



Portuguese Local Breeds

Nuno Carolino



2022 ERFP General Assembly
Porto-Portugal, September 3rd and 4th 2022

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PORTUGAL

Territorial Area :
92 212 km²



BIODIVERSITY

50 Local Breeds

Cattle, Sheep, Goats, Pigs, Chicken, Horses, Ass

+ 11 Local Dog Breeds Officially Recognized




Farm Animal Genetic Diversity




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2/24

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The importance of Conservation and Improvement of Animal Genetic Heritage is officially recognized in Portugal



The Convention on Biological Diversity (CBD –Rio Convention)




1st Report on the State of the World's AnGR
1st Portuguese Report on AnGR



Global Plan of Action for AnGR Interlaken Declaration


National Plan for Animal Genetic Resources




PNRGAn 6 strategic priorities

Activities to be implemented and consolidated in AnGR


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2027




NOVAGRI




PAMAF




Agro



ProDeR
Programa de Desenvolvimento Rural




PDR 2020
PROGRAMA DE DESENVOLVIMENTO RURAL 2014 - 2020



PEPAC 2023/27 ?

Own Measures aimed at AnGR



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Current Situation of the Local Breeds in Portugal

Conservation v Breeding Program

↓

Maintenance of genetic variability




150 ♀

VS



Genetic Progress




30000 ♀

Each breed ⇒ BBook, Conservation/Breeding Program 

Management of the BB's, Conservation and Breeding Programs – Breeders' Associat. (Ofic. Services AG)

Prod. Geographical Indications and Producers Groups (PDO and PGI)   30 PDO, 18 PGI + 41 (DPO + 39 PGI)

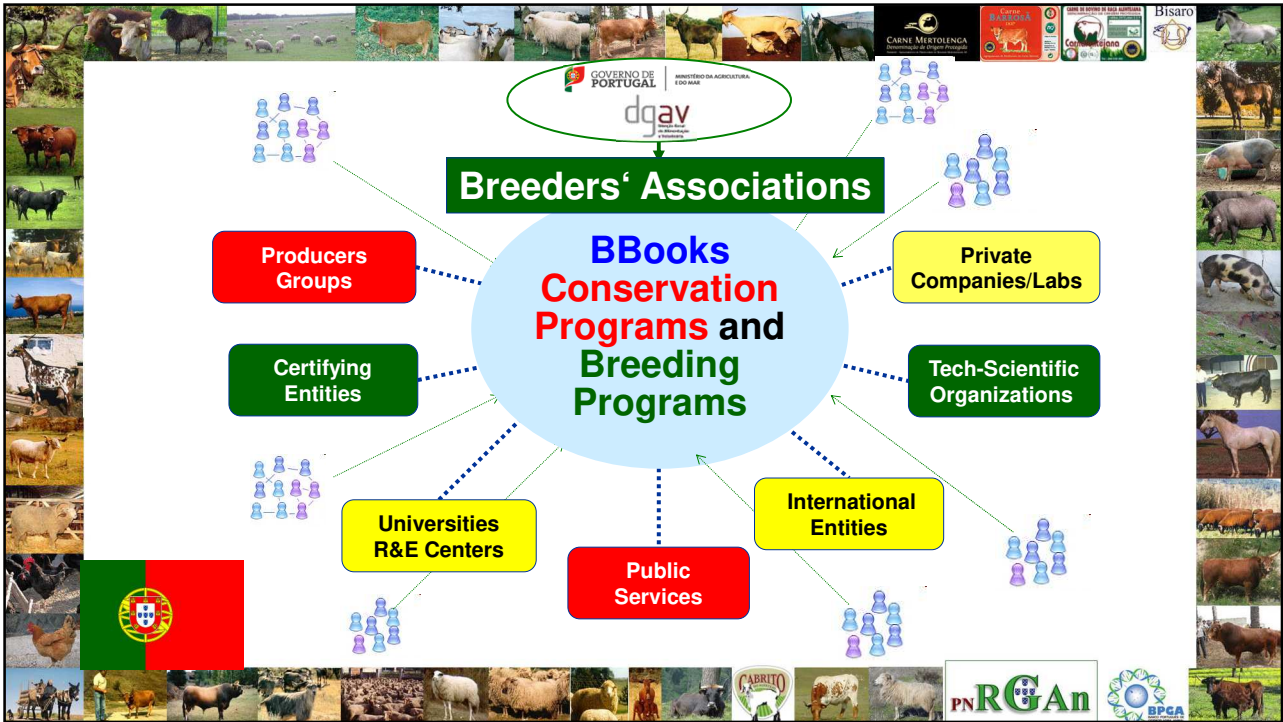


Importance of Animal Biodiversity

- ▶ Establish residents in rural areas and for their sustainable management
- ▶ Production systems in equilibrium with the environment
- ▶ Maintain Traditional and cultural activities
- ▶ Keep a Multifunctionality in the livestock activity
- ▶ Reduction of fire risk,.....

