Scientific Research Publishing

Journal of Biosciences and Medicines, 2026, 14(8), 282-293
https://www.scirp.org/journal/jbm
ISSN Online: 2327-509X
ISSN Print: 2327-5081

Influence of Age on the Physicochemical, Nutritional and Sensory Properties of Indigenous Dog Meat from Concealed Cynophagy Practices in Northern Benin

Florence Y. O. Akpo[1], Polycarpe Ulbad Tougan[2*], Mendinatou Agbetou[1], Koudous A. Akambi[2], Reine S. Ahouanto[2], Hortense O. M. Odounlami[2], Larissa Atchade[2], Luc Falola[2], Adrien Hodonou[1]

[1]Research Unit of the Institute of Nursing and Obstetrical Sciences of the University of Parakou, Parakou, Benin
[2]Department of Nutrition and Agro-Food Sciences, Faculty of Agronomy, University of Parakou, Parakou, Benin
Email: *ulbad.tougan1@gmail.com

How to cite this paper: Akpo, F.Y.O., Tougan, P.U., Agbetou, M., Akambi, K.A., Ahouanto, R.S., Odounlami, H.O.M., Atchade, L., Falola, L. and Hodonou, A. (2026) Influence of Age on the Physicochemical, Nutritional and Sensory Properties of Indigenous Dog Meat from Concealed Cynophagy Practices in Northern Benin. *Journal of Biosciences and Medicines*, **14**, 282-293.
https://doi.org/10.4236/jbm.2026.148025

Received: July 11, 2026
Accepted: August 23, 2026
Published: August 26, 2026

Abstract

In spite of the risk of zoonoses, cynophagy is increasing as a hidden dietary practice in Northern Benin. The present study aimed to evaluate the variation in proximate composition, technological properties, and sensory quality of dog meat in relation to age. Methodologically, thirty composite samples of the longissimus dorsi muscle were collected from indigenous dogs of 12, 36, and 60 months old and analyzed following AOAC procedures. The results revealed that rhelogical and technological characteristics were strongly influenced by age. The values of pH didn't vary according to the animal age and ranged from 6.48 to 6.52, but drip loss declined from 1.25% at 12 months to 1.14% at 36 months and 1.21% at 60 months ($p = 0.001$). Similarly, cooking loss decreased from 25.86% at 12 months to 24.71% at 60 months ($p = 0.002$), while water-holding capacity declined from 27.11% to 25.92% ($p = 0.001$). Meat color was also affected, with lighter meat (L*) at 12 months (39.74 vs. 38.48 - 38.47 at 36 - 60 months; $p < 0.001$) and greater redness (a*), yellowness (b*), and chroma values in older animals ($p < 0.01$). The proximate analysis revealed no significant differences ($p > 0.05$) in dry matter (38.9 to 39.5 g/100g), protein, and ash contents across age groups. The fat content declined significantly with age ($p = 0.015$). Sensory evaluation indicated that the meat samples from animal of 36 months old were most appreciated ($p < 0.05$). However, the practice of cynophagy could be avoided.

Keywords

Benin, Age, Cynophagy, Rheological Traits, Meat Quality, Health Risk

1. Introduction

Meat is a source of protein and contains important micronutrients, including iron and B-complex vitamins [1] and serves as a marker of culture and identity [2] [3]. The choice of species is not random, and some meats are more frequently subject to dietary prohibitions despite their market value [4]. These prohibitions vary across cultural and geographic contexts and remain socially debated [2]. Two theoretical approaches explain these practices: functional and symbolic [2] [4]. The functional approach links consumption to nutritional, ecological, or health benefits, rejecting species associated with disease, such as pork in Jewish tradition to prevent trichinosis [5]. The symbolic approach emphasizes cultural or religious significance, with animals regarded as impure, sacred, or profane, such as cows in India or certain animal species in Africa [5] [6].

Dog consumption, or cynophagy, derives from the Greek kynós ("dog") and phagos ("to eat") [2]. This practice has varied over time and across cultures. Dogs, the first animals domesticated by humans, were likely initially tamed for food purposes [2]. Historical accounts also document dog meat consumption in ancient Rome, pre-Columbian Americas, medieval Europe, and more recently in France and Germany [2]. In subsaharan Africa, cynophagy existed by the end of prehistory and persists today in some countries in West Africa such as Nigeria, Burkina Faso, Togo, Benin, etc. [2] [3]. Despite social stigma in these regions, the trade, slaughter, and consumption of dog meat are increasing globally in the food systems [2] [3] [7] [8]. Motivations include cultural, ritual, nutritional, and medicinal beliefs [9]. Stray dogs are typically grouped and transported to slaughter facilities for human consumption [9] [10]. Although dogs are widely regarded as companion animals, their consumption continues in rural communities and periurban zones in Northern Benin under concealed dietary practices [3]. In Northern Benin, [3] reported that both local and exotic dog breeds are consumed. These nonconventional domestic animals are generally slaughtered at different ages under unsafe conditions despite the risk of zoonosis.

