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Fatty Acid Composition of Fat-Tail and Visceral Fat Depots from Chaal and Zandi Pure Bred Lambs and Their Crosses with Zel (Three Iranian Breeds)

Research Article

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ABSTRACT

The present study was done to evaluate the breed, sex and sampling site influence on fat-tail and visceral fatty acid composition of five pure and cross bred lambs from three Iranian sheep breeds. Particularly, on the content of saturated and unsaturated fatty acids from two cut-able fat depots (fat-tail and visceral). All animals were managed and finished up together and received the same diet. Statistically significant differences ($P<0.05$ and $P<0.01$) in the proportions of some fatty acids were observed among breeds, genders and sampling sites. The values of unsaturated fatty acids (UFA) were significantly higher in fat-tail fat than in visceral ($P<0.01$). In addition, there was no significant difference in total amount of saturated fatty acids (SFA) in visceral and fat-tail fat tissue. The UFA and SFA of the two fat depots was not affected by sex ($P>0.05$). The result showed that SFA in Zel × Zandi, Chal × Chal and Zandi × Zandi lambs are more than the USF ($P<0.05$). In all the five groups, the most content of total saturated fatty acids (SFA) was made of palmetic acid (C16:0) and stearicacid (C18:0) and also, palmitoleic (C16:1 n7), oleic (C18:1) and linoleic acids (C18:2 n6) compromised most part of unsaturated fatty acids (UFA). However, the overall content of SFA and UFA was significantly affected by sampling site ($P<0.01$).

KEY WORDS chal, fat-tail, fatty acid profile, pure and cross bred lamb, saturated and unsaturated, visceral, Zandi, Zel.

INTRODUCTION

There have been relatively few studies on the fatty acid composition of lipids in visceral and fat-tail fat depots of sheep (Alipanah and Kashan, 2011). Although, there have been some studies which have evaluated the lipid percentage and quantity of sheep meat in different cuts of meat and of the entire carcass (Okeudo *et al.* 2004; Skiba *et al.* 2010). Effects of factors such as breed or genotype, age, sex and nutritional conditions on fat deposition in fattened lambs have been studied (Warren *et al.* 2008; Wood *et al.* 2004). The fatty acid composition of fat usually has little influence on market value of the carcass, for which the quantity of fat is of greater importance. However, physical and chemical properties of lipids affect eating and keeping qualities of meat favor is influenced by fatty acid composition (Rao *et al.* 2003; Wood *et al.* 2004). Knowledge of both the total amount of fat in the most valuable joints and the quality of that fat is of great interest. Saturated fats that solidify quickly as they cool improve carcass quality and appearance by increasing firmness and decreasing the degree of oiliness although they may negatively affect palatability (Cañeque *et al.* 2005). Onthe other hand, unsaturated fats oxidise most easily, leading to rancidity problems

(Wood *et al.* 2008; Wood *et al.* 2004). The proportion of fatty acid in the diet is very important in relation to consumer health and an imbalance in the proportion of fatty acid in the diet may increase the risk of coronary heart disease and cardiovascular disease (Mushi *et al.* 2010). Various recommendations have been made in recent years with regard to the importance of the relationship between certain fatty acids and health (Claus, 1990). Various factors, such as breed, weight, degree of fatness, gender and diet, may affect the fatty acid composition of lamb fat (Warren *et al.* 2008; Zapletal *et al.* 2009). Due to increasing importance of lambs as a source of meat, there is a need to determine profile of fatty acid for various fat depots, the area which has suffered lack of adequate research attention (Das Graças Padre *et al.* 2007).

The effect of breed has been confirmed by Subrt *et al.* (2001) and Aldai *et al.* (2006). Breed is one of the main factors affecting the fatty acid profile and carcass composition because fat composition differs between breeds and is related to the ratio of triacylglycerols to phosphor lipids (Wood *et al.* 2004). Only few studies evaluating the nutritional quality of meat of different breeds fattened in the sameintensive conditions have been reported (*Scollan et al.* 2006).

The objective of the present study was therefore to study fatty acid composition of visceral and fat-tail fat depots from pure and cross breed lambs of three Iranian sheep breeds fattened up in the same condition.

