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Evaluation of Cattle Slaughtering Efficiency at the M'pila Slaughterhouse in Brazzaville (Republic of Congo)

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Abstract | **Original Research Article**

The majority of cattle breeding herds in Congo are made up of the N'Dama breed. Despite their hardiness and trypanotolerance, they have low productivity, which explains the massive importation of meat products, specifically beef. The objective of this study was to evaluate the slaughter yield of cattle according to their place of origin at the M'pila abattoir. The study involved 180 heads of cattle of different origins for the period August-October 2022. Barymetric measurements (height at withers, chest circumference, ventral circumference, and scapulo-ischial length) on live animals and weighing of hot carcasses for yield calculation were performed. The results obtained in this study show an average live weight of 438.75 kg; an average carcass weight of 204.93 kg and therefore an average yield of 49.97%. The barymetric measurements indicate averages of 144.74 cm for scapulo-ischial length; 172.77 cm for chest circumference; 137.5 cm for height at withers and 196.15 cm for ventral circumference. The average age of this study was 4.11 years, for 4 different breeds (N'dama, M'bororo, Goudali and Foulbé). These results made it possible to determine the beef performance of animals from Congo and Cameroon, respectively 56.88% and 51.72%. Nevertheless, it appears that the hazards of transport and feeding affect these results.

Keywords: Yield, cattle, morphology, slaughterhouse, Congo.

1. INTRODUCTION

Bovine meat is the primary source of animal protein, thanks to its richness in indispensable amino acids, and constitutes a foodstuff of primary necessity in our society, our habits and our consumption requirements (Tremolieres *et al.*, 1984).

The Congo is largely deficient in terms of beef coverage. The Congolese peasant population is traditionally a farmer, unlike other countries, which are traditionally breeders. Some rural people are mainly involved in hunting and fishing. Thus, there is no tradition of herding in Congo (Boussafou, 1995).

However, the number of animals in Congo is very low. There are 40,207 head of sheep, 44,911 head of goats, 72,682 head of pigs, 862,492 poultry and 37,098 head of cattle (MAEP, 2017).

The country is currently facing enormous problems of beef supply following the destruction of a large part of its bovine herd during the successive armed conflicts that the country has experienced and which will necessarily have to be reconstituted. It is in this context that the Congolese government has put in place a strategy for the development of cattle breeding, the implementation of which necessarily involves the reconstitution of the national herd (Oyaba, 2013).

In view of the demographic growth of the city of Brazzaville, with a population estimated at 2,553,000 in 2022 (statistiques-mondiales.com), and the increasing need for beef, the Congo imports live animals from Chad and the Central African Republic (Kadekoye *et al.*, 2002), as well as imported frozen meat from developed countries. Several traders import cattle from the Central African sub-region to supply the city of Brazzaville with red meat. Although the slaughter yield and certain zootechnical parameters are known (CIRAD-GRET, 2010), we wanted to ascertain the slaughter yield of the animals and identify the countries of origin that have a good slaughter yield. At present, with slaughter technology in advanced countries, the yield is between 51 and 70% in Europe, America and even in some Asian

countries; the case of Africa is estimated at between 40-50% with variations linked to breeds and breeding systems (CIRAD-GRET, 2010).

However, no scientific study has been conducted in Congo to assess the carcass yield of cattle at the M'pila abattoir in Brazzaville.

To fill this gap, the present study proposed to evaluate the slaughter yield of cattle according to their place of origin at the M'pila slaughterhouse.

2. MATERIALS AND METHODS

2.1 Study Location and Period

The study was carried out at the M'pila slaughterhouse located in the 5th arrondissement of Brazzaville on Avenue Edith Lucie BONGO, in Rue Lifou 145. It is bounded to the north by the two twin towers, to the south and east by the Congo River and to the west by the Brasserie du Congo. The work took place from 13 August to 20 October 2022.

2.2 Animal Material

The animal material consisted of 180 Zebu (M'bororo, Goudali and Foulbé) and Taurine (N'dama) cattle slaughtered during the study period. These animals came from various countries.

2.3 METHODOLOGY

- Body Measurements

Measurements were taken on live animals. They are grouped into four categories of variables. They were carried out by two (2) people and the third person was used to record the different measurements.

