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Connection between sheep carcasses' S/EUROP qualification and several cutting parameters

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ABSTRACT

The editors in their examination compared the slaughtering characteristics of Hungarian merino and ile de france sheep with their S/EUROP qualification results. They established that the presently used qualification system is well useable for judging the commercial value of a carcass, and at the same time they call the attention to mistakes. They suggest, a new more objective method of elaboration and introduction.
(Keywords: sheep, S/EUROP, tallow, conformation, slaughter)

ÖSSZEFOGLALÁS

Juh vágott testek S/EUROP minősítése és néhány vágási paraméter közötti összefüggés

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A szerzők vizsgálatukban magyar merinó és ile de france juhok vágási tulajdonságait hasonlították össze azok S/EUROP minősítési eredményeivel. Megállapították, hogy a jelenleg használatos minősítési rendszer jól alkalmazható az állatok értékének megítélésére, ugyanakkor felhívják a figyelmet a hibákra is. Javasolják, egy új, objektívebb szisztéma kidolgozását és bevezetését.
(Kulcsszavak: juh, S/EUROP, faggyúzottság, testalakulás, vágás)

INTRODUCTION

In the order of sheep products, the lamb as human food, takes a remarkable part. The importance of this red meat type increased gradually during the last decades and according to the 1996 year's Parisian forecast of OECD (light increase till 2000), slackness can be counted on. The 10-15% of the world's all living sheep meat and carcass production will go into the trade where it had been missed in several countries, our country as well, nowadays still missing the mutually honest and trustworthy deal's condition would be drafted; "among same quality of carcass same classes and the price is according to this" – principle. (*Toldi,* 1994.) In several countries of the Europian Union (EU) the S/EUROP qualification system of the sheep carcasses is in use, according to expectation of the task in practice. Because Hungary probably will be one of the members of this association at the beginning of the next millenium, it must identify its agrarian policy with that. To form the qualification of sheep carcasses to the EU is part of this huge transformation in the near

future. In the near future the setting of maximum time of live animals shipping at the EU's member countries urges for the export of sheep carcasses instead of the live animals' export which predominates presently and one of its conditions is their qualification in accordance with the EU standard before their sale (*Mucsi,* 1977).

The S/EUROP qualification (subjective) system of sheep carcasses defines exactly the classing among quality and the marking of 7-13 kgs is small weight, and between 13-22 kgs is, high weight carcass. This commercial qualification system contains the detailed descriptions in the case of small weight carcasses (southern-europian qualification) over the body-weight categories after the tallow and colour, in the case of high weight sheep carcasses in regards to conformation and tallow *(Journal officiel des Communautés européennes,* Reglement (CEE) n° 2137/92, 1992*)*. A characteristic which determines the quality of high weight carcasses and has a strong effect on the commercial value is the tallowing. It has 5 main classes (3-3 subclasses inside these, we mark them with +, 0 and – sign):

1 – very low
2 – low
3 – medium
4 – high
5 – very high

We examine this characteristic on the external and internal surfaces of the carcass. To examine the tallowing from a dorsal view first on the base of tail and directly around it, then covers the loin and back's upper part, and directly around the spine. After this it extends in its thickness on the whole carcass, first on the upper parts and at last on the haunches and shoulders. First thin "tallow-pellicle" appears, then a thicker "tallow-layer" and at last it become a thick "tallow-cover" on the surface of the muscles, one after the other. The muscles commeasurated with this, will be less and less visible. At the estimation of the tallow's degree, in the case of same utilizing type's homogen breed a really close connection was found (r=0.6-0.7) between the weight of the carcasses and the degree of tallow-deposit, because the weight of the heaviest carcasses have the most tallow (in absolute and relative sense also). In addition, the influence of conformation and precocity on extent of tallow according to the changing of conformation and precocity within the sheep species it seems to have little hope for finding a connection, which gives enough estimately correctness between the weight of carcass and tallowing condition. The scientists suggested to write down the general tallowing of carcass with the thickness of surface tallow that can be established by measuring exact points of the body, such as the musculus longissimus dorsi (MLD), i.e. with thickness of tallow on the long muscle of the back (*Hirzel, R*., 1939; *Starke, J.S., Joubert, D.M.* 1961). One of these methods, because of its measuring relief (mechanical measuring with metal tape, with supersound), it appears with proving itself as a subjective, practical method of this characteristic's valuation. The last ones were coming from the estimation of the tallow conditions's degrees, with comparing to standard carcasses, standard photos and with the help of a realitively detailed explanation. The ITOVIC and INRA suggested a system for the goal of commercial qualification of lamb carcasses (*Roy, G., Dumont, B.L., Legras, P.* 1971) and the method processed for qualification of adult sheep based on this principle (*Dumont, B.L., Legras, P., Roy, G.*, 1972). French scientists had already accentuated that it would be useful to study the connections between subjective judgings, objective data of carving, and data of meat processing.

