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ORIGINAL ARTICLE

The Economic Implication of Foetal Wastage in Cattle, Sheep and Goat in Makurdi Abattoirs, Benue State, Nigeria

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SUMMARY

This study was conducted to determine the incidence and economic implication of foetal wastage in Makurdi abattoirs. The species observed to be slaughtered during the 3 months study (from November 2011 – January 2012) were bovine, caprine and ovine. The total number of animals slaughtered were 424 cattle (i. e. 177 males and 247 females), 754 goats (i. e. 119 males and 635 females) and 138 sheep (i. e. 21 males and 117 females). The incidence of foetal wastage in cattle, goats, and sheep was 2.43%, 44.09% and 23.08% respectively with most of the foetuses in their second and third trimesters. More female animals were slaughtered in all three species with 247 (58.25%) in cattle, 635 (84.22%) in goats and 117 (84.78%) in sheep. There was a significant difference ($p<0.05$) in the sex of slaughtered animals and foetal wastage in each trimester but no significant difference ($p>0.05$) in the sex of wasted foetuses. An estimated sum of ₦ 600,000 equivalent to $ 3,530 was lost in cattle, ₦ 2.8 million an equivalent of $16,471 was lost in goats and ₦ 270,000 an equivalent of $1,588 was lost in sheep. A total sum of ₦ 3.4 million equivalent to $20,000 was lost within the three months this study lasted. This is a huge economic loss to the livestock sector of the economy. Efforts should be made to reduce the occurrence of foetal wastage by effective ante-mortem meat inspection.

Key words: Cattle, Economic implication, Foetal wastage, Goat, Sheep.

INTRODUCTION

The global livestock population consists of about 1.340 billion cattle and buffalo, 1.149 billion sheep, and 390 million goats (Campbell and Lesly, 2003). The foremost reason for maintaining animal population is to provide nutritious and desirable levels of protein supply for human beings. It has been well established that animal proteins are more superior to vegetable proteins due to presence of some essential amino acids that are lacking in plant derived protein (Devendra, 2001). Livestock husbandry and slaughter have become millenary traditions in every part of the world. The main reason

for these traditions is that humans are at the top of the biological chain in the habit of meat consumption (Okoli *et al.*, 2006). The average animal protein intake/head/day in Nigeria is 19.2 ±1.1g, as against the European/North American average of 43.3± 1.1 g/head/day (Okoli *et al.*, 2005; Bilsborough and Mann, 2006). From the global point, Nigeria falls below the recommended average per head consumption of animal protein. This has partly been due to decrease in the population of sheep and goats in the Sahel region of Nigeria consequent of reproductive wastage (Chaudhari and Bokko, 2000). This therefore serves as the foremost reason for maintaining animal populations to provide a nutritious and desirable form of food for people (Adama *et al.*, 2011).

The economic losses from pregnancy wastage from the Sahel region of Nigeria have been estimated to be 63.27 billion naira (432 million US dollars) per annum (Bokko, 2011). Similarly, Nma (2011) put the economic wastage at 8.3 million naira (56, 828 US dollars) from Minna abattoir in North Central Nigeria. These losses are mainly due to inadequate antemortem inspection of animals before slaughter in most Nigerian abattoirs, resulting in slaughter of pregnant animals leading to wastage of the already scarce animal protein (Cadmus and Adesokan, 2010). Several studies on foetal wastage in Nigeria have relied wholly on secondary data collected by livestock division of the agency of Government responsible for abattoir management. These data sometimes are inaccurate and inconsistent, thus there is need to survey the abattoir and obtain primary data.

Previous findings (Caleb and Ayo, 2003), showed a decrease in annual growth rate of livestock production in Nigeria which has led to a decline in the percentage contribution of livestock subsector to the gross domestic production from 1991 - 1995. The aim of this study was to determine the implication of foetal losses in Makurdi abattoirs. Therefore, the objectives of this study were to determine incidence of foetal wastage, stage of pregnancy slaughtered, sex ratio of slaughtered animals, rate of multiple births and to determine the economic implication of foetal wastage.

