

Carcass traits and meat quality of the Eurasian collared dove (*Streptopelia decaocto*)

PETER HAŠČÍK¹ , MATÚŠ RAJSKÝ² , MARTIN FIK³ , ONDŘEJ BUČKO³ ,
ADRIANA PAVELKOVÁ^{1*} 

¹*Institute of Foods Sciences, Faculty of Biotechnology and Food Sciences,
Slovak University of Agriculture in Nitra, Nitra, Slovak Republic*

²*Institute of Nutrition, Research Institute for Animal Production Nitra,
National Agricultural and Food Centre, Lužianky, Slovak Republic*

³*Institute of Animal Husbandry, Faculty of Agrobiological and Food Resources,
Slovak University of Agriculture in Nitra, Nitra, Slovak Republic*

*Corresponding author: adriana.pavelkova@uniag.sk

Citation: Haščík P., Rajský M., Fik M., Bučko O., Pavelková A. (2026): Carcass traits and meat quality of the Eurasian collared dove (*Streptopelia decaocto*). Czech J. Food Sci., 44: 412–423.

Abstract: The present study provides a comprehensive evaluation of carcass traits and meat quality characteristics of the Eurasian collared dove (*Streptopelia decaocto*), with particular emphasis on the effects of sex and muscle type on meat quality. A total of 40 adult birds (20 males and 20 females) were analysed for carcass traits, proximate composition, amino acid profile, fatty acid composition, lipid quality indices and colour characteristics. Carcass yield averaged approximately 67% and did not differ significantly between sexes ($P > 0.05$). Breast muscle was characterised by a high protein content [male 24.32; female 24.36 g·(100 g)⁻¹] and low intramuscular fat and cholesterol contents, whereas thigh meat contained higher levels of intramuscular fat and cholesterol, particularly in females ($P \leq 0.05$). The amino acid profile was dominated by lysine, leucine and arginine and was characterised by a high proportion of essential amino acids. Monounsaturated fatty acids represented the predominant lipid fraction, followed by saturated and polyunsaturated fatty acids, with oleic acid being the major fatty acid. The PUFA/SFA ratio ranged from 0.42 to 0.49, while atherogenic and thrombogenic indices remained low (AI: 0.40–0.42; TI: 0.78–0.82). Colour analysis revealed lower lightness values in breast meat than in thigh meat, indicating a darker appearance of the breast meat. Overall, the results indicate that *S. decaocto* meat is a lean source of high-quality protein with favourable nutritional characteristics comparable to those reported for other members of the Columbidae family.

Keywords: columbid meat; game birds; chemical composition; lipid indices; colour

The Eurasian collared dove (*Streptopelia decaocto*) (Figure 1) is currently among the most widely distributed columbid species, having undergone a rapid expansion across Europe and other regions during the 20th century.

This expansion is commonly attributed to its high ecological adaptability, extended breeding period, and ability to utilise anthropogenic food resources (Coombs et al. 1981; Kaspárek 1996; Camacho-Cervantes and Schon-

Supported by the APVV under Grant No. 23-0077.

© The authors. This work is licensed under a Creative Commons Attribution 4.0 International Licence (CC BY 4.0).



Figure 1. Eurasian collared dove (*Streptopelia decaocto*) (Author 2026)

dube 2018). As a result, the species has become a regular component of both urban and agricultural ecosystems. Morphometric measurements reported by Akmal et al. (2023) indicated a body weight of approximately 158 g, body length of 31.6–31.8 cm, wingspan of 48.2–48.6 cm and tail length of 12.9–14.6 cm.

Although the ecology, behaviour and population dynamics of *S. decaocto* have been relatively well documented, considerably less attention has been devoted to the nutritional and technological quality of its meat. This is particularly relevant because interest in alternative sources of animal protein has increased in recent years, and pigeon meat has been recognised as a nutritionally valuable poultry product (Vinayananda et al. 2019; Lan et al. 2025). Within the family Columbidae, most available studies have focused on domestic pigeons (*Columba livia*), which are generally characterised by high protein content, low intramuscular fat levels and favourable nutritional properties (Pomiński et al. 2009; Kokoszyński et al. 2020; Sule et al. 2024). Furthermore, pigeon meat has been reported to possess a balanced amino acid composition and a desirable fatty acid profile, contributing to its high biological value (Sales and Janssens 2003; Adawy and Abdel-Wareth 2023; Lan et al. 2025). In contrast, comparable information on wild columbid species, particularly those living under natural feeding conditions, remains scarce.

Meat quality is determined by a complex interaction of factors, including carcass characteristics, proximate composition, amino acid and fatty acid profiles, and physicochemical properties such as colour. Together, these parameters influence not only the nutritional value of meat but also its technological properties, sensory attributes and consumer acceptance (Petracci et al. 2015). Previous studies have reported high proportions of essential amino acids, particularly lysine, leucine and arginine, together with a predominance of oleic and linoleic acids in pigeon meat, highlight-

ing its nutritional significance (Ali et al. 2021; Yang et al. 2025; Pavelková et al. 2026). Recent metabolomic and multi-omics investigations have further demonstrated the complexity of pigeon meat composition and identified numerous metabolites associated with flavour development, antioxidant activity and overall meat quality (Wang et al. 2025). In columbid species, muscle type appears to be one of the principal factors influencing meat composition and quality traits, whereas sex-related differences are generally less pronounced, as also suggested by morphometric studies of *S. decaocto* (Akmal et al. 2023).

From a nutritional perspective, columbid meat is considered a valuable source of high-quality protein with a favourable amino acid composition and lipid profile. Unlike most poultry species, pigeons produce crop milk, a nutrient-rich secretion that supports rapid post-hatch growth and contributes to the unique nutritional characteristics of pigeon meat (Sales and Janssens 2003). In addition, the nutritional evaluation of meat increasingly incorporates lipid quality indices, including the polyunsaturated-to-saturated fatty acid ratio (PUFA/SFA), atherogenic index (AI), thrombogenic index (TI) and hypocholesterolaemic/hypercholesterolaemic ratio (h/H), which provide a more comprehensive assessment of the potential health effects of meat lipids (Ulbricht and Southgate 1991). However, the extent to which these favourable nutritional characteristics apply to wild columbid species such as *S. decaocto* remains unclear. To the best of our knowledge, no study has comprehensively evaluated carcass traits, proximate composition, amino acid profile, fatty acid composition, lipid quality indices and meat colour in wild Eurasian collared doves under natural feeding conditions.

