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Fat content and fatty acid composition in Istrian and Dalmatian dry-cured ham

Marušić[1], N., M. Petrović[2], S. Vidaček, T. Janči, T. Petrak, H. Medić

scientific paper

Summary

The aim of this research was to analyze the content of fat and fatty acid composition in samples of M. biceps femoris of Istrian and Dalmatian dry-cured ham. Contents of saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA) were analyzed. Fat content in Istrian dry-cured ham was 7.45 – 21.12%, whereas it was 9.49 – 21.29% in Dalmatian dry-cured ham. The fatty acid content of Istrian and Dalmatian dry-cured ham did not differ; Istrian and Dalmatian dry-cured hams contain 39 - 41% SFA, 51 - 53% MUFA and 8% PUFA. The ratio of PUFA/SFA in Istrian and Dalmatian dry-cured ham is 0.20 (recommended PUFA/SFA > 0.4), while the ratio of n6/n3 was 15 – 17. According to recommendations, the ratio of n6/n3 in dry-cured hams is generally close to the upper allowable limit.

Keywords: *Istrian dry-cured ham, Dalmatian dry-cured ham, fatty acid content, n6/n3*

Introduction

Dry-cured ham is a durable dry-cured meat product obtained by dry salting, limited dehydration and gradual chemical and enzymatic transformations from a fresh pork ham to the finished product. Production process basically includes the salting of a pork ham which was previously technologically processed, then the procedure of drying and maturing. The listed principles are common in the production of all types of dry-cured hams, but it needs to be emphasized that basic raw material and some technological aspects of production can differ significantly, which then leads to different sensory traits of dry-cured ham.

Dry-cured ham production is traditionally related to Mediterranean countries, especially to Spain, Italy, France and Croatia, where the largest number of different kinds of dry-cured hams originate from. Their characteristics depend on a large number of factors such as: genetic basis and breeding manner, age and body weight, then feeding of pigs, climatic conditions, ham quality, processing technology, etc. Croatian traditional kinds of dry-cured hams, Dalmatian and Istrian dry-cured ham definitely belong by their characteristics to the group of high-quality dry-cured hams with an unquestionable production tradition. Istrian and Dalmatian dry-cured hams have some specific qualities which differentiate them form other kinds of dry-cured hams in the world.

Fat content is one of the most important quality parameters of dry-cured ham which influences its acceptability. Except for fat content, fatty acid composition should also be emphasized. The share and kind of fatty acids play an important role in prevention and treatment of many chronic disorders, especially cardiovascular diseases. The possibility of changing the profile of fatty acids in dry-cured hams by feeding of pigs has lately been especially emphasized.

Material and methods

Sample

In this paper there were analyzed samples of Istrian dry-cured ham of 11 different producers and Dalmatian dry-cured hams of 9 different producers. The analyses were performed on the sample of *M. biceps femoris.*

Istrian dry-cured ham

Istrian dry-cured ham was produced of white meaty pig breeds like Large White and Swedish Landrace, as well as of their crossbreds, weighing from 150 to 200 kg, all bred in Istria. Pelvic bones were left on pork ham, and the skin and subcutaneous fatty tissue were removed from the surface of the ham. After skin removal the ham is massaged by hands, which removes the residues of blood from femoral artery (*arteria femoralis*). The ham was then salt-cured i.e. salted by sea salt exclusively, with the addition of natural spices, pepper, laurel, rosemary and garlic. After salt-curing, dry-cured

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hams were arranged one above the other and left lying for 7 days. After seven days they were salted again and turned on the opposite side. Room temperature was from 3 to 6°C and air humidity was 80 – 90%. After pressing, dry-cured hams were dried in spaces where there is air circulation. When the hams lost 25% of their initial mass, they were moved to basements without significant fluctuations in temperature and air humidity. The temperature was 13 – 15°C and relative air humidity was 65 – 70%. The period from the beginning of salting until the end of maturing lasted for at least 15 months.

