Incidence of Fetal Loss among Cattle, Sheep and Goats Slaughtered in Zuru Metropolis

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Authors' contributions

This work was carried out in collaboration among all authors. Author AMS handled the design and protocol of the study. Author IDS performed the statistical analysis. Author MG managed the literature research and author LUF wrote the first draft of the paper. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

A total of eight hundred and ninety two (892) animals which includes cattle, sheep and goats were used to study the incidence of fetal loss in Zuru, Kebbi state, Nigeria. The study considered metropolitan slaughterhouse located in Rafin Zuru and a slaughter slab in Rikoto area for the study. The data was collected for twelve (12) weeks using a format containing information on the species and number of animals slaughtered, sex and pregnant status, number and sex of the fetuses observed from the pregnant slaughter. These were analyzed using simple descriptive statistics. The results revealed a total slaughter of 97 (10.87%) cattle, 202 (22.65%) sheep and 593 (66.48%)

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goats. From the total slaughter, there were 30 (30.93%) bulls, 67 (69.07%) cows, 80 (39.60%) rams, 122 (60.40%) ewes (female sheep), 384 (64.75%) bucks (male goat) and 209 (35.25%) does (female goats) slaughter. Among the female slaughter, there were 32 (47.76) pregnant and 35 (52.24%) non-pregnant cows, 79 (64.75%) pregnant and 43 (35.25%) non-pregnant ewes, 146 (69.86%) pregnant and 63 (30.14%) non-pregnant does slaughtered in the metropolis during the period of the study. A total of 32 (8.58%) calves, 85 (22.79%) lambs and 256 (68.63%) kid fetuses were recorded due to pregnant slaughter in the metropolis. Among the fetuses, 10 (31.25%) males and 22 (68.75%) female calves, 33 (38.82%) males and 52 (61.18%) female lamb, 100 (39.06%) males and 156 (66.03%) female kid fetuses were observed. In the future, the loss of fetuses due to slaughter of pregnant animals could pose a serious challenge to animal population and food security in the metropolis. Therefore, suggesting sound policies and legislations to reshuffle livestock marketing and abattoir operations in order to check fetal loss due to pregnant slaughter.

1. INTRODUCTION

Livestock continue to play a significant role in improving the economic growth and nutritional status of Africans [1]. Nigeria has an estimated population of 15 million cattle, 49 million sheep and goat. This made the country among the four leading livestock producers in sub-Saharan Africa [2]. Animal husbandry system, management, feed and disease problems are some of the major factors that hinder large scale animal production in Nigeria [2]. Depending on environment and economic factors, an individual requires over 50g of daily food intake. Attainment of this requirement ranked the developed countries about 3 to 4% higher than the corresponding developing countries including Nigeria [3]. The average daily protein requirement of an individual is 70g, and 35g of this must come from animal origin for good physiological status. However, decrease in the population and productivity of livestock has negatively impacted on percapita consumption of animal protein in Nigeria [2].

Over the years, researchers have reported the annual meat consumption rate of 1202kg in United States, 111.5kg in Australia and 84.2kg in United Kingdom against 8.8kg in Nigeria, 7.3kg in Sierra-lone, 6.5kg in Rwanda and 5.2kg in Burundi/person/year respectively [4]. By 2030, it is expected that the average annual meat consumption of developing countries including Nigeria will rise to 37kg/person/year [3]. However, the inverse relationship between the growth of human population and that of livestock has increased the demand for animal protein and this led to the slaughter of animals for meat during their active breeding ages, including the pregnant ones [5]. The resultant effect of slaughtering pregnant animals is the wastage of

fetuses (growing embryos) that would have served as replacement stock to increase animal population for future purposes [1]. Slaughterhouse refers to a special facility design and licensed for receiving, holding, slaughtering and inspecting meat and meat products before they are released for public consumption [6]. A total of 46.94% slaughter of pregnant cows was reported from northern Nigeria and significant fetal losses from the Northern and Southern part of the country [5,7]. The act of slaughtering pregnant animals and fetal losses due to slaughtering such animals has been reported in various parts of Nigeria [7-11]. Fetal losses due to slaughter of pregnant cattle result in the wastage of protein available for human purpose and lower the growing capacity of such animals for herd replacement in the country [7].

