

Article

Effects of Slaughter Age and Sex on Carcass Traits and Meat Quality of Crossbred Kids Under Semi-Intensive System

Elizabete Cristina Batista da Costa Macena ¹, Roberto Germano Costa ^{1,*}, Wandrick Hauss de Sousa ²,
Felipe Queiroga Cartaxo ², Francisco Fernando Ramos de Carvalho ³ and Neila Lidiany Ribeiro ¹

¹ Animal Science Department, Federal University of Paraiba, Areia 58397-000, Brazil; elizabetec.b@hotmail.com (E.C.B.d.C.M.); neilalr@hotmail.com (N.L.R.)

² Paraiba State Agriculture and Livestock Research Agency S.A, EMEPA, João Pessoa 58755-000, Brazil; wandrick@gmail.com (W.H.d.S.); felipeqcartaxo@yahoo.com.br (F.Q.C.)

³ Animal Science Department, Federal Rural University Pernambuco, Recife 52171-900, Brazil; ffrcarvalho@gmail.com

* Correspondence: betogermano@hotmail.com

Simple Summary

Goat meat is gaining consumer acceptance due to its nutritional profile, leanness, and sensory attributes. This study evaluated the effect of slaughter age and sex on carcass characteristics, commercial cut yields, and meat quality in Boer crossbred kids reared under semi-intensive conditions. Results showed that slaughter age significantly influenced carcass yield, fat deposition, and muscle–bone ratio, while sex had minimal impact. Younger kids produced tender meat with desirable sensory traits, making them ideal for gourmet markets, specialized food markets that value premium quality, refined flavor, and superior culinary experiences.

Abstract

This study aimed to evaluate the effects of age and sex on carcass traits, commercial cuts, and meat quality in crossbred kids. A total of 32 Boer × native crossbred kids were used, equally distributed according to sex and slaughter age: 16 male kids (8 slaughtered at 70 days and 8 at 100 days) and 16 female kids (8 at 70 days and 8 at 100 days). However, slaughter age significantly affected ($p < 0.05$) total weight gain, empty body weight, hot and cold carcass weights, loin eye area, internal fat percentage, and carcass compactness index. A significant interaction ($p < 0.05$) between sex and age was found for thoracic depth. In addition, leg length and leg compactness index were significantly influenced ($p < 0.05$) by both factors. Slaughter age also had a significant effect ($p < 0.05$) on internal body length, leg length, rump width, thigh perimeter, rump perimeter, chest circumference, thoracic depth, internal thoracic depth, and carcass compactness index. Regarding commercial cuts (neck, shoulder, ribs, loin, and leg), slaughter age had a significant influence ($p < 0.05$), reflecting the same pattern observed in hot and cold carcass weights, and indicating consistent distribution across cuts. In conclusion, slaughter age had a more pronounced effect on carcass characteristics than sex, highlighting its importance in determining meat yield and quality in crossbred kids.

Keywords: commercial cuts; carcass quality; leg fat deposition; non-carcass components; performance



Academic Editor: Edward C. Webb

Received: 29 June 2025

Revised: 29 August 2025

Accepted: 2 September 2025

Published: 5 September 2025

Citation: da Costa Macena, E.C.B.; Costa, R.G.; Sousa, W.H.d.; Cartaxo, F.Q.; Ramos de Carvalho, F.F.; Ribeiro, N.L. Effects of Slaughter Age and Sex on Carcass Traits and Meat Quality of Crossbred Kids Under Semi-Intensive System. *Ruminants* **2025**, *5*, 41. <https://doi.org/10.3390/ruminants5030041>

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The growing demand for healthier foods, with lower fat content and higher nutritional value, has driven the increasing global appreciation for goat meat [1,2]. Modern consumers are increasingly attentive to the sensory and functional quality of foods, preferring lean meats that are easy to digest and have a lipid profile favorable to health [3,4]. In this context, goat meat stands out for its distinctive flavor, high nutritional density, low fat and cholesterol content, and as a rich source of high-quality proteins, polyunsaturated fatty acids, and minerals such as iron [5–7].

In Brazil, however, goat meat production is still largely traditional, especially in the Northeast, where animals are typically slaughtered at older ages. This practice leads to higher feeding and management costs, as well as reduced production efficiency [8]. Although the introduction of specialized breeds such as Boer has improved carcass yield and meat quality, few studies have assessed the performance of young animals under commercial conditions.

In Brazil, early-slaughtered kid goats known locally as “mamão” are typically harvested around 60 days of age, yielding tender meat with mild flavor, and carcass weights between 4 and 6 kg. This category holds strong culinary and cultural value, especially in regions that favor gourmet-quality meat cuts of weaned kids (4–6 months, around 12 kg), depending on regional traditions [9]. In countries such as France, Portugal, and Spain, early-slaughtered kids are traditionally appreciated for their tenderness and mild flavor. Therefore, slaughtering animals at 70 days of age may represent a promising strategy to diversify goat meat products, especially for gourmet markets or consumers seeking tender, low-fat cuts without compromising quality.

In addition to meeting this demand, early slaughter can promote production sustainability by reducing confinement time, input consumption, and increasing herd turnover. These factors improve profitability, particularly for smallholders, and reduce the environmental footprint of meat production.

Age, sex, and live weight significantly influence carcass yield and the physicochemical properties of meat, including color, pH, water-holding capacity, and chemical composition [10]. The typically low intramuscular and subcutaneous fat deposition in goats can be modulated by genetic and nutritional factors, making it essential to understand their behavior under different slaughter strategies [11].

In this context, this study aimed to evaluate the effects of age and sex at slaughter (70 and 100 days) on carcass traits, commercial cuts, and meat quality in crossbred kids (non-descript females $\times$ Boer bucks). The goal is to generate technical and market-relevant data to support the development and valorization of goat meat as a distinct and strategic product for strengthening the goat production chain in Brazil’s semi-arid regions.

2. Materials and Methods

2.1. Experiment Site

The experiment was carried out at the Estação Experimental Pendência, belonging to the Empresa Estadual de Pesquisa Agropecuária da Paraíba (EMEPA-PB), located between the geographical coordinates 7°8'18" latitude South and 36°27'2" latitude west of Greenwich, with an altitude of 534 m. At an average temperature of 30 °C and an average relative humidity of 70.1%.

2.2. Animals

The study was approved by the Animal Ethics Committee of the Federal University of Paraíba-UFPB, Brazil (Protocol number 2305/14).

