



Sahel J. Vet. Sci. Vol. 19, No. 1, pp 31-34 (2022)
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Article History
Received: 03-02-2022
Revised: 19-03-2022
Accepted: 28-03-2022
Published: 31-03-2022

Retrospective Study of Cattle Fetal Wastage at Hadeja Abattoir, Jigawa State: Economic Implication and Seasonal Variation

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ABSTRACT

Fetal wastage usually occurs due to indiscriminate slaughter of pregnant cows without proper ante mortem assessment of the pregnancy status prior to slaughter in most of the abattoir in Jigawa state. Therefore, the current retrospective study was aimed to determine the extent of cattle fetal wastage and its economic implications for a period of 6 years (2016-2021) in Hadeja abattoir Jigawa state. The total number of cows slaughtered in Hadeja abattoir and the fetal wastage were evaluated. Variation in the number of fetal wastages during dry season and rainy season were determined. Economic implications of fetal wastage were evaluated. The results revealed the number of fetuses wasted were 3,763 within a six-year period. The highest number of fetal wastages 2777 (73.8 %) were recorded in the dry season with ($P < 0.05$), compared to the number of fetal wastages 986 (26.2 %) recorded in the rainy season. The financial losses due to fetal wastages was estimated at ₦2,162,160,000 with an annual loss of ₦ 360,360,000. The yearly average fetal wastage across the study period was 627 (16.7 %). Large number of fetal wastages were recorded during the dry season with significant economic losses. Hence, effective ante mortem inspection and pregnancy diagnosis in cows is necessary in order to avert this problem at the abattoir. Similarly, reinforcement of legislation law against indiscriminate slaughter of pregnant cows should be enforced at the abattoir.

Keywords: Abattoir, Cattle Fetal Wastage; Economic Loss; Seasonal Variation

INTRODUCTION

Cattle are one of the most important livestock species in terms of output for meat, milk and the capital value (Oyedipe, 2011). Meat is an important source of animal protein and the role cattle play as a source of protein cannot be overemphasized (Addas *et al.*, 2011; Ibrinke, 2011). In the previous years, low productivity in farm animals in most of the developing nations particularly in the Sub-Saharan Africa has been attributed to factors like low production traits of the indigenous breeds, inadequate or poor veterinary services; improper management and high incidence of diseases (Hale *et al.*, 1997). Fetal wastage was also identified as one of the major causes of losses in livestock industries particularly in respect to gross losses linked to fetal wastage in abattoirs in Nigeria (Abdulkadir *et al.*, 2008; Ardo *et al.*, 2013; Odeh *et al.*, 2015; Dunka *et al.*, 2017). Previous reports of fetal wastages in different states in Nigeria include; Borno State with a fetal wastage of 1,336 per annum (Iliyasu *et al.*, 2015), while Kano state reported a fetal wastage of 391-440 per

annum (Ogunbodede *et al.*, 2016). With all these data on the level of fetal wastages from many abattoirs across the country, there is paucity of information on cattle fetal wastage in Hadeja abattoir, Jigawa State, State where large number of cattle are frequently slaughtered all year round.

Hence, without proper pregnancy diagnosis of the animals presented for slaughter. Fetal wastage might be at its highest peak and this might similarly lead to poor supply of low meat quality to consumers (Iliyasu *et al.*, 2015). It will also lead to decrease in livestock population of the state and low herd replacement rates (Okorie-kanu *et al.*, 2018). It is against this background that the present study was designed to determine the extent of cattle fetal wastage, economic losses and seasonal variation associated with the cattle fetal wastage within the study period of six years (2016 – 2021).

MATERIALS AND METHODS

Study Location and Climate

The study was conducted at Hadeja abattoir in Jigawa State, Nigeria. The abattoir occupies a global position of Latitude 12:45⁰N and Longitude 10:03⁰E. Jigawa State is situated in the North-Western part of Nigeria between Latitudes 11:00⁰N to 13:00⁰N and Longitudes 8:00⁰E to 10:15⁰E. The climate presents a typical sub-tropical condition characterized by hot wet and cool dry weather with an average rainy season of 3 to 5 month (Source: Google Map).

