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Farmers' perceptions towards production of Ojinegra lamb meat, an autochthonous sheep breed

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Additional keywords

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SUMMARY

Over the last two decades, in Spain there has been a growing interest in recovering and maintaining autochthonous livestock breeds. This has partly occurred because these breeds are considered essential to coping with changing socio-economic and environmental conditions. The aim of the present work is to analyze the perceptions of the farmers toward the production lamb meat from an autochthonous livestock breed in Spain. In addition, were explored the interrelationships between these perceptions and characteristics of farms as well as the farmers' objectives. The information used was obtained from a sample of 34 lamb meat producers of an autochthone sheep breed originally from northeastern Spain. The statistical analysis performed was descriptive analysis, factor analysis and cluster analysis. The results show that breeders greatly value the positive effects of sheep breeding on rural development, which generate employment in disadvantaged areas. The cluster analysis reveals the existence of two groups of farmers with different perceptions. Moreover, results indicate that the positive perceptions of producers toward autochthonous breeds are closely related to the farmers' objectives. Hence, public and private organization initiatives that seek to promote the development of a particular breed should account for livestock farm heterogeneity.

Percepciones de los ganaderos hacia la producción de carne de cordero Ojinegro, una raza ovina autóctona

Palabras clave adicionales

Criadores de ovino.
Raza local.
Desarrollo rural.
Objetivos de los ganaderos.
Conservación.

RESUMEN

En las dos últimas décadas se ha producido en España un creciente interés por recuperar y mantener razas de ganado autóctonas, en parte por considerarse esenciales en la adaptación a condiciones socioeconómicas y ambientales cambiantes. El objetivo del trabajo es analizar las percepciones de un grupo de productores hacia la carne de cordero de una raza autóctona, relacionándolas con diferentes objetivos de los ganaderos y con características de sus explotaciones. La información empleada en el estudio se obtuvo a partir de entrevistas personales dirigidas a una muestra de 34 productores de ovino de la raza autóctona originaria del noreste de España. El análisis estadístico consistió en análisis descriptivo, factorial y cluster. Los resultados indican que los ganaderos valoran mucho el efecto positivo de la explotación de la raza sobre el desarrollo rural y la generación de empleo en zonas desfavorecidas. La segmentación realizada muestra la existencia de dos grupos de productores con percepciones diferentes hacia la raza. Además las percepciones positivas de los ganaderos hacia la raza autóctona, están muy relacionadas con los objetivos perseguidos por los ganaderos en su explotación. Es por ello que cualquier medida tomada por organizaciones públicas ó privadas que pretenda la promoción y fomento de una raza, debería tener en cuenta la heterogeneidad de las explotaciones.

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INTRODUCTION

According to Food and Agriculture Organization (FAO 2007a, p. 15), 20% of the animal breeds used in agricultural and food industries are globally endangered species, and Europe and North America are the regions that present the highest risk levels. This results in part to high levels of specialization in the livestock industry, which often focuses on the breeding of a limited number of breeds, resulting in a significant decline of traditional production systems (Carson et al. 2009, p. 288; FAO 2007a, p. 9). Globally, there has been a growing interest in regional autochthonous animal genetic resources given the potential benefits that this

present for sustainable economic development and food safety (FAO 2007b, p. 1; Hoffmann, Boerma & Scherf 2011, p. 9). Although autochthonous breeds generally produce lower yields, they offer unique genetic compositions; are better adapted to local conditions, including variations in water and food availability; and exhibit a greater capacity to cope with possible environmental changes, such as climate change and the occurrence or recurrence of disease (Hoffmann 2010, p. 32; Hoffmann, 2011, p. 71; Woolliams, Matika & Pattison 2008, pp. 72-3). Several local breeds provide a wide range of ecosystem services and products that allow livestock farms to remain in operation. These services and products are not easily quantifiable and marketed. However, their value may exceed that of marketed products in relation to numerous production systems (Barba et al. 2016, p. 446; Hoffmann 2011, p. 71).

