

EXPLOITATION OF NATURAL RESOURCES OF THE *DEHESA* FOR MEAT PRODUCTION

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Extensive Systems of Livestock Production

The extensive systems of livestock production are supported on the use of stockbreeding species of zootechnical interest, which are able to use the natural resources efficiently through grazing. Generally, the exploited stockbreeding species correspond to adapted local genotypes, particularly, to the limiting and ecological factors proper to the natural background. Extensive stockbreeding, as well as the spreading of its productions, present common characteristics, of ecological interest regarding its role in the preservation of nature, but with certain productive and commercial limitations:

- a) Importance of its census.
- b) Outstanding source of nutrient contribution to the soil by means of the animals defecation.
- c) It can coexist, correctly managed, with the fauna and flora, making up an ordinary element within the ecosystem.
- d) The grazing in the mountain represents an effective element to prevent forest fires.
- e) It generates high quality products, which are well appreciated by the consumers.
- g) The profitability levels are low, therefore financial help is needed for the capitalisation of exploitations as well as compensation for income losses.

The extensive livestock systems must be managed in a suitable way and get the balance production-preservation. All in all, the levels of livestock must be adequate to the availability of the background resources. In this way, overgrazing and subgrazing are ecological disadvantages, as result of unsuitable management. The livestock over the level of sustainability produce a degradation of the local flora, with the apparition of the soil erosion phenomena. The subgrazing derives into the apparition of vegetal species of poor interest, with few nutrient requirement and palatability. The invasion of species with grazing of low interest produces loss of pasture quality, translated into a greater risk of forest fires in the stockbreeding exploitations.

The *dehesa*

The *dehesa* systems in the Iberian Peninsula make up the most representative models of extensive exploitations in the Mediterranean area. The *dehesas* are extensive and semi-arid systems of soil uses where the perennial vegetation (trees and shrub-like) grow in the exploitations with the marginal agricultural farming and the animals (domestic and hunting ones), and among such components there are economic and environmental interactions. It means that, it is possible to characterise the *dehesa* globally as an farming-forest system whose woody, grazing, stockbreeding and farming components interact in a beneficial way regarding commercial and environmental terms under certain managing circumstances. The *dehesa* is characterised by having large extension of surface assigned to grazing animal, where stockbreeding species are exploited. These species are adapted to the limiting conditions proper of the production marked by the background. Due to the adverse agricultural and climatic factors which limit the getting of a generalised farming practice in the space and time, the stockbreeding makes up, with any doubt, the greatest commercial production of the *dehesa* in Spain, aspect which has been supported by the importance of the stockbreeding census location in this area. The stockbreeding productions are supplemented with farming and forest use, the ones which are replaced, at high percentage, in the animal feeding.

These systems exploitation has been carried out, generally, through farming, stockbreeding and forest uses all together. The alternative use of the pieces of land for farming and pastures has always been a common feature in these exploitations. In the last years, the stockbreeding orientation of the *dehesa* exploitations has been strengthened to the detriment of the farming. On one hand, this has provoked the proliferation and invasion of shrub-like species due to the decrease of soil ploughing up but on the other, it has contributed to the recovery of the soil organic richness.

The potential surface of *dehesas* in the Spanish west and south-west is slightly superior to 7 million of hectare, from which the oak tree occupies 1,900,000 ha and the cork oak 230,000 ha, approximately. These figures show that on one hand, the unwooded *dehesa* represents two third parts of the *dehesa*

area. On the other hand, the *dehesa* means more than one third of the pastures surface in Spain. The pasture area of Extremadura is of 2.4 million ha, about 34 % of the total *dehesa*.

The absence or presence of the wooded stratum in the *dehesas* will determine the uses and exploitations that can be carried out on it so, the wooded exploitation allows, regarding the soil, a varied use of its productions. The oak and cork oak wood is dedicated to direct consumption or to the elaboration of vegetal coal. The branches cut after pruning are used, firstly, as food for the animals and finally for the elaboration of "Picón" (little pieces of coal used to heat). The production of acorns is used for the Iberian pig feeding and the cork represents a considerable source of incomes in the cork oak exploitations. As it can be checked, the wooded area represents a key factor for the *dehesa*, which determines the productive orientation of the exploitations and it leads to present a higher level in the diversity or uses. This aspect is typical of the extensive systems in the Spanish Southwest, where the most determining factor, regarding the productive and technical-economic orientations are the biophysical limitations of the background; even more than the effects of the possible prices variations in the marketing of different products generated in the *dehesa*.

