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Review article

FATTY ACIDS FROM BEEF FEED TO BEEF MEAT

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Abstract: Beef meat has exceptional nutritional value that distinguishes it from other types of meat and makes it a highly valued food. However, the meat of cattle as well as other ruminants, is characterized by a more complex fatty acid profile compared to the meat of monogastric animals. This complexity is a consequence of the activity of the rumen microflora.
In recent decades, changes in animal breeding, feeding practices, and modern slaughtering techniques imparted significant progress in improving beef's nutritional, sensory and market value. Different proportions of concentrated feed and roughages, as well as their types, affect the composition of intramuscular fat. Excluding genetic factors and production practices, nutrition emerges as the main factor influencing the fatty acid profile of beef meat.
Today, numerous studies support the nutritional approach to modifying the fatty acid composition of beef meat by using selected feedingstuffs. Therefore, this review aims to collect and systematize data as a guide for implementing such a nutritional strategy in practice, with the health benefits of the final consumers in mind.

Key words: *ruminants, animal feed composition, grass feeding, concentrate feeding, fatty acid profile, human health*

INTRODUCTION

Fats are one of the main components of diets and should be considered as much important as proteins and carbohydrates in farm animal nutrition. Fat supplements play an important role in improving the absorption of fat-soluble vitamins and reducing the powderiness of feed and can enhance productive performance in cattle, pigs and poultry (Cetingül & Yardimci, 2008). Natural fats consist of 3 fatty acids and 1 glycerol component, while fatty acids are usually classified as saturated (SFA), unsaturated (USFA), monounsaturated (MUFA) and polyunsaturated (PUFA). Among the polyunsaturated fatty acids group, linoleic (LA) and linolenic (LNA) are the essential fatty acids. The fatty acid profile of feed affects the fatty acid composition of the animal tissues. Therefore, there is currently much interest in optimizing the amount and type of fat in the diets of farm animals.
Beef has exceptional nutritional properties (Rodriges et al., 2024). Beef is a rich source of

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protein of high biological value and digestibility and contains valuable fatty acids and a significant amount of B complex vitamins, as well as many minerals (Pećina & Ivanković, 2021). Depending on the breed, sex, age, diet, and anatomical region, there are significant differences in the composition of beef, and the most variable component is the fat content. The impact of meat on human health is largely related to its fat content and fatty acid composition (Giromini & Givens, 2022).

