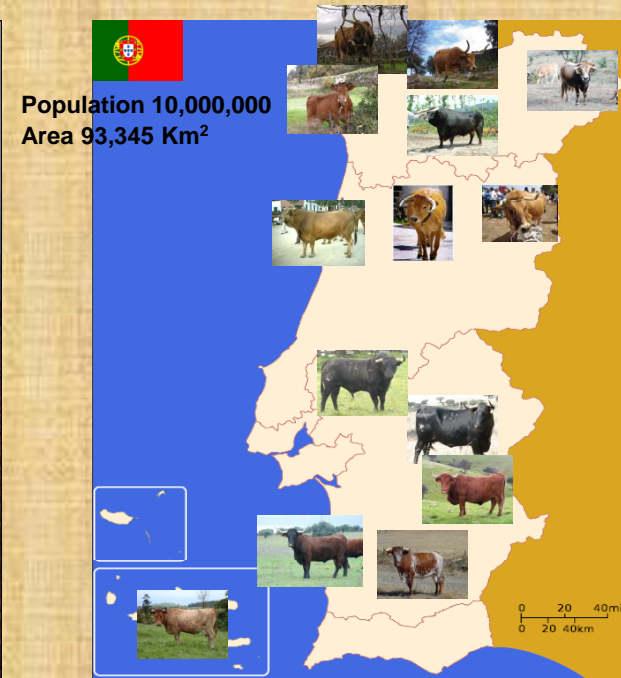




Contribution of Protected Designation of Origin (PDO) beef for sustainable agriculture and meat quality in Portugal



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Protected productions in UE



- Protected Designation of Origin (PDO)
- Protected Geographical Indication (PGI)
- Traditional Speciality Guaranteed (TSG)

Linking Products and Their Origins

(Council Regulation (EEC)
Nº. 2081/92 & 2082/92)

➤ **PDO** - used as a designation for an agricultural product or a foodstuff:

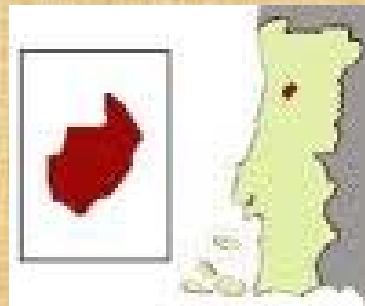
- which comes from such an area, place or country,
- whose quality or properties are significantly or exclusively determined by the geographical environment, including natural and human factors,
- whose production, processing and preparation takes place within the determined geographical area.

PDO status: product must be traditionally and **ENTIRELY** manufactured (prepared, processed **AND** produced) within the specific region and thus acquire unique properties.

Protected productions in UE



PGI status: product must be traditionally and at least **PARTIALLY** manufactured (prepared, processed **OR** produced) within the specific region and thus acquire unique properties.



TSG status: product does not have to be manufactured in a specific geographically delimited area; it is sufficient that it be traditional and different from other similar products

Protected productions in EU



Objectives ^[1;2]

- Protect the reputation of the regional foods,
- Preserve traditional methods of food production,
- Promote rural and agricultural activity,
- Encourage people to stay settled in rural areas,
- Help producers to obtain a premium price for their products,
- Eliminate the unfair competition and misleading of consumers by non-genuine products, which may be of inferior/different quality,
- Increase consumer confidence by certifying that foods with a PDO/PDI/TSG label are produced to a basic standard.

PDO beef in Portugal

PDO & PGI in PORTUGAL (2003)

Borrego do Baixo Alentejo (PGI)
Borrego de Montemor-o-Novo (PGI)
Borrego Serra da Estrela (PDO)
Cabrito das Terras Altas do Minho (PGI)
Cabrito da Gralheira (PGI)
Cabrito da Beira (PGI)
Cabrito Transmontano (PDO)
Carne Barrosã (PDO)
Carne Maronesa (PDO)
Carne Mirandesa (PDO)
Vitela de Lafões (PGI)
Borrego da Beira (PGI)
Cabrito de Barroso (PGI)
Borrego Terrincho (PDO)
Carnalentejana (PDO)
Carne Arouquesa (PDO)
Carne Marinhoa (PDO)
Carne Mertolenga (PDO)
Cordeiro Bragançano (PDO)

