CHARACTERIZATION OF RABBITS OF LOCAL ALGERIAN POPULATION: REPRODUCTIVE PERFORMANCES, GROWTH AND CARCASS TRAITS

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ABSTRACT

The aim of this experiment was to characterise the reproductive performances, growth and carcass trait of rabbits of local Algerian population keep under a controlled breeding. In total, 35 females and 35 kits aged of 30 days were used in this study for the reproductive performances and growth, respectively. The weight of females at mating was 2803g and was significantly affected by the parity and physiological status of the females. The nonlactating and multiparous females presented the higher weight at mating (P<0.05). The litter size at birth in this study was 6.1 kits. Multiparous females have shown a significantly higher litter size compared to nulliparous and primiparous females (7.5 vs. 5.8 kits and 7.5 vs. 6 kits, respectively; P<0.05). On other side, average daily gain was 27.21g. Also, the daily feed intake increased by age, from 54.12g/d in the first week post weaning to 139.62g/d at slaughter. The weight of rabbit at slaughter, the weight of hot carcass and the dressing out percentage were respectively 2138 g, 1463g and 69%. In conclusion, the performances obtained is this study allow to classify rabbit of local Algerian population as medium size rabbit with lower performances of litter size and growth which can be improved by genetic selection.

Keywords: Algeria, growth, local population, reproduction, rabbits.

Introduction

Rabbit meat is considered as healthful food product. It has a higher protein level, low cholesterol and fat content (Dalle Zotee, 2000; Aboah and Lees, 2020). The rabbit can be an important source of meat at a lower cost because of its many advantages, such as effortless starting and management, flexible investment, producing high quality meat, and creating jobs for rural people, especially women, younger or aged people (Wu and Lukefahr, 2021). Indeed, the prolificacy of this specie is an asset (51.8 rabbits produced per female per year), so the annual meat production provided by a rabbit represents 25 to 35 times its weight, which corresponds to 130 kg of carcass per year, with a meat yield, largely superior to that of all other herbivorous animals (Lebas, 2007; Jentzer, 2008). In 2019, the total rabbit meat production reached 1.41 million tonnes with European countries participation for only 12.11%, but Asian countries dominating with a rate of 81.75% (Wu and Lukefahr, 2021). In Algeria the rabbit marketing is still modest, not organized or structured. It is practiced on a small scale (Sanah et al., 2022). The rabbit farming is essentially based on the breeding of rabbits from the local Algerian population in order to ensure a supply of proteins to urban markets at a lower cost. This population has always shown a good adaptation to local climatic changes, good meat quality but lower live weight (Gacem and Bolet, 2005; Zerrouki et al., 2014). In order to the develop rabbit meat production based on the use of rabbit of local population, several studies were undertaken in Algeria for its characterization (Mefti et al., 2010; Benali et al., 2011; Moumen et al., 2016; Belabbas et al., 2021). The purpose of these studies was the characterization of the animal, its biological and zoon technical aptitudes. However, the majority of these studies were based on the use of rabbits obtained from different rural farms in which the animals are sometimes crossed whit other lines.

Thus, the objective of the present work is to characterize the reproductive performances, growth and carcass traits at slaughter age in rabbits of local Algerian population keep under controlled breeding.

Materials and Methods

The present study was carried out at the Experimental Rabbity of the University Blida 1 (Algeria). All experimental procedures involving animals were approved by the Scientific Committee of the Institute of Veterinary Sciences, University Blida 1.

Animals

The females were obtained from the Livestock Technical Institute (ITELV Bab Ali, Algeria) (Figure 1). The Local Algerian population was generated from breeding stock received from different Algerian counties (Ain el Benian, Ain M’Lila, Sidi Belabes, Blida, Constantine, Djelfa,
Ksar Chelala, Tiaret and Tizi Ouzou) in 1988. The animals were divided into groups according to their origins, kept in closed groups and mated following a rotary intersection plan among groups. The rotation began in 1988 and closed in 2005.

Fig. 1: Rabbits of local Algerian population.

**Experiment 1**

In total, 35 nulliparous females of local Algerian population were used in this experiment. Females were housed in individually in flatdeck cages. The criteria of selection were the age (4.5 months), the average live weight at mating (2683 ± 225g) and a good sanitary condition. Seven males from the same population (3255 ± 252g) were used to mate females three times a week and a one-day rest between two consecutive matings.

