

Proceedings of the
International Symposium on
basis of the quality of
typical Mediterranean
animal products

Basis of the quality of typical Mediterranean animal products

Organized by



EAAP



FAO



CIHEAM



JUNTA DE
EXTREMADURA



UE

*Badajoz and Zafra, Spain
29 September - 2 October 1996*

Basis of the quality of typical Mediterranean animal products

Proceedings of the International Symposium on
Basis of the quality of typical Mediterranean
animal products

Organized by EAAP, FAO, CIHEAM and
The Government of Extremadura
Badajoz and Zafra, Spain, 29 September - 2 October 1996

EAAP Publication No. 90

J.C. Flamant, D. Gabiña, M. Espejo Díaz
(Editors)



Wageningen Pers

Wageningen 1998

**CIP-data Koninklijke Bibliotheek,
Den Haag**

**ISBN 90-74134-53-X hardbound
ISSN 0071-2477
NUGI 835**

**Subject headings:
quality
Mediterranean
animal products**

First published, 1998

All rights reserved.

Nothing from this publication may be reproduced, stored in a computerized system or published in any form or in any manner, including electronic, mechanical, reprographic or photographic, without prior written permission from the publisher, Wageningen Pers, P.O. Box 42, 6700 AA Wageningen, The Netherlands.

The individual contributions in this publication and any liabilities arising from them remain the responsibility of the authors.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the European Association for Animal Production concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

In so far as photocopies from this publication are permitted by the Copyright Act 1912, Article 16B and Royal Netherlands Decree of 20 June 1974 (Staatsblad 351) as amended in Royal Netherlands Decree of 23 August 1985 (Staatsblad 471) and by Copyright Act 1912, Article 17, the legally defined copyright fee for any copies should be transferred to the Stichting Reprorecht (P.O. Box 882, 1180 AW Amstelveen, The Netherlands).

For reproduction of parts of this publication in compilations such as anthologies or readers (Copyright Act 1912, Article 16), written permission must be obtained from the publisher.

**© Wageningen Pers, Wageningen,
The Netherlands, 1998**

INFLUENCE OF PRODUCTION FACTORS ON THE CHARACTERISTICS OF MEAT FROM RUMINANTS IN MEDITERRANEAN AREA

A. Teixeira¹, R. Delfa² and P. Alberti²

¹ Instituto Politécnico de Bragança. Apto 172. 5300 Bragança. Portugal

² Servicio de Investigación Agroalimentaria. D.G.A. Apdo.727, 50080 Zaragoza, Spain

Summary

The production systems of cattle sheep and goats in Mediterranean area and the factors linked with carcass and meat quality are discussed. The production systems in the mountain and semi-arid areas, typical of Mediterranean, are refereed. Finally a group of actions to be taken regarding the improvement of meat production from ruminants is suggested.

Keywords: meat, cattle, sheep, goats, Mediterranean area

Résumé

Les systèmes de production des bovins, ovins et caprins et les facteurs liés à la qualité de la viande et des carcasses, sont discutés. Les cas particuliers des systèmes de production de montagne et chênaié typiques des zones à caractere méditerranéen, sont aussi analysés. Finalement sont sugerées diferents types actions a prendre dans la production de ruminants, en vue de l'amélioration de la production et de la comercialisation.

Mots-clés: viande, bovins, ovins, caprins, méditerranéenne area

Introduction

Two main groups of factors linked with carcass and meat quality may be discerned: - animal intrinsic parameters *i.e.* breed, age and sex; - animal extrinsic parameters *i.e.* production system diet and feeding level.

Age and breed are factors that have not had great variations along the last years in the Mediterranean area and we do not predict changes in the future if we assume the verity of the current policy of protection of extensive areas of production and the protection and improvement of local breeds. In this way the extrinsic factors like nutrition and production systems are decisive for carcass and meat quality of ruminants in the Mediterranean area. Nevertheless, most studies have shown that cattle and sheep breeds differ greatly in fat content when taken to the same final slaughter weight though the variations in carcass composition are less important at the same age and at the same degree of maturity.

