Effects of Breed and Weight on the Reproductive Status of Zebu Cows Slaughtered in Imo State Nigeria

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Abstract: Gross morphological studies of 200 zebu cows (*Bos indicus*) slaughtered in Owerri abattoir, southeastern Nigeria was carried between the months of September and November, 2005 to determine the effects of breed and weight on the reproductive activities of such animals. Seventy seven (38.5%) of these cows were White Fulani, 75 (37.5%) and 48(24.0%) Sokoto Gudali and Cross-breeds. Among these cows examined, 77 (38.5%) of them weighed between 351 – 400 kg, 76 (38.0%) weighed 301 – 350 kg while the cows that were within the 451 – 500 kg and 601 – 650 kg weight groups each recorded 1 (0.5%) against them. Macroscopic examination of the ovaries for corpus luteum in the different breeds revealed that 130 (65.0%) of the cows were undergoing active estrous cycle, with 53 (40.8%), 48 (36.9%) and 29 (22.3%) falling within the Sokoto Gudali, white Fulani and Cross-breed cows respectively. Presence of corpus albicans on their ovaries showed that 178 (89.0%) had calved before, again with Sokoto Gudali breed recording 70 (39.3%), while the White Fulani and Cross-breeds recorded 65 (36.5%) and 43 (24.2%) number of corpus albicans. Mean ovarian measurements (pole to pole, border to border) showed no gross difference among the breeds. However, the cross-breed had more follicles than the pure breeds. Weight of the cows positively affected the ovarian measurements. A number of atrophied ovaries were recorded which equally reduced the mean ovarian measurements and weight for cows in the 451 – 500 kg body weight range. It was concluded that breed and weight could be veritable tools to ascertain the reproductive status of cows brought for slaughter in order to stop the indiscriminate slaughtering of reproductively active animals thereby depleting the Nigerian livestock population. [Life Science Journal. 2006;3(3):77 – 81] (ISSN: 1097 – 8135).

Keywords: breed weight; reproductive status; cows; Imo state; Nigeria

Abbreviations: CA: corpus albicans; CH: corpus haemorrhagicum; CL: corpus luteum

1 Introduction

More than 80% of livestock population in Nigeria is in the hands of the illiterate Fulani nomads[1]. These livestock include cattle, sheep and goats. Typical of their traditional, the Fulanis perceive ownership of livestock more as symbol of status than as meat animals[2,3]. Proper economic management of food animals demands that those sold for slaughter should be males and females that are reproductively inactive. Thus, information on the reproductive status, breed and weight of animals sent for slaughter should be continually evaluated to avoid wastage through the slaughtering of reproductively active females. It is recommended that cattle be sold based on their weights, breeds and sometimes age, as consumers prefer very big cattle to smaller ones because of their meat proportion[3] and palatability[4]. The total reliance on these indices however may be misleading as some breeds reproduce more than others[5].

Research studies on data from abattoirs have revealed high occurrence of fetal wastage among cows slaughtered in Nigeria[6-9]. These studies may not reveal the exact magnitude of the problem since they depict mainly the prevalence of indiscriminate slaughtering of pregnant cows in the country. Ovaries collected from slaughter houses have been noted to contain evidence of the present and past reproductive status of such animals in the form of follicles in varying degrees of development, corpus haemorrhagicum (CH) and corpus albicans (CA) among others[2,10].

Studies on ovarian morphology could yield valuable information on the present reproductive conditions and history of cows of different breeds and weights slaughtered within a locality.

This study was thus designed to investigate the influence of breed and weight on the reproductive activities of cows brought in for slaughter at the Owerri municipal abattoir of Imo state, southeastern Nigeria.

2 Materials and Methods

Gross morphological studies of ovaries of 200 *Bos indicus* cows slaughtered at Owerri municipal abattoir Imo state were carried out between the months of September and November, 2005 to determine the effects of breed and weight on the reproductive activities of such slaughtered cows. The abattoir was visited twice in a week and during each visit, the cows were identified before slaughter, their breeds and weights equally noted.

After the slaughter, pairs of ovaries from each of the cows were harvested and put into properly labeled clean glass dishes and taken to the laboratory where morphological examinations were carried within 3 hours. In addition, the uterus of each cow was excised and inspected for fetal materials. The weights of the ovaries were determined in grams, using an electronic balance, while their dimensions (lengths of pole to pole and border to border) were measured in millimeter using a venier calipers. The number of corpus luteum (CL), CA, and CH and other gross observations such as adhesions and atrophy were equally recorded for each pair of ovaries. The data generated were analyzed, using simple averages, percentages and statistics.

3 Results

Breeds and weights of cows slaughtered in the abattoir at Owerri are reported in Table 1. Out of 200 slaughter cows examined, 77 (38.5%) were White Fulani breed, while 75 (37.5%) and 48 (24.0%) were Sokoto Gudali and Cross-breeds respectively. Across these breeds too, 77 (38.5%) of them weighed between 351 – 400 kg. Also, 41 (54.7%) of the cows belonged to the Sokoto Gudali breed while 27 (35.1%) and 9 (18.8%) were of the White Fulani breed and Cross-breed respectively. Seventy-six (38.0%) of the cows examined belonged to the 301 – 350 kg weight range, where 33 (42.9%) of them were of White Fulani breed 25 (33.3%) and 18 (37.5%) were Sokoto Gudali and Cross-breed.