• 19 PDO/PGI “meat” labels in 2003

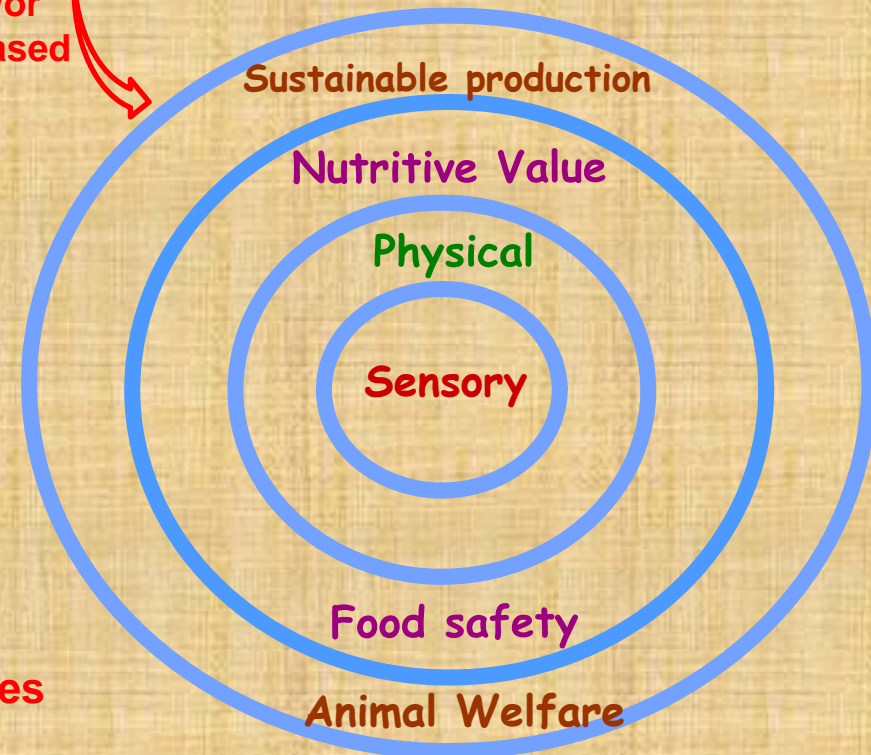
• 12 PDO/PGI beef labels in 2007

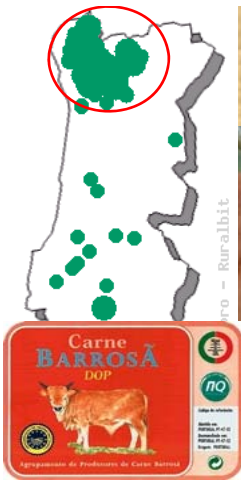
Portugal is the country of the EU with the largest number of beef with protected names

**Portuguese
PDO beef**

**Unique
and/or
increased**

- Specific genotype
- +
- Geographic region
- +
- Traditional agricultures practices (...)





