

#### CHOLESTEROL CONTENT IN DIFFERENT MEATS

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#### INTRODUCTION

Health concern are believed to be partly responsible for meat's loss of market share to other foods. Good information about values of fat and cholesterol in meats will reverse the trend away from meat consumption. Several authors have detected a association between cholesterol content and intramuscular fat content. Arneth et al.(1990) found that the cholesterol content of pork was closely related to fat content but cholesterol content of beef was variable and only loosely related to fat content. Wheeler et al. (1987) results indicate that muscle and fat tissue cholesterol concentrations did not vary in steers in response to breed type, sex class or time on feed and thus may be an inherent characteristic dependent on quantitative needs for cellular membrane functions. Hood (1987) found in beef rib steaks a curvilinear relationship when cholesterol content was expressed as mg/g of extracted muscle lipids.

The objectives from the present paper were to determine the content of cholesterol of beef, poultry, lamb and pork meats and the study the relationship between cholesterol and intramuscular fat content.

#### Material and Methods

Aliquot samples of commercial muscles from beef, pork, lamb and poultry were used as experimental material for cholesterol and intramuscular fat determinations. Aliquot samples were dried and extracted with boiling hexane to obtain the % of chemical fat (IMF%) or extracted according to Folch et al., (1957). One aliquot sample of the chloroform extract was used for cholesterol determination, after saponification, with an enzymatic-colorimetric method (García et al. 1994) The description of the muscles and the type of animal used are shown in Table 1.

#### Results and Discussion

The average cholesterol and intramuscular fat content in the different meats is shown in Table 2. The average values of cholesterol were from 43.7 to 49.9 mg/100g. In Table 3 are shown the intramuscular fat %, the cholesterol content (mg/100 g) and the cholesterol per g of IMF in several muscles from the different meats. Differences in IMF% and mg chol/100 were detected several muscles in the same type of meat. The cholesterol (mg/100g) regressions on IMF% were significant only in poultry meat but the cholesterol (mg/g IMF) were significant in the four meats.

#### Conclusions

The cholesterol contents (mg/100g fresh meat) of several muscles from commercial poultry, lamb, pork and beef meats were no related, except for poultry meat, to the intramuscular fat percentage. The cholesterol content (mg/g of IMF) was negatively related to the IMF(%) in all the diffent meats.

#### References

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**Table 1**  
Description of the Origin of the Muscle Samples

Meat	Muscle	Liveweight (kg)	Category
Pork	ST SM LD BF G TKL PM RF	85	Castrated
Beef	SM BF ST LD RF PM	400	Steers
Lamb	SM ST RF BF G	11	Lamb
Poultry	B L T	2	Chicken

ST (Semitendinosus), SM (Semimembranosus), LD (Longissimus dorsi), BF (Bicep Femoris), G (Gluteous), TFL (Tensor fasciae latae), PM (Psoas major), RF (Rectus femoris), B (Breast without skin), L (leg without skin) and T (thigh without skin)

**Table 2**  
Cholesterol (mg/100g) and Intramuscular Fat (IMF%)  
in the Different Meats. All Muscle Combined

	Beef	Poultry	Lamb	Pork
n	120	150	350	320
<b>Cholesterol</b>				
Mean±STD	49.9±4.9	56.6±15.8	49.9±11.8	43.7±5.7
CV%	10	28	24	13
<b>Intramuscular Fat</b>				
Mean±STD	2.3±0.7	2.9±1.5	2.2±0.88	2.7±1.3
CV%	30	53	40	48

**Table 3**

Cholesterol (mg/100g or mg/g IMF) and Intramuscular Fat (IMF%) of Several Muscles from the Different Meats

	N	IMF%	mg chol/100g	mg chol/g IMF
<b>Poultry</b>				
B	50	1.0±0.29 a	38±11 a	38
T	50	3.6±0.84 b	63±11 b	18
L	50	3.9±0.98 b	65±9 b	17
<b>Lamb</b>				
SM	70	2.0±0.75 a	50±11 a	25
ST	70	2.2±0.83 a	49±11 a	22
RF	70	2.6±1.04 b	50±9 a	19
BF	70	2.1±1.12 a	49±11 a	23
G	70	2.2±0.77 a	50±14 a	23
<b>Pork</b>				
ST	15	4.5±2.9 b	50±7 bc	11
SM	15	2.0±0.9 a	42±2 a	21
LD	15	2.0±1.1 a	42±2 a	21
BF	15	2.5±0.3 ab	46±3 ac	18
G	15	3.2±1.3 b	43±6 a	13
TFL	15	3.8±1.1 b	43±3 a	11
PM	15	2.1±0.8 a	44±4 a	21
RF	15	2.2±0.9 a	45±6 ac	20
<b>Beef</b>				
SM	20	1.1±0.3 a	53±4 b	48
BF	20	1.2±0.3 a	49±8 ac	41
ST	20	1.7±0.6 a	46±4 a	27
LD	20	2.6±0.9 c	50±5 ac	19
RF	20	2.9±1.0 c	47±8 a	16
PM	20	4.5±1.1 b	54±3 bc	12

a, b, c Same letters in the same column Differences NS (P>0.05)

**Table 4**  
Regression of mg chol/100g of Meat  
or mg chol/g IMF on IMF%

Meat	mg chol/100g =	R <sup>2</sup>
Poultry	36.0288+7.1504 IMF%	R <sup>2</sup> =0.48**
	mg chol/g IMF = 29.9079-3.1758 IMF%	R <sup>2</sup> = 0.44**
Pork	42.4460+0.4588 IMF%	NS
	mg chol/g IMF = 30.3368-3.8109 IMF%	R <sup>2</sup> = 0.54**
Lamb	mg chol/100g = 49.4676+0.0485 IMF%	NS
	mg chol/g IMF = 42.5535-8.2088 IMF%	R <sup>2</sup> = 0.45**
Beef	mg chol/100g = 44.3014+2.0720 IMF%	NS
	mg chol/g IMF = 47.5894-8.9394 IMF%	R <sup>2</sup> = 0.61**