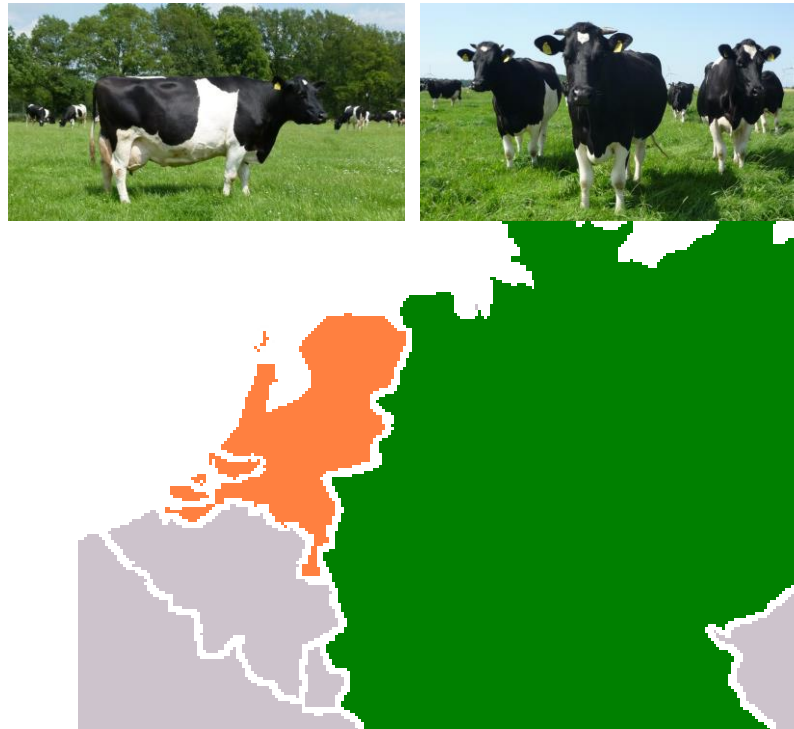
- Transboundary breed or two separated breeds?
- Recognize distinct subpopulations within a breed
- Genetic comparison of uniqueness of breeds
- Sustainable level of exchange of breeding stock between breeds

# Local or Transboundary, level of exchange and risk status?

1 endangered breed, 2 populations  
Exchange breeding animals  
PDI +/- 60%



2 endangered breeds  
Limited exchange of breeding animals  
Preliminary genomic results show relatedness, but distinct populations



1 endangered breed, 1 population  
3 subpopulations (NL, BE, DE)  
Limited export from NL



# Framework 2nd layer: Biological & Management Compatibility

Classify transboundary breed based on different levels of genetic improvement, genetic control, and conservation measures

