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TÉCNICO LISBOA



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“Alentejo’s beef farms economic and environmental performance through a regionally developed decision support tool”

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- The **largest region in Portugal**, covering most of the southern part of the country;
- From the approximately 2 million ha of useful agricultural area in Alentejo, **67% are permanent pastures**;
- There are approximately 1 million bovines in mainland Portugal, **57% of which are located in Alentejo**;
- Production is obtained mainly through extensive cow grazing, in so called **pasture-based beef farms – PBBF**.

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The case study

- On average, **PBBF** in Alentejo have 182 ha, 98 LU and occupy 0.39 full-time equivalent AWU;
- A significant share of pastures are sown biodiverse pastures, with additional capacity for carbon sequestration;
- These farms and respective production systems additionally provide a whole range of **ecosystem services**.



System 1 - Calves fattening

Grazing + roughage and/or concentrate until reach weight for sell for latter finishing abroad



System 2 - Beef

Grazing + roughage and/or concentrate regime until reach weight for slaughter



System 3 – Lamb

Grazing until reach weight for slaughter

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Examples of inputs

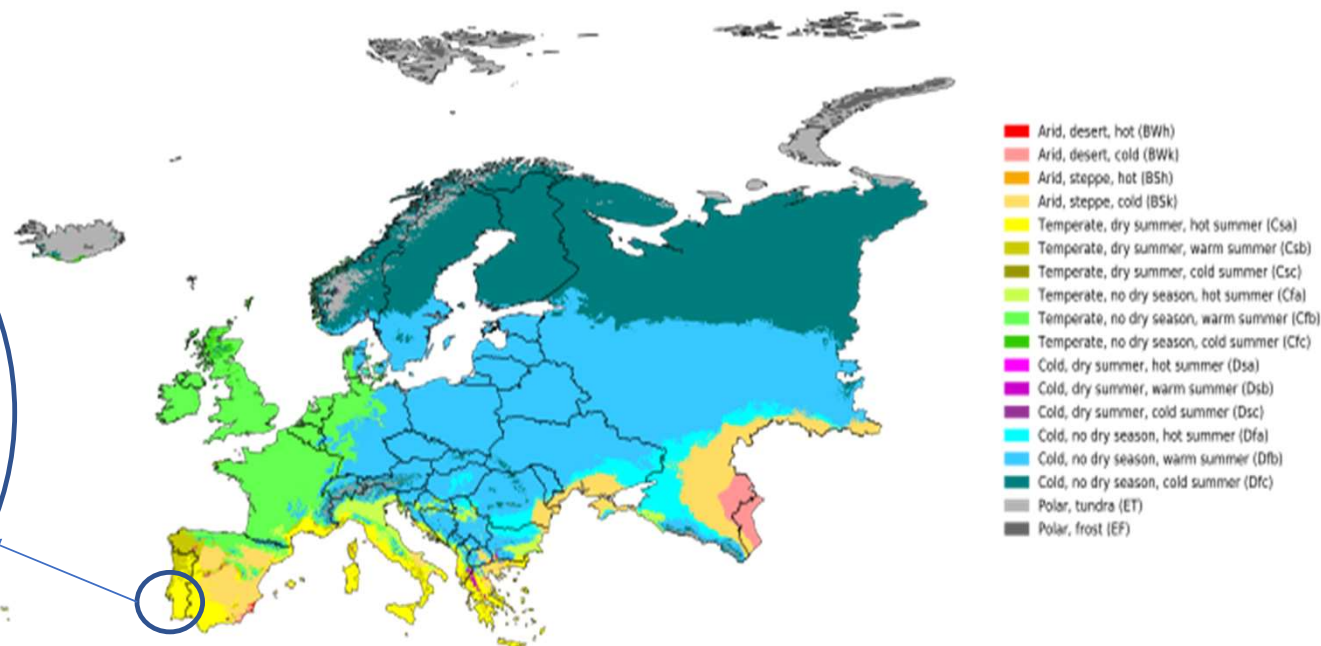
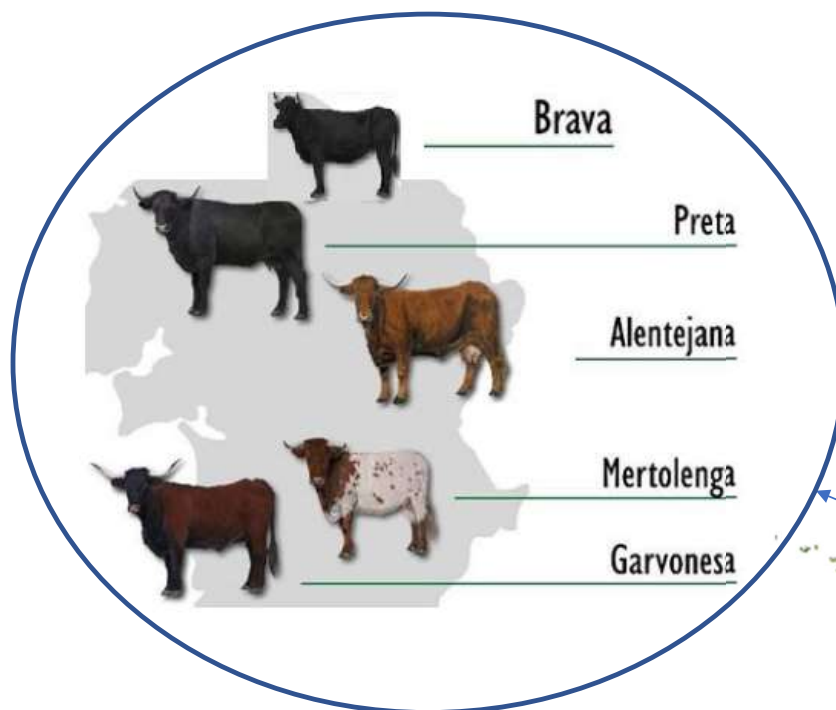
GENERAL INFORMATION	ANIMAL COMPARTMENT	DIET COMPARTMENT	RESOURCES	ECONOMIC
<ul style="list-style-type: none"> • Own Land (ha) • Rented Land (ha) • Legal Form • Farmer Since • Family Labour (hours/year) • Hired Labour (hours/year) • Conventional or Organic • Area In Natura 2000 (ha) 	<ul style="list-style-type: none"> • LivestockType (Cattle/Sheep) • Categor (per age) • Average Number (n°) • Number Of Produced Animals • Age At End of Fattening (months) • Number Of Sold Animals • Live Weight At Sale (kg) • Outdoor Area (ha) 	<ul style="list-style-type: none"> • Diet name • Diet component name (ex: hay) • Diet Component Quantity • Protein Content Fraction • Considered number of animals • Diet Component Quantity 	<ul style="list-style-type: none"> • Diesel Consumption (l) • Electricity Consumption (kw) • Renewable Energy Fraction • Irrigated Area (ha) • WaterAnimals (m3) 	<ul style="list-style-type: none"> • Total Output Vegetal • Total Output Animal • Total SpecificCosts • Total Farming Overheads • Taxes • Total Subsidies On Crops • Total Subsidies On Livestock • Total Support For RD • Decoupled Payments • Depreciation • Wages Paid • Rent Paid • Total Subsidies • Profit