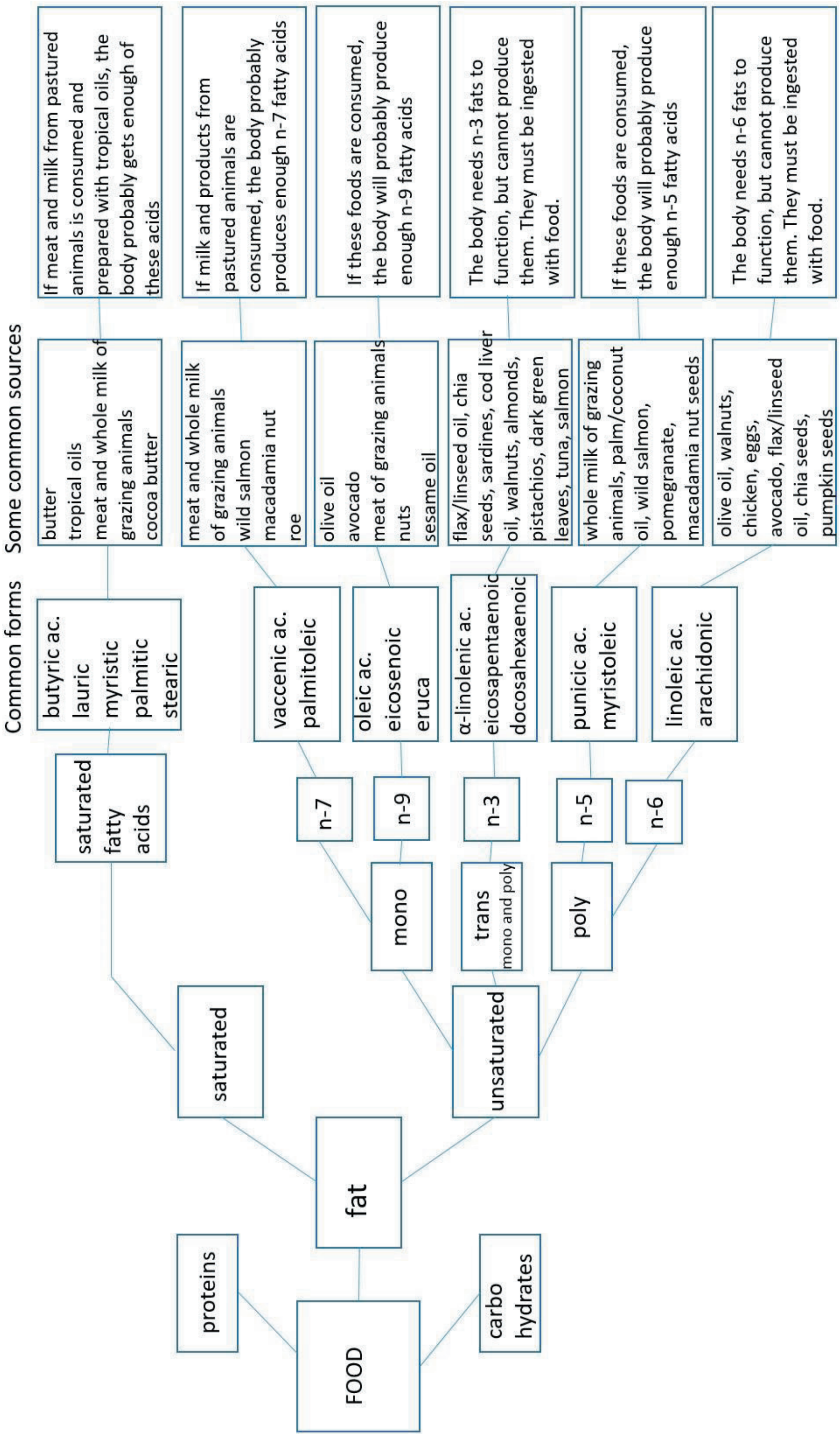

Figure 1. Fats and fatty acids: classification, sources, effects

This paper aims to give an overview of the influence of the composition of the diet of fattening beef on the fatty acid composition of their meat, which for a practical outcome has a beneficial influence on human nutrition and health.

Fatty acid profile of beef meat

The fatty acid composition of the intramuscular fat (IMF) of beef has received a lot of interest given the implications of beef fat on cardiovascular disease risk (Briggs, Petersen & Kris-Etherton, 2017), as well as the positive association regarding the sensory characteristics of beef, such as aroma, taste, juiciness and tenderness (Listrat et al., 2020). The amount of intramuscular fat and its fatty acid composition, as well as biologically valuable proteins, microelements and vitamins, are key factors that contribute to the nutritional value of meat (Wyness, 2013). The connection between the intake of saturated fatty acids and an increase in the risk of developing cardiovascular diseases contributed to the view that the impact of meat on human health is largely determined by the content of fat and its fatty acid composition. In recent decades, the exceptional nutritional value of beef is associated with intramuscular fat which contains more monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA) than other fat depots in cattle (Tan & Jiang, 2024). Beef lean meat contains up to 5% intramuscular fat (Scollan et al., 2005), which contributes to the juiciness, aroma and softness of the meat (O′Quinn et al., 2012), and as it is an inseparable part of muscle tissue, its fatty acid composition is of great health importance. The average composition of intramuscular fat of beef is 45-48% SFA, 35-45% MUFA and up to 5% PUFA (Scollan et al., 2006a). Beef meat, as well as other ruminants, is characterized by a more complex fatty acid profile compared to the meat of monogastric animals, which is a consequence of the activity of the rumen microflora (Dugan, Aldai, Aalhus, Rolland & Kramer, 2011). Rumen microorganisms produce fatty acids with conjugated double bonds, branched-chain fatty acids, *trans* fatty acids (t11-18:1 – *trans* vaccenic acid), as well as fatty acids with an odd number of C atoms (pentadecanoic acid C15:0 and heptadecanoic acid C17:0) (Hackmann, 2024; Xin et al., 2021). The share of the most abundant monounsaturated and polyunsaturated fatty acids in beef meat and fat tissue is shown in Table 1 (Đorđević, 2016). In countries where fish is less present in the diet, beef is an important source of n-3 PUFA: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA) and docosapentaenoic acid (DPA), which are known to prevent heart disease and improve the immune response (Paszczyk, Polak-Śliwińska & Łuczyńska, 2019). Concerning the attitude about beef as a source of saturated fat, it should be pointed out that approximately one-third of the SFA in beef is stearic acid (C:18) which compared with other saturated FA, lowers LDL cholesterol (Mensik, 2006), and in addition, it is partially converted into oleic acid in the body (Valsta, Tapanainen & Mannisto, 2005).