At the mating time, each female was transferred to the male’s cage, and left with males about 5-10 minutes. After success of the first copulation, the female is returned to their cage. Pregnancy test was carried out by abdominal palpation on day 12 after mating. For the second and the third parity, the females were mated at 12 days after parturition. Litters were reared by their dams up to weaning (35 days of age). At weaning, rabbits were individually identified and placed in collective cages.

The females were kept under controlled photoperiod with 16 hours of light: 8 hours of dark. Temperature and humidity 25°C and 67%, respectively. During the whole experimental period, females were fed ad libitum whit commercial pelleted diet containing 15.89% of crude protein and 15% of crude fibers. Females had a free access to water.

Measured parameters were: litter size: measured as the total number of kits born; number born alive: measured as the number of kits born alive; mortality at birth: measured as the number of kits found dead the day of parturition.

**Experiment 2**

In total, 35 rabbits aged of 30 days and from the local Algerian population were used. They were housed in individual cages (46 cm×26 cm×33 cm). The rabbits were fed ad libitum with a commercial pelleted diet containing 15.90% of crude protein, 13% of crude cellulose and 3% of fat matter. Growth traits were recorded weekly from day 30 to slaughter (91 days): live body weight, mortality, food consumption, average daily gain and feed conversion ratio.

At 94 days, 30 rabbits were weighted and slaughtered without prior fasting. The slaughtering and carcass traits were recorded according to recommendations of the World Rabbit Science Association recommendations described by Blasco et al. (1993), except for sleeves were kept to conform to the commercial regulations in Algerian markets (Louanaoui, 2001).

The slaughtered rabbits were bled, skinned, and emptied of the digestive tract and urogenital organs before being weighted. The measures included weight of hot carcasses, the liver weight and the weight of the full gastrointestinal tract which were took 30 minutes after slaughter. The weight of the chilled carcasses was determined after keeping the carcasses cool for 24 hours at 4°C which allows calculating the dressing out percentage (weight of chilled carcass on weight at slaughter), weight of perirenal fat and the weight of scapular fat. The degree of maturity was estimated by the ratio of the slaughter weight to the average live weight of the local population rabbit at adult age (2900 g).

Head was separated from the carcass. The carcass was the cut between the last thoracic and the first lumbar vertebrae and between the 6th and 7th lumbar vertebrae, resulting in three parts: fore, intermediate, and hind.

**Statistical analyses**

The results are described by the mean and standard error. The Mixed procedure of the statistical package SAS was used (SAS Institute, 2022). The following model was used to analyse the data in relation with the reproductive performances of the females:

\[
Y_{ijklm} = \mu + P_i + L_j + S_k + p_{ijkl} + e_{ijklm}
\]

\(\mu\) was the mean; \(P_i\) was the parity effect with 3 levels (nulliparous, primiparous and multiparous), \(L_j\) was lactation effect with three levels (nulliparous, lactating and nonlactating females), \(S_k\) was the season effect with two levels (summer and autumn), \(p_{ijkl}\) was the environment permanent effect and \(e_{ijklm}\) was the error.

**Results and Discussion**

**Reproductive performances of females**

The reproductive performances of the females, recorded during the first three parities, are presented in table 1. The average female’s weight at mating was 2803g, value in the same rage with those previously reported for this population by Zerrouki et al. (2005).
Primiparous females had significantly lower weights at mating compared to nulliparous females (-5%; P<0.05) and to multiparous females (-10%; P<0.05) (Figure 2). These results are in agreement with those reported by several authors, who point out that nulliparous rabbits are generally mated at the first time when they reach 2/3 of their adult weight (Perrier and Chevallier, 1984). The parity affects also the energy balance of females. Feed consumption is higher in multiparous females than in primiparous ones (+10-20%; Fortun-Lamothe and Gidenne, 2003; Fortun-Lamothe, 2006). Therefore, at the primiparous stage, the rabbit must cover her needs for unfinished growth, lactation and lactation and ensure a new gestation. In addition, after the first parturition, the feed consumption increases rapidly (60 to 70%), but remains insufficient to cover all the female's needs (Berchiche et al., 2000; Castellini et al., 2010). Unlike primiparous rabbits, multiparous females are usually considered capable of ingesting higher quantities of feed required to attain protein equilibrium and body energy (Xiccato et al., 2004).

Similarly, the effect of lactation was highly significant on the female’s weight at mating. Indeed, lactating females had a significantly lower weight compared to non-lactating females (2772 g vs. 2891 g, a significant difference of 4%; P<0.05) (Figure 3). Our results agree with those reported in the literature explaining that during lactation, the female’s feed requirements due to the milk production (Fortun-Lamothe, 2006). That is why, the primiparous does cannot entirely meet the high nutritional demands of lactation and usually prove an energy deficit (Xiccato et al., 2004) which reduces their body fat depots and is partially responsible for their low reproductive performance (Castellini et al., 2006). For that reason, the energy balance of does is more negative during the first lactation than for following lactations (Bolet and Fortun-Lamothe, 2002). Finally, the weight of the females did not vary significantly between the two studied seasons.

