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Effect of sex and fattening intensity on health-promoting value of lamb meat

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A fatty acid (FA) profile was determined in two repeations of superficial and intermuscular fat derived from legs of 64 lambs. More favourable profile of both types of fats was obtained in the intensive fattening, mainly owing to a higher content of polyunsaturated FA (PUFA). Body weight of lambs (20-30 *vs*. 30-40 kg) had no effect on FA profile, with the tendency, however, of being more favourable in lambs fattened to lower body weight. Lambs' sex differentiated their FA profile to a limited range, with the tendency of being more favourable in ram- than in ewe-lambs, mainly owing to the higher PUFA content. The location of fat deposited within the leg did not differentiate the composition of FA (including CLA content), with lower cholesterol content of superficial than intermuscular fat.

KEY WORDS: lamb/ fattening / meat/ fatty acid/ profile/ cholesterol

According to the consistent expert's opinion dealing with health-promoting properties of food [Bartnikowska 2000], the main threats of "defective nutrition" which may be related to consumption of animal products, result from the excessive fat content, unfavourable composition of fatty acids of animal fats and excessive content of cholesterol.

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Unilateral and generally unfavourable opinions of medicinal environments and dieticians on the presence of animal fats in human diet have recently been re-evaluated, mainly due to the content of many important bioactive compounds of fat in milk and in meat [Oprządek and Oprządek 2003].

In all animal species, the content and the composition of fats as well and proportions of fatty acids in meat may be desirably directed through the selection of animals destined for fattening, the choice of the appropriate age and body weight of animals at slaughter and the use of proper feeds. In numerous studies on the factors determining health-promoting quality of foods and possibilities of their modification [Oprządek and Oprządek 2003, Nuernberg *et al*. 2006], there is a mall number of papers concerning fatty acid profile of fatty tissue, occurring in meat, which would consider its anatomic origin and location in the carcass as combined with genetic and environmental factors. The available papers concern mainly intermuscular and superficial (cover) fat from the selected muscles or sites in the carcass [Bas and Morand-Fehr 2000]. Borys *et al.* [2007] revealed a significant differentiation of fatty acid profile, depending on the location of fat tissue within the carcass.

Due to the complicated character of processes of depositing fat in the body of the fattened lambs and differentiated culinary importance of the particular types of fat and health-promoting quality of meat, the determination of the lamb's body response to different factors is significant in shaping the optimum health-promoting quality of the meat considered.

Facing the above, the studies on fatty acid profile of fat of lamb carcasses have been found justified.

Materials and methods

The experimental fattening and post-slaughter evaluation of the lambs was conducted at the Experiment Station Kołuda Wielka of the National Research Institute of Animal Production, Cracow, while the analytical work on fatty acids was carried out at the Meat and Fat Research Institute, Warsaw.

The animal material consisted of the F1 lambs (1:1 sex ratio) derived from the commercial crossing of the Suffolk meat rams with ewes of prolific Merinofin Mf-40 line. The experimental fattening commenced after weaning the lambs at the age of 8 weeks and was applied in two systems: intensive (IN) and semi-intensive (SIN). Fattening in each system lasted to lower (L) or higher (H) body weight (L rams up to 25-30, L ewes up to 20-25, H rams up to 35-40 and H ewes up to 30-35 kg). The experiment was duplicated (two repeations), with 32 rams and 32 ewes in each. In this way four sub-groups of rams and four sub-groups of ewes, each of four animals, were arranged per repeation.

Experimental design is presented below.

