CMU Journal of Science
The Official Scientific Journal of Central Mindanao University
ISSN Print: 0116-7847 js.cmu.edu.ph ISSN Online: 2704-3703

Research Article

Comparative Analysis of Nutritional and Sensory Attributes in Aseel and Broiler Chicken

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ABSTRACT

The study compares the nutritional and sensory properties of Aseel and Broiler chicken meat, highlighting their high protein content and essential bioactive compounds. This study provides a detailed comparison of the quality and sensory properties of Aseel and Broiler chicken meat, contributing valuable insights into poultry meat production and consumption. Results indicated that Aseel chicken exhibited higher nutritional value, with elevated levels of minerals and protein (17.95%) and lower fat content (1.53%) than Broiler chicken, which had 15.46% protein and 1.95% fat. Additionally, Aseel chicken has lower Ash, moisture, water-holding capacity, and pH, indicating better oxidative stability. Its meat is darker, yellower, and redder with lower L* and higher a* and b* values. Aseel chicken muscles contain fatty acids like capric acid, pentacyclic, heptadecenoic acid, stearic acid, and arachidic acid, while broiler chicken has tricyclic acid, myristic acid, and palmitoleic acid. Aseel chicken scores higher for aroma, flavor, taste, and appearance, while broiler chicken excels in tenderness. This study underscores the superior nutritional and sensory attributes of Aseel chicken, promoting its potential in poultry meat production.

Keywords: Chicken meat, Aseel, Broiler, Fatty acid profile, Texture profile

Citation: Haris, M., Alvi A.S., Haq, S.M.A.U., & et al. (2024) "Comparative Analysis of Nutritional and Sensory Attributes in Aseel; and Broiler Chicken." CMU Journal of Science, 28(1), 100

Academic Editor: Mark Lloyd G. Dapar

Received: June 14, 2024
Revised: June 21, 2024
Accepted: June 22, 2024
Published: July 31, 2024

INTRODUCTION

Meat is animal flesh that is used as food by humans. Meat is important in fulfilling dietary requirements, serving as a major protein source. Meat is also a good source of essential vitamins and minerals (Lee et al., 2020). Meat consumption varies worldwide due to ethical, religious, environmental and health concerns related to meat production (Badar et al., 2021). Meat is one of the most nourishing, substantial and high-energy natural meals people eat to achieve their daily nutritional requirements (Lee et al., 2020). The consumption of poultry meat is rising consistently and significantly worldwide because of its dietary advantages and affordable prices compared to other types of meat. It is considered a major source of polyunsaturated fatty acids (PUFA)(Hailemariam et al., 2022). The meat muscle's water and protein proportion is generally 75% and 20%, respectively. The remaining 5% of the muscle comprises mixtures of lipids and minerals (Ahmad et al., 2018). Animal protein sources are not widely available in Pakistani diets. It is crucial to meet the need for animal protein in the country's population. In Pakistan, the poultry business is a growing and well-organized segment of the livestock industry. One of the most effective sources of animal protein is considered to be poultry meat due to its rapid expansion potential and greater feed conversion ratios. Pakistan now ranks 11^{th} in the world for production of chicken, producing 1.02 billion broilers annually (Jaspal et al., 2020). The economic survey of Pakistan for 2021–2022 estimates that 1977 million tonnes of poultry meat will be made during this year.

In Western countries, fish consumption is a crucial source of omega-3 fatty acids. A good source of these fatty acids may be found in poultry meat. Unsaturated triglycerides (found largely in the skin and easily removed), vitamins of the B-group (predominantly pyridoxine, thiamine, and pantothenic acid), minerals like zinc, copper and iron. Moderately consistent yet moderately high energy content make poultry flesh a valuable food (Ahmad et al., 2018)

In Pakistan, poultry birds are classified into the following main categories: commercial broiler, aseel/desi. Commercial broilers are specifically reared for meat production. Commercial broilers are generally raised in 35-40 days to attain a weight of 2.0 kg (Devatkal et al., 2019). Broiler chicken has been specifically developed to produce meat because broilers can be delivered to the market within 5 to 6 weeks. It offers more financial benefits. Farm households tend to increase broiler chicken production in response to the increased demand for chicken meat. Broiler chicken meat is less expensive and has great nutritional content, pleasant flavor, aroma, and soft texture (Lakshani et al., 2016).