In this experiment, the total and alive kits at birth were 6.6 and 6.48 kits respectively. These values were similar to that reported by literature (Gacem et al., 2009; Alliane and Mekked, 2003) but lower (-11%) than that noted recently by Belabas et al. (2021). Other authors cited a difference of -7% for the number of total born kits but similar results kits born alive (Zerrouki et al., 2005; Moulla and Yekhlef, 2007; Abdelli et al., 2014). In the white population of rabbits, 7.1 and 5.8 kits were found, respectively, for litter size at birth and number of born alive (Sid et al., 2018). The litter size of the local population is always lower than that of the synthetic strain ITELV2006 (Gacem et al., 2009; Sid et al., 2018; Ezzeroug et al., 2019; Boudour et al., 2020; Belabas et al., 2021) and other strains (El-Raffa et al., 2005; Khalil and El-Saef, 2012). This improvement in litter size could be related to a modification in the litter size components traits (Argente, 2016; Belabas et al., 2016; Belabas et al., 2021). The French breed "fauve de Bourgogne" indicated a significantly lower litter size (4.3 kits) than the local population (Savietto et al., 2021). However, Hungarian Giant rabbit breed reported, respectively, 9.13 and 8.03 kits for total born and alive kits at birth (Eiben et al., 2021).

Fig. 3: Weight of lactating and nonlactating females.

On other side, the parity of the female has a significant effect on the litter size at birth (Figure 4). Multiparous females have shown a significantly higher litter size compared to nulliparous and primiparous females (7.5 vs. 5.8 kits and 7.5 vs. 6 kits, respectively). Litter size was similar between nulliparous and primiparous groups. These results corroborate those of other authors showing that litter size in

Table 1 : Reproductive performances rabbit does of local Algerian population (mean±SE).
Growth and carcass traits

The mortality rate was 14.2%, value corroborates with those of the literature (9 to 23%; Lakabi et al., 2008; Benali et al., 2011) and 10 to 14% (Lebas, 2005; Alabiso et al., 2016; Assan, 2018). The mortality in our study was recorded mainly in the first week after weaning of kits. The dead animals presented only diarrhea, probably due to digestive disorders linked to the stress caused by the weaning process. Digestive disorders are the main source of rabbit mortality just after weaning and are responsible of high economic losses in a rabbit farms (Assan, 2018). El-Ashtaram et al. (2020) reported that 9.63% mortality is related to enteritis in post weaning period.

The evolution live body weight is presented in the figure 6. In this experiment, the evolution of the live body weight from weaning to slaughter was similar to that reported by Benali et al. (2011) for two rabbit populations (local and white population). The live weight increases from 700g at 42 days of age to 1000g at the 56th day of age, then it records a weight around 1700g at 79 days to finally reach a weight of 1900g at slaughter (Belabbas et al., 2019). At weaning, several authors cited similar weight which was approximately 550g (Boudour et al., 2020; Belabbas et al., 2019). The synthetic strain also has shown the same result (Ezeroug et al., 2019; Belabbas et al., 2019). However, at slaughter, the live body weight was higher than 1700g. According to the bibliography, the result was in the standards obtained in rabbit of local Algerian population. The weight at slaughter was 1.5 to 3 kg at 10 to 14 weeks of age (Sanah et al., 2022; Benabdellaziz et al., 2021).

According to the authors' findings, for the same age, rabbits of local population showed a variation in weights (Berchiche et al., 2000; Berchicheet Kadi, 2002; Benali et al., 2011).

In this experiment, the average daily gain was 27.21g. This value was close to those cited by several authors on different local populations and strains (Lakabi et al., 2008; Benali et al., 2011; Belabbas et al., 2019); but it was significantly higher than those observed in the local Algerian population by Moulla (2006), Berchiche et al. (2000) and Mefti et al. (2010) with 20.44, 21.22 g/d and 25.86g/d, respectively. However, it remains low compared to the daily gain obtained by other authors (Capra et al., 2013; Belabbas et al., 2019). The daily gain increased as the age progressed, which explain the evolution of the weight previously presented.