Non genetic factors such as age, rearing management, health status, and slaughter methods can influence meat quality and zoonotic risk [3] [9] [11]. In northern Benin, hidden cynophagy increases despite the known health hazards [12]. Dogs are sometimes raised specifically for meat in villages, with dedicated dog meat markets and slaughtering units in towns such as Natitingou and Parakou.

The present study was undertaken to evaluate the influence of age on the chemical composition and quality attributes of local dog meat consumed in Benin. Specifically, it is to:

- Assess the rheological and technological properties of meat from local dogs at different ages;
- Determine the impact of age on the proximate chemical composition and sensory characteristics of local dog meat.

2. Materials and Methods

2.1. Study Area

This study was conducted at dog slaughterhouses in Parakou, Borgou Department (Figure 1), and at the Central Laboratory for Food Safety of the Beninese Food Safety Agency (LCSSA/ABSSA) in Cotonou. Sensory and technological analyses were performed at the Quality and Safety of Agro-Food Products Unit (LARAEQ), University of Parakou.

Borgou Department is located in northeastern Benin between 8˚52' and 10˚25' North latitude and 2˚36' and 3˚41' East longitude, covering 25,856 km^2. The climate is Sudanese, with a dry season from November to May and a rainy season from June to October, with annual rainfall ranging from 900 to 1200 mm [13]. As in Alibori Department, the Harmattan winds blow from December to February.

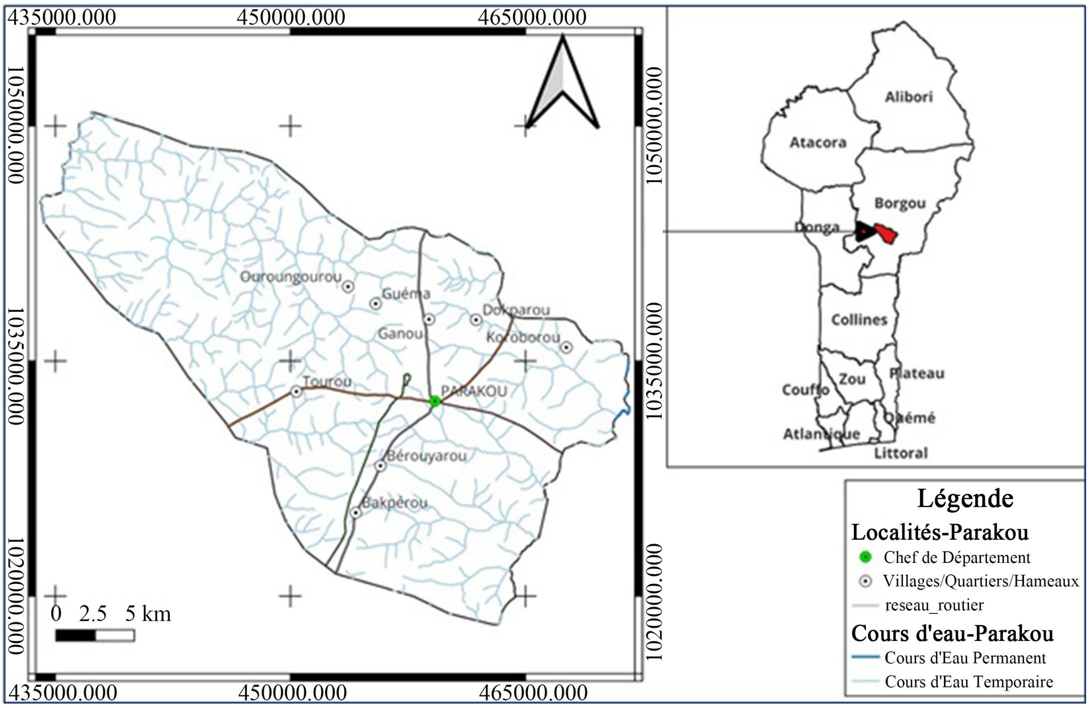

Figure 1. Study area.