A total of 32 crossbred goats (Boer $\times$ native crossbred kids) were used in the study, comprising 16 males (8 slaughtered at 70 days and 8 at 100 days) and 16 females (8 slaughtered at 70 days and 8 at 100 days). Average birth weights were 3.11 ± 0.64 kg (males) and 3.00 ± 0.76 kg (females) for animals slaughtered at 70 days, and 3.65 ± 0.71 kg (males) and 3.25 ± 0.38 kg (females) for those slaughtered at 100 days of age.

At the beginning of the trial, all animals were individually identified, weighed, treated for ecto- and endoparasites, and vaccinated against clostridial diseases. They were then housed in individual pens, with eight animals per pen, resulting in an average stocking density of approximately 3.5 m^2 per animal, ensuring adequate space for welfare and behavioral expression. Body weights were recorded weekly to monitor weight gain. Experimental animals were selected one week prior to the first slaughter (at 70 days), based on birth type (single or twin) and live weight, to minimize the influence of these factors on the variables evaluated.

2.3. Diet and Management

The diet was formulated according to the National Research Council [12], aiming at a weight gain of 200 g day^{-1} , with a forage–concentrate ratio of 12:84, composed of Tifton grass hay (*Cynodon dactylon*), and the concentrates were composed of ground corn, soybean meal, finely ground mineral supplement, and calcitic limestone. The adaptation of the animals was made for 14 days, and the weight gain was carried out weekly. All experimental animals were selected one week before the first weaning (70 days) (Table 1). From 10 days of age, the kids received a complete diet ad libitum in their troughs.

Table 1. Percentual and bromatological composition of experimental diets.

Ingredient g kg ⁻¹ Dry Matter	Diet
Tifton hay	480
Ground corn	360
Soybean meal	120
Finely ground	20
Mineral supplement	10
Calcitic limestone	10
<i>Chemical composition</i>	
Dry matter (g kg ⁻¹ as fed)	889
Crude protein(g kg ⁻¹ DM)	180
Mineral matter(g kg ⁻¹ DM)	61
Ethereal extract (g kg ⁻¹ DM)	48
Neutral detergent fiber (g kg ⁻¹ DM)	210
Calcium (g kg ⁻¹ DM)	8
Phosphorus (g kg ⁻¹ DM)	4.2
Metabolizable energy (Mcal kg ⁻¹ DM)	2.5

DM = dry matter.

After 70 days, the other half of the offspring that remained in the system started different management, and were released with their respective mothers having access to the pickets and multi-nutritional blocks in the morning and the afternoon, when they returned to the facilities, they received hay of Tifton grass (*Cynodon dactylon*) and concentrate in a 48% roughage ratio to 52%: concentrate (Table 2), until 100 days are complete, at the time of slaughter. The concentrate consisted of corn bran (36%), soybean meal (12%), soybean oil (2%), mineral salt, and limestone (2%).

Table 2. Chemical composition of the experimental diet ingredients based on the dry matter for offspring up to 100 days old.

Ingredient g kg ⁻¹ DM	Diet
Tifton hay	200
Ground corn	550
Soybean meal	210
Soybean oil	20
Mineral supplement	10
Calcitic limestone	10
<i>Chemical Composition</i>	
Dry matter, DM (g kg ⁻¹ as fed)	890
Crude protein, CP (g kg ⁻¹ DM)	233
Mineral matter, MM (g kg ⁻¹ DM)	61
Ethereal extract, EE (g kg ⁻¹ DM)	50
Neutral detergent fiber, NDF (g kg ⁻¹ DM)	258
Calcium (g kg ⁻¹ DM)	8.4
Phosphorus (g kg ⁻¹ DM)	3.8
Metabolizable energy, ME (Mcal kg ⁻¹ DM)	2.5

2.4. Meat Quality Evaluation

2.4.1. Pre-Slaughter and Slaughter Conditions

After 48 d on test, animals were weighed to obtain the final live weight (FLW). Subsequently, they underwent a solid 16 h fast. After this period, they were weighed again in order to obtain body weight at slaughter (BWS) and to determine the weight loss due to fasting. All lambs were slaughtered on the same day by using standard commercial procedures according to the Brazilian welfare codes of practice [13] in the industrial slaughterhouse of the Federal University in Paraíba–Bananeiras Campus. Prior to slaughter, the animals were transported in a truck specifically designed for livestock transport during the early hours of the day to ensure low ambient temperatures and minimize thermal stress and discomfort during handling. The animals were stunned with a captive dart pistol and left bleeding for four minutes after sectioning the carotid and jugular veins. After skinning and evisceration, the head (sectioned at the atlanto-occipital joint) and the hooves (sectioned at the metacarpal and metatarsal joints) were removed.

After skinning and evisceration, the head and the hooves were removed, and the weight of the hot carcass was recorded (HCR). The kidneys and perirenal fat were removed from the carcass prior to weighing and estimation of the hot carcass yield (HCY).

All non-carcass components, whether edible or not, were weighed. The viscera were emptied, washed, and reweighed to determine the yields of buchada and panelada. The buchada components included: blood, liver, kidneys, lungs, spleen, tongue, heart, abomasum, rumen, reticulum, omasum, and small intestine [14]. For panelada, the head and feet were also included [15].

2.4.2. Carcass Quality Traits

The carcasses were taken to the cold chamber, with an average temperature of 4 °C, where they remained for 24 h suspended from hooks by the tendon of the gastrocnemius muscle. The measurement of meat pH was performed 24 h post-mortem [16] on the Longissimus lumborum (LL) muscle, by using a digital potentiometer (DIGIMED, model pH 300 M, São Paulo, Brazil), equipped with a glass electrode.

Carcasses were placed in a cold room at 4 °C for 24 h, suspended by the gastrocnemius tendon. Cold carcass weight (CCW) was then recorded following the methodology of Cezar and Sousa [16]. Based on these measurements, the following indices were calculated: hot

carcass yield ($HCY = HCW/SBW \times 100$), cold carcass yield ($CCY = CCW/SBW \times 100$), and chilling loss ($CL = [(HCW - CCW)/HCW] \times 100$).

The gastrointestinal tract (GIT) was weighed full and empty to estimate empty body weight (EBW) using the formula: $EBW = SBW - [(GIT \text{ full} - GIT \text{ empty}) + \text{urine} + \text{bile}]$. This variable was used to calculate true or biological yield ($BY = HCW/EBW \times 100$).

