

EFFECT OF THE DIET MEAT THE QUALITY AND PALATABILITY IN SERRANA SORIANA BREED.

Ciria J.; Asenjo, B.; Beriain, M.J.*; Gorraiz, C.*

Escuela Universitaria de Ingeniería Técnica Agrícola de Soria. Universidad de Valladolid.

*Escuela Técnica Superior de Ingenieros Agrónomos. Universidad Pública de Navarra.

Background

The consumer loss of confidence in healthfulness and meat quality has given rise to a consume decrease, what puts in danger the rentability of cattle. That is why there exist a growing necessity to protect the quality of meat, and in Spain, the native cattle farmers have put it into practice in fields situated in undeveloped areas. This cattle allows a considerable rural development and fix to the environment a population with a very high environmental culture.

Nowadays, the parameters evaluating the meat quality and consequently its commercial value are referred to parameters related to the canal (weight, conformation and fat). But these parameters have no much to do with the quality of the meat for the consumer, and new technologies are being developed to properly estimate the quality of meat and its commercial value coming from new measures made on the canal after the slaughter. The organoleptic quality of meat is defined by its own properties (composition and structure), which can be determined through laboratory technology. The evaluation through sensorial methods is the way used to measure, analyze and interpret the reactions to determined characteristics by the consumer. It is the perception by the senses of sight, smell, taste, touch and hearing of the final user.

Objectives

On this study we try to evaluate the quality of meat (technological and sensorial) of steer bulls of the Serrana breed from Soria, native breed implanted in the mountain, using two sorts of alimentation during the feeding stage, because this has a decisive role and it is going to determine the fattening and muscular characteristics, which are very important in the final quality of the product.

Methods

Two groups of 15 animals each have been the base of this study, fed from the weaning state with concentrate "ad libitum", on the open air during the period between October 1996 and June 1997. Each group has been fed with concentrate of different composition, being the most important different the content and composition of the fat; the concentrate used for this test (P2) is usually more unsaturated than the other conventional concentrate (P1). Besides, the first has no additives.

The animals are of the Serrana Soriana Breed, belonging to the Agrupación Negra Ibérica. It is a native breed of the highlands of the Sistema Ibérico, having been used in the past as an instrument for work, meat and milk. The female calves' shoulder high is 138 cm and the average weight is 518 kg, and the male calves are born with an average weight of 38 kg. They have an average daily growing of 1,3 kg a day and a conversion Index of 5-5,5, during the fattening period which goes from the waning - 6-7 months with a weight of 210 kg - until the 13-15 months with an approximate weight of 550 kg.

10 animals of each lot were slaughtered, being considered yearling. After a maturation of 7 days, it is made the technological and sensorial analysis of the longissimus dorsi muscle as it is following indicated:

* Technological analysis

- The pH measure, carried out 24 hours after the slaughter, on the canal, in the dorsal region, with a portail Crison pHmeter 507.
- The holding water capacity (HWC) was determined, through compression, described by Grau and Hamm(1953).
- Physical colour parameters, were measured by the CIE- L* a* b* (Minolta 200 colorimeter) and myoglobin concentration (Hornsey, 1956).
- The shear force, was measured by texturometer TA. XT2. Stable Micro Systems.
- The chemical composition (proteins, fat, ashes and moisture). It was carried out under the analytical official methods (BOE 29/8/1979) and the International rules ISO R-1442 (moisture), ISO R-936 (ashes), ISO R-1443 (fat) and ISO R-937 (total nitrogen).

* Sensorial analysis.

It was carried out by 9 judges trained in five sessions, using 2 samples/lot/session in an homologated sampling room (AFNOR, 1987) of ETSIA of the Universidad Pública de Navarra.

The sensorial evaluation was realized applying the techniques of the descriptive quantitative analysis (STONE et al 1974) with a trained panel formed by 9 tasters. The organoleptic characteristics about aroma, flavour and texture previously evaluated are detailed in table 2. These characteristics were measured pointing at their intensity in a scale of 150 mm.

