D/4 CORRELATION BETWEEN MUSCLE FIBRE DIAMETER AND SOME CHARACTERISTICS OF LAMB

by

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Introduction

Numerous researches indicate that the carcass weight of lambs, their age when slaughtered, as well as their sex represent factors that affect the carcass composition and some qualitative characteristics of the lamb meat. However, the interdependence which exists between certain qualitative and quantitative characteristics of meat (muscle fibre diameter, water holding capacity, pH, contents and qualities of intramuscular fat, of connective tissue, etc.) has been investigated insufficiently and consequently, very often there are controversies on these questions.

Waters (1909), studying the differences in the size of muscle fibres among individual species of meat animals, was the first investigator who attempted to bring into correlation the size of muccle fibre and meat quality. Hammond and Appleton (1932) point to differential growth rates of the tissue of animals on various parts of their bodies.

We can say that it has not yet been clarified definitely, when does the number of muscle fibres in animal's body stop growing and, are there any differences, in this respect, between individual species of farm animals? Thus, Hammond and Appleton (1932), Trautman and Fiebiger (1941), Hamilton et al.

(1945), and others, consider that the growth of muscle tissue in prenatal period is the consequence of hyperplasia i.e. of the increase in the number of individual elements of the tissue, while in the postanatal period the increase of muscle tissue is the consequence of the hypertrophy i.e. of the increase in size of the cells. Experimental proof of this assumption is given by McMeekan (1940-41), Eliot et al. (1943), and Meara (1947), who were not able to state that the number of muscle fibres increase in the postnatal period.

The opinion controversial to this one is stated first by Schultz (1934) who proved, in experiments on frogs, that in postnatal period the number of muscle fibres doubles, but the increase in fibre numbers proceeds more rapidly in younger than in older age. Essentially, this opinion is supported by data stated by Tuma et al. (1962) as in their investigations on beef they did not find the interdependence between the muscle fibre diameter and the surface of cross-section of m. long. dorsi, which gives support to the assumption that the growth of the cross-section surface (as well as of the weight) is not the result of the increase of muscle fibre diameter but of the number of muscle fibres.

Jaubert's investigations (1956) on lamb showed that there is a significant correlation between the muscle fibre diameter and the weight of particular muscles, of the whole musculature and the entire carcass. Similar results were obtained by Moody et al. (1970) who stated that the lamb weight at slaughter has a great influence on the muscle fibre diameter, stressing that this influence depends to a great deal upon the sex and the muscle from which the fibres originate.

Chrystall and Zobrisky (1967) have also stated positive correlations while they were investigating the correlations between the weight and the age of pigs and the muscle fibre diameter.

Correlations between muscle fibre diameter and meat tenderness were investigated by many authors. Tuma et al. (1962) stated that within an age group of beef no interdependence appe-

ars between the muscle fibre diameter and the meat tenderness. Romans et al. (1965) have found no significant differencies in the muscle fibre diameter between maturity groups (A, B, C, D), but they declare that is a significant interdependence between the muscle fibre diameter and the meat tenderness of beef. Similar results were published by Einer et al. (1953) who state, in addition to this, that the muscle fibre diameter depends also upon the activity of particular muscles in cattle body.

As it can be seen, the investigation of the interdependence between the diameter of muscle fibres and some other characteristics of the carcass and quality characteristics of muscle tissue yielded rather different results, depending upon the conditions and methods used.

This work has been undertaken aiming to give a contribution to knowledge on the effect of age, weight and sex of lambs produced on the muscle fibre diameter, as well as to get information on the interdependence between the diameter of muscle fibres and some qualitative characteristics of lamb carcass.

Material and Methods

For investigation, 96 lambs were used of the breed Merion précoce, of the Caucasus merion, and of the cross-breeds of the two breeds, as well as the cross-breed of these breeds with the native breed "cigaja".

According to the weight at slaughter, the lambs were distributed in weight groups : light weight (up to 20 kg), middle weight (20-30 kg) and heavy weight (above 30 kg).

After killing and cooling, the dissection on carcass was made in primal cuts whereby from one side of carcass a three-rib section, civering the ribs 9, 10 and 11, was taken out. The cuts were made at caudal edges of ribs 8. and 11. The three-rib samples were dissected thoroughly and the sepa-

ration was made between muscle tissue, fat tissue, bone tissue, and connective tissue. We want to point out that Kirton and Barton (1962), as well as Field et al. (1963), who made the dissection of the whole carcass in elementary tissues, stated very high correlations between the tissue ratio in the three--rib section and in the whole carcass.