Barrosã



Cachena

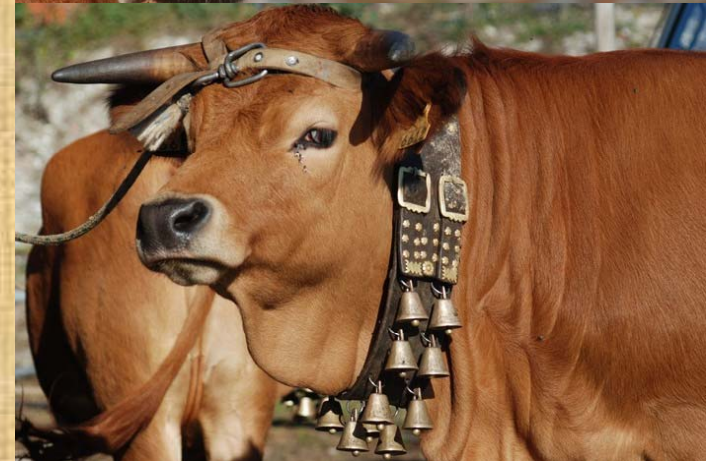


**PDO
beef
Breeds**

Maronesa



Aroquesa



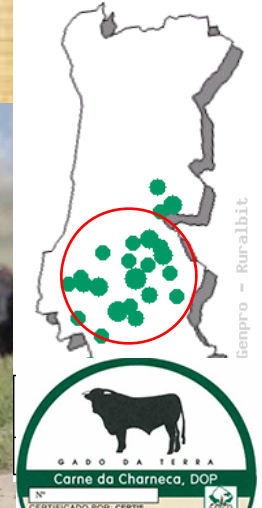
PDO
beef
Breeds



Minhota



Preta



**PDO
beef
Breeds**



Garvonesa



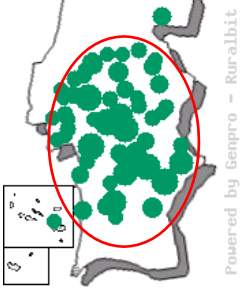
Mirandesa



PDO
beef
Breeds



Mertolenga



PDO
beef
Breeds










Alentejana



PDO beef framework in Portugal

Actors

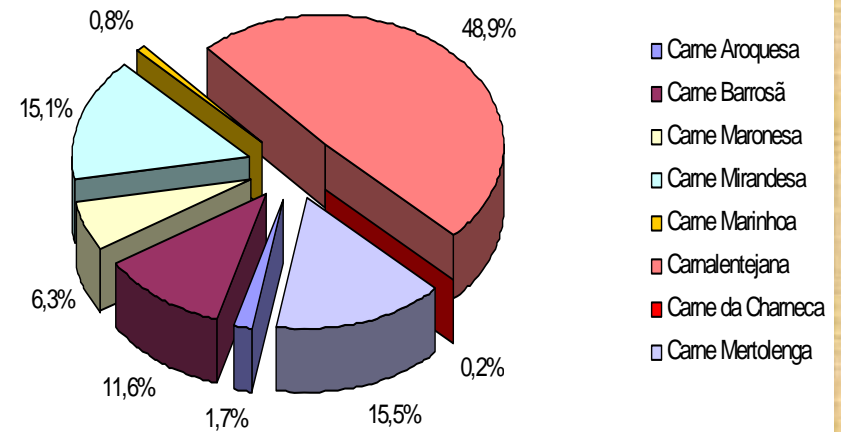
- producer group (collect animals for slaughter, marketing of meat)
- certifying entity (verifying compliance with the specifications book)
- entity holding the herd book (genealogy, records, identification)

[3;4;11]	DOP	Prod. Group	Nº Adult ♀	Cert. Ent.
		ANCRA	5,800 (2008)	Norte e Qualidade
		CAA Arcos Vald.	1,300 (2008)	Norte e Qualidade
		CA Vila Real	5,928 (2006)	Trad. e Qualidade
		CAPOLIB	7,500 (2004)	Norte e Qualidade
		AGROPEMA	5,821 (2008)	Trad. e Qualidade
		ACB Marinhoa	2,300 (2008)	Norte e Qualidade
		CARNALENTEJANA	9,744 (2008)	Certialentejo
		MERTOCAR	10,215 (2008)	Certialentejo
		MERTOCAR	5,126 (2007)	Certialentejo
9		8	53,734	4



PDO beef in Portugal

PDO/year ^[12]	2003	2004	2005
Carne Arouquesa	39.5	35.6	36.0
Carne Barrosã	266.2	243.2	248.8
Carne Maronesa	81.0	110.0	134.5
Carne Mirandesa	296.4	310.0	325.3
Carne Marinhoa	24.1	124.4	181.0
<i>Carnalentejana</i>	<i>991.4</i>	<i>623.9</i>	<i>1051.5</i>
Carne da Charneca	9.2	9.5	3.5
Carne Mertolenga	261.0	267.0	334.0
Total (carcass tons)	2114	1901	2479



Although a study revealed that 34% of the consumers are willing to pay an higher price for PDO labelled beef, the PDO beef production was **less than 5%** of the total beef production in Portugal (118 000 carcass tons in 2005).

