IPIDS IN ARGENTINE BEEF CUTS.

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ummary

The intramuscular fat (IMF%), total cholesterol and the fatty acid composition were determined in twelve cuts from forty grass-fed Angus steers, selected at random from a commercial exploitation, at two carcass fat levels. The IMF% were from 1 to 4.6 in Fat 1 and from 1.1 to 5.4 in Fat 2. The average CV% were 30+-5.7 in Fat 1 and 34 +- 9.4 in Fat 2. The cholesterol contents were between 46.3 and 58.9 mg% in Fat 1 and 47.7 to 60.3 mg% in Fat 2. The fatty acid composition was strongly affected by the IMF%

ntroduction

The lipid content of beef, is a very important aspect for Argentine, considering the importance of the country as beef exporter and beef consumer (approximately 80 g/person/year). Beef is considered a food with high levels of saturated fat and holesterol. The consumption of saturated fatty acids has been shown to increase plasma DL-cholesterol in man (Mattson and Grundy, 1985) and the increase of LDL-cholesterol has een correlated with coronary heart disease. Consumers are becoming more diet/health onscious, and it is of considerable importance to the meat industry to produce red meat hat is perceived as being more healthful. Investigations have been performed which show hat beef produces on grass has less intramuscular fat than beef supplemented with grain (Marmer et al.,1984). Feeley et al.(1972) have shown beef to be similar to, or lower than, ther meats in cholesterol concentration.

The objective of this paper is report the amounts of intramuscular fat, the fatty acid omposition and the cholesterol content of 12 commercial beef cuts from 40 grass fed Angus teers representing two different carcass fat levels.

aterials and Methods

Forty grass fed Angus steers were selected at random from a commercial exploitation (Cabaña Las Lilas. Comega S.A.), 20 steers classified as Fat 1 and 20 steers as Fat 2 according to the Argentine Meat Board standard regulations. The steers were of similar birth ate, live-weight at slaughter and management. The average half carcass weight was 107 kg. he selected cuts, Adductor externus (A), Biceps femoris (BF), Gluteos supeficialis et edious (G), Infraspinatus (I), Longissimus (LD 10-12th and LD 5-6th ribs), Psoas major (P), ectus femoris (RF), Semimembranosus (SM), Semitendinosus (ST),

he lean part were finely chopped. Aliquot samples of 10 g were extracted to determine the otal weight of chemical fat according to the Official Method of the British Standards nstitution (1958). Fatty acid composition and cholesterol were determined in aliquot amples from the chloroform lipid extract obtained according to Folch et al.(1957). The ethylesteres were analyzed using GLC (Garcia et al., 1979) and cholesterol with an enzymatic-colorimetric method(Roschlan et al., 1975). The data were analyzed with the SYSTAT 1987 Statistical Program.

esults and Discusion

The intramuscular fat content (IMF%) of the 12 muscles from Fat 1 and Fat 2 steers are iven in Fig.1. The CV (%) are presented in Fig. 2. The IMF% are lower than the ones given y The National Research Council (1988) for several USA beef cuts and grades. Marmer et al. (1984) have demonstrated that tissues from grass fed steers are leaner than tissue from rain fed steers.

The fatty acid composition from a very lean muscle as BF and one of the fattiest as PM

is shown in Fig.3. The fatty acid composition for the other muscles showed intermedi values according to the IMF%. In Table 1 are given the percentages of saturated, mono saturated, polyunsaturated, n-6, n-3 fatty acid and other relations for the Mm BF and P The changes in the fatty acid composition of intramuscular lipids are related to t relative changes in concentration among the lipids classes.

The mg of cholesterol % g of muscle in the two fat levels are presented in Fig. 3. SD values are given in Fig. 4. The values were similar to the given in the literature for lean beef (Rhee et al., 1982). In Fig. 5 de SD are presented.

The relation beween cholesterol content and IMF% was not statistically signific (Fig. 6) but a slight increment in cholesterol with increasing amounts of IMF% was detecte Rhee el al.(1982) found no significant differences in cholesterol content (wet wt. basi among steaks with different amounts of marbling except that steaks with "Practicaly Devoi marbling.