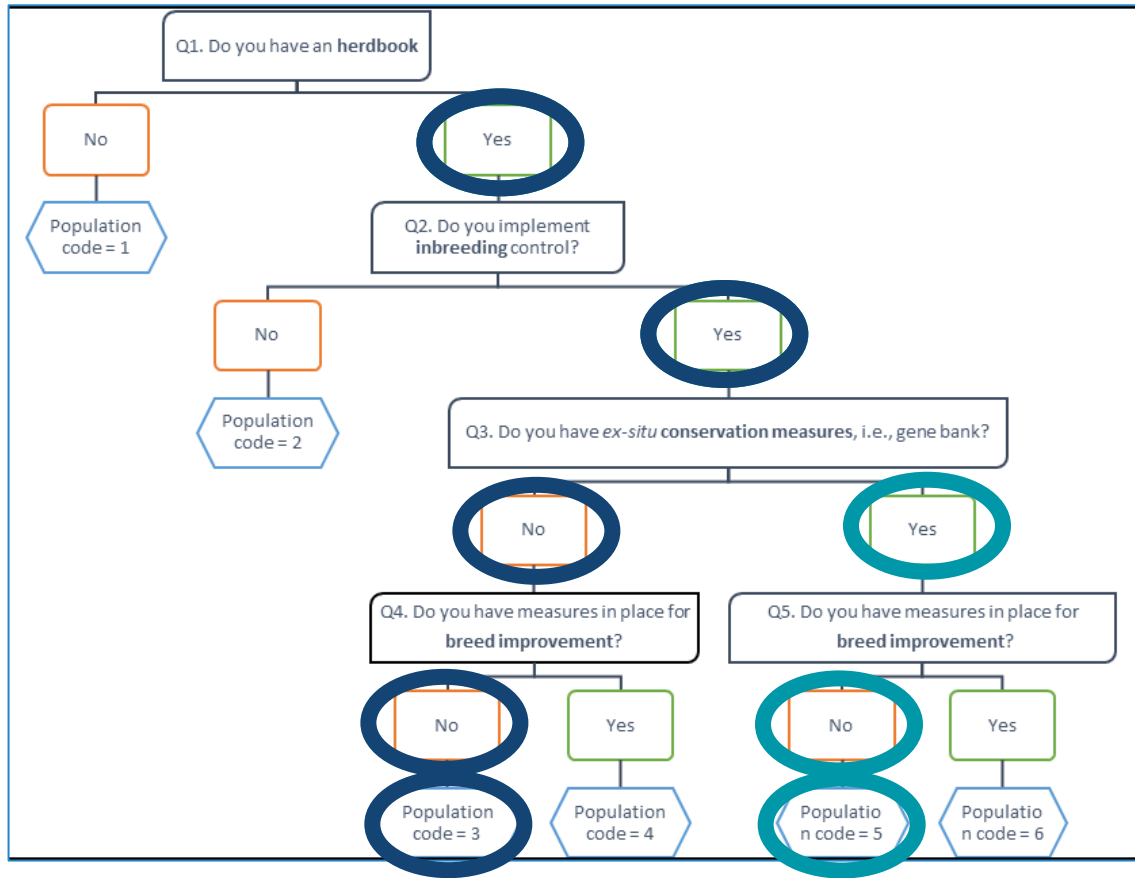
## Population codes

1. Unstructured
2. Herdbook only
3. Herdbook + inbreeding control
4. Herdbook + inbreeding control + breed improvement
5. Herdbook + inbreeding control + gene bank
6. Herdbook + inbreeding control + breed improvement + gene bank

**Decision tree** to with yes/no question to help classify own + foreign breeds for possible collaboration

Grid to identify guidelines code

# Framework 2nd layer: Biological & Management Compatibility



Grid to convert population code into guidelines codes

		<i>Secondary population</i>					
		1	2	3	4	5	6
Focal population	Population code	1	2	3	4	5	6
	1	-	B	B	B	B	B
	2	B	A	C	C	C	C
	3	B	C	A	C	D	D
	4	B	C	C	A	D	D
	5	B	C	D	D	A	D
6	B	C	D	D	D	A	

Same level across breeds

# Herdbook, inbreeding control, gene bank and genetic improvement



		NL population					
Focal population	Population code	1	2	3	4	5	6
	1	-	B	B	B	B	B
	2	B	A	C	C	C	C
	3	B	C	A	C	D	D
	4	B	C	C	A	D	D
	5	B	C	D	D	A	D
	6	B	C	D	D	D	A

Population code: D

		NL population					
Focal population	Population code	1	2	3	4	5	6
	1	-	B	B	B	B	B
	2	B	A	C	C	C	C
	3	B	C	A	C	D	D
	4	B	C	C	A	D	D
	5	B	C	D	D	A	D
	6	B	C	D	D	D	A

Population code: C

		NL population					
Focal population	Population code	1	2	3	4	5	6
	1	-	B	B	B	B	B
	2	B	A	C	C	C	C
	3	B	C	A	C	D	D
	4	B	C	C	A	D	D
	5	B	C	D	D	A	D
	6	B	C	D	D	D	A

Population code: A

# Framework 3rd layer: Legislative Compliance

Classify transboundary breed based on the legislative framework (herdbook, same/different breed, etc.)

## Legislation codes

1. Two EU-approved programmes, same breed name
2. Two EU-approved programmes, different breed names
3. Single EU-approved programme with territorial extension
4. EU-approved vs non-EU-approved programme within EU
5. EU-approved vs non-EU-approved programme outside EU



**Decision tree** to with yes/no question to help classify own + foreign breed for possible collaboration

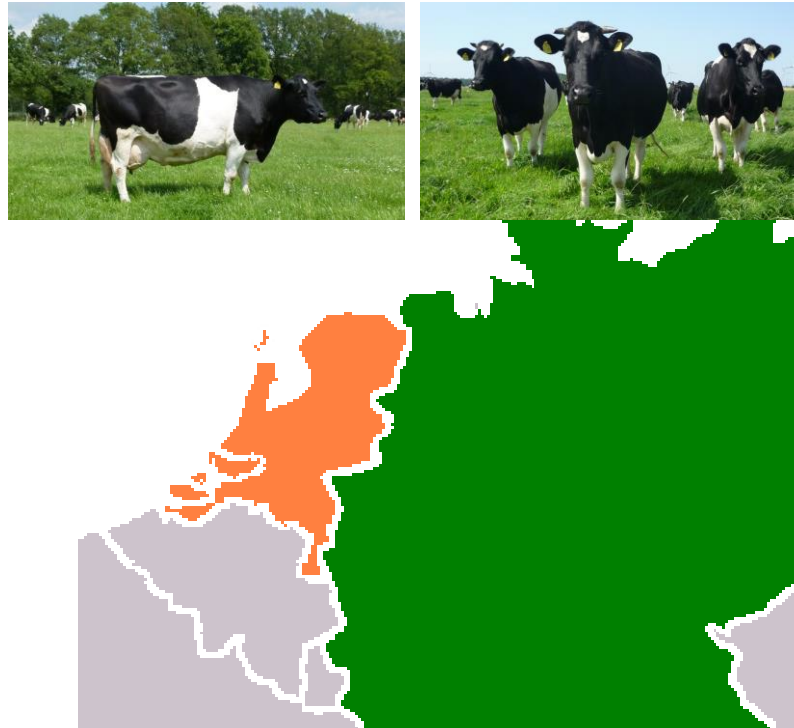
Grid to identify **guidelines code**

# EU Breeding Programme, same or different breed, geographical extension?

1 breed, 2 herdbooks  
2 EU Breeding Programmes  
Belgium is book of origin



2 breeds, 2 herdbooks  
2 EU Breeding Programmes  
Both accept each others breeding animals