After cold storage, the cold carcasses were weighed to determine the cold carcass weight and were subjected to the following morphometric evaluations, using a measuring tape: thorax width, rump width, thorax depth, thorax perimeter, rump perimeter, leg perimeter, leg length, internal carcass length, and carcass length [16]. The right half carcasses were sectioned into six primal cuts, determining the weight and yield of the primal cuts, as follows: Neck (separated from the head at its lower extremity, between the last cervical vertebra and the first thoracic vertebra); Shoulder (obtained by the section of the axillary region, by the cut of the tissues that bind the scapula and the humerus to the thoracic region of the carcass); Loineye (obtained by two cuts, one between the last thoracic vertebra and the first lumbar, and another between the last lumbar and the first sacral); Rib (resulted from two cuts, the first between the last cervical vertebra and the first thoracic vertebra and the first lumbar); Leg (separated from the carcass at its upper extremity, between the last lumbar and the first sacral). As the primal cuts were removed from the carcasses, they were immediately weighed [17].

Subjective evaluations included carcass conformation, carcass fat cover, and kidney fat coverage. Internal fat was considered to be the pelvic fat (surrounding kidneys and pelvic cavity) and the fat enveloping the gastrointestinal tract (omental and mesenteric fat). Carcass conformation was assessed based on the shape of the leg, rump, loin, and shoulder musculature, while carcass fat cover referred to the thickness and distribution of subcutaneous fat. These parameters were scored using a 5-point scale (1 = denotes the least fat to 5 = denotes the most fat), with 0.5-point intervals [15]. Kidney fat coverage was evaluated on a 3-point scale: 1 = exposed kidneys, 2 = partially covered, and 3 = fully covered kidneys.

Carcasses were then split along the ischiopubic symphysis and the spinal midline [18]. Internal body length (IBL) and leg length (LL) were measured following Cezar and Sousa [16]. Based on these, the carcass compactness index ($CCI = CCW/ICL$) and leg compactness index ($LCI = \text{rump width}/\text{leg length}$) were calculated.

2.4.3. Meat Quality

Physicochemical parameters were evaluated using the Semimembranosus muscle obtained from the dissection of the left leg. The loin eye area (LEA) was evaluated in the Longissimus dorsi muscle by tracing its contour on transparent plastic. Maximum width (A) and depth (B) were measured, and the area was calculated using the formula: $LEA = (A/2 \times B/2) \times \pi$. Subcutaneous fat thickness over the 12th rib (KF) and overall subcutaneous fat thickness (SFT) were measured using a digital caliper [19]. Measurements included ultimate pH (pH_a) and temperature, taken approximately 24 h postmortem, after carcass chilling at 4 °C. These parameters were recorded using a penetration pH meter equipped with a temperature probe (TESTO, model 205, Lenzkirch, Germany). Meat color was assessed with a digital colorimeter (Minolta, CR-400, Tokyo, Japan) using a 45°/0° viewing geometry and expressed in the CIE Lab system (L, a, b), where L indicates lightness, a* redness intensity, and b* yellowness intensity [20]. Two readings were taken on each sample, and the mean was calculated. Samples were thawed overnight at 4 °C, and color readings were performed after 50 min of blooming at room temperature to allow myoglobin to oxygenate and form oxymyoglobin, the main pigment responsible for the bright red color of meat [21].

The characteristics of the Longissimus lumborum muscle were evaluated based on visual and instrumental analyses, following methodologies adapted from Cezar and Sousa [16], in accordance with international standards such as those used by the United States Department of Agriculture (USDA) and Meat Standards Australia (MSA). Marbling was assessed visually on a six-point scale, where 1 indicated absence and 5 represented highly abundant intramuscular fat, reflecting adaptations from the USDA marbling classification. Texture was scored from 1 to 5 based on visual granulation and tactile assessment, with 1 indicating very coarse and 5 representing very fine texture, in line with tenderness evaluation protocols such as the Warner–Bratzler Shear Force method. Meat color was initially classified visually into five categories, ranging from light pink to dark red. The a^* value from the instrumental color analysis served as the primary index for objective categorization of meat redness, as proposed by Milovanovic et al. [20].

To determine cooking loss (CL), two steaks (2.5 cm thick) were cut transversely to the muscle fibers of the Semimembranosus muscle [22]. The steaks were thawed for 24 h in a refrigerator at 5 °C and weighed using a precision balance (SHIMADZU, TX3202L, Kyoto, Japan). They were then placed on a grill over a baking tray and roasted in an electric oven at 150 °C (FISCHER, Brusque, Santa Catarina, Brazil), until reaching 71 °C at the geometric center. Internal temperature was monitored with type-K thermocouples inserted into the center of the sample, and data were recorded with a digital reader (Comark, PK23M, Ipswich, UK). After cooking, the samples, trays, and grills were left at room temperature until the internal temperature of the steaks reached 24–25 °C, measured using a penetration thermometer (TESTO, model 106, Melrose, MA, USA). The steaks were weighed again, and cooking loss was calculated as the percentage of weight lost, according to the method described by Wheeler et al. [23].

Texture was then evaluated using the Warner–Bratzler shear force (WBSF) test. The same samples used for cooking loss were left at room temperature, and at least three cores were extracted parallel to the muscle fibers using a cylindrical sampler (1.27 cm diameter). Each core was sheared perpendicularly using a Warner–Bratzler blade attached to a texture analyzer (G-R MANUFACTURING Co., Model 3000TAXT2, Stable Micro Systems, Godalming, UK), equipped with a 25 kgf load cell and a crosshead speed of 20 cm/min, following Wheeler et al. [24]. The mean of the readings was used to represent the shear force of each steak, expressed in kgf/cm² [24].

For chemical composition analysis, the Semimembranosus muscle from each animal was cleaned of connective tissue, homogenized using a household blender, and analyzed for moisture, ash, fat, and crude protein contents following AOAC [25] procedures.

2.5. Statistical Analysis

The experimental design followed a completely randomized 2 × 2 factorial scheme (two sexes and two ages), comprising 16 males (eight slaughtered at 70 days and eight at 100 days) and 16 females (eight slaughtered at 70 days and eight at 100 days). Based on a power analysis and the standard deviation of the measurements, the study achieved a statistical power of 0.915 for detecting a 5% difference between treatments. All data were initially tested for normality using the Shapiro–Wilk test. Once assumptions were verified, the data were subjected to analysis of variance (ANOVA), and treatment means were compared using Tukey's test at a 5% significance level. Statistical analyses were conducted using the MIXED procedure available in the SAS OnDemand software (version 9.4).