There is a differential effect of different SFAs on blood lipid concentrations. While lauric, myristic and palmitic acids raise blood LDL-cholesterol when replacing carbohy-drates, the effect of stearic acid is more neutral (EFSA NDA Panel, 2022). However, the pro-portion of lauric acid (less than 1%) and myristic acid (2-3%) in beef is insignificant. In addition, more than 30% of beef fatty acids is oleic acid (C18:1), which has beneficial effects on many cardiovascular disease risk factors,

Table 1.
Monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids in beef lean meat and fatty tissue

Tissue type	FATTY ACIDS (MUFA and PUFA)										
	18:1c n-9	18:2 n-6	18:3 n-3	20:4 n-6	20:5 n-3	22:5 n-3	22:6 n-3	*trans* mono-	*trans* poly-	*trans* total	n-6 /n-3
Beef lean meat	39.1	2.8	0.8	0.5	0.3	0.5	nd	2.8	0.8	3.6	2.1
Beef fatty tissue	36.6	1.0	0.5	nd	nd	nd	nd	3.5	1.4	4.9	2.0

including reduction of serum total and LDL cholesterol levels and increased HDL cholesterol concentrations in human studies (Smith, Lunt, Smith & Walzem, 2020). Cholesterol content in beef is 43-84 mg/100g and is influenced by various factors such as breed, gender, diet, total fat content in the carcass, and degree of muscle marbling. Studies show that there is a high correlation between cholesterol content and the presence of intramuscular fat. With the increase in muscle marbling, the concentration of cholesterol per gram of tissue also increases (Alfaia et al., 2007).

The specificity of the digestion process in the rumen induces the formation of *trans*-octadecenoic fatty acid (t-C18:1). This *trans*-fatty acid is produced by industrial hydrogenation of vegetable oils, but in nature, it is synthesized in the rumen of ruminants by isomerization and biohydrogenation of PUFA by the action of the microflora of the rumen. Among the numerous *trans*-18:1 isomers that are produced in the rumen, the most abundant are t10-18:1 and t11-18:1 and together they represent 60-90% of these isomers (Dugan et al., 2011). Beef is one of the naturally richest sources of the t11-18:1 isomer, known as vaccenic acid, and its derivative rumenic acid (c9,t11CLA) which have been proven to have several beneficial biological effects (Dilzer and Park, 2012). *Trans*-vaccenic acid (TVA) reduces pro-inflammatory cytokines (Jaudszus et al., 2012), reduces aggregation of thrombocytes in humans (Sofi et al., 2010), and as shown in animal studies, it lowers blood triglyceride levels (Wang, Jacome-Sosa & Proctor, 2012). Unlike elaidic acid (t9C18:1) which is the main industrial *trans* fat that has a negative effect on cholesterol metabolism in humans, vaccenic acid t11-18:1 does not affect the concentration of total or LDL cholesterol (Chardigny et al., 2008). The average content of vaccenic acid in lean beef is 2.1-2.8 g/100 g of fatty acids and in fatty tissue 3.5 g/100 g of fatty acids (Aldai, Lavín, Kramer, Jaroso & Mantecón, 2012), which corresponds to a content of 3-8% of total fatty acids (Gebauer, Psota & Kris-Etherton, 2007). The content of conjugated linoleic acid (CLA) amounts to 2.7-5.6 mg/g of fat tissue and is largely determined by the way the animals are fed.