The *dehesa* systems cannot be understood without the socioeconomic implications of their rural background, where the traditional cultural functions have made possible, since old times, the farming practices in balance with the environmental features. The productive diversity of the *dehesa* is characterised by the presence of commercial functions. These functions are directly valued by the market, as well as by the items and services of environmental character, which nowadays are important social demands. In Figure 1 it is detailed a summary of the different items and services which sustain the *dehesa* ecosystem, showing the necessity of combining the farming productions with the territory preservation (Martín Bellido and Col., 1997). In table 1, with the economic and environmental functions of the *Dehesas* and Portuguese Montados, the most common benefits of these farming-forest systems are shown depending on the dominant vegetation (Campos Palacín, P., 1992).

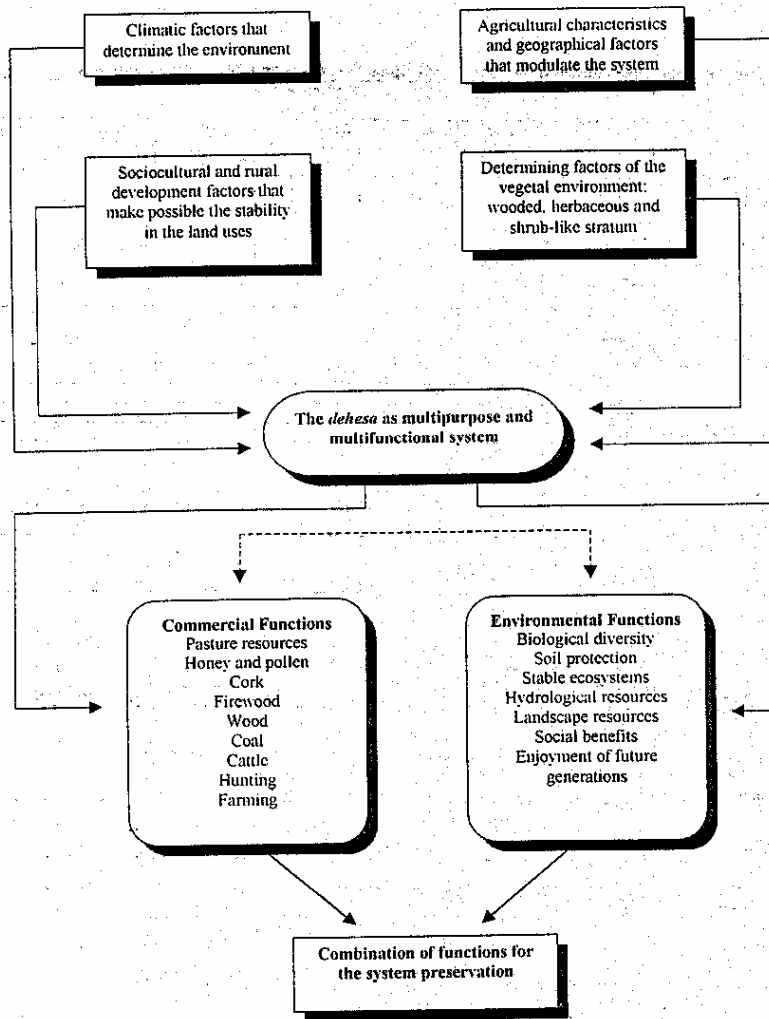
Figure 1. The *dehesa* as example of extensive system which makes possible the preservation and the sustainable use of the land.

Due to the debate and demand of the different social sectors in favour of the Natural Preservation, it is necessary to assume the maintenance of a farming production that generates enough incomes and in a sustainable way makes possible the protection and rational use of the natural resources. It is foreseeable, due to the competitiveness of these exploitations, a regulation of their production devoted to the obtaining of high quality products, assigned to limited markets of high purchasing power. Producing also an increase in the offer of enjoyment and environmental services.