For valuation of the whole tallowing of the slaughtered lamb body and the weight of kidneytallow was suggested (*Boccard, R., Dumont, B.L.* 1960) according to the

following biometrical connection.

Total tallow (g)=8*weight of kidney-tallow+878.

The estimating equation's fault is that the place and value of tallow-deposit can change in the breeds.

On the whole, the carcass beyond the component characteristics (meat, bone and tallow %), the size dimensions are what determinate the shape and size of the meat – slice sold to the customer. In the carcass this important characteristic is determinated by its dimensions (length, width), roundness and contours, not just its weight. All of these characteristics come together as a value, which when expressed is the conformation. To value the composition of the carcass, the most trusted way in practice can be realized by the technological method of carcasses' carving and commercial processing of the carved parts, which can help to establish the true slaughtering value. This method was used, for example to compare different type of sheep's carcasses. Using of it for French lambs, what have the same weight but different conformation and different types, showed that a certain anatomical harmony is reflected from the relative rations of different body-parts, which is approximately constant (*Boccard, R., Dumont, B.L.* 1960) and indicates that the conformation has less influence on the body parts' ration and composition of individuals that have the same carcass-weight. This observation was proved by *Kirton and Pickering* (1967) in New-Zealand and *Jackson and Mansour* (1974) in Great-Britain.

Different straight and circle sizes determine the profile of the carcass and these are influenced by the weight, more or less. It was shown that between the different weighing lambs the ratio of carved bodies changed during the growth (*Boccard, R., Dumont, B.L.* 1962). So between 8-20 kg weighing carcass, the haunch's relatively ratio decreased meaningfully; at the same time, the chest's increases, *Colmer-Rocher and Espejo Diaz* (1973) had found over and above these differences between rams and ewes, because the female individuals in the same weight after their condition in growth, are earlier maturing (and have more tallow, than the rams do). The importance of the standardized subjective judging method (*Legras, P., Domont, B.L., Roy, G.* 1971), which is made for judging the conformation, needs to be emphasized from a practical and a theoretical point also, what was used on the basis of comparing shapes are fixed in standard photos and their relatively detailed description. These were like the classing gate of ITOVIC-INRA (*Roy, G., Dumont, B.L., Legras, P.* 1971) made for qualifying carcasses of lambs, and the gate for classifying commercial valuation of adult sheep's carcass (*Dumont, B.L., Legras, P., Roy, G.,* 1972). In the case of later method, which is almost the same with the S/EUROP system, what is in use nowadays, the sizes and shape of the carcass are depends on its showing and observation conditions. Therefore, it was proper to regulate and standardize the researching conditions to get comparable data also with qualification from another judging. It was a specially accentuated by the influence of the so called "fridling" of forelegs on the shoulders' and the chest's constitution. The practice generally used the crossing of haunches, to correct the conformation of hindparts.

The S/EUROP qualification system for sheep carcass determines conformation classes and uses the following categories according to the first five letters of word EUROPE except the "S":

S – super
E – excellent
U – very good
R – good
O – medium
P – weak

With the exception of super "S" classification, within the other 5 main categories it uses 3 subclasses marking them with +, 0, - signs. Use of super classification is allowable for countries in the EU, which reported previously that they would like to use this category.