MATERIALS AND METHODS

Animals and experimental design

This study was conducted at the Research Station of the Abureyhan College of Agriculture, University of Tehran, Iran. Ewes from two flocks of 70 and 50 ewes of the Chaal and Zandi breeds, respectively, were randomly divided into five groups. In each breed, one group was mated with rams of the same breed and the other group with Zel rams. In addition, in one of groups, Chal ewes mated with Zandi rams to produce the Zandi × Chal crossbred lambs. After weaning, 40 lambs (20 male and 20 female) were balanced for age and weight and randomly allocated to five treatment groups (Chaal×Chal, Zandi×Zandi, Zandi×Chal, Zel×Chaal and Zel×Zandi) in a finishing trial. The finishing diet consisted of 40% ucerne, 40% barley and 20% straw.

The feed was offered twice a day *ad libitum*. When lambs reached the slaughter weight; they were transported to the abattoir and slaughtered within the 15 minutes after arrival. After slaughter the carcass and non-carcass parts were weighed separately.

The 150-200 g samples were taken from fat-tail and visceral fat depots. After that, the samples were vacuum-packed and stored at -20 ˚C until analysis.

Chemical and fatty acids analysis

Fat from samples were extracted by the method of Folch *et al.* (1957), using a chloroform/methanol/ water mixture (v:v:v/2:2:1.8). Fatty acids were converted to methylesters by base-catalyzed trans-esterification and any free acids in the fat were esterified by subsequent reaction with BF_3/CH_3OH. The methyl esters were analyzed by gas chromatography on an Omegawax 320 capillary column; 30 m × 0.32 m ID fused silica (Supelco, Bellefonte, PA). The temperature of the column rose from the initial 100 ˚C up to 250 ˚C. The carrier gas was nitrogen. The injector and detector were set at 280 ˚C. For each analysis 2 µL of the sample was injected into the gas chromatograph equipment. Peaks were identified by the use of standards and the results were expressed for each fatty acid as a percentage of the total fat extracted.

Statistical analysis

All statistical analyses were performed using General Linear model procedure of SAS (2001). Breed, sex and sampling site were considered as fixed effects and residual as random effect. Due to small variation in carcass weight of animals within groups, all fatty acids were corrected by animal carcass as a covariate. In all analyses, when least square means were significantly different by ANCOVA at $P < 0.05$ and $P < 0.001$, were separated by PDIFF option of SAS (2000). Analyses of variancewere performed using the model:

$$Y_{ijkl} = \mu + B_i + S_j + P_k + BS_{ij} + BP_{ik} + SP_{jk} + BSP_{ijk} + b(x_{ijk} - \overline{x}) + e_{ijkl}$$

Where:

Y: dependent variable.

µ: overall mean.

B_i, S_j and P_k: breed, sex and sampling site (fat-tail or visceral fat) effects respectively and others are two and three-way interactions between the main effects.

e_{ijkl}: error.

b: correction factor of carcass weight (x_{ijk}) on total carcass mean ($\overline{x}$) as a covariate. Lest square means were compared using Duncan's multiple range test.

All statistical tests were performed for significance levels of $P < 0.05$ and $P < 0.01$.

RESULTS AND DISCUSSION

Fatty acid composition in fat-tail tissue

Fat-tail fatty acid composition of five genetic groups is presented in Table 1. Statistical significant differences ($P<0.05$) in the proportions of individual fatty acids were observed between some genetic groups (breeds).

Table 1 Least squaresmeans (±SE) for fatty acids compositions (percentage of total fatty acids) of fat-tail fat tissue

