FATTY ACIDS COMPOSITION OF "PALETA" AND "NALGA DE AFUERA", FOREQUARTER AND HINDQUARTER CUTS, TYPICAL OF THE URUGUAYAN DOMESTIC MEAT MARKET.

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Abstract – In the Uruguayan market, the commercial value of the forequarter cuts is generally lower than the one from hindquarter cuts. However, the price differences are not necessarily associated with a better nutritional value. Therefore, the objective of this investigation was to compare the fatty acids composition of the "Paleta" (PAL), a forequarter cut, and the "Nalga de afuera" (NAL), a hindquarter cut. Both cuts are typical of the meat market of Uruguay. The results showed that NAL presents more nutritionally relevant fatty acids such as C18:3n-3, EPA, DPA and DHA, but not CLA. In conclusion, the higher commercial value of NAL as a hindquarter cut is associated to a better nutritional value, at least regarding the fatty acids composition.

Key Words – Aberdeen Angus, forequarter and hindquarter cuts, nutritional quality of meat.

I. INTRODUCTION

The hindquarter meat cuts are frequently considered as commercially more valuable than cuts from the forequarter. In Uruguay, hindquarter cuts are always more expensive than forequarter cuts. The higher retail price of those cuts is expected to correspond to a higher quality product. However, there is no information which compares and associates quality and price to the nutritional value of those cuts. The aim of this work was the determination of the composition of fatty acids in two different cuts: a forequarter cut (Paleta) and a hindquarter cut (Nalga de afuera). Both are typical cuts of the local Uruguayan meat market.

II. MATERIALS AND METHODS

The meat was from three groups of ten Aberdeen Angus (AA) steers each (24-28 months, 498-503 kg of live weight) reared and finished on pasture alone (PAST), pasture and supplement (PAST+SUP, corn grains) or finished on concentrate (CONC), the last two feeding were for 90 days before slaughtering. After slaughtering, carcasses were kept refrigerated at 1-2 ºC for 36 hours postmortem and then the cuts "Paleta" (PAL. selected muscle *Triceps brachi*) and "Nalga de afuera" (NAL, selected muscle *Biceps femoris*) were withdrawn and conserved at – 20 ºC until analysis. Fatty acids determination was done according to the methods and procedures previously described [1]. Results were statistically analyzed by general linear model (GLM) procedure using NCSS 2007 software.

III. RESULTS AND DISCUSSION

The results showed that the NAL presents a better composition, in comparison to PAL, in the most nutritionally relevant fatty acids such as C18:3n-3, EPA, DPA and DHA, but not for CLA (Table 1). At the same time C14:0, an atherogenic fatty acids, showed a lower level in NAL than in PAL. However, the level of C16:0, another known atherogenic fatty acid, is not different between the two cuts (Table 1). The total saturated and monounsaturated fatty acids showed a lower level in NAL than in PAL, inversely to the level of polyunsaturated fatty acids. Concerning the diet effects, it could be concluded that PAST and PAST+SUP produced a meat with a better fatty acids composition from a nutritional viewpoint. In some cases, the use of PAST+SUP produced better results when compared to PAST, for instance for CLA, C18:3n-3, EPA and DHA (Table 1). This last observation regarding the interesting effect of the association between pasture and supplementation should be considered in future investigations.

Table 1: Fatty acids composition of Paleta (forequarter cut) and Nalga de afuera (hindquarter cut) in Aberdeen Angus steers produced on pasture (PAST), pasture and supplement (PAST+SUP) and concentrate (CONC).