Aseel/Asil birds are typically raised in 90 days without antibiotics or synthetic chemicals to attain a 1.0 kg weight. Meat from slow-growing breeds is healthier because of its low-fat content and high polyunsaturated fatty acid concentration. Furthermore, indigenous chicken breeds are more resistant to harsh climatic conditions such as high stocking density, heat stress and metabolic diseases (Jaspal et al., 2020). Aseel is a local chicken breed known for its fighting abilities, toughness, lean flesh and good meat and egg flavor. Aseel can be classified as a dual-purpose breed(Thavasi Alagan et al., 2020). Thus, the study's main objective is to compare the quality and sensory attributes of Aseel and broiler chicken to understand the better nutritional value and important quality traits of Aseel and broiler chicken.

MATERIALS AND METHODS

2.1 Sample Procurement and Animal Welfare

Aseel and broiler chicken samples were sourced from local farms in Punjab, Pakistan. Eight chickens, evenly split between both types, were selected based on average live Weight (1746.25 ± 32.48 g). Slaughtering followed Islamic guidelines and the University of Agriculture Faisalabad's Institutional Animal Care protocols. Chickens were scalded at 53°C, de-feathered, eviscerated, and washed. Chicken breast samples were collected and transported in ice-filled containers to the Meat Science and Technology Laboratory at the University of Agriculture Faisalabad, then stored at -18°C. Each homogenized breast meat sample was replicated three times for nutritional composition analysis.

2.2 Proximate Analysis of Chicken Meat

2.2.1 Moisture content

The moisture content of chicken meat samples was determined following the procedure mentioned in AOAC (AOAC, 1995). A 5g sample was dried in a China dish in a hot air oven at 100±5°C for 24 hours. After drying, the sample was cooled in a desiccator to prevent moisture reabsorption and then reweighed. Moisture content was calculated using the formula:

$$\text{Moisture (\%)} = \frac{\text{Weight of sample before drying} - \text{Weight of the sample after drying}}{\text{Weight of the sample before drying}} \text{x100}$$

2.2.2 Determination of Crude Fat

The crude fat in chicken meat samples was determined using the Soxhlet apparatus according to the procedure mentioned in AOAC (AOAC, 1995). After drying the sample in a hot air oven for 24 hours, 5g of the dried sample was powdered and enclosed in filter paper secured with staples. N-hexane solvent was used in a Soxhlet apparatus for 6 to 8 cycles to extract soluble fat. The sample was dried in a hot air oven at 60-80°C for 3-4 hours. The difference in Weight before and after drying was used to calculate fat content using a specific formula.

$$\text{Crude Fat (\%)} = \frac{W_1 - W_2}{W} \times 100$$

Where W_1=Weight of sample + Thimble wt. before drying; W_2= Weight of sample + Thimble wt. after drying; and W= Weight of sample

2.2.3 Determination of Crude Protein

Crude protein in the chicken meat sample was determined using the Kjeldhal apparatus following the procedure mentioned in AOAC (AOAC, 1995). In a digestion flask, 3g of chicken meat sample, one digestion tablet, and 30 H2SO4 were mixed until a light green appeared. After cooling, 100ml distilled water was added to dilute the sample. A mixture of 10ml diluted sample and 10ml 40% NaOH was distilled in a setup. In a separate beaker, 20ml 2% boric acid solution with indicator was prepared. The distillate turned golden yellow. Titration with 0.1N H2SO4 was conducted until a pink color appeared, noting the volume used. This volume was used in the calculation of the formula.

$$\text{Nitrogen (\%)} = \frac{\text{Vol. of 0.1N } H_2SO_4 \text{ used} \times \text{Vol. of dilution} \times 0.0014}{\text{Weight of sample} \times \text{Vol. of diluted sample}} \times 100$$

$$\text{Protein (\%)} = \text{Nitrogen(\%)} \times 6.25$$

2.3 Quality Analysis of Chicken Meat

2.3.1 Determination of pH

The pH of 10g of chicken meat was determined by calibrating a pH meter after homogenizing raw meat with 90 ml of distilled water according to the method of Ullengala *et al.* (Ullengala et al., 2020).

2.3.2 Color Analysis

The color of the chicken meat sample was determined with the help of a colorimeter by following the method of Cafferky *et al.* (Cafferky et al., 2019). The instrument was calibrated, and the meat sample was placed under the photocell of the calorimeter. The triplicate readings were used to determine the lightness (L*), redness (a*), and yellowness (b*) of chicken meat samples.