2.2. Meat Sampling

The study involved 30 indigenous dogs at 3 different age-types (12 months, 36 months, 60 months). Animals were classified into three age categories (12, 36, and 60 months) using information provided by animal owners and meat traders. The study protocol was conducted in accordance with the ethical principles governing the use of animal-derived biological materials for research. Ethical approval was obtained from the Institutional Research Ethics Committee of the University of Parakou/Faculty of Agronomy (Approval No.: 0067_-2025/UP-FA-DNSAA/CD/CDA). Prior to sample collection, authorization was obtained from the owners and operators of the slaughter sites where dogs were processed for human consumption. Because the study involved meat collected after routine slaughter and did not require additional handling or sacrifice of animals for experimental purposes, no intervention was performed on live animals. About the slaughtering process, dogs were bled and skinned according to the slaughtering diagram described by [3]. Carcasses were processed and thirty (30) composite samples of the *Longissimus dorsi* muscle were collected (10 per age-type) from the processed indigenous dogs for the meat quality analysis. During sampling, all personnel complied with standard biosafety procedures to minimize potential zoonotic risks. Disposable gloves, laboratory coats, face masks, and sterile sampling instruments were used throughout the collection process. Meat samples were individually packaged in sterile polyethylene bags, transported under refrigerated conditions (4˚C), and processed according to established laboratory biosafety guidelines.

2.3. Rheological and Technological Attributes Assessment

The rheological and Technological attributes analyzed included color (CIE Lab*), drip loss, cooking loss, and water-holding capacity (WHC) and pH. Color was determined according to CIE Lab* standards: L* (lightness), a* (redness), b* (yellowness). Saturation (C) and hue (h) were calculated as $C = (a*^2 + b*^2)^{1/2}$;

H* = 1/Tan(b*/a*). Five repetitions were conducted per sample. The water-holding capacity was determined as described by [3].

Drip loss was measured on post-mortem muscle samples, which were tied with wire and placed in Stomacher bags (without contact between meat and bag) at 4˚C for 24 hours. Drip loss was expressed as a percentage of initial weight [3].

Samples were then vacuum-sealed and cooked at 95˚C in a water bath for 60 minutes. After cooking, samples were cooled under running water, wiped, and weighed. Cooking loss was expressed as a percentage of initial weight [3] [14]. Drip and cooking losses together represent the water holding capacity. The drip loss, the cooking loss and the water holding capacity were calculated by using the following formula:

$$\text{Drip loss}(\%) = \frac{(\text{Initial weight of meat sample} - \text{Final weight after drip process})}{(\text{Initial weight of meat sample}} \times 100$$

$$\text{Cooking loss}(\%) = \frac{(\text{Initial weight of meat sample} - \text{Final weight after cooking process})}{(\text{Initial weight of meat sample}}$$

$$\text{WHC}(\%) = \text{Drip loss} + \text{Cooking loss}$$

pH was measured 24 hours post-slaughter using a HANNA portable pH meter with a muscle-specific probe on the Longissimus dorsi, with 3 repetitions per sample [3].

2.4. Macronutrient Composition Analysis

Proximate analyses were performed according to standard procedures of [15] and

[3]. Dry matter content was determined by drying muscle at 105˚C until constant weight. Ash content was measured gravimetrically by incinerating 3 - 5 g of meat at 550˚C. Crude protein was determined via Kjeldahl method, converting nitrogen content (N) to protein. Fat content was determined according to [16] through HCl treatment, filtration, fat extraction, and calculation [3]. Two repetitions were performed per measurement.

2.5. Sensory Quality Assessment

Cooked meat samples from each age group were evaluated by a trained panel of 10 members. The samples were cut into uniform cubes and served sequentially on coded plates. The panel members evaluated five key sensory attributes of the meat [3]: tenderness, juiciness, taste, flavor intensity, and overall acceptability. These attributes were rated on a 1 - 5 scale.

2.6. Statistical Analyses

Statistical analyses were conducted using SAS (2006). Means were calculated using PROC MEANS. The Proc GLM procedure of SAS Software was used for variance analysis. The significance of the effect of slaughtering age was evaluated by using the Student's t-test.

3. Results

3.1. Effect of Age on Proximate Composition of Dog Meat

The variation of the chemical composition of dog meat according to age is presented in Table 1. It appears that the dry matter and protein contents don't vary significantly between 12, 36, and 60 months ($p > 0.05$). Indeed, the dry matter of dog meat of 12, 36 and 60 months olds varies between 38.9 and 39.5 g/100g. In contrast, fat content decreases significantly with age ($p = 0.015$), from 19.51% at 12 months to 18.83% at 60 months, indicating a progressive mobilization of lipid reserves or reduced fat accumulation in older animals. Ash content does not vary significantly with age ($p = 0.522$), reflecting a relatively constant mineral content. Overall, age has little influence on the chemical composition of meat, except for fat content, which tends to decrease with aging.