Saturday, September 3, 2022
09:52

4



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Portuguese Local Breeds

Species	Number of breeds
Cattle	7 500
Sheep	19 000
Goats	18 000
Pigs	3 000
Poultry	14 000
Alpacas	23 000

42/50

84%

16%

at Risk of Extinction

Sustainability

?
Economic

Social

Environmental

Johannesburg Summit, 2002

sábado, 3 de setembro de 2022
11:15

6

Difficulties in AnGR Conservation and Breeding




- ❖ Lack of interest from the Livestock Sector / Producers
- ❖ General difficulties in livestock sector
- ❖ Structural and demographic problems
- ❖ Difficulties in products marketing and valorization
- ❖ Lack of structures and guidance
- ❖




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For the last 8 years

Conservation and Genetic Improv. Activities



Commitment of the Portuguese Government





50



<p>A1. Inovação e conhecimento</p> <p>M1. Inovação</p> <p>M2. Conhecimento</p>	<p>A2. Competitividade e organização da produção agrícola</p> <p>M3. Valorização da produção agrícola</p> <p>M4. Valorização dos recursos florestais</p> <p>M5. Organização da produção</p> <p>M6. Gestão risco e rest. potencial produtivo</p>	<p>A3. Ambiente, eficiência no uso dos recursos e clima</p> <p>M7. Agricultura e recursos naturais</p> <p>7.1 Agricultura biológica</p> <p>7.2 Produção integrada</p> <p>7.3 Pagamentos Rede Natura</p> <p>7.4 Conservação do solo</p> <p>7.5 Uso eficiente da água</p> <p>7.6 Culturas permanentes tradicionais</p> <p>7.7 Pastoreio extensivo</p> <p>7.8 Recursos genéticos</p> <p>7.9 Mosaico agroflorestal</p> <p>7.10 Silvoambientais</p> <p>7.11 Inv. não-produtivo</p> <p>7.12 Apoio agroambiental e rural</p> <p>Informação específica</p> <p>M8. Proteção e reabilitação de povoamentos florestais</p> <p>M9. Manutenção da atividade agrícola em zonas desfavorecidas</p>	<p>A4. Desenvolvimento local</p> <p>M10. LEADER</p>
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Agri-environmental measures


ACTION 7.8 – GENETIC RESOURCES

Operation 7.8.1 MAINTENANCE OF LOCAL BREEDS AT RISK → **Breeders**

Operation 7.8.3 CONSERVATION AND BREEDING OF ANIMAL GENETIC RESOURCES → **Breeders' Associations**

1.2% →



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PDR 2020 Each Breed
Cons. v Breed. Plan
 Structured Plan
 Set Goals
 Actions to be taken
 Expected Results
 Information Diffusion

Conservation v Breeding Plan

Maintenance of genetic variability VS Genetic Progress

150 ♀ vs 30000 ♀

PNRGAN BPGA

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Ongoing Breeding Programs

≠ S

Breeding Goals
 Selection Criteria
 Selection Method

Annual Results of Genetic Evaluation
 Modest Results

Núcleo Seleção
 3000-4000 Fêmeas
 Controlo Produtivo e Reprodutivo
 Controlo de Genealogias

Teste Performance (C, Natural e em AM)

Fêmeas Substituição

Núcleo Comercial
 3500 a 4000 Fêmeas
 Controlo Performance Simplificado

MACHOS FÊMEAS

Raça Bovina Mertolenga
 Catálogo de Touros 2020

ANCORME

PNRGAN BPGA

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Ex situ Conservation – in vivo



❖ in vivo ⇒ nucleus of conservation

- Research / Experimentation Farms (Public)
- Natural and Farm Parks
- Protected Areas
- Pedagogical Farms
- Zoos