Dalmatian dry-cured ham

Dalmatian dry-cured ham was produced of the ham of Yorkshire and Landrace breeds and their crossbreds, weighing from 140 - 180 kg. Pork ham with bones and skin was salted by sea salt at the temperature of 4 - 6°C and after 7 days it was salted additionally, if needed. The salted hams were then put in a press. On average hams are pressed by a mass 10 times larger than their own. The pressing procedure lasted for 5 – 8 days, depending on the size of the ham or until the draining of the juice from meat stops. After that the dry-cured hams were slightly smoked by a source of smoke located as far away and in a room as cold as it can be. In the production of dry-cured hams there was used cold smoking at the temperature lower than 22°C, which doesn't stop the process of fermentation, i.e. maturing of meat. Processes of drying and then maturing followed. Maturing process is the last stage in dry-cured ham production and at the same time it is the most important one where complex biochemical changes take place in all meat nutrients. The hams were maturing in dark basement rooms in order to avoid the unwanted activity of sunlight to fatty component of dry-cured ham. There were constant regimes of temperature (12 – 15°C) and relative air humidity (60 – 70%) in maturing facility during the period of maturing. A product of high quality was obtained by maturing from 9 to 12 months, depending on the mass of dry-cured ham.

Table 1 **Share of fat (%) in samples of biceps femoris of Istrian and Dalmatian dry-cured ham**

	Min	Max	Mean	St. dev
Istrian dry-cured ham	7.45	21.12	13.84	3.80
Dalmatian dry-cured ham	9.49	21.29	13.85	3.33

Table 2 **Composition of fatty acids in samples of M. biceps femoris of Istrian dry-cured ham (% of total fat)**

Fatty acid	Min	Max	Mean	St. dev
C10:0	0.09	0.16	0.13	0.03
C12:0	0.08	0.12	0.10	0.01
C14:0	1.23	1.63	1.41	0.15
C15:0	0.02	0.07	0.04	0.03
C16:0	23.17	26.70	24.80	1.22
C16:1	2.39	4.32	3.42	0.53
C17:0	0.30	0.75	0.51	0.13
C17:1	0.16	0.47	0.31	0.12
C18:0	9.12	13.68	11.79	1.36
C18:1trans	0.31	0.74	0.45	0.14
C18:1cis	44.91	53.96	48.54	2.70
C18:2cis	4.06	11.00	6.44	2.21
C18:3cis	0.23	0.95	0.44	0.23
C20:0	0.17	0.43	0.26	0.09
C20:1	0.65	1.15	0.83	0.15
C20:2	0.23	0.59	0.34	0.12
C20:3n6	0.03	0.24	0.10	0.07
C20:4n6	0.04	0.25	0.15	0.07
C20:3n3	0.02	0.12	0.05	0.04
SFA	34.99	42.87	38.97	2.23
UFA	57.14	65.01	61.04	2.23
MUFA	49.29	59.97	53.54	3.08
PUFA	4.85	12.83	7.51	2.58
n-6	4.64	12.32	7.23	2.49
n-3	0.25	0.96	0.48	0.23
n-6/n-3	12.29	21.15	16.58	2.84
MUFA/PUFA	3.96	12.23	7.96	2.74
UFA/SFA	1.33	1.88	1.58	0.16

*SFA- saturated fatty acids; UFA- unsaturated fatty acids; MUFA- monounsaturated fatty acids; PUFA-polyunsaturated fatty acids

Determining the content of fat

The content of fat in samples of *M. biceps femoris* was determined by the Soxhlet method (HRN ISO 1443:1999).

Preparation of methyl esters of fatty acids

The fat obtained by extraction was used for determining the composition of fatty acids. Ester-linked fatty acids were converted to methyl esters of fatty acids which are suitable for gas chromatography analysis (ISO 5509, 2000). About 60 mg± 10 mg of sample are weighed into a glass beaker and 4 ml of isooctane is added. After the sample is completely dissolved, there is added 200 µL of potassium hydroxide solution in methanol (13.6 g KOH in 100 mL of methanol) and then shaken strongly two times for 30 sec. The solution is added 1 g of sodium hydrogen sulfate monohydrate for neutralization and the solution is shaken two times for 30 sec. When the crystals settle, 500 µL of the obtained solution of the sample is transported to injection container, 1 mL of isooctane is added and the container is then closed and shaken.