Fattening system	Final body weight (kg)	Repeation I		Repeation II	
		No. of rams	No. of ewes	No. of rams	No. of ewes
IN	low (L)	4	4	4	4
	high (H)	4	4	4	4
SIN	low (L)	4	4	4	4
	high (H)	4	4	4	4

Lambs were fed according to the standards of the National Research Institute of Animal Production [Osikowski *et al.* 1998]. During the fattening period, the lambs were kept in pens with a slatted floor, with a constant access to drinking water and salt slices. In the IN system the lambs were fed *ad libitum* the complete mixed concentrate diet and 100 g hay per kg of mixed diet offered per animal/day. In SIN system, the standardized feeding was based on roughages and concentrate mixture. In Table 1, the composition of full-ration mixture, employed in IN fattening and of the mean rate applied in SIN fattening are given. Their nutritive value was calculated according to INRA 1998 standards.

Table 1. Feeding of experimental lambs

Intensive fattening		Semi-intensive fattening	
Components of full-ration mixture (%):		Components of 1kg-ration mixture (%)	
barley grain	30.0	silage (maize + lucerne)	27.00
wheat meal	25.0	grass hay	19.00
rapeseed meal	20.0	total mixture of concentrates:	54.00
dry beet pulp	15.0	including:	
dried Lucerne	8.5	barley grain	15.0
mineral mixture MM	1.0	wheat meal	50.0
Polfamix „O”	0.5	rapeseed meal	15.0
		wheat brans	10.0
		dried beet pulp	10.0
		mineral mixture MM	0.02
		Polfamix „O”	0.02
Nutritive value of 1 kg	0.88	Nutritive value of 1 kg	
UFV	98.87	UFV	0.65
PDIE (g)	104.22	PDIE (g)	70.51
PDIN (g)		PDIN (g)	69.27

Slaughtering of lambs, cutting of right carcass-sides into cuts and detailed dissection of the leg were carried out following the methods of the National Research Institute of Animal Production [Nawara *et al.* 1963]. The mean body weight of lambs at the beginning of fattening (initial live weight) was 18.6 kg for both groups daily gain in IN group was 335 g and in SIN – 248 g. Dressing percentage was 44.8 and 42.1% and meat to fat ratio for leg – 4.19 and 4.45, respectively (figures not tabulated).

Fatty acid (FA) profile and cholesterol content were determined in superficial and intermuscular fat (SF and IM, respectively), isolated during detailed dissection of leg. Within repeation II, the content of conjugated dienes of linolenic acid (CLA) was also determined.

Determination of fatty acid profile and cholesterol content was conducted according to Kramer *et al.* [1997] with modifications suggested by Borys *et al.* [1999]. For FA gas chromatograph of Hewlett Packard model 6890 was used with flame-ionization detector, on column Rtx-2330 with the following parameters: 105 m x 0.25 mm x 20 μm. Cholesterol content was determined with gas chromatograph of Hewlett Packard 5890 sII with flame-ionization detector, on column HP-1, 25 m long, with diameter of 0.20 mm and ∅ 0.11 μm. FAs content was determined within the range of C10:0-C22:6 (see the legend to Tab. 2).

The statistical verification of the results was conducted separately for each type of fat, using STATISTICA 8.0 package, with the application of ANOVA procedure in orthogonal four-factor system: feeding method, final weight (weight standard), sex and repeation. The interactions of the first degree were considered.

Results and discussion

Superficial fat (SF)

The fattening system significantly affected the content of the most of FAs of superficial fat (SF) of lamb leg, excluding myristic and palmitic acids (Tab. 2). The SF of the IN fattened lambs contained significantly less stearic acid (C18:0) as compared to the SIN fattened animals (by 24.7 per cent points). Considering remaining acids, their significantly higher content was found in IN than in SIN fattened lambs (the difference amounted from 2.7 pp for C18:1c9 to 75.0 pp for C20:4).

The system of fattening differentiated significantly the parameters of health-promoting quality of SF based on FA profile – Table 2. SF fat of IN lambs occurred significantly better in this respect. As compared to SIN group, it contained significantly less saturated fatty acids (SFA) and more unsaturated fatty acids (UFA). Owing to that, it presented a favourable, higher by 24.7 pp ratio of UFA to SFA ($P \leq 0.001$). The fat of IN lambs contained by 5.9 per cent points (pp) more monounsaturated fatty acids (MUFA) whereas of polyunsaturated acids (PUFA) – by as much as 51.4 pp. As a result, PUFA to SFA ratio was more favourable in case of IN than of SIN lambs (by 66.7 pp, $P \leq 0.01$).