Table 1. Weight and breeds of cows slaughtered at the abattoir in Owerri, Imo state

Weight(kg)	No.(%)WF	No.(%)SG	No.(%)CB	Total (%)
200 – 250	6(7.8)	–	–	6(3.0)
251 – 300	8(10.4)	7(9.3)	21(43.8)	36(18.0)
301 – 350	33(42.9)	25(33.3)	18(37.5)	76(38.0)
351 – 400	27(35.1)	41(54.7)	9(18.8)	77(38.5)
401 – 450	2(2.6)	1(1.3)	–	3(1.5)
451 – 500	1(1.3)	–	–	1(0.5)
501 – 550	–	–	–	–
551 – 600	–	–	–	–
601 – 650	–	1(1.3)	–	1(0.5)
Total	77(38.5)	75(37.5)	48(24.0)	200(100)

WF = White Fulani, SG = Sokoto Gudali, CB = Cross-Breed.

The result of the effect of breed on the number of CL from cows slaughtered at the abattoir in Owerri is reported in Table 2. Of the 200 cows examined, 130 (65.0%) had CL, while 70 (35.0%) of them had no CL. Among the cows whose ovaries had CL, 53 (40.8%) were Sokoto Gudali followed by 48 (36.9%) and 29 (22.3%) of the White Fulani and Cross-breeds respectively. Nineteen (27.1%) of the Cross-breed had no CL, while 29 (41.4%) of White Fulani and 22(31.4%) of Sokoto Gudali breeds had no CL.

The effect of breed on the number of CA from cows slaughtered at the abattoir in Owerri is shown in Table 3. Out of the total number of cows examined, 178 (89.0%) of them had CA on their ovaries whereas 22 (11.0%) had none. Of the cows with CA, 70 (39.3%) of them were Sokoto Gudali, while 65 (36.5%) and 43 (24.2%) were White Fulani and Cross-breed respectively. Majority, 12 (54.5%) of the cows without CA were of White Fulani breed, whereas Sokoto Gudali and Cross-breed each was 5 (22.7%).

Table 4 shows the mean ovarian measurements in cows of different breeds slaughtered at the abattoir in Owerri. Out of the 70 cows examined here, 28 of them were Sokoto Gudali with mean ovarian

weight of 6.649 ± 0.34, while 26 White Fulani and 16 Cross-breed cows had mean ovarian weights of 6.04 ± 0.31 and 5.543 ± 0.40 respectively. The mean pole to pole length of the ovaries harvested from 28 Sokoto Gudali was 3.21 ± 0.70, followed by 2.34 ± 0.09 and 2.30 ± 0.09 from ovaries collected from 16 Cross-breed and 26 White Fulani cows respectively. The mean border to border measurements of ovaries from 16 Cross-breed was 2.01 ± 0.15, followed by 1.80 ± 0.08 and 1.80 ± 0.06 from 26 White Fulani and 28 Sokoto Gudali cows. The mean number of follicles measured was highest for the 16 Cross-breed cows which recorded 7.25 ± 0.97 followed by 6.535 ± 0.96 and 5.577 ± 0.78 mean number of follicles on ovaries belonging to 28 Sokoto Gudali and 26 White Fulani breeds of cows.

Table 2. Effect of Breed on number of CL from cows slaughtered at the abattoir in Owerri, Imo state

Breed of cows	Cows with CL (%)	Cows without CL (%)	Total examined (%)
F	48(36.9)	29(41.4)	77(38.5)
SG	53(40.8)	22(31.4)	75(37.5)
CB	29(22.3)	19(27.1)	48(24.0)
Total	130(65.0)	70(35.0)	200

Table 3. Effect of breed on number of CA from cows slaughtered at the abattoir in Owerri, Imo state

Breed of cows	Cows with CA(%)	Cows without CA(%)	Total (%)
WF	65(36.5)	12(54.5)	77
SG	70(39.3)	5(22.7)	75
CB	43(24.2)	5(22.7)	48
Total	178(89.0)	22(11.0)	200

The effect of weight on ovarian measurements of cows slaughtered at the abattoir in Owerri is reported in Table 5. The longest pole to pole length was obtained from ovaries of cows weighing 601 – 650 kg body weight, followed by 3.05 ± 0.51 and 2.73 ± 0.23 measurements from ovaries of cows that weighed 351 – 400 kg and 401 – 450 kg body weights respectively. The least pole to pole dimension was from ovaries of cows in 200 – 250 kg body weight range. The mean border to border dimensions of ovaries were highest for those harvested from cows weighing between 401 – 450 kg. Again the least border to border measurement was obtained from ovaries belonging to cows that weighed 200 – 250 kg body weight, which was 1.6 ± 0.13. The mean ovarian weight was highest (8.25 ± 0.0) for cows that weighed between 601 – 650 kg, followed by 7.94 ± 0.0 got for cows weighing 401 – 450 kg. The least ovarian weights of 2.571 ± 4.49 and 5.70 ± 0.0 were recorded against cows which weighed between 200 – 250 kg and 451 – 500 kg respectively.