Study Design

A retrospective study was designed and conducted using records taken from the abattoir. Data collected include total number of cattle slaughtered, number of cows and bulls slaughtered and number of fetuses wasted over a period of six years from 1st January, 2016 to 31st December, 2021.

Economic Analysis of the Fetal Wastage

The financial loss incurred from the fetuses wasted over the study period was computed using modified procedure provided by Ndi *et al.*, 1990 as outlined below:

MLN (₦) = (N₂ x P₂) – (N₂ x C₀); where MLN (₦) is the monetary loss in naira of matured cattle; N₂ is the number of cattle at maturity P₂ is the average price of matured cattle and C₀ is the cost of rearing a calf to maturity under traditional livestock management system at the study area.

Data Analyses

Data collected were analyzed using GraphPad Prism 5 version 2.0, (GraphPad, 2010) and the results were presented in tables, ratio, means, percentages and frequency distribution. P < 0.05 were considered significant.

RESULTS AND DISCUSSION

The result in (Table 1) showed the number of slaughtered cattle, number of foetal wastage and the ratio of the cattle to fetal wastage over the study period. A total of 34,174 cattle were slaughtered. The decreasing trend in the yearly slaughter figure observed from 2016 – 2021 in the present study might be attributed to the increasing economic recession in the country which might have a bearing on beef purchasing power of the populace. This finding was in agreement with the findings reported by Babatunde *et al.* (2011). Average numbers of cows slaughtered were compared to the number of bulls throughout the period of study. This agreed with the findings reported by Iliyasu *et al.* (2015), who stated that cows were sold off during the dry season regardless of pregnancy status due to feed shortage.

The total number of cows slaughtered in the current study was lower than the findings reported by Babatunde *et al.* (2011), who observed a total of 74.5 % as proportion of cows slaughtered at Ogun State. These differences in the numbers of cows slaughtered could be attributed to the indiscriminate slaughter of pregnant cows in the study area as shown in Table I 21,781 (64 %). Similar findings were reported by Joseph *et al.* (2013), Ogunbodede *et al.* 2016 and Abonyi *et al.* (2013) at Kumasi abattoir (41.9 %), Ghana, Nsukka Abattoir (49.74 %) Enugu and Bodija abattoir (40 %) Ibadan

Oyo State, respectively. The variability of slaughter among cows was due to intolerance of the pregnant cows to travel long distances coupled with shortage of feed especially during the dry season. This agrees with the findings reported by Tihze *et al.* (2010).

The mean yearly ratios for cows slaughtered and fetuses wasted indicated that for every nine to six cows slaughtered there was a loss of one fetus. The result also indicated that 17.9 % of the cows were slaughtered within the study period, which agreed with the findings reported by Joseph *et al.* (2013), but lower than the findings reported by Ogunbodede *et al.* (2016) and higher than 4.56 %, 10.7 %; 6.7 % and 8.7 % reported by Dunka *et al.* (2017), Oduguwa *et al.* (2013), Garba *et al.* (2019) and Abonyi *et al.* (2013), respectively. The disparities in the rate of foetal wastage with the current study might be attributed to variation in the number of pregnant cows presented for slaughtered, season of study period and poor enforcement of laws regarding slaughter of pregnant cow particularly in the study area. The mean yearly ratio (9:1) for cows slaughtered and fetuses wasted in the current study agreed with (9:1) obtained by Oduguwa *et al.* (2013) but disagrees with (15:1) obtained by Babatunde *et al.* (2011). The higher ratio of cows slaughtered to fetuses wasted has attained an alarming rate and this might be linked to inadequate Veterinary facilities and service in the abattoir, especially availability of ultrasound scanners for prompt and accurate pregnancy diagnosis during ante mortem inspection and failure of enforcement of the legislation prohibiting slaughter of gravid animals at the slaughter house and abattoir in the state.