MATERIALS AND METHODS

Location of the study

This study was carried out in Makurdi the capital of Benue State, Nigeria. Makurdi according to Omudu and Amuta (2007) is located on the east central part of Nigeria on longitude 8° 35'' E and latitude 7° 44" N and has a radius of 16 km. The climate of the area is tropical and the vegetation is predominantly guinea savannah with an annual rainfall of 1090 mm. This area is defined by two seasons, the rainy season lasting from April to October and the dry season lasting from November to March. The atmospheric temperature ranges from 27.38° C to 34.09° C. For the purpose of this study three abattoirs in Wurukum abattoir, Wadata abattoir and Modern Market abattoir were surveyed.

Sample collection

The samples were collected from November, 2011 to January, 2012, three times a week. The contents of the uteri of slaughtered females were determined by visual inspection, by palpation and then confirmed by incision to expose the foetus(es) and a metric rule was used to take the head to rump measurement to estimate the age of the foetus. This study was carried out over a period of 3 months and required visits to the 3 abattoirs in Makurdi. The sample size was determined by using the formula of Thrustfield (1995) and considering the prevalence rate of 3.9 % reported in cattle by Abdulkadir *et al* (2008). The sample size for cattle was 107 as the minimum sample size to be used for this study. In order to have a good representation our sample size

was above calculated sample size (424 for Cattle, 138 for sheep and 734 for goat respectively.

Ages of foetuses at slaughter were determined by measuring the crown to anal length and the values fixed into a formula proposed by Richardson (1980).

Calf X = 2.5(Y + 17)

Kid and Lamb X=2.1(Y +17),

Where X is the developmental stage in days and Y is the crown to anal length in cm.

Determination of economic wastage

The economic wastage of foetuses was determined by multiplying the total number of foetal wastage in each species by the amount worth in Naira (₦) it would have been sold for if their gestation was not terminated

Example a) in the international cattle market Makurdi a fully grown cattle is sold at ₦70, 000 to ₦ 100, 000

Therefore the amount lost in bovine was calculated as

6 (total number of foetuses wasted) x ₦ 70, 000 to ₦ 100, 000

= ₦ 420, 000 to ₦ 600, 000

This means that an amount of ₦ 420, 000 to ₦ 600, 000 was lost in the bovine species

Plate I. shows measurement of a foetal female calf

Data Collection

The following data were collected based on the three species: (1) total number of male and female animals, (2) pregnant animals at slaughter, (3) number of foetuses, (4) age of foetus, (5) sex of foetus. The estimated foetal age were used to classify the foetuses into appropriate trimesters depicting the three stages of gestation. Data collected were analysed using chi-square to show whether there was a significant difference in the occurrence of

a) Male or Female animals slaughtered
b) Foetal wastage in each trimester across species
c) Male or Female wasted foetuses within species

With 0.05 as level of significance and incidence of foetal wastage in slaughtered animals was determined.

RESULTS

A total of 1316 animals were slaughtered over a period of 3 months with 999 females and 317 males. i. e. a ratio of 3:1 (female to male) was slaughtered. A breakdown for each species slaughtered and incidence of foetal wastage of each species is presented in Table I. Number of multiple births, sex of foetuses and trimesters are presented in Table II. Plates II, III and IV show a foetal calf, a foetal lamb and two foetal kids in their third trimester respectively.

Economic implication was calculated as :

Economic wastage = Total number of foetuses wasted in each species X the amount in Naira a life animal is sold for in the international livestock market Makurdi, fully grown cattle was sold for about ₦ 70, 000 – ₦ 100, 000, while an adult goat was sold for about ₦ 8, 000 – ₦ 10, 000. The cost of sheep varies with festive periods but can be sold for an average of ₦ 10, 000.