4 Discussion

Very useful information on the reproductive states of cows could be obtained from the ovaries of such animals sent for slaughter. This study shows that over 75% of the cows slaughtered in Owerri abattoir were of Sokoto Gudali and White Fulani breeds and also that about this population of cows weighed between 301 – 400 kg. This finding agrees with earlier reports[3,6,9], that people prefer these breeds of cattle as meat because of their big sizes. That about 65% of the cows slaughtered possessed corpora lutea, shows that they were still reproductively active. Over 75% of these animals were Sokoto Gudali and White Fulani breeds of cattle. This again confirms our earlier reports[2] and others[6-9] that most animals slaughtered in our abattoirs are usually those still having high reproductive ability.

Breed seemed not to have obvious effect on the number of CA on the ovaries of Sokoto Gudali and White Fulani cows examined. Although the percentages of cows with CA show a gross difference between the Sokoto Gudali, White Fulani and Cross-breed, there is lack of literature to support this trend. This is the first report of the effect of breed on the reproductive status of cows slaughtered for meat at the abattoirs in Owerri, Nigeria. CA count from pairs of ovaries from slaughtered animals showed that this may be a good tool to highlight the problem of reproductive wastage among cows slaughtered in Nigeria. It has been document-

ed[10,11] that previous reproductive history in the form of fibrosed remains of CL of pregnancy (CA) persist for life in majority of cows and this preserves a record of the number of pregnancies undergone by each animal. Our reports showed that 89% of the cows had calved while 11% had not, again depicting the insufficiency of fetal wastage measurements as a major tool in evaluating reproductive wastage among slaughtered animals.

Table 4. Mean ovarian measurement in cows of different breeds slaughtered at the abattoir in Owerri, Imo state

Parameter	Breeds of cows ($n=70$)		
	WF No./mean	SG No./mean	CB No./mean
Wt. of ovary(g)	26(6.04±0.31)	28(6.649±0.34)	16(5.543±0.40)
Pole to pole(cm)	26(2.30±0.09)	28(3.21±0.70)	16(2.34±0.09)
Border to border(cm)	26(1.80±0.08)	28(1.80±0.06)	16(2.01±0.15)
No. of follicles	26(5.577±0.78)	28(6.535±0.96)	16(7.25±0.97)

Table 5. Effect of weight on ovarian measurement of cows slaughtered at the abattoir in Owerri, Imo state

Weight(kg)	Pole to pole (cm)	Border to border (cm)	Weight of ovaries (g)
200 – 250	1.86±0.14	1.60±0.13	2.57±4.49
251 – 300	2.26±0.05	1.73±0.04	6.68±0.52
301 – 350	2.44±0.04	1.87±0.04	6.01±0.36
351 – 400	3.05±0.51	1.88±0.05	6.05±0.29
401 – 450	2.73±0.23	2.20±0.32	7.94±0.0
451 – 500	2.50±0.0	1.70±0.0	5.70±0.0
501 – 550	–	–	–
551 – 600	–	–	–
601 – 650	3.10±0.0	1.80±0.0	8.25±0.0

Breed of cows slaughtered in Owerri abattoir seems to influence the ovarian measurements. The ovaries harvested from White Fulani and Sokoto Gudali were heavier than those of the Cross-breed cows. Also, Sokoto Gudali cows had longer pole to pole measurement of their ovaries than the other breeds. The Cross-breed cows had wider border to border measurements of their ovaries than the pure breeds. The Cross-breed equally had higher number of follicles than the pure breeds. These findings are in agreement with a similar work carried out among small ruminants in Ogun state, southwestern Nigeria[5]. The difference that existed between the Cross-breed and pure breeds might be revealing an improvement in the reproductive traits of the Cross-breed cows as a result of combined genetic make ups.

The ovarian measurements seem to increase as the cows attained bigger body weights. In the pole to pole measurements, exceptions to this trend were among the ovaries collected from cows within the weight of 401 – 500 kg. The cows seemed to have ovaries which were wider than they were long. But the ovaries belonging to cows that weighed 451 – 500 kg had shorter border to border measurements. The difference in these orders may be attributed to the presence of some atrophied ovaries in the group encountered during this study. Weight also seemed to increase the weight of the ovaries. Exceptions here were ovaries of cows that weighed 451 – 500 kg, this again is explained by the presence of atrophied ovaries as supported by Arthur[10].

5 Conclusion

Our studies revealed that about 65% of different breeds of cows slaughtered at Owerri abattoir for meat, irrespective of their weights were still in their active reproductive states but are being sent for slaughter for reasons other than reproductive inactivity. Breeds seemed to positively influence the reproductive performance of our indigenous cows, however cross breeding also slightly improved this trait. Ovarian measurements increased with the body weight of the cows. Age[2] and body weight

of animals sent for slaughter could be a future reliable index to ascertain the reproductive status of such animals before they are finally passed for slaughter.

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