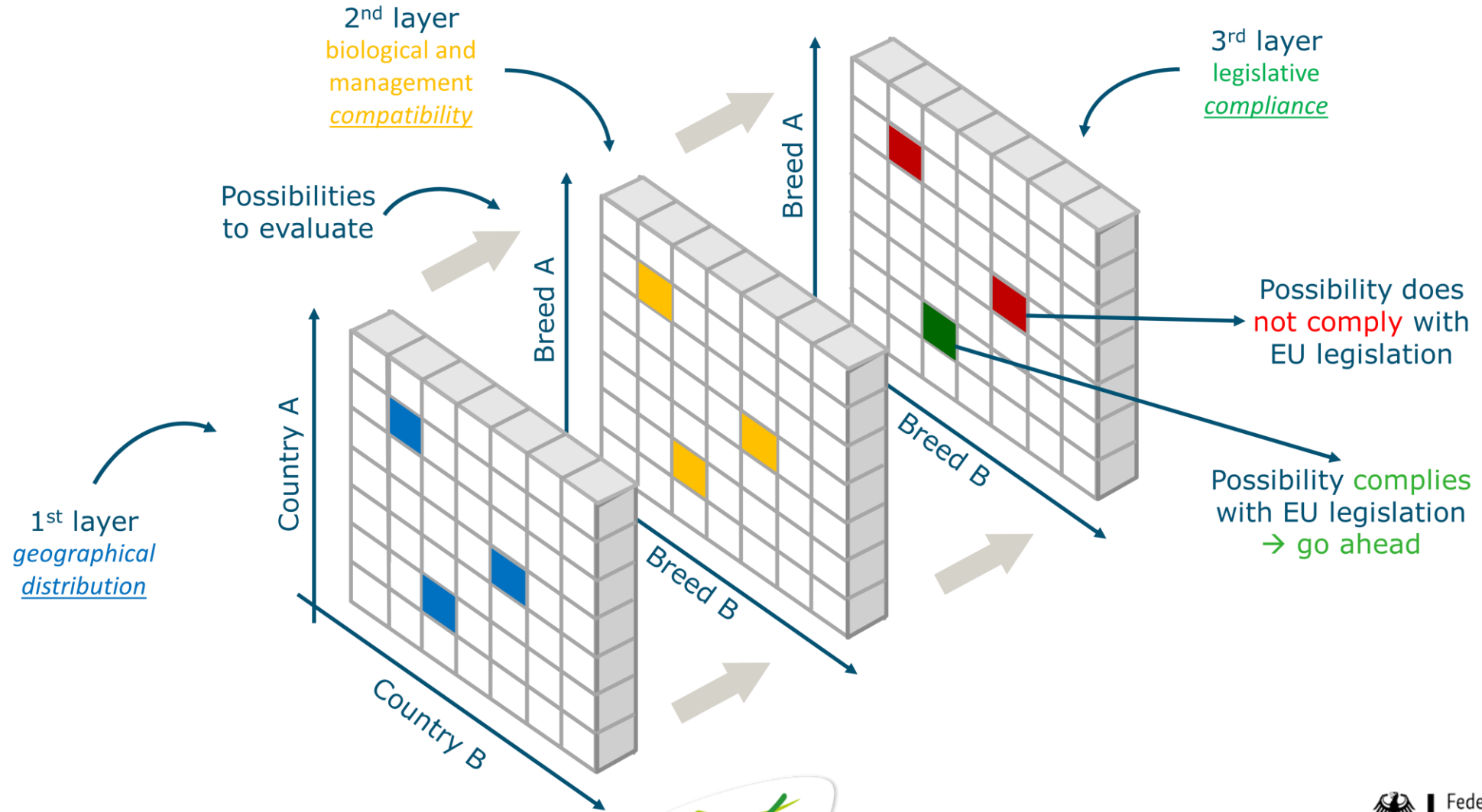


1 breed, 1 herdbook  
1 EU Breeding Programme in NL  
Territorial extension to DE & BE





# Framework 3-layers



# Guidelines for Breeding Programmes of Transboundary Breeds

Guidelines set-up for different scenario's, based on 3-layer framework

- Geographical distribution
- Biological and management compatibility
- Legislative compliance

Breed society/NCA are directed to **specific guideline per scenario**

→ via three **decision trees and supporting tools**

Guidelines and information include:

- **Genetic relatedness**
- **Collaboration** between breeding programmes
- **Exchange** of breeding animals or gene bank material



**EUROPEAN UNION  
REFERENCE CENTRE FOR  
ENDANGERED  
ANIMAL BREEDS**

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