	Paleta (PAL) *Triceps brachii*			Nalga de afuera (NAL) *Biceps femoris*			Main effects P values	
	PAST	PAST+SUP	CONC	PAST	PAST+SUP	CONC	M	F
Fatty Acids								
C12:0	0.09 ±0.03	0.12 ±0.03	0.12 ±0,03	0.07 ±0.01	0.05 ±0.01	0.06 ±0.00	0.05	NS
C14:0	2.74 ±0.59	3.15 ±0.53	3.81 ±0.53	1.96 ±0.27	1.35 ±0.15	1.99 ±0.08	0.01	NS
C15:0i	0.26 ±0.05	0.36 ±0.05	0.21 ±0.02	0.23 ±0.03	0.18 ±0.02	0.12 ±0.00	0.01	0.02
C15:0ai	0.29 ±0.05	0.38 ±0.05	0.21 ±0.02	0.28 ±0.04	0.22 ±0.02	0.14 ±0.01	NS	NS
C14:1	0.53 ±0.2	0.65 ±0.11	0.95 ±0.13	0.24 ±0.04	0.16 ±0.02	0.34 ±0.01	0.01	0.05
C15:0	0.68 ±0.13	0.93 ±0.12	0.64 ±0.06	0.73 ±0.09	0.59 ±0.04	0.42 ±0.01	0.05	0.05
C16:0i	0.23 ±0.02	0.26 ±0.03	0.20 ±0.00	0.22 ±0.02	0.18 ±0.02	0.16 ±0.00	0.01	0.05
C16:0	25.0 ±2.10	25.8 ±1.68	29.6 ±1.34	26.5 ±1.63	23.7 ±0.90	25.5 ±0.33	NS	NS
C16:1	4.24 ±0.60	4.65 ±0.31	5.20 ±0.25	3.24 ±0.21	3.04 ±0.12	3.19 ±0.05	0.01	NS
C17:0	1.18 ±0.11	1.42 ±0.01	1.15 ±0.02	1.22 ±0.02	1.11 ±0.03	0.96 ±0.01	0.01	0.01*
C17:1	1.06 ±0.03	1.21 ±0.01	0.86 ±0.04	0.95 ±0.12	1.13 ±0.15	0.96 0.01	NS	NS
C18:0	15.2 ±1.15	14.7 ±0.90	11.9 ±0.67	16.0 ±0.66	15.6 ±0.31	14.1 ±0.15	0.05	0.01
C18:1	40.1 ±1.86	39.3 ±1.58	39.8 ±1.54	36.2 ±0.90	36.6 ±0.47	40.1 ±0.18	NS	NS
C18:2n6 LA	3.28 ±0.36	2.39 ±0.11	2.15 ±0.08	5.47 ±0.18	6.74 ±0.06	5.91 ±0.03	0.01	0.05*
C20:0	0.11 ±0.05	0.07 ±0.01	0.05 ±0.01	0.08 ±0.03	0.05 ±0.00	0.09 ±0.01	NS	NS
C18:3n6	0.03 ±0.01	0.02 ±0.00	0.07 ±0.06	0.04 ±0.01	0.07 ±0.01	0.02 ±0.01	NS	NS
C20:1	0.17 ±0.06	0.15 ±0.03	0.18 ±0.02	0.14 ±0.03	0.13 ±0.03	0.18 ±0.00	NS	NS
C18:3n3 ALA	0.71 ±0.08	0.62 ±0.03	0.21 ±0.01	0.90 ±0.18	1.59 ±0.03	0.41 ±0.01	0.01	0.01*
CLA (c9-t11)	0.59 ±0.08	0.60 ±0.04	0.35 ±0.02	0.27 ±0.04	0.53 ±0.01	0.30 ±0.00	0.01	0.01*
C20:4n6 ARA	0.50 ±0.10	0.39 ±0.10	0.28 ±0.05	1.02 ±0.10	1.78 ±0.10	1.39 ±0.03	0.01	0.01*
C20:5n3 EPA	0.07 ±0.02	0.07 ±0.01	0.01 ±0.00	0.12 ±0.02	0.38 ±0.15	0.05 ±0.00	0.05	0.05
C22:5n3 DPA	0.03 ±0.01	0.02 ±0.01	0.05 ±0.01	0.07 ±0.02	0.13 ±0.01	0.19 ±0.01	0.01	0.01*
C22:6n3 DHA	0.26 ±0.10	0.22 ±0.07	0.10 ±0.02	0.48 ±0.10	1.06 ±0.09	0.57 ±0.02	0.01	0.01*
Others	2.61 ±0.09	2.48 ±0.08	1.85 ±0.21	3.54 ±0.20	3.62 ±0.05	2.88 ±0.06	…….	…….
SAT	47.9 ±1.33	45.8 ±1.87	47.9 ±1.33	47.3 ±1.42	43.1 ±0.83	43.5 ±0.26	0.05	NS
MUFA	46.1 ±1.21	45.9 ±1.19	47.0 ±1.21	40.7 ±0.87	41.0 ±0.47	44.7 ±0.12	0.01	0.05
PUFA	5.47 ±0.76	4.32 ±0.36	3.23 ±0.25	8.36 ±0.62	12.3 ±0.34	8.84 ±0.08	0.01	0.01*
n-6/n-3	3.66 ±0.26	3.06 ±0.18	6.88 ±0.50	4.53 ±0.91	2.74 ±0.11	5.98 ±0.11	NS	0.01
P/S	0.12 ±0.02	0.09 ±0,01	0.07 ±0.00	0.18 ±0.02	0.29 ±0.01	0.20 ±0.00	0.01	0.01*

Values are mean± SEM for meat from Aberdeen Angus (AA) steers. i= iso, ai=anteiso. CLA= isomer c9t11 of conjugated linoleic acid. P= level of signification. NS= no significant. M=muscle effect, F=fed effect. * mean significant interaction M x F.

IV. CONCLUSION

Taken together, results showed that the nutritional value of meat, at least when considering the fatty acids composition, is better for the hindquarter cuts in AA steers produced on different kinds of fed. It could be interesting to consider, in future studies, this comparative approach which takes into account the relation quality/price with the nutritional value of the different kinds of cuts.

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