3. Results

The weights and yields of non-carass components in goats of different sexes and slaughter ages showed a significant interaction ($p < 0.05$) for liver weight (Table 3). There

was a significant difference ($p < 0.05$) between sexes for blood ($p = 0.0014$) and feet ($p = 0.001$) weights, with high-er values observed in males. Regarding slaughter age, significant effects were found for the following components: blood ($p < 0.0001$), skin ($p < 0.0001$), head ($p < 0.0001$), liver ($p = 0.014$), feet ($p = 0.001$), diaphragm ($p = 0.001$), esophagus ($p = 0.001$), kidneys ($p < 0.0001$), tail ($p = 0.001$), and buchada yield ($p = 0.006$).

Table 3. Weights and yields of non-carass components of goats as a function of sex and slaughter age.

Variables (kg)	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
Blood	0.64	0.59	0.53	0.69	0.06	0.014	<0.0001	0.189
Skin	1.31	1.24	1.16	1.40	0.13	0.141	<0.0001	0.514
Head	0.81	0.78	0.71	0.88	0.09	0.378	<0.0001	0.647
Liver	0.28	0.27	0.26	0.29	0.02	0.860	0.014	0.006
Heart	0.08	0.08	0.07	0.09	0.02	1.000	0.079	0.772
Spleen	0.02	0.02	0.02	0.02	0.005	0.229	0.063	0.602
Feet	0.51	0.46	0.45	0.51	0.03	0.001	0.001	0.809
Diaphragm	0.06	0.05	0.04	0.06	0.01	0.256	0.001	0.818
Esophagus	0.06	0.05	0.01	0.02	0.005	0.508	0.001	0.324
Kidneys	0.31	0.30	0.50	0.56	0.09	0.931	<0.0001	0.931
Tail	0.29	0.28	0.24	0.32	0.05	0.324	0.001	0.509
BY EBW (%)	32.77	32.57	31.36	33.98	2.49	0.824	0.006	0.640

BY = Buchada Yield; EBW = Empty Body Weight; SEM = Standard Error of the Mean.

Regarding carcass traits, no significant effects ($p > 0.05$) were observed for the interaction between sex and age, nor for sex alone. However, total weight gain ($p < 0.0001$), slaughter ($p < 0.0001$) and empty ($p < 0.0001$) body weight, hot ($p < 0.0001$) and cold carcass ($p < 0.0001$) weights, loin eye area ($p < 0.0001$), GR ($p = 0.001$), IFP ($p = 0.015$), CCI (kg cm^{-1}) ($p < 0.0001$), CCI (cm^2) ($p = 0.003$), conformation ($p = 0.005$), carcass fat cover ($p = 0.001$), kidney fat ($p < 0.0001$), texture ($p < 0.0001$) and color ($p < 0.0001$) were significantly influenced by slaughter age (Table 4).

Table 4. Carcass characteristics of goats as a function of sex and slaughter age.

Variables	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
TWG (kg)	13.20	12.74	11.05	14.89	1.22	0.301	<0.0001	0.988
SW (kg)	16.58	15.87	13.69	18.31	1.33	0.142	<0.0001	0.753
EBW (kg)	13.25	13.79	11.79	15.17	1.10	0.255	<0.0001	0.951
HCW (kg)	8.36	7.46	6.63	9.19	2.06	0.227	<.001	0.623
CCW (kg)	7.64	7.36	6.47	8.53	0.74	0.284	<0.0001	0.638
HCY (%)	49.71	46.92	47.01	49.63	8.06	0.336	0.366	0.772
BY (%)	60.04	56.14	56.16	60.03	9.56	0.258	0.261	0.685
CCY (%)	46.09	46.25	45.84	46.49	2.16	0.829	0.400	0.124
CL (%)	4.99	1.43	2.47	3.96	8.28	0.234	0.615	0.562
LEA (cm^2)	5.61	5.57	4.80	6.38	0.80	0.884	<0.0001	0.715
SFT (mm)	0.35	0.31	0.29	0.38	0.11	0.432	0.059	0.917
GR (mm)	6.34	6.43	5.42	7.34	1.27	0.835	0.001	0.574
IFP (%)	2.33	2.81	2.26	2.89	0.69	0.062	0.015	0.486
CCI (kg cm^{-1})	0.13	0.13	0.12	0.15	0.01	0.902	<0.0001	0.902
LMI (cm^2)	0.39	0.41	0.39	0.41	0.41	0.011	0.033	0.492
LCI	0.36	0.37	0.36	0.38	0.38	0.192	0.133	0.879
Conformation (1–5)	1.56	1.47	1.41	1.62	0.20	0.205	0.005	0.349

Table 4. Cont.

Variables	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
carcass fat cover (1–5)	1.51	1.43	1.34	1.60	0.18	0.249	0.001	0.336
Kidney fat (kg)	0.12	0.17	0.10	0.19	0.37	0.011	<0.0001	0.040

TWG = Total Weight Gain; SW = Slaughter Weight; EBW = Empty Body Weight; HCW = Hot Carcass Weight; CCW = Cold Carcass Weight; HCY = Hot Carcass Yield; BY = Biological Yield; CCY = Cold Carcass Yield; CL = Chilling Loss; LEA = Loin Eye Area; SFT = Subcutaneous Fat Thickness; GR = GR Measurement (Maximum Fat Cover Thickness); IFP = Internal Fat Percentage; CCI = Carcass Compactness Index; LMI = Leg Muscularity Index; LCI = Leg Compactness Index; SEM = Standard Error of the Mean.

The variables internal length ($p = 0.001$), leg length ($p < 0.0001$), rump width ($p < 0.0001$), thigh perimeter ($p < 0.0001$), rump perimeter ($p < 0.0001$), thoracic perimeter ($p < 0.0001$), thoracic depth ($p = 0.008$) and internal thoracic depth ($p < 0.0001$) showed significant differences according to age (Table 5).

Table 5. Morphometric measurements of the carcasses of goat as a function of sex and slaughter age.