- Determination of Height at Withers

The height at the withers is the distance from the ground to the highest point of the shoulder. To find out the height at the withers that each animal could have, we used a measuring stick following the following procedures:

- The animal was placed on level ground in a holding pen,
- The ruler was placed from the ground at foreleg level to the highest point of the shoulder,
- The ruler is read in cm.

- Determination of Scapulo-Ischial Length

The scapulo-ischial length measures the distance between the tip of the shoulder and the tip of the ischium. It is measured with a flexible tape measure.

The thoracic circumference is the circumference of the chest immediately behind the shoulders. The knowledge of the thoracic perimeter led to the use of the tape measure according to the following procedure and under the same conditions:

- The tape measure was placed around the perimeter of the chest;
- The tape is read.

- Determination of the Ventral Circumference

The ventral circumference was determined as follows:

- The tape measure is placed all around the abdomen;
- The tape measure is read.

- Determination of Live Weight (Barymetry)

Throughout this study, the 5th quarter (heart, liver, lung, spleen, digestive tract, oesophagus and kidney) as well as the extremities of the limbs (head, legs and skin) are not taken into consideration during data collection and of course during data processing.

Barymetry is a method of estimating live weight from measurements taken on the live animal. Three formulas are possible: the linear formula, the logarithmic formula and the Crevât formula, which is the simplest and most widely used at present (CIRAD-GRET, 2010).

Live weight was determined using a tape measure measuring thoracic circumference which was used in the Crevât formula: **Live weight = a x Pth3,**
P = weight in kg ;
Pth = thoracic perimeter in metres;
a = coefficient depending on the animal

The value obtained for the thoracic perimeter allows us to deduce the coefficient a based on those proposed in Table I.

Table I: Different values of the coefficient "a" for the N'Dama and Zebu

	Type of animal	Value of the coefficient a
Zebu	Bulls	73 < a < 83
	Steers	70 < a < 76
	Cows	72 < a < 82
Taurin N'Dama	Pth < 1,4 m	a = 80
	1,4 m < Pth < 1,6 m	a = 75
	Pth > 1,6 m	a = 70

Source: *CIRAD-GRET, 2010*

- Weighing

The unstamped half carcasses (4 quarters) were weighed using a mechanical scale with a capacity of 100kg and 500g of precision connected to the overhead rail designed solely for weighing, before being transported either to the butcheries, markets or sales

posts, or to the storage room (cold room) for those that would be kept for a later sale date. At the end of the weighing, the sum of the four (4) quarters was made to determine the carcass weight of each slaughtered animal.

- Determination of Coat Colour

This was done by counting the coats of the slaughtered animals according to their country of origin.

- Determination of Age (A) in Years

Age was estimated by examining the teeth of the Ndama and Goudali breeds, and the horns of the M'bororo and Foulbé breeds.

- Determination of the Slaughter Yield

The slaughter yield of cattle was calculated according to the formula proposed by **CIRAD-GRET, 2010**

Gross yield = (carcass weight) / (live weight) ×100

Yield is the ratio between the weight of the live animal (live weight) and the weight of the carcass after slaughter multiplied by 100. It is always expressed as a percentage. The net weight of the carcass or four quarters includes the parts of the body that are usually made up of red muscle and bones.

The rest, i.e. the skin, viscera and their contents, the head, lungs, trachea, heart, diaphragm, liver, spleen, extremities up to the knee and hock, internal fat, blood, and genitalia, constitute the fifth quarter. The fifth quarter and the offspring are not included in the calculation of the slaughter yield.

2.4 Data Processing

The data collected was entered into EXCEL version 2013 to create a database and then transferred to Statistical Package for Social Sciences (SPSS 22.0). ANOVA was performed to find out if there was a significant difference between the different groups using the Post-Hoc or Tuckey test. Significance on differences in means was sought at the 5% level.

The results were presented as means, standard deviations, maximum and minimum for quantitative variables. For the qualitative variables they were represented in the form of figures.

3. RESULTS

3.1 Origin of the Animals

The results of this study made it possible to identify the different countries of origin of the cattle slaughtered at the M'pila slaughterhouse (Figure 1). This figure shows that the animals slaughtered at the M'pila abattoir come from the sub-region (CEMAC). Most of the animals slaughtered come from Chad, accounting for 67.78% of the livestock, followed by the Central African Republic (17.22%), and finally the Republic of Congo has the smallest livestock population (1.67%).