2.3.3 Water Holding Capacity (WHC)

WHC of the chicken meat sample was measured by following the method described by Ijaz *et al.* (Ijaz et al., 2020).

In a 50 ml centrifuge tube, 15g minced chicken meat and 22.5 ml 0.6M NaCl were stirred for 1 minute. The mixture stood at 4°C for 15 minutes, then transferred to new tubes and centrifuged at 5000 rpm for 10 minutes at 4°C. After centrifugation, the supernatant was removed. The residue in the tube was weighed and used in the subsequent formula.

$$\text{WHC (\%)} = \frac{W1 - W2 - W}{W} \times 100$$

Where, W = Weight of sample; W_1 = Initial weight; and W_2 = Final weight

2.3.4 Thiobarbituric Acid Reactive Substances (TBARS)

The TBARS in chicken meat sample was determined by following the method described by Zheng *et al.* (Zheng et al., 2019). In a sample tube, 2g chicken meat and 10ml 20% TCA in 10ml distilled water were vortexed for 2 minutes. After standing for 10 minutes, 3ml filtrate was mixed with 3ml 0.1% TBA solution. The mixture was boiled at 90°C for 35 minutes, then cooled. Optical density at 530nm was measured using a spectrophotometer against a blank. TBARS value as MDA/kg was calculated using the formula provided.

$$\text{TBA Value (mg MDA/kg)} = \frac{50 \times (\text{A} - \text{B})}{\text{m}}$$

Where A = Test solution's absorbance; B = Blank reagent absorbance; and m = Mass of the test.

2.3.5 Total Volatile Basic Nitrogen (TVBN)

The TVBN value of the chicken meat sample was analyzed using the method described by Nisar *et al.* (Nisar et al., 2019). A 10g chicken sample was homogenized with 100 ml distilled water and then filtered. 5ml filtrate and 5ml MgO (10g/L) were distilled. The distillate was absorbed in 20 ml 2% boric acid with a mixed indicator (0.1g methyl red, 0.1g methyl blue in 100 ml ethanol). Titrate against 0.1N H2SO4 to light pink endpoint. Note the acid volume used for titration. TVBN in chicken meat was calculated using the given formula.

$$\text{TVBN (mg \%)} = \frac{14 \times \text{N}(\text{X} - \text{Y})}{\text{S}} \times 100$$

Where, N = Normality of H_2SO_4; x = H_2SO_4 required for titration of samples; y = H_2SO_4 required for blank; and S = Weight of sample

2.3.6 Cooking Yield

30g chicken samples were weighed individually, sealed in plastic bags, and reweighed. Samples were heated in a 90°C water bath for 30 minutes, then cooled in a 25°C water container for 20 minutes before reweighing. The cooking yield of the samples was determined as described by Piao *et al.* (Piao et al., 2015).

$$\text{Cooking Yield(\%)} = \frac{\text{Weight of the sample after cooking}}{\text{Weight of the sample before cooking}} \times 100$$

2.3.7 Texture Profile Analysis

The texture profile analysis of the meat sample was performed using a texture analyzer (TX-700 Lamy Rheology) as described by Singh *et al.* (Singh et al., 2017). A 20g chicken meat sample was heated in a 90°C water bath for 30 minutes. The cooked meat was cut into 1cm³ pieces and placed on the texture analyzer stage. Using specified settings (blade number, speeds, maximum load), the software initiated the test, and the blade pierced the meat to obtain a force-deformation graph. The force and hardness values were recorded.

2.4 Nutritional Analysis

2.4.1 Mineral Analysis

Chicken meat was digested in a volumetric flask with HCl and HNO3 (7:3 ratio) on a hot plate for 3-4 hours until transparent, leaving 1-2ml residue. Volume was adjusted to 100-250ml with distilled water. Mineral content was analyzed using atomic absorption spectrophotometry at 4000nm wavelength. Standard solutions (5, 10, 15, and 20 ppm) were used, with burner flushing and zeroing between samples. Absorption plotted against µg/ml measured sample concentration.

2.4.2 Fatty Acid Profile

The fatty acid compositions of chicken meat were determined by a direct method for fatty acid methyl ester (FAME) synthesis with slight modifications, as described by Jaspal *et al.* (Jaspal et al., 2020). Three main processes were involved in fatty acid profiling. Fat extraction was done using the Soxhlet apparatus, and crude fat was extracted from chicken meat samples.