Areas as similar as possible to the region of origin

- Select animals for breeding (N_e + Gen. Charact.)
 - Effective population size (N_e) ≥ 50
 - $\Delta F < 1\%$ /generation – Monitoring
 - 10-15 males + 200 females / generation
 - Maximizing genetic variability \Rightarrow high $\sigma^2_{F_2}$ ratio and random mating
 - Conservation nucleus with rotating mating
 - Directed mating $\Rightarrow a_n$ minimum
 - Promotional and Valorization Activities
- ? Conservation v Selection Compatibility ?**

Peneda-Gerês National Park



CEBA – Herd. Abobada



EZN - INIAV



EZN - INIAV



2013-2015

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Ex situ Conservation – in vivo ⇒ Nucleus of Conservation



Parque Natural Peneda-Gerês
Escola Sup. Agraria Pte Lima

National Strategy on Adaptation to Climate Change

- ❖ Use of public areas/land - natural parks and state farms by Animals
- ❖ Integration of the AnGR in land management and forest defense programs - valorization of forestry-pastoralism

INIAV - Santarem
Malhado de Alcobaca, Galinha Amarela, Pedres, Preta Lusitnica e Branca
Escola Superior Agraria de Santarem
Sorraia, Serrana
Reserva Natural do Cavalo do Sorraia - Alpiarga
Escola Profissional Agricola FBLeal (Runa)



Conservation / Divulgaoo



- Escola Superior Agraria de Bragana
- Rede de Estaoes Dir. Reg. Agricultura e Pesca do Norte
- Centro de Valorizaoo e Melhoramento de breeds Autoctonas
- Centro de Atividades Ludico-Pedagogicas do Burro de Miranda **NEW**
- Centro de Competencias da Caprincultura (CCC)
- Escola Superior Agraria de Castelo Branco
- Churro do Campo, Merino Beira Baixa
- Coudelaria de Alter (Lusitano e Sorraia)
- INIAV – Elvas
- Mertolenga (Malhado), Galinhas **NEW**
- Universidade de vora
- Mertolenga, Serpentina
- Centro de Experimentaoo do Baixo Alentejo
- Mertolenga, Serpentina, Merino Branca, Merino Preta, Campana, Alentejana

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Ex situ Conservation – in vivo

Pedagogical Farms







1. Qta. Pedagógica de Braga
2. Qta. Pedagógica de Aveiro
3. Qta. Pedagógica do Fundão
4. Qta. Pedagógica de Viseu
5. Qta. Pedagógica da Casa das Palmeiras (Mangualde)
6. Qta. Pedagógica Burros do Magoito (Mafra)
7. Qta. Pedagógica Armando Villar (Cascais)
8. Qta. Pedagógica dos Olivais (Lisboa)
9. Qta. Pedagógica de Almada (Lisboa)
10. Qta. Pedagógica Lugar dos Pernilongos (Setúbal)
11. Qta. Pedagógica do Monte das Arouchas (Serpa)
12. Qta. Pedagógica de Portimão
13. Qta. do Arrife
14. Casa de Serralves (Porto)
15. Monte Selvagem (Lavrè)
16. Granja Abbatiale (Alcobaça)

Conservation / Divulcation


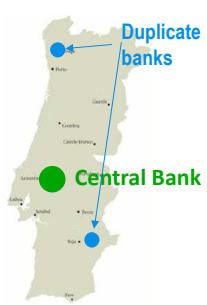
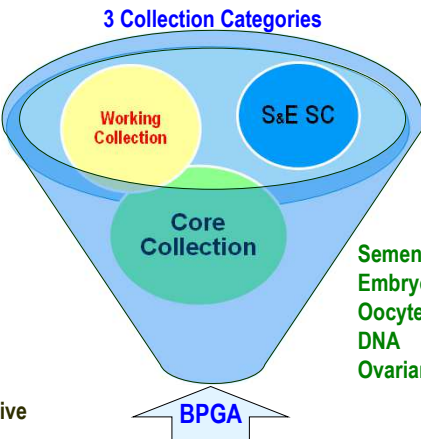


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Ex situ Conservation – in vitro

Portuguese Animal Germplasm Bank (BPGA) Set 2010

Repository of genetic material from all Portuguese local breeds (Cattle, sheep, goats, chicken, horses, ass, pigs and ... dogs)