Fatty acid	Structure	Groups (breeds)					Sig.	Sex		Sig.	Total mean
		Ch × Ch	Za × Za	Za × Ch	Ze × Ch	Ze × Za		Male	Female		
Myristic	C14:0	3.67± 0.57	3.85± 0.05	3.39± 0.56	4.06± 079	3.97± 0.56	NS	4.26± 0.36	3.15± 0.39	NS	3.79± 0.24
Pentadecanoic	C15:0	1.17± 0.14	1.02± 0.21	1.14± 0.23	1.55± 0.33	1.57± 0.23	NS	1.17± 0.48	1.14± 0.52	NS	1.25± 0.11
Palmitic	C16:0	20.35± 1.0	19.30± 1.05	17.6± 0.80	21.49± 1.15	17.7± 1.14	NS	18.76± 0.60	19.8± 0.65	NS	19.1± 0.5
Palmitoleic	C16:1n7	3.35± 0.38	2.45± 0.34	2.50± 0.37	3.8± 0.53	3.78± 0.37	NS	3.3± 0.24	3.05± 26	NS	3.08± 0.13
Margaric	C17:0	3.02± 0.33	2.55± 0.34	2.47± 0.26	3.74± 0.38	3.50± 0.37	NS	3.41± 0.19	2.72± 0.21	NS	3.08± 0.13
Heptadecenoic acid	C17:1	1.04± 0.26	0.93± 0.27	1.12± 0.20	1.62± 0.30	1.93± 0.29	*	1.49± 0.15	1.17± 0.17	NS	1.33± 0.11
Stearic	C18:0	9.6± 0.98	13.4± 0.86	9.7± 0.95	14.6± 1.35	13.8± 0.97	**	12.5± 0.62	11.98± 0.66	NS	12.09± 0.6
Oleic	C18:1	45.1± 2.5	39.0± 2.2	40.9± 2.4	37.7± 3.5	40.9± 2.4	NS	39.7± 1.6	42.5± 1.7	NS	40.8± 1.16
Linoleic	C18:2n6	3.74± 0.59	3.09± 0.53	3.7± 0.57	3.33± 81	4.47± 0.57	NS	3.89± 0.38	3.03± 0.40	NS	3.49± 0.28
Linolenic	C18:3n3	1.08± 0.38	1.20± 0.23	1.24± 0.37	1.40± 0.52	3.4± 0.37	NS	1.50± 0.24	1.43± 0.35	NS	1.48± 0.19
Conjugated linoleic acids	CLA	1.11± 0.11	1.08± 0.09	1.39± 0.10	1.19± 0.15	0.89± 0.1	*	1.20± 0.07	1.07± 0.07	NS	1.13± 0.05
Total saturated	SFA	37.1± 1.3	43.0± 1.1	34.9± 1.29	43.72± 1.82	40.45± 1.29	**	40.41± 0.8	39.2± 0.9	NS	39.6± 0.92
Total unsaturated	UFA	54.62± 2.4	48.07± 2.1	50.96± 2.41	48.25± 3.4	54.33± 2.41	NS	50.2± 1.5	52.29± 1.6	NS	51.3± 1.15
Unsaturated/saturated	USF:SFA	1.48± 0.08	1.11± 0.07	1.46± 0.08	1.10± 0.11	1.35± 0.05	*	1.25± 0.05	1.35± 0.05	NS	1.31± 0.001

NS: non significant.
* (P<0.05) and ** (P<0.01).
Ch: Chal; Za: Zandi and Ze: Zel.
CLA: conjugated linoleic acids; SFA: saturated fatty acids and UFA: unsaturated to saturated.

In all genetic groups, there were no significant differences in the proportions of myristic (C14:0), pentadecanoic (C15:0), palmitic (C16:0), palmitoleic (C16:1n7), Oleic (C18:1), Linoleic (C18:2n6) and linolenic (C18:3n3) acids in relation to the fat-tail fat tissue. The greatest differences (P<0.01) were observed among the saturated fatty acids (SFA) and stearic (C18:0) in Chal×Chal and Zel×Chal (Chal×Chal 9.6 *vs.* 14.6 Zel×Chal) and (Chal×Chal 37.1 *vs.* 43.72 Zel×Chal), respectively. Palmitic (C16:0) and oleic acid (C18:1) accounted for the highest proportions in fat-tail fat of five groups with total mean values 19.1 and 40.8 correspondingly. The proportion of unsaturated to saturated fatty acids (USF:SFA) observed in fat-tail fat tissue in the present study ranged from 1.1 to 1.48 (Table 1), which is agreement with the ranges reported by Alipanah *et al.* (2011). According to Scollan *et al.* (2006) the predominant SFA are palmitic acid and stearic acid which corresponds with our results. Moreover, the C16:0 made up the greatest proportion of SFA which is in agreement with Das Graças Padre *et al.* (2007), who studied steers from different genetic groups.

Similar results were found by Warren *et al.* (2008) who analyzed fatty acids composition in the Longissimus muscle of different breeds.

The highest and lowest proportions of UFA observed in Chal × Chal and Zandi × Zandi pure lambs respectively and the crossbreds had the intermediate values. However, UFA least squares mean differences between all groups was not significant (P>0.05). Male lambs in comparison with females had no significant statistically difference between all fatty acids (P>0.05).