2.4.3 Fatty Acid Methyl Ester Preparation (FAMEs)

It involved two different procedures mentioned below –

2.4.3.1 Preparation of Methyl Esters using Boron Trifluoride

The fat sample (100ml flask) was mixed with 8ml methanolic NaOH and refluxed for 5-10 minutes until fat globules vanished. Then, 9ml BF3 solution was added via a condenser and boiled for 2 minutes. Hexane (5ml) was added via a condenser and boiled for 60 seconds. The flask was removed, and 15 standard NaCl solutions were added. Additional saturated NaCl solution floated hexane layer (1ml) transferred to a small bottle, Na2SO4 added to remove water.

2.4.3.2 Preparation of Methyl Ester using Sodium Methoxide Method

The chicken meat sample was weighed into a vial by a pipette. Then, 5 ml hexane was added to a sample vial and vortexed for 2 minutes. A saturated solution of 5 ml NaCl was added to the vial, sealed completely, shaken for 15 seconds, and kept for 10 minutes. The hexane layer was removed from the sample vial, transferred to another with a small amount of Na_2SO_4, and kept for 15 minutes before G.C. analysis.

2.4.4 Gas Chromatography (G.C.) Analysis

Operating conditions were adjusted for analysis, and the column and syringe were rinsed three times before injecting the sample into the port with hexane. The same procedure was followed with a reference standard mixture (25mg of 20A GLC reference standard FAME dissolved in 10 mL hexane). After washing it three times with hexane, 1 ml of standard FAME solution was injected via a syringe. The sample solution was prepared with methanol, and 0.5-4µl was injected through the septum into the port.

2.4.5 Sensory Analysis

Sensory characteristics were determined by trained panelists using a 9-point hedonic scale following the procedure as described by Meilgaard *et al.* (Meilgaard et al., 1999).

2.6 Statistical Analysis

The significance level of the obtained data was analyzed using a completely randomized design (CRD) as described by Montgomery *et al.* (Montgomery, 2017). The results are presented as mean ± standard deviation of the mean.

RESULTS AND DISCUSSION

3.1 Proximate analysis

3.1.1 Moisture content

Table 1 shows the moisture content of steel and broiler chicken breast meat. There was a significant difference in moisture content between the two types. With higher moisture, broiler breast muscle was tender, while Aseel chicken muscle, lower in humidity, was harder. This aligns with findings by Haunshi *et al.* (Haunshi et al., 2022) that chicken meat typically has 70-80% moisture. Indigenous breast muscle had lower moisture than broiler breast muscle, with thigh muscle showing minimal difference.

3.1.2 Crude Fat

Table 1 displays the crude fat content of broiler and steel breast muscles. There was a significant difference in fat content between the two breeds. Broiler breast muscles contained more fat compared to steel. Adequate fat is crucial for muscle fiber growth, vitamin retention, and normal metabolic function. These results are relevant to those reported by Haunshi *et al.* (Haunshi et al., 2022). Rajkumar *et al.* (Rajkumar et al., 2017) also examined the crude fat content of the native and broiler thigh and breast muscles. Broiler chicken muscles were found to have a high concentration of oil fat. The crude fat content of both types of chicken was different from one another.

3.1.3 Crude Protein

The mean values of crude protein in aseel and broiler chicken are shown in Table 1. The results showed that the difference in oil protein of breast muscle was highly significant among both breeds. Aseel breast contained more crude protein than broiler breast. The high amount of protein content indicates the high nutritional value of meat. It plays a vital role in the growth and development of muscle cells and tissues. It provides strength to muscles and helps support and move the body. The current study's findings were very similar to the previous survey of Ullengala *et al.* (Ullengala et al., 2020), who found that the two breeds had significantly different amounts of protein. According to Capan *et al.* (Çapan and Bağdatli, 2021), the protein content of broiler breast muscles was 16.08% and 20.62% of indigenous chicken, respectively.

3.1.4 Ash

The amount of Ash in the breast muscle of both asteeland broiler aispresented in Table 1. The results indicated a highly significant difference between the two breeds regarding the amount of Ash contained in the breast muscle. Aseel breast contained less ash content than broiler breast. The results of the present study were relevant to the study of Wideman *et al.* (Wideman et al., 2016), who concluded that the two breeds have comparable ash percentages in their breast and thigh muscles.

