

Chemical composition on several commercial veal pieces of the carcass

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Abstract

The objective of this study was to assess the chemical composition of the muscles by the different anatomical location on the carcass. Nine young calves with a low fatness score from the 'Galician Blond' breed were studied. Calves were slaughtered with 300 kg of liveweight. Samples of the *Longissimus thoracis*, *Longissimus lumborum*, *Psoas major*, *Semitendinosus*, *Semimembranosus*, *Rectus femoris*, *Biceps femoris*, *Triceps sural*, *Tensor fascia latae* and *Gluteus medius* muscles from the left half of the carcass were collected. Fat, protein, ash, and moisture contents of muscles were determinate by near infrared reflectance spectroscopy (NIRS) at 48 h *post mortem*. Anatomical location differences on the moisture and fat content were found. The *Longissimus thoracis* muscle showed ($P<.001$) the higher (76.59) and the lower (1.15) values, and the *Gluteus medius* showed the lower (75.08) and the higher (2.82) values, on the moisture and fat content respectively.

Introduction

There are many studies on the organoleptic and nutritional beef quality characteristics (Varela *et al.*, 2004; Moreno *et al.*, 2006, 2007). However, these studies are focused on the *Longissimus thoracis* muscle which is the reference for most of the works, but it is interesting to study the chemical composition of other veal commercial pieces of the carcass and the differences among pieces.

Material and methods

Nine male Galician Blond-breed calves from the Mabegondo Research Centre herd were used in this study. The calves were reared and suckled with their mothers on pasture. Calves were weaned with six months of age and were taken indoors for two months. During the indoor period they were offered the concentrate and the grass hay *ad libitum*. Animals were slaughtered with 300 kg liveweight. Carcasses were chilled for 48h at 4°C. Samples of the *Longissimus thoracis*, *Longissimus lumborum*, *Psoas major*, *Semitendinosus*, *Semimembranosus*, *Biceps femoris*, *Triceps sural*, *Tensor fascia latae* and *Gluteus medius* from the left side of the carcass were collected. Samples were split into 2 cm-thick steaks for assessment of chemical composition (moisture, ash, protein and fat) by NIRS at 48h *post mortem*. Data were statistically analysed using the General Linear Model (GLM) of the SAS package.

Results and discussion

Table 1. Means chemical composition of different carcass anatomical location of the muscles from Galician Blond calves

Muscles	Characteristics(%)			
	Moisture	Ash	Protein	Fat
<i>L. thoracis</i>	76.59 ^a ±0.70	1.20 ^a ±0.01	22.16 ^{ab} ±0.73	1.15 ^e ±0.40
<i>L. lumborum</i>	76.20 ^{ab} ±0.41	1.19 ^{ab} ±0.01	22.38 ^a ±0.71	1.48 ^{de} ±0.53
<i>Psoas major</i>	76.24 ^{ab} ±0.58	1.18 ^b ±0.01	22.11 ^{ab} ±0.59	1.84 ^{bcd} ±0.37
<i>Semitendinosus</i>	76.38 ^{ab} ±0.58	1.19 ^{ab} ±0.01	20.99 ^b ±3.18	1.77 ^{bcd} ±0.36
<i>Semimembranosus</i>	75.94 ^{ab} ±0.45	1.20 ^a ±0.01	22.54 ^a ±0.91	1.53 ^{cde} ±0.32
<i>Biceps femoris</i>	75.71 ^{bc} ±0.50	1.18 ^b ±0.01	22.33 ^{ab} ±0.56	2.12 ^{bc} ±0.37
<i>Triceps sural</i>	75.79 ^{bc} ±0.80	1.19 ^{ab} ±0.01	22.35 ^a ±0.65	1.96 ^{cd} ±0.58
<i>Tensor fascia latae</i>	75.20 ^c ±1.22	1.15 ^c ±0.02	21.74 ^{ab} ±0.90	2.78 ^a ±1.08
<i>Gluteus medius</i>	75.08 ^c ±0.56	1.16 ^c ±0.02	22.05 ^{ab} ±0.94	2.82 ^a ±0.85
F-test	***	***	n.s.	***

+, *, **, *** refer to significant at the 10, 5, 1 and 0.1% probability levels, respectively; NS refers to not significant.

Means in the same column bearing different letters are significantly different under the Duncan test.

Intramuscular fat content have changed on depending of the different carcass anatomical location of the muscles (Johnson, 1975; Moreno et al., 2004). The *Longissimus thoracis* muscle showed the lower (1.15) and the *Gluteus medius* showed the higher (2.82) fat content ($P<.001$), and consequently these muscles showed the higher (76.59) and the lower (75.08) values on the moisture content ($P<.001$), respectively. Bousset et al. (1986) showed that fat and moisture content in muscles are inversely proportional. There are no differences on the protein content among different carcass anatomical location muscles.

Conclusions

Different anatomical location muscles in carcass from the Galician Blond-breed calves have shown significantly differences on the chemical composition.

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