Fatty acid composition in visceral fat tissue

The effects of genetic group (breed) and sex on the fatty acid composition of visceral fat tissue were shown in table 2. There were significant differences in the proportions of palmitoleic (C16:1n7), stearic (C 18:0), conjugated linoleic acids (CLA) and total unsaturated to saturated (UFA:SFA) fatty acids (P<0.05). The stearic acid concentrations decreased in the crossbreds in compare with the purebred lambs, especially in the crossbred lambs from mating Chal and Zandi ewes with Zel rams (P<0.05).

Table 2 Least squaresmeans (±SE) for fatty acids compositions (percentage of total fatty acids) of visceral fat tissue

Fatty acid	Structure	Groups (breeds)					Sig.	Sex		Sig.	Total mean
		Ch × Ch	Za × Za	Za × Ch	Ze × Ch	Ze × Za		Male	Female		
Myristic	C14:0	3.49± 0.68	4.31± 0.51	3.00± 0.51	3.73± 0.65	3.28± 0.68	NS	3.62± 0.37	3.51± 0.40	NS	3.68± 0.23
Pentadecanoic	C15:0	1.39± 0.44	1.27± 0.32	1.36± 0.32	1.28± 0.41	1.24± 0.44	NS	1.33± 0.24	1.28± 0.25	NS	1.30± 0.13
Palmitic	C16:0	21.72± 1.40	22.26± 1.08	18.71± 1.08	22.28± 1.37	19.58± 1.45	NS	20.80± 0.79	21.01± 0.84	NS	20.86± 0.56
Palmitoleic	C16:1n7	1.89± 0.58	2.13± 0.43	2.52± 0.43	2.85± 0.54	3.27± 0.58	*	2.52± 0.32	2.55± 0.33	NS	2.59± 0.19
Margaric	C17:0	1.80± 0.33	2.08± 0.24	1.93± 0.24	2.14± 0.31	1.7± 0.33	NS	2.06± 0.18	1.80± 0.19	NS	1.97± 0.11
Heptadecenoic acid	C17:1	1.19± 0.28	1.06± 0.21	1.30± 0.21	0.97± 0.27	1.29± 0.28	NS	1.02± 0.15	1.30± 0.16	NS	1.14± 0.09
Stearic	C18:0	16.12± 1.44	13.18± 1.07	11.47± 1.07	14.03± 1.36	16.70± 1.44	*	14.37± 0.79	14.22± 0.83	Ns	14.07± 0.62
Oleic	C18:1	32.55± 2.5	32.28± 1.92	33.92± 1.92	31.24± 2.43	32.44± 2.50	NS	32.06± 1.4	32.9± 1.50	NS	32.54± 0.91
Linoleic	C18:2n6	3.02± 0.48	2.89± 0.35	3.26± 0.35	2.68± 0.45	3.63± 0.48	NS	3.49± 0.26	2.7± 0.28	*	3.22± 0.21
Linolenic	C18:3n3	1.29± 0.28	1.06± 0.21	1.06± 0.21	1.69± 0.26	1.86± 0.28	NS	1.35± 0.15	1.43± 0.16	NS	1.36± 0.10
Conjugated linoleic acids	CLA	1.19± 0.16	1.22± 0.12	1.13± 0.12	0.68± 0.15	0.76± 0.16	*	1.06± 0.09	0.94± 0.09	NS	0.97± 0.07
Total saturated	SFA	43.7± 3.5	39.73± 2.61	36.46± 2.61	43.57± 3.30	36.28± 3.5	NS	40.53± 1.92	39.39± 2.03	NS	39.5± 1.21
Total unsaturated	UFA	41.14± 2.6	40.6± 1.94	43.21± 1.94	40.14± 2.45	43.27± 2.60	NS	41.52± 1.43	41.84± 1.51	NS	41.85± 0.88
Unsaturated/ Saturated	USF:SFA	0.94± 0.12	1.02± 0.09	1.19± 0.09	0.92± 0.12	1.25± 0.12	*	1.03± 0.07	1.10± 0.07	NS	1.06± 0.14

NS: non significant.
* (P<0.05) and ** (P<0.01).
Ch: Chal; Za: Zandi and Ze: Zel.
CLA: conjugated linoleic acids; SFA: saturated fatty acids and UFA: unsaturated to saturated.

The lowest proportion of unsaturated to saturated fatty acids (UFA:SFA) was found in Zel × Zandi lambs. The UFA content was higher in the crossbred lambs because of the greater proportion of palmitoleic acid (C16:1n7). The same finding was also reported by Velasco *et al.* (2000) in suckling lambs.