BPGA management


- 2 Public Institutions (INIAV + DGAV)
- Committee (2 INIAV + 2 DGAV + 3 Representative Stakeholders)

3 Collection Categories

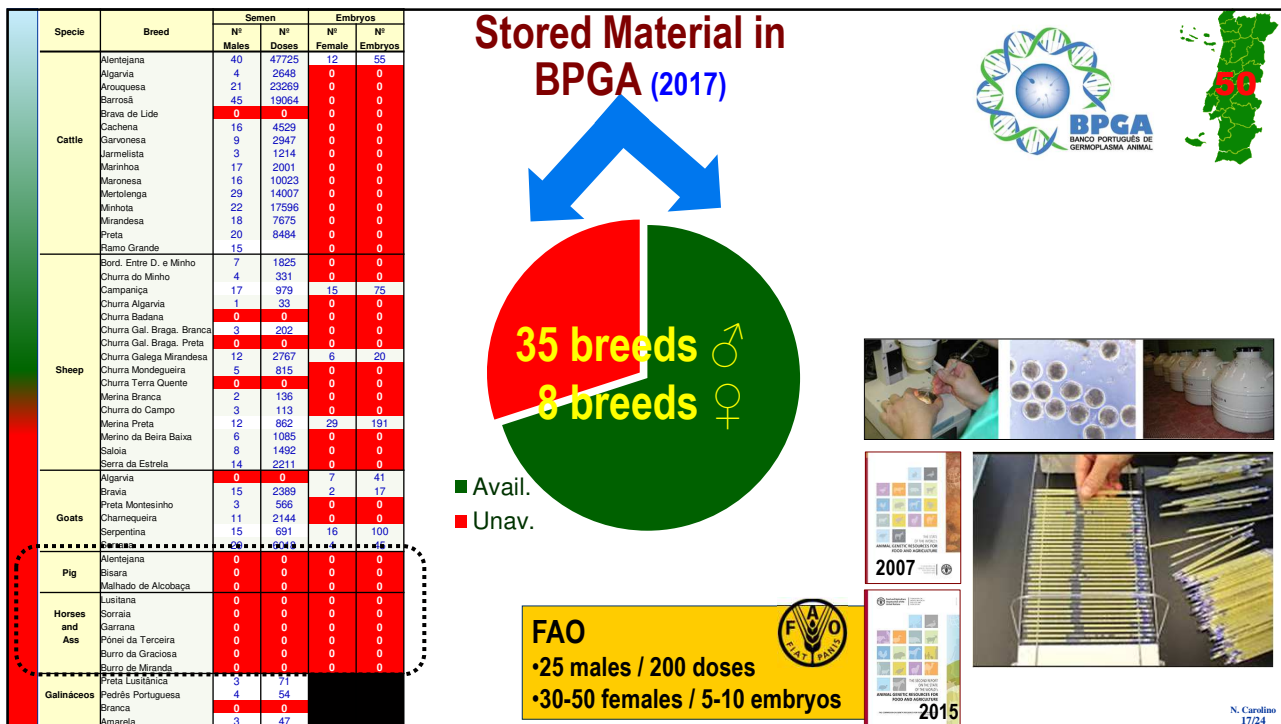
- Working Collection
- S&E SC
- Core Collection