• Statistic treatment.

It was carried out an analysis of unifactorial variation with the S.P.S.S. program.



Results and discussions

The analytical and sensorial analysis results are expressed on tables 1 and 2.

Identical pH values after 24 hours for both treatments are observed. They are in the same level to the ones described by CONSIGLI (1994) and inferior to the ones found by ALBERTÍ et al in other native breed. The HWC was lower in the animals fed with P2 concentrate, although the differences are not very significant, considering the results obtained by ALBERTÍ et al (1993), the meat of these animals was more juiciness in the sensorial analysis and and less hardness, being observed significant differences ($p<0,05$) in both cases and a negative correlation between the continued juiciness evaluated by the samplers and the hardness.

The moisture content was considerably different in both treatments and lower in the group P2, also coinciding with less hardness. Similar results were obtained by MAMAQUI (1996) with diets in which barley was substituted by cassava and gluten feed.

The lightness (L^*) was higher in the group P2 (significant difference) coinciding with the lower content in myoglobin. This lightness was slightly lower to the one observed by ALBERTÍ et al (1995) in other native breed.

Finally, it is observed lesser shear force in the group P1, coinciding with an slightly higher fat content.

Conclusions

After 24 hours, the pH was smaller than the ones obtained in other Spanish native breed. It was observed the influence of the diet in some parameters which determine the quality of meat, improving with free additives concentrate and more unsaturated concentrate. The improved parameters were: Juiciness and hardness, as well as moisture and lightness.

Pertinent literature

ALBERTÍ, P.; SAÑUDO, C. SANTOLARIA, P.; LAHOZ, F.; JAIME, J.; TENA, R.(1993): Calidad de la canal y de la carne de terneros cebados con dietas de paja tratada. ITEA, vol Extra N° 12, Tomo II, 640-642.

ALBERTÍ, P.; SAÑUDO, C. SANTOLARIA, P. (1995 a): El cebo de terneros con pienso. Bovis N° 63, 43-52.

CONSIGLI, R. (1994): Influencia de la mandioca y otros subproductos agroindustriales en el cebo de terneros: parámetros productivos y calidad de canal y de carne. Master of Science. C.I.H.E.A.M. Instituto Agronómico Mediterráneo de Zaragoza. 255 p. y anexos.

MAMAQUI, E. (1996): Influencia de la raza de terneros y del tipo de pienso en los parámetros productivos y en la calidad de la carne. Master of Science. C.I.H.E.A.M. Instituto Agronómico Mediterráneo de Zaragoza.

Data in form of tables

Table 1 - Results of the technological analysis.

SERRANA	P1	P2	SIGNIFICATION LEVEL
pH-24	5.4	5.4	N.S.
HWC		1	
(% ejected water)	17.97	9.97	N.S.
Moisture (%)	75.10	73.93	**
Protein (%)	22.76	23.22	N.S.
Fat (%)	2.29	1.9	N.S.
Ashes (%)	1.00	1.03	N.S.
Myoglobin (mg/g)	6.35	5.62	N.S.
L^*	36.27	38.03	**
a^*	22.24	23.05	N.S.
b^*	10.43	10.97	N.S.
Shear force (kg/cm ²)	7.21	7.68	N.S.

N.S.: No significative. **: Significant difference ($p<0,05$).

Table 2 - Results of the sensorial analysis

SERRANA	P1	P2	SIGNIFICATION LEVEL
Characteristic aroma	70	66	N.S.
Liver aroma	35	42	N.S.
Characteristic flavour	71	67	N.S.
Blood flavour	58	61	N.S.
Liver flavour	38	41	N.S.
Fat flavour	51	52	N.S.
Residual flavour	63	68	N.S.
Initial juiciness	65	72	N.S.
Continued juiciness	57	64	**
Hardness	70	59	**
Cohesiveness	71	62	N.S.
Flourmess	53	51	N.S.
Facility to swallow	56	65	N.S.
Greasiness	52	56	N.S.

N.S.: No significative. **: Significant difference ($p<0,05$).