There was only a significant difference (P<0.05) between male and females lambs in linoleic (C18:2n6) content and the male lambs had a higher linoleic acid proportion than females (3.49 *vs*. 2.7).

Total fatty acid composition in visceral and fat-tail fat tissue

Table 3 shows the total fatty acid profiles (visceral+fat-tail tissues) of five genetic groups fattened up at the same conditions. Genetic groups (breeds) showed a significant difference in proportion of palmitic (C16:0), stearic (C18:0), linolenic (C18:3n3) and conjugated linoleic acids (CLA) and other fatty acids contents did not significantly vary. The total content of unsaturated fatty acids (UFA) was affected by genetic groups but total content of saturated fatty acids (SFA), had not a significant difference (P>0.05).

According to Scollan *et al.* (2006) the predominant SFA are myristic (C14:0), palmitic (C16:0) and stearic (C18:0) which corresponds with our results. Within unsaturated fatty acids (UFA) oleic acid (C 18:1) showed the highest mean proportions ranges from 41.03 in Chal × Chal pure lambs to 31.16 in Zel × Zandi crossbreds of fatty acid profile in five genetic groups.

The least square mean proportion of unsaturated fatty acids (UFAs) does not differ statistically (P>0.05) among breeds , similar to earlier observations by Barbosa *et al.* (2003) between two autochthonous Portuguese ewe breeds and Pešek *et al.* (2005) for Czech pied and Holstein cattle, fed on identical diets.

The content of stearic (C18:0) and linolenic (C18:3n3) was significantly higher in Zel × Zandi and Zel × Chal crossbred lambs, while palmitic (C16:0) and conjugated linoleic acids (CLA) content was higher in Chal and Zandi purebreds and their crosses. These findings indicated a different potential of each of the breeds to synthesize fatty acids in the same production conditions. Except linoleic acid (C18:3n3), other fatty acid contents were not affected by sex.

Table 3 Least squaresmeans (±SE) for fatty acids compositions (percentage of total fatty acids) of fat-tail fat + visceral tissue

Fatty acid	Structure	Groups (breeds)					Sig.	Sex		Sig.	Sampling site		Sig.	Total mean
		Ch × Ch	Za × Za	Za × Ch	Ze × Ch	Ze × Za		Male	Female		Visceral	Fat-tail		
Myristic	C14:0	3.68± 0.49	4.06± 0.37	3.19± 0.39	3.89± 0.53	3.63± 0.62	NS	3.94± 0.94	3.44± 0.27	NS	3.56± 0.28	3.82± 0.29	NS	3.7± 1.05
Pentadecanoic	C15:0	1.16± 0.25	1.12± 0.19	1.25± 0.2	1.41± 0.27	1.4± 0.23	NS	1.36± 0.14	1.17± 0.15	NS	1.31± 0.12	1.21± 0.11	NS	1.25± 0.53
Palmitic	C16:0	23.06± 0.84	22.82± 0.64	20.17± 0.68	23.87± 0.91	20.63± 0.79	*	21.8± 0.47	22.42± 0.51	NS	24.91± 0.49	0.49b± 21.31	*	23.1± 2.5
Palmitoleic	C16:1n7	2.4± 0.23	2.24± 0.25	2.51± 0.26	3.36± 0.35	3.53± 0.3	NS	2.93± 0.18	2.67± 0.19	NS	2.53± 0.19	3.07± 0.19	NS	2.27± 0.16
Margaric	C17:0	1.78± 0.24	2.0± 0.18	1.74± 0.19	2.18± 0.26	2.06± 0.22	NS	2.15± 0.13	1.76± 0.14	NS	1.93± 0.14	1.97± 0.14	NS	1.95± 0.56
Heptadecenoic acid	C17:1	1.17± 0.180	1.1± 0.14	1.19± 0.15	1.26± 0.2	1.5± 0.17	NS	1.29± 0.1	1.19± 0.11	NS	1.16± 0.1	1.32± 0.25	NS	1.23± 1.48
Stearic	C18:0	13.06± 0.88	13.41± 0.68	10.6± 0.71	14.31± 0.96	15.27± 0.83	**	13.45± 0.5	13.21± 0.53	NS	18.3± 0.53	12.3± 0.53	**	15.3± 2.8
Oleic	C18:1	41.03± 2.0	37.7± 1.5	39.03± 2.18	36.15± 2.17	38.71± 1.8	NS	37.47± 1.13	41.8± 1.2	NS	34.48± 1.16	42.47± 1.18	**	38.64± 6.1
Linoleic	C18:2n6	2.89± 0.43	2.96± 0.33	3.52± 0.34	2.95± 0.46	4.05± 0.43	NS	3.72± 0.24	2.83± 0.26	*	3.10± 0.25	3.4± 0.25	NS	3.2± 1.10
Linolenic	C18:3n3	1.16± 0.27	1.12± 0.21	1.15± 0.22	1.54± 0.29	2.17± 0.25	*	1.42± 0.15	1.44± 0.16	NS	1.39± 0.15	1.47± 0.16	*	1.43± 0.67
Conjugated linoleic acids	CLA	1.15± 0.09	1.17± 0.07	1.26± 0.07[a]	0.93± 0.01	0.82± 0.02	*	1.13± 0.05	1.00± 0.6	NS	1.00± 0.05	1.13± 0.05	*	1.06± 0.31
Total saturated	SFA	44.13± 1.9	45.41± 1.4	41.3± 1.5	47.74± 2.1	42.9± 1.8[b]	*	46.9± 1.09	45.7± 1.17	NS	51.96± 1.12[a]	41.66± 1.14b	*	46.81± 4.5
Total unsaturated	UFA	49.8± 2.04	46.4± 1.5	49.08± 1.6	46.19± 2.2	50.8± 1.9	NS	47.99± 1.15	48.95± 1.2	NS	43.68± 1.18	53.26± 1.2	NS	48.64± 6.5
Unsaturated/saturated	USF:SFA	1.22± 0.08	1.07± 0.06	1.32± 0.06	1.01± 0.09	1.3± 0.07	*	1.14± 0.04	1.2± 0.05	NS	0.84± 0.048	1.27± 0.048	*	1.05± 0.19