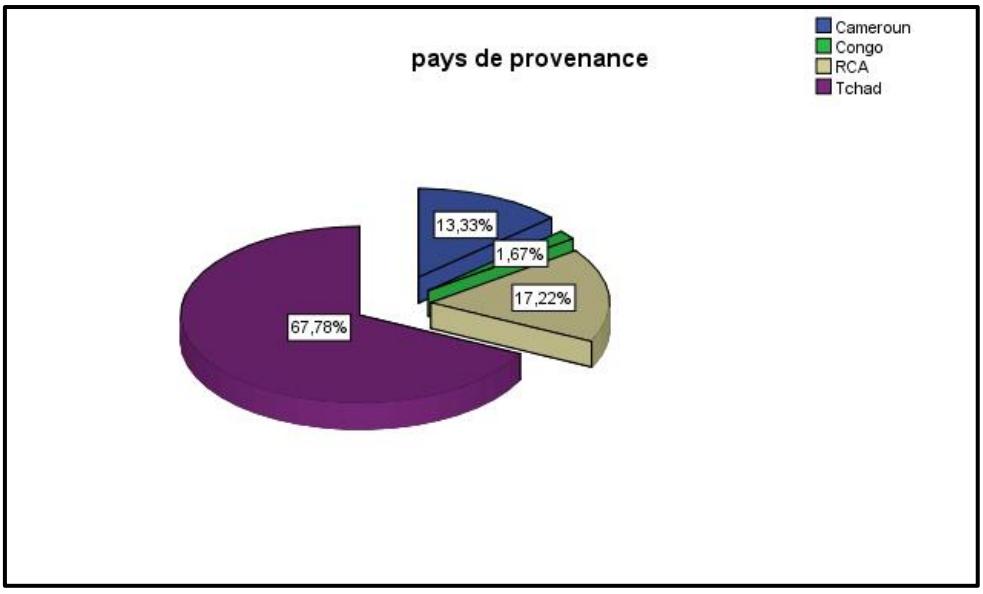

Figure 1: Origin of slaughtered animals

3.2 Composition of the Slaughtered Herd

The composition of the slaughtered cattle herd includes several categories of animals according to breed, sex, age and coat colour.

- By Breed

Figure 2 shows the different breeds of cattle slaughtered at the M'pila abattoir during the study period. 52.22% of the cattle slaughtered were of the M'bororo breed, followed by the Foulbé breed (30.56%), the Goudali breed (15.56%) and the Ndama breed from Congo, which had the smallest number (1.67%).

- By Origin

As regards the origin of the breeds, 33.89% of the M'bororo breed, 30.56% of the Foulbé breed and

3.33% of the Goudali breed come from Chad; 17.22% of the M'bororo breed come from the Central African Republic; 12.22% of the Goudali breed and 1.11% of the M'bororo breed come from Cameroon; and finally, 1.67% of the Ndama breed come from the Congo.