Given that, the autochthonous breeds form part of the genetic heritage of animals and play a crucial role in helping livestock farms cope with regional socioeconomic and environmental changes, in Spain, over the last two decades, an interest in recovering and maintaining autochthonous livestock breeds has emerged (Fernández & Cima 2011, p. 321; BOE 2013). The present work focuses on the Ojinegra sheep breed, an autochthonous sheep breed originating from the province of Teruel of northeastern Spain. Ojinegra sheep breed, is categorized in the country as an autochthonous breed according to the national program for the conservation, improvement and promotion of livestock breeds (BOE 2009). This breed exhibits great hardiness, as it survives in harsh, rugged terrain under poor weather conditions, large temperature fluctuations and low rainfall (Sierra 2002, pp. 46-7). The Ojinegra sheep breed's habitat, the province of Teruel, is considered a largely disadvantaged area due to its mountainous and unpopulated characteristics (Gobierno de Aragón 2009). Hence, the Ojinegra sheep breed not only play an important economic role as a genetic resource but also play a social and environmental role in areas where it is found.

Although, several studies have focused on technical aspects related to Ojinegra sheep breed production (Arrufat 1982; Flores et al. 2002; Lara et al. 2000; Picazo et al. 2004; Ripoll-Bosch et al. 2012a; Ripoll-Bosch et al. 2012b; Ripoll-Bosch et al. 2012c), none have considered the role of the human factor in maintaining and preserving of this breed. A level to economic analysis, exist a gap in market analysis for autochthonous breed products and effects on farmers' livelihoods by using alternative breeds (Cardellino & Boyazoglu 2009, p. 172). As noted by Gibon et al. (1999, p. 127), this involves analyzing livestock production primarily as a human activity that is embedded within a larger socioeconomic system rather than exclusively considering the activity as a mere production process. Considering the contexts within which livestock farms evolve is critical, especially in disadvantaged areas where biophysical and socioeconomic factors can better explain farmers' decisions than technical factors (Beranger & Vissac 1994; Dent 1995, pp. 337-9). It is also widely recognized that farm heterogeneity has a social component; hence, it is important to study and understand farmers' perceptions and objectives (Brodt, Klonsky & Tourte 2006, p. 104; Commandeur 2006, p. 125; Farmar-Bowers & Lane 2009, p. 1143; Ondersteijn, Giesen & Huirne 2006, p. 207).

The autochthonous Ojinegra de Teruel sheep breed is named after an area of black pigmentation found around the sheep's eyes and for its location in a very deprived in northeastern Spain. The breed has been recognized as a local breed since 1997. Ever since, the breed has received support from public administrations, and a plan for improvement was established. The OjinegraSheep Breeders Association (AGROJI) was created in 1999, and the Herdbook was approved in 2001. In turn, the breed was converted from a breed at risk of extinction to a promoted autochthonous breed. The interest in maintaining and exploiting this breed is motivated by the fact that the breed is perfectly adapted to adverse conditions that characterize the area where it is raised. Generally, the breed grazes in poor and abrupt steppe grasslands covered by scrub and shrubs. The breed also plays an important social role in helping farmers utilize severely deprived areas that present few, if any, alternative avenues for sheep farming. The number of stockbreeders belonging to the association has modestly increased from 44 in 1999, the year of its establishment, to 54 in 2012 (Fortea 2012, pp. 15-7).

This paper examines the perceptions of a group of farmers toward autochthonous Ojinegra sheep breed for lamb meat and relates these perceptions to different farming goals, such as economic, lifestyle and sustainability objectives, and to other characteristics of livestock farms. Additionally, a sample of sheep farmers was segmented and different profiles are identified.

Characterizing stockbreeders based on their attitudes and perceptions of the local Ojinegra sheep breed can help direct public administration efforts to promote this breed. An important factor in the success of animal breeding programs for local breeds is the interaction of people and animal. Without this dual component, programs have no continuity because when the external source of financing is gone almost all activities stop (Cardellino & Boyazoglu 2009, pp. 171-2).