The result as seen in Table I showed the distribution of animals slaughtered in the abattoir in the course of 3 months that the study was carried out. A total of 1316 animals were slaughtered with 424 cattle which was made up of 177 males and 247 females, 138 sheep consisting of 21 males and 117 females and 754 goats consisting of 119 males and 635 females. This indicated that more females were being slaughtered with a ratio 3:1, especially in goats. 239 pregnant animals were slaughtered consisting of 6 cows, 23 ewes and 210 does while a total number of 313 foetuses wasted 6 foetal calves, 27 foetal lambs and 280 foetal kids.

Table I: Distribution and incidence of foetal wastage in bovine, ovine and caprine species of animals slaughtered at the Makurdi abattoirs

Species	Male	Female	Total	% Male	% Female	No. Pregnant	% Pregnant	No. Foetuses	% Foetal wastage to number of females
Bovine	177	247	424	41.75	58.25	6	2.43	6	2.43
Ovine	21	117	138	15.22	84.78	23	19.66	27	23.08
Caprine	119	635	754	15.78	84.22	210	23.92	280	44.09
Total	317	999	1316	24.09	75.91	239	23.93	313	69.60

*p=0.0001 for male or female animal slaughtered

Table II: Distribution of foetal wastage of bovine, ovine and caprine species slaughtered in Makurdi abattoirs showing rate of multiple births, the trimester of gestation and foetal sexes

Species	Bovine	Ovine	Caprine
Singe	6	19	147
% Single	100	82.61	70
Twining	0	4	56
% Twining	0	17.39	26.67
Triplet	0	0	7
% Triplet	0	0	3.33
No Pregnant	6	23	210
1 Trimester	0	0	24
2 Trimester	1	19	213
3 Trimester	5	8	43
Male Foetus	4	10	106
Female Foetus	2	17	174
% Foetal wastage to number of females	2.43	23.08	44.09

*p = 0.0001 for foetal wastage in each trimester across species
*p = 0.03528 for male or female foetuses within the species

DISCUSSION

In the international cattle market Makurdi, fully grown cattle is sold at ₦70, 000 - ₦100, 000, while an adult goat is sold for between ₦ 8,000-10,000. The cost of sheep varies with festive periods but it can be sold for an average of ₦10, 000. An estimated 3.4 million naira equivalent to 20,000 US dollars was lost within the three months period this study lasted. This is a huge economic loss to the livestock sector of the economy. Efforts should be made to reduce the occurrence of foetal wastage.

The result as seen in Table I showed the distribution of animals slaughtered in the abattoir in the course of 3 months that the study was carried out. A total of 1316 animals were slaughtered with 424 cattle which was made up of 177 males and 247 females, 138 sheep consisting of 21 males and 117 females and 754 goats consisting of 119 males and 635 females. This indicated that more females were being slaughtered with a ratio 3:1, especially in goats. 239 pregnant animals were slaughtered consisting of 6 cows, 23 ewes and 210 does while a total number of 313 foetuses wasted 6 foetal calves, 27 foetal lambs and 280 foetal kids.

In this study, the percentage foetal wastage in cattle was 2.43%. This is lower than 4.44% in Minna (Nma, 2011), 3.90% reported in Benue State (Abdulkadir *et al.* 2008) and 5.01% in South-western States (Cadmus and Adesokan, 2010). This