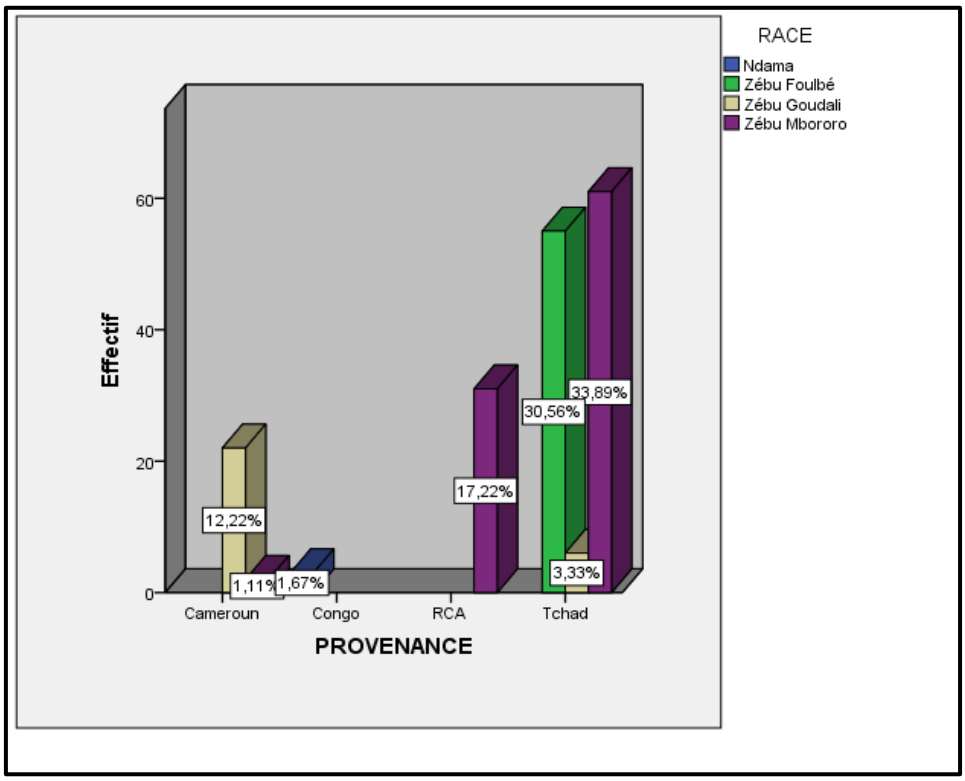

Figure 2: Breed of cattle slaughtered at the M'pila slaughterhouse

- By Coat Colour

The different coat colours are represented mainly by the white colour, which has all the intensities of white (57.78%), followed by the black coat with a mullet stripe (14.44%), black with a mullet stripe (14.44%), black piebald (12.22%), fawn (7.22%), mahogany red (3.89), red fawn (1.67%), red fawn and red (1.11%) and finally red piebald (0.56%) (Figure 3).

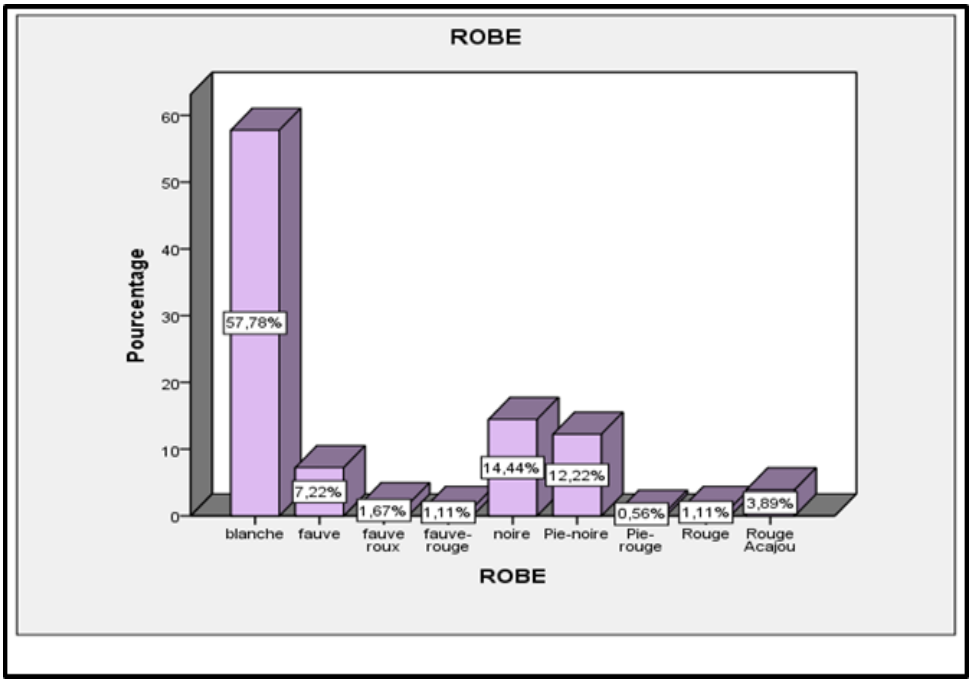

Figure 3: Dress of cattle slaughtered at the M'pila slaughterhouse

- By Sex

All the animals slaughtered at the M'pila slaughterhouse during the study period were male.

- By Age

Table II presents the results on the age (in years) of cattle slaughtered at the M'pila abattoir. The table shows that the average age at slaughter of cattle from the Central African Republic is 4.64 years, followed by Chad 4.41 years, Cameroon 3.75 years and Congo 3.67 years, with an overall average of 4.11 years. The extremes are 1 year and 7 years.

