PE7.29 Chemical, physical and fatty acid profile characterization of Monchina breed meat. 304.00

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***Abstract*— Eight Monchina entire males were reared in a grain and silage production system and slaughtered at an average age of twelve months. The animals were evaluated for chemical, physical and fatty acid characterization of *Longissimus thoracis* muscle. pH, L*, a*, b*, C*, Hº, myoglobin pigments, cooking loss, expressible juice, drip loss, moisture, ash, total protein, intramuscular fat, SFA (saturated fatty acids), MUFA (monounsaturated fatty acids), PUFA (polyunsaturated fatty acids), n6/n3 ratio and PUFA/SFA ratio were studied.**

In this study Monchina meat was characterized by higher values of lightness (38) and chrome (38) at seven days ageing, cooking loss (33,08%), expressible juice (23,45%) and PUFA (16,65%) than other local breeds.

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***Index Terms*— Fatty acid profile, local breed, meat, physical and chemical parameters.**

I. INTRODUCTION

ACCORDING to a report of the FAO [1] about the genetic resources of the world, almost one breed per month was lost during the last 6 years. This owes to the cattle production of the world is growing on the basis of the use of a reduced number of races and even the genetic diversity inside these races more used is also declining.

Throughout the years there have been a series of initiatives directed to studying the quality of the meat, genetic classification and productive improvement of those breeds in Spain and other countries.

Monchina is a rustic local bovine breed from Cantabria (located in the northern Spain) which is catalogued as stated by a Spanish law [2] in danger of extinction with 1.443 heads in Cantabria Community.

In Cantabria, bovine extensive breeding plays an important role in the agricultural system but the low meat yield of this breed is a limiting factor in the meat production.

Keep this animals in confinement becomes an alternative to the Monchinas breeder with the aim to increase the meat yield.

The objective of this study was to evaluate the physical, chemical composition and fatty acid profile of Monchina meat submitted to a intensive diet.

II. MATERIALS AND METHODS

A. Animals

Eight Monchina entire males were weaned at 6 months of age, from this moment the essay began with an intensive production system until they were sacrificed at the age of 12 months.

B. Diet

Each animal consumed an average of 331 kg concentrate feed, 77.5 kg crush barley and 2.906,25 kg grass silage with the following nutritive value (Table 1).

C. Slaughter

Eight animals were slaughter in an authorize slaughter-house located in Boo de Guarnizo (at 30 km from the cattle farming). One day later, the *Longissimus thoracis* muscle was extract from the carcass and was prepared in several steaks for the analysis.

D. Meat analysis

Different meat analyses were carried out; pH (pH-meter Crison 507), color measurements (Minolta Colorimeter CR-400) [3] at 24h and 7 days, hemoglobyn pigments (spectrophometer UV-VIS Shimadzu UV-2501) [4], texture (SMS TA.TXplus) [5], water holding capacity: drip loss [6], cooking loss [7] and expressible juice [8] at 48h, nutritive [9] and fatty acids profile (Varian 3900 Gas Chromatograph with a fused silica column and polietilenglicol stationary phase,

Varian CP 7488, 50m length, 0.25internal diameter, 0.25 µm phase thickness) [10] [11] .

E. Statistical analysis

The information was analyzed with the SPSS v.17 using descriptive statistics as means and standard deviations.

III. RESULTS AND DISCUSSION

There were no differences between pH measure at 24h (5,61 ± 0,09) and at 7 days (5,57 ± 0,10), although the last one has lower values, they were inside the normal range.

The color of the meat is one of the most important criterions used by the consumers in the moment of buying meat. The results corresponding to the variables referred to color meat quality are summarized in (Fig.1). At seven days ageing meat, lightness, b* value, chroma and saturation were higher than in 24h ageing meat. In contrast with results referred by most of authors, meat lightness and saturation increase after 7d ageing (L*=36, Hº=38) as [12] determined for Charolais and Limousin breeds. These high L* values in Monchina meat constitute a positive characteristic for the consumer.

As it was expected, a* and b* values presented significant differences between 24h and 7days, coinciding with the results of other breeds.

The concentration of myoglobin pigment in Monchina meat was no different at 24h (3,67 ± 0,74 mg/g) and 7 days (3,78 ± 0,75 mg/g) ageing meat in contrast with other authors, nevertheless this is an average value compared with other breeds.

The *Longissimus thoracis* expressible juice (33,08 %) and coking loss (23,45 %) found in Monchina yearlings were higher than the results reported by [13] and [14] (Fig.2).

The obtained results in nutritive analysis are according to the ones obtained in the muscle *L. thoracis* for meat of bull (75 %water, 21-22 %proteins, 1-2 %fat, 1 %mineral substances and less than 1 % carbohydrates [15] (Fig.3).