When cholesterol content was calculated on a lipid-content basis (mg/100g lipid) negative relation was found between amounts of IMF and cholesterol content (mg/100g lipid The correlation coefficient for the different beef cuts were SM (0.79), BF (0.53), (0.70), LD10-12th (0.99), G (0.87), TFL (0.84), LD5-6th (0.91), I (0.63), RF (0.79), (0.66), SS (0.92) and P (0.97) ($p<.05$).

Conclusions

The variability in the percentages of intramuscular fat among the different beef cu allows the selection of cuts with very low levels of fat. The cholesterol content is n significantly affected by the intramuscular fat content. The fatty acid composition strongly affected by the intramuscular content.

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Table 1. Percentages of saturated (SFA), monounsaturated(MUFA) and polyunsaturated (PUFA) fatty acid in the lipids from Mm BF and PM. * $p < .05$

	Biceps femoris	Psoas major		Biceps femoris	Psoas major
SFA	42.7*	50.3	n-6	5.1	3.3*
MUFA	46.1	41.9*	n-3	3.4	1.7*
PUFA	8.5	5.0*	n-6/n-3	1.5*	1.9

Fig 1. Intramuscular fat % in the 12 beef cuts of the two carcass fat levels.

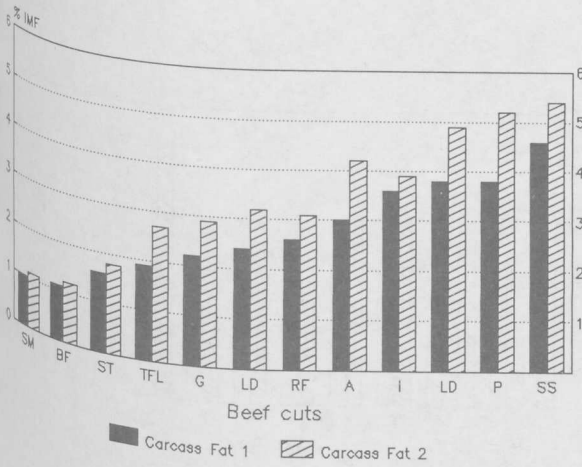

Fig 2. Coefficient of variation (CV%) in IMF in the 12 beef cuts. two fat levels.

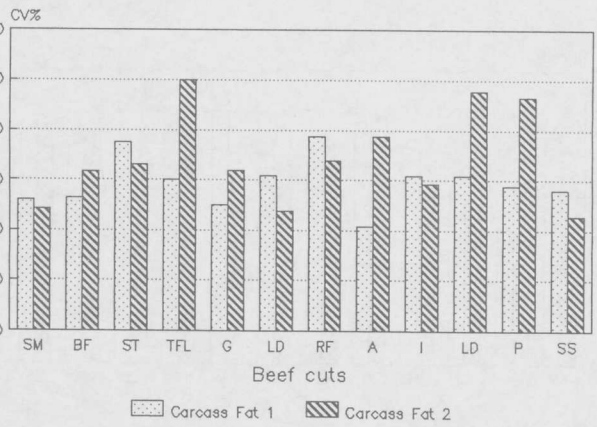

Fig. 3. Fatty acid composition from lipids of Mm BF and PM.