Data collected under the scope of Project “Animal Future”

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The main motivations



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Example of interface (herd management)

TerraPrima ≡ < Ano civil 2020 > ⚙️ 🌐

Efectivo animal Home > Efectivo animal

Mostrando 12 registos Selectionado 1 registo Procurar:

Acções	Descrição	Espécie	Género	Idade	U. De Produção	Origem	Função	Quantidade
	Novilhas de substituição		♀	6 meses a 1 ano	Extensivo	Interno	Reposição	17
	Vacas aleitantes		♀	Mais de 2 anos	Extensivo		Reprodução	88
	Novilhos para carne		♂	6 meses a 1 ano	Extensivo	Interno	Produção de carne	10
	Vitelos e vitelas		♀	Menos de 6 meses	Extensivo		Reprodução	31
	Bois de cobrição		♂	Mais de 2 anos	Extensivo		Reprodução	2
	Ovelhas em vazio		♀	Mais de 12 meses	Extensivo		Produção de leite	218
	Ovelhas paridas		♀	Mais de 12 meses	Extensivo		Produção de leite	61
	Ovelhas em pré-parto		♀	Mais de 12 meses	Extensivo		Produção de leite	118
	Ovelhas em ordenha		♀	Mais de 12 meses	Extensivo		Produção de leite	187

Mapa: + - 📄 📍 Passa o rato sobre uma parcela
 Lat: 40.2700, Lon: -7.4282 Leaflet

Período de pastoreio:
 2020-01-01 - 2020-12-31, 24 h/dia, 15 Parcelas
 Área de pastagens: 197.86 ha (15/48 parcelas)

Alimentos 1 **Produtos** 0 **Fluxo De Animais** 0

Acções	Origem	Alimento	Quantidade	Período De Alimentação
	Interno	Silagem - Milho Para Silagem	369600.0 kg	2020-01-01 - 2020-12-31

TerraPrima tool
TerraPrima

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Economic and Social indicators for PBBF (n=27)

- The ownership of land belongs to the farmers in 23 of 27 of the farms, with 5 renting additional land;
- 4 farmers fully rent the area in exploitation, paying between 46€ and 259€ per ha per year. The average value for the totality of the **rented land is 91 €/ha/year**.
- Only 2 farmers account for land ownership cost;
- 16 owners work directly on the farm, with only 4 not requiring additional workers to operate the farm;
- Corresponding one workforce with 2080 hours of work per year, in average each hectare requires 19.3 hours of work per year, which represents an estimated **yearly cost of 146.29 €/ha in wages**;
- The wages weight on the total output represent between 0% and 82 % of the total output, **27% in average**.