Variables	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
Morphometric measurements (cm)								
EL	42.50	46.25	44.88	43.88	10.63	0.327	0.792	0.107
IL	54.13	53.00	51.25	55.88	8.52	0.284	0.001	0.284
LL	32.06	31.00	30.31	32.75	2.31	0.057	<0.0001	0.565
TW	16.69	10.94	10.63	11.00	0.40	0.274	0.105	1.000
RW	12.50	12.81	11.88	13.44	0.43	0.190	<0.0001	0.190
TP	26.75	27.19	25.44	28.50	0.99	0.223	<0.0001	0.381
RP	39.13	39.69	36.50	42.31	5.63	0.508	<0.0001	0.341
THP	52.13	51.50	49.50	54.13	2.73	0.294	<0.0001	0.832
TD	18.31	13.25	18.50	13.06	29.02	0.312	0.008	0.317
ITD	21.31	20.63	19.81	22.13	0.93	0.053	<0.0001	0.587

EL = External Length; IL = Internal Length; LL = Leg Length; TW = Thoracic Width; RW = Rump Width; TP = Thigh Perimeter; RP = Rump Perimeter; THP = Thoracic Perimeter; TD = Thoracic Depth; ITD = Internal Thoracic Depth, and SEM = Standard Error of the Mean.

Commercial cut weights and yields showed no interaction between sex and age ($p > 0.05$). No significant effect ($p > 0.05$) of sex was observed for any of the cuts (Table 6). However, neck ($p < 0.0001$), shoulder ($p < 0.0001$), ribs ($p < 0.0001$), loin ($p < 0.0001$), leg ($p < 0.0001$) cuts, and cuts yield shoulder ($p = 0.001$) and leg ($p = 0.007$) were significantly affected by slaughter age (Table 6).

Table 6. Weight and yield of commercial goat cuts as a function of sex and slaughter age.

Variable	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
Weight of Cuts (kg)								
Neck	0.47	0.44	0.41	0.51	0.07	0.333	<0.0001	0.076
Shoulder	0.81	0.76	0.70	0.87	0.08	0.086	<0.0001	0.633
Rib	0.97	0.95	0.84	1.08	0.14	0.796	<0.0001	0.626
Loin	0.41	0.41	0.34	0.48	0.05	0.801	<0.0001	0.801
Leg	1.24	1.21	1.08	1.38	0.13	0.356	<0.0001	0.476

Table 6. Cont.

Variable	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
Cut yield (%)								
Neck	6.20	6.11	6.27	6.04	0.73	0.751	0.393	0.087
Shoulder	21.29	20.73	21.67	20.36	0.85	0.072	0.001	0.898
Rib	25.51	25.95	26.01	25.44	3.05	0.682	0.603	0.953
Loin	10.68	11.26	10.70	11.24	0.82	0.056	0.072	0.251
Leg	32.81	32.81	33.38	37.6	1.13	0.975	0.007	0.378

SEM = Standard Error of the Mean.

Tissue composition of the leg showed no interaction between sex and age ($p > 0.05$). Bone content ($p = 0.003$) and muscle-to-bone ratio ($p = 0.028$) were influenced by the sex effect. Other traits, such as leg weight before ($p < 0.0001$) and after dissection ($p < 0.0001$), muscle ($p < 0.0001$), bone ($p = 0.002$), fat ($p = 0.045$), and muscle-to-bone ratio ($p = 0.004$) differed significantly with slaughter age (Table 7).

Table 7. Tissue composition of the left leg of goats as a function of sex and slaughter age.

Variable (kg)	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
LBD	1.23	1.19	1.06	1.36	0.12	0.302	<0.0001	0.415
LAD	1.14	1.10	0.98	1.26	0.17	0.427	<0.0001	0.559
Muscle	0.76	0.75	0.64	0.86	0.12	0.773	<0.0001	0.505
Other tissues	0.04	0.04	0.04	0.04	0.01	0.791	0.791	0.193
Bone	0.27	0.23	0.23	0.27	0.03	0.003	0.002	0.959
Fat	0.07	0.07	0.06	0.08	0.02	0.850	0.045	1.000
M:B	2.83	3.17	2.77	3.23	0.42	0.028	0.004	0.329
M:F	10.80	11.57	11.17	11.21	3.95	0.589	0.977	0.571

LBD = leg before dissection; LAD = leg after dissection; M:B = Muscle:Bone; M:F = Muscle:Fat; SEM = Standard Error of the Mean.

The chemical composition of the Semimembranosus muscle was not affected by sex or age ($p > 0.05$, Table 8). However, brightness ($p = 0.020$) and shear strength ($p = 0.023$) showed significant interaction. Brightness differed between sexes ($p = 0.010$).

Table 8. Mean values of the physical and chemical constituents of goat meat as a function of sex and slaughter age.

Variable	Sex-S (16)		Age-A (16)		SEM	p Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
pH, 0 h	6.62	6.67	6.62	6.67	0.22	0.529	0.635	0.165
pH, 24 h	5.83	5.66	5.67	5.82	0.26	0.061	0.106	0.592
Temperature, 0 h	33.79	34.21	33.40	34.60	1.77	0.508	0.066	0.471
Temperature, 24 h	6.29	6.28	5.22	7.34	1.03	0.986	0.098	0.552
CL (%)	33.79	35.73	34.80	34.71	4.74	0.107	0.941	0.066
SF (kg/cm ²)	2.99	3.08	3.11	2.95	1.02	0.666	0.398	0.023
Texture (1–5)	4.29	4.33	4.57	4.06	0.10	0.300	<0.0001	0.170
Marbling (1–5)	0.21	0.22	0.20	0.23	0.14	0.715	0.544	0.076
Color (1–5)	4.25	4.27	4.53	3.98	0.09	0.553	<0.0001	0.842

Table 8. *Cont.*

Variable	Sex–S (16)		Age–A (16)		SEM	<i>p</i> Value		
	Male (8)	Female (8)	70 (8)	100 (8)		Sex	Age	S*A
Color: Lightness	36.75	34.11	35.32	35.52	4.98	0.010	0.846	0.020
Redness	7.49	8.59	8.00	8.08	2.99	0.073	0.905	0.364
Yellowness	7.30	6.90	7.13	7.07	3.03	0.511	0.914	0.322
Water (g 100 g ^{−1})	75.99	76.28	75.81	76.46	3.01	0.700	0.384	0.279
Ash(g 100 g ^{−1})	1.02	1.04	1.02	1.04	0.19	0.729	0.757	0.975
Protein (g 100 g ^{−1})	21.62	21.51	21.41	21.72	1.15	0.712	0.279	0.806
Fat (g 100 g ^{−1})	1.96	2.17	2.13	1.99	0.73	0.258	0.453	0.670

SF = Shear Force; CL = Cooking Loss; SEM = Standard Error of the Mean.