MATERIAL AND METHODS

Sample selection and description

Data used in this study were obtained through personal interviews conducted with a sample of 34 sheep farmers producers of Ojinegra lamb meat of the province of Teruel in May and June of 2012. A convenience sample (Santesmases 2004, p. 357) was used due to difficulties associated with collecting probability samples among farmers raising the Ojinegra sheep breed. For the purposes of this study, the interviewed farmers were stockbreeders belonging to the AGROJI sheep breeders association. The number of sheep belonging to the surveyed partners (34 breeders) accounted for 52.9% of the total amount of livestock belonging to breeders of the association.

Information were carried out through personal, face-to-face interviews and, to a lesser extent (seven

surveys), by sending the survey by mail after a prior phone call. The survey was tested prior to the realization of the final interviews. The socio-demographic characteristics of the sample are shown in **Table I**.

The survey consists of closed-ended questions that are divided into four sections. The first section included a block questions on sheep farmers' perceptions toward the Ojinegra de Teruel lamb meat. The second section of questionnaire concerns sheep farmers objectives, and the third and fourth sections collect variables related to farm characteristics and other socio-demographic aspects of the livestock breed, respectively.

To measure farmers' perceptions toward Ojinegra lamb meat, an ordinal rating scale of 1 to 5 was used, in which 1 = no association, 2 = little association, 3 = moderate association, 4 = substantial association and 5 = high association. The items and scores obtained can be observed in **Figure 1**.

Farmer objectives were categorized as economic, lifestyle and sustainability objectives, and an ordinal scale of assessment from 1 to 5 was used, in which 1 = of no importance, 2 = of little importance, 3 = of medium importance, 4 = of high importance and 5 = of very high importance. The items were added to this section and clustered into the three objective categories following the methodology developed by Willock et al. (1999, pp. 12-5) and applied by authors including Gil, Perdiguero and Ben Kaabia (2003, pp. 160-5), Maybery, Crase and Gullifer (2005, p. 65) and Sepúlveda et al.(2010, pp. 92-3).

Statistical analysis

Table I. Socio-demographic characterisation of the producer sample (Socio-demographic characterisation of the producer sample).

Socio-demographic variables	
Farmer age (mean age and standard deviation (SD))	52.3 (9.1)
From 20 to 39 years	8.8%
From 40 to 59 years	64.7%
Over 59 years	26.5%
Gender (per cent)	
Male	100%
Number of household members (mean and SD)	3.4 (1.3)
Live as a couple-Yes (per cent)	79.4%
With grandparents-Yes (per cent)	20.8%
With children-Yes (per cent)	58.8%
Number of children per household (mean and SD)	1.5 (0.7)
Children under 14 years (per cent)	29.4%
Children between 15 and 24 years (per cent)	20.8%
Children between 25 and 34 years (per cent)	26.5%
Children 35 years or over (per cent)	5.9%
Education level (per cent)	
Elementary	73.5%
Secondary	26.4%
Nationality (per cent)	
Spanish	100%

The SPSS Statistics software program version 19.0 was used to perform the data analysis. Two multivariate statistical techniques, factor analysis and cluster analysis, were used. Univariate analyses were developed for all the variables included in the study to observe their individual behaviours and detect outliers.

A factor analysis (a technique used to condense and summarise information) was carried out for the set of questions corresponding to farmers' perceptions toward Ojinegra lamb meat (ordinal rating scale) and for questions relating to farmers' objectives. For the questions that included ordinal variables, factor analysis was used to condense information, and thus, from a statistical point of view, an assumption of linearity and normality among the variables can be ignored. Principal component analysis was applied to extract factors. As a measure of correlation between the variables, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's sphericity test were used. Variables that exhibited a low degree of communality were not included in the factor analyses, as $h< 0.6$ denotes that these variables were not adequately correlated with the new factors obtained. The selected factors were those that presented ≥ 1 eigenvalues. To provide a more complete understanding of the factors obtained, an orthogonal rotation was carried out using the Varimax method. Factor scores were estimated using a regression method, and these scores were therefore saved as new variables to be used in the cluster analysis (Hair et al. 2005; Uriel & Aldas 2005). The results of the factor analyses regarding farmers' objectives are presented in Annex 1, while the results of the factor analyses corresponding to their perceptions are presented in **Table II**.