Aims

In our study we wanted to get an answer to the question, to what extent the S/EUROP judgment system reflects the actual body composition of the animals. So we performed the S/EUROP commercial qualification and later the test-slaughter of meat sheep of different genotypes. Comparing the results of the test-slaughter to those of the commercial qualification, we aimed to find out to what extent the commercial qualification reflects the actual slaughter values, first of all with respect to tallow content and bodyparts giving valuable meat. We performed a comparative study of the subjective qualification of large weight sheep carcass and the characteristics of the connected slaughter values, on the basis of the Northern European carcass weight categories (13-22kg).

MATERIALS AND METHODS

During our attempt we examined the qualification and cutting parameters of 60 carcasses. We had slaughtered Hungarian Merino and Ile de France breed 30-30 individuals in 28-35 kg live weight, with 2 sexes. So we had the opportunity to compare 4 groups *(1st table).*

Table 1

Characteristics of the examined groups

	Heads (5)	Live weight, kg (6)		Weight of carcass, kg (7)	
		Mean (8)	SD (9)	Mean	SD
Hungarian Merino ram (1)	15	31.07	2.65	14.47	1.97
Hungarian Merino lamb ewe (2)	15	29.26	1.89	13.48	1.08
Ile de France ram (3)	15	33.74	3.64	15.86	1.93
Ile de France lamb ewe (4)	15	32.25	1.99	15.18	1.22

1. táblázat: A vizsgált csoportok vágósúlya, illetve vágott testtömege

Magyar merinó kos(1), Magyar merinó jerke(2), Ile de france kos(3), Ile de france jerke(4), Egyedszám(5), Vágási testtömeg(6), Karkasz tömege(7), Átlag(8), Szórás(9)

At slaughtering, after racking, we removed the head and the feet, the entrails and meayured at this time the weight of suminal and kidney-tallow also with 0.01 kg exactness. We judged the warm carcasses according to the standard's regulations. The original nominating system of S/EUROP qualification, because of the statistical authenticity, we changed it for a code-system made by us *(2nd and 3rd table).*

We carved the carcasses according to the Australian standard then measured them with 0.01 kg exactness also. Because in the course of S/EUROP qualification primarily the 1st class so called roast meat parts' rates are determinants, so at evaluation to establish the connections, we considered the values of haunch, spine, and within this, the frontal part (short chop), the hing part (long chop), and the shoulder.

Table 2

Correspondence between the S/EUROP talbwing-qualification and our own codes

S/EUROP (1)	1			2			3			4			5		
Subclasse	-	0	+	-	0	+	-	0	+	-	0	+	-	0	+
Code (2)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

2. táblázat: Az S/EUROP faggyúzottság minősítés és a kategóriák kifejezésére alkalmazott kódok

S/EUROP(1), Kód(2)

Table 3

Correspondence between the S/EUROP conformation qualification and our own codes

S/EUROP (1)	P			O			R			U			E			S
Subclasse	-	0	+	-	0	+	-	0	+	-	0	+	-	0	+	
Code (2)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

3. táblázat: Az S/EUROP testalakulás minősítés és a kategóriák kifejezésére alkalmazott kódok

S/EUROP(1), Kód(2)

We' ve done our statistical analysis with the help of SPSS for Windows 8.0 program file. After the calculation of basic statistical samples, we fixed by pairs correlation values.

RESULTS AND DISCUSSION

The S/EUROP qualification in the case of weight 13-22 kg carcasses , like we made known above, is made up of parts, which are describing the tallowing and conformation. On the basis of the *4th table,* is ascertainable that the sex influences the value of tallowing and the conformation is influenced by the breed above all.

Table 4

Values of S/EUROP qualification

	Values of the tallowing's qualification (5)				Values of the conformation's qualification (6)			
	Mean (7)	SD (8)	Min. (9)	Max. (10)	Mean	SD	Min.	Max.
Hungarian Merino ram (1)	5.27	0.96	4	7	6.33	1.35	3	8
Hungarian Merino ewe (2)	5.93	0.88	5	8	6.67	0.72	5	8
Ile de France ram (3)	5.20	1.20	2	7	8.35	1.46	5	10
Ile de France ewe (4)	6.00	0.82	4	7	8.30	0.82	7	10

4. táblázat: A vizsgált csoportok alapstatisztikai adatai

Magyar merinó kos(1), Magyar merinó jerke(2), Ile de france kos(3), Ile de france jerke(4), Faggyúzottság minősítésének értékei(5), Testalakulás minősítésének értékei(6), Átlag(7), Szórás(8), Minimum(9), Maximum(10)

In the first step we examined the values of S/EUROP tallowing qualification and the connections between the weight of ruminal, and kidneycapsule – tallow *(5th and 6th table*).