Table 1**.** Results of moisture, crude fat, crude protein and ash content of broiler/aseel breast muscle (data represented mean ± standard deviation)

Treatments	Variety	Moisture	Ash	Crude Fat	Crude Protein
Breast	Aseel	72.35 ± 0.02^{a}	1.73 ±0.02^{a}	1.53 ±0.03^{b}	17.95 ±0.03^{a}
	Broiler	76.84 ± 0.02^{a}	1.91 ±0.02^{a}	1.95 ±0.02^{a}	15.46 ±0.03^{b}

3.2 Quality Analysis of Chicken Meat

3.2.1 pH

The pH of Aseel and broiler chicken meat is shown in Table 2. The results indicated a significant difference in the pH of the breast muscle between the two breeds. Poultry meat with a low pH value of broiler is related to the low water holding capacity, which ultimately increases drip loss (Khan et al., 2019). The pH value of the broiler breast muscle was higher than that of the Aseel breast muscle. The mean pH values in the present study were near those observed by Khan *et al.* (Khan et al., 2019) for commercial broilers after 15 minutes of slaughter.

3.2.2 Water Holding Capacity

The holding capacity of Aseel and broiler chicken are shown in Table 2. The results showed that the difference in WHC of breast muscle was highly significant among both breeds. The broiler chicken had more WHC than the Aseel chicken. The high WHC value indicates good quality meat, probably due to intact protein structure, as suggested by Abdullah *et al.* (Abdullah et al., 2010). The present study's findings were similar to those of Devatkal *et al.* (Devatkal et al., 2019), who concluded relevant results regarding broiler and Aseel.

3.2.3 Thiobarbituric Acid Reactive Substances (TBARS)

The TBARS values of Aseel and breast chicken are shown in Table 2. The results showed that the difference in TBARS of breast muscle was highly significant among both breeds. Aseel breast contained less TBARS value than that of broiler breast. TBA value determines the extent of deterioration in meat quality during storage. The low value of TBARs indicates the good quality of meat. The findings were comparable to the study of Abdullah *et al.* (Soni et al., 2018). The result validates well with the conclusions of Ali *et al.* (Ali et al., 2022) in chicken breast meat during storage at refrigeration temperature.

3.2.4 Total Volatile Basic Nitrogen (TVBN)

The results showed that the difference in the TVBN value of breast muscle was highly significant among both breeds. Broiler breast contained more TVBN than aseel breast. TVBN is an important index to determine the degree of freshness and quality of lean meat. The current study's findings were similar to those of Kokoszynski *et al.* (Kokoszyński et al., 2016), who found comparable results for steel and broiler. The results were comparable to those obtained in Mancinelli *et al.*'s studies (Mancinelli et al., 2021).

Table 2. The results of pH, water holding capacity, TBARS, TVBN of broiler/aseel breast muscle

Treatments	Variety	pH	Water Holding Capacity	TBARS	TVBN
Breast	Aseel	5.55 ± 0.03^{b}	62.66 ± 0.03^{b}	0.33 ± 0.02^{b}	37.14 ± 0.03^{b}
	Broiler	5.65 ± 0.03^{a}	64.86 ± 0.02^{a}	0.76 ± 0.02^{a}	41.04 ± 0.03^{a}

3.2.5 Color Analysis

The mean values of color (L*, a*, and b*) are presented in Table 3. Breast muscles of both breeds showed significant differences in lightness (L*), redness (a*), and yellowness (b*) according to analysis of variance of muscle color. Low L* values were observed in the breast muscles of both breeds. The appearance or color of the food is the first impression perceived by the consumer, which is also a main determinant of food quality. The current research results were similar to the observations of Barbut *et al.* (Barbut and Leishman, 2022), who found significant results for both breeds' L*, a*, and b* values. They reported that meat from breeds for speedy development also tends to be pale in color (higher L*) due to a lack of the heme pigment that normally increases with age. According to Ullengala *et al.* (Ullengala et al., 2020), the different types of muscle fibers may account for the varying degrees of redness between genotypes.