In the last few decades, changes in the way animals are bred and fed, as well as modern slaughtering techniques have contributed to significant progress in improving the nutritional, sensory and market value of meat products (Pethick, Hocquette, Scollan & Dunshea, 2021), although carcass processing and trimming of excess adipose or fat tissues leads to lower returns (Ponnampalam & Holman, 2023). The content of intramuscular fat in lean beef is 2-5%, so it can be considered a low-calorie food. Important indicators that are taken into account when considering the fatty acid composition of food in relation to its impact on health are the ratio of polyunsaturated and saturated fatty acids PUFA:SFA (P/S index) and the ratio of n-6/n-3 PUFA. In beef, the P/S ratio is low, at around 0.1, which is significantly less than the 0.4 value that is considered optimal, which is a consequence of the biohydrogenation of unsaturated fatty acids in the rumen. The exception is the extremely meaty breeds of cattle (Belgian Blue Double Muscled Bulls), in which the content of intramuscular fat is less than 1%, and the P/S index has a value of 0.5-0.7 (Scollan et al., 2006a).

The n-6/n-3 PUFA ratio is favourable (on average it has a value of less than 3), which reflects the considerable presence of n-3 PUFA in beef, especially ALA, EPA and DHA (Scollan et al., 2014). It is considered that the ratio n-6: n-3 is optimal if it has a value less than 4 (Simopolous, 2002). The fatty acid composition of the feed has a far greater influence on the n-6/n-3 PUFA ratio in beef than the genetic factor (Choi, Enser, Wood & Scolan, 2000), whose influence is insignificant (De Smet, Raes & Demeyer, 2004). The genetic factor and nutrition affect the fat content, i.e. the degree of fattening of the animal. As shown by Zhou et al. (2022), FA profiles and healthy FA index in subcutaneous adipose tissue differ among cattle breeds. Therefore, genetic selection for FA profiles that contribute to beef quality is breed-dependent and certain genes may serve as the genetic markers for such selection, but validation of the potential marker genes in a larger population is needed.

The influence of nutrition on fatty acid profile of beef

The proportion of fat in cattle feed is usually 1-4% and they mainly consist of PUFAs, linoleic (LA, 18: 2n-6) and α - linolenic acid (ALA, 18:3n-3) (Vahmani et al., 2015). Lipids in the rumen are subject to the action of microbial lipases, releasing mainly free PUFAs that are toxic to rumen microorganisms (Jenkins, Wallace, Moate & Mosley, 2008), so ruminal microflora very efficiently hydrogenate PUFAs to SFAs, especially to stearic acid (C18:0). A small part of PUFAs that do not undergo the biohydrogenation process reach the small intestine where they are resorbed and incorporated into beef meat. The amount and composition of PUFA in beef meat largely depends on the source of PUFA in feed, that is, on the way animals are fed, and on conditions in the rumen because they determine the degree of biohydrogenation (Mapiye et al., 2012). The ratio of coarse to concentrated feed in the ration affects the biohydrogenation pathways of linoleic acid (LA) and α-linolenic acid (ALA), the main fatty acids in cattle feed (Chilliard et al., 2007), which is reflected in the fatty acid profile of tissue lipids.

The fatty acid composition of beef in a certain production system is determined by the influence of breed, genotype, sex, age, animal nutrition and growing conditions, but the influence of nutrition is dominant (De Smet et al., 2004). Despite the high level of ruminal biohydrogenation, dietary manipulation is the most effective strategy for improving the fatty acid profile of beef. The main goal of applying different nutritional regimes is the reduction of SFA and the ratio of n-6/n-3 PUFA and simultaneously increasing the content of n-3PUFA and CLA (Ponnampalam, Priyashantha, Vidanarachchi, Kiani & Holman, 2024) so that feeding cattle on pasture leads to a higher content of n-3 PUFA and total MUFA compared to a concentrate-based diet, which increases the content of n-6 PUFA in intramuscular fat.

Fresh grass in cattle diets increases the proportion of n-3 PUFA in both the triglyceride and phospholipid fractions of muscle lipids (Scollan et al., 2014). Nuernberg et al. (2005) examined the fatty acid composition of the meat of Simmental and Holstein bulls that were fed on pasture and concentrated rations and found a significantly lower content of palmitic (C16:0) and stearic acid (C18:0), an increase in the content of n-3 PUFA and CLA, as well as a more favourable n-6/n3 ratio of fatty acids in the intramuscular fat of cattle fed coarse feed. Similar results were obtained by Ponnampalam et al. (2006) who reported a decrease in the proportion of SFA, a higher prevalence of n-3 PUFA and CLA, as well as a lower ratio of n-6/n3 in the intramuscular fat of steaks - *m. longissimus lumborum* of cattle fed on pasture compared to cattle fed concentrates. The available results of numerous studies on the beneficial effect of pasture on the fatty acid profile of beef show consistent results (Table 2).