Determining the composition of fatty acids

The composition of fatty acids was determined by the method of gas chromatography (HRN EN ISO 5508, 1999), by the device CP-3800 (Varian, Palo Alto, CA, USA). TriPlus autosampler was used for injection (Thermo Scientific, Augustin, TX, USA). The temperature of the injector with the option of partial loop filling was 250°C and injection volume was 1 µL with partition coefficient 1:30. Samples were analyzed on DB-23 capillary column of 60 m length, internal capillary diameter 0.25 mm and thickness of selective liquid layer of 0.25 µm (Agilent, Walnut Creek, CA, USA) and temperature program of the column was: initial column temperature of 60°C, temperature increase rate of 7°C/min until final column temperature of 220°C which was maintained for 15 min. Carrier gas was helium with the flow of 1.5 mL/min. The temperature of flame ionization detector was 260°C. The program Star GC Workstation Ver. 6.4 (Varian, Palo Alto, CA, USA) was used for data analysis. A more detailed description of the method and its suitability for analysis was presented in the paper by Petrović, Kezić and Bolanča (2010).

Results and discussion

Fat content

Different kinds of dry-cured hams have different content of fat. The difference is in the fact that different breeds of pigs and different feeding regimes are used in the production of dry-cured hams. Iberian dry-cured hams contain more intramuscular fat than dry-cured hams produced from the meat of white pigs, such as Bayonne or Parma ham.

The content of fat in Istrian and Dalmatian dry-cured hams varied between different producers. The content of fat in Istrian dry-cured ham ranged from 7.45 - 21.12%, whereas it was 9.49 - 21.29% in the Dalmatian one. It can be concluded from the results that the content of fat in Istrian and Dalmatian dry-cured ham did not differ significantly. It was not expected due to the fact that Dalmatian dry-cured ham is produced with the skin and subcutaneous fat tissue as opposed to the Istrian one, so it would be expected that the Dalmatian one has a higher fat content. However, the analyses in this research were performed on *M. biceps femoris* so the difference in the content of fat of Istrian and Dalmatian dry-cured ham was not significant. The fat content of Istrian and Dalmatian dry-cured ham is similar to the fat content of Iberian dry-cured ham (19.2%) (Jiménez-Colmenero, Ventanas and Toldrá, 2010). Namely, it is known that Iberian dry-cured hams are produced from the meat of autochthonous breed of pigs which is bred in almost extensive conditions, in prolonged fattening (18 to 24 months of age, 160 kg live weight) (Toldrá, 2010) and specific feeding. A desirable marbling of the ham, i.e. desirable amount of intramuscular fat is achieved that way. A similar fat content (17 – 19%) was published by Honikel (2005) for German (Rohschinken) and French dry-cured ham, then D'Evoli et al. (2009) for Prosciutto di Parma (18.4%) and Prosciutto di San Danielle (23.0%).

Fat content is one of the most important parameters of dry-cured ham quality (the higher fat content, the higher dry-cured ham acceptability). But, what influences the appearance most, the texture (juiciness), intensity and durability of dry-cured ham taste is intramuscular fat (Jiménez-Colmenero, Ventanas and Toldrá, 2010). Intramuscular fat and subcutaneous fat tissue decrease the possibility of water diffusion and therefore can influence the ability of salt penetration and slow the loss of water during the process of dry-cured ham production.

Fatty acid composition

The share and kind of fatty acids play an important role in prevention and treatment of many chronic disorders, especially cardiovascular diseases. Many scientific and health organizations, the same as the World Health Organization (WHO, 2003), suggested an optimum intake of total and unsaturated acids by food. The intake of fat should be between 15 – 30% of total energy intake. The intake of saturated fatty acids (SFA) should be up to 10%, polyunsaturated fatty acids (PUFA) between 6 and 10% (n-6: 5 – 8%; n-3: 1 – 2%), about 10 – 15% of monounsaturated fatty acids (MUFA) and less than 1% of trans fats. It is recommended to decrease the share of cholesterol to 300 mg / day.