Texture results obtained at 48h were higher (11,86 ± 2,05 kg/cm^2) due to the low content in intramuscular fat (1,41%) and because the rustic breed needs more ageing time.

The fatty acid profile of Monchina meat (Fig.4) was characterised because of the absence of CLA (Conjugated Linolenic Acid), the ratio n6/n3 was near 5 wich is the limit recommended from the Department of health of UK [16] and the ratio FUFA/SFA was less than 0,45. Furthermore, SFA (48,8%) in Monchina were similar to Retinta and Pardo Alpina, MUFA (34,6%) were less and PUFA (16.65%) were higher than those described in the study of the seven Spanish breeds [14]. The proportion of FUFA and n6 was increased because the diet from the animals was based on grain fed principally.

IV. CONCLUSION

This study constitutes a first step to know Monchina´s meat quality with the aim to investigate and find an adding value in the meat production.

ACKNOWLEDGEMENT

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Fig.1 Monchina meat color evolution at 24 h and 7 days. Mean and Standard derivation.

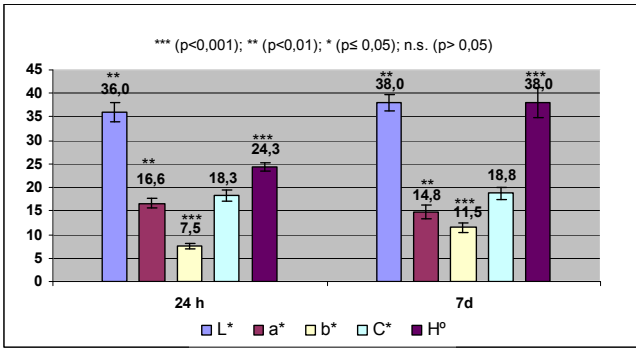

Fig.2 Monchina meat water holding capacity at 48 h. Mean and Standard derivation.

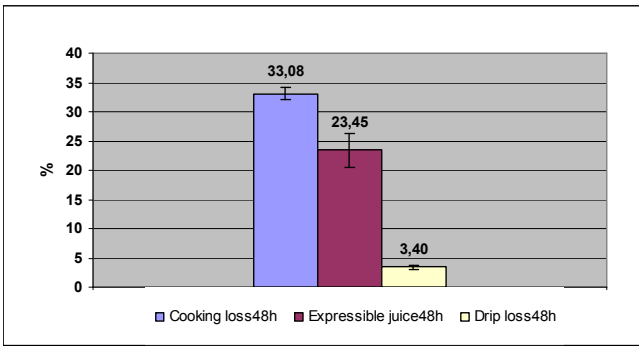

Fig.3 Monchina nutritive values. Mean and Standard derivation.

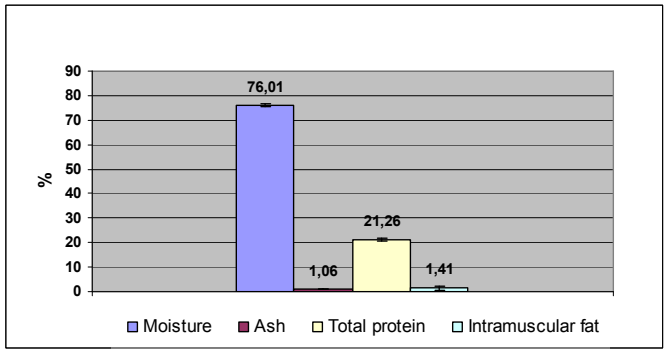

Fig.4 Monchina fatty acid profile values. Mean and Standard derivation.

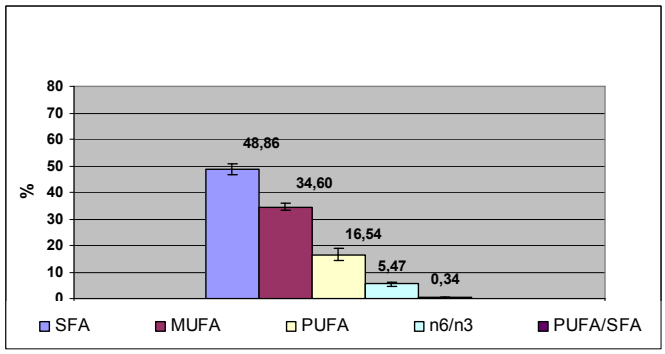

Table 1. Diet composition.

NUTRITIVE VALUE	**Concentrate**	**Grass Silage**	**Crush Barley**
Moisture (%)	12	56,8	13,5
Dry mater (%)	88	43,2	86,5
Ash (%)	5,13	11,8	2
Fiber (%)	7,13	31,3	3,78
Fat (%)	2,95	2,44	1,82
Protein (%)	12,60	10,70	9,05
FAD (%)		43,9	
FND (%)	20,3	60,7	17,3