4. Discussion

4.1. Non-Carcass Components

The development of non-carcass components (blood, skin, head, liver, heart, feet, diaphragm, esophagus, kidneys, and tail) occurs proportionally to body growth. As body weight increases, so does the weight of these organs [26], which explains the differences observed between slaughter ages in the present study. These components are also important elements in the preparation of traditional Brazilian dishes, most notably buchada.

4.2. Carcass Characteristics

The values obtained for carcass traits generally increased with slaughter age. These results can be attributed to animal growth, which promoted higher averages for these variables [27,28]. Ideal carcass weights for goats range from 12 to 15 kg, which is associated with increased lean meat yield [28]. The greater weight gain observed in kids slaughtered at 100 days in this study may be linked to their longer access to solid feed, which had a higher nutritional value and better rumen development. Similar findings were reported by Ekiz et al. [29], who observed that non-weaned lambs kept with their dams until 120 days had greater growth rates and pre-slaughter live weights than lambs weaned at 45 or 75 days.

At 100 days, the hot carcass yield averaged 49.63%, higher than that reported by Menezes et al. [27] at 90 days in Alpine and Boer goats. In the present study, kids slaughtered at 100 days post-weaning had access to a better-quality diet, which supported higher growth rates and better carcass indices. Cold carcass yield remained proportional but lower than hot carcass yield due to moisture loss by evaporation during chilling, which occurs because of the reduced subcutaneous fat that typically protects the carcass against cold desiccation [30,31]. Lighter animals showed lower carcass fat cover, resulting in greater chilling loss. It is also worth noting that younger animals tend to show greater chilling losses [32], primarily due to insufficient fat coverage on the carcass surface—a species-specific trait of goats, which deposit more visceral than subcutaneous fat [33].

According to Cezar and Sousa's [16] carcass classification scale, the kids in this study produced carcasses with fair conformation, lean carcass fat cover, fine texture, pale pink coloring, and no marbling—attributes related to young slaughter age—resulting in a differentiated product with desirable tenderness and texture.

4.3. Carcass Morphometry

The leg compactness index increased with slaughter age. Regarding sex, females showed higher average values than males. This superiority is likely related to the greater rump width in females—a key measurement in leg compactness index calculation—which

is associated with anatomical adaptations for reproduction [33]. Similarly, Ozcan et al. [28], working with Gokceada kids, reported no effect of sex on thoracic depth, leg length, hind limb length, carcass compactness index, or leg compactness index. Costa et al. [33] also found no sex-related differences for internal length, rump width, or rump perimeter in Blanca Serrana Andaluza goats.

Slaughter age also influenced kidney fat thickness and the carcass compactness index, with values consistent with animal weight and age. However, kidney fat thickness values were below the ideal range (7 to 12 mm) recommended by Cezar and Sousa [16]. Similarly, the CCI values of 0.12 and 0.15 kg/cm for 70- and 100-day-old kids, respectively, indicate greater muscle deposition per unit length in older animals—close to the 0.14 kg/cm reported by Silva et al. [34] for 90-day-old Boer goats. Greater kidney fat deposition was observed in female carcasses, likely due to physiological maturity and reduced testosterone influence, which promotes lean tissue and skeletal growth, resulting in leaner carcasses in young males [34].

4.4. Cuts and Yields

Slaughter age significantly influenced the weight and yield of commercial cuts, with the leg showing the highest yield, accounting for 33.38% and 37.6% of the carcass at 70 and 100 days, respectively. Similar results were reported by Costa et al. [33] in goats with 19 kg live weight and in F1 Boer × Saanen kids. The average yield of high-value cuts (shoulder, loin, and leg) observed in this study was 64.78%, a value consistent with specialized meat breeds and expected for meat-type goats [35]. This proportion is an important indicator of carcass quality and market value [36]. These results are comparable to those of Menezes et al. [27], who reported higher proportions of prime cuts in 18 kg kids.

In young animals with similar slaughter weights, the rib tends to grow faster than the shoulder, which is attributed to the higher proportion of bone in the rib and greater muscle content in the shoulder [28]. Among the remaining cuts, loin yield was the lowest at 100 days (11.24%), likely due to the carcass weights observed in this study, and because the loin is considered a late-developing cut. The leg contributed the highest percentage of edible portion in the carcass.

4.5. Tissue, Muscle, and Bone Composition

The small age difference resulted in variation in loin eye area among animals (4.80 and 6.83 cm² for slaughter ages of 70 and 100 days, respectively), reflecting the growth achieved between groups. These values are consistent with expected results for animals at these ages, as also reported by Menezes et al. [27], who evaluated carcass traits and meat tenderness in Alpine and Boer goats slaughtered at 60 and 90 days and found LEA values of 5.89 cm² and 7.83 cm², respectively.

4.6. Meat Physicochemical Traits

However, physicochemical parameters such as pH and shear force showed no significant variation with slaughter age, suggesting that the sensory quality effects are not necessarily linked to changes in muscle structure or postmortem metabolism. This finding highlights that perceived tenderness may be more closely related to the histological composition of the meat than to measurable physicochemical factors in this context [36].

Meat color—an attribute linked to consumer acceptance—was lighter at 100 days, showing a ~12% reduction in intensity. This lighter color is typically associated with freshness and quality. The results indicate that slaughtering at 100 days positively influences sensory attributes such as color and tenderness, which are highly valued by consumers and can add commercial value to meat produced in early harvesting systems. Meat from

younger animals showed a lighter color, typically associated with freshness and quality, as well as greater tenderness possibly due to lower deposition of connective tissue [35].

5. Conclusions

Slaughter at 100 days proved to be more advantageous for muscle development, commercial yield, and the physicochemical attributes of the meat, without compromising tissue composition or palatability.

Beyond mere numerical differences between groups, the data reveal a pattern of physiological maturation that directly influences economic efficiency and adds value to the final product. These findings reaffirm the importance of decisions based on technical criteria to promote sustainability and enhance the goat meat value chain in tropical regions.

Thus, slaughtering kids at 100 days is recommended as an effective practice to optimize zootechnical and commercial outcomes, contributing to the strengthening of goat farming focused on high-quality meat production.

These insights reinforce the potential of early slaughter strategies to produce meat with desirable sensory characteristics, even without changes in physical texture or acidity parameters. Future studies may explore the role of genetics and nutrition on these outcomes, as well as establish correlations with sensory analyses to validate consumer perception.