MATERIAL AND METHODS

Animals and sampling. The study was conducted on 40 adult Eurasian collared doves (*S. decaocto*), comprising 20 males and 20 females, harvested from a hunting area located in the Topoľčany district, south-western Slovakia. The hunting area consisted predominantly of agricultural land interspersed with small woodland patches, orchards and rural settlements, representing a typical habitat of *S. decaocto* in the region. Birds were collected during the autumn hunting season (September–November 2023), outside the breeding period. Adult individuals were identified based on fully developed plumage, body size and morphometric characteristics typical of mature birds (Akmal et al. 2023).

Sex was determined during carcass dissection by macroscopic examination of the gonads. Based on this assessment, 20 males and 20 females were included in the study. Examination of the reproductive organs confirmed the absence of reproductive activity in all sampled birds. All specimens were obtained in accordance with the Hunting Act of the Slovak Republic (Act No. 274/2009 Coll.) as part of routine game management activities. No birds were harvested specifically for the purposes of this study. Immediately after harvesting, body weight was recorded using a digital balance (PCB 1000-2, Kern & Sohn GmbH, Germany; capacity 1 000 g, accuracy 0.01 g). The carcasses were subsequently transported to the laboratory under refrigerated conditions (4 ± 1 °C) for further processing and analyses.

Slaughter and carcass evaluation. Following evisceration, carcasses (Figure 2) were weighed using a digital balance (PCB 1000-2, Kern & Sohn GmbH, Germany; capacity 1 000 g, accuracy 0.01 g), and carcass traits were evaluated according to the methodology described by Haščík et al. (2024). The weights of edible offal, including the heart, liver, gizzard and neck, were determined using the same balance. Carcass yield was calculated as the percentage of carcass weight, including edible offal, relative to live body weight.

After carcass evaluation, samples of the breast muscle (*musculus pectoralis major*) and thigh muscle (*musculus biceps femoris*) (Figure 2) were excised for subsequent analyses. All measurements and sample collections were performed 24 h post mortem following refrigerated storage at 4 ± 1 °C.

Chemical composition. The chemical composition of breast and thigh muscle samples was determined using an INFRATEC 1265 Meat Analyser (FOSS Analytical A/S, Denmark) based on near-infrared transmission (NIT) spectroscopy. Prior to analysis, muscle samples were homogenised and analysed in triplicate. The analyser was calibrated and verified according to the manufacturer's recommendations before sample evaluation. Moisture, crude protein, intramuscular fat and cholesterol contents were determined using the calibration models implemented in the instrument. Results were expressed as $\text{g} \cdot (100 \text{ g})^{-1}$ of fresh muscle tissue.

Amino acid analysis. Amino acid composition was determined using an automatic amino acid analyser (AAA 400, Ingos Ltd., Czech Republic). Muscle samples were homogenised and hydrolysed in $6 \text{ mol} \cdot \text{L}^{-1}$ hydrochloric acid at 110 °C for 24 h. Sulphur-containing amino acids (methionine and cysteine) were oxidised with performic acid prior to acid hydrolysis to ensure their stability during hydrolysis. The hydrolysates were subsequently analysed by ion-exchange chromatography with post-column ninhydrin derivatisation using the AAA 400 amino acid analyser. Amino acid concentrations were expressed as $\text{g} \cdot (100 \text{ g})^{-1}$ of fresh muscle tissue.

Fatty acid composition and lipid indices. Total lipids were extracted from muscle samples, and fatty acid methyl esters (FAMES) were prepared according to ISO 12966-2:2017. Fatty acid composition was determined using a gas chromatograph (Agilent 6890A, Agilent Technologies, USA) equipped with a flame ionisation detector (GC-FID). Separation of FAMES



Figure 2. Carcass, breast and thigh muscle of Eurasian collared dove (*Streptopelia decaocto*) (Author 2026)

was performed on an SP-2560 fused-silica capillary column (100 m × 0.25 mm × 0.20 µm; Supelco, USA) using helium as the carrier gas. Individual fatty acids were identified by comparing their retention times with those of certified FAME reference standards and expressed as a percentage of total identified fatty acids.

The nutritional quality of lipids was evaluated using the PUFA/SFA ratio, n-6/n-3 polyunsaturated fatty acid ratio, AI, TI, and h/H ratio. Lipid quality indices were calculated according to the equations proposed by Ulbricht and Southgate (1991).

Meat colour. Meat colour was measured 24 h post mortem using a CM-2600d spectrophotometer (Konica Minolta, Japan). Prior to measurement, the instrument was calibrated according to the manufacturer's instructions using a standard white calibration plate. Colour was assessed on a fresh transverse cut made at the same anatomical location of the breast (*musculus pectoralis major*) and thigh (*musculus biceps femoris*) muscles. Colour characteristics were performed on the freshly cut surface in the central region of each muscle, avoiding visible connective tissue, fat deposits, blood vessels, and haemorrhagic areas, using an 8-mm aperture under standardised conditions with illuminant D65 and a 10° standard observer. Colour characteristics were recorded in the CIE *Lab** colour space, where *L** represents lightness, *a** redness, and *b** yellowness. Three measurements were performed on

each muscle sample at the same anatomical location on the fresh cut surface, and the mean value was used for statistical evaluation.

Statistical analysis. Data were analysed using XLSTAT software (version 2018.5, Addinsoft, USA). The normality of data distribution was verified using the Shapiro–Wilk test. Differences between males and females were evaluated separately within each muscle type (breast and thigh muscles) using Student's *t*-test for independent samples. Results are presented as mean ± standard deviation (SD). Statistical significance was set at $P < 0.05$.