Muscle lipids of dry- cured ham contain triacylglycerols (TAG) which are found in fat cells and membrane lipids such as phospholipids (PL) and cholesterol. It should be mentioned that free fatty acids in the finished product can contain 9 – 20% of total fats. TAG are rich in MUFA and contain more SFA, whereas PL contain a higher share of PUFA, the third out of which are long-chain PUFA with

4, 5 or 6 double bonds. The profile of free fatty acids is more similar to the profile of phospholipids and contain long-chain PUFA primary esterified in phospholipids of fresh meat, which indicates to the fact that hydrolysis of phospholipids protects long-chain polyunsaturated fatty acids from oxidation (Gandemer, 2009).

Table 2 presents the content of fatty acids of Istrian dry-cured ham from 11 different producers, whereas the table 3 presents the content of fatty acids from 9 different producers of Dalmatian dry-cured ham. The content of fatty acids of dry-cured hams made from the meat of white pig breeds contains 35 - 40% SFA, 45 – 50% MUFA and 10 – 15% PUFA (Jiménez-Colmenero, Ventanas and Toldrá, 2010). Istrian dry-cured ham contains 39% SFA, 53% MUFA and 8% PUFA (Picture 1a) and Dalmatian one 41% SFA, 51% MUFA and 8% PUFA (Picture 1b). It follows from the obtained results that Istrian and Dalmatian dry-cured hams have similar ratio of fatty acids. Iberian dry-cured ham contains a higher percentage of MUFA (54 – 58%) and a lower share of SFA (30 – 35%) and PUFA (8 – 12%) which can be connected to a higher share of oleic acid that is found in acorns which pigs are fed on (Isabel et al., 2003). Ruiz-Carrascal et al. (200) concluded that a high share of intramuscular fat in Iberian dry-cured ham has a positive influence on the ratio of oleic acid and PUFA (TAG are rich in MUFA as opposed to phospholipids). Other authors (Gandemer, 2009; Isabel et al., 2003) also published a similar trend in the composition of fat of white pigs in comparison to differences in feeding. The most represented saturated fatty acids in dry-cured hams are palmitic (25%), stearic (12%) and myristic (1.5%) (Fernández et al., 2007). The same trend is in Istrian and Dalmatian dry-cured ham – palmitic C16:0 (24.80 – 25.85%); stearic, C18:0 (11.79 – 13.51%) and myristic, C14:0 (1.41 – 1.47%). Oleic acid, C18:1cis was the most represented (46.51 – 48.54%) fatty acid.

Table 3 **Composition of fatty acids in samples of M. biceps femoris of Dalmatian dry-cured ham (% of total fat)**

Fatty acid	Min	Max	Mean	St. dev
C10:0	0.10	0.15	0.12	0.01
C12:0	0.08	0.15	0.11	0.02
C14:0	1.31	1.75	1.47	0.13
C15:0	0.00	0.06	0.02	0.03
C16:0	25.33	27.31	25.85	0.58
C16:1	2.72	3.71	3.10	0.37
C17:0	0.17	0.31	0.24	0.05
C18:0	12.51	14.79	13.51	0.92
C18:1trans	0.22	0.40	0.27	0.05
C18:1cis	42.81	48.77	46.51	2.05
C18:2cis	4.41	10.99	6.87	2.00
C18:3cis	0.25	0.80	0.46	0.17
C20:0	0.16	0.33	0.22	0.05
C20:1	0.68	0.96	0.76	0.08
C20:2	0.21	0.49	0.31	0.09
C20:3n6	0.00	0.09	0.05	0.02
C20:4n6	0.13	0.24	0.17	0.03
C20:3n3	0.00	0.12	0.07	0.04
SFA	40.03	42.36	41.42	0.83
UFA	57.64	59.97	58.58	0.83
MUFA	46.56	53.02	50.65	2.10
PUFA	5.12	12.59	7.93	2.25
n-6	4.82	11.67	7.40	2.08
n-3	0.30	0.92	0.53	0.20
n-6/n-3	11.30	24.20	14.72	3.86
MUFA/PUFA	3.70	10.30	6.88	2.07
UFA/SFA	1.40	1.50	1.42	0.04