Author Contributions: Conceptualization, R.G.C., W.H.d.S. and F.F.R.d.C.; methodology, F.Q.C., E.C.B.d.C.M. and N.L.R.; software, N.L.R.; validation, E.C.B.d.C.M., N.L.R. and R.G.C.; formal analysis, E.C.B.d.C.M., N.L.R. and R.G.C.; investigation, E.C.B.d.C.M., N.L.R. and R.G.C.; resources, R.G.C., W.H.d.S. and F.F.R.d.C.; data curation, E.C.B.d.C.M., N.L.R. and R.G.C.; writing—original draft preparation, E.C.B.d.C.M., N.L.R. and R.G.C.; writing—review and editing, R.G.C.; visualization, E.C.B.d.C.M., N.L.R. and R.G.C.; supervision, R.G.C.; W.H.d.S. and F.Q.C.; project administration, R.G.C.; W.H.d.S. and F.F.R.d.C.; funding acquisition, R.G.C.; W.H.d.S. and F.F.R.d.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was approved by the Animal Ethics Committee of the Federal University of Paraiba-UFPB, Brazil (Protocol number 2305/14; Approval Date: 10 January 2014).

Informed Consent Statement: Not applicable.

Data Availability Statement: The information published in this study is available on request from the corresponding author.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

References

1. Pophiwa, P.; Webb, E.C.; Frylinck, L. A review of factors affecting goat meat quality and mitigating strategies. *Small Rumin. Res.* **2019**, *183*, 106035. [[CrossRef](#)]
2. Zhang, N.; Teng, Z.; Qin, Q.; Hua, G.; Lian, H.; Gao, T. Carcass traits, meat quality characteristics, and lipid metabolism-related gene expression pattern of Yaoshan white goats raised in traditional extensive production system: Effects of slaughter age and meat cuts. *Small Rumin. Res.* **2019**, *182*, 29–36. [[CrossRef](#)]
3. Ayeb, N.; Addis, M.; Fiori, M.; Atti, N.; Barmat, A.; Hammadi, M.; Boukhris, H.; Damergi, C.; Khorchani, T. Effect of local diets on nutritional and sensory quality of meat of indigenous goats in Tunisian arid regions. *J. Anim. Physiol. Anim. Nutr.* **2019**, *103*, 1637–1645. [[CrossRef](#)] [[PubMed](#)]
4. Brand, T.S.; Van Der Merwe, D.A.; Hoffman, L.C.; Geldenhuys, G. The effect of dietary energy content on quality characteristics of Boer goat meat. *Meat Sci.* **2018**, *139*, 74–81. [[CrossRef](#)]
5. Wyness, L.; Weichselbaum, E.; O'Connor, A.; Williams, E.B.; Benelam, B.; Riley, H.; Stanner, S. Red meat in the diet: An update. *Br. Nutr. Found. Nutr. Bull.* **2011**, *36*, 34–77. [[CrossRef](#)]