Many factors limit the growth of cattle and sheep in the arid and semi-arid regions of European Mediterranean area. Some breeds are adversely affected by poor adaptation to high spring and summer temperatures as well as to tick and parasite infestations. In some conditions high energy concentrates are recommended in ruminant fattening diets for improving animal growth. In cattle and sheep, rapid growth associated with intensive feeding has also been shown to produce more tender meat in comparison with the slower growth resulting from extensive rearing on grass and natural forages. On the other hand the fast growths tend to produce fat carcasses.

Although eating quality is the most important aspect of meat quality to consumers, colour, global aspect and marbling are also important. In the Mediterranean area, high levels of tenderness and juiciness were associated with "better finished" beef carcasses from local breeds in comparison with a poorer quality from dairy crosses. Nevertheless, according to several authors the breed differences in eating quality have also been linked to the quantity and type of collagen in muscle.

Another group of factors affecting meat production systems in the Mediterranean area are of social and economic nature. The economic development, the urbanisation of rural communities and the displacement of the rural population to the great cities, led to an intensification of the production systems, originating thus a great influence over the production systems of ruminants. At present the tendency to rethink the systems of agrarian exploration, gained great importance, specially in highly populated E.U. countries with a strong environmental policy, where they try to link the use of the soil to appropriate practices. The agrarian sector is forced to recognise this tendency and to adjust the systems of soil use. Within an environmental context, it is necessary complementing the agricultural policy with the determination at an appropriate level of intensification of the agrarian systems and with the adequate treatment of the landscape.

Cattle

In the Mediterranean area an intensive fat system $\frac{3}{4}$ based in high percentage of concentrates $\frac{3}{4}$ for cattle has been developed. Traditionally local breeds were exploited in systems based on pastures, but nowadays an industrial crossing between local breeds with good conformation breeds has take place in the fattening systems. High energy concentrates are used in ruminant fattening diets in order to improve performance, but the precocious breeds from Mediterranean countries have a moderate growth in this situation and show a better adaptability to the traditional pasture with periods of abundant feed and others of scarcity. During some periods with good feeding conditions animals have a compensatory growth, stocking fat depots necessary to periods with lack of feeds.

The fat class is conditioned by breed and diet type, mainly for the level of energy. The animals from intensive system have a higher fat content than the animals from the traditional system. First ones are normally classified in fat class 4 and the second ones in class 2.

Conformation is more related with the breed than with diet type. The cattle breeds in the Mediterranean area have straight profiles with a medium muscularity and low compactness. Most of them have an R category in comparison with better conformed carcasses from industrial crosses that have normally a U category. This factor could affect the carcass yield varying from 57% to 61% for poor conformed or good carcasses, respectively. Nevertheless, no differences exist in the percentage for first category joints but differences in carcass composition have been found (Alberti, et al., 1995).

In Mediterranean countries consumption is mainly for lean meat with rose colour, tender and without flavour. To achieve this type of meat the animals are slaughtered at young ages, 10 to 12 months, producing light carcasses commercially designated by *ternera* in Spain, *vitela* in Portugal, *veaux* in France or *vitella* in Italy. Females are slaughtered at younger age than males provided they have an earliest fat deposition. The fattening males in intensive systems are slaughtered among 12 to 16 months age and from 450 to 600 kg live weight.

The most important aspect of meat quality is eating quality, like tenderness, juiciness and flavour. Fat within the muscle (intramuscular fat or marbling) is the crucial component. Some local breeds traditionally exploited in mountain or meadow areas have an earliest development of intramuscular fat, producing a very high quality of meat. Normally the meat from these

breeds have a red bright colour in contrast to the meat from animals produced in feed-lots that produce a pale and clear meat.