Specific Genotypes

- North African cattle genetic influences in Portuguese breeds [6]
- High genetic diversity. Some breeds with ancestral haplotypes derived from Aurochs [6]
- Some native breeds are in high risk

Mirandesa

Maronesa

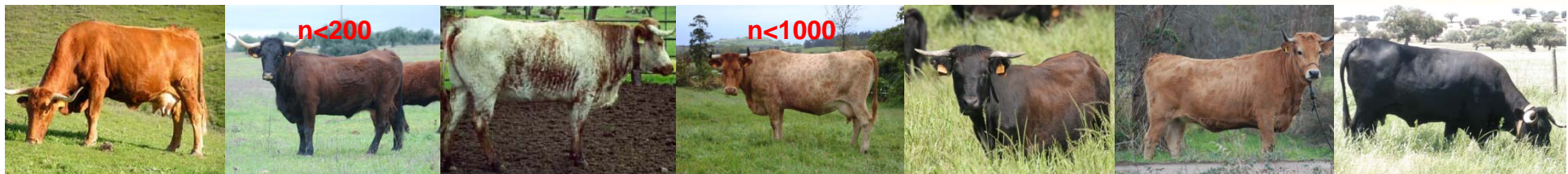
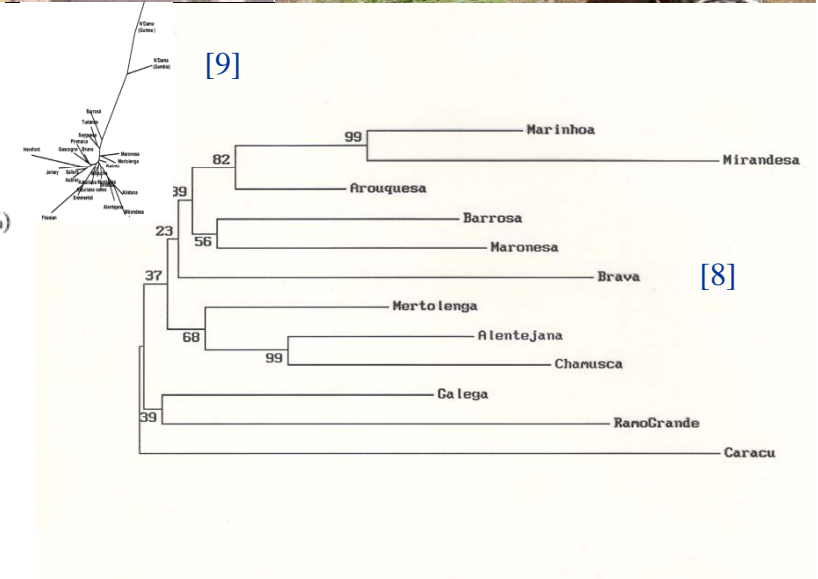
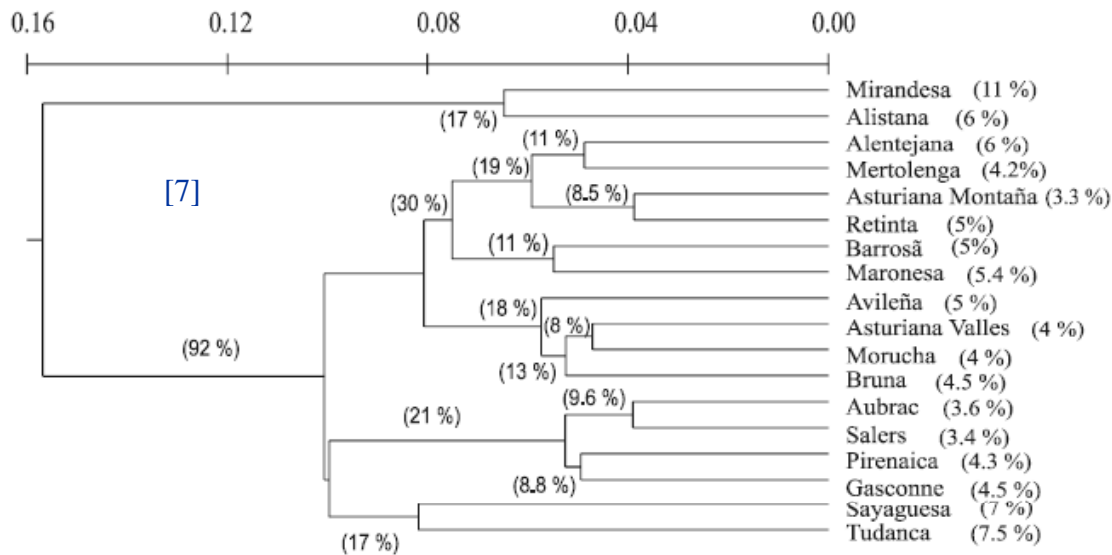
Barrosã