The weight and the dimensions of m. long. dorsi were measured on the other side of each carcass. Measurements were made also of the cross-section surface of m. long. dorsi between the ribs 12 and 13 and two measures were made also of the cross-section : dorso-ventral (diameter "a") and medio-lateral (diameter "b").

The diameter of muscle fibres was determined on the samples from m. long. dorsi (the part between the ribs 12 and 13) and on the samples from m. gracilis (central part). The samples of both muscles were cut in pieces of equal dimensions (2 x 0,5 x 0,3 cm) and were put into bottles in 10% formalin solution (the solution was made by means of physiological solution). The samples were stored in this way for 5 days at least, and thereafter they were thoroughly washed with distilled water and cut with sizors in ten equal parts. Preparations were made of each part, and in each preparation diameter measurements were made for 20 fibres; this means that for each carcass the diameter was measured on 200 fibres from two muscles, i.e. on 400 fibres in all.

The findings are elaborated by usual statistical methods (Ezekiel, 1960; Mulić, 1969).

The results of investigations

We shall lay out the results of investigations in three parts: Part One contains the investigations regardless to sex and breed, and the lambs are devided in three weight groups by their live weight : up to 20 kg, from 20 to 30 kg, and above 30 kg; in Part Two, there were all lambs male and be-

longed to the same breed (Caucasus merino) and the same maturity group (60 days), and were weighing not more than 20 kg; they were also distributed in three weight groups-up to 12,5 kg,from 12,5 kg to 15 kg, and from 15 to 20 kg; in Part Three the lambs were observed according to the sex.

1. Effect of carcass weight of lambs, differing more considerably in weight and age, on the tissue ratio, the size and the shape of. m. long. dorsi and the muscle fibre diameter

The data in Table 1 show that the differencies in all observed characteristics are highly significant between the light weight and the middle weight group of lambs, and of course, between the light weight and the heavy weight group. Between the middle weight group and the heavy weight group the differencies in tissue ratio of the three-rib section are not significant but the differencies in the muscle fibres diametre in m. long. dorsi are significant ($P < 0.05$), and in m. gracilis even highly significant ($P < 0.01$).

The results shown in Table 1 also indicate that, simultaneously with the increase of carcass weight between the light and the middle weight group for 93.6%, the weight of m. long. dorsi increases for 88.8%, the surface of the cross-section of m. long. dorsi for 30.5%, the length of m. long. dorsi for 13.3%, and the muscle fibre diameter for 22.9% in m. long. dorsi and in m. gracilis for 21.3%.

When the differencies between the middle and the heavy weight group are considered, it can be observed that with the increase of carcass weight for 26,4%, the weight of m. long. dorsi increases for 29.0%, the area of m. long. dorsi for 21.4% and the length of m. long. dorsi for 5.4%, while the muscle fibre diameter increases for 7,32 in m. long. dorsi and 9,4 in m. gracilis.

Tab. 1. Tissue ratio in three-rib cuts, size and shape of m.long. dorsi and the muscle fibre diameter of lambs with different carcass weight

	A-Light (n=49)		B-Medium (n=36)		C-Heawy (n=11)		Signific.		
	$\bar{X}$	Cv	$\bar{X}$	Cv	$\bar{X}$	Cv	A:B	A:C	B:C
1.L.weight at slaughter (kgs)	14,8	14,1	24,3	10,8	32,4	7,8	xx	xx	xx
2.Carcass weight affter chilling (kgs)	6,3	17,3	12,1	12,1	15,3	9,6	xx	xx	xx
3.Three-rib cuts weight (g)	112,0	20,8	236,1	15,9	302,8	18,3	xx	xx	xx
4.Tissue ratio in three-rib cuts:									
- muscle tissue (%)	53,5	8,8	45,3	12,1	47,3	9,9	xx	xx	NS
- fatty tissue (%)	0,0	0,0	25,8	33,7	27,6	28,7	xx	xx	NS
- conect.tissue (%)	15,3	26,2	7,4	50,1	5,8	56,8	xx	xx	NS
- bones (%)	29,4	16,4	20,0	21,1	18,2	22,3	xx	xx	NS
5.WEight and size of m.long dorsi:									
- weight (g)	157,9	23,8	298,5	11,9	385,1	12,2	xx	xx	xx
- lenght (cm)	39,5	8,7	44,8	3,6	47,2	2,9	xx	xx	xx
- area (cm^2)	7,9	20,4	10,3	16,5	12,5	15,8	xx	xx	xx
- diameter"a"(cm)	4,8	9,2	5,1	9,4	5,5	8,0	xx	xx	xx
- diameter"b"(cm)	1,8	24,7	2,4	15,8	2,9	14,8	NS	NS	xx
6.Muscle fibre diameter:									
- m. long. dorsi (μ)	22,2	2,8	27,3	8,3	29,3	9,9	xx	xx	x
- m. gracilis (μ)	25,3	6,7	30,8	7,0	33,7	11,7	xx	xx	xx