IN fattening led to the increase in the content of PUFA from n-3 family (by 65.2 pp in relation to SIN) and narrowing of PUFA n-3 to n-6 ratio by 11.9 pp (Tab. 2).

Significant differences in CLA content were found in the IN fattened lambs according to SIN system. On the other hand, any significant effect of fattening technology on cholesterol level was not recorded.

The final body weight of lambs did not show any effect on FA profile of superficial fat. Only one statistically confirmed difference was found for C22:5 acid, which was

Table 2. Fatty acid and cholesterol content of superficial fat of lambs' leg (g/100 g of fat)

Item	Fattening system (F)			Final body weight (W)			Sex (S)			Repeation (R)	Interaction	SEM
	IN	SIN	Effect	L	H	Effect	R	E	Effect	Effect		
C14:0	4.94	4.74	ns	4.87	4.81	ns	4.74	4.94	ns	ns	ns	0.185
C16:0	22.09	22.49	ns	21.95	22.63	ns	21.61	22.97	xx	ns	ns	0.222
C16:1	3.32	2.97	xx	3.06	3.23	ns	3.11	3.19	ns	xxx	1^{x}	0.051
C17:0	3.26	2.91	xx	3.01	3.15	ns	3.06	3.10	ns	x	ns	0.057
C18:0	14.03	18.63	xxx	16.91	15.75	ns	16.86	15.80	ns	ns	ns	0.448
C18:1T	4.02	3.20	x	3.77	3.46	ns	3.60	3.62	ns	ns	ns	0.168
C18:1c9	35.16	34.24	x	34.13	35.27	ns	34.81	34.59	ns	ns	ns	0.255
C18:1c11	1.62	1.24	xxx	1.46	1.40	ns	1.51	1.35	x	xx	2^{x}	0.043
C18:2	3.89	2.66	xxx	3.29	3.26	ns	3.68	2.87	xx	xx	$2, 3, 6^{xx}$	0.102
C18:3	0.58	0.36	xxx	0.46	0.47	ns	0.51	0.43	ns	xxx	$2^{xx}. 3^{xxx}$	0.017
C20:4	0.21	0.12	xxx	0.17	0.16	ns	0.17	0.16	ns	xx	3^{x}	0.008
C22:5	0.16	0.10	xx	0.14	0.11	X	0.11	0.13	ns	x	$1^{x}, 3^{xxx}$	0.005
SFA	46.26	50.61	xxx	48.68	48.21	ns	48.19	48.70	ns	ns	ns	0.427
UFA	42.82	48.44	xxx	50.34	50.92	ns	50.84	50.41	ns	ns	ns	0.440
UFA/SFA	1.15	0.92	xxx	1.04	1.07	ns	1.072	1.04	ns	ns	ns	0.018
MUFA	47.81	45.13	xxx	46.13	46.81	ns	46.23	46.71	ns	ns	ns	0.363
PUFA	5.01	3.31	xxx	4.21	4.11	ns	4.61	3.71	xx	x	$2, 6^{xx}, 3^{xxx}$	0.126
PUFA/SFA	0.11	0.07	xxx	0.09	0.09	ns	0.10	0.08	xx	xx	$2, 3^{xx}, 6^{x}$	0.003
n-3	0.76	0.46	xxx	0.62	0.59	ns	0.65	0.56	ns	xx	2^{xx}	0.020
n-6/n-3	5.58	6.34	ns	5.89	6.03	ns	6.21	7.71	ns	xxx	2^{xxx}	0.141
CLA	0.39	0.51	xx	0.49	0.41	ns	0.46	0.44	ns		ns	0.025
Cholesterol	0.08	0.08	ns	0.08	0.08	ns	0.08	0.08	ns	ns	ns	0.002