Sheep and goats

A large proportion of Spanish sheep and some Portuguese flocks are kept on a transhumance system where sheep are moved from the southern wintering areas to the central plateaux further north for summer pasturing. The sheep of the mountains were traditionally milked on the routes between the local home and the winter pasture and the cheese produced was sold in the towns on the way. In some cases the hill farmer pays for wintering land for his flock. Most of semi-arid areas have variable conditions with prolonged droughts. In conclusion sheep and goats are species naturally adapted to the optimal use of the poor and marginal regions. At present the tendency to rethink the systems of agrarian exploration, gained great importance, specially in highly populated E.U. countries with a strong environmental policy, where they try to link the use of the soil to appropriate practices. Today we are aware that the sheep and goat production systems, organised in small production systems are a fundamental part of the development of mountain and extensive areas.

In the Mediterranean area of the E.U., a great number of sheep and goat breeds are milk producers. This, and others characteristics, such as hardiness and lack of seasonal anoestrus, associated with the demand for light carcasses from 7 to 12 kg determine lamb and kid production.

One of the greatest differences in E.U. sheep and goat production systems is the carcass weight. The Mediterranean areas of the E.U. produce the lightest carcasses in Europe. Another difference is the age at slaughter. In Mediterranean Europe, generally speaking, the lambs and kids are slaughtered at 1 to 4 months of age.

For commercial evaluation, lamb carcasses can be classified in the different countries of the European Mediterranean area, according to weight, age, breed, diet type, conformation, fatness, etc.

In France, consumption is mainly of fresh or cooled carcasses from young lambs with good carcass conformation, rose colour and appropriate fatness. In the Mediterranean area of France, the carcass weight varies from 12 to 14 kg and in the Nimes region from 8 to 13 kg. In Italy, lamb consumption depends on the season and is usually linked to some religious festivals. Young lambs, 4 to 8 weeks old, from milk-sheep herds are preferred. In Greece, consumption is characterised by the preference for light carcasses, less than 12 kg in weight, from lambs aged 50 to 70 days. Some breeds, like Mytilini and Chios, produce carcasses with a high fat content. In Spain and Portugal, consumption tends to be mainly of young lamb carcasses, fresh or cooled, of light weight, rose colour, tender and without fat (Teixeira et al, 1994).

Production in the European Mediterranean area is mainly of light carcass of 7-12 kg. This results from a combination of the effects of systems of production and consumer preferences. The reasons for this are:

- Most of the lambs and kids are from extensive systems in which the main feeds are milk and Mediterranean pastures;
- The lambs and kids, being from dairy breeds, cannot compete with milk production, which is the most important objective of the system;
- The traditional requirement of the home market is for carcasses with a relatively low level of fat and consumers do not like fat carcasses;
- Preference is influenced more by fat class than by conformation, carcass conformation is less important than fatness;

- The meals are prepared according to a classical cuisine in which the traditional cooking methods are grilling or roasting the carcass whole.

The mountain and semi-arid particular cases

The mountain and semi-arid regions have always been under considerable change, particularly the Mediterranean ones. In the past they were regarded as regions where the modern methods of animal production could not be practised. In this sense, its environmental and socio-economic location, prevented the introduction of new methods without the preliminary analysis and preparation of its possibilities. This must have been one of the main reasons which led to the complete abandonment of the mountain's population, leading to the human and physical desertion of those areas.

Today we are aware that the cattle, sheep and goat production systems, organised in small production systems are a fundamental part of the development of these areas, specially in the following points:

- **economic**: large areas with a low productivity potential can be explored ;
- **social and cultural** : this type of production was and still is a traditional activity;
- **ecological and environmental**: the interaction between the forest and the populations of small ruminants as intervenients in the control of the vegetal cover is essential to fires prevention and necessary to the landscape maintenance.

In any case, the use of animals in pasturing for the landscape maintenance requires care, depending on the following group of factors: type of animal, expected yield, lengthening and handling of pasturing. The economic viability of the sheep and goat production and its positive contribution to nature's conservation is nowadays defended by several sectors.

Nevertheless, we shall look at some problems which may prevent such viability:

- great competition in the European meat market, with a tendency to lower the prices;
- difficulties in keeping an outcome which ensures the survival of a family;
- lack of the commercial strategies to sell their products;
- difficult social conditions which lead to the abandonment of the shepherds profession;
- problems with difficult solution in the link of the meat production with the landscape and other agricultural practices.