Table 1. Effect of age on proximate composition of dog meat.

Variable	Dog of 1 year	Dog 3 years	Dog of 5 years	Age effect (p-value)
	Mean ± SE	Mean ± SE	Mean ± SE	
Dry Matter (%)	39.49 ± 0.14	39.36 ± 0.15	38.99 ± 0.22	0.129
Crude Protein (%)	18.53 ± 0.12	18.67 ± 0.19	18.99 ± 0.16	0.130
Fat (%)	19.51 ± 0.16	19.07 ± 0.07	18.83 ± 0.20	0.015*
Ash (%)	0.90 ± 0.01	0.89 ± 0.02	0.93 ± 0.03	0.522

*: $p < 0.05$.

3.2. Variation of Rheological and Technological Properties of Dog Meat According to the Age

The rheological and technological properties of dog meat at 12 months, 36 months and 60 months are given in Table 2. The pH values of the meat at the various ages are similar and vary between 6.48 and 6.52 ($p = 0.851$). In contrast, water losses differ significantly with the slaughtering age. The highest drip loss of the meat is recorded at 12 months (1.25%) to the respective values of 1.14% and 1.21% at 36 months and 60 months ($p = 0.001$). Cooking loss also decreases with age (25.86% at 12 months vs 24.71% at 60 months, $p = 0.002$), indicating lower water retention in older animals. Similarly, water holding capacity increases from 27.11% in young dogs of 12 months to 25.92% at 60 months ($p = 0.001$).

Rheologically, the luminance (L*) of the meat at 12 months (39.74) is significantly higher than the values found at 36 and 60 months (38.48 and 38.47, respectively, $p < 0.001$), indicating lighter meat in younger animals. Redness index (a*) and chroma (C*) increased with age ($p < 0.01$), reflecting more intense color in older dogs. The yellowness (b*) and the hue (H*) values also vary significantly with age with the more important values recorded at 60 months ($p = 0.010$). These results indicate that age of the animals significantly affects technological characteristics, particularly color (CIE, L*, a*, b*), drip loss, cooking loss and water holding capacity.

Table 2. Effect of age on rheological and processing properties of dog meat.

Variable	Dog of 1 year	Dog 3 years	Dog of 5 years	Age effect (p-value)
	Mean ± SE	Mean ± SE	Mean ± SE	
pH	6.50 ± 0.02	6.48 ± 0.03	6.52 ± 0.02	0.851
Drip loss (%)	1.25 ± 0.02	1.14 ± 0.03	1.21 ± 0.01	0.001**
Cooking loss (%)	25.86 ± 0.28	25.20 ± 0.17	24.71 ± 0.14	0.002**
WHC (%)	27.11 ± 0.28	26.34 ± 0.17	25.92 ± 0.13	0.001**
Luminance L*	39.74 ± 0.15	38.48 ± 0.28	38.47 ± 0.23	0.000***
Red index a*	18.14 ± 0.19	18.63 ± 0.16	19.24 ± 0.36	0.015*
Yellow index b*	9.32 ± 0.18	9.00 ± 0.16	9.70 ± 0.09	0.010*
Chroma C*	18.65 ± 0.18	19.11 ± 0.15	19.74 ± 0.35	0.013*
Hue H*	1.78 ± 0.05	1.91 ± 0.04	1.81 ± 0.05	0.146

WHC: Water Holding Capacity. ***represents $p < 0.001$; **represents $p < 0.01$; *represents $p < 0.05$.

3.3. Effect of Age on the Sensory Attributes of Dog Meat

The effect of age on the organoleptic quality of dog meat is given in Table 3. Flavor intensity increases significantly with age, from 4.25 at 12 months to 4.69 at 60 months ($p < 0.001$). Texture is rated best at 36 months (4.70 versus 4.53 at 12 months and 4.33 at 60 months, $p = 0.008$), suggesting an optimal balance between tenderness and firmness at this age. Taste follows a similar trend, with a significant preference for meat from animals of 36-month-old (p = 0.004). Color or appearance is considered most attractive at 36 months (4.40 versus 4.10 and 4.13, p = 0.041). Finally, the highest overall acceptability is noted at 36 months (4.63, p < 0.001), confirming that this age represents the most favorable period for consumption according to the sensory criteria.