RESULTS AND DISCUSSION

Carcass traits. Carcass traits of *S. decaocto* are presented in Table 1. In general, no statistically significant differences between sexes were observed for most of the evaluated parameters, including live body weight, carcass weight, edible offal weight, and overall carcass yield ($P > 0.05$). These findings indicate a relatively uniform body composition between males and females, which is consistent with morphometric observations reported for *S. decaocto* by Akmal et al. (2023), who found only limited sexual dimorphism in adult birds. The average live body weight ranged from 185.24 to 197.36 g, which is within the range reported for adult Eurasian collared doves. Akmal et al.

Table 1. Carcass traits of *Streptopelia decaocto* (g)

Parameter	Male	Female	<i>P</i> -value
Live weight	197.36 ± 7.94	185.24 ± 15.22	0.195
Carcass weight	118.78 ± 5.21	110.00 ± 12.89	0.242
Edible offal	14.62 ± 1.38	13.72 ± 1.16	0.346
Carcass + edible offal	133.40 ± 6.58	123.72 ± 13.44	0.231
Heart	2.56 ± 0.31	2.22 ± 0.54	0.307
Liver	3.36 ± 0.58	3.42 ± 0.46	0.875
Gizzard	4.68 ± 0.74	4.82 ± 0.54	0.767
Neck	4.02 ± 0.39 ^a	3.26 ± 0.46 ^b	0.035
Wings	17.38 ± 1.39	17.18 ± 3.19	0.911
Carcass yield (%)	67.61 ± 2.45	66.64 ± 2.40	0.585
Skin with feathers	38.88 ± 4.78	39.46 ± 2.97	0.842
Shanks	3.42 ± 0.27 ^a	2.94 ± 0.22 ^b	0.024
Head	7.98 ± 0.50	7.48 ± 0.68	0.271
GIT	6.06 ± 1.35	7.30 ± 0.98	0.176
Breast part	67.88 ± 5.57	61.48 ± 5.64	0.145
Thigh part	11.88 ± 0.81	10.86 ± 1.58	0.283

^{a, b} different letters within a row indicate statistically significant differences between sexes ($P \leq 0.05$); values are presented as mean ± SD

(2023) reported body weights of approximately 180–220 g in adult individuals, while Romagosa and Młodinow (2022) described *S. decaocto* as a medium-sized columbid species typically weighing between 150 and 250 g. The carcass yield obtained in the present study (66.64–67.61%) was comparable between sexes and was similar to values reported for domestic pigeons. Pomianowski et al. (2009) reported dressing percentages ranging from approximately 65% to 70% in pigeon meat, whereas Kokoszyński et al. (2020) observed carcass yields close to 68% in White King pigeons. These findings suggest that *S. decaocto* exhibits carcass efficiency comparable to that of domesticated columbid species despite being harvested under natural conditions.

No significant sex-related differences were observed in the weights of the heart, liver, gizzard, wings, head or gastrointestinal tract ($P > 0.05$), indicating a similar development of visceral organs and non-carcass body components in adult males and females. Significant differences were detected only for neck and shank weights, which were higher in males ($P \leq 0.05$). However, these differences were relatively small and were not accompanied by significant variation in the main edible portions of the carcass.

Breast part weights averaged 67.88 g in males and 61.48 g in females, whereas thigh part weights averaged 11.88 g and 10.86 g, respectively, although these differences were not statistically significant ($P > 0.05$). The breast portion represented the largest edible component of the carcass, reflecting the importance of the pectoral musculature in flying birds. Similar observations have been reported in domestic pigeons, in which breast meat constitute the most developed carcass region (Pomianowski et al. 2009; Włodarczyk et al. 2024). Kokoszyński et al. (2020) reported breast meat weights ranging from approximately 70 to 90 g in White King

pigeons, which are specialised meat-type birds and therefore exhibit greater breast meat development than wild-living *S. decaocto*.

Overall, the carcass characteristics of *S. decaocto* were comparable to those reported for domestic pigeon breeds and other members of the Columbidae family. The limited sex-related variation observed in the present study indicates that carcass composition in adult Eurasian collared doves is relatively stable between sexes under natural conditions and indicates the potential of this species as a source of lean game meat.

Proximate chemical composition. The proximate chemical composition of breast and thigh muscles of *S. decaocto* is presented in Table 2.

No significant differences between sexes were observed in breast meat for moisture, protein or cholesterol content ($P > 0.05$), indicating a similar chemical composition in males and females. Protein content remained high in both sexes [24.32 and 24.36 g·(100 g)⁻¹ in males and females, respectively], whereas intramuscular fat content was low, ranging from 0.96 to 1.21 g·(100 g)⁻¹. Female breast meat contained slightly more intramuscular fat than male breast meat ($P = 0.008$), although the absolute difference was relatively small.

More pronounced sex-related differences were found in thigh meat. Females exhibited higher intramuscular fat and cholesterol contents and lower protein concentrations than males ($P \leq 0.05$). Intramuscular fat content increased from 1.78 g·(100 g)⁻¹ in males to 3.08 g·(100 g)⁻¹ in females, while protein content decreased from 23.21 to 22.37 g·(100 g)⁻¹. Moisture content did not differ significantly between sexes and ranged from 73.29 to 73.57 g·(100 g)⁻¹.