Semen Embryos Oocytes DNA Ovarian tissue

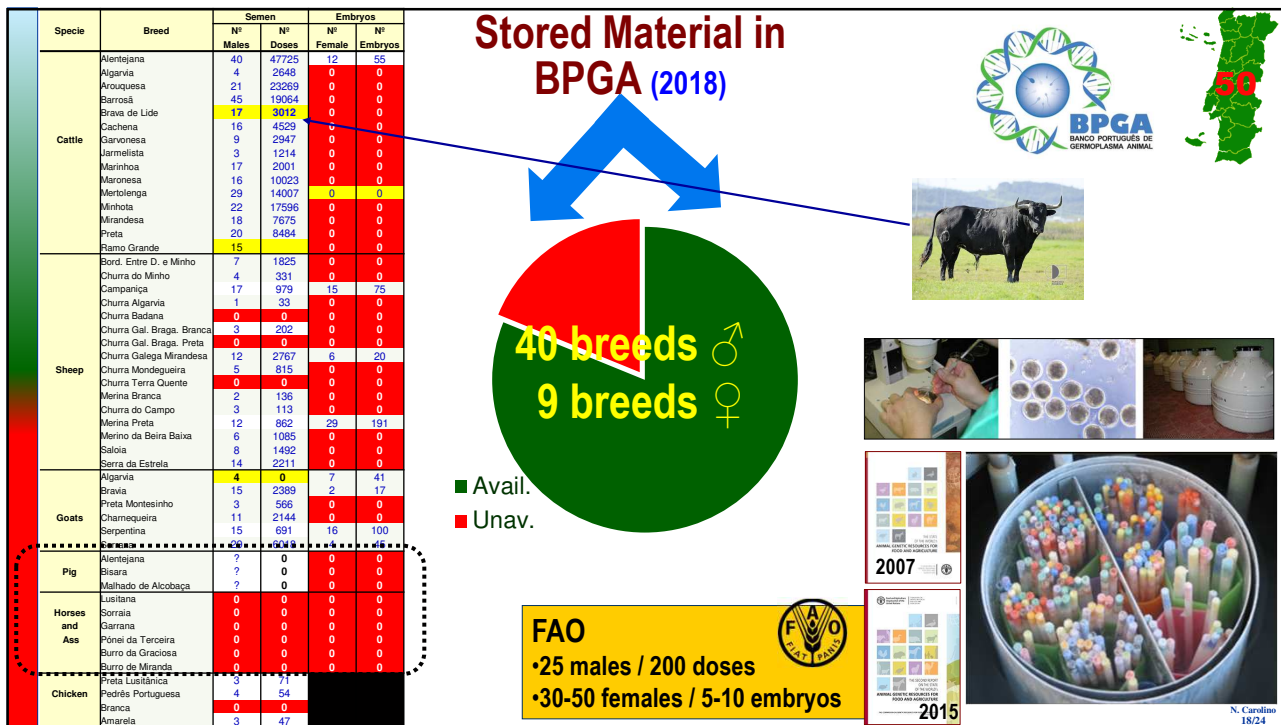
BPGA



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Stored Material in BPGA (2022)

Specie	Breed	Semen		Embryos	
		Males	Doses	Female	Embryos
Cattle	Alentejana	44	47725	12	55
	Algarvia	4	2549	0	0
	Arouquesa	33	25669	0	0
	Barrosã	82	25064	0	0
	Brava de Lide	17	3012	0	0
	Cachena	23	5629	0	0
	Garvonesa	9	2947	0	0
	Jarmelista	3	1214	0	0
	Marinho	17	2001	0	0
	Maronesa	32	13923	0	0
	Mertolenga	29	14007	3	10
	Minhota	59	21196	0	0
	Mirandesa	18	9775	0	0
	Preta	20	8484	0	0
	Puro Grande	15		0	0
Sheep	Bord. Entre D. e Minho	7	1825	0	0
	Churra do Minho	4	331	0	0
	Campaniça	17	979	15	75
	Churra Algarvia	1	33	0	0
	Churra Badana	?	?	0	0
	Churra Gal. Braga. Branca	3	202	0	0
	Churra Gal. Braga. Preta	?	?	0	0
	Churra Galega Mirandesa	12	2767	6	20
	Churra Mondegueira	5	815	0	0
	Churra Terra Quente	?	?	0	0
	Merina Branca	2	136	0	0
	Churra do Campo	3	113	0	0
	Merina Preta	12	892	29	191
	Merino da Beira Baixa	6	1085	0	0
	Saloia	8	1492	0	0
Serra da Estrela	14	2211	0	0	
Goats	Algarvia	4	70	7	41
	Brava	15	2389	2	17
	Preta Montesinho	3	566	0	0
	Charnqueira	11	2144	0	0
	Serpentina	15	691	16	100
Serrana	29	6018	4	45	
Pig	Alentejana	?	?	0	0
	Bisara	?	?	0	0
	Malhado de Alcobaca	?	?	0	0
Horses and Ass	Lusitana	?	?	0	0
	Sorraia	5	363	0	0
	Garrana	19	576	0	0
Chicken	Pónei da Terceira	0	0	0	0
	Burro da Graciosa	0	0	0	0
	Burro de Miranda	0	0	0	0
Chicken	Preta Lusitânica	18	351		
	Pedrés Portuguesa	20	362		
	Branca Amarela	7	140		

47 breeds

9 breeds

■ Avail.
■ Unav.