Table 5

Characteristics of the examined groups' ruminal, and kidneycapsule tallow

	Weight of ruminal tallow, kg (5)		Weight of kidneycapsule tallow, kg (6)	
	Mean (7)	SD (8)	Mean	SD
Hungarian Merino ram (1)	0.26	0.09	0.09	0.03
Hungarian Merino ewe (2)	0.39	0.11	0.16	0.07
Ile de France ram (3)	0.20	0.07	0.08	0.02
Ile de France ewe (4)	0.28	0.09	0.10	0.06

5. táblázat: A vizsgált csoportok bendő és vesetok faggyú jellemzői

Magyar merinó kos(1), Magyar merinó jerke(2), Ile de france kos(3), Ile de france jerke(4), Bendő faggyú tömege(5), Vesetok faggyú tömege(6), Átlag(7), Szórás(8)

Table 6

Values of tallowing's qualification, correaltions between the weight of ruminal, and kidneycapsule tabllow

	S/EUROP qualification	Weight of ruminal tallow	Weight of kidneycapsule tallow
S/EUROP qulification (1)	1	0.303 *	0.632 **
Weight of ruminal tallow (2)		1	0.643 **
Weight of kidneycapsule tallow (3)			1

* $P \leq 0.05$, ** $P \leq 0.01$

6. táblázat: A faggyúzottság minősítésének értékei, a bendő és a vesetok faggyú tömege közötti korrelációk

S/EUROP minősítés(1), Bendő faggyú tömege(2), Vesetok faggyú tömege(3)

We established a strong connection between the S/EUROP qualification and the quantity of kidneycapsule – tallow ($P \leq 1\%$), while the same as ruminal tallow regards was weaker ($P \leq 5\%$). We got strong correlation also ($P \leq 1\%$) between quantities of tallow coming from two places. In the *7th table* we indicated the connection between the breed and sex and the examined parameters.

Between breeds in regards to being covered with tallow we have not found an estimated difference in the same slughtering category. It seems to prove that the presently used qualification system doesn't prefer any breed. According to the ruminal tallow and kidneycapsule – tallow however, the ile de france statistically proved ($P \leq 5\%$ and $P \leq 1\%$), had less abdominal tallow. To examine the influence of sex, in the same

weight, the ewe lambs both the kidneycapsule – tallow and the ruminal tallow ($P \leq 1\%$), depose to a higher degree than the rams do. This connection is strong at the S/EUROP qualification data also, statistically provable ($P \leq 1\%$).

Table 7

Connections of breed and sex and talbreing paramteres

	S/EUROP qualification (3)	Weight of ruminal tallow (4)	Weight of kidneycapsule tallow (5)
Breed (1)	0.064	0.462 **	0.271 *
Sex (2)	0.347 **	0.458 **	0.495 **

* $P \leq 0.05$, ** $P \leq 0.01$

7. táblázat: A fajta és az ivar valamint a faggyúzottsági paraméterek összefüggései

Fajta(1), Ivar(2), S/EUROP minősítés(3), Bendő faggyú tömege(4), Vesetok faggyú tömege(5)

In the second step we examined the connections between conformation and slaughtering parameters. The *8th and 9th table* contain the data of 1st class parts.