The daily feed intake increased by age, from 54.12g/d in the first week post weaning to 139.62g/d at slaughter. This evolution corroborates to those noted in two local populations by Benali et al. (2011), but the average daily feed intake in the whole experiment period (99.34g/d) was lower than that cited by the same author. The New Zealand White rabbit showed slightly higher daily feed intake (111.5g/d) (Cardinali et al., 2015).

The conversion ratio showed increasing values between weaning and slaughter. These results agree with those reported in literature confirming that the feed conversion ratio increases proportionally with the animal’s age (Mefti et al., 2010; Benali et al., 2011). The average value was 3.70 in agreement with Lakabi et al. (2008).
Table 2: Evaluation of the daily gain, daily feed intake and feed conversion ratio according to rabbit’s age.

<table>
<thead>
<tr>
<th>Periods</th>
<th>n=30 (g)</th>
<th>Daily gain</th>
<th>n=30 (g)</th>
<th>Daily feed intake</th>
<th>n=30</th>
<th>Conversion ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-37d</td>
<td>21.45</td>
<td>SE</td>
<td>54.12</td>
<td>2.52</td>
<td>1.89</td>
<td>0.01</td>
</tr>
<tr>
<td>37-44d</td>
<td>23.84</td>
<td>1.22</td>
<td>61.17</td>
<td>4.75</td>
<td>2.23</td>
<td>0.45</td>
</tr>
<tr>
<td>44-51d</td>
<td>25.78</td>
<td>1.32</td>
<td>78.45</td>
<td>6.52</td>
<td>3.09</td>
<td>0.85</td>
</tr>
<tr>
<td>51-58d</td>
<td>27.58</td>
<td>0.44</td>
<td>92.75</td>
<td>1.85</td>
<td>3.96</td>
<td>0.41</td>
</tr>
<tr>
<td>58-65d</td>
<td>29.16</td>
<td>0.19</td>
<td>101.52</td>
<td>9.74</td>
<td>4.15</td>
<td>0.75</td>
</tr>
<tr>
<td>65-72d</td>
<td>28.85</td>
<td>0.18</td>
<td>112.14</td>
<td>4.11</td>
<td>4.15</td>
<td>0.75</td>
</tr>
<tr>
<td>72-79d</td>
<td>29.25</td>
<td>0.45</td>
<td>120.56</td>
<td>12.26</td>
<td>4.55</td>
<td>0.42</td>
</tr>
<tr>
<td>79-89d</td>
<td>29.79</td>
<td>0.38</td>
<td>132.74</td>
<td>1.85</td>
<td>5.1</td>
<td>0.23</td>
</tr>
<tr>
<td>89-93d</td>
<td>30.22</td>
<td>1.36</td>
<td>139.62</td>
<td>10.41</td>
<td>4.2</td>
<td>0.23</td>
</tr>
<tr>
<td>93-99d</td>
<td>27.21</td>
<td>0.66</td>
<td>99.34</td>
<td>6.00</td>
<td>3.70</td>
<td>0.45</td>
</tr>
</tbody>
</table>

d: day.

The weights, dressing out percentage and proportions of carcass components of slaughtered rabbits are shown in Table 3. In this experiment, the maturity rate (73.7%) was estimated considering the adult weight of 2900 g (Gacem et al., 2009). The slaughter weight was 2138g, value similar to those recorded by several authors in the same population of rabbits (Benali et al., 2011; Belabbas et al., 2019). However, this result was higher than those reported by Lakabi et al. (2008) and Alagon et al. (2015), but lower than that reported in synthetnic line ITELV2006 by Belabbas et al. (2019) (+300g).

The weight of hot carcass was 1475g, which is similar to that cited by Belabbas et al. (2019) but it is a heavier weight compared at those noted in others tests (Lakabi et al., 2008; Benali et al., 2011; Moumen et al., 2016). However, for the same rabbit’s age, this value was higher than that reported in Chinchilla’s carcass (+334 g) and Grey Giant’s carcass weight (+418 g) (Ghosh and Mandal, 2008). Concerning, chilled carcass’s weight, the result obtained was higher than those reported by other authors for different populations and breeds (Pla et al., 1998; Lakabi et al., 2008; Benali et al., 2011), but Benali et al. (2018) pointed out an elevated weight with a mean of 1760g. The difference in the weight of chilled carcasses depends on the weight of the hot carcass, which is linked to the live body weight, as well as the loss of weight during cooling after drying, which can vary from 2 to 4% (Ben Abdelaziz et al., 2021).