FAO

•25 males / 200 doses

•30-50 females / 5-10 embryos

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Data Management of Animal Genetic Resources IMPROVED

Electronic Identification

New Software specific to AnGR (BB's / CP / BP)

Online Platform

GENPRO

<https://genpro.ruralbit.co>

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AnGR Promotion and Divulagation Activities

Every year

Fairs, Competitions, Exhibitions, Meetings, ...

Promotion and Dissemination

21

Demonstration activities involving children

"O Pinto vai à Escola"

3. Como vivem as galinhas?

Galinhas e Galos

"O Pinto vai à Escola"

7. Como controlar a incubação?

ovoscópio

"O Pinto vai à Escola"

9. Final do projeto

"O Pinto vai à Escola"

4 Raças Portuguesas

Amarela

Branca

Preta Lusitânica

Pedra Portuguesa


• Distribuídas por todo o País
 • Número reduzido de animais — Consideradas em risco de extinção
 • Adaptadas ao meio ambiente — Elevadas resiliência do gado
 • Criação ao ar livre — Produção de carne e de ovos de qualidade


Conservação da Biodiversidade e desenvolvimento sustentável

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Sustainability of Local Breeds

Conservation

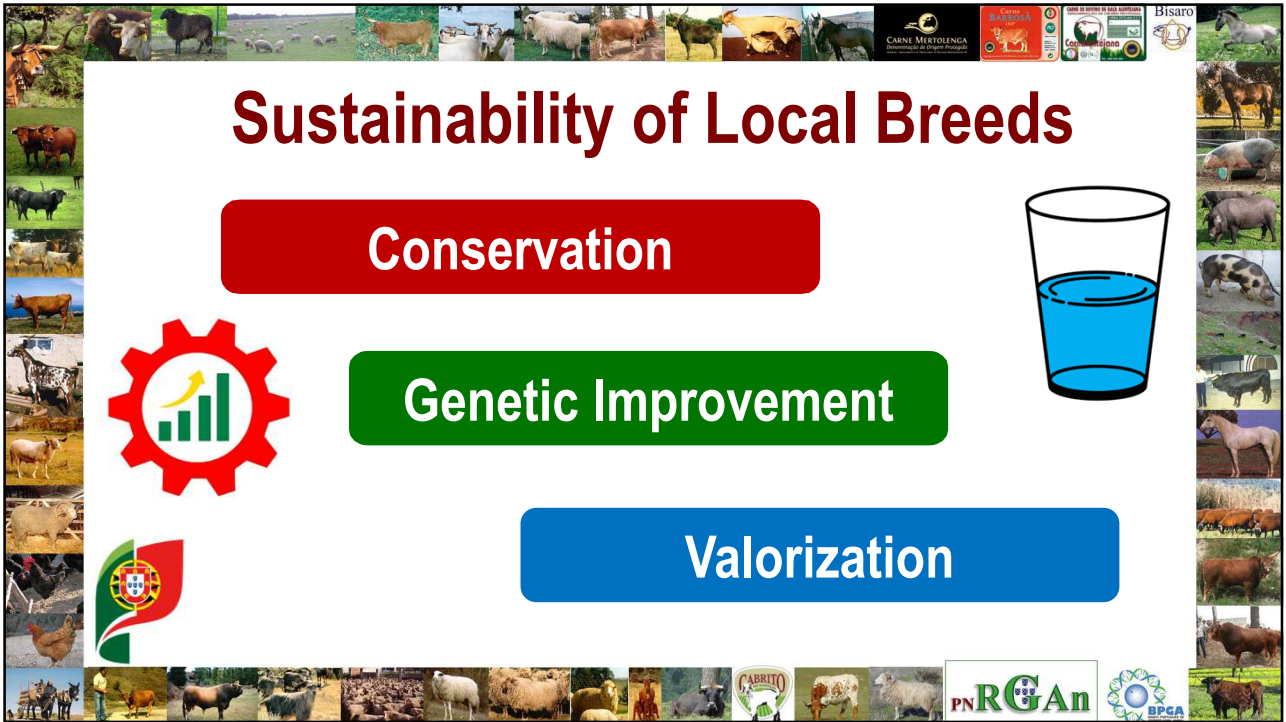




Genetic Improvement



Valorization



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"Challenge forever"

Obrigado



#POFRA
EURO2016
EURO2016.COM
2021

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