According to several policies of the different European countries, two fundamental aspects should be considered:

1 - Society acquired a knowledge and awareness of the importance of the environment in the quality of life; and

2 - The increased determination of the civil administration of agricultural policies to adjust the agricultural super productions in the E.U.

In an environmental context, this is about complementing the agricultural policy with the determination at an appropriate level of intensification of the agrarian systems and with the adequate treatment of the landscape.

Actions to be taken

The group of actions to be taken regarding meat production from ruminants cannot be an individual task and it has to obey to a wide and integrated program of defined aims and priorities. Thus, given the above situation, we believe according to Teixeira (1995) that the following group of future actions can be suggested:

- resolution of animal management problems, with especial emphasis on sanity and prophylactics of the main diseases;
- measures of social and economic protection to the exploration of the more abandoned regions;
- the maintenance of the landscape is a service of society, and thus society should compensate those who carry it out;
- an increase of the pasturing areas in the mountain and of the areas used formerly for cereal crops;
- organisation of the mixed systems of forest and animal grazing;
- a dialogue between the civil administration and the rural community as a vital way of fighting adversity;
- an intensive co-operation between the agricultural administrative services and the environment as a pre-requisite to find adequate solutions to the problems of interaction between the animal and the environment;
- an effective maintenance in the interest of the cattle, sheep and goat production, through the organisation of associations of selected animal breeders and of commercial producers;
- a study of the situations of the use of the local breeds viability, through the definition of models and simulation of situations which allow decision making on the future;
- the definition of the strategies of conservation of the local breeds;
- to consider alternative situations (lowlands, upland and hill farming), according to the species and the systems, the exploration of the pure breeds and the use of crosses;
- development of field experiment, with the participation of breeders associations, seeking to test and to validate the data obtained through research;
- definition of improvement strategies, conditioned to the modalities of the production systems, involving characteristics linked to fertility, adaptability, viability, maternal aptitude, also involving production characteristics;
- definition of the type of cattle sheep and goat produced, considering the weight, maturing stage and the consumers demands;
- a definition of commercial and marketing strategies for producers associations;
- a qualitative characterisation of the cattle, sheep and goat products as a way of defining the origin denominations and the demarcation of the production areas.

References

- Alberti, P.; Sañudo, C.; Santolaria, P. and Negueruela, I., 1995. Variación de la calidad de la carne, de las medidas de la canal y de los parámetros productivos de añejos de seis razas españolas. ITEA, 16, 627-629.
- Teixeira, A. and Delfa, R., 1993. Sheep consumer preferences and commercial classification in the Mediterranean area of the european community. 44rd Annual Meeting of EAAP. Abstracts, SV.1, (2), 136-137.
- Teixeira, A., 1995. Trends in small ruminant production in extensive areas of Ne of Portugal. Register of Research Projects on Extensification of Beef and Sheep Production on Grasslands. Ed.Drs M. G. Keane e E. G. O'Riordan. Paris, 1995 (in press).

This publication provides a compilation of the papers presented at the International Symposium on the Basis of the quality of typical Mediterranean animal products organized by EAAP, FAO, CIHEAM, the Regional Government of Extremadura (Spain) and supported by the European Commission (DGVI). The aim of this symposium was to gather information and discuss arguments concerning the quality of typical Mediterranean products of animal origin. The subjects were discussed in specific sessions: quality and typical characteristics; milk products; meat products; other products; marketing of quality Mediterranean products; study cases. The symposium was a success, because it provided a contrasted view of the assessment of the products by the consumer from various origins and discussed the marketing of these products and their possible future. It provided a description of the scientific investment carried out on this type of products in the Mediterranean. The scientific studies dealt with in this symposium are considered valuable works for further research and reflections. This book is a collection of information in this respect and will be very useful for students and researchers in future events and debates on the quality of typical Mediterranean animal products.

ISBN 90-74134-53-X
ISSN 0071-2477
NUGI 835



Wageningen Pers
Wageningen 1998