Table II: Age of cattle slaughtered at the M'pila abattoir

Origin	Age min	Age max	Age avg
Cameroun	1	7	3,75
Congo	1	5	3,67
RCA	3	7	4,64
Tchad	2	7	4,41
Average	**1,75**	**6,5**	**4,11**

Avg: average; Max: maximum; Min: minimum

3.3 Barometric Measurements

- Height at Withers

Table III presents the results of the height at the withers of the animals according to their place of origin. For the whole population, the height at the withers varies from 85 to 170cm. The average value is 137.5± 0.11cm.

The highest height at the withers is observed in cattle from the CAR. The lowest value is found in animals from Congo. The animals from Cameroon and Chad have withers heights that do not differ from each other, respectively 140±0.15 and 140±0.09 cm.

These results show that the place of origin has an influence on the size of the animals. These four values are significantly different at the 5% threshold.

Table III: Comparison of the average height at the withers

Height at withers (cm)			
Origin	**Means and And**	**Min**	**Max**
Cameroun	140±0,15[b]	119	165
Congo	122±0,32[a]	85	141
RCA	148±0,09[c]	130	170
Tchad	140±0,09[b]	125	170
Average	**137,5±0,11**	85	170

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

- Scapulo-Ischial Length

Table III presents the analysis of variance of the scapulo-ischial length of slaughtered animals according to their place of origin.

The results of this table show that the scapulo-ischial length of animals slaughtered at the M'pila slaughterhouse ranged from 139.96±0.07cm to 149.67±0.16cm with an overall average of 144.74±0.10cm. The highest length is observed in animals from Congo, followed by those from Chad, and finally those from Cameroon have the lowest value of the slaughtered herd.

The analysis of variance of the scapulo-ischial length shows that there is a significant difference between the animals from Cameroon and those from Congo, Central African Republic and Chad.

Table III: Comparison of the means of scapulo-ischial length

Scapulo-ischial length (cm)			
Origin	**Means and And**	**Min**	**Max**
Cameroun	139,96±0,07[a]	150	130
Congo	149,67±0,16[b]	170	131
RCA	144,06±0,11[b]	165	125
Tchad	145,27±0,10[b]	165	125
Average	**144,74±0,107**	**170**	**125**

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

- Thoracic Perimeter

The results of the thoracic perimeter of slaughtered animals are presented in table IV. The results of this table show that the thoracic perimeter of the animals slaughtered at the M'pila slaughterhouse ranged from 162.33±0.28 to 181.19±0.20 cm with an overall average of 172.77 cm. The highest thoracic perimeter was observed in animals from Cameroon, followed by those from Chad, and finally those from Congo had the lowest value. The extremes of the thoracic circumference in the whole population are 130 cm and 205 cm, and are recorded in the population coming from Chad and Congo.

The analysis of variance of the thoracic perimeter shows that there is a significant difference between the animals according to their place of origin.

Table IV: Comparison of chest perimeter averages

Chest circumference (cm)			
Origin	**Means and And**	**Min**	**Max**
Cameroun	181,19±0,20[b]	144	204
Congo	162,33±0,28[a]	130	182
RCA	171,19±0,11[ab]	140	200
Tchad	176,57±0,11[ab]	139	205
Average	**172,77±0,13**	**130**	**205**

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

- Belly Turn

The results of the belly circumference of animals slaughtered at the M'pila slaughterhouse are presented in table V. The table shows that animals from Cameroon have the highest average belly circumference of all animals slaughtered at the M'pila slaughterhouse, with an average of 207.52 cm, followed by animals from the Central African Republic (201.12 cm) and finally animals from Congo (182.33 cm) with the lowest belly circumference.

Comparing these four values, a significant difference at the 5% level is observed. This means that the belly circumference is much more developed in cattle from Cameroon and CAR than in animals from Congo and Chad.