In the farming systems the dissociation, after the green revolution, from the traditional productive function, has meant important technological innovations and increase of the farming incomes, but everything associated to a poor rural development: the loss of natural resources as background items, the lack of replacement of renewable items and as result, a decrease of environmental quality. Even certain traditional farming systems not only do not damage the natural resources, but they mean a defence or improvement for them. However there is the risk of a progressive isolation due to their limited profitability as it happened a few years ago regarding the extensive farming systems or the maintenance of local breeds as base of the extensive stockbreeding. These factors can derive into an important damage on the biological diversity of the farming systems and into considerable economic and social connotations.

Equally, the spreading of farming systems and particularly the spreading of stockbreeding productions must provide a suitable formation about set of methods and techniques that contribute to combine the farming activity with the nature preservation. Therefore, preserving nature runs in parallel with the necessity of fostering the inner rural development through the possibility of increasing the productive offer of the farming systems.

Currently, the varied regulation and the farming-environmental measures taken by the Public Administrations (European Union, Spanish and local Community Governments) support clearly the production extensive systems; they support particularly those systems which make possible the income level improvement of the rural populations, avoiding the field isolation and the emigration to urban areas. The production of stockbreeding products of high quality plays a key role within this process (cattle, sheep and goat meat from animals bred in the country and fed with natural products; cured products of Iberian pig, rural chicken, rabbits, etc).



Taken from Martín Bellido and Col. (1997)

Table 1. Economic and environmental functions of the Spanish *dehesas* and Portuguese *Montados*

FUNCTIONS	Market	Predominant Vegetation																			
		Oak trees		Cork trees		oak Wood- Yielding conifer	Bushes		Pastures		Farming										
		S	P	S	P		S	P	S	P	S	P									
Pasture resources																					
Acorns	Yes	xx	xxx	xx	xx																
Fleshy fruit	Yes/No	x		x		0		xx	x												
Natural pastures	Yes	x	xx	x	xx	0				xx	xxx										
Improved pastures	Yes		xx		xx					xx	xxx										
Stubble	Yes																		x	xx	
Other fruits	Yes/No			x		x															
Cork																					
Winter cork	Yes/No				x																
Summer cork	Yes			xxx	xxx																
Wood	Yes					xx															
Firewood	Yes/No	x	x	xx	x	x															
Coal	Yes	x	x	xx	x																
Rest of wood after heating	Yes	x	x	x	x			xx	x												
Cattle																					
Bovine Meat	Yes	x	xx	x	xx	0				x	xx	x	xx								
Ovine meat	Yes	x	xx	x	xx	0				xx	xx	xx	xx	xx							
Caprine	Yes	x	x	xx	x	0		xx	x	x	xx	xx	xx	xx							
Iberian pig	Yes	xx	xxx	xx	xx	0				x											
Hunting																					
Game hunting	Yes	xx	xx	xx	xx	0		xx	xx	xx		x	x								
Shooting	Yes/No	x		x		0		x		xx	xxx	xx	xxx								
Farming																					
Cereal	Yes		xx		x					x	xx	x	xxx								
Hay	Yes		xxx		xx					x	xx	xx	xxx								
Fodder	Yes																				
Recreational services	Yes/No	xx	x	xxx	x	x0		xx	x0	x0	x0	x0	x0								
Habitat/Biodiversity	No	xxx	xx	xxx	xx	0		xxx	x0	xxx	xx	xx	x0								
Hydrological resources																					
Water amount	Yes	x	x	x	x	0															
Storm effects	No	xxx	xx	xxx	xx	xx		xxx	xx	x	x	0	0								
Freatic layers	No	xx	xx	xx	xx	0		xx	x	x	x	0	0								
Water quality	No	x	x	x	x	x		x	x	x	x	0	0								
Climate																					
Global	No																				
Microclimate	No	xx	xx	xxx	xx	x		xx	x	x	x	0	0								
Soil protection																					
Nutrient cycles	Yes/No	xx	xx	xxx	xx	x0		x0	x0	x	xx	x0	x0								
Erosion reduction	Yes/No	xxx	xx	xxx	xx	xxx		xxx	xx	x	x	0	0								
Employment																					
Seasonal nature	Yes	x	x	xx	x	x		xx	x	x	x	0	0								
Forest improvement	Yes/No	x	x	xx	x	x		x	x												