Series of researches have reported various rates of fetal wastages with respect to season, it is however important to note that factors such as occasions and festivities, record keeping, economic status and living standard, risk and uncertainties, and subsequent slaughter of pregnant animals could result to the wastage of large number of fetuses. This could affect the population of livestock and food security in the future as well as welfare of animals and the consumers of animal products. It is against this background that this paper intends to study the incidence of fetal wastage due to pregnant slaughter among cattle, sheep and goat slaughter Zuru metropolis.

2. MATERIALS AND METHODS

2.1 Experimental Site

This study was conducted in Zuru metropolis, Zuru local government area, Kebbi State,

Nigeria. Zuru is located on a hilly terrain of the extreme South-Eastern part of Kebbi State, on latitude $11^0 35'$ and $11^o 55'$ North and on longitude $4^0 45'$ and $4^0 25'$ East of the equator [12]. The area has an estimate population of 165547 people and covers an area of 9000 square kilometer [13]. Zuru has an annual rainfall of 1025 mm/annum and a long dry season. The climatic condition of the area is characterized by a hot and wet season as in the tropics and a harmattern period occurring around November to January. The soil type is sandy-loam and fertile, this makes it suitable for various agricultural activities [12].

2.2 Sample Size and Sampling Technique

A total of 97 cattle, 202 sheep and 593 goats were considered for this study. Multi-stage sampling technique was adopted for the selection of one slaughterhouse located in Rafin Zuru and a slaughter slab in Rikoto area. These are the only available slaughter points in the metropolis.

2.3 Data Collection

The data for this study was collected (on average weekly slaughter) for twelve weeks, between February and May, 2020. To ease the collections process, a structured format containing information on the species and number of animals slaughtered, sex and pregnant status, number and sex of the fetus recovered from the slaughtered pregnant animals.

2.4 Data Analysis

The data collected for this study was analyzed using simple descriptive statistics such as frequency counts and percentages and presented according to their distribution in the two areas within the metropolis.

3. RESULTS AND DISCUSSION

The results on fetal loss due to slaughter of pregnant cattle, sheep and goats in Zuru metropolis (according to area distribution) are presented on Table 1.

From the results of this study (Table 1), cattle sheep and goats constituted the three major source of meat for the inhabitant of the metropolis, and more goats were slaughtered than sheep and cattle respectively. The same trend was observed in the two area of the study.

It has also been shown that a total of 892 animals were averagely slaughtered within the length of the study period. Out of the total, 97 (10.87%) cattle, 202 (22.65%) sheep and 593 (66.48%) goats were slaughtered within the metropolis. The species of animals reported for slaughter in the metropolis confirms the reports of Addass et al. [14]; Adebowale et al. [15]; Anyaku et al. [11]; Fayemi and Muchenje [16]; Garba et al. [17] and Oduguwa et al. [18] who reported the slaughter of cattle, sheep and goats in Nigeria. The reduced number of sheep and cattle slaughtered over goats in the metropolis could be attributed to the crises affecting livestock production around metropolis. This is in line with the findings of Anyaku et al. [11] who reported decreasing number of meat animals brought for slaughter due to livestock crises, cattle rustling, crop-livestock and ethno-religious crises in Nigeria. The number of cattle sheep and goats slaughtered in the present study could also be explained by the economic status and meat preference of the inhabitants, adaptability and population of the animal species, and facilities available for processing and storage of meat in the study area. Season of the year and need for inputs and payment of farm labor could have forced farmers to sale their animals especially the small ruminants, thus making goats more available for slaughter in the study area. The higher number of goats made available for slaughter could also be attributed to the knowledge of butchers towards meat handling and processing and available facilities that could help prolong the shelf life of meat in the study area.