Plate I: Showing measurement of a foetal calf

Plate II: Foetal calf in its third trimester

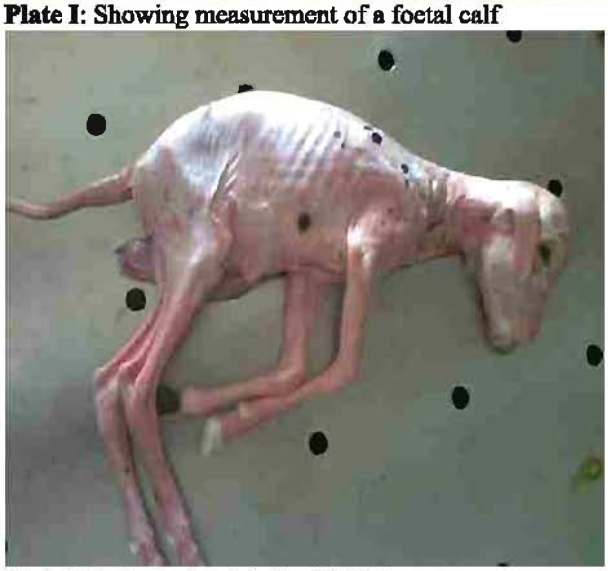

Plate III: Foetal lamb in its third trimester

Plate IV: Foetal kids in their third trimester

difference seems to be as a result of the total cattle slaughtered in Makurdi which was lower than the total slaughtered in the whole of Benue State and the whole of South-western States. The more animals slaughtered the more the probability of getting more animals that are pregnant. The wastage in sheep was 23.08%. This is higher than the 22.78% in the Sahel region of Nigeria (Bokko, 2011) and the 44.09% incidence in goats is higher than the 17.88% in the Sahel region of Nigeria (Bokko, 2011). These could be as a result of slaughtering more females in Makurdi (84.78%) ewe compared to 73% in the Sahel region and 84.22 % does as compared to 41%. This means more female animals were slaughtered and higher possibility of getting pregnant animals being slaughtered.

More female animals were slaughtered in this study, in total 999 (75.91%). The differences in sex of slaughtered animals was significantly different in ovine and caprine but not significantly different in bovine species. This may indicate a preference for chevon in the study area as 754 goats were slaughtered, as compared to 138 sheep. The result of this study is in agreement with the report of Ikeme (1996) and Idahor *et al.*, (2008) where more goats

were slaughtered as to sheep. In a study in the Sahel region of Nigeria Bokko (2011) reported 73% ewes and 41% does were slaughtered. This is contrary to the current study where more goats were slaughtered in Makurdi. This may be an indication of preference of mutton over chevon in Sahel region. While there is a preference for goat meat over sheep meat in Makurdi and Benue State generally these preferences maybe due to cultural and/or religious attractions to these two types of meat (mutton and chevon).

The stages of pregnancy as seen in Table II showed that most of the pregnant animals slaughtered were in the 2nd trimester and least in the first trimester (Figure I). This is contrary to the report of Bokko (2011) where more first trimester foetuses were reported, followed by the second and third trimesters. There was significant difference in the occurrence of foetal wastage in the trimester across the species but no significant difference in the occurrence of male or female wasted foetuses. This Table also showed that there was a high loss of twins and triplets of 26.67% and 3.33% of foetal kids respectively which is a desirable trait in goats. Goats are kept primarily for meat production, so production traits of interest are the number of young weaned per breeding female per year and their growth rate (Bradford, 1993).

Slaughtering of pregnant animals for meat purpose is unethical and is contrary to the international standard rules of slaughter where pregnant animals are not allowed to enter the food chain (Khan and Khan, 1989). It also frustrates the scientific endeavours of geneticists, nutritionists and livestock breeders working for the propagation of animal species (Khan and Khan, 1989). It also implies the lack of adequate ante-mortem examination of animals before slaughtering.

This unethical practice if left unchecked has the capacity to reduce the quantity and quality of animal protein available for human consumption in most developing countries. The practice of slaughtering of pregnant animals should therefore be discouraged as it amounts to cruelty to animals and negates the principles of animal welfare. Thus, adequate ante-mortem of female animals before slaughtering should be enforced by the appropriate Veterinary authorities in our abattoirs. The recommendation to Government, especially in the developing countries, is to increase the number of Veterinarians working in our abattoirs and slaughter houses to enable comprehensive ante-mortem and post-slaughter inspection of carcasses. The use of ultrasonography can be employed in sheep and goats to detect pregnancy as practiced in developed economies. Butchers and farmers should be properly educated on the implication of slaughtering pregnant female animals.

CONCLUSION

There is a significant foetal wastage in Makurdi abattoirs, and this can translate into large economic losses, loss of genetic potential and sustainability of meat production since productive pregnant animals are not spared in the quest for meat.

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