Moisture content ranged from 73.11 to 73.57 g·(100 g)⁻¹ and did not differ significantly between sexes. Similar values were reported by Yang

Table 2. Proximate chemical composition of *Streptopelia decaocto* breast and thigh muscles [g·(100 g)⁻¹]

Parameter	Muscle	Male	Female	<i>P</i> -value
Moisture	Breast	73.33 ± 1.07	73.11 ± 0.98	0.584
	Thigh	73.29 ± 0.81	73.57 ± 1.94	0.626
Total protein	Breast	24.32 ± 0.64	24.36 ± 0.54	0.864
	Thigh	23.21 ± 0.47 ^a	22.37 ± 0.64 ^b	0.001
Intramuscular fat	Breast	0.96 ± 0.26 ^b	1.21 ± 0.18 ^a	0.008
	Thigh	1.78 ± 0.35 ^b	3.08 ± 1.78 ^a	0.017
Cholesterol [g·(100 g) ⁻¹]	Breast	45.00 ± 0.01	44.00 ± 0.00	0.226
	Thigh	51.00 ± 0.01 ^b	65.00 ± 0.02 ^a	0.044

^{a, b} different letters within a row indicate statistically significant differences between sexes ($P \leq 0.05$); values are presented as mean ± SD

et al. (2025), who found moisture contents of 73.87 and 74.17 g·(100 g)⁻¹ in Yuzhong and European meat pigeons, respectively. In contrast, Włodarczyk et al. (2024) reported lower moisture contents in White King pigeons, ranging from 63.4 to 66.4 g·(100 g)⁻¹ depending on muscle type and age. These differences may be associated with genotype, age, muscle type and production system.

The protein content observed in the present study [22.37–24.36 g·(100 g)⁻¹] was comparable with values reported for other columbid species. Pomianowski et al. (2009) reported protein contents of 21.73 g·(100 g)⁻¹ in breast meat and 21.33 g·(100 g)⁻¹ in leg muscle of King pigeon squabs. Similarly, Yang et al. (2025) reported values of 20.82–21.23 g·(100 g)⁻¹ in breast meat of Yuzhong and European meat pigeons. Włodarczyk et al. (2024) found protein concentrations ranging from 22.8 to 26.8 g·(100 g)⁻¹ in White King pigeons depending on age and muscle type. The protein levels observed in *S. decaocto* were therefore higher than those reported by Pomianowski et al. (2009) and comparable with values reported for White King pigeons by Włodarczyk et al. (2024). They were also slightly higher than those commonly reported for chicken breast meat [approx-

imately 21–23 g·(100 g)⁻¹] (Marangoni et al. 2015), highlighting the high nutritional value of Eurasian collared dove meat.

Intramuscular fat concentrations were generally lower than those reported for domestic pigeon breeds. Yang et al. (2025) found fat contents of 3.64–3.82 g·(100 g)⁻¹ in breast meat of meat pigeons, while Włodarczyk et al. (2024) reported values ranging from 3.18 to 3.79 g·(100 g)⁻¹. In comparison, breast meat of *S. decaocto* contained only 0.96–1.21 g·(100 g)⁻¹ intramuscular fat. Pomianowski et al. (2009) likewise reported higher intramuscular fat contents in King pigeon meat than those observed in the present study. These findings indicate that Eurasian collared dove meat is particularly lean. As expected, higher fat concentrations were recorded in thigh meat, especially in females.

Cholesterol concentrations ranged from 44 to 65 mg·(100 g)⁻¹. These values are comparable with those reported by Pomianowski et al. (2009), who found cholesterol concentrations of approximately 52–67 mg·(100 g)⁻¹ in pigeon meat. The relatively low cholesterol content observed in breast meat, together with its high protein and low-fat contents, contributes to the nutritional quality of this tissue.

Table 3. Amino acid composition of *Streptopelia decaocto* breast and thigh muscles [g·(100 g)⁻¹]

Amino acid	Muscle	Male	Female	<i>P</i> -value
Threonine	Breast	1.00 ± 0.15	0.97 ± 0.10	0.534
	Thigh	1.06 ± 0.09 ^b	1.16 ± 0.11 ^a	0.009
Valine	Breast	0.96 ± 0.10	0.92 ± 0.08	0.303
	Thigh	1.00 ± 0.06	1.06 ± 0.12	0.095
Methionine	Breast	0.79 ± 0.09	0.74 ± 0.08	0.129
	Thigh	0.84 ± 0.07 ^b	0.95 ± 0.09 ^a	0.002
Isoleucine	Breast	0.96 ± 0.14	0.89 ± 0.10	0.154
	Thigh	1.00 ± 0.10 ^b	1.14 ± 0.13 ^a	0.004
Leucine	Breast	1.89 ± 0.28	1.78 ± 0.19	0.223
	Thigh	1.97 ± 0.17 ^b	2.22 ± 0.23 ^a	0.004
Phenylalanine	Breast	0.97 ± 0.14	0.91 ± 0.10	0.176
	Thigh	1.01 ± 0.08 ^b	1.12 ± 0.12 ^a	0.006
Lysine	Breast	2.08 ± 0.30	1.93 ± 0.22	0.133
	Thigh	2.15 ± 0.19 ^b	2.43 ± 0.27 ^a	0.004
Cysteine	Breast	0.32 ± 0.04	0.31 ± 0.03	0.563
	Thigh	0.34 ± 0.03 ^b	0.38 ± 0.02 ^a	0.001
Histidine	Breast	1.00 ± 0.17	0.96 ± 0.14	0.472
	Thigh	1.13 ± 0.11 ^b	1.24 ± 0.16 ^a	0.045
Arginine	Breast	1.55 ± 0.22	1.44 ± 0.16	0.136
	Thigh	1.61 ± 0.15 ^b	1.81 ± 0.20 ^a	0.004

^{a, b} different letters within a row indicate statistically significant differences between sexes ($P \leq 0.05$); values are presented as mean ± SD

Overall, the meat of *S. decaocto* was characterised by a high protein content, low intramuscular fat concentration and moderate cholesterol levels. The values obtained were generally comparable with those reported for domestic pigeons and other members of the Columbidae family, indicating that Eurasian collared dove meat represents a nutritionally valuable source of animal protein.