Table 3. The results of lightness, redness and yellowness of broiler/aseel breast muscle

Treatments	Variety	Lightness (L*)	Redness (a*)	Yellowness (b*)
Breast	Aseel	48.95 ± 0.02^{a}	2.14 ± 0.02^{b}	3.36 ± 0.02^{b}
	Broiler	46.75 ± 0.03^{b}	5.45 ± 0.02^{a}	11.44 ± 0.03^{a}

3.2.6 Cooking Loss

The mean values for cooking loss of aseel and broiler breast muscles are given in Table 4. The result showed that the difference in cooking loss of breast muscle was highly significant among both breeds. Aseel breast had more cooking loss than broiler breast. High values of cooking loss indicate the lower quality of meat. The current study's findings are consistent with those of Jin *et al.* (Jin et al., 2021), who found statistically significant results for the differences in cooking loss. Papadomichelakis *et al.* (Papadomichelakis et al., 2019) conclude that the cooking loss percentage of Indigenous birds was higher than that of broiler birds. Castellini *et al.* (Castellini et al., 2006) reported more protein lost during cooking in organic or free-range chicken than in commercial broiler chicken. This may be because organic chicken has a lower ultimate pH than commercial broiler chicken.

3.2.7 Texture Profile Analysis (TPA)

The texture Profile **(**cohesiveness, gumminess, chewiness, and hardness) of steel and broiler breast muscle is shown in Table 5. The result showed that the difference in TPA of breast muscle was highly significant among both breeds. The mean values for cohesiveness, gumminess, chewiness, and hardness of steel breast were higher than broiler breast muscle. The results of this study were related to the findings of Jung *et al.* (Jung et al., 2011), who found similar results for aseel and broiler.

Table 4. The results of cooking losses and texture profile (cohesiveness, gumminess, chewiness, and hardness) of breast muscle

Treatments	Variety	Cooking loss	Texture profile			
			Cohesiveness	Gumminess	Chewiness	Hardness
Breast	Aseel	28.66 ± 0.03^a	5.13 ± 0.02^a	1.84 ± 0.02^a	1.57 ± 0.02^a	0.37 ± 0.02^a
	Broiler	24.34 ± 0.03^b	3.85 ± 0.03^b	1.44 ± 0.03^b	1.25 ± 0.02^b	0.25 ± 0.02^b

3.3 Nutritional Analysis

3.3.1 Mineral Content

The mean values of mineral content in steel and broiler chicken are shown in Table 5. In the present study, the mineral content of aseel chicken was more significant than broiler chickens. The mean values for sodium, potassium, phosphorus, and magnesium were higher in assel chicken than in broiler chicken. Other minerals were also higher in the aseel breast than in the broiler breast. Minerals act as activators of hormones and enzymes; they are necessary for the maintenance of acid-base balance (sodium (Na), potassium (K), and chloride (Cl)), and they are required for osmotic homeostasis. Many physiological processes, including growth, depend on trace minerals. The current research results were close to Fanatico *et al.* (Fanatico et al., 2005), who observed similar results for Aseel and Broiler, namely that the predominant minerals were higher in the desi breed than the broiler.

Table 5. The results of sodium, magnesium, phosphorus, and potassium of broiler/aseel breast muscle

Treatments	Variety	Sodium	Potassium	Phosphorus	Magnesium
Breast	Aseel	72.65 ± 0.03^a	326.65 ± 0.03^a	196.46 ± 0.03^a	29.65 ± 0.02^a
	Broiler	69.45 ± 0.04^b	323.86 ± 0.03^b	194.66 ± 0.03^b	27.36 ± 0.03^b

3.3.2 Fatty Acid Profile

The fatty acid profile of Aseel and broiler chicken is shown in Table 6. In the present study, the fatty acid profile of the Aseel chicken was more significant than that of the broiler chicken. Fatty acids such as capric acid, pentacyclic acid, oleic acid, stearic acid and arachidic acid were found only in aseel chicken muscles. In contrast, tricyclic, myristic, and palmitoleic acids were found only in broiler muscles. Short-chain fatty acids were common in both breeds, like butyric acid, caproic acid, and caprylic acid. Some long-chain fatty acids, like margaric acid, elaidic acid, and eicosadienoic acid, were also common. Aseel chicken breast muscles were higher for saturated fatty acids and a lower percentage of polyunsaturated fatty acids than broiler chicken muscles. There was no difference between the muscles for total monounsaturated fatty acids.