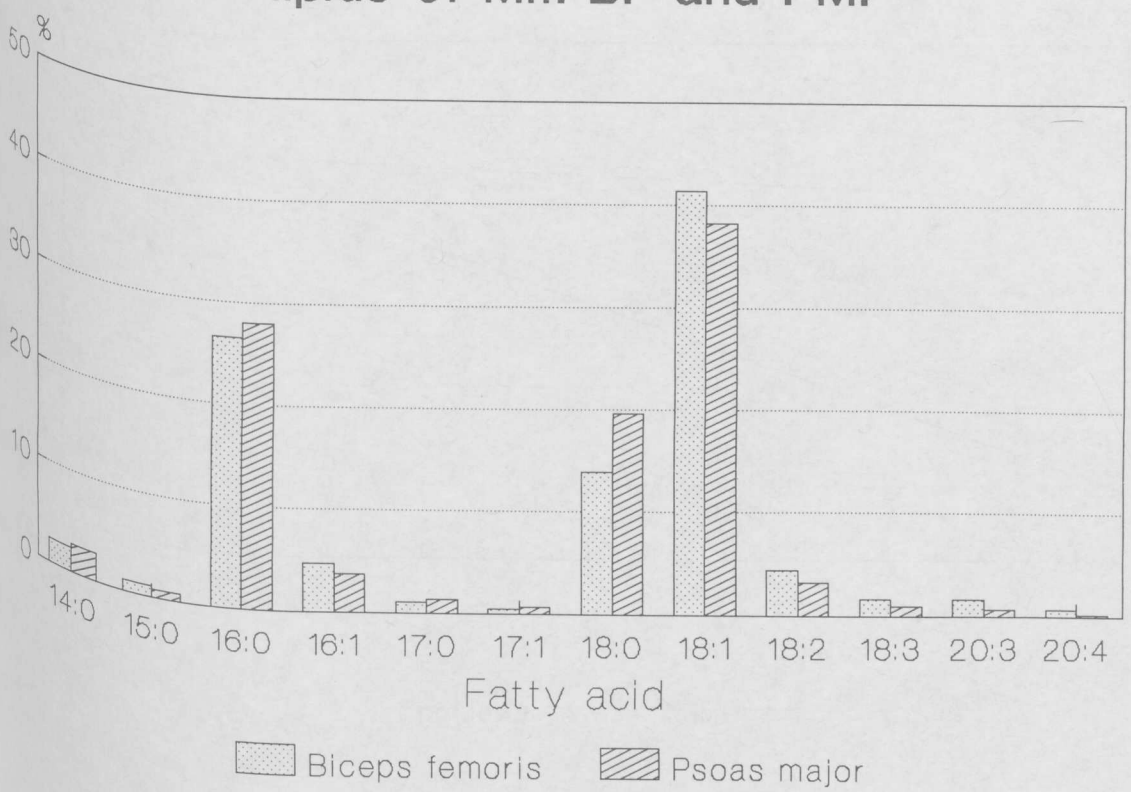

Fig 4. Cholesterol (mg%) in the 12 beef cuts of the two fat levels.

Fig 5. Cholesterol SD (±) in the 12 beef cuts of the two fat levels.

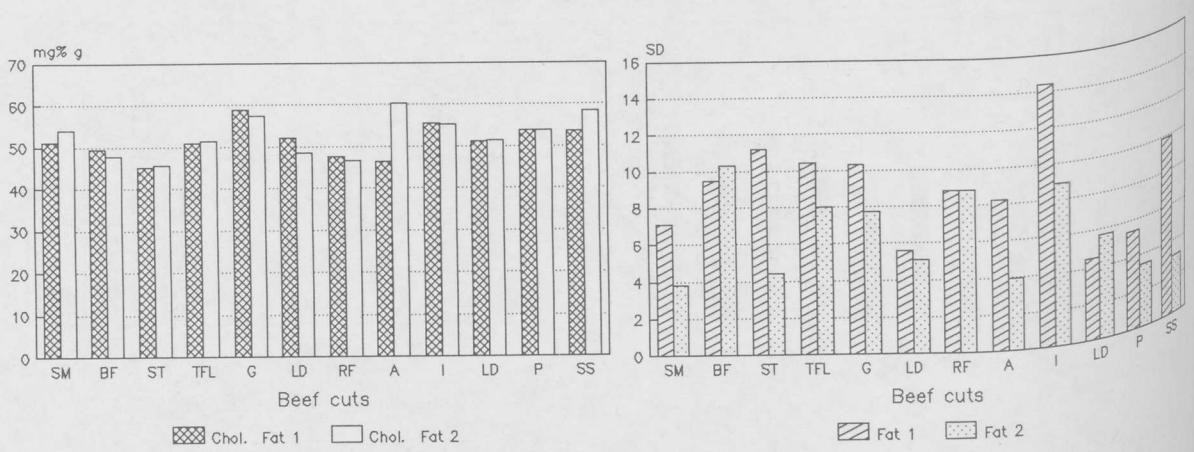

Fig. 6. Cholesterol vs. IMF% in all beef cuts.