Fattening method: IN – intensively, SIN – semi intensively. Weight standard: L – low, H – high. Sex: R – ram-lamb, E – ewe-lamb. SEM – standard error of the mean, xxx – P≤0,001, xx – P≤0,01, x – P≤0,05; ns – insignificant. Interaction: 1 – FxW, 2 – FxS, 3 – FxR, 6 – SxR

SFA = Σ C10:0, C12:0, C14:0, C15:0, C16:0, C17:0, C18:0, C20:0. UFA = MUFA + PUFA. MUFA = Σ C14:1, C15:1, C16:1, C17:1, C18:1, C20:1. PUFA = Σ C18:2, CLA, C18:3, C20:2, C20:3, C22:4, C22:5, C22:6; n-3 = Σ C18:3; C22:5; C22:6, n-6 = Σ C18:2; C20:2; C22:4.

observed in higher percentage in lighter (L) than in heavier (H) animals – by 27.3 pp (P≤0.05). No significant effect on cholesterol content of SF was found of final body weight.

Both ram lambs and ewe lambs, as fattened to different final body weight showed quite distinctly differentiated FA profile of SF. From viewpoint of health-promoting quality, it was more favourable in the former. SF of the ram lambs contained less C16:0 acid (by 5.9 pp, P≤0.01) and more unsaturated C18:1c11, C18:2 and C18:3 acids – by 11.8, 28.2 and 18.6 pp, respectively.

Superficial fat in the ram lambs was characterized by a higher PUFA level than in ewe lambs and, owing to that, by higher PUFA to SFA ratio – by 24.3 and 28.6 pp, respectively, (P≤0.01) and by the trend to higher content of acids from n-3 family (by 16.1 pp) and to better n-3:n-6 ratio.

Differences in CLA and cholesterol content of SF as related to the lamb sex were not observed (Tab. 2).

The repeation of the experiment had no effect on the content of the basic fatty acids of SF (C16:0, C18:0 and C18:1c9). On the other hand, it differentiated significantly the content of long-chain PUFAs. In consequence, the significant differences between the repeations in most of parameters of health quality, based on PUFA content of fat, were recorded.

Significant interactions of the first degree occurred, first of all, in PUFA level and in parameters of health-promoting quality, being based on them. It indicates that in respect of the components discussed, important from health-promoting quality viewpoint, a relatively high mutual impact of the examined experimental factors exists.

Intermuscular fat (IF)

The effect of the fattening system was observed on the content of most of analysed fatty acids of intermuscular fat (IF) – Table 3. The IF of IN fattened group contained significantly less C18:0 as compared to SIN fattened group. On the other hand, it contained more of all unsaturated acids. The significant intergroup differences were identified for C18:1T, C18:1c11, C18:2 and C18:3. The IF in IN fattened group as compared to SIN group contained significantly less SFA and more UFA, owing to which the UFA to SFA ratio occurred wider (by 14.7 pp, P≤0.001). The fat of IN group was characterized by higher than that of SIN content of MUFA and PUFA, owing to which it presented more favourable ratio of PUFA to SFA (by 44.3 pp, P≤0.001). In the IF of IN lambs, the content of acids from n-3 family (by 35.3 pp, P≤0.01) was also more favourable. However, CLA content was lower by 14.6 pp (P≤0.05).