Table 3. Effect of age on sensory quality of dog meat.

Variable	Dog of 1 year	Dog 3 years	Dog of 5 years	Age effect (p-value)
	Mean ± SE	Mean ± SE	Mean ± SE	
Flavor	4.25 ± 0.06	4.35 ± 0.06	4.69 ± 0.03	0.000***
Tenderness	4.53 ± 0.09	4.70 ± 0.06	4.33 ± 0.08	0.008**
Taste	4.35 ± 0.08	4.58 ± 0.04	4.28 ± 0.06	0.004**
Color	4.10 ± 0.10	4.40 ± 0.06	4.13 ± 0.10	0.041*
Acceptability	4.35 ± 0.04	4.63 ± 0.06	4.28 ± 0.06	0.000***

***represents p < 0.001; **represents p < 0.01; *represents p < 0.05.

4. Discussion

4.1. Effect of Age on Proximate Composition of Dog Meat

The proximate composition of dog meat shows little variation with age. Dry matter, protein, and ash contents remain relatively stable across age groups. However, fat content tends to decrease progressively as animals get older. This reduction in intramuscular fat with age may reflect altered lipid metabolism and lower fat deposition in older animals, a pattern previously reported in cattle meat quality [17]-[19] and in poultry meat [20] [21]. Ash content remained stable across ages, indicating consistent mineral levels.

The proximate composition values obtained in the present study are generally close to those reported by [3], with the exception of fat content, which was considerably lower than 21 g/100g. In their study, these authors reported dry matter contents ranging from 38.87% to 39.11%, protein content of 19.02%, fat content of 21.1%, and ash content of 0.85%. The difference observed in fat content may be attributed to the type of muscle samples analyzed. [3] used composite samples from thigh, back, and shoulder muscles of two different dog genotypes, whereas in the present study, only the Longissimus dorsi muscle of the indigenous breed was analyzed.

According to [22], the decrease in intramuscular fat content with age can be explained by changes in energy metabolism and muscle physiology. Younger animals tend to deposit more intramuscular lipids as part of growth and energy storage, contributing to marbling. As animals mature, lipid deposition shifts toward subcutaneous and visceral depots, while muscle fibers become more metabolically active, mobilizing intramuscular lipids for maintenance and activity [22]. This redistribution leads to leaner meat in older animals [3] [19]. Furthermore, the proximate composition of dog meat consumed in Nigeria, as reported by [7], indicated a water content of 69%, ash content of 1%, fat content of 6.01%, protein content of 21.19%, and carbohydrate content of 2.19%.

Although dog meat contains all macronutrients necessary for human nutrition, there is a risk of exposure to rabies and other zoonoses among processors and consumers of dog meat [10].

4.2. Variation of Rheological and Technological Properties of Dog Meat According to Age

The rheological and technological traits of dog meat are influenced by age. pH values remain similar regardless of age, but water retention characteristics change, with drip loss, cooking loss, and water-holding capacity varying between younger and older animals. Meat color is also affected, with younger dogs showing lighter meat, while older ones develop a more intense and pronounced coloration. These age-related influences on the processing abilities of meat are consistent with previous reports on beef and rabbit by [23] and [24], on indigenous chickens of Benin [21]. These works indicate that animal age is a major factor affecting meat quality.

In the present study, pH values remained relatively stable with age, around 6.5, suggesting that post-mortem biochemical processes are largely independent of age. According to [3], dog meat presented a pH of 6.52, with color parameters including a red index of 15.35, a yellow index of 8.51, a chromaticity of 16.52, a luminance of 39.87, and a hue value of 28.91. Technological traits were characterized by drip losses of 1.21%, cooking losses of 25.11%, and a water retention capacity of 26.51%. The differences observed between these values and our findings may be attributed to the type of muscle samples analyzed. In their study, [3] used composite samples from thigh, back, and shoulder muscles of two different genotypes of dog, whereas in the present study, only the Longissimus dorsi muscles of indigenous dog breed were examined.

This finding aligns with previous studies on poultry and beef, where pH was relatively unaffected by age [19] [20] [24]. In contrast, significant age-related differences were observed in water-holding capacity, drip loss, and cooking loss. Younger dogs (12 months) exhibited higher drip loss (1.25%) and lower water retention (27.11%), whereas older dogs (60 months) showed lower drip loss (1.21%) and slightly better water-holding capacity (25.92%). This trend indicates that meat from older animals retains water more effectively, which can influence juiciness and processing yield. Similar effects of age on water on color (CIE L*, a*, b*) and retention and cooking losses have been reported in beef [19] [25] [26].