The number of cattle slaughtered did not differ significantly (P > 0.05) in the dry and rainy seasons (Table 2). However, there was a significant difference (P < 0.05) in the number of cows slaughtered and number of fetuses wasted between the two seasons. The higher fetal wastage obtained in the dry season reaffirmed the indiscriminate slaughter of pregnant cows in Nigeria which follows a seasonal pattern (Nwakpu and Osakwe 2007; Ngbede *et al.*, 2012). Hence, fetal wastage during the dry seasons might be linked to shortage of feeds and indiscriminate slaughter of pregnant cows which agrees with the findings of Iliyasu *et al.* (2015), who reported that improper pregnancy diagnosis during ante mortem examination prior to slaughter might lead to loss of high number of cattle fetal wastage.

In the present study, 3,763 fetal wastages were presented in (Table I). Therefore, the monetary loss was calculated using the following equation as stated by Ndi *et al.* (1990).

$$\text{MLN (₦)} = (\text{N}_2 \times \text{P}_2) - (\text{N}_2 \times \text{C}_0)$$

Where MLN (₦) = Monetary loss at maturity

N₂ = Number of cattle at Maturity

P₂ = Average Price of matured cattle and C₀ = Cost of rearing a calf to maturity under the traditional livestock management system practiced at the study area (Ndi *et al.*, 1990).

Number of cows at maturity = 21,781 and the cost at maturity of a cow = ₦120,000. The number of calves at weaning age = 3,763, and the total cost for rearing a calf to maturity age = ₦120,000. Therefore, (21,781 × 120,000) - (3,763 × 10,000) = 2,613,720,000 – 451,560,000. MNL = ₦2,162,160,000.

Table 1: Slaughtered Cattle and Fetal Wastage for a period of 6 years

Years	NCS	NBS	NC ₀ S	NFW	% F.W	NCS: NFW	NC ₀ S: NFW
2016	7158	2863 (40)	4,295 (60)	768	17.9	9:1	6:1
2017	6224	2178 (35)	4,046 (65)	695	17.2	9:1	6:1
2018	5658	2150 (38)	3,508 (62)	550	15.7	10:1	6:1
2019	5362	2145 (40)	3,508 (60)	668	20.7	8:1	5:1
2020	5011	1804 (36)	3,217 (64)	607	18.9	8:1	5:1
2021	4761	2,000 (42)	3,207 (58)	475	17.2	10:1	6:1
Total	34,174	13,140	21,781 (64)	3,763	-	9:1	6:1
Mean Yearly	5,696	2,190	3,630	627.2	17.9	9:1	6:1

Figures in parenthesis represent percentages.

Keys:

NCS: Number of Cattle Slaughtered.

NBS: Number of Bulls Slaughtered.

NC₀S: Number of Cows Slaughtered.

NFW: Number of Fetuses Wasted.

% F.W: Percentage Fetal Wastage.

NCS: NFW: Ratio for Number of Cattle Slaughtered and Number of Fetuses Wasted.

NC₀S: NFW: Ratio for Number of Cows Slaughtered and Number of Fetuses Wasted

Table 2: Monthly distribution of the fetal wastage during the dry season months from November to April within study period of 6-year

Months Years	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2016	120*	101*	80*	68*	40	37	31	27	45	50	72*	97*
2017	90	87	79	73	51	28	17	14	30	40	81	105
2018	91	85	73	67	24	16	14	7	0	9	70	94
2019	105	77	81	70	60	20	9	0	5	30	91	120
2020	61	57	63	79	39	43	50	10	19	28	49	109
2021	51	37	45	61	41	46	55	15	12	23	40	49
Total	518	444	421	418	255	190	176	73	111	180	403	574
Mean	86.3	74	70.2	69.7	42.5	31.7	29.3	12.2	18.5	30	67.2	95.7

*Columns indicated with a superscript are the months of the dry season

Conclusion

The study found that economic losses from cattle fetal wastage were larger during the dry season. It was also observed that one fetus was lost for every nine cattle or six cows slaughtered on an annual average within the study period, which is worrisome and has a serious impact on future productive herd reduction, potentially undermining revenue generation and welfare of various actors along the cattle value chain.

Acknowledgements

The cooperation and assistance of the entire workers of Hadeja Abattoir towards the success of this study is greatly acknowledged.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Author's Contribution

ZAH., HU, ID, designed the research work. MAR assisted and guided DI on data collection while MM. and AL assisted in statistics analysis. The drafted copy was revised and proof read by all authors.

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