On other side, values obtained for the weights of liver and the full gastro-intestinal tract were higher those cited in bibliography (Ghosh and Mandal, 2008; Rotimi et al., 2021). The variation in dressing out percentage among studies might be related to the use of different genotypes, age and live body weight at slaughter and the carcass definition from country to country. In Europe, the head and feet are part of the carcass, so the rabbit dressing percentage obtained (60-62%) is higher than that in the United States (50%) where head and feet are removed. According to Xiccato et al. (2013), stand density and group size affect slaughtering performance. Also, the carcass dressing out percentage obtained in this experiment are satisfactory and within the norms reported in rabbits of medium size (50 to 60%) (Ouhayoun, 1989).

The proportion of full gastro-intestinal tract in this study was 14.2%. This result agrees with the norm described by Ouhayoun (1989) which is 14%. The same author explained that the better performances are related to the lower percentage of the digestive tract. He suggests that the relatively reduced weight of the digestive tract could be a consequence of the extension of the fattening period beyond 77 days of age, knowing that the growth of the digestive tract becomes slower than that of the body growth from 650 g and skin growth from 850 g. Moreover, Ben Abdelaziz et al. (2021) confirmed this with a trial of 3 groups rabbits where the highest yield was attributed to the group with the lowest percentage of full gastro-intestinal tract. Also, Alagon et al. (2015) reported a higher percentage for full gastro-intestinal tract (20.2 %) with low dressing out percentage (55%).

The average adiposity of rabbit carcasses represented mainly by perirenal fat in relation to the weight of the cold carcass (Blasco et al., 1993). In this experiment, it was obtained a percentage of 1.5% which is similar to that reported by Lakkabi et al. (2008) but lower (-2%) then that cited by other authors (Berriche et al., 2000; Alagon et al., 2015; Moumen et al., 2016). The literature is contradictory concerning the relationship between muscle and adiposity. Petracci et al. (1999) observed that the heaviest animals are the fattest. Conversely, Piles et al. (2000) noted a decrease in overall apparent fat deposition in rabbits selected on growth rate compared to control animals. According to the experiment conducted by Ben Abdelaziz et al. (2021), and under local Algerian production conditions, breeders produce carcasses with an average fatness.
Table 3: Slaughter yield components and carcass characteristics of the local population at 13 weeks of age

<table>
<thead>
<tr>
<th>Traits</th>
<th>Rabbits (n=30)</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity rate, %</td>
<td>73.72</td>
<td>4.68</td>
</tr>
<tr>
<td>Weights (g)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slaughter weight (SW)</td>
<td>2138.3</td>
<td>135.69</td>
</tr>
<tr>
<td>Skin (S)</td>
<td>203.34</td>
<td>38.08</td>
</tr>
<tr>
<td>Full gastro-intestinal tract (FGIT)</td>
<td>305.55</td>
<td>72.44</td>
</tr>
<tr>
<td>Hot carcass (HC)</td>
<td>1475.89</td>
<td>86.13</td>
</tr>
<tr>
<td>Chilled carcass (CC)</td>
<td>1436.39</td>
<td>86.80</td>
</tr>
<tr>
<td>Scapular fat (SF)</td>
<td>7.74</td>
<td>1.54</td>
</tr>
<tr>
<td>Perirenal fat (PF)</td>
<td>21.51</td>
<td>3.69</td>
</tr>
<tr>
<td>Liver (L)</td>
<td>69.52</td>
<td>7.41</td>
</tr>
<tr>
<td>Dressing out (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC/SW</td>
<td>69.02</td>
<td>0.4</td>
</tr>
<tr>
<td>CC/SW</td>
<td>67.29</td>
<td>3.8</td>
</tr>
<tr>
<td>Proportions (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S/SW</td>
<td>9.46</td>
<td>1.36</td>
</tr>
<tr>
<td>FGIT/SW</td>
<td>14.2</td>
<td>2.90</td>
</tr>
<tr>
<td>PF/CC</td>
<td>1.5</td>
<td>0.25</td>
</tr>
<tr>
<td>SF/CC</td>
<td>0.54</td>
<td>0.10</td>
</tr>
<tr>
<td>L/CC</td>
<td>4.84</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Conclusions

In summary, concerning the relationships between parity order and reproductive traits, our results agreed with existing literature showing a greater weight of the females and higher litter size in multiparous stage. The weight of females is affected by its physiological status and the lighter weight was recorded in the nonlactating females.

The study of the growth allowed us to confirm once again that the rabbit’s live body weight of the local Algerian population is in the range of those belong to the small category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds. The evolution of the weight, between weaning and slaughter, corroborate to the literature with an evolutionary category of breeds.

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