Table V: Comparison of ventral girth means

Belly circumference (TV cm)			
Origin	**Means and And**	**Min**	**Max**
Cameroun	207,52±0,22[c]	179	225
Congo	182,33±0,28[a]	150	200
RCA	201,12±0,11[c]	160	230
Tchad	193,64±0,11[b]	155	220
Average	**196,15±0,15**	**150**	**230**

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

3.4 Weight

- Live Weight at Slaughter

Table VI shows the live weight of animals slaughtered at the M'pila slaughterhouse according to their place of origin. The table shows that the maximum live weight is observed for animals from Cameroon with an average weight of 450.80 kg. While the minimum live weight was observed in cattle from Congo with an average weight of 384.33 kg. The overall average live weight of slaughtered cattle is 438.75 kg.

With a confidence level of 5%, there is no significant difference between the average weight of animals according to their place of origin.

Table VI: Comparisons of average live weight at slaughter

Live weight (LW)			
Origin	**Means and**	**Min**	**Max**
Cameroun	450,58±137,9[a]	238	609
Congo	384,33±159,4[a]	175	480
RCA	415,80±87,23[a]	219	559
Tchad	446,87±85,53[a]	214	609
Average	**438,75±97,08**	**175**	**609**

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

- Carcass Weights

The results of the carcass weights of animals slaughtered at the M'pila slaughterhouse are presented in Table VII. The table shows that the carcass weights of animals slaughtered at the M'pila slaughterhouse ranged from 200.66±90.99 kg to 210.09±28.59 kg, depending on the country of origin, with a general average of 204.93±33.33 kg, which a butcher could obtain at each slaughter if he did not take into account the place of origin of the cattle. The extremes of carcass weight in the whole population are 291kg and 90kg. The minimum value is observed in cattle from Congo, while the maximum value is found in the Chad population.

With a confidence level of 5%, there is no significant difference between the average weight of carcasses according to their place of origin.

Table VII: Comparison of carcass weights at slaughter

Carcass weight (kg)			
Origin	**Means and**	**Min**	**Max**
Cameroun	210,62±44,88[a]	134	288
Congo	200,66±90,99[a]	90	267
RCA	204,09±28,59[a]	164	255
Tchad	204,37±29,82[a]	134	291
Average	**204,93±33,33**	**90**	**291**

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

- Hot Carcass Yield

The average carcass yield was 49.97% that a butcher can obtain at each slaughter if he does not take into account the place of origin of the cattle (Table VIII). The extremes of slaughter yield in the overall cattle population are 31.78% and 66.21%; and are recorded in the cattle population of Chad.

The slaughter yield of animals from Congo and Cameroon is significantly higher at the 5% level than those from Chad and the Central African Republic.

Table VIII: Comparisons of slaughter yield averages

Carcass yield (%)			
Origin	**Means and**	**Min**	**Max**
Cameroun	51,72±8,51[b]	41,42	65,75
Congo	56,88±3,52[b]	52,94	59,75
RCA	45,17±5,66[a]	33,99	56,86
Tchad	46,47±5,66[a]	31,78	66,21
Average	**49,97±5,83**	**31,78**	**66,21**

Avg: mean; Sd: standard deviation; Max: maximum; Min: minimuma, b, c: values with different letters are significantly different at the 5% level.

4. DISCUSSIONS

Four countries were identified during this study as the countries of origin of cattle slaughtered at the M'pila slaughterhouse in Brazzaville, Republic of Congo. These were Chad (67.78%), the Central African Republic (17.22%), Cameroon (13.33%) and Congo (1.67%). The percentage obtained by Congo in this study is very low in contrast to other studies in the sub-region. This can be explained by the weakness of the national production system currently being reconstituted (Bitemo, 2012).

It is impossible to rely on local livestock to supply butchers with fresh meat, as cattle breeding in Congo still has the stamp of prestige and the number of animals has been reduced by several hazards, notably the looting caused by the political and military conflicts that took place in the country in 1997. As a result, the Congo is currently obliged to import live cattle to feed its population with red meat.

The present study highlights four breeds of cattle slaughtered during the study period at the M'pila slaughterhouse. The same work carried out by Ratsimbazafy (2013) at the Imerintsiatosika slaughterhouse (Antananarivo Madagascar) shows three breeds of zebu slaughtered.