Amino acid profile. The amino acid composition of breast and thigh meat of *S. decaocto* is presented in Table 3. No statistically significant differences between sexes were observed in breast meat for any of the analysed amino acids ($P > 0.05$), indicating a relatively stable amino acid composition irrespective of sex. Among the individual amino acids, lysine and leucine were the most abundant, followed by arginine. Lysine concentrations ranged from 1.93 to 2.08 g·(100 g)⁻¹, while leucine concentrations ranged from 1.78 to 1.89 g·(100 g)⁻¹. These findings are consistent with previous studies on columbid species, in which lysine, leucine and arginine were identified as the predominant amino acids. In contrast, thigh meat exhibited more pronounced sex-related variation. Females showed significantly higher concentrations of threonine, methionine, isoleucine, leucine, phenylalanine, lysine, cysteine, histidine and arginine than males ($P \leq 0.05$). The largest differences were observed for lysine [2.43 vs. 2.15 g·(100 g)⁻¹], leucine [2.22 vs. 1.97 g·(100 g)⁻¹] and arginine [1.81 vs. 1.61 g·(100 g)⁻¹]. No significant sex-related difference was found for valine ($P > 0.05$).

The amino acid profile observed in the present study was generally comparable with that reported for other members of the Columbidae family. Yang et al. (2025) identified lysine, leucine and arginine as the dominant amino acids in the breast meat of both Yuzhong and European meat pigeons. Similarly, Pavelková et al. (2026) reported that California pigeon meat was characterised by a balanced amino acid composition, with lysine, leucine and arginine among the predominant amino acids. Comparable findings were reported by Haščík et al. (2026) for wood pigeon (*Columba palumbus*), where lysine, leucine and arginine were likewise identified as the major amino acids.

Particular attention should be paid to the lysine content because lysine is commonly considered the limiting amino acid in cereal-based diets. The relatively high lysine concentrations recorded in both breast and thigh meat therefore contribute substantially to the nutritional quality of *S. decaocto* meat. Leucine, which plays an important role in muscle protein synthesis, was the second most abundant essential amino acid,

reaching values of up to 2.22 g·(100 g)⁻¹ in female thigh meat. Arginine concentrations ranged from 1.44 to 1.81 g·(100 g)⁻¹ and were comparable with those reported for domestic pigeons and other poultry species.

The predominance of essential amino acids, particularly lysine, leucine, threonine and methionine, indicates a nutritionally favourable amino acid composition. Similar conclusions were reported by Chang et al. (2023), who observed a high proportion of essential amino acids in local Chinese pigeon breeds, and by Lan et al. (2025), who highlighted the high biological value of pigeon meat protein.

Overall, the amino acid composition of *S. decaocto* was characterised by high concentrations of essential amino acids and was comparable with that reported for domestic pigeons and other members of the Columbidae family. These findings indicate that Eurasian collared dove meat represents a valuable dietary source of high-quality dietary protein.

Fatty acid composition and lipid quality indices. The fatty acid composition of breast and thigh muscles of *S. decaocto* is presented in Table 4, while lipid quality indices are summarised in Table 5.

In both muscle types, monounsaturated fatty acids (MUFA) represented the predominant fraction of total fatty acids, followed by saturated fatty acids (SFA) and polyunsaturated fatty acids (PUFA). MUFA accounted for 48.46–50.43% of total fatty acids, whereas SFA and PUFA ranged from 34.14–35.24% and 14.70–16.90%, respectively. This distribution is consistent with previous studies on domestic pigeons and other members of the Columbidae family, in which MUFA were reported as the dominant lipid fraction (Pomianowski et al. 2009; Yang et al. 2025; Pavelková et al. 2026).

Among individual fatty acids, oleic acid (C18:1n-9) was the most abundant component in both breast and thigh meats, accounting for 31.35–38.84% of total fatty acids. Palmitic acid (C16:0) was the dominant saturated fatty acid (24.38–24.48%), whereas linoleic acid (C18:2n-6) represented the major polyunsaturated fatty acid (9.44–10.66%). Similar fatty acid distributions have been reported for domestic pigeons, California pigeons and wood pigeons, where oleic acid was likewise identified as the predominant fatty acid, followed by palmitic and linoleic acids (Pomianowski et al. 2009; Haščík et al. 2026; Pavelková et al. 2026).

Although the overall fatty acid profile was broadly similar between sexes, several significant differences were observed. In breast meat, males exhibited a higher proportion of PUFA than females (16.35 vs. 14.70%; $P = 0.005$), resulting in a higher PUFA/SFA

Table 4. Fatty acid composition of *Streptopelia decaocto* breast and thigh muscles (%)

Fatty acid	Muscle	Male	Female	P-value
Lauric	Breast	0.07 ± 0.01 ^b	0.08 ± 0.01 ^a	0.011
	Thigh	0.10 ± 0.01 ^a	0.09 ± 0.01 ^b	0.009
Myristic	Breast	1.35 ± 0.04	1.34 ± 0.03	0.421
	Thigh	1.31 ± 0.03	1.31 ± 0.02	0.573
Palmitic	Breast	24.48 ± 0.20	24.48 ± 0.16	0.952
	Thigh	24.39 ± 0.17	24.38 ± 0.18	0.883
Heptadecanoic	Breast	0.31 ± 0.03	0.32 ± 0.03	0.305
	Thigh	0.29 ± 0.03	0.28 ± 0.04	0.314
Stearic	Breast	10.83 ± 0.24	10.94 ± 0.22	0.202
	Thigh	11.03 ± 0.21	10.92 ± 0.18	0.138
Oleic	Breast	31.35 ± 6.13	33.87 ± 1.71	0.149
	Thigh	35.03 ± 1.90	38.84 ± 6.95	0.065
Vaccenic	Breast	4.74 ± 0.12	4.70 ± 0.13	0.347
	Thigh	4.62 ± 0.09	4.58 ± 0.09	0.291
Linoleic	Breast	10.66 ± 1.87	9.51 ± 1.72	0.103
	Thigh	9.44 ± 1.05	10.37 ± 3.05	0.294
Conjugated linoleic	Breast	0.13 ± 0.01	0.13 ± 0.01	0.520
	Thigh	0.13 ± 0.01	0.12 ± 0.02	0.152
α-Linolenic	Breast	0.29 ± 0.04	0.27 ± 0.02	0.139
	Thigh	0.25 ± 0.03 ^b	0.29 ± 0.05 ^a	0.006
Eicosenoic	Breast	0.53 ± 0.09	0.53 ± 0.09	0.924
	Thigh	0.41 ± 0.06 ^b	0.51 ± 0.17 ^a	0.049
Arachidonic	Breast	1.69 ± 0.34	1.69 ± 0.29	0.953
	Thigh	1.63 ± 0.24 ^a	1.28 ± 0.33 ^b	0.003
Eicosapentaenoic	Breast	0.10 ± 0.01	0.10 ± 0.01	0.320
	Thigh	0.09 ± 0.01	0.08 ± 0.02	0.193
Docosapentaenoic	Breast	0.14 ± 0.01	0.13 ± 0.01	0.194
	Thigh	0.14 ± 0.01	0.13 ± 0.01	0.111
Docosahexaenoic	Breast	0.04 ± 0.00	0.04 ± 0.00	0.999
	Thigh	0.04 ± 0.00	0.04 ± 0.00	0.361
Omega 3	Breast	0.63 ± 0.05	0.62 ± 0.05	0.412
	Thigh	0.63 ± 0.05 ^b	0.72 ± 0.08 ^a	0.001
Omega 6	Breast	13.13 ± 1.29	12.39 ± 1.01	0.103
	Thigh	13.59 ± 1.05	14.18 ± 3.17	0.512
Σ SFA	Breast	34.56 ± 1.78	34.90 ± 0.94	0.527
	Thigh	35.24 ± 1.25	34.14 ± 2.29	0.126
Σ MUFA	Breast	48.46 ± 1.16	49.20 ± 1.53	0.158
	Thigh	49.54 ± 1.10	50.43 ± 3.45	0.362
Σ PUFA	Breast	16.35 ± 1.51 ^a	14.70 ± 1.37 ^b	0.005
	Thigh	15.77 ± 1.25	16.90 ± 3.01	0.207

