Portuguese *Equidae* native breeds: main characteristics, census and demographic parameters

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**71ˢᵗ Annual Meeting of European Federation of Animal Science
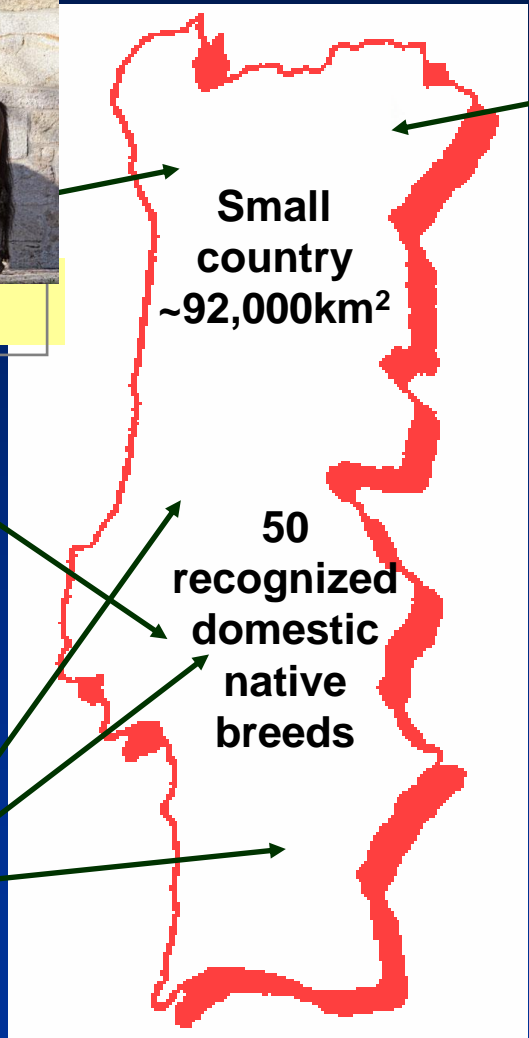Virtual Meeting - December 2020**

Portuguese Native Breeds
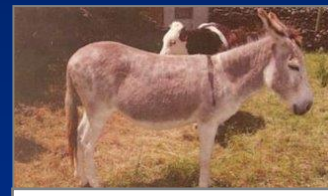
4 Equine

Garrano

Sorraia

Lusitano

Small country ~92,000km^2

50 recognized domestic native breeds

2 Donkey

Miranda Donkey

Terceira Poney

Graciosa Donkey

PORTUGAL

Lusitano Horse

- Main equine native breed in Portugal
  - Hotblooded horse, mediline, eumetric (BW~500kg), HW ~1.60m, close studbook

- Extraordinary versatility:

  - Bullfighting, Dressage, Carriage Driving, Working Equitation, Portuguese Classical Riding, Model and Movements Competitions, Show Jumping, Horse-ball, Vaulting, Eventing, TREC, Equestrian Art, Cattle work, Fieldwork, Cinema, Leisure,...
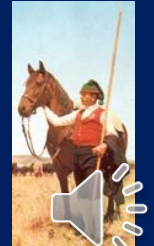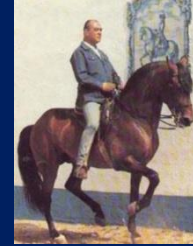
Lusitano Demography

- Small census of 3623 broodmares (½ in Portugal)
  - Remaining abroad, spread around the globe, mainly in Brazil, Spain, France, Mexico, Belgium, England, Germany, Italy, Canada, USA, South Africa, Switzerland, ... (births in 32 ≠ countries)
  - 20 different foreigner breeding associations

- Mean generation interval:
  - ♂ 11.33±5.23yr and ♀ 9.71±4.48yr

- Mean Nb equivalent generations:
  - 11.20±0.71

- Average inbreeding:
  - 11.34±7.48%   ΔF/year 0.173±0.070 Ne = 28

Garrano Pony

- Mainly bred in mountains (semi-wild)
  - Max. HW 1.35m (ideal 1.23m; μ=1.29m)
- Concave or straight profile of head
  - Reproved all animals with convex profile
- Only bay color accepted
  - Eliminated all others
- Same branding for all animals registered in Studbook
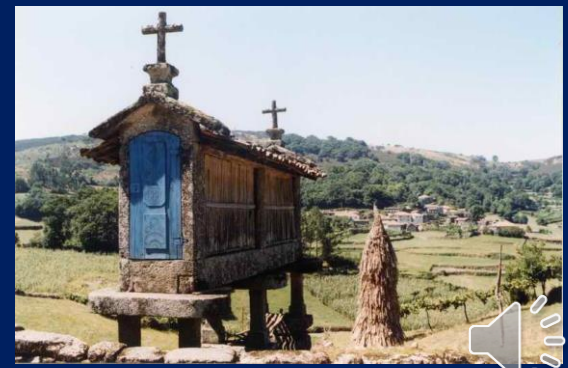
Garrano Pony