The dominant coat colour in the study was represented by the white coat (57.78%), followed by the black coat (14.44%), the low colour is observed in the piebald red coat population (0.56%), these different colours are related to the breeds of the animals. These results differ from those reported in Niger on the M'Bororo zebu by Maaouia *et al.*, (2017), for whom the dominant coat colour was the piebald (28.4%) followed by the black (18.3%). Similar observations were made on the Peul zebu of Niger by the appearance of red fawn, red fawn and black coats that are characteristic of other local breeds of Niger, notably the Azawak (Niger, 2003) and the M'Bororo breed (Maaouia *et al.*, 2017). Serres *et*

al., (1960), present a high ratio of black and black and white coloured population. Grey and white coats are in the minority.

Males represent 100% of the herd slaughtered during the study at the M'pila abattoir. This result confirms that females are used for breeding purposes and are only used for meat production at the end of their career, whereas males are mostly used at an average age of 2 years for the production of young beef cattle (bullocks). Moreover, males have a better slaughter yield than females, which is why importers buy more males than females. The results of this study are superior to those obtained by Bouzebda *et al.,* (2007) who obtained 77% of the slaughtered males of the herd. This is justified by the fact that the age of the animals slaughtered in their study ranged from 1 to 14 years, and it can be seen that in this range, females at the end of their career are included, whereas in our study the age range is 1 to 7 years, and the females are still in full reproduction.

The average age of the total population in our study is 4.11 years, with extremes of 1 and 7 years. Our results are higher than those obtained by Micol *et al.,* (1993) on the Prim'Holstein breed in fattening (2 years); and lower compared to the results obtained by Ratsimbazafy, (2013) on the Malagasy zebu. This shows the real need for beef, as the deficit is significant and most farms around Brazzaville practice fattening.

The average height of the total population in our study is 137.5±0.11 cm, with extremes of 85 and 170 cm observed. This difference in height observed between animals depending on their place of origin is linked to the characteristics of the breeds and the rearing system (Kakisingi, 2007). Chatellier *et al.,* (2003) believe that in each rearing system, a given diet can influence the size of the animal, given that apart from genetic characteristics, a well-fed animal is predisposed to express its phenotypic potential, particularly its size, in relation to an animal that is not well-fed.

For the whole population, the scapulo-ischial length varied from 125 to 170 cm with a mean of 144.74 ± 0.10 cm. The difference between these 4 values is significant at the 5% threshold. This difference in length observed between the animals would be related to breed traits. Traore *et al.,* (2015), in recent studies characterising cattle (zebu and taurine) in West Africa, also found for the Peul zebu of Burkina Faso, a scapulo-ischial length of 141.41 ± 1.10 cm.

Similar observations were made on the Peul zebu from Niger (Traore *et al.,* 2016). Our results differ from those reported in Niger on the M'Bororo zebu by Maaouia *et al.,* (2017) who observed the scapulo-ischial length of 160 cm for males and 145 cm in M'Bororo females.

The average thoracic circumference of the study population is 171.77 cm, this thoracic circumference varies from 162.33±0.28 to 181.19±0.11cm depending on the origin of the animals. At the 5% level, the difference between these four values is significant. The difference in thoracic circumference observed between the animals is thought to be related to the age of the animals, breed characteristics and the rearing system (Kakisingi, 2007). A good quality diet can influence the rib cage of the animal since, apart from genetic traits, a well-fed animal is predisposed to express its phenotypic potential. The extreme values and standard deviations show the very heterogeneous character of the population. Compared to the results of Boulahbal. (1999) (158.34 cm), the results of this study give higher values (171.77 cm).

Concerning the ventral circumference, the respective mean values of animals from CAR, Congo, Cameroon and Chad 207.12±0.1cm, 182.33±0.28cm, 201.52±0.22cm and 193.64±0.11cm show a significant difference. The overall mean ventral circumference of the study is 196.15±0.15cm. This value is comparable to that obtained by Ratsimbazafy, (2013), 190.79 ± 16.54cm for castrated males. On the other hand, it is 170.45 ± 8.64cm for females.

The average live weight of the total population is 438.75 kg, the extremes observed (175 and 609 kg) can be explained by differences in age and the breeding system. This result is similar to that reported by Serres *et al.,* They found that the average live weight of slaughtered animals is between 280 and 400 kg depending on the slaughterhouse.

The fattening level can be modified by several factors such as sex, age, genotype and growth rate (Micol *et al.,* 1993).

