

PROXIMATE COMPOSITION AND FATTY ACID PROFILE IN THE *LONGISSIMUS LUMBORUM* MUSCLE OF PURE AND CROSSBRED SANTA INÊS LAMBS, FEEDLOT FATTENED WITH DIETS CONTAINING DIFFERENT SOURCES OF VEGETABLE OIL¹

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¹ Parte da dissertação de mestrado do primeiro autor, financiada pela Fundação Araucária-PR

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Introduction

The meat sheep presents averages values of 65% of moisture, 28% of protein, 7% of fat, 1,1% of matter mineral, less than 1% of carbohydrates and cholesterol around 80 mg/100g (Briggs & Schweigert, 1990). The great existent variation in the chemical composition of the meat is owed to several factors, such as: muscular group sampled, degree of finish carcass and type of diet regime. Due to the fraction lipidic that characterizes her, it has been associated to food little healthy, considered source of saturated fatty acids, cholesterol and excess of calories, and consequently, primary dietary contributor for arteriosclerosis development and coronary diseases (Willians, 2000).

Among the saturated fatty acids presents in the carcasses of the animals, the cholesterol is the emphasized, for being caused of coronary cardiopatia and arteriosclerosis, and several factors affect the cholesterol levels in the carcass of lambs, among them the finish system, determined for the feeding type the that the same are submitted (Silva Sobrinho, 2001).

Objective

The objective was to evaluate the chemical composition in the *Longissimus lumborum* muscle of pure Santa Inês (SI) and ½ Dorset + ½ Santa Inês (DS) lambs, feedlot fattened, submitted to diets with different sources of vegetable oil (soybean oil, canola oil and linseed oil) and a control diet.

Materials and Methods

Twenty-four lambs weaned with 60 days old, with 17.75 kg of average live weight, were used. The treatments used in the feedlot can be observed in the Table 1. The animals were slaughtered when reached the band of 30 kg of live weight. After *rigor mortis* establishment, was done the transversal cut of *Longissimus lumborum* muscle samples (between 12^a and 13^a ribs), which had been duly conditioned, and later, triturated. The analyses of moisture and ash had been carried in hot stuff and muffle, respectively, and the determination of crude protein for the half-micron Kjeldahl methodology, in accordance with Cuniff, (1998). The total lipids extraction was carried out using the technique in cold described by Foch et al. (1957). The 5509 of ISO (1978) method was used for triglycerides transesterification, in *n*-heptane and KOH/methanol solution. The cholesterol extraction and quantification was made according to the methodology described by Al Hasani al. (1993). The cholesterol content was quantified through the Shimadzu 14^A gas chromatography, and the cholesterol identification was done by comparison with Sigma standards. The cholesterol quantification contained in the samples was made after the verification of the linearity of the method. The design experimental was it entirely randomly. The statistical analysis of the studied variables was interpreted by the variance analysis, being used the System of Statistical Analyses (SAS, 1992), in agreement with the following model: $Y_{ijk} = \mu + T_i + G_j + TG_{ij} + e_{ijk}$, being Y_{ijk} = observed value of the variable studied in the individual *k*, belonging to the genetic group *j*, receiving the treatment *i*; μ = constant general; T_i = effect of the treatment *i*; G_j = effect of the genetic group *j*; TG_{ij} = interaction between treatment and genetic group; e_{ijk} = aleatory error associated to each observation Y_{ijk} .

Results and Discussions

Results of moisture, ash, crude protein, total lipids and cholesterol contents of *Longissimus lumborum* muscle of pure and crossbreed Santa Inês lambs, feedlot fattened, according to the treatments and genetic groups can be visualized in the Table 2. Didn't have interection effect for the studied variables. In relation to the moisture and ash contents, there were not differences among treatments and genetic groups, whose values were 63.50% and 0.92%, respectively. Studying the effects of different energetic sources in the chemical composition of *Longissimus dorsi* and *Semiteminosus* muscles of Apennine race lamb, Russo et al. (1999) founded values of 75.12% and 75.85% for moisture and of 1.10 and 1.08% for ash, respectively, higher than those obtained in this experiment.

It was observed treatments effect for crude protein, total lipids and cholesterol contents. The highest protein content (17.85%) was obtained in the meat of animals that received the control treatment, being also found in this treatment the lower total lipids contents (15.00%), probably for the fact that the control diet showed lesser extract ether contents (2.3%) that the others treatments (5.16%). The lambs fed with the rations containing linseed oil showed lower cholesterol contents (52.13 mg 100g⁻¹). The crossbreed lambs showed lower ($p < 0.05$) total lipids contents, but the others variables didn't differed among genetic groups. The crude protein, total lipids and cholesterol averages were 19.32%, 2.20% and 57.42 mg 100g⁻¹ of meat, respectively.

Taking into account that, according to The American Heart Association (Krzynowek, 1985), the maximum value recommended for the cholesterol consume is 300mg day⁻¹, the ingestion until 500g/day⁻¹ of sheep meat would not be prejudicial to the human health.

Conclusion

It can be evaluated that the inclusion of vegetable oils in the diets influenced on the chemical composition of the muscle *Longissimus lumborum* of lambs, increasing the content of total lipids and reducing the protein content.

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Table 1 – Percentage and chemical composition of experimental diets (%DM)

Ingredients(%)	Treatments			
	Control	Soybean	Canola	Linseed
Oat hay	25,10	32,00	32,00	32,00
Corn grain cracted	53,40	42,00	42,00	42,00
Soybean meal	20,00	21,50	21,50	21,50
Limnystone	1,00	1,00	1,00	1,00
Salt	0,50	0,50	0,50	0,50
Soybean oil	-	3,00	-	-
Canola oil	-	-	3,00	-
Linseed oil	-	-	-	3,00
Nutrients				
Dry matter (DM)	91,58	92,12	91,92	91,79
Crude protein (CP)	17,18	17,80	17,44	17,52
Ethereal extract (EE)	2,30	5,09	5,40	5,00
Neutral detergent fiber (NDF)	25,56	28,72	29,47	29,98
Mineral matter (MM)	5,11	5,59	5,50	
TDN	76,07	76,87	77,68	75,75

Table 2 – Centesimal composition of Longissimus lumborum muscle of lambs, according of the treatment and genetic groups

Variable	Treatments				Genetic groups	
	Control	Soybean	Canola	Linseed	SI	DS
Water (%)	64,55±1,85 ^a	64,38±1,74 ^a	63,65±1,75 ^a	61,41±1,75 ^a	62,11±1,20 ^a	64,89±1,31 ^a
Ash (%)	0,89±0,03 ^a	0,93±0,03 ^a	0,95±0,03 ^a	0,91±0,03 ^a	0,86±0,02 ^a	0,89±0,02 ^a
Crude protein (%)	17,86±0,43 ^a	14,06±0,40 ^b	13,36±0,40 ^b	12,94±0,40 ^b	14,23±0,27 ^a	14,87±0,30 ^a
Total lipids (%)	15,00±2,47 ^a	16,23±2,33 ^b	16,42±2,33 ^b	20,08±2,33 ^b	18,42±1,59 ^a	15,45±1,74 ^b
Cholesterol (mg/100g)	61,40±3,62 ^a	61,19±3,41 ^a	57,36±3,41 ^a	52,13±3,41 ^b	55,82±2,34 ^a	60,22±2,56 ^a

SI =Santa Inês pures; DS = ½ Dorset x ½ Santa Inês

Means followed by the same letters, within a row, are not different by the Tukey test (p<0.05)