The present study recorded a total of 30 (30.93%) However, 78.14% ewes slaughter reported by the same author was higher than 60.40% for the present results. Furthermore, the 64.75% buck slaughter from the present result agreed with 62.30% reported by Anyaku et al. [11]. The variation in number of male and female animals slaughter between the present and the existing literature could be attributed to the financial need of farmers and season of the year as the need for farm input and payment of farm labor might force them to sale their animals, therefore making more female animals available for slaughter. There were higher percentages of cows and ewes slaughter in the two areas except for goats where buck slaughter was higher than the does, this could be explained by the preference of occupants towards meat consumption. The heterogeneous number of animals slaughtered in the study area indicated

Table 1. Number of animals slaughtered

				Rafin Zuru		Rikoto
Species	**F**	**P**	**F**	**P**	**F**	**P**
Cattle	97	10.87	61	10.61	36	11.36
Sheep	202	22.65	114	19.83	88	27.76
Goat	593	66.4	400	69.56	193	60.88
Total	892	100.00	575	100.00	317	100.00
Slaughter by Sex	**F**	**P**	**F**	**P**	**F**	**P**
Bulls	30	30.93	19	31.15	11	30.56
Cows	67	69.07	42	68.85	25	69.44
Total	97	100.00	61	100.00	36	100.00
Rams	80	39.60	48	42.11	32	36.36
Ewes	122	60.40	66	57.89	56	63.64
Total	202	100.00	114	100.00	88	100.00
Bucks	384	64.75	260	65.00	124	64.25
Does	209	35.25	140	35.00	69	35.75
Total	593	100.00	400	100.00	193	100.00
Pregnant Status						
(Cows)	**F**	**P**	**F**	**P**	**F**	**P**
Pregnant	32	47.76	17	40.48	15	60.00
Non-Pregnant	35	52.24	25	59.52	10	40.00
Total	67	100.00	42	100.00	25	100.00
Ewes						
Pregnant	79	64.75	47	71.21	32	57.14
Non-Pregnant	43	35.25	19	28.79	24	42.86
Total	122	100.00	66	100.00	56	100.00
Does						
Pregnant	146	69.86	98	70.00	48	69.57
Non-pregnant	63	30.14	42	30.00	21	30.43
Total	209	100.00	140	100.00	69	100.00
Fetal Waste	**F**	**P**	**F**	**P**	**F**	**P**
Calves	32	8.58	17	7.20	15	10.95
Lambs	85	22.79	51	21.61	34	24.82
Kids	256	68.63	168	71.91	88	64.23
Total	373	100.00	236	100.00	137	100.00
Fetal Waste by Sex						
Calves	**F**	**P**	**F**	**P**	**F**	**P**
Males						
Females						
Total						
Lambs						
Males	30	35.29	19	37.26	14	41.18
Females	55	64.71	32	62.74	20	58.82
Total	85	100.00	51	100.00	34	100.00
Kids						
Males	100	39.06	65	38.69	35	39.77
Female	156	60.94	103	61.31	53	60.23
Total	256	100.00	168	100.00	88	100.00

Calve: New born of a cow; Lamb: New born of a sheep; Kid: New born of a goat; Ewe: Female sheep, Doe: Female goat

the loss of female animals which may challenge the production and productivity of animals as well as the welfare of animals and meat consumers in the study area. In the study area, there were 30.93% bull slaughter, 69.07% cow slaughter, 39.60% ram slaughter, 60.40% ewe slaughter, 64.75% buck slaughter and 35.25% doe slaughter. The bull slaughter recorded for this

study was lower than 71.30% while the cow slaughter was higher than 28.7% reported by Anyaku et al. [11].

The result (Table 1), showed higher pregnant slaughter with 69.86% in does, 64.75% in ewes and 47.76% in cows respectively. The same trend of pregnant slaughter was observed in the two slaughter points. The percentage slaughter of pregnant ewes in the present study was higher than 26.30% reported by Mutwedu et al. [19] and 34.30% reported by Muhammad et al. [20] from semi-arid part of Nigeria, this value was however lower than 70.10% reported by Mukasa-Mugerwa and Tekelye [21] from Ethiopia. The slaughter of pregnant does from the present study was also higher than 59% reported by Okorie-Kanu et al. [22]. The difference in the percentage of pregnant slaughter from the present and earlier studies could be attributed to the period of study, record keeping and number of pregnant animals available for slaughter and ability of farmers, butchers and abattoir personnel to detect pregnancy from the animals before slaughter. The slaughter of pregnant animals in this study confirms the sales of young animals in their prime breeding ages; this could be influenced by their body condition, desperate financial need and theft. This is in line with the findings of Ogunbodede and Oladele [23] who opined that good body condition, financial need and theft forced farmers to sale young and productive animals for slaughter. It also agrees with Okorie-Kanu et al. [22] who maintained that the growth of farming activities result in the sales of pregnant animals for the purchase of farm inputs (such as seeds, fertilizers, pesticides) and payment of farm labor. The slaughter of pregnant animals in the study area could also be attributed to the existing legislations affecting livestock markets and abattoir operations; as opined by Fayemi and Muchenje [16] that weak policies and legislations negatively affects livestock marketing and abattoir operations and result in the conversion of active breeding animals to meat sources. The findings of this study are also in agreement with Adebowale et al. [15] who reported that period of data collection, season of the year and management system plays a great role in the slaughter of animals at their active breading ages and subsequent fetal loss. The records of pregnant slaughter in the present study indicated the need for on-farm diagnostic strategies to check against a future constraint to livestock population due to sales and slaughter of pregnant animals in the study area.