During the dry season, animals lose a significant part of the weight they gained during the rainy season. This weight loss increases by 10% when animals walk to the slaughterhouse with a journey of more than 400km (Serres *et al.,* 1960). In addition, there is weight loss due to emptying of the digestive tract when animals are not eating while waiting to be slaughtered in the holding pens and during transport by trucks. This weight loss affects the carcass obtained and the meat yield (Serres *et al.,* 1960).

The overall average live weight of the study 438.75 kg is higher than that obtained by Bouzebda *et al.,* (2007) 392.55 kg in local Malagasy breeds, comparable to the average obtained by Derkaoui, (2019) (415 kg). A certain heterogeneity according to the different morphometric variables is observed within the population. This is due to several factors, mainly extrinsic. Considering the breeding method, which is specific to each breeder, the number of livestock maintained by each breeder has an influence on dry

season feeding, as natural pastures tend to disappear due to overgrowth. Thus, a large number of livestock implies a lack of nutrient intake by the animals. Capitaine. (1983), argues that the low feed value, especially nitrogen, of most natural grasses in the tropics does not allow livestock to grow quickly, and leads to low herd productivity.

Compared to the European average weights of 274-340 kg (Chatellier *et al.*, 2003), the average carcass weight in this study is 204.93 kg lower, reflecting the rearing system of the animals. The comparative study of the average carcass weight of these four origins of the slaughtered herd reveals no significant difference at the 5% threshold.

However, 26.66% of the population had a carcass weight of 250 kg or more. The heaviest carcasses were obtained in the population from Chad (291kg).

The low carcass weight can be attributed to the lack of good quality pasture (DIMI, 2021) and to the fact that these animals arrive at the slaughterhouse in a poor state of overweight, at the end of their career, and without first undergoing a finishing phase.

The work of NISDEL (2004) on the improvement of the average carcass weight reveals that the average carcass weight increased from 135 kg in 1999 to 150 kg in 2002. If the results of this study are different from those of the New Sectoral Initiative for Livestock Development (NISDEL), this is due to the fact that this study is limited to the origin of the animals and to a short period (August-October).

In the present study, meat yields ranged from 31.78 to 66.21% for the total population. This is a wider range than that reported by (Meyer, 2002). The mean value of the yield obtained in this study is equal to 49.97%. This value is within the range given by Ibrahima, (1971) and this value is higher than that obtained by Ratsimbazafy. (According to these authors, the carcass of a bovine represents 44 to 56% of the animal's live weight. The best performance in terms of yields comes from the N'Dama reared in Congo, and it would seem that bulls perform better than zebus in terms of meat yields. Comparing the results of our study with other results, we note that all the cattle slaughtered at the M'pila slaughterhouse give an acceptable meat yield, because according to (Chama *et al.*, 1981), Ngezirabona, (2014) a well-fattened bull gives a meat yield of 52 to 60% depending on the system that is used (traditional, ranching or intensive system). During drought or on poor pasture the same meat bull gives a slaughter yield of around 42% (Tudorascuradi, 1997). DIMI *et al.*, (2021) believe that meat production is strongly dependent on growth, which expresses the conditions of the farm where the animals are kept.

5. CONCLUSION

This study, which focused on the evaluation of cattle slaughter yields at the M'pila slaughterhouse in Brazzaville (Republic of Congo), made it possible to identify the various countries of origin. At the end of this study, the following conclusions were drawn:

- 98% of the cattle slaughtered at the M'pila slaughterhouse come from abroad (Chad, Central African Republic and Cameroon).
- Majority of zebus (M'bororo, Goudali, Foulbé).

Based on observed parameters,

- The height at the withers of the total slaughtered population has an overall average of 137.5 cm,
- The average thoracic perimeter is 177.77 cm,
- The average live weight is 438.75 kg,
- The average carcass weight is 204.93 kg.
- The slaughtered herd consists only of males.

Although the livestock slaughtered at the M'pila slaughterhouse during the study presented acceptable slaughter yields according to their places of origin. The best carcass yields were observed in animals from Congo and Cameroon respectively 56.88% and 51.72%.

Finally, the average eviscerated hot carcass yield of the entire population, in relation to the carcass weight of the slaughtered animals, was 49.97%. With the galloping demography and the constant expansion of the city of Brazzaville, cattle breeding throughout the country needs to be strengthened in order to reduce or even stop the import of red meat, which costs the country a lot of money.

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