Cachena

Minhota

Arouquesa

Jarmelista



Alentejana

Garvonesa

Mertolenga

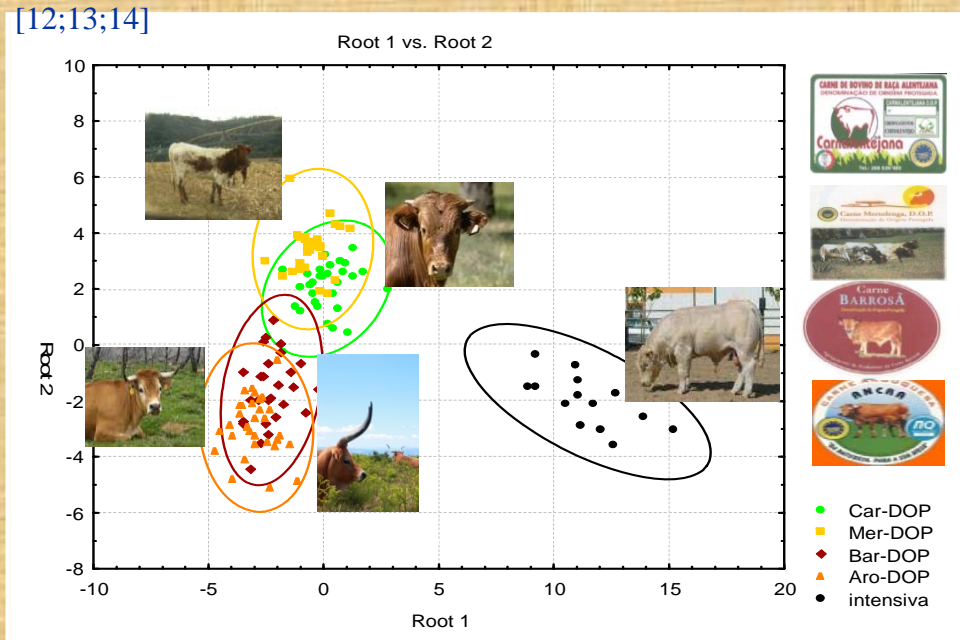
Ramo Grande

Brava

Marinhoa

Preta

Geographic region + Production system



- PCA using IMF FA profile distinguishes PDO beef of meat obtained in intensive production.

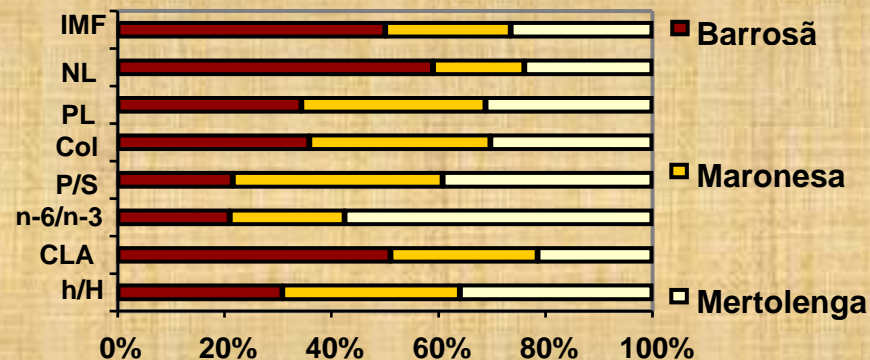
- Barrosã and Arouquesa (Maronesa, Cachena and Mirandesa) PDO meats have their origins on purebred calves fed with farm products and suckling from cows grazed on natural pastures.