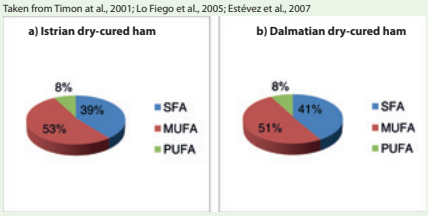
* SFA- saturated fatty acids; UFA- unsaturated fatty acids; MUFA- monounsaturated fatty acids; PUFA-polyunsaturated fatty acids

Table 4 presents the composition of fatty acids in *M. biceps femoris* in different kinds of dry-cured hams (Iberian, Serrano, Parma, Nero, Siciliano, Bayonne). Among different factors which influence the sensory and technological quality of dry-cured ham, the composition of fatty acids is noted as one of the most important factors (Bosi et al., 2000). The composition of fatty acids depends on feeding of pigs and the share of saturated, monounsaturated and polyunsaturated fatty acids. The share of SFA in Parma ham is 38%, MUFA 51% and PUFA 11% which is in accordance with the results of the composition of fatty acids of other commercial Italian, French and Spanish dry-cured hams (Bosi at al., 2000; Gandemer, 2002). In comparison with the composition of fatty acids of other kinds of dry-cured hams (e.g. Iberian, Serrano, Parma, Nero Siciliano, Bayonne), Istrian and Dalmatian dry-cured hams contain a higher share of SFA and a lower share of PUFA (Table 4). Monounsaturated fatty acids contain from 52.96% (Istrian) and 50.65% (Dalmatian), which is a lower share from Iberian (57.90%), Serrano (53.37%) or Parma (54.04%) dry-cured hams. The Italian Nero Siciliano (43.29%) and the French Bayonne (47.49%) have a somewhat lower share of MUFA.

Table 4 **Composition of M. biceps femoris in different kinds of dry-cured hams**

Fatty acids (%)	Iberian	Serrano	Parma	Nero Siciliano	Bayonne
C12:0	0.07	0.07	-	0.08	-
C14:0	1.27	1.37	1.18	1.09	1.08
C16:0	22.92	24.48	21.65	22.55	22.91
C18:0	7.45	10.98	12.67	11.08	12.53
C20:0	0.22	-	0.14	0.14	-
SFA	31.93	37.00	35.99	34.94	36.52
C16:1	3.39	3.41	3.05	2.94	3.32
C18:1	54.51	47.99	49.99	39.53	43.60
C20:1	-	0.97	0.86	0.80	0.57
MUFA	57.90	53.37	54.04	43.29	47.49
C18:2	9.41	9.62	7.77	16.75	11.70
C18:3	0.65	0.53	0.21	0.93	0.50
C20:4	0.11	0.97	0.61	2.35	3.10
PUFA	10.17	11.01	8.59	20.03	15.30

Taken from Timon at al., 2001; Lo Fiego et al., 2005; Estévez et al., 2007



Picture 1 **Total share of fatty acids in Istrian (a) and Dalmatian (b) dry-cured ham**

Some saturated fatty acids (< 18 carbon atoms) increase the shares of total cholesterol and lipoproteins of low density (LDL) and the ratio of HDL/LDL which are connected to the appearance of cardiovascular diseases. Opposite to that, MUFA lowers the level of LDL cholesterol without the decrease in the positive effect of HDL cholesterol and lipoproteins (Mattson and Grundy, 1985).

