Alliance for Mediterranean Nature & Culture

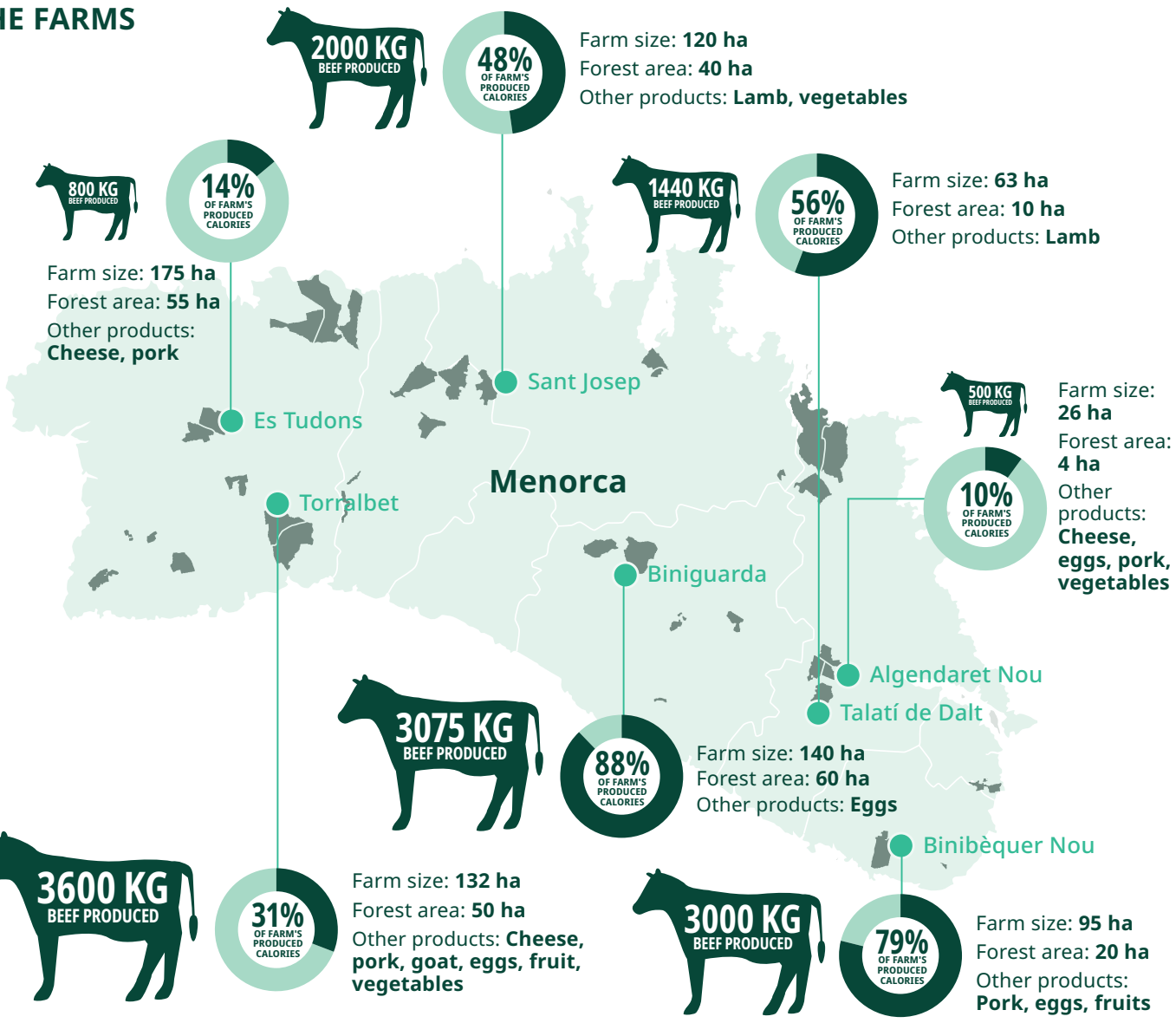
Many Paths · One Mediterranean

Foodnected

Ecological Footprint: beef products from Menorca's Custòdia Agrària programme

We set out to calculate the Ecological Footprint of beef produced on seven farms on the island of Menorca. All the farms are part of the Custòdia Agrària programme, and use sustainable management techniques. We then compared the average results with national Spanish figures for conventionally and intensively produced beef. The study showed that the Menorcan model has a significantly lower environmental impact.

THE FARMS



Custòdia Agrària

Custòdia Agrària – 'Agrarian Stewardship' – is a programme run by GOB Menorca. It works with farmers on the island to support sustainable production models for everything from beef to fruit and vegetables, reducing negative environmental impacts while maximizing conservation benefits, and increasing the value and visibility of their products.

