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in

Pacheco F. (ed.), Morand-Fehr P. (ed.).
Changes in sheep and goat farming systems at the beginning of the 21st century :
research, tools, methods and initiatives in favour of a sustainable development

Zaragoza : CIHEAM / DRAP-Norte / FAO
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 91

2009
pages 237-240

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=801152>

To cite this article / Pour citer cet article

Ameen F., Manrique E., Olaizola A.M. **Spanish regional sheep systems: differences and evolution of sheep productivity.** In : Pacheco F. (ed.), Morand-Fehr P. (ed.). *Changes in sheep and goat farming systems at the beginning of the 21st century : research, tools, methods and initiatives in favour of a sustainable development* . Zaragoza : CIHEAM / DRAP-Norte / FAO, 2009. p. 237-240 (Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 91)



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Spanish regional sheep systems: Differences and evolution of sheep productivity

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Abstract. From the information provided by the National Farm Accountancy Data Network (FADN), referred to the sheep orientation for years 1987, 1990, 1994, 1999 and 2002 (added information of the sample of the sheep farms), the structural, economic and productive characteristics of representative meat and milk sheep systems of nine Spanish regions are described. Indices of animal productivity are elaborated (livestock capital), assimilable to the technical efficiency. For the considered regions, the differences in productivity, its evolution during the period 1987-2002 and its possible relationship with some characteristics of farms are analyzed. Considering that the productivity is a long term determinant of standard of living for sheep farmer, we try to advance a hypothesis related to sources of knowledge of this sector and role of technological change.

Keywords. Sheep farming systems – Productivity – Inter-regional analysis – Economic sustainability.

Systèmes ovins régionaux de l'Espagne : différences et évolution de la productivité des ovins

Résumé. A partir de l'information fournie par le Réseau d'Information Comptable Agricole (RICA), correspondant au secteur ovin et aux années 1987, 1990, 1994, 1999 et 2002 (de l'information de l'échantillon des exploitations d'élevage ovin a été ajoutée), les caractéristiques structurelles, économiques et productives des systèmes ovins lait et ovins viande, représentatifs de 9 régions espagnoles, sont décrites dans cette communication. Les indices de productivité animale sont élaborés (capital correspondant aux animaux d'élevage) et assimilables à une efficacité technique. Dans les régions considérées, les différences de productivité, son évolution dans la période 1987-2002 et sa relation possible avec certaines caractéristiques des exploitations, sont analysées. Considérant que la productivité est un indicateur à long terme du niveau de vie de l'éleveur ovin, nous essayons d'avancer une hypothèse liée aux sources de connaissance dans ce secteur et au rôle du changement technologique.

Mots-clés. Systèmes d'élevage ovins – Productivité – Analyse interrégionale – Durabilité économique.

I – Introduction

Level of productivity is considered in the long term to be the main determining factor in the standard of living of the population and the sustainability of production units. It is an essential variable for measuring the efficiency and evolution of economic sectors (Maté, 1995), the use of new production practices or technologies (Block, 1994) and for inter-temporal and inter-sectoral comparisons of the economic operation of production sectors (USDA, 1980).

The most commonly used measurements are those referring to partial productivity that relate the total product (in physical or monetary units) and the selected input, which is frequently labour or capital.

This paper forms part of a research work into the behaviour of the Spanish sheep-farming sector over the period from 1987-2002 by means of inter-regional measurements of partial productivities. The level, differences and evolution of livestock productivity in groups of representative sheep farms from different regional systems are studied.

II – Material and methods

Accountancy data on groups of regional sheep-oriented farms obtained from the National Farm Accountancy Data Network (FADN) have been used (MAPA, 2004). This is the only source of information with this degree of representativity and homogeneity for all of the Spanish regions for such a long period of time. However, the samples are not constant over time; they are heterogeneous and the information is not sufficiently disaggregated. Six meat-producing regions and three milk-producing regions have been established based on the criterion of the mean level of unit production per animal.

The effect of output prices (meat and milk) have been estimated, establishing a fixed proportion of milk and meat in the production of the dairy sheep systems and just one type of sheep carcass recental (1.5-3 months) or pascual (3-8 months) for each sheep meat system. The prices used for each product are mean national prices.

The indicators used to measure livestock productivity are: (i) $P_1 = AO / LU$; and (ii) $FNVA / LU$; AO = Animal Output; $FNVA$ = Farm Net Value Added and LU = Livestock Unit. The deflator used to convert to prices in 1987 has been the Retail Price Index (RPI).