Cherian *et al.* (Cherian et al., 2023) also discovered that the fatty acid profile of the muscle in a desi chicken differed from that of a broiler. Fatty acids such as alpha-linolenic acid, eicosadienoic acid and mead acid were found only in broiler chicken muscles, while capric acid and C24:1 were found only in desi chicken muscles. The different fatty acid composition of muscles probably affects stability and flavor. According to some reports, unsaturated fatty acids and other meat components may differ in chickens fed the same diet (El-Tarabany et al., 2022).

Table 6. Fatty acid profile of aseel and broiler breast muscle

Fatty Acid	**Aseel**		**Broiler**	
	RT	**%**	**RT**	**%**
Butyric acid	2.17	1.7	-	-
Caproic acid	3.84	0.22	3.23	0.73
Caprylic acid	4.69	0.28	4.22	0.45
Capric acid	6.82	0.24	-	-
Lauric acid	11.26	0.81	11.11	11.35
Tridecylic acid	11.94	4.78	11.73	5.14
Myristic acid	-	-	15.14	6.35
Pentadecylic acid	-	-	-	-
Pentadecenoic acid	15.35	5.13	-	-
Palmitic acid	-	-	16.78	7.97
Palmitoleic acid	-	-	14.54	5.30
Margaric acid	17.46	3.67	17.23	6.82
Heptadecanoic acid	-	-	-	-
Stearic acid	22.77	1.14	-	-
Elaidic acid	24.89	14.7	-	-
Oleic acid	25.66	23.8	25.34	27.97
Archaic acid	30.93	-	-	-
Cetoleic acid	31.76	2.42	30.22	3.51
Eicosadienoic acid	32.45	3.91	32.66	0.89

**RT = Retention Time*

3.3.3 Sensory Analysis

The appearance of the meat is the single most important factor among all other quality characteristics that play a role in consumer choice. Texture is the most significant key to meat quality in terms of customer satisfaction. The color of the meat is an essential quality attribute, not only for consumers to select fresh meat but also for the acceptance of meat products at the time of consumption (Mancinelli et al., 2021).

The sensory score of steel and broiler chicken is shown in Table 7. The results showed that flavor, color, taste, texture, and overall acceptability differences were highly significant among both breeds. The mean value for flavor is higher in aseel chicken than in broiler chicken. Panelists preferred aseel chicken due to its intense flavor and aroma. Similarly, the mean value for color, taste texture and overall acceptability of broiler was lower than that of for aseel, as mentioned in Table 7. The aseel chicken meat was preferred due to more flavor intensity and more taste, and some panelists preferred broiler chicken due to more tenderness and juiciness.

Although the Aseel meat was tough, its acceptability was significantly higher, indicating a preference for it. Meat from native chickens is more popular than commercial broilers due to its distinct flavor and firm texture (Çapan and Bağdatli, 2021).

Table 7. The results of flavor, color, taste, texture, and overall acceptability of cooked meat

Treatments	**Flavor**	**Color**	**Taste**	**Texture**	**Overall Acceptability**

Aseel	8.65 ± 0.03[a]	8.53 ± 0.02[a]	8.75 ± 0.03[a]	7.87 ± 0.02[a]	8.55 ± 0.02[a]
Broiler	6.75 ± 0.02[b]	6.47 ± 0.03[b]	7.35 ± 0.02[b]	5.97 ± 0.02[b]	6.55 ± 0.03[b]

CONCLUSION

The study compared the nutritional and sensory qualities of broiler and Aseel chicken. Aseel breast muscle exhibited higher crude protein, saturated fatty acids, and mineral content, while broiler breast muscle had higher pH, water-holding capacity, TBARs, and TVBN values. Texture analysis and sensory scores indicated significant qualities for both types. Overall, Aseel chicken is considered superior due to its unique flavor, lower fat content, and higher protein levels, making it a healthier option.

Author Contributions: Muhammad Haris, Syed Muhammad Abrar Ul Haq: Conceptualization, Writing - Original draft, Methodology, Investigation, Formal analysis, Data curation. **Adeel Shahzad Alvi, Saadullah Jan Khan, Shah Zaib Fareed**: Writing - Original draft, Methodology, Formal analysis, Data curation. **Md Afsar Ahmed Sumon**: Writing - Original draft, Writing – Review & Editing, Supervisor, Validation.

Funding: This research received no external funding.

Data Availability Statement: The data are available from the corresponding author upon request.

Acknowledgments: This research did not receive a specific grant from any funding agencies.

Conflicts of Interest: The authors declare no conflict of interest.

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