- Small horse from Northeast POR:
  - 1994 broodmares; close studbook
  - 162 stallions, 435 breeders.
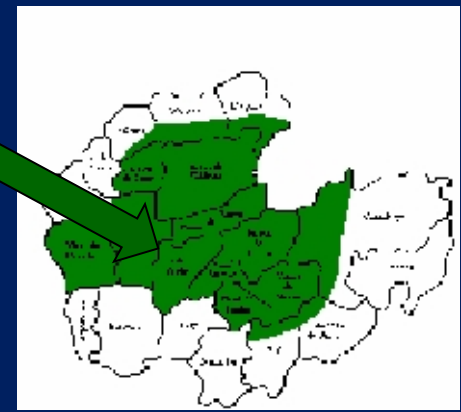- Uses: *In*: Carolino et al., 2019
  - Saddle, transport, light carriage;
  - Agricultural works, very resilient;
  - Eco-tourism, social and cultural events;
  - Landscape preservation and rural areas.
- Problem of consumption of foals by Iberian wolf
- Lack of pedigree info (2 known generations)
- Average inbreeding ~2.2%, AR 5% (ΔF/gen=0.86%, Ne=58)

71st EAAP, Vicente et al. 2020
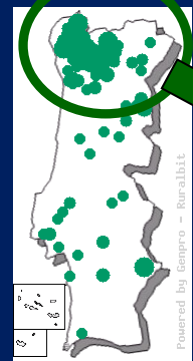
- Primitive breed from southwest Iberian Peninsula

  - Universal genetic resource descending from only 12 founders;

  - Close studbook and population since 1937 with only 18 breeders (10 POR + 8 GER)

  - ~150 broodmares; total ~350 animals worldwide

- Breed standard:

  - Type: sub convex profile, elipometric and mediline; Dun/Grullo, primitive colors

  - HW average: 1,44m (♀) and 1,48m (♂);

  - Very balanced proportions and conformation

71st EAAP, Vicente et al. 2020

- Skills and uses:
  - Saddle horse, carriage driving, disabled riding and small agricultural work

- Very resistant and versatile

- Very low genetic variability
  - High inbreeding (Mean=38%; $\Delta F/gen$=5.2%)
  - 7.46 effective founders, 4 effective ancestors
  - 97% living pop with Fx > 25%

In: **Kjollerstrom, 2016**

António Vicente | https://autoctones.ruralbit.com

71st EAAP, Vicente et al. 2020

Terceira Pony

- Recently recognized as native equine breed (2014)
- Small pony from Azores islands
  - HW ~1.28m; BW 250-270 kgs
  - Less than 100 animals (Open SB);
    - ✓ From only 14 founders (6 sires + 8 dams)
    - ✓ High risk of genetic erosion
  - All different colors accepted
  - Balanced, mediline, elipometric

  In: Lopes et al., 2015

- Skills/Uses:
  - Saddle for young riders;
  - Light carriage driving, agriculture;
  - Eco-tourism, social and cultural events;
  - Landscape preservation and rural areas.

71st EAAP, Vicente et al. 2020

Miranda Donkey

- Spread in Miranda plateau (northeast Portugal)
- Long bay coat animal; HW >1.30m; calm behavior
- Demographic parameters (2020):
  - 756 females & 60 stallions registered on Studbook
  - 460 breeders (mean age > 66 years old)
  - Very low % of breeding ♀/year <20%
  - High mortality rates in youngsters
  - Increasing inbreeding (low nb stallions)
  - Generation interval=9.3 yr; Only 8% ♂ with sons.