The proportionate calf fetal losses out of total fetal loss was 8.58 which was higher than 4.50 but lower than 12.60 and 26.28% calves fetuses reported by Adebowale et al. [15]; Dunka et al. [24] and Mutwedu et al. [19]. Also, the 68.63% kid loss from the present study was higher than 22% reported by Dunka et al. [24]. The value was also higher than 7.90, 49 and 38% reported by Hassan et al. [25]; Sanusi et al. [26] and Mhina et al. [27]. The fetal losses in the area of study were higher in goats, sheep and cattle respectively. Variations in the fetal losses between this study and earlier reports could be attributed to the number of pregnant slaughter and the season of the year. The disparity in the percentages of fetal losses could also be explained by the period of data collection, number and prolificacy of the animals slaughtered. From these results (Table 1), goats and sheep appeared to be more prolific due to their ability for multiple birth, therefore had more fetal losses than cattle in the study area. This agrees with Dunka et al. [24] who opined that festive periods influenced the slaughter of pregnant animals for meat and prolificacy of goats resulted to the loss of large number of fetuses. The number of fetuses recorded in this study has confirmed the loss of fetuses due to slaughter of pregnant animals for meat purposes as reported by Ayodele et al. [28] who reported the wastage of fetuses due to slaughter of pregnant cows from Akure, Nigeria and Muhammad et al. [29] from Kaduna, Northern Nigeria. The number fetuses recorded in the present study indicated that fetal loss could occur in all the three species animals used for meat sources and in every season of the year. It also indicated that for every two cows slaughtered, one calf was lost and for every ewe and doe slaughtered one lamb and kid fetus was lost.

The percentages of fetal sex observed in the two areas for this study were 31% male and 68.75% female calves, 38.82% male and 61.18% female lambs, 39.06% male and 60.94% female kids. There were more kid fetuses observed than lambs and calves in the study area. The values recorded for male and female kid fetuses were higher than 37.64% males and 55.67% females kid fetuses reported by Ogunbodede and Oladele [30], variation in the sex and number of fetuses recorded in the study area could be attributed to the laws governing sales of animals and abattoir operations, ages of the slaughtered animals and the period of data collection, as matured female animals might have been served during the active mating period before they were sold out

for slaughter. The number of female fetuses observed in the study area implies a serious challenge to food security in the study area as the lost fetuses could be one of the major targets for herd replacement in the future. This is in line with the findings of Abdulkadir et al. [31] who reported that fetal loss due to poor policies and legislations affecting animal production or their implementation in livestock markets and abattoir operations could pose a serious challenge to the future growth of animal population.

4. CONCLUSION

Based on the findings of this study, cattle, sheep and goats are the major sources of meat in the study area. These animals are slaughtered without considering sex, age and physiological status therefore slaughtering large number of pregnant animals which resulted to the loss of a large number of fetuses that would have served for herd replacement in the future. Such Fetal losses due to slaughter of pregnant animals could continue until there is improvement in the implementation of policies and legislations affecting livestock marketing, abattoir operations, animal welfare, knowledge and skills of farmers in the study area.

5. RECOMMENDATIONS

The findings of this study suggested the need for government intervention through effective implementation of policies and legislations towards good livestock marketing and standard abattoir operations in the study area. Also, the knowledge and skills of farmers and abattoir personnels should be improved towards detecting of pregnancy and to understanding the implications of pregnant slaughter and fetal loss on the productivity and sustainability of livestock production in the study area.

ETHICAL APPROVAL

Animal Ethic committee approval has been taken to carry out this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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