Ecological Footprint

The Ecological Footprint is a method created by Global Footprint Network to measure human demand on natural capital. In this context, we're using it to measure how much of the planet's natural resources are required to produce a kilo of beef and make it available to consumers.

Biocapacity is the other side of the ecological balance sheet. It tracks the natural assets available to us, and their productivity.

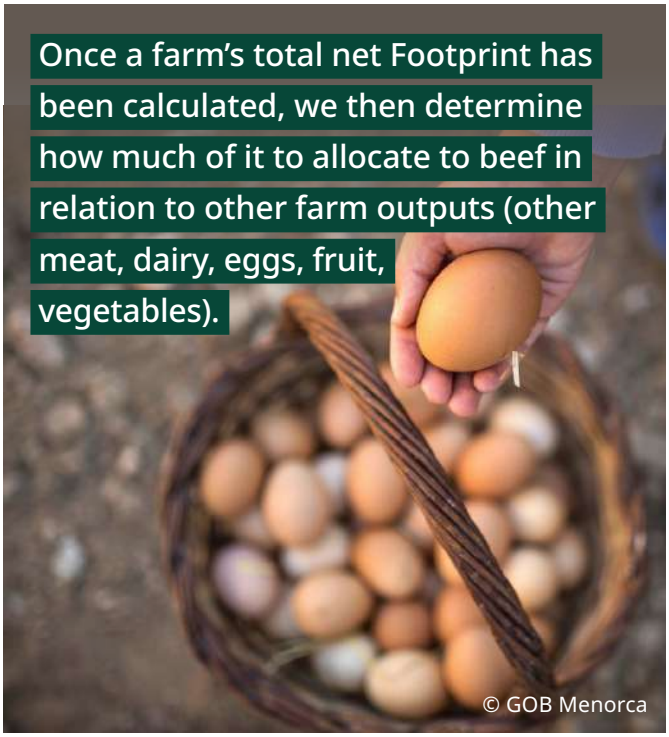
[EF greater than BC] = Ecological deficit

[EF smaller than BC] = Ecological reserve

Calculating a farm's Ecological Footprint: a new perspective

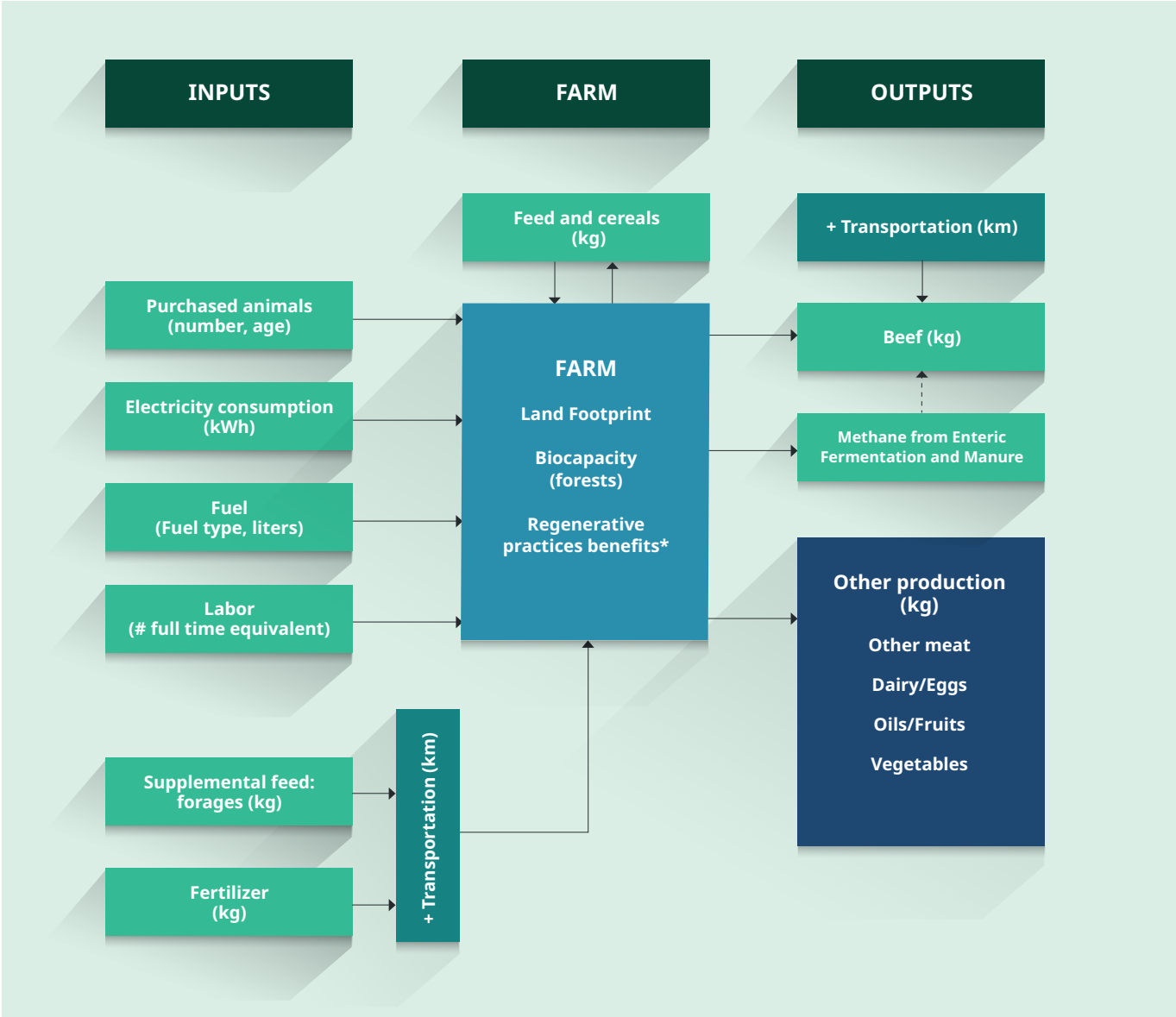
This assessment is among the first to be applied at the whole farm level to quantify both the carbon emissions and the land appropriation due to beef production and consumption. It's also the first to quantify the positive impacts of land preservation and land stewardship practices, reflecting the contribution sustainable management makes to Menorca's biocapacity. Tree cover, for example, contributes to ecosystem maintenance and biodiversity, and therefore has a positive Footprint.