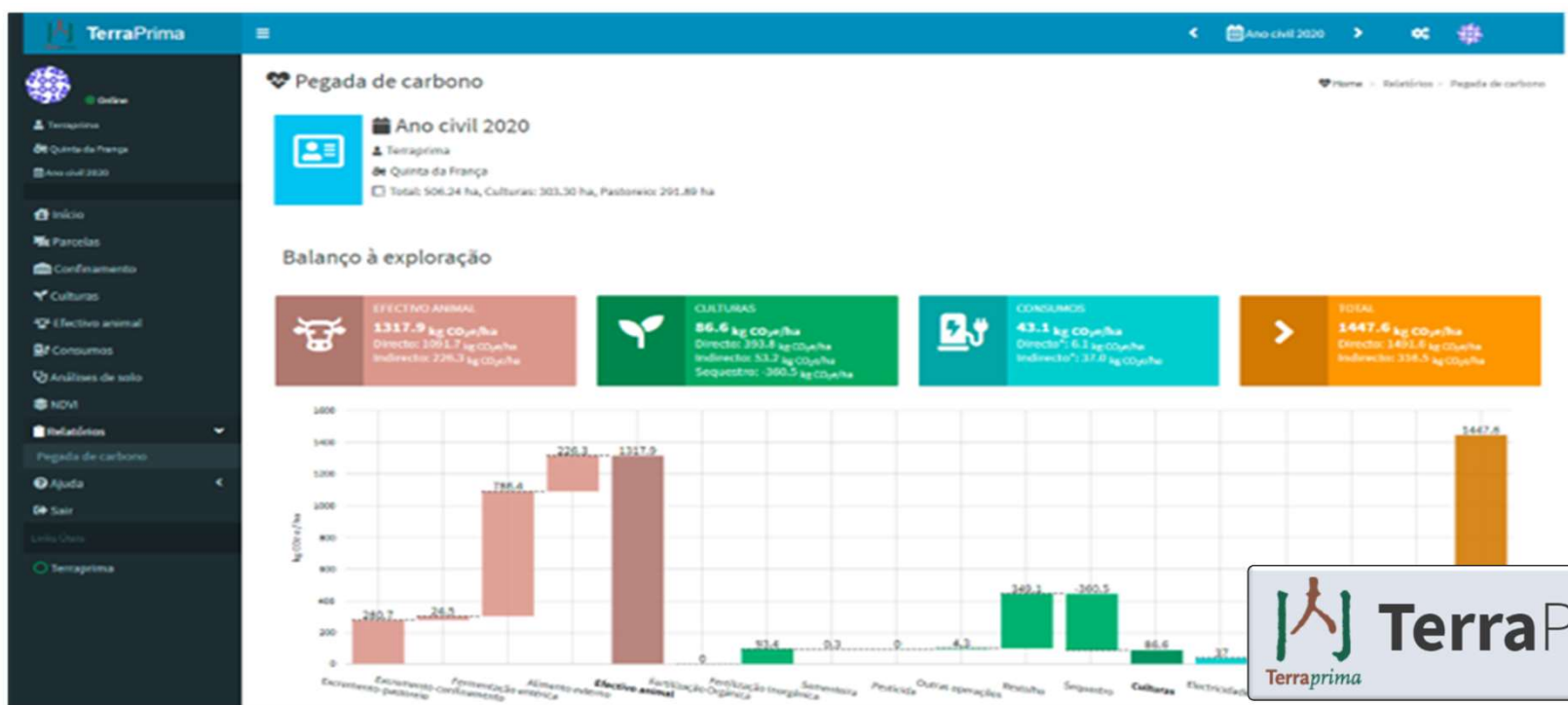
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Economic results for PBBF (n=27)

- Average total farm output of 134K €, from a min of 15K € to a max of 750K €;
- Animal production in average responsible for 87% of the output, min 20% max 100%;
- **Average total output of 256 €/ha, with values lying between 85 €/ha and 690 €/ha;**
- Average variable cost specifically related to animal production represent between 36% to 134% of the total output (w/o wages);
- **Average operational results** (= total output – variable costs – general farm costs) of **2 €/ha**, lying between -378 €/ha and 201 €/ha.
- Profitability of PBBF dependent on the subsidies provided under the CAP framework

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Carbon footprint and resources’ consumption for a single farm



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Carbon footprint results for PBBF (n=25)

Unit: kg CO ₂ eq/kg LW	w/o sequestration	w/ sequestration
Average	22.4	16.6
Median	20.7	17.5
Maximum	52.3	31.5
Minimum	6.9	-17.9

By source (w/o seq)	kg CO ₂ eq/kg LW	Share (%)
External feed	3.9	17%
Crop production	1.3	6%
Enteric fermentation	10.8	48%
Manure management	6.1	27%
Energy & resources	0.3	1%

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Take home messages

- Economically, PBBF are farms specialized in animal production that obtain a **very low operational results per ha**, being subsidies crucial for the maintenance of their activity;
- In environmental terms, **enteric CH4 is the main source** of GHG emissions in PBBF while energy and resources consumption have low relevance;
- For a subset of n=25 PBBF, the average **carbon footprint was 22.4 kg CO₂eq/kg LW**, but considering **carbon sequestration this value decreased to 16.2 kg CO₂eq/kg LW**;
- **TerraPrima tool** is an integrative and useful tool that fully assess the economic and environmental effects of beef production in Alentejo, **taking in account regional specificities**.



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Thank you for your attention!
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