Lipid fraction [12;13;14]	Alent DOP	Mert DOP	Barro DOP	Arouq DOP	Int. Prod.
IMF (mg/g)	11-22	12-18	16-23	17-30	9-15
Coolest. (mg/g)	0,42-0,49	0,40-0,50	0,42-0,56	0,49-0,53	0,35-0,37
PUFA/SFA	0,32-0,63	0,36-0,68	0,19-0,29	0,17-0,29	0,40-0,84
n-6/n-3	10-14	7-15	3	2	17-20
CLA (mg/g IMF)	4-5	3-4	7-9	7-9	4

- Alentejana and Mertolenga PDO meats are obtained from young bulls, in general, finished on concentrates.

Nutritional Composition

- Portuguese PDO meat is lean (< 3% intramuscular fat: longissimus L4-L6).
- Arouquesa Barrosã and Mirandesa PDO veal have typical pasture fed characteristics (high levels of n-3 PUFA and t11c13 and c9t11 CLA isomers).
- Alentejana and Mertolenga PDO beef have typical values close to those obtained in animals raised on concentrates. [12;13;14]
- Barrosã (15-34 mg/150 g) > 2x total CLA than Mertolenga (7-15 mg/150 g). [15]



The role of PDO Beef-Conclusions

- Preserve native breeds (**Portuguese understanding**) - maintain overall diversity and biodiversity in rural areas
- Establish farmers in rural areas.
- Refrain desertification of mountain areas (maintenance of mountain pastures).
- Preserve traditional methods of beef production.
- Help producers to obtain a premium price for their meat.
- Protect small-scale differentiated productions.
- Obtain meat with unique sensory attributes (resulting from a unique interaction genotype×environment)
- Obtain healthier meat from extensive production systems (IMF with more favorable n-3 PUFA, CLA and P/S levels)



- [1] Geographical Indications and the challenges for ACP countries, a discussion paper (April 2005). ([agritrade.cta.inhttp://agritrade.cta.int/en/content/view/full/1794](http://agritrade.cta.int/en/content/view/full/1794)).
- [2] INFORMATION NOTE ON PROTECTED DESIGNATION OF ORIGIN (PDO), PROTECTED GEOGRAPHICAL INDICATION (PGI) & TRADITIONAL SPECIALITY GUARANTEED (TSG) (2003). Department of Agriculture, Food and Rural Development. Food Division, Dublin.
- [3] Faria M. M. (2007). OS CORNOS DO AUROQUE - RAÇAS DE BOVINOS NO ENTRE DOURO E MINHO. DRAP-N (http://www.drapn.min-agricultura.pt/drapn/conteudos/cen_documentos/outros/OsCornosdoAuroque.pdf).
- [4] Leite, J.A.M.V. (2008). BIODIVERSIDADE DOMÉSTICA. SEMINÁRIO BIODIVERSIDADE DOMÉSTICA E PRODUTOS DE QUALIDADE. Vieira do Minho.
- [5] Oliveira V. (2007). Produtos tradicionais com nomes protegidos. DGADR. (<http://www.gppaa.min-agricultura.pt/valor/doc/pub2005.pdf>).
- [6] Ginja C., Gama, LT, Penedo MCT (2008). MOLECULAR CHARACTERIZATION OF PORTUGUESE NATIVE CATTLE BASED ON AUTOSOMAL, Y CHROMOSOME AND mtDNA MARKERS. Conservation Genetics Meeting, Salzburg November 2008.
- [7] Cañon, J. et al. 2001. *Genet Sel & Evol*, 33: 311-332.
- [8] Mateus, J.C. et al. 2004. *Anim. Genet*, 35: 106-113.
- [9] A. BEJA-PEREIRA et al. 2003. *Journal of Heredity*, 94: 243-250.
- [10] Consumo de carne em Portugal. Estudo da Euroteste.
- [11] A Mirandesa, a Raça e a Carne (2009). <http://www.mirandesa.pt/Documentacao/infotecnica.htm>
- [12] Alfaia et al. 2006. *Meat Sci*. 72: 425-436.
- [13] Alfaia et al. 2007. *Meat Sci*. 76: 787-795.
- [14] Alfaia et al. 2007. *Meat Sci*. 75: 44-52.
- [15] Costa et al. 2006. *Meat Sci*. 72: 130-139.

Thank you