The share of PUFA in Croatian traditional products, Istrian and Dalmatian dry-cured ham was 8%. Iberian dry-cured hams have a similar value (6 – 8%), whereas Serrano hams contain 11 – 15% of PUFA (Jiménez-Colmenero, Ventanas and Toldrá, 2010). Nutritionists today emphasize the importance of PUFA/SFA proportion and n-6/n-3 in comparison to the total share of fatty acids or individual shares of individual fatty acids. A diet rich in polyunsaturated fatty acids lowers LDL cholesterol in blood whereas saturated fatty acids have an opposite effect. Therefore, the proportion of PUFA/SFA higher than 0.4 is recommended for a healthier diet (UK Department of Health,1994). The proportion of PUFA/SFA in Istrian and Dalmatian dry-cured ham is 0.15. Generally, the listed proportion in dry-cured hams amounts 0.17 – 0.35 provided that the highest proportion is in dry-cured hams produced from the meat of white pig breeds such as Serrano or Parma ham (Jiménez-Colmenero, Ventanas and Toldrá, 2010). But, the higher share of PUFA does not mean that the food is healthier, but the proportion of n-6/n-3 which should be around 4 (Simopoulos, 2002) or 6 (British Nutrition Foundation, 1992) is also important. An increased share of n-6 PUFA and a high share of n-6/n-3 PUFA is connected with the appearance of different cardiovascular diseases, cancer and autoimmune diseases, whereas an increased share of n-3 PUFA and a lower share of n-6/n-3 PUFA have an opposite effect. Dry-cured hams have a higher proportion of n-6/n-3 and it is 15 – 20 (Simopoulos, 2002). According to recommendations, the proportion of n-6/n-3 in dry-cured hams is generally close to upper allowable limit (Jiménez-Colmenero, Ventanas and Toldrá, 2010). Different genetic strategies and changes in feeding of the pigs which have the influence on a decrease of that ratio have been conducted lately.

The manner and type of feeding, i.e. the composition of meals, has a decisive influence on the content of fatty acids of intramuscular fat. Fatty acids from the feed are implanted into adipose tissue of pigs (Toldrá et al., 1996), and the degree of implantation depends on specific qualities of the type of fatty acids and the kind of the meal. Changes in feeding of the pigs have a purpose to produce a healthier product so that there is a lower share of SFA and a higher share of MUFA and PUFA/SFA and a higher antioxidative activity. The composition of fatty acids in pigs' tissue depends on fatty acids brought into by feed (direct deposition) and those appearing endogenously (by de novo synthe-

sis). Due to the traditional free range breeding of Iberian pigs and feeding them acorns and grass, Iberian dry-cured hams contain more MUFA (55.8 – 57.4%) than Serrano or Teruel dry-cured hams (46.9 – 48.7%) and a significant content of long-chain PUFA (Fernández et al., 2007). The reason for this is a high share of fat (>6%) and a high share (>60%) of oleic acid in acorn and a high share of linolenic acid in grass. Ventanas et al. (2007) were feeding Iberian pigs the feed containing a high share of sunflower oil and α-tocopherol. It has been concluded that a share of linolenic acid and antioxidants has been significantly increased in comparison with Iberian dry-cured hams of the pigs which didn't have a controlled feeding.

Some sensory traits have also been improved (appearance, texture and odor). Adding a higher quantity of highly unsaturated oils (sunflower, soybean, rapeseed oil) into the meal decreases the share of palmitic and oleic, and increases the share of long-chain (18:2, 20:2 and 20:3) fatty acids (Larick et al., 1992; Monahan et al., 1992). Isabel et al. (2003) researched a positive effect of feeding on feed rich in MUFA on the share of oleic acid in muscles and dry-cured hams. Food enriched by oleic acid in the quantity of 6% gives a softer subcutaneous fatty tissue which causes technological problems in the production of dry-cured hams from the meat of white breed of pigs such as Serrano or Parma ham and it is recommended that that share should be decreased to 2% so that it doesn't cause an unwanted texture of dry-cured hams (Bosi et al., 2000). Although the increase in the share of MUFA has positive effects on health, MUFA does not influence the proportion of n-6/n-3, which is generally higher than 10. That proportion can be influenced by using feed rich in polyunsaturated fatty acids, especially n-3 fatty acids and long-chain PUFA, such as flaxseed oil (Santos et al., 2008).