Lipids of pasturefed animals contain a high proportion of α-linolenic acid (Muchenje et al., 2009). Cattle raised on pasture are characterized by a lower content of total fat (Ponnampalam, Mann & Sinclair, 2006), as well as a less pronounced marbling of muscle tissue (Leheska et al., 2008), which is accompanied by a lower cholesterol content (Daley, Abbott, Doyle, Nader & Scollan, 2010).

Table 2.
PUFA content in the meat of cattle fed on pasture and with concentrate

Type of diet	**Fatty acids**							Reference
	LA	**ALA**	**EPA**	**DPA**	**DHA**	**ΣPUFA**	**n6/n3**	
	g/100g fat							
Pasture	12.55	5.53	2.13	2.56	0.20	28.99	1.77	**Alfaia et al., (2009)**
Concentrate	11.95	0.48	0.47	0.91	0.11	19.06	8.99	
	g/100g fat							
Pasture	2.01	0.71	0.31	0.24	np	3.41	2.78	**Leheska et al., (2008)**
Concentrate	2.38	0.13	0.19	0.06	np	2.77	13.6	
	% total FA							
Pasture	3.41	1.30	0.52	0.70	0.43	9.31	1.72	**Garcia et al., (2008)**
Concentrate	3.93	0.74	0.12	0.30	0.14	7.95	10.38	
	% FA IMF							
Pasture	3.29	1.34	0.69	1.04	0.09	9.96	1.44	**Realini et al., (2004)**
Concentrate	2.84	0.35	0.30	0.56	0.09	6.02	3.00	

LA - linoleic; ALA - α-linolenic; EPA - eicosapentaenoic; DPA - docosapentaenoic; DHA - docosahexaenoic acid; ΣPUFA-total polyunsaturated acids; n-6/n-3 - ratio n-6/n3PUFA

This is supported by the results of Garcia et al. (2008), who reported a cholesterol content of 40.3 mg/100g meat in pasture-fed and 45.8mg/100g meat in concentrate-fed cattle. A review by Nogoy et al. (2022) revealed that grass-fed beef contained less total fat than grain-fed cattle. The decrease in total fat content significantly affected the fatty acid composition of beef for human consumption. A 100 g beef meat from grass-fed cattle contained 2.773 mg less total SFA than that from the grain-fed beef. Grass-fed beef also showed a more favourable SFA lipid profile containing less cholesterol-raising fatty acids (C12:0 to C16:0), but also contained a lesser amount of cholesterol-lowering C18:0 fatty acid compared to grain-fed beef. Regarding fatty acids essential to human health, grass-fed beef showed higher TVA, total omega-3, and long-chain n-3 PUFA than grain-fed beef. Increased long-chain n-3 PUFA in grass-fed beef are EPA, DPA, and DHA. The increased n-3 PUFA in grass-fed beef also reduced the n-6 to n-3 ratio as compared to grain-fed beef. The net effect of grass-feeding increased the n-3 PUFA but decreased MUFA due to the decreased total fat content. Grass-fed beef increased functional lipid components (omega-3 PUFA) while decreasing undesirable SFA compared to grain-fed beef, and consequently could exert protective effects against several diseases ranging from cancer to cardiovascular diseases. Thus, literature shows that animals in extensive production systems with pasture grazing deliver meat with more nutritionally favourable traits (ω-3 FAs and CLAs). In contrast, feeding concentrate-based diets high in hay, cereal grains, and by-products of oil industries (sunflower, safflower, and cotton meals) leads to more fat content and ω-6 FAs (Ponnampalam et al., 2024).

Different proportions of concentrated feed and roughages, as well as their types, affect the composition of intramuscular fat. French et al. (2000) compared the effect of a diet containing different ratios of grass, grass silage, and concentrate on the fatty acid composition of ox meat. It was found that with a decrease in the proportion of concentrated feed in the diet, the content of n-3 PUFA increased linearly, while the content of SFA decreased, and no differences were recorded in the content of n-6 PUFA. In addition, animals from the group that consumed only grass had the highest proportion of PUFA and CLA in intramuscular fat (5.35g/100g of total FA and 1.08g/100g of total FA, respectively). Different methods of feeding in finishing fattening can significantly affect the fatty acid composition of beef meat.