We calculate a farm's total net Footprint by quantifying the Footprint of all its inputs and outputs – this includes everything from the food needed to feed a worker, to carbon emissions resulting from transportation of products, to the land needed to raise livestock. Once a farm's total net Footprint has been calculated, we then determine how much of it is associated with beef production in relation to other farm outputs (other meat, dairy, eggs, fruit, vegetables). We do this by comparing the share of calories related to beef production to the total number of calories produced on the farm.



We also incorporate the CO_2 emissions from enteric fermentation and manure for each kilogram of beef. Organic and pasture-based production, like on the farms in this study, generally has higher enteric fermentation emissions than conventional agriculture, because these are highly dependent on the diet of the cows and the digestibility of their feed – the more fibre the diet contains (from natural grasses and hay) the more methane is produced compared to conventional farm diets based on processed feeds. By contrast, there are relatively low emissions from manure: liquid storage encourages anaerobic respiration, which is a significant secondary source of methane, a powerful greenhouse gas. But these Menorcan farms use unmanaged pasture spread and solid storage, which results in only negligible methane emissions.

Figure 1. Inputs and outputs used in calculating a farm's total net Footprint



* The benefits of regenerative practices, as direct seeding and rotational grazing, have not been taken into account for this calculation. It is an improvement that should be included when there is enough data available quantifying its bio-capacity benefits.

Results

Beef: Ecological Footprint drivers

The lowest Footprint values are in farms that use locally produced feed and that limit the purchase of supplementary feeds and fertilizers.

41%

Greenhouse gas emissions from enteric fermentation and manure

43%

Feed (30% cropland, 13% pasture)

16%

Other factors (transport, labour)

Average Footprint of 1kg of beef

(without biocapacity benefits of land conservation/stewardship)

116gm²* Custòdia Agrària farms, Menorca

157gm² National average, Spain

*Footprint is expressed in global square metres (gm²), representing the area of bioproductive land required to produce 1kg of beef.

Producing beef using the methods employed in Menorca requires

26% less of the planet's biocapacity

Land stewardship and conservation in Menorca

44% **lower** than the national average

75% When pasture land with trees is included, the Footprint is **reduced** by up to 75%

The farms in the Custòdia Agrària programme incorporate trees and local vegetation on their pasture land. Several also include significant forested areas, which are spared from the increased agricultural intensification of conventional farming. When the benefits of forests are subtracted from the farms' overall footprints, they are 44% lower than the national average. When pasture land with trees is also included, the Ecological Footprint is reduced by up to 75%.

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www.mednatureculture.org
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Prepared by:

Global Footprint Network
Advancing the Science of Sustainability

GOB MENORCA
ECOLOGISME RESPONSABLE

CUSTÒDIA AGRÀRIA
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