NS: non significant.
* (P<0.05) and ** (P<0.01).
Ch: Chal; Za: Zandi and Ze: Zel.
The means within the same column with at least one common letter, do not have significant difference (P>0.05).
CLA: conjugated linoleic acids; SFA: saturated fatty acids and UFA: unsaturated to saturated.

The results show significant differences in palmitic (C16:0), steatric (C18:0), oleic (C18:1), linolenic (C18:3n3), conjugated linoleic acids (CLA) fatty acid levels between sampling sites (fat-tail and visceral fat). The predominant saturated fatty acids palmitic and stearic were highest in visceral fat tissue compared with fat-tail (P<0.05). In contrast, the highest content of unsaturated fatty acids: oleic, linoleic, linolenic and CLA were observed in fat-tail fat tissue.

It is interesting to note that the ratio of UFA:SFA, important for human nutrition, was 1.27 in fat-tail fat while averaging 0.84 in visceral fat, which is about 21% higher. An increase in the UFA content in fat-tail fat elevated the ratio of UFA:SFA compared with other sampling site. The ratio of UFA:SFA for fat-tail and visceral in the present study was similar to that found for lamb meat by Scollan *et al.* (2006). The present study shows that the amount of health claimable fat in the edible portion of fat lamb can vary with sampling site. There can be also variation due to sex and genotype of animal. In some studies, the researcher report that age, nutritional background, primal cut site or the number of samples used can influence the levels fatty acid profile contents (Rao *et al.* 2003; Talpur *et al.* 2009).

CONCLUSION

This study evaluate lipid content and fatty acid composition in the two cuttable fat depots (fat-tail and visceral) of lamb carcass by comparing result from five genetic groups that finished up at same condition. The fat content values found in the present study indicate genetic background, sampling site and sex can affect content of fatty acid composition in lamb's fat depots. This study showed that breed can significantly affected the difference in cuttable fat depots fatty acid compositions of Iranian pure and crossbred lambs that received an identical diet and were housed under the same conditions. The saturated fatty acids (SFA) had most significant differences between genetic groups (breeds) in fat-tail, visceral and fat-tail + visceral fat depots. Also, the total unsaturated fatty acids (USF) in none of genetic groups (breed) had difference. Our data showed a higher USF (53.26 *vs.* 43.68) and CLA (1.13 *vs.* 1) content and lower SFA (41.66 *vs.* 51.96) content in fat-tail fat tissue as compared to visceral fat.

The variability among breeds might be useful in the quality improvement of fat depots and derived products. Implementation of feeding strategies for dairy goats and ewes should also be considered in order to improve both visceral and fat-tail fat nutritional value and acceptance by consumers.

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