Color parameters were also affected by age. Luminance (L*) was higher in younger dogs (39.74), reflecting lighter-colored meat, while redness (a*) and chroma (C*) increased with age, indicating that meat becomes darker and more saturated in older animals. Yellowness (b*) and hue (H*) were less affected, although b* showed a significant increase with age. These findings suggest that meat color develops more intensity with age, consistent with observations in beef and poultry [20] [26].

Proximate composition showed only minor age-related changes. Dry matter and protein contents decreased slightly with age, though not significantly, while fat content declined significantly (19.51% at 12 months vs. 18.83% at 60 months, $p = 0.015$). The proximate composition of the different dog meat samples under analysis herein is similar to the findings of [3].

Sensory evaluation revealed notable effects of age. Flavor intensity decreased with age (4.69 at 12 months vs. 4.25 at 60 months, $p < 0.001$), suggesting that younger animals produce meat with less pronounced aroma. Texture and taste were optimized at 36 months, showing a balance between tenderness and firmness, and the highest overall acceptability was observed at this intermediate age (4.63, $p < 0.001$). These results indicate that meat from very young or very old animals may be less preferred sensorially, a phenomenon also observed in poultry and rabbit studies.

Overall, age significantly influences the technological, chemical, and sensory properties of dog meat. Younger animals tend to produce lighter, more aromatic meat with higher fat content but lower water retention, while intermediate-aged animals (around 36 months) display optimal balance in texture, flavor, and overall acceptability. These findings highlight the importance of considering slaughter age in the production of dog meat to optimize both technological and sensory quality.

4.3. Effect of Age on Organoleptic Quality of Dog Meat

Sensory evaluation reveals that flavor intensity increases with age. Texture, taste, and overall acceptability are considered most favorable at an intermediate age of 36 months, suggesting that this stage offers the best balance of sensory qualities. This finding confirms that age is a major non-genetic factor influencing the various quality attributes of meat. Several studies have reported that fat content generally decreases with advancing age, reflecting a gradual mobilization of lipid reserves and reduced intramuscular fat deposition in older animals [19] [22]. Younger animals typically exhibit higher intramuscular fat, which contributes to juiciness and flavor, whereas older animals produce leaner meat with lower marbling. The highest taste and overall acceptability scores observed at 36 months may be attributed to the interaction between lower moisture content and higher fat content in the muscle [3]. The greater flavor intensity observed in older animals as reported by [19] is likely associated with age-related hormonal activities and biochemical changes in muscle tissue, including increased concentrations of flavor precursors and intramuscular fat.

5. Conclusion

The present study showed that age exerts limited influence on the proximate composition of dog meat, with dry matter, protein, and ash contents remaining relatively constant between 12, 36, and 60 months. However, fat content declined significantly with increasing age, reflecting reduced lipid deposition in older animals.

In contrast, technological and sensory properties were strongly affected by age. Younger animals exhibited higher drip and cooking losses as well as lighter meat color, whereas older animals showed improved water retention and more intense redness and hue value. Sensory evaluation highlighted that meat from 36-month-old dogs provides the best texture, taste, appearance, and overall acceptability, despite flavor intensity increase with age. These findings suggest that 36 months constitutes the optimal slaughter age for balancing nutritional value, technological attributes, and consumer acceptability of dog meat. However, the lower moisture content and the higher fat content of this unconventional meat make it less recommendable for human consumption. Further studies on its fatty acid composition are necessary to better assess the potential cardiovascular risks associated to its consumption.

Acknowledgements

The authors thank the Ministry of Public Health of the Republic of Benin. They also express their gratitude to the Department of Nutrition and Agro-Food Sciences at the Faculty of Agronomy, as well as to the Institute of Nursing and Obstetrical Sciences of the University of Parakou, Benin, for the support provided during this trial.

Author Contributions

Conceptualization, AKPO Y. O. Florence and TOUGAN Polycarpe Ulbad; methodology, TOUGAN Polycarpe Ulbad.; software, TOUGAN Polycarpe Ulbad.; validation, TOUGAN Polycarpe Ulbad., AGBETOU Mendinatou, HODONOU Adrien and AKPO Y. O. Florence; formal analysis, AKPO Y. O. Florence and TOUGAN Polycarpe Ulbad; investigation, AKAMBI A. Koudous, AHOUANTO S. Reine, ODOUNLAMI O. Hortense M., and ATCHADE Larissa; resources, AKPO Y. O. Florence and TOUGAN Polycarpe Ulbad.; data curation, TOUGAN Polycarpe Ulbad; writing—original draft preparation, AKPO Y. O. Florence and TOUGAN Polycarpe Ulbad; writing—review and editing, AKPO Y. O. Florence and TOUGAN Polycarpe Ulbad; supervision, AGBETOU Mendinatou and TOUGAN Polycarpe Ulbad. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Leroy, F., Smith, N.W., Adesogan, A.T., Beal, T., Iannotti, L., Moughan, P.J., *et al.* (2023) The Role of Meat in the Human Diet: Evolutionary Aspects and Nutritional Value. *Animal Frontiers*, **13**, 11-18. https://doi.org/10.1093/af/vfac093