NS - non significant

x - significant ($P<0,05$)

xx - significant ($P<0,01$)

Correlation between the fibre diameter of m. long. dorsi and the carcass weight, the weight of the three-rib section, the characteristics of m. long. dorsi, as well as fibre diameter of m. gracilis is shown in Table 2.

Table 2.- Correlation between the fibre diameter of m. long. dorsi and the carcass weight, three-rib section weight, size of m. long. dorsi as well as by the fibre diameter of m. gracilis

Fibre diameter of m. long. dorsi	r (n = 96)
carcass weight	0.8622 xx
three-rib section	0.8582 xx
weight of m. long. dorsi	0.8125 xx
lenght of m. long. dorsi	0.7388 xx
area of m. long. dorsi	0.6883 xx
diameter "a" of m. long. dorsi	0.4318 xx
diameter "b" of m. long. dorsi	0.6947 xx
fibre diameter of m. gracilis	0.8369 xx

As it can be seen, the results of our investigations are in concordance with Joubert's results (1956). In all investigations the high significance at the level $P<0.01$, was found.

According to the rule on the strength of dependence, high correlative dependence exists between the fibre diameter of m. long. dorsi and the carcass weight, the weight of the three-rib section, the weight of m. long. dorsi, and the fibre diameter of m. gracilis; the moderate correlative dependence exists between the fibre diameter of m. long. dorsi and length, area of m. long. dorsi as well as the diameter "b" of m. long. dorsi, but a low correlative dependence to the diameter "a" of the same muscle.

The results of these investigations do not offer sup-

port to the statement that with animal's weight increase the muscle mass increases only as result of the increase in the size of the muscle fibre diameter i.e. as a result of hypertrophy, as the increase of the fibre diameter and also of the lenght of m. long. dorsi is proportionately considerably lower than the increase in its weight, and somewhat lower than the growth of the cross-section area of m. long. dorsi.

If differencies between light and heavy lambs are

2. Effect of the carcass weight of male lambs, with lower weight difference, on the tissue ratio, the size and the shape of m. long. dorsi and the muscle fibre diameter

With difference to the data given in Table 1, the data in Table 3 show a lower degree of differencies in the observed characteristics, which, in addition, are not always significant, and rather rarely highly significant. This is important in particular for the reason that it applies also to the muscle fibre diameter, the length and the area of m. long. dorsi.

If differencies between light and heavy lambs are considered, where all more important characteristics are significative we can observe the following: with the increase in carcass weight for 52.2% the weight of m. long. dorsi increases for 66.2%, the lenght of m. long. dorsi for 10%, and the cross-section surface of m. long. dorsi for 28.3%, while the muscle fibre diameter in m. long. dorsi increases for 12.2% and in m. gracilis for 7.9%.

These results, yield in the investigation of lambs of the same sex, same breed, and same age, confirm the results shown in Table 1. Namely, also in this case the relative increase of muscle weight is significantly higher that the increase of its length, its cross-section area and its fibre diameter.

Taking into consideration that it has been declared by some authors that with the increase of fibre diameter the meat tenderness decreases, then on the basis of our results we can

Tab. 3. Tissue ratio in three-rib cuts, size and shape of m. long. dorsi and the muscle fibre diameter of light weight lamb carcasses