A cluster analysis was performed to identify farmer profiles based on their perceptions toward the Ojinegra sheep breed. Ward's method was applied to cluster the observations, using the squared Euclidean distance as a measure of distance. The distance matrix was calculated based on factor scores obtained through previous analyses. Rather than applying other methods, hierarchical clustering was adopted for ease of use. This approach is also recommended for the study of exploratory processes for which no adequate assumption exists regarding the number of clusters that may form within the population analysed. Ward's method was used due to its robustness and because it is highly discriminative (Uriel & Aldas 2005).

Once groups of farmers were defined, they were characterised according to their socio-demographic and farm characteristics, personal perceptions and economic, lifestyle and sustainability objectives. To identify the most important variables that differentiate between groups, the Mann-Whitney's *U* test, a non-parametric test for the comparison of independent means, and independent samples T-test were used.

RESULTS

Farmer perceptions toward the Ojinegra sheep breed

Stockbreeder perceptions toward Ojinegra de Teruel sheep breed were measured using a Likert scale, as shown in **Figure 1**. Farmers strongly associate this

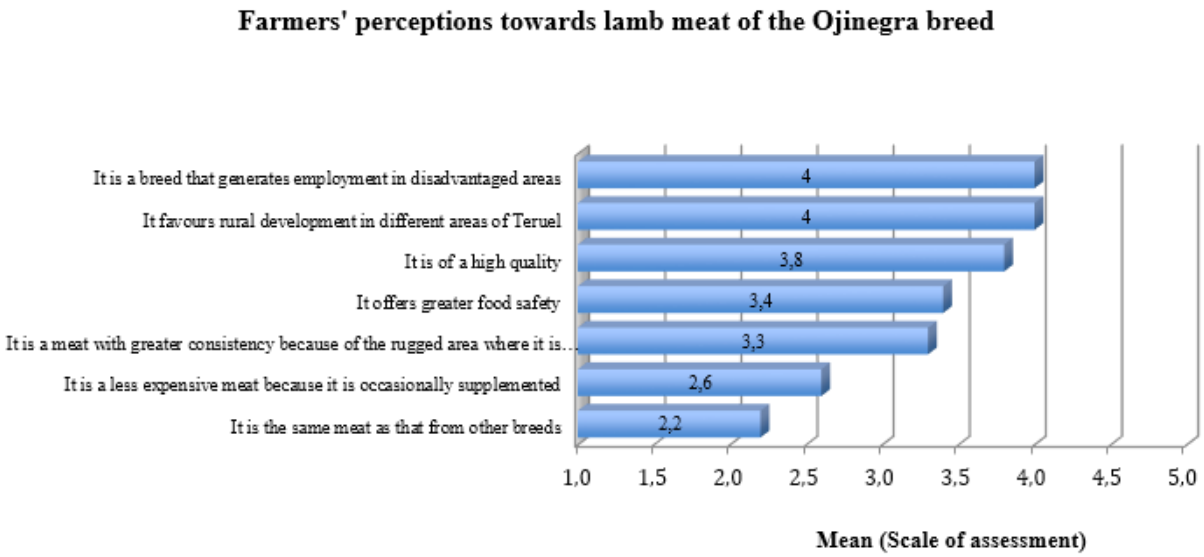

Figure 1. Farmer's perception of Ojinegra lamb breed (Percepciones de los ganaderos de corderos de oveja Ojinegra).

breed with the fact that it benefits rural development in various areas of Teruel and generates employment in disadvantaged areas. The farmers also closely associate this meat-related breed with high quality meat products, food safety and high consistency because the breed can survive in rugged terrain. By contrast, the lowest scores were obtained for statements relating to the meat's low cost as a result of the breed's occasional supplementation and to its quality in relation to the meat of other breeds. This may demonstrate that while the breed is moderately associated with lower production costs, farmers believe that it produces markedly different meat products than those from other breeds.

From the principal component analysis, we obtained three factors that explain 73.5% of the total variance, an acceptable percentage (**Table II**). Bartlett's sphericity test (P<0.001) and the finding that KMO = 0.566 indicate that the series of variables included in the analysis are significantly correlated, and thus, it was possible to carry out the analysis.