[2] Galassi, V. (2017) Évolution de la cynophagie dans le monde. Médecine vétérinaire et santé animale. https://dumas.ccsd.cnrs.fr/dumas-05034511v1

[3] Tougan, U.P., Bah, H., Hongbete, F., Houngbedji, W.M. and Chabi, C. (2025) Propriétés technologiques, nutritionnelles et sensorielles de la viande de chiens locaux et exotiques (*Canis lupus* familiaris) consommés au Nord-Bénin. *International Journal of Biological and Chemical Sciences*, **19**, 502-515. https://doi.org/10.4314/ijbcs.v19i2.8

[4] Douglas, M. (2003) Purity and Danger: An Analysis of Concepts of Pollution and Taboo. Routledge.

[5] Obioha, E.E., Isiugo, P.N., Jimoh, S.O., Ikyaagba, E., Ngoufo, R., Serge, B.K., *et al.* (2012) Bush Meat Harvesting and Human Subsistence Nexus in the Oban Hill Communities of Nigeria. *Journal of Human Ecology*, **38**, 49-64. https://doi.org/10.1080/09709274.2012.11906474

[6] Eka, S., Putra, D. and Purnawan, A. (2013) The Analysis of Comparison of Expert System of Diagnosing Dog Disease by Certainty Factor Method and Dempster-Shafer Method. *International Journal of Computer Science Issues*, **10**, 576-584.

[7] Ray Ayu, A.R. and Arman, F.A.G. (2022) Proximate Levels of Dog Meat (*Canis lupus* familiaris) in Rantepao, North Toraja Regency, South Sulawesi, Indonesia. *Journal of Aafiyah Health Research*, **3**, 25-30.

[8] Ajoke, E., Solomon, A. and Ikhide, E. (2014) The Role of Dog Trading and Slaughter for Meat in Rabies Epidemiology with Special Reference to Nigeria—A Review. *Journal of Experimental Biology and Agricultural Sciences*, **2**, 130-136.

[9] Odeh, L.E., Umoh, J.U. and Dzikwi, A.A. (2013) Assessment of Risk of Possible Exposure to Rabies among Processors and Consumers of Dog Meat in Zaria and Kafanchan, Kaduna State, Nigeria. *Global Journal of Health Science*, **6**, 142-153. https://doi.org/10.5539/gjhs.v6n1p142

[10] Dashen, M.M., Nanya, A.C., Nanret, M.J., Lilian, U.M. and Peter, G.S. (2020) Microbiological Quality of Ready-to-Eat Dog Meat Sold in Some Parts of Plateau State, Nigeria. *Science World Journal*, **15**, 26-29.

[11] Vido, A.A. (2013) La viande de chien dans l'alimentation des populations du Bas-Bénin durant la période coloniale. *Revue d'Histoire Arts Archéologie Afrique*, **23**, 20-29.

[12] Adam, S.K. and Boko, M. (1993) Le climat du Bénin. Éditions Karthala.

[13] Tougan, P.U., Bonou, A.G., Gbaguidi, T., Koutinhouin, G.B., Ahounou, S., Salifou, C.F.A., Zannou, M.S., *et al.* (2016) Influence of Feed Withdrawal Length on Carcass Traits and Technological Quality of Indigenous Chicken Meat Reared under Traditional System in Benin. *Journal of World's Poultry Research*, **6**, 48-58.

[14] Association of Official Analytical Chemistry (AOAC) (2005) Official Methods of Analysis. 18th Edition, Association of Official Analytical Chemists, Methods 935.14 and 992.24.