Final fattening on pasture increases the content of n-3 PUFA, as well as the content of CLA in intramuscular fat (Realini et al., 2004), while feeding cattle with concentrate two months before slaughter, after grazing, causes a decrease in the percentage of n-3 PUFA and an increase in the percentage n-6 PUFA (Aldai et al., 2011). Forages such as grass and clover are characterized by a high proportion (50-75%) of α-linolenic acid (ALA) in the fatty acid composition (Dewhurst, Shingfield, Lee & Scollan, 2006), which is the basic building block for the formation of a series of n-3 long-chain PUFAs, such as eicosapentaenoic (EPA), docosapentaenoic (DPA) and docosahexaenoic (DHA) acid. Accordingly, grazing compared to concentrate not only contributes to an increase in intramuscular fat ALA but also long-chain n-3 PUFAs, such as EPA, DPA and DHA (Dannenberg et al., 2004). This is supported by the results of Garcia et al. (2008) who found that pasture-fed cattle meat contained 15 mg EPA/100 g and 12 mg DHA/100 g, while in conventionally (concentrate) fattened animals, 4 mg EPA/100 g and 6 mg DHA/100 g were found. Different types of roughages affect the increase in n-3 PUFA concentration to a different extent. Duckett, Neel, Lewis, Fontenot and Clapham (2013) determined that alfalfa has the greatest contribution to n-3 PUFA increase in beef meat. A grass-red clover diet compared to a grass diet leads to an increase in both n-6 and n-3 PUFA in intramuscular fat, resulting in an increased P:S ratio (Scollan et al., 2006a). Red clover is thought to reduce ruminal PUFA biohydrogenation, which is attributed to the protective effect of the polyphenol oxidase (PPO) enzyme that prevents the last step of biohydrogenation (Lee et al., 2004). The content of n-3 PUFA is higher in the meat of animals fed with fresh grass compared to grass silage, as well as with a higher proportion of grass in the meal and a longer stay on pasture (Scollan et al., 2006b). The use of certain types of silage in the diet of cattle shows a different effect on the fatty acid composition of the meat. Dymnicka, Klupczyński, Łozicki, Miciński and Strzetelski (2004) reported that the content of n-3 PUFA was significantly higher in the intramuscular fat of oxen fed with grass silage compared to corn silage. Similar results were reported by Bilek and Turhan (2009) who found a higher proportion of n-3 PUFA, a lower level of LA and a better n-6:n-3 ratio in the meat of Limousin bulls fed grass silage, as well as a higher proportion of CLA compared to bulls fed corn silage. Rodriges et al. (2024) reported that different breeds and a high-lipid diet modified the metabolite profile of beef meat and the profile of subcutaneous fat.

Apart from the strategy of increasing the proportion of unsaturated fatty acids in beef by feeding roughages, the inclusion of oil and oilseeds rich in PUFA in ruminant diets represents a more direct way of increasing their proportion of intramuscular fat. The main sources of fatty acid supplementation in ruminants are vegetable oils, oilseeds, fish oil, and seaweed (Woods & Fearon, 2009). However, this method of supplementation is limited both by the efficient biohydrogenation of the rumen microflora and by the fact that the inclusion of fatty acids in feed must be limited (up to 60g/kg of dry matter consumed) to avoid disruption of rumen function (Scollan et al., 2014). Flaxseed and linseed oil contain about 53% ALA (Nowak & Jeziorek, 2023) and very effectively increase the concentration of ALA in the tissue, which is accompanied by a desirable decrease in the n-6/n-3 PUFA ratio (Scollan et al., 2001). Sunflower seeds and oil contain large amounts of LA (C18:2n-6) and lead to an increase of this fatty acid in the tissue, which is associated with an unfavourable increase in the n-6/n-3 PUFA ratio. Soybean oil and rapeseed oil contain about 7% ALA and significant amounts of LA, and thus a high n-6/n-3 PUFA ratio. Therefore, these oils have little effect on increasing the content of n-3 fatty acids in intramuscular fat, especially when compared to linseed oil (Marković et al., 2011). This is supported by the results of González, Moreno, Bispo, Dugan and Franco (2014) who compared the effect of 4.5% linseed, sunflower and soybean oil addition to concentrate-based rations, whereby supplementation with linseed oil compared to sunflower and soybean oil had the most