^{a, b} different letters within a row indicate statistically significant differences between sexes ($P \leq 0.05$); values are presented as mean ± SD; MUFA – monounsaturated fatty acids; SFA – saturated fatty acids; PUFA – polysaturated fatty acids

ratio (0.47 vs. 0.42; $P = 0.048$). In thigh meat, females showed higher concentrations of α-linolenic acid (0.29 vs. 0.25%; $P = 0.006$), eicosenoic acid (0.51 vs. 0.41%; $P = 0.049$) and total n-3 fatty acids (0.72 vs. 0.63%;

Table 5. Lipid quality indices of *Streptopelia decaocto* breast and thigh muscles

Index	Muscle	Male	Female	P-value
PUFA/SFA	Breast	0.47 ± 0.05 ^a	0.42 ± 0.04 ^b	0.048
	Thigh	0.45 ± 0.04	0.49 ± 0.06	0.091
n-6/n-3	Breast	20.84 ± 2.31	19.98 ± 2.02	0.392
	Thigh	21.57 ± 2.18	19.69 ± 2.77	0.124
AI	Breast	0.41 ± 0.03	0.42 ± 0.03	0.611
	Thigh	0.42 ± 0.03	0.40 ± 0.04	0.287
TI	Breast	0.79 ± 0.06	0.81 ± 0.07	0.548
	Thigh	0.82 ± 0.07	0.78 ± 0.08	0.314
h/H	Breast	2.59 ± 0.21	2.51 ± 0.19	0.401
	Thigh	2.46 ± 0.18	2.63 ± 0.25	0.103

^{a,b}different letters within a row indicate statistically significant differences between sexes ($P \leq 0.05$); values are presented as mean ± SD; AI – atherogenic index; TI – thrombogenic index; h/H – hypocholesterolemic/hypercholesterolemic ratio

$P = 0.001$), whereas males exhibited higher arachidonic acid concentrations (1.63 vs. 1.28%; $P = 0.003$).

The fatty acid composition observed in the present study was generally comparable with that reported for other pigeon species. Yang et al. (2025) identified oleic acid as the predominant fatty acid in both Yuzhong and European meat pigeons, while linoleic acid represented the major PUFA fraction. Similarly, Pavelková et al. (2026) reported that California pigeon meat was characterised by a predominance of MUFA, particularly oleic acid, whereas Haščík et al. (2026) observed comparable fatty acid distributions in wood pigeon meat.

From a nutritional perspective, the predominance of oleic acid together with moderate PUFA concentrations and relatively low SFA levels contributes positively to the nutritional quality of the lipids. Oleic acid has been associated with favourable effects on serum lipid metabolism and is generally regarded as one of the most desirable fatty acids in human nutrition (Wood et al. 2004). The relatively low proportion of SFA observed in *S. decaocto* meat further supports its nutritional value.

The calculated lipid quality indices also indicated favourable nutritional characteristics of *S. decaocto* meat. The PUFA/SFA ratio ranged from 0.42 to 0.49. Values observed in thigh meat met or exceeded the minimum ratio of 0.45 frequently recommended for human nutrition, whereas the value recorded in female breast meat (0.42) was slightly lower. The PUFA/SFA ratios obtained in the present study were nevertheless comparable with fatty acid distributions reported for other columbid species. California pigeon meat contained approximately 13.9–15.0% PUFA and 33.6–34.9% SFA, while wood pigeon meat contained approximately 13.9–17.0% PUFA and 31.9–34.6% SFA.

The AI ranged from 0.40 to 0.42, while the TI ranged from 0.78 to 0.82. In addition, the h/H ratio varied between 2.46 and 2.63. According to Chen and Liu (2020), lower AI and TI values together with higher h/H ratios are generally considered indicative of a more favourable fatty acid composition from a nutritional perspective. Comparable data for AI, TI and h/H in pigeon meat are scarce because most published studies on Columbidae report fatty acid composition rather than calculated lipid quality indices. Therefore, direct comparisons with other pigeon species remain limited.

The n-6/n-3 ratio ranged from 19.69 to 21.57. Although these values exceed those generally recommended for human nutrition (Simopoulos 2002), similar trends have been reported in pigeon meat. Yang et al. (2025) reported a predominance of n-6 fatty acids over n-3 fatty acids in both Yuzhong and European meat pigeons, while Sakhawat et al. (2023) demonstrated considerable variation in the relative proportions of n-6 and n-3 fatty acids between wild and farmed pigeons, highlighting the importance of feeding ecology in shaping lipid composition.