[15] Prado, I.N., Campo, M.M., Muela, E., Valero, M.V., Catalan, O., Olleta, J.L., *et al.* (2014) Effects of Castration Age, Dietary Protein Level and Lysine/Methionine Ratio on Animal Performance, Carcass and Meat Quality of Friesian Steers Intensively Reared. *Animal*, **8**, 1561-1568. https://doi.org/10.1017/s1751731114001591

[16] Tefera, T.D., Mummed, Y.Y., Kurtu, M.Y., Letta, M.U., O'Quine, T.G. and Vipham, J.L. (2019) Effect of Age and Breeds of Cattle on Carcass and Meat Characteristics of Arsi, Boran, and Harar Cattle in Ethiopia. *Open Journal of Animal Science*, **9**, 367-383. https://doi.org/10.4236/ojas.2019.93030

[17] Clinquart, A., Ellies-Oury, M.P., Hocquette, J.F., Guillier, L., Santé-Lhoutellier, V. and Prache, S. (2022) Review: On-Farm and Processing Factors Affecting Bovine Car-

cass and Meat Quality. *Animal*, **16**, Article ID: 100426. https://doi.org/10.1016/j.animal.2021.100426

[18] Tougan, P.U., Dahouda, M., Ahounou, G.S., Salifou, C.F.A., Kpodekon, T.M., Mensah, G.A., *et al.* (2013) Effect of Breeding Mode, Type of Muscle and Slaughter Age on Technological Meat Quality of Local Poultry Population of *Gallus gallus* Species of Benin. *International Journal of Biosciences*, **3**, 81-97.

[19] Tougan, U.P., Dahouda, M., Salifou, C.F.A., Ahounou, G.S., Kpodekon, T.M., Mensah, G.A., Théwis, A. and Youssao, A.K.I. (2013) Conversion of Chicken Muscle to Meat and Factors Affecting Chicken Meat Quality: A Review. *International Journal of Agronomy and Agricultural Research*, **3**, 1-20.

[20] Tougan, P.U., Dahouda, M., Salifou, C.F.A., Ahounou, G.S., Kpodekon, T.M., Mensah, G.A., Kossou, N.F.D., *et al.* (2013) Nutritional Quality of Meat of Local Poultry Population of *Gallus gallus* Species of Benin. *Journal of Animal and Plant Science*, **19**, 2908-2922.

[21] Hocquette, J.F., Gondret, F., Baéza, E., Médale, F., Jurie, C. and Pethick, D.W. (2010) Intramuscular Fat Content in Meat-Producing Animals: Development, Genetic and Nutritional Control, and Identification of Putative Markers. *Animal*, **4**, 303-319. https://doi.org/10.1017/s1751731109991091

[22] Salifou, C.F.A., Dahouda, M., Ahounou, G.S., Kassa, S.K., Tougan, P.U., Farougou, S., *et al.* (2013) Assessment of Offal Components of Lagunaire, Borgou and Zebu Fulani Bulls Raised on Natural Pasture and Analysis of Macroscopic Lesions Associated with Potential Hazards for the Consumer. *International Journal of Animal and Veterinary Advances*, **5**, 216-225. https://doi.org/10.19026/ijava.5.5601

[23] Tougan, P.U., Aholou, R.B., Yayi-Ladekan, E., Tchobo, P.F., Akouegninou, A., Hanzen, C., *et al.* (2019) Qualité technologique et nutritionnelle de la viande des lapins nourris avec des rations contenant des feuilles de *Cissus populnea* et *Synedrella nodiflora* et corrélations. *International Journal of Biological and Chemical Sciences*, **13**, 1747-1761. https://doi.org/10.4314/ijbcs.v13i3.43

[24] Dagne, T., Mummed, Y.Y., Kurtu, M.Y., Leta, M.U., O'Quinn, T.G. and Vipham, J.L. (2021) Proximate Composition and Fatty Acid Profile of Beef from Arsi, Borana and Harar Cattle Breeds in Oromia National Regional State, Ethiopia. *Open Journal of Animal Sciences*, **11**, 139-156. https://doi.org/10.4236/ojas.2021.112011

[25] Poveda-Arteaga, A., Krell, J., Gibis, M., Heinz, V., Terjung, N. and Tomasevic, I. (2023) Intrinsic and Extrinsic Factors Affecting the Color of Fresh Beef Meat—Comprehensive Review. *Applied Sciences*, **13**, Article No. 4382. https://doi.org/10.3390/app13074382

[26] Lunesu, M.F., Mellino, M.R., Rassu, S.P.G., Battacone, G., Pulina, G. and Nudda, A. (2025) Meat Quality and Consumers Perception of Dry and Wet-Aged Beef from Autochthonous Cattle Breed and Their Crosses. *Italian Journal of Animal Science*, **24**, 1718-1729. https://doi.org/10.1080/1828051x.2025.2537224