In: Quaresma, 2015

- Uses/skills:
  - Transport (on back), people and products;
  - Agricultural works, Eco-tourism;
  - Donkey therapy / disabled riding;
  - Leisure, social and cultural events;
  - Milk for food and cosmetic industry.

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In: www.aepga.pt

71st EAAP, Vicente et al. 2020

Graciosa Donkey

- Last recognized breed (2015)
- Scarce info, very small census
  - Total of 92 dams; only 22 in reproduction
  - 13 stallions & 63 breeders
- Dwarf population, very small size (HW ~1,06m)
- Skills/uses:
  - Leisure, transport, agricultural works, Eco-tourism; milk production; conservation;
  - Donkey therapy.

71st EAAP, Vicente et al. 2020

Portuguese native breeds

Thanks

Book of Abstracts of the 71st Annual Meeting of the European Federation of Animal Science

Portuguese Equidae native breeds: main characteristics, census and demographic parameters
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The aim of this study was to summarise the main characteristics of the Portuguese *Equidae* native breeds. Portugal is a small country from the southwest of Europe with 50 recognised domestic native breeds. Among them there are 6 *Equidae* breeds, 4 equine (Lusitano, Sorraia, Garrano and Terceira pony) and 2 donkey populations (Miranda and Graciosa). In this review we present an overall census of each population, average body weight, height at withers, skills and uses, dynamics in the studbook and some demographic parameters such as known generations, generation interval and inbreeding. Lusitano horse is the main equine breed, with a close studbook and small census of 3,623 breeding females (half outside Portugal), spread around the globe with more than 30 countries breeding it. The Garrano pony is a small horse from the northwest, with a close studbook, with 1,994 breeding females, 162 stallions, and 435 breeders. Sorraia horse is a primitive southern European breed regarded as an universal genetic resource, very resistant and versatile, managed as a close population since 1937 with only 18 breeders, ~150 breeding females and a total of ~350 animals worldwide. Terceira Pony, from Azores, with an open studbook, was the last to be recognised (2014), with a total of ~100 animals descending from 14 founders. The Miranda donkey from the northeast is a long bay coat animal, with a calm temperament suited for agriculture, milk production and leisure, with a total of 756 females, 60 stallions and 460 breeders. The Graciosa donkey, from Azores, is the most recently recognised donkey breed (2015). With a very small size, a scarce census of 92 dams, of which only 22 are in production, 13 stallions and 63 breeders, are bred for conservation, tourism and milk production. Beside the opportunities for research and conservation programs, all these breeds represent important socio-economic and ecological values, that will enhance the sustainability of Mediterranean production systems. Acknowledgement: Project CIISA UID/CVT/00276/2020.

The use of estimated breeding values (EBVs) to improve lamb performance and carcase composition
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Sire and dam genetics are both significant determinants of lamb performance and meat quality. Genetic improvement on commercial sheep farms is largely realised through the purchase of breeding males. The adoption of estimated breeding values (EBVs) into flock breeding programmes can increase both animal performance and the rate of genetic gain within sheep populations. However, at present it is estimated that only 40% of sheep holdings in the UK use EBVs to select new breeding sires. The objective of this study was to evaluate the effect of sire EBV on the performance, carcase characteristics and meat quality of their progeny. This study involved 637 ewes over two breeding years. Ewes were artificially inseminated with 23 different terminal sires from two breeds (Suffolk and Texel), with either a high or low EBV for muscle. A total of 1,171 lambs were born, weighed at birth, and then fortnightly until slaughter. All lambs were ultrasound scanned at a mean age of 14 weeks, with muscle depth and fat depth being measured. In addition, a subset of 160 lambs were scanned using computer tomography (CT) at a mean age of 15 weeks. CT scanning was used to determine the relative proportions of muscle, fat and bone within each third of the body (fore, saddle and hind). Lambs were drafted for slaughter at approximately 45 kg live weight (LW). At slaughter, carcase weight, conformation and fat classification were recorded for all lambs. The saleable meat yield proportion of 277 carcases were calculated. In addition, a meat sample from the loin was retained from each of these carcases for instrumental meat quality measurements (colour, ultimate pH, cooking loss and Warner Bratzler shear force). Results indicate that lambs from the high EBV sire group had a higher muscle depth and muscle:fat ratio and reached target slaughter weight earlier than lambs from the low EBV sire group. Thus, this study provides an evaluation of the potential to improve lamb performance through the use of EBVs.