Table 8

The haunch and shoulders's characteristics of the examined groups

	Weight of haunch, kg (5)		Weight of shoulder, kg (6)	
	Mean (7)	SD (8)	Mean	SD
Hungarian Merino ram (1)	2.43	0.29	1.26	0.15
Hungarian Merino ewe (2)	2.30	0.20	1.18	0.12
Ile de France ram (3)	2.74	0.32	1.51	0.15
Ile de France ewe (4)	2.65	0.19	1.42	0.11

8. táblázat: A vizsgált csoportok comb és lapocka jellemzői

Magyar merinó kos(1), Magyar merinó jerke(2), Ile de france kos(3), Ile de france jerke(4), Comb tömege(5), Lapocka tömege(6), Átlag(7), Szórás(8)

Table 9

The long, and short chop characertistics of the examined groups

	Weight of long chop, kg (5)		Weight of short chop, kg (6)	
	Mean (7)	SD (8)	Mean	SD
Hungarian Merino ram (1)	0.78	0.16	0.60	0.12
Hungarian Merino ewe (2)	0.70	0.09	0.57	0.09
Ile de France ram (3)	0.81	0.17	0.63	0.12
Ile de France ewe (4)	0.73	0.09	0.66	0.09

9. táblázat: A vizsgált csoportok hosszú- és rövidkaraj jellemzői

Magyar merinó kos(1), Magyar merinó jerke(2), Ile de france kos(3), Ile de france jerke(4), Hosszúkaraj tömege(5), Rövidkaraj tömege(6), Átlag(7), Szórás(8)

It can be seen from the data of the tables that the French breed, with nearly same weight of carcass, has a bigger weight according to the valuable meatparts. Between the S/EUROP qualification and 1st class parts, we found strong connection (P≤1%) at every correspondence *(10th table)*.

Table 10

Values of the conformations's qualification, correlations between the weight of haunch, shoulder long and short chop

	S/EUROP qualification	Haunch	Shoulder	Long chop	Short chop
S/EUROP qualification (1)	1	0.669 **	0.624 **	0.431 **	0.439 **
Haunch (2)		1	0.827 **	0.742 **	0.665 **
Shoulder (3)			1	0.565 **	0.546 **
Long chop (4)				1	0.695 **
Short chop (5)					1

** P≤0.01

10. táblázat: A testalakulás minősítésének értékei és a comb, a lapocka, a hosszú- és rövidkaraj tömege közötti korrelációk

S/EUROP minősítés(1), Comb(2), Lapocka(3), Hosszúkaraj(4), Rövidkaraj(5)

In the *11th table* we indicated connections between the breed and sex and the examined parameters.

Table 11

Connections of breed, sex and conformations's parameters

	S/EUROP qualification (3)	Haunch (4)	Shoulder (5)	Long chop (6)	Short chop (7)
Breed (1)	0.621 **	0.547 **	0.689 **	0.170	0.251
Sex (2)	0.169	0.264 *	0.341 *	0.309	0.035

* P≤0.05, ** P≤0.01

11. táblázat: A fajta és az ivar valamint a testalakulási paraméterek összefüggései

Fajta(1), Ivar(2), S/EUROP minősítés(3), Comb(4), Lapocka(5), Rövidkaraj(6), Hosszúkaraj(7)

We can establish that the conformation in the case of ile de france carcasses shows more favourable forms (P≤1%). We experienced the same in the case of the haunch and the shoulder also. The weight of the short chop and long chop doesn't reflect the values of S/EUROP qualification.

The sex gave provable connection (P≤5%) only with the weight of haunch and shoulder.

CONCLUSIONS

On the basis of our results, we found that the S/EUROP commercial qualification system was suitable for the estimation of the proportion of talowing values of sheep carcass and body composition, i.e. the proportion of the bodyparts giving valuable meat.

Determining the tallowing values with the help of this qualification system on the basis of the tallow amount of the kidney-capsule provides more reliable information than the tallow amount of the rumen. Taking the latter into consideration during slaughter is difficult. With the S/EUROP qualification system the greater tallow values of the female sheep is possible to be determined with a bigger safety margin irrespective of breed. Based on the comparative analysis of the body composition results of the S/EUROP qualification and the quantitative data of the slaughter value the conclusion could be drawn, that out of the bodyparts giving first class meat, the estimated muscularity values of first the leg then the shoulder and last the rib can be connected with the slaughter value data.

To sum up it is to point out that the tallow content and the body constitution of the carcass can be estimated with the help of S/EUROP qualification so that the estimations meet the current claims of commerce. In the future this qualification system, as it is a subjective qualification with the possibility of human mistake, might raise several problems that have already been successfully eliminated in pigs.

In addition to the principles of the S/EUROP qualification system we suggest the development of an objective judgment system in sheep, too.

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