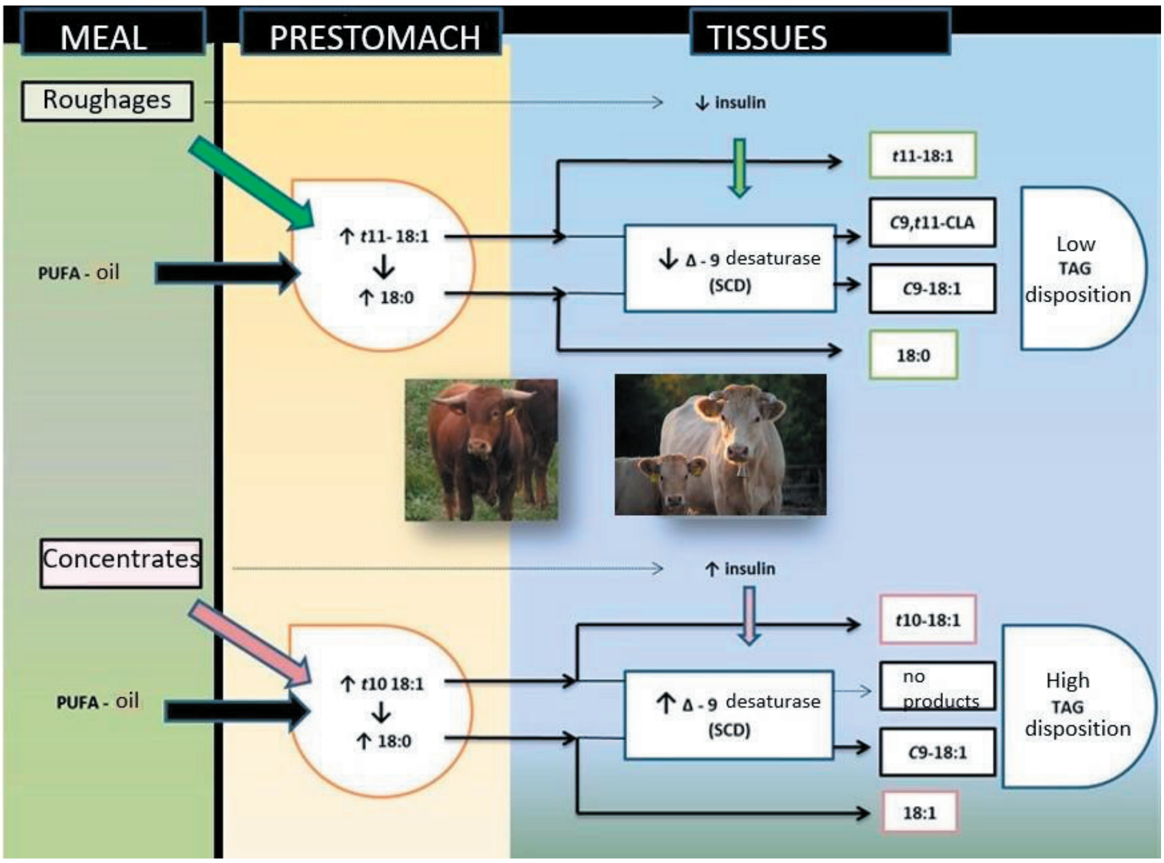

Figure 2. The influence of roughages and concentrated feed on the fat content and fatty acid composition of ruminant meat (Source: adapted from Marković and Baltić (2018))