6. Aghwan, Z.A.; Alimon, A.R.; Goh, Y.M.; Nakyinsige, K.; Sazili, A.Q. Fatty acid profiles of supraspinatus, longissimus lumborum and semitendinosus muscles and serum in Kacang goats supplemented with inorganic selenium and iodine. *Asian-Australas. J. Anim. Sci.* **2014**, *27*, 543–550. [\[CrossRef\]](#)
7. Binnie, M.R.; Barlow, K.; Johnson, V.; Harrison, C. Red meats: Time for a paradigm shift in dietary advice. *Meat Sci.* **2014**, *98*, 445–451. [\[CrossRef\]](#)
8. Guimarães, C. Cabrito, a carne vermelha mais saudável do mundo. *Rev. Polít. Agríc.* **2017**, *26*, 125–126.
9. Teixeira, A.; Silva, S.; Rodrigues, S. Advances in sheep and goat meat products research. *Adv. Food Nutr. Res.* **2019**, *87*, 305–370.
10. Toplu, H.D.; Goksoy, E.O.; Nazligul, A.; Kahraman, T. Meat quality characteristics of Turkish indigenous Hair goat kids reared under traditional extensive production system: Effects of slaughter age and gender. *Trop. Anim. Health Prod.* **2013**, *45*, 1297–1304. [\[CrossRef\]](#)
11. Xie, Y.; Zhang, C.; Qin, Q.; Li, X.; Guo, J.; Dai, D.; Wang, Z.; Zhao, Y.; Su, R.; Wang, Z.; et al. Proteomics analysis of meat to identify goat intramuscular fat deposits potential biomarkers. *Food Anal. Methods* **2023**, *16*, 1191–1202. [\[CrossRef\]](#)
12. National Research Council (NRC). *Nutrient Requirements of Small Ruminants: Sheep, Goats, Cervids, and New World Camelids*; The National Academies Press: Washington, DC, USA, 2007.
13. Brasil. Ministério da Agricultura. Instrução Normativa n° 3, de 07 de janeiro de 2000. Regulamento técnico de métodos de insensibilização para o abate humanitário de animais de açougue. *Diário Of. União.* **2000**, *Seção I*, 14–16.
14. Medeiros, G.R.; Carvalho, F.F.R.; Ferreira, M.A.; Alves, K.S.; Mattos, C.W.; Saraiva, T.A.; Nascimento, J.F.D. Efeito dos níveis de concentrado sobre os componentes não-carcaça de ovinos Morada Nova em confinamento. *Rev. Bras. Zootec.* **2008**, *37*, 1063–1071. [\[CrossRef\]](#)
15. Clementino, R.H.; Sousa, W.H.; Cunha, M.G.G.; Gonzaga Neto, S.G.; Carvalho, F.F.R.; Cavalcante, M.A.B. Influência dos níveis de concentrado sobre os cortes comerciais, os componentes não carcaça e os componentes da perna de cordeiros confinados. *Rev. Bras. Zootec.* **2007**, *36*, 681–688. [\[CrossRef\]](#)
16. Cezar, M.F.; Sousa, W.H. *Carcaças Ovinas e Caprinas: Obtenção, Avaliação e Classificação*, 1st ed.; Editora Agropecuária Tropical: Uberaba, MG, USA, 2007.
17. Sousa, W.H.; Cezar, M.F.; Cartaxo, F.Q.; Ramos, J.P.F.; Gomes, J.T.; Cavalcante, I.T.R.; Moraes, L.K.C.; Melo, T.S.; Oliveira, F.G.; Santos, E.M.; et al. Primal and b primal carcass cuts from three different genetic groups finished in feedlot. *Arq. Bras. Med. Vet. Zootec.* **2024**, *76*, 93–102. [\[CrossRef\]](#)
18. Colomer-Rocher, F. Los criterios de calidad de la canal: Sus implicaciones biológicas. In *Curso Internacional Sobre la Producción de Ovino de Carne*; Institución Fernando el Católico: Zaragoza, Spain, 1986; p. 66.
19. Safari, E.; Hopkins, D.L.; Fogarty, N.M. Diverse lamb genotypes 4: Predicting the yield of saleable meat and high value trimmed cuts from carcass measurements. *Meat Sci.* **2001**, *58*, 207–214. [\[CrossRef\]](#)
20. Milovanovic, B.R.; Djekic, I.V.; Tomovic, V.M.; Vujadinovic, D.; Tomasevic, I.B. Color measurement of animal source foods. *Theory Pract. Meat Process.* **2021**, *6*, 311–319. [\[CrossRef\]](#)
21. Miltenburg, G.A.; Wensing, T.; Smulders, F.J.; Breukink, H.J. Relationship between blood hemoglobin, plasma and tissue iron, muscle heme pigment, and carcass color of veal. *J. Anim. Sci.* **1992**, *70*, 2766–2772. [\[CrossRef\]](#)
22. Abularach, M.L.S.; Rocha, C.E.; Felício, P.E. Características de qualidade do contrafilé (m. L. dorsi) de touros jovens da raça Nelore. *Ciênc Tecnol. Aliment.* **1998**, *18*, 205–210. [\[CrossRef\]](#)
23. Wheeler, T.T.; Cundiff, L.V.; Koch, R.M. Effects of marbling degree on palatability and caloric content of beef. *Beef Res. Prog. Rep.* **1995**, *4*, 133.
24. Bratzler, L.J. Determining the tenderness of meat by use of the Warner-Bratzler method. *Proc. Reciprocal Meat Conf.* **1949**, *2*, 114.
25. AOAC. *Official Methods of Analysis of the AOAC International*, 18th ed.; Latimer, G.W., Horwitz, W., Eds.; Association of Official Analytical Chemists: Gaithersburg, MD, USA, 2005.
26. Pereira Filho, J.M.; Resende, K.T.; Teixeira, I.A.M.A.; Sobrinho, A.G.S.; Yáñez, E.A.; Ferreira, A.C.D. Características da carcaça e alometria dos tecidos de cabritos F1 Boer × Saanen. *Rev. Bras. Zootec.* **2008**, *37*, 905–912. [\[CrossRef\]](#)
27. Menezes, J.J.L.; Gonçalves, H.C.; Ribeiro, M.S.; Rodrigues, L.; Cañizares, G.I.L.; Medeiros, B.B.L. Carcass and meat tenderness of goats according to age, breed group and age at slaughter. *Rev. Bras. Zootec.* **2009**, *38*, 1769–1778. [\[CrossRef\]](#)
28. Ozcan, M.; Yalcintan, H.; Tölü, C.; Ekiz, B.; Yilmaz, A.; Savas, T. Carcass and meat quality of Gokceada Goat kids reared under extensive and semi-intensive production systems. *Meat Sci.* **2014**, *96*, 496–502. [\[CrossRef\]](#)
29. Ekiz, B.; Ergul Ekiz, E.; Kocak, O.; Yalcintan, H.; Yilmaz, A. Effect of pre-slaughter management regarding transportation and time in lairage on certain stress parameters, carcass and meat quality characteristics in Kivircik lambs. *Meat Sci.* **2012**, *90*, 967–976. [\[CrossRef\]](#) [\[PubMed\]](#)
30. Lisboa, A.C.C.; Furtado, D.A.; Medeiros, A.N.; Costa, R.G.; Queiroga, R.C.E.; Barreto, L.M.G. Quantitative characteristics of the carcasses of Moxotó and Canindé goats fed diets with two different energy levels. *Rev. Bras. Zootec.* **2010**, *39*, 1565–1570. [\[CrossRef\]](#)

31. Gomes, H.F.B.; Menezes, J.L.; Gonçalves, H.C.; Cañizares, G.I.L.; Medeiros, B.B.L.; Polizel Neto, A.; Lourençon, R.V.; Cháviri, A.C.T. Características de carcaça de caprinos de cinco grupos raciais criados em confinamento. *Rev. Bras. Zootec.* **2011**, *40*, 411–417. [\[CrossRef\]](#)
32. Grande, P.A.; Alcalde, C.R.; Macedo, F.A.F.; Yamamoto, S.M.; Martins, E.N. Desempenho e características de carcaças de cabritos Saanen recebendo rações com farelo de glúten de milho e/ou farelo de soja. *Acta Sci. Anim. Sci.* **2003**, *25*, 315–321.
33. Costa, R.G.; Vallejo, M.E.C.; Bermejo, J.V.D.; Henríquez, A.A.; Vallecillo, A.; Santos, N.M. Influence of animal gender and production system on the carcass characteristics of goats of the Blanca Serrana Andaluza breed. *Rev. Bras. Zootec.* **2010**, *39*, 382–386. [\[CrossRef\]](#)
34. Silva, T.M.; Oliveira, R.L.; Barbosa, L.P.; Garcez Neto, A.F.; Bagaldo, A.R.; Jesus, I.B.; Macome, F.M.; Ribeiro, C.V.D.M. Componentes corporais de caprinos jovens $\frac{3}{4}$ Boer submetidos a dietas com óleo de licuri (*Syagrus coronata*). *Arq. Bras. Med. Vet. Zootec.* **2010**, *62*, 1448–1454. [\[CrossRef\]](#)
35. Siqueira, E.R.; Simões, C.D.; Fernandes, S. Efeito do sexo e do peso ao abate sobre a produção da carne de cordeiro. Morfometria da carcaça, peso dos cortes, composição tecidual e componentes não constituintes da carcaça. *Rev. Bras. Zootec.* **2001**, *30*, 1299–1307. [\[CrossRef\]](#)
36. Silva Sobrinho, A.G.; Purchas, R.W.; Kadim, I.T.; Yamamoto, S.M. Características de qualidade da carne de ovinos de diferentes genótipos e idades ao abate. *Rev. Bras. Zootec.* **2005**, *34*, 1070–1078. [\[CrossRef\]](#)

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.