	A-Light (n=8)		B-Medium (n=15)		C-Heawy (n=24)		Signific.		
	$\bar{X}$	Cv	$\bar{X}$	Cv	$\bar{X}$	Cv	A:B	A:C	B:C
1.L.weight at slaughter (kgs)	11,7	6,8	13,9	5,0	16,2	8,3	xx	xx	x
2.Carcass weight affter chilling (kgs)	4,6	8,0	5,7	6,4	7,0	9,3	xx	xx	xx
3. Three-rib cuts weight (g)	84,4	13,3	96,1	10,3	129,7	11,5	x	xx	xx
4. Tissue ratio in three-rib cuts:									
- muscle tissue(%)	53,2	6,4	52,3	10,2	54,3	9,0	NS	NS	NS
- fatty tissue (%)	11,4	19,8	14,8	24,5	16,8	23,9	x	xx	NS
- bones (%)	33,1	6,7	31,1	17,1	27,2	14,9	NS	xx	x
5.Weight and size of m.long.dorsi:									
- weight (g)	109,0	18,4	139,5	18,9	181,1	15,0	x	xx	xx
- lenght (cm)	37,0	7,5	38,7	4,4	40,7	10,0	x	x	NS
- area (cm^2)	6,7	17,5	7,3	15,4	8,6	19,3	NS	xx	x
- diameter"a" (cm)	4,7	5,7	4,7	10,8	5,0	8,9	NS	NS	NS
- diameter"b" (cm)	1,5	12,6	1,6	22,0	1,9	22,6	NS	xx	x
6. Muscle fibre diameter:									
- m. long dorsi (μ)	20,4	4,4	22,1	16,5	22,9	6,3	x	xx	NS
- m. gracilis (μ)	23,9	2,6	25,2	7,3	25,8	6,6	NS	xx	NS

NS - non significant
x - significant ($P < 0,05$)
xx - significat ($P < 0,01$)

Tab. 4. Tissue ratio in three-rib cuts, size and shape of m. long. dorsi and the muscle fibre diameter of male and female lambs of the some age and weight

	Male lambs (n = 18)			Female lambs (n = 18)			♂ .. ♀
	$\bar{X}$	σ	Cv	$\bar{X}$	σ	Cv	
1. L. weight at slaughter (kgs)	24,64	2,67	10,84	23,89	2,57	10,76	NS
2. Carcass weight affter chilling(kgs)	11,99	1,77	14,76	12,21	1,12	9,17	NS
3. Thre-rib cuts weight (g)	234,72	43,97	18,73	237,46	31,29	13,18	NS
4. Tissue ratio in three-rib cuts:							
- muscle tissue (%)	47,20	5,09	10,77	43,44	5,30	12,20	x
- fatty tissue (%)	22,68	7,05	31,08	30,11	6,14	20,40	x
- conect. tissue (%)	8,66	4,13	47,64	6,20	2,89	46,63	NS
- bones (%)	21,30	4,52	21,22	18,70	3,57	19,08	NS
5. Weight and size of m. long. dorsi:							
- weight (g)	297,48	47,07	15,82	299,38	38,12	12,73	NS
- lenght (cm)	45,00	1,58	3,51	44,55	2,31	5,19	NS
- area (cm^2)	10,65	1,94	18,19	9,92	1,37	13,84	x
- diameter "a" (cm)	5,09	0,89	17,54	4,98	0,51	10,24	NS
- diameter "b" (cm)	2,46	0,40	16,38	2,37	0,37	15,44	NS
6. Muscle fibre diameter:							
- m. long. dorsi (μ)	26,92	1,35	5,01	27,68	2,89	10,44	NS
- m. gracilis (μ)	29,99	2,02	6,75	31,54	2,06	6,53	x

NS = non significant
x = significant ($P < 0,05$)
xx = significant ($P < 0,01$)

assume that with the increase of lamb weight up to the definitive age limit, may negligible contribute the meat tenderness. as the fibre diameter increases at a much slower rate than the weight of muscles and the whole carcass.

3. Effect of lamb's sex on the tissue ratio, the size and the shape of m. long. dorsi and the muscle fibre diameter

The data shown in Table 4 indicate that in the three--rib section male lambs had a greater relative amount of muscle tissue, connective tissue and bone tissue, and less fat tissue than female lambs. The differences were, however, significant in the muscle and the fat tissue only. In relevance to this, also the cross-section surface of m. long. dorsi is somewhat larger in males. But, with respect to the diameter of muscle fibres in m. long. dorsi the differencies are minimal and non-significant, and in m. gracilis they are also very smal, but significant.

Conclusion

On the basis of the results obtained, the following conclusions may be drawn:

1. With the increase of the carcass weight of lambs the muscle fibre diameter increases as well, but at a relatively slower rate than the increase of the cross-section area of m. long. dorsi, and relatively much slower than the increase in m. long. dorsi weight and the carcass weight. However the length of m. long. dorsi gradually increases at a slower rate than the increase of muscle fibre diameter with the carcass weight increase.