The effect of final body weight of lambs on FA profile was relatively small and mostly not significant (Tab. 3). Significant differences were identified for C18:0, C18:1 and C18:3. Generally, IF of the lambs fattened to higher body weights was distinguished by more favourable health-promoting parameters in respect of MUFA content and UFA to SFA ratio significantly higher for H than for L lambs (by 2.7 and

Table 3. Fatty acid and cholesterol content of intermuscular fat of lambs'leg (g/100 g of fat)

Item	Fattening system (F)			Final body weight (W)			Sex (S)			Repeation (R)	Interaction	SEM
	IN	SIN	Effect	L	H	Effect	R	E	Effect	Effect		
C14:0	5.44	5.05	ns	5.29	5.20	ns	5.32	5.17	ns	ns	6^{x}	0.169
C16:0	22.51	22.29	ns	22.08	22.72	ns	21.92	22.86	xx	ns	ns	0.221
C16:1	3.07	2.77	ns	2.78	3.06	ns	2.92	2.92	ns	x	ns	0.058
C17:0	2.76	2.60	ns	2.67	2.69	ns	2.51	2.85	ns	ns	6^{xx}	0.044
C18:0	14.51	18.62	xxx	17.32	15.81	x	16.47	16.67	ns	ns	ns	0.479
C18:1T	3.70	2.67	xxx	3.11	3.26	ns	3.15	3.22	ns	ns	ns	0.126
C18:1c9	35.58	34.91	ns	34.54	35.95	x	35.62	34.87	ns	ns	ns	0.304
C18:1c11	1.59	1.26	xxx	1.47	1.38	ns	1.47	1.39	ns	x	ns	0.035
C18:2	3.66	2.76	xxx	3.22	3.19	ns	3.47	2.94	xx	xx	$2, 3^{x}$	0.081
C18:3	0.55	0.39	xx	0.46	0.47	ns	0.49	0.44	x	xxx	3^{xxx}	0.014
C20:4	0.21	0.17	ns	0.23	0.15	x	0.20	0.18	ns	ns	ns	0.013
C22:5	0.13	0.11	ns	0.14	0.11	ns	0.12	0.12	ns	ns	ns	0.005
SFA	47.24	50.46	xxx	49.36	48.34	x	48.19	49.51	ns	ns	ns	0.416
UFA	51.89	48.64	xxx	49.74	50.78	x	50.90	49.62	ns	x	ns	0.416
UFA/SFA	1.11	0.97	xxx	1.02	1.06	x	1.07	1.08	ns	ns	ns	0.017
MUFA	47.21	45.14	xxx	45.55	46.79	xx	46.48	45.91	ns	ns	ns	0.364
PUFA	4.68	3.50	xxx	4.19	3.99	ns	4.46	3.72	xx	xx	3^{xx}	0.103
PUFA/SFA	0.10	0.07	xxx	0.09	0.08	ns	0.09	0.08	xx	xx	$2, 3^{x}$	0.003
n-3	0.69	0.51	xx	0.62	0.58	ns	0.63	0.57	ns	xx	3^{xxx}	0.017
n-6/n-3	5.60	5.88	ns	5.71	5.78	ns	5.96	5.53	ns	xxx	3^{xx}	0.130
CLA	0.41	0.48	x	0.46	0.44	ns	0.46	0.43	ns		ns	0.017
Cholesterol	0.10	0.11	ns	0.11	0.10	ns	0.11	0.10	ns	x	ns	0.005

For abbreviations and significance of differences, see Table 2.

4.3 pp, respectively) and cholesterol content that for H subgroup was favourably, but not significantly lower – by 6.3 pp.

The effect of sex of lambs was identified on fatty acid profile of the IF. In rams, significantly lower was content of C16:0 (by 4.3 pp, $P \leq 0.01$) and higher of PUFA C18:2 and C18:3 (by 18.0 and 11.4 pp, respectively). The IF of the rams was characterized by more favourable health-promoting properties. However, the significant differences between sexes were found only in PUFA content and PUFA to SFA ratio, being higher by 19.9 and 25.0 pp, respectively, in rams $P \leq 0.01$).

No significant relation was found between the content of essential FA in the IF and the repeation of the experiment. On the other hand, repeation differentiated the content of the most of unsaturated fatty acids accompanied with their higher participation in the total fat FAs (Tab. 3). Variable conditions of the implementation of the successive fattening repeations differentiated significantly many health-promoting parameters of the fat in question, especially in respect of PUFAs.