The first factor, which explains 33.9% of the total variance and which relates the following variables: "the breed generates employment in disadvantaged areas", "the breed favours rural development in different areas of Teruel" and "the breed produces meat of high quality", was called the sustainability and quality factor. The second factor, which explains 24.1% of the variance and which relates the following variables: "produces less expensive meat because it is occasionally supplemented" and "the meat is of the same quality as that of other breeds", was called the meat differentiation factor. The third factor, called the food safety factor, is only characterised by the following variable: "the breed provides greater food safety". It is important to note that the variable regarding meat

Table II. Farmers' perceptions of Ojinegra lamb meat (Percepciones de los agricultores de la carne de cordero ojinegro).

	Components		
Perceptions of Ojinegra lamb meat. The breed…	Sustainability and quality factor	Meat differentiation factor	Food safety factor
Generates employment in disadvantaged areas	**0.909**	-0.053	-0.051
Favours rural development	**0.842**	0.003	-0.109
Produces meat of high quality	**0.636**	-0.038	0.329
Produces less expensive meat	0.118	**0.858**	0.100
Produces comparable meat to that of other breeds	-0.377	**0.759**	-0.106
Produces meat more consistently	0.457	0.498	0.466
Offers a higher degree of food safety	-0.068	0.016	**0.954**
Percentage of explained variance	33.9%	24.1%	15.4%

consistency is positively correlated with moderate coefficients of the three factors.

The farmers' perceptions of this breed can be summarised using the three following constructs: sustainability and quality, differentiation and food safety.

Farmer segmentation

The cluster analysis based on the factor scores of the factors obtained through the analyses of farmers' perceptions of the Ojinegra sheep breed suggests the presence of two distinct groups of farmers. Their characterisation was carried out using socio-demographic variables that relate to farm characteristics and to factors obtained from the analysis of stockbreeder objectives and perceptions of the Ojinegra sheep breed (**Table III**).

The two segments obtained are of different sizes. Cluster 1 is composed of eight stockbreeders, while Cluster 2 consists of 26 stockbreeders. From a socio-demographic point of view, none of the variables analysed (age, the presence of children and education level) allowed for differentiation between the groups (P>0.05). However, higher education levels and a smaller percentage of farmers with only a primary education are found in the largest group, Cluster 2. Concerning farm characteristics, no differences were found regarding how long farmers had been devoted to sheep breeding. The farmers were not highly variable in the average number of years that they had been producing Ojinegra lambs, though significant differences were found with respect to average herd size (P<0.1). The largest group in terms of the number of stockbreeders devoted to sheep breeding (Cluster 2) presents a greater average herd size.

As for factors relating to farmers' perceptions, sustainability and quality factor (P<0.001) and food safety factor (P<0.1) vary considerably between the groups. Farmers from Cluster 1 differ considerably from those of Cluster 2 with respect to "sustainability and quality" factor, explaining the farmers' perceptions of Ojinegra sheep meat to a greater extent. Differences concerning the "food safety" factor, though present (P<0.1), are less significant, and thus, members of Cluster 1 believe to a lesser extent that this meat provides greater food security.

Furthermore, the results show that the groups differ in terms of life goals that respondents pursue, which showed significant differences for all factors except one. Regarding economic objective factors, both the farm success factor (P<0.001) and diversification factor (P<0.05) differ significantly between the groups. Both factors obtained from the lifestyle objective, quality of life and leisure factors (P<0.05) and farm success and future factors (P<0.1),also show significant differences. Finally, the factor of the sustainability objectives was highly significant (P<0.001) in differentiating between the groups.

Hence, the results indicate that Cluster 1, which is composed of stockbreeders who associate Ojinegra sheep meat to a lesser extent with its contribution to rural development and food safety and with its high

Table III. Characterisation of clusters obtained (Caracterización de clusters obtenidos).