2. The muscle fibre diameter in m. long. dorsi is smaller than the diameter of fibres in m. gracilis; with the in-

crease in lamb weight the fibre diameter increases approximately at the same rate in both muscles.

3. There is a high correlation between the muscle fibre diameter in m. long. dorsi and the carcass weight, the weight of three-rib section, the weight of m. long. dorsi and the muscle fibre diameter of m. gracilis; a moderate correlation exists between the muscle fibre diameter in m. long. dorsi and the length, the area and the diameter "b" of m. long. dorsi, but a low correlation is found with the diameter "a" of the same muscle.

4. The sex of lamb seems to be of less effect on muscle fibre diameter if the age, the carcass weight, the weight and the area of the cross-section m. long. dorsi are approximately equal.

5. The results of investigations indicate that the studies on the interdependence of individual factors that affect the yield, and in particular the qualitative characteristics of lamb meat, should be continued.

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CORRELATION BETWEEN MUSCLE FIBRE DIAMETER AND SOME CHARACTERISTICS OF LAMB

by

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Summary

The investigations were performed on 96 lambs, devided in three weight groups. In three-rib cuts the tissue ratio was defined, and also measurements were taken for the weight and the shape of the m. long. dorsi. The muscle fibre diameter was determined on the samples taken from m. long. dorsi and m. gracilis.

In the first part the investigation was carried out with lambs of different breeds, age and sex (tab. 1 and 2); in the second part of the investigation all the lambs were of the same breed, sex and age, and they were not heavier than 20 kg. (tab. 3); in the third part, the lambs were of the same weight group, and of the same age, but of different sex (tab. 4).

It was stated that the muscle fibre diameter increases with the increase of carcass weight. The muscle fibre diameter of m. long. dorsi, however, shows relatively smaller increase than the increase of the cross-section area of m. long dorsi, and even less than the increase of the m. long. dorsi weight, as well as the carcass weight.

There is a high correlation between muscle fibre diameter of m. long. dorsi and the carcass weight, the weight of the three-rib cuts, the weight of m. long. dorsi, as well as with the muscle fibre diameter of m. gracilis; moderate correlation has been found between the muscle fibre diameter of m. long. dorsi and the length, the cross-section area and the medio-lateral diameter of m. long. dorsi. A low correlation was

found between muscle fibre diameter of m. long. dorsi and the dorso-ventral diameter of the same muscle.

The sex lambs has no substantial effect on the muscle fibre diameter. The fibre diameter of m. long. dorsi was always smaller than the fibre diameter of m. gracilis. With the carcass weight increase the muscle fibre diameter increases approximately at the same rate in both muscles.

CORRELATION ENTRE LE DIAMETRE DES FIBRES MUSCULAIRES ET CERTAINES CARACTERISTIQUES DE LA VIANDE D'AGNEAU

par

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RÉSUMÉ

Les examens sont fait sur 96 agneaux, classés en trois groupes selon leur poids. Le rapport des tissus dans les échantillons à trois côtes est déterminée et les mesures du poids et de la forme m. long. dorsi sont effectuées. Le diamètre des fibres muscularies a été établi sur les échantillons de m. long. dorsi et m. gracilis.

Dans la première partie, les examens sont faits sur les agneaux différents de race, de sexe et d'âge (tab. 1 et 2); dans la douxième partie, tous les agneaux étaient du même sexe, de la même race et du même âge, dont le poids dépassait de 20 kg (tab. 3); dans la troisième partie, sont classés les agneaux ayant les mêmes poids et âge, mais appartenant aux sexes différents (tab. 4).

Il est constaté que le diamètre des fibres muscularies augmente avec augmentation du poids de la carcasse. Cependant, le diamètre m. long. dorsi augmente relativement moins que ne le fait la surface de découpe m. long. dorsi, et relativement encore moins que le poids m. long. dorsi et le poids de la carcasse.

Il existe une haute interdépendance entre le diamètre des fibres muscularies m. long. dorsi et le poids de la carcasse, poids de l'échantillon à trois côtes, poids de m. long. dorsi et le diamètre m. gracilis; une interdépendance moyenne existe entre le diamètre des fibres muscularies m.

long. dorsi par rapport à la longueur, la surface et le diamètre médio-latéral m. long. dorsi, et une interdépendance basse par rapport au diamètre dorso-ventral du même muscle.