Overall, the fatty acid composition and lipid quality indices indicate that *S. decaocto* meat possesses a nutritionally favourable lipid profile characterised by a predominance of MUFA, moderate PUFA concentrations, low AI and TI values, and relatively high h/H ratios. These findings are generally consistent with those reported for domestic pigeons and other members of the Columbidae family and support the potential of Eurasian collared dove meat as a source of high-quality dietary lipids.

Meat colour. Colour characteristics of breast and thigh meats of *S. decaocto* are presented in Table 6. No significant differences between sexes were ob-

Table 6. Colour characteristics of *Streptopelia decaocto* breast and thigh muscles

Parameter	Muscle	Male	Female	P-value
L^*	Breast	26.34 ± 1.48	27.49 ± 0.78	0.057
	Thigh	37.90 ± 4.47	37.10 ± 2.24	0.636
a^*	Breast	11.36 ± 1.18	12.01 ± 1.19	0.258
	Thigh	15.17 ± 3.10	14.33 ± 2.81	0.556
b^*	Breast	6.42 ± 1.16	7.30 ± 1.07	0.112
	Thigh	15.26 ± 2.11	13.15 ± 2.48	0.069
C^*	Breast	13.05 ± 1.18	14.05 ± 1.16	0.166
	Thigh	21.52 ± 2.65	19.45 ± 2.66	0.207
h°	Breast	29.47 ± 5.11	31.29 ± 4.50	0.528
	Thigh	45.17 ± 7.07	42.54 ± 7.77	0.554

Values are presented as mean ± SD; L^* – lightness; a^* – redness; b^* – yellowness; C^* – chroma; h° – hue angle

served for any of the evaluated colour characteristics ($P > 0.05$), indicating that sex had only a limited effect on meat colour in this species. Similar colour values were therefore recorded in males and females for both breast and thigh meats.

More pronounced differences were observed between muscle types. Breast meat exhibited lower L^* values (26.34–27.49), indicating a darker appearance, whereas thigh meat showed substantially higher lightness values (37.10–37.90). Differences were also observed for redness (a^*), with thigh meat displaying higher values (14.33–15.17) than breast meat (11.36–12.01). Likewise, b^* values were higher in thigh meat (13.15–15.26) than in breast meat (6.42–7.30), indicating a more pronounced yellow colour component. Similarly, chroma (C) and hue angle (h°) values were numerically higher in thigh meat than in breast meat, reflecting a more saturated colour with a slightly different hue. However, no significant sex-related differences were observed for either parameter ($P > 0.05$).

The colour characteristics observed in the present study are consistent with those reported for other members of the Columbidae family. Pomianowski et al. (2009) reported relatively dark breast meat in domestic pigeons, while Włodarczyk et al. (2024) observed L^* values ranging from approximately 34 to 38 in the *pectoralis major* muscle of White King pigeons, depending on age. Similarly, Haščík et al. (2026) reported relatively low lightness values in wood pigeon (*Columba palumbus*) meat, reflecting the naturally dark colour typical of columbid species. These findings indicate that darker meat colour represents a characteristic feature of pigeon and dove muscles.

The relatively low L^* values observed in *S. decaocto* are consistent with the high oxidative capacity of avi-

an flight muscles and the associated myoglobin content. Darker meat colour is commonly reported in wild and semi-wild bird species and differs markedly from the lighter appearance typically observed in conventional poultry. Lan et al. (2025) highlighted that muscle type is one of the principal factors influencing colour variation in pigeon meat, together with age, genotype and production system.

From a practical perspective, the darker appearance of *S. decaocto* meat may influence consumer perception, particularly when compared with conventional poultry meat. However, such colour characteristics are typical of game birds and are often regarded as desirable attributes in niche markets.

Overall, the colour characteristics of *S. decaocto* meat were characterised by low lightness values and moderate redness, which are consistent with published data for pigeons and other wild avian species. The results indicate that muscle type exerts a greater influence on colour characteristics than sex.

CONCLUSION

The present study provides the first comprehensive characterisation of carcass traits, proximate composition, amino acid profile, fatty acid composition, lipid quality indices and colour characteristics of Eurasian collared dove (*S. decaocto*) meat. Overall, sex had only a limited effect on most evaluated traits, whereas more pronounced differences were associated with muscle type. Breast meat was characterised by a higher protein content and lower intramuscular fat concentration, while thigh meat contained higher levels of intramuscular fat and cholesterol. The amino acid profile was dominated by lysine, leucine and arginine

and was characterised by a high proportion of essential amino acids, indicating good protein quality. The fatty acid composition was characterised by a predominance of monounsaturated fatty acids, particularly oleic acid, while the calculated lipid quality indices (AI, TI and h/H) indicated a favourable lipid nutritional profile. Differences in colour characteristics between breast and thigh meats reflected the distinct physiological and functional characteristics of these tissues. When compared with published data for domestic pigeons and other members of the Columbidae family, the nutritional composition of *S. decaocto* meat was generally comparable and, in some respects, characterised by lower intramuscular fat content. The results indicate that Eurasian collared dove meat represents a lean source of high-quality animal protein with favourable nutritional properties. These findings contribute to the limited body of knowledge on the meat quality of wild columbid species and provide a basis for future studies focusing on the nutritional value, technological properties and potential utilisation of meat from free-living avian species.