III – Results and discussion

Throughout the period analysed structures, productions and economic results in sheep farming systems have evolved considerably. Annual Working Units have tended to decrease both in dairy production systems (except in the Basque Country where it has remained fairly stable) and in the sheep meat systems in Murcia and Aragón. Employment only increased on the sheep meat farms of Andalusia and Extremadura. This structural change increases in importance as livestock unit numbers increased in all of the regions, although to differing degrees. The sheep meat farms of Andalusia, Murcia and Extremadura showed the greatest growth with mean annual rates of 9.8%, 9.4% and 6.4%. The landless farms of La Rioja experienced a more moderate growth rate (2.3% per annum). All of the livestock units in the regional dairy sheep systems also grew, although to a lesser extent than in the sheep meat systems. Greatest growth was recorded in Castile-León (annual rate of 3.8%). (Table1).

Farm production (AO) also underwent an expansion, which, measured in constant money terms, affected all of the regional systems except La Rioja where there was a negative evolution. The greatest growth rates occurred in Extremadura and Andalucía and on dairy sheep farms in Castile-León (annual rate of 7.1%) and the lowest in the Basque Country (annual rate of 1.6%). $FNVA$, an expression of farm income, increased in all of the regional systems from 1990 onwards and particularly in Navarra, Extremadura and above all in Andalusia. The growth rate of milk production systems was 0.6% in the Basque Country, 11.3% in Castile-la Mancha and 24.8% in Castile-León. In 1990 the farms in Murcia recorded the highest livestock productivity although the levels were very close to those of other sheep meat systems. In 2002, Murcia, Extremadura and Andalusia showed the highest productivities and Aragón's farms the lowest, according to all of the indicators. Over the period studied losses were recorded in Navarra and Murcia (-3.7% per annum), productivity remain stable in Aragón and La Rioja and it grew moderately in Extremadura and Andalusia. Disregarding the effect of prices, in these latter two regions growth in productivity was lower, whilst there was a decrease in livestock productivity in the rest of the regions. In the dairy sheep systems the greatest livestock productivity was recorded in 1987 in the Basque Country and the lowest in Castile-León. In 2002 the livestock in the Basque Country showed the lowest productivity. As a whole, there has been a more positive evolution in productivity in the dairy sheep systems than in the sheep meat systems. Disregarding the effect of output prices, in the 1990-2002 period productivity remained unchanged in the Basque Country and Castile-La Mancha, whilst there were slight gains in Castile-León, 1.6% (Table 2).

Table 1. Index of the livestock productivity in sheep meat systems (constant value 1987=100)

	1987	1990	1994	1999	2002
Navarra					
AO/LU	100	62	65	68	86
FNVA/LU	100	32	56	57	78
La Rioja					
AO/LU	100	63	76	75	65
FNVA/LU	100	91	135	119	107
Aragón					
AO/LU	100	101	75	73	72
FNVA/LU	100	132	106	117	114
Murcia					
AO/LU	100	92	56	34	45
FNVA/LU	100	111	81	62	81
Extremadura					
AO/LU	-	100	76	104	112
FNVA/LU	-	100	139	144	170
Andalucía					
AO/LU	-	100	187	211	212
FNVA/LU	-	100	136	141	138

Table 2. Index of livestock productivity in the dairy sheep systems (constant value 1987=100)

	1987	1990	1994	1999	2002
Basque Country					
AO/LU	100	89	92	84	99
FNVA/LU	100	91	80	73	86
Castile - León					
AO/LU	100	88	96	107	131
FNVA/LU	100	142	251	268	300
Castile - La Mancha					
AO/LU	100	98	107	128	113
FNVA/LU	100	108	190	201	193

In general terms the behaviour of livestock productivity has been more negative than that observed for labour productivity in the same systems and for the same period (Ameen *et al.*, 2007).

IV – Conclusions

During the 1987-2002 period the Spanish economy in general and the sheep-farming sector in particular underwent important changes (entry into the EU, CAP reform). The farms analysed experienced significant structural changes (growth in livestock unit, reduction in labour, etc.) in production and farm income. However, these changes have not resulted in appreciable gains in livestock productivity. The best performing farms are those more closely linked to a favourable evolution in the price ratios than to technical improvements in the livestock factor. The

exceptions are the sheep meat systems of Andalusia and Extremadura and the dairy sheep system of Castile-León, which, in this latter case can be attributed to local breeds (churra) being generally replaced by other more productive breeds.

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