Variables	Cluster 1 (n=8)	Cluster 2 (n=26)
Socio-demographic		
Producer's age (mean years)	55.38	51.42
Presence of children-Yes (per cent)	62.5%	61.5%
Level of education (elementary)	85.5%	69.2%
Farm characteristics		
Farm size Ojinegra (sheep herd) *	318.25	535.08
Number of years producing lambs (Mean years)	32.0	30.50
Number of years producing Ojinegra (Mean years)	26.88	29.15
Perceptions and attitudes towards the breed		
Sustainability and quality factor ***	-1.23	0.38
Meat differentiation factor	0.08	-0.02
Food safety factor *	-0.53	0.16
Economic objectives		
Success factor ***	-1.28	0.39
Diversification factor **	-0.57	0.18
Risk factor	-0.45	0.14
Lifestyle objectives		
Quality of life and leisure factor **	-0.94	0.29
Farm success and future factor*	-0.56	0.17
Sustainability objectives		
Sustainability factor***	-1.36	0.42

(*P<0.1, **P<0.05, ***P<0.001)

quality, includes farmers with smaller average farm sizes and higher proportions of elementary studies, although the education level does not seem significant. In turn, these farmers are less inclined to pursue economic objectives, such as farm success, diversification through off-farm income generation or other on-farm activities, such as additional training beyond stockbreeding. These farmers value to a lesser extent quality of life and leisure or future farm success. Sustainability variables are also less valued by this group.

In contrast, the other segment is composed of a larger number of stockbreeders, with a total of 26 farmers who are characterised by a higher average farm size (535 livestock on average) and a higher level of education. The farmers of Cluster 2 are more likely to associate Ojinegra sheep meat with its high quality and capacity to generate employment in disadvantaged areas and deliver food security while favouring rural development. As for economic objectives, this group more heavily values farm success in the sense of securing maximum economic benefits by using their own resources, keeping buildings and equipment in good condition and having the best herd. Consequently, these farmers were also more likely to have concern over keeping the farm in good condition. These farmers also value farm income diversification, diversification activities and the acquisition of other qualifications to a greater degree. As for their lifestyles, this group values quality of life and leisure, as well as future farm success, to a greater extent. This group of stockbreeders also places more importance on sustainability objectives, valuing environmental preservation, the limited use of chemicals, keeping land in good condition, maintaining the countryside and improving the quality of the estate to a higher degree.

DISCUSSION

This paper examines sheep farmers' perceptions of the autochthonous Ojinegra sheep breed in a deprived area of the province of Teruel. The paper identifies profiles of sheep farmers, whose varying perceptions toward the breed may be related to socio-demographic differences, farm characteristics and different economic, lifestyle and sustainability objectives. The identification of farmers who hold more positive perceptions of the breed may guide public administrations in the design of sheep farming promotion approaches.

Farmer assessments of the breed show that more than all the other attributes related to meat quality, the breed is understood to favor rural development while generating employment in disadvantaged areas. This indicates that stockbreeders are aware that autochthonous breeds facilitate development in disadvantaged areas, as has been the case in the province of Teruel, where the population density is one of the lowest in Spain and where maintaining a minimal production structure is critical to retaining residents. As noted by Hoffmann (2011, p. 72), while several local breeds offer a wide range of functions that allow for the subsistence of agricultural, economic and cultural ecosystems, these functions are not formally recognised, as these breeds are not marketed. Nonetheless, their value may exceed that of the market for many production systems.

Farmers appreciate that Ojinegra sheep meat is of high quality, provides greater food safety and is produced more consistently as a result of the rugged terrain on which this breed is raised. At the same time, the statement that was given lower scores is that Ojinegra sheep meat is equivalent in quality to that of other breeds. This may indicate that according to stockbreeders, marketed lamb meat possesses differential characteristics that are based on quality attributes that can be differentiated from other sheep meats. Furthermore, this breed is recorded under the Protected Geographical Indications (PGI) *"Ternasco de Aragón"* categorisation along with two other autochthonous breeds. Sepúlveda et al.(2010, p. 93) have highlighted that the production of quality label lamb meat generates greater consumer confidence and allows for the production of high quality meat, increasing lamb sales. The commercial advantages of selling quality label meat have been noted by several authors (Fearne & Walters 2004; Hubbard, Bourlakis & Garrod 2006; Ilbery & Kneafsey 2000, p. 229); Spriggs, Hobbs & Fearne 2000, pp. 105-7; Verbeke et al. 2005, p. 38).