Le sexe des agneaux n'a pas d'influence importante sur le diamètre des fibres. Le diamètre des fibres m. long. dorsi est plus petit que celui des fibres m. gracilis, et avec augmentation du poids des agneaux, augmente également le diamètre des fibres dans les deux muscles, approximativement dans la même mesure.

KORRELATION ZWISCHEN DES MUSKELFASERDIAMETER UND EINIGE EIGENSCHAFTEN DES LAMMFLEISCHES

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Zusammenfassung

Die Untersuchungen wurden an 96 Lämmer durchgeführt, die in drei Gewichtsgruppen geteilt wurden. In den Dreirippen Teilstück wurde der Anteil des Gewebes festgestellt. Auf dem m. long. dorsi wurden Massen und Form genommen. Muskelfasendiameter wurde an Teilen m. long. dorsi und m. gracilis festgestellt.

In dem ersten Teil der Untersuchungen wurden Lämmer verschiedener Rassen, Alter und Geschlecht behandelt (Tab. 1 und 2); in dem zweiten Teil der Untersuchungen, alle Lämmer waren von der selben Rasse, vom selben Geschlecht und Alter, und nicht schwerer als 20 kg (Tab. 3); in dem dritten Teil, die Lämmer waren in der selben Gewichtsgruppe und von selben Alter, aber von verschiedenen Geschlecht (Tab. 4).

Es wurde festgestellt dass die Muskelfaserdiameter sich vergrössern mit der Steigerung des Körpergewichtes. Die Muskelfaserdiameter des m. long. dorsi aber zeigen relativ kleinere Vergrösserung als die Steigerung der Durchschnittfläche des m. long. dorsi, und zwar noch weniger als die Gewichtszunahme des m. long. dorsi und des Körpergewichtes.

Es besteht eine hohe Korrelation zwischen Faserdiameter des m. long. dorsi und des Körpergewichtes, des Dreirippenstückgewichtes, des Gewichtes des m. long. dorsi, sowie auch Faserdiameter des m. gracilis; eine gemässige Korrelation wurde zwischen Faserdiameter des m. long. dorsi und der Länge, der Durchschnittfläche und des Medio-lateral diameter

des m. long. dorsi gefunden. Eine schwache Korrelation zwischen Faserdiameter des m. long. dorsi und des Dorsoventral--Diameter der selben Muskel. wurde gefunden.

Das Geschlecht der Lämmer hat keinen wichtigen Einfluss auf Muskelfaserdiameter. Der Faserdiameter war immer kleiner denn der Faserdiameter des m. gracilis. Mit der Schlachtkörpergewicht zunahme wurde auch der Faserdiameter der beiden Muskeln bei Nähe im selben Masse vergrössert.

КОРРЕЛЯЦИИ МЕЖДУ ДИАМЕТРОМ МЫШЕЧНОГО ВОЛОКНА И НЕКОТОРЫМИ ХАРАКТЕРИСТИКАМИ ЯГНЯТИНЫ

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Для исследований употреблено 96 ягнят, разделенных на три группы по весу. Отношение между тканями утверждено путем трехреберной вырезки /9, 1о и 11 ребро/ и проведены измерения веса и формы m. long. dorsi. Диаметр мышечного волокна утверждался на образцах из m.long. dorsi и m. gracilis.

В первой части исследований ягнята были разной породы, пола и возраста /таб.1 и 2/; во второй части все ягнята были одинаковой породы, пола и возраста, не превышая в весе 2о кг /таб/3/; тогда как в третьей части исследований ягнята были одного веса в группе и одинакового возраста, но разного пола /таб.4/.

Утверждено, что диаметр мышечного волокна растет по мере увеличения веса туловища. Однако, диаметр m. long. dorsi сравнительно меньше растет чем вес m.long. dorsi и вес туши.

Высокая корреляционная зависимость существует между диаметром мышечного волокна m.long.dorsi и весом туши, весом трехреберного образца, весом m. long. dorsi и диматром m. gracilis; средняя корреляционная зависимость существует между диаметром мышечного волокна m.long. dorsi сообразно длине, поверхности и медио-лятеральному поперечнику m.long.dorsi, а низкая сообразно дорзо-вентральному поперечнику той же мышцы.

Пол ягнят не оказывает существенного влияния на диаметр мышечного волокна.

Диаметр волокна m.long.dorsi меньше диаметра волокна m.gracilis, а при увеличении веса ягнят в обоих мышцах диаметр волокна увеличивается приблизительно в одинаковой мере.