REFERENCES

- Adawy A.M.G., Abdel-Wareth A.A.A. (2023): Productive performance and nutritional of domesticated pigeons. Present status and future concerns. *SVU-International Journal of Agricultural Sciences*, 5: 160–167.
- Akmal H., Ahmad S., Akram I., Shahzadi M., Ali S., Dita A., Mehmood A., Bukhash N., Ahmad I., Jaffari T.S., Shahzad K. (2023): Morphometry and food preference in relation to sex and hematological values of Eurasian collared dove (*Streptopelia decaocto*). *Journal of Advanced Veterinary and Animal Research*, 10: 244–248.
- Ali M.S.M., Abdel-Naeem H.H.S., Mansour H.A.-E., Zaki H.M.B.A. (2021): Fatty acids profiling of pigeon squabs (*Columba livia domestica*) using gas-liquid chromatography. *Journal of World's Poultry Research*, 11: 210–214.
- Camacho-Cervantes M., Schondube J.E. (2018): Habitat use by the invasive exotic Eurasian collared-dove (*Streptopelia decaocto*) and native dove species in the Chamela-Cuixmala region of West Mexico. *Wilson Journal of Ornithology*, 130: 902–907.
- Chang L., Tang Q., Zhang R., Fu S., Mu C., Shen X., Bu Z. (2023): Evaluation of meat quality of local pigeon varieties in China. *Animals*, 13: 1291.
- Chen J., Liu H. (2020): Nutritional indices for assessing fatty acids: A mini-review. *International Journal of Molecular Sciences*, 21: 5695.
- Coombs C.F.B., Isaacson A.J., Murton R.K., Thearle R.J.P., Westwood N.J. (1981): Collared doves in urban habitats. *Journal of Applied Ecology*, 18: 41–62.
- Haščík P., Pavelková A., Fik M., Bučko O. (2024): Meat performance and physicochemical evaluation of pigeon meat. *Journal of Microbiology, Biotechnology and Food Sciences*, 13: e10997.
- Haščík P., Fik M., Bučko O., Rajský M., Pavelková A. (2026): Meat performance and physico-chemical evaluation of wood pigeon (*Columba palumbus*) meat. *Agriculture & Forestry*, 72: 7–20.
- Kasperek M. (1996): (Dismigration und Brutarealexpansion der Türkentaube *Streptopelia decaocto*). *Journal für Ornithologie*, 137: 1–33. (in German)
- Kokoszyński D., Stęczny K., Żochowska-Kujawska J., Sobczak M., Kotowicz M., Saleh M., Fik M., Arpášová H., Hrnčár C., Włodarczyk K. (2020): Carcass characteristics, physicochemical properties, and texture and microstructure of the meat and internal organs of carrier and King pigeons. *Animals*, 10: 1315.
- Lan Y., He Q., Gibril B.A.A., Xu J., Shang H., Xiong X. (2025): Influencing factors and quality traits of pigeon meat: A systematic review. *Poultry Science*, 104: 105000.
- Marangoni F., Corsello G., Cricelli C., Ferrara N., Ghiselli A., Lucchin L., Poli A. (2015): Role of poultry meat in a balanced diet aimed at maintaining health and wellbeing: An Italian consensus document. *Food & Nutrition Research*, 59: 27606.
- Pavelková A., Fik M., Bučko O., Rajský M., Haščík P. (2026): The amino acid and fatty acid profile of California pigeons (*Columba livia*) meat. *Journal of Microbiology, Biotechnology and Food Sciences*, 15: e13572.
- Petracci M., Mudalal S., Soglia F., Cavani C. (2015): Meat quality in fast-growing broiler chickens. *World's Poultry Science Journal*, 71: 363–374.
- Pomianowski J.F., Mikulski D., Pudyszak K., Cooper R.G., Angowski M., Jóźwik A., Horbańczuk J.O. (2009): Chemical composition, cholesterol content, and fatty acid profile of pigeon meat as influenced by meat-type breeds. *Poultry Science*, 88: 1306–1309.
- Romagosa C.M., Mlodinow S.G. (2022): Eurasian Collared-Dove (*Streptopelia decaocto*). *Birds of the World*.
- Sakhawat A., Siddique S., Ali Z., Perveen Z., Habib-ur-Rehman, Massey H. (2023): Fatty acids and fat contents of wild and farmed pigeon meat. *Pakistan Journal of Science*, 75: 14–19.
- Sales J., Janssens G.P.J. (2003): Nutrition of the domestic pigeon (*Columba livia domestica*). *World's Poultry Science Journal*, 59: 221–232.
- Simopoulos A.P. (2002): The importance of the ratio of omega-6/omega-3 essential fatty acids. *Biomedicine & Pharmacotherapy*, 56: 365–379.

<https://doi.org/10.17221/50/2026-CJFS>

- Sule K., Adegbenro M., Akintomide A.A., Folorunso O.R., Onibi G.E. (2024): Comparative evaluation of meat quality parameters of domestic pigeons and selected conventional poultry species. *Animal Research International*, 21: 5650–5662.
- Ulbricht T.L.V., Southgate D.A.T. (1991): Coronary heart disease: Seven dietary factors. *The Lancet*, 338: 985–992.
- Vinayananda C.O., Kiran M., Fairoze M.N., Rongsensusang (2019): Alternative Poultry Meat as Source of Nutrition: An Overview. *Journal of Meat Science and Technology*, 7: 12–17.
- Wang X., Hu Y., Liu Y., Li C., Wang Z., Zhou J., Wang M. (2025): Multi-omics characterization of quality attributes in pigeon meat. *Foods*, 14: 3230.
- Wood J.D., Richardson R.I., Nute G.R., Fisher A.V., Campo M.M., Kasapidou E., Sheard P.R., Enser M. (2004): Effects of fatty acids on meat quality: A review. *Meat Science*, 66: 21–32.
- Włodarczyk K., Kokoszyński D., Żochowska-Kujawska J., Kotowicz M., Wegner M., Stęczny K., Arpášová H., Cebul-ska A. (2024): Age-related changes in carcass composition, physicochemical properties, texture and microstructure of meat from White King pigeons. *British Poultry Science*, 66: 212–217.
- Yang P., Song X., Wu W., Zhang L., Han Z., Wang X., Wang R., Yang M., Zhang Z. (2025): Nutritional profiling of breast muscle: A comparative study between Yuzhong pigeons and European meat pigeons. *Food Chemistry: X*, 25: 102157.

Received: March 30, 2026

Accepted: August 8, 2026

Published online: September 15, 2026