In order to prevent oxidation of cholesterol and lipids, scientists suggest an increase in the content of α-tocopherol, which acts as antioxidant (Jiménez-Colmenero, Ventanas and Toldrá, 2010). Owing to the influence of quality of fat on the quality of the final product, the analysis of fatty acids of the subcutaneous and intramuscular fatty tissue can be useful at introducing changes in feeding of pigs, which will improve and stabilize the quality of the final product (Ruiz et al., 1998).

Conclusion

The share of fat is one of the most important quality parameters of dry-cured hams (higher share of fat, higher acceptability of dry-cured ham). Istrian and Dalmatian dry-cured hams contain a high share of fat (Istrian – 7.45 – 21.12%, Dalmatian – 9.49 – 21.29%). The content of fatty acids of Istrian and Dalmatian dry-cured ham did not differ; Istrian and Dalmatian dry-cured hams contain 39 – 41% of SFA, 51 – 53% MUFA and 8% PUFA. The proportion of PUFA/SFA in Istrian and Dalmatian dry-cured ham is 0.20 (recommendation PUFA/SFA > 0.4), whereas the proportion of n-6/n-3 amounted 15 – 17. The proportion of n-6/n-3 in dry-cured hams, according to recommendations, is generally close to the upper allowable limit.

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Anteil vom Fett und Zusammensetzung von Fettsäuren im rohen geräucherten Schinken (Prosciutto) aus Istrien und Dalmatien

Zusammenfassung

Das Ziel dieser Untersuchung war, den Anteil vom Fett und die Zusammensetzung von Fettsäuren in Prosciutto in Mustern von M. biceps femoris in Prosciutto aus Istrien und Dalmatien zu analysieren. Analysiert wurde der Inhalt von gesättigten (SFA), monoungesättigten (MUFA) und polyungesätigten (PUFA) Fettsäuren. Der Fettanteil im Prosciutto aus Istrien war 7,45 - 21,12 %, im Prosciutto aus Dalmatien 9,49 – 21,29 %. Die Zusammensetzung von Fettsäuren im Prosciutto aus Istrien und aus Dalmatien zeigte keine Unterschiede: sie enthält 39 – 41 % SFA, 51 – 53 % MUFA und 8 % PUFA. Das Verhältnis von PUFA/SFA im Prosciutto aus Istrien und Dalmatien war 0,20 (Empfehlung PUFA/SFA > 0,4), das Verhältnis n6/n3 betrug 15-17. Das Verhältnis n6/n3 in Prosciutto, ist nach Empfehlung im allgemeinen nahe an der oberen genehmigten Grenze.

Schlüsselwörter: *roher geräucherter Schinken (Prosciutto) aus Istrien, roher geräucherter Schinken (Prosciutto) aus Dalmatien, Zusammensetzung von Fettsäuren, N6/n3*

Percentuale dei grassi e composizione degli acidi grassi nel prosciutto istriano e dalmata

Sommario

L'obiettivo di questa ricerca era di analizzare la percentuale dei grassi e la composizione degli acidi grassi nei campioni M. biceps femoris del prosciutto istriano e dalmata. È stato analizzato il contenuto degli acidi saturi (SFA), acidi monoinsaturi (MUFA) e acidi polinsaturi (PUFA). La percentuale dei grassi nel prosciutto istriano era 7,45-21,12%, mentre nel prosciutto dalmata era 9,49-21,29 %. La composizione degli acidi grassi nel prosciutto istriano e dalmata non è differente; il prosciutto istriano e dalmata contengono 39-41% SFA, 51-53% MUFA e 8% PUFA. La proporzione PUFA/SFA nel prosciutto istriano e dalmata era 0,20 (raccomandazione PUFA/SFA > 0,4), mentre la proporzione n6/n3 era 15-17. La proporzione n6/n3 nei prosciutti, secondo le raccomandazioni, in genere è vicina al limite superiore

Parole chiave: *prosciutto istriano, prosciutto dalmata, composizione degli acidi grassi, n6/n3*