favourable effect on the content of n-3 PUFA in meat (2.48%, 1.06%, 1.37% of total FA, respectively), as well as in adipose tissue of cattle (0.83%, 0.30%, 0.32% of total FA, respecttively). In addition, linseed oil contributes to significantly higher values of EPA and DPA and a more favourable ratio of n-6/n-3 PUFA in meat and fat tissue, compared to sunflower and soybean oil. Mapiye et al. (2012) examined the influence of sunflower seeds and flaxseeds on the fatty acid composition of beef meat, which were added to rations based on concentrate and roughage (meadow hay or red clover) in an amount that provides 5.4% oil on the dry matter of the ration. Meals containing flaxseed significantly increased the quality proportion of n-3 PUFA in intramuscular fat, while sunflower seed contributed to a significantly higher proportion of TVA, c9t11-CLA and n-6 PUFA. Since protection from ruminal biohydrogenation of PUFAs is an important step for their increased deposition in intramuscular fat, many procedures have been investigated to protect dietary lipids. To this end, various chemical treatments were applied, such as saponification, formation of fatty acid amides, emulsification, encapsulation of oil with protein and subsequent chemical protection (Gulati, Garg & Scott, 2005). Ponnampalam et al. (2024) noted that the inclusion of oils rich in ω-3 FAs can increase health-enhancing long-chain ω-3 PUFA profiles; however, with the increase in long-chain ω-3 PUFAs, the taste and aroma of meat products may become compromised, unless antioxidants are optimised in the products for the avoidance of lipid oxidation, ensuring maximum storage.

CONCLUSIONS

Consumers are increasingly aware of the impact of nutrition on the occurrence of widespread, chronic, non-contagious diseases such as cardiovascular diseases, type 2 diabetes, cancer, obesity, and allergies. Given the influence of fatty acids in food on human health and disease prevention, significant attention has been directed towards enhancing the fatty acid profile of meat, particularly beef, to improve its nutritional value. Despite the extensive biohydrogenation of polyunsaturated fatty acids (PUFA) in the rumen, ruminant nutrition remains the primary strategy for increasing beneficial fatty acids in meat. As plants serve as the primary source of n-3 PUFA in terrestrial and marine ecosystems, numerous studies have focused on investigating the potential of grasses to enhance PUFA content in beef. The transfer of α-linolenic acid (C18:3n-3) from feed to meat depends primarily on two factors: an increase in the level of this essential fatty acid in feed and a reduction in the degree of its biohydrogenation in the rumen. Despite the unfavourable aspect of ruminal biohydrogenation, resulting in the formation of saturated fatty acids, this process also generates conjugated linoleic acid (CLA), which is now recognized for its beneficial effects on human health. The positive biological effects of CLA on prevalent diseases among modern populations have led to numerous studies aiming to increase its content in the muscle fat of ruminants. Excluding genetic factors and production practices, nutrition emerges as the dominant factor influencing CLA content in beef meat, as it provides the substrate for its formation. Presently, numerous studies advocate for a nutritional approach to modify the fatty acid composition of beef meat using selected feedingstuffs. Therefore, this review paper was created with the intention of gathering and organizing this data as a practical guide for implementation. Also, considering that numerous results indicate the advantages of cattle breeding on pastures, it is necessary to encourage farmers engaged in this production. Branding of meat obtained by this type of farming is desirable, which would contribute to the improvement of local production and the rural area.

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MASNE KISELINE OD HRANE ZA JUNAD DO JUNEĆEG MESA

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Sažetak: Juneće meso ima izuzetnu nutritivnu vrednost koja ga izdvaja od ostalih vrsta mesa i čini ga veoma cenjenom hranom. Iako se meso preživara odlikuje složenijim profilom masnih kiselina u odnosu na meso monogastričnih životinja, što je posledica aktivnosti mikroflore buraga. Međutim, u poslednjih nekoliko decenija, promene u načinu uzgoja i ishrane životinja, kao i savremene tehnike klanja doprinele su značajnom napretku u smanjenju sadržaja masti u junećim trupovima. Različite proporcije koncentrovane i grube hrane u obrocima tovne junadi, kao i odabir vrsta hraniva, utiču na sastav intramuskularne masti. Ako se izuzme genetski faktor i proizvodna praksa, ishrana je glavni faktor koji ima dominantan uticaj na profil masnih kiselina junećeg mesa. Danas brojna istraživanja govore u prilog nutritivnom pristupu za modifikaciju sastava masnih kiselina u junećem mesu upotrebom odabrane hrane za životinje. Stoga je ovaj rad pripremljen sa ciljem prikupljanja i sistematizacije podataka poput vodiča za primenu nutritivne strategije u praksi uzgoja tovne junadi, a imajući na umu zdravstvene koristi za krajnje potrošače.

Ključne reči: *preživari, sastav hrane za životinje, ispaša, ishrana koncentratima, masnokiselinski profil, ljudsko zdravlje*

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