The first degree significant interactions of the IF parameters (mainly the fattening system x repeation and sex x repeation) indicate the differentiated response of the lambs, depending on the fattening technology and sex, on the uncontrolled changes in the conditions of implementation of the successive repeations of experiment. Similarly as in case of superficial fat, the interactions concerned mainly C18:2 and C18:3 acids and health-promoting parameters based on PUFA content.

Fatty acid profile

The system of fattening and the related system of feeding affected the fatty acid profile of both fats examined. The obtained results indicate more favourable shaping of FA profile of the lambs fattened intensively as compared to those semi-intensively fattened. In both types of fat examined (SF and IF), the system of fattening affected similarly the content of stearic acid C18:0 (significantly lower in IN than in SIN group) and of C17:0, C18:1T, C18:1c11, C18:2 and C18:3 (IN>SIN). In case of IN, the higher levels of PUFA C20:4 and C22:5 important from health-promoting quality viewpoint, were also obtained. SF and IF of the IN lambs were characterized by considerably better health-promoting parameters. The intensive fattening of lambs favourably affected SFA, UFA, MUFA, PUFA and PUFA n-3 contents and UFA to SFA and PUFA to SFA ratios.

In numerous studies [Wood and Enser 1997, Rowe *et al*. 1999, Fisher *et al*. 2000, Bas and Morand-Fehr 2000] more favourable FA profile of meat and deposited fats was obtained in the lambs less intensively fattened with the use of roughages as compared to intensive fattening with dry mixed concentrate diets. The mentioned regularity was confirmed first of all in case of grazing animals. On the other hand, in case of winter feeding, it was found that higher share of silages in the diet led to the increase of saturation of reserve fats of the lambs as compared to the fattening based on the concentrate mixtures, consisting of cereal components and dried forage crops [Bas and Morand-Fehr 2000, Enser 2000, Kraus *et al.* 2001].

The compared body weights of the lambs did not affect the FA profile of the fats examined. In this respect, the mentioned fats differed from IF of the same lambs which in case of fattening to lower weight standards (L) showed more favourable composition of FA, mainly owing to the significantly higher content of PUFA.

The effect of sex of lambs on FA profile was similar for both types of fats. In case of rams they contained significantly less palmitoleic acid (C16:0) and more UFA, mainly linoleic (C18:2) and linolenic (C18:3) acids as compared to the ewes. Owing to this fact, fats of the rams were distinguished by higher PUFA content and more favourable indicators of health-promoting quality, wider PUFA to SFA ratio and higher content of n-3 acids.

The higher degree of FA saturation in ewes than in rams was related to physiologically determined trend of the former to reach the final live weight at younger age on one hand, and of the known regularity that the progressive depositing of fatty tissue in animal body is accompanied by the increase in the degree of saturation of FA constituting their profile, on the other. The discussed regularities are also in accordance with the results of earlier studies of Borys and Borys [2001], Diaz *et al.* [2003] and Kosulwat *et al.* [2003].

The results reported here indicate a great similarity in FA composition of both superficial and intermuscular fat in lambs, similar SFA, MUFA, PUFA and n-3 composition, as well as similar composition of essential fatty acids C16:0, C18:0 and C18:1c9. Moreover, Borys *et al.* [2007] reported similar FA composition in the lambs, fattened to similar body weight, being considerably less favourable in respect of health-promoting aspects compared to the intramuscular fat.