In this sense, the conservation of animal biodiversity through the raising of autochthonous breeds must go hand in hand with the development of products that offer added value. Only in this way can stockbreeders' living conditions be improved while also ensuring that biodiversity is preserved (Hoffmann 2011, p. 78).

The results obtained show that two groups of farmers exist who hold significantly differences perceptions of the Ojinegra sheep breed. The first group includes stockbreeders who hold positive perceptions of Ojinegra sheep meat, as they believe that this breed favors rural development while generating employment in disadvantaged areas. These stockbreeders also believe that this meat is of high quality and that it provides greater food safety. The second group of stockbreeders is characterized by more negative perceptions of these factors. Farmers who hold positive perceptions of the breed represent 76.5% of the analysed sample. This may be beneficial to the breed's maintenance, especially given that these farmers also maintain significantly larger average herds than farmers holding more negative perceptions of the breed.

However, the analysis revealed that both groups exhibit significant differences in all but one factor related to farmer objectives: economic, lifestyle and sustainability objectives. These objectives must be considered and related to this study's main aim: to examine stockbreeder perceptions of this breed. This is achieved effectively using a systemic approach. Indeed, when farmers make decisions, they consider long-term preferences and safety, lifestyle and quality of life (Brossier et al. 1991; Gafsi & Brossier, 1997, p. 91-4). The ways in which a farm is managed depends on the producer's objectives and values and on how potential and expected obstacles are perceived (Willock et al.1999, p. 6).

The farmers holding positive perceptions of the breed achieved a positive score in factors related to suc-

cess and the diversification of economic objectives. This may demonstrate that these farmers pursue maximum benefits for their farms that go beyond the maintenance of farmland and strong herds. Rather, these farmers remain open to diversification at given points in time and will earn off-farm income or engage in other on-farm activities in addition to sheep farming. By contrast, the farmers holding more negative perceptions of the Ojinegra sheep breed achieved negative success and diversification factor scores. In Gil, Perdiguero and Ben Kaabia, (2003, p. 163) work focusing on the region of Aragon, it is highlighted that diversification through participation in non-agricultural activities would represent factors that may decrease a farmer's likelihood of remaining in the sector. However, pessimistic views of economic prospects significantly affect tendencies toward continuation. This may gradually restructure the sector into one in which farmers determined to produce quality products and to be market-oriented contrast with those who only seek to survive as long as subsidies exist as a result of a lack of alternatives in rural areas (Gil, Perdiguero and Ben Kaabia, 2003, p.176).

The group of farmers holding more positive perceptions of the Ojinegra sheep breed achieved positive scores in the areas concerning quality of life and leisure and future farm success. These farmers are more interested in spending time with their families, taking holidays each year and devoting time to activities other than farming. Additionally, factors related to interests in bequeathing the farm to a family member, participating in public displays and fairs or being highly regarded by neighbours and other farmers differentiate this group from the other, although not significantly. One may conclude that these farmers hold a greater desire to spend time with family, take holidays or bequeath the farm to a family member because they have more children. Sepúlveda et al. (2010, p. 95) showed that farmers that exhibit greater interest in personal and family development had more children. The analysed sample presents a high degree of homogeneity in this respect, with no significant differences between both groups.

Finally, the group of stockbreeders holding more positive perceptions of the Ojinegra sheep breed achieved positive sustainability objective scores. To some extent, it can be considered logical that farmers who are more interested in preserving the environment, maintaining the countryside, etc. will hold more positive attitudes towards raising local breeds that are perfectly adapted to harsh environmental conditions.

CONCLUSIONS

We can conclude that for the analysed sample of farmers, positive perceptions of local breeds, such as the Ojinegra sheep breed, are closely related to farming objectives pursued by stockbreeders. Hence, public administration efforts that seek to promote the development of particular breeds should take farm heterogeneity into account, as certain groups are more inclined towards their adoption than others, and farmer decisions may be influenced by the payment of subventions.

Although the present study is limited to an examination of a small Spanish autonomous community, similar trends may be observed in other deprived areas of Spain. However, given the limited literature available on this subject, other studies should attempt to corroborate, where relevant, the results obtained.

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