Signs: xxx Positive and very relevant potential
 xx Positive and relevant potential
 x Positive and little relevant potential
 0 Negative effect

S Mountain range
 P Plain

Taken from: Campos Palacin (1992)

Livestock products quality

The extensive systems production is smaller than the one obtained from intensive systems, but it makes possible the obtaining of high quality products which reach high prices in the market. In the *dehesa* the most relevant stockbreeding products are:

Pig

In the Spanish and Portuguese *dehesa* the Iberian pig is bred. It is local and fully integrated in the ecosystem. It is characterised by the great quality of its cured products: hams, loins, shoulders. Its fattening process at the final stage with acorns in the mountain makes possible to reach a high level of unsaturation in its meat products, with the following benefits for the health.

Cattle

The main bovine production in the peninsular Southwest are the calves sold at weaning, with 200 kg of weight, to finish their process in fattening enclosures in other regions as yearlings, with a weight of 500 kg. Their origin, from local breeds (Retinta, Avileña, Morucha), and the natural environment where they are bred provide their meat with high quality.

Sheep and goat

In Extremadura and Andalucía most of the lambs and kids are sold alive out of the regions, with weights of about 23 and 10 kg, respectively, losing in this way, as with the bovine, the added value that would mean a slaughter and transformation and its later commercialisation. However, lately, a great effort is being made in Extremadura in order to categorise the lambs carcasses. The most representative breed is the Merine one, fully adapted to the hard conditions proper of the *dehesa*. The cheese production has also to be highlighted, since it is very important in certain areas (La Mancha, La Serena, Casar de Cáceres, Los Ibóres).

North African oak trees

The experience gained by the technical experts, who carry out their work on varied aspects of *dehesa* exploitation and preservation, can be used in the *dehesas* exploitations in the North of Africa, particularly in Morocco

The total cork oak surface in Morocco is between 300.000 and 325.000 (Palming, 1947; Bondy, 1948). summed to the hectares in the Spanish territory (Vieira, 1992), means about 350.000 ha. The cork oak fields are distributed around different regions: Rif, Middle Atlas and mainly (more than 80 %) on the coast of Rabat (Mamora). They are in perfect conditions regarding regeneration the cork oak trees produce cork in a 50 % of their surface but mainly "bornizo" the rest of cork from the 1st cutting; more than 70 % of the production, whose total can reach 50, 000 Tm. The density is placed about the 80 feet/ha, pruning is not carried out neither farming action takes place, therefore the age of the trees is equal among them.

Regarding the oak fields, the total surface is 1 million of ha approximately (Barbero and Col., 1992), distributed around the Rif, the Grand Atlas and The Middle Atlas. They have no regeneration problems either, and they usually fight with other species to colonise new areas. The density is no more than 70 feet/ha without any forest treatment. Under such conditions, the seed production is very irregular and the mean per tree cannot surpass the 5 Kg/tree.

An interesting aspect, over all because is totally opposite to the Iberian Peninsula, is the bitter character of the acorn from the Moroccan oak trees and the sweet character of the cork oak trees acorns.

In the Moroccan oak fields as well as in the cork oak fields bovine and ovine is produced, although in a limited number and of poor value, keeping still the transhumance. The animal production does not reach the 100,000 heads of each specie in the oak fields whereas in the cork oak fields of the coast plains in the Northwest of the Country about 70,000 heads are bred of bovine and 200,000 of ovine (Vieira, 1992).

From these brief data, it is possible, through a suitable forest and stockbreeding planning, to improve and increase the number of heads pasturing in the *dehesas* in the North of Africa, as well as increase and categorise their quality products. This would affect in a positive way the economy of this region.

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