Conjugated linoleic acid (CLA)

Fattening system had a significant effect on CLA content (of superficial fat of lambs'leg), being higher in SIN than in IN group of lambs (Tab.3.). The remaining factors showed a small effect on the content of the conjugated diene of CLA (C18:2 c9t11). In the literature available there is scarce information on the effects of the examined factors on CLA content in milk and meat, and on the feasibility of modifying CLA concentration in raw materials and products of sheep. It is recognized, however, that bacterial isomerization of linoleic acid in the rumen is the main process of synthesizing CLA in ruminants [Demirel *et al.* 2001]. The intensification of the process in question and the rate of CLA embedding in tissues of the fattened lambs is affected by the development of function of forestomachs and nutrition applied. The results of this study indicate that the SIN feeding favourably affected the intensity of the discussed processes. It is not possible, however, on the ground of the observations conducted to state whether the mentioned intergroup differences result from the different age of the lambs fattened according to the discussed systems or different feeds employed in fattening.

Cholesterol

Any significant effect of any of the factors on cholesterol content of the examined fats was not identified. Attention, however, should be paid to the fact that the mean cholesterol content of SF in the groups within the particular factors was very uniform (Tab. 2). In the IN group (Tab. 3) a tendency to greater differentiation was observed, especially in relation to the fattening system: in SIN the cholesterol content was by 12.9 pp higher as compared to IN lambs.

The studies on factors, determining the cholesterol level in fat and meat of the lambs are still in run, and the so far obtained results are often divergent. The attention should, however, be paid to complex and still unexplained effect of nutritive factors on the content of cholesterol in food products of animal. Also, the relation between the body weight of lambs and cholesterol content of meat has not been entirely explained. Kłosowska *et al.* [1998] and Arsenos *et al*. [2000] reported a gradually declining tendency in cholesterol content of carcass with the growth and progressing age of lambs. On the other hand, in the study by Borys and Borys [2001], muscular tissue of light lambs (19 kg) and those fattened to 35-40 kg showed a similar cholesterol level. Higher concentration of cholesterol in tissues of younger lambs is physiologically natural and related to the higher demand of growing organism for the compound in question.

Divergent results were obtained concerning the effect of sex on cholesterol content of the lamb meat. The study by Honikel [2000] on the lamb meat as well as most of the data related to the meat of other species of farm animals indicate the significant and positive correlations of cholesterol level with carcass fatness. Sevi *et al.* [1997] and of Borys *et al.* [2006] did not confirm such relations. Arsenos *et al.* [2000] recorded lower cholesterol level in the meat of better fattened ewes in comparison to the rams.

In the present study a wide differentiation of cholesterol content was found depending on location of deposit fat in the carcass (Tab. 2 and 3). In the IF it amounted to 35.4 pp more, on average, compared to SF (0.107 and 0.079 g/100g, respectively). On the other hand Solomon [1991] did not find any univocal differences in cholesterol content between different elements of the lamb carcass. High cholesterol content of IF should constitute the reason for undertaking the attempts aimed at reduction of its presence in culinary lamb meat.

The results presented and discussed here showed that the technological factors (feeding method and final body weight) as well as sex of the lambs differentiated the parameters of health quality of fats deposited in the lamb carcass, being important from the viewpoint of the contemporary consumers' requirements.

As far as the health-promoting quality is concerned, the more favourable fatty acid profile of two deposited fats was reached in the intensive fattening, mainly owing to higher content of polyunsaturated fatty acids.

Body weight of the lambs did not affect significantly the fatty acid profile of both

fats examined, with the tendency, however, to more favourable selected parameters of health-promoting quality in case of the lambs, fattened to lower weight intervals.

Sex of the lambs fattened to medium and high body weight differentiated the fatty acid profile of their deposit fat in a limited degree only. Both fats of the ram-lambs were generally characterized by better health-promoting quality compared to the ewe-lambs, mainly owing to the higher content of polyunsaturated fatty acids. The sex of the lambs did not affect the CLA and cholesterol content of the examined fats.

Location of reserve fat in the lamb carcass did not differentiate significantly the fatty acid profile and health quality of fat (including CLA content) at the distinctly lower cholesterol content in superficial than in intermuscular fat.

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