

Research Article

Fetal Wastage in Cattle Slaughtered at Gambella Municipality Abattoir, Ethiopia

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Abstract

The slaughter of pregnant animals for meat has been reported in different parts of the world. This practice is becoming a very serious constraint to future livestock populations. Information on the level of fetal wastage in slaughtered cattle in Ethiopia is limited. The study was aimed at evaluation of the incidence of fetal wastage of pregnant cows slaughtered at Gambella Municipality Abattoir, Ethiopia. An active abattoir survey study design was employed. The data on breed, origin and number of the cattle slaughtered at the abattoir were used. The data were analyzed using SPSS software. The results showed that there was significant ($P<0.05$) higher proportion (70.5%) of the slaughtered cattle of Nuer (Abigar) breeds followed by Horro (16.6%). There was significant difference ($P<0.05$) in the rate of fetal wastage among the studied months with the highest value (46.67%) observed in November. There was significant difference ($P<0.05$) in the pregnancy status among the studied trimesters with majority of the fetuses (42.86%) encountered throughout the period under study were in the second trimester. During the study period the fetal wastages for pregnant cows accounts for economic losses of 828,000.00 ETB (25,668.00 USD). There should be legislative reinforcement through sound surveillance in the ruminant production and an integrated strategic planning and decision-making on animal food security in Ethiopia.

Keywords

Abattoir, Cattle, Economic Loss, Fetal Wastage, Pregnant Cows

1. Introduction

In recent decades, the world food economy has seen a shift towards increased consumption of animal-source foods. In developing countries, the meat and dairy sectors have grown at average yearly rates of 5.1 percent and 3.6 percent respectively since 1970 [1]. Studies in many African countries show that many local cattle slaughtered in different slaughter-houses are pregnant [2-4]. The slaughter of productive, clinically healthy animals at different stages of pregnancy and converting them into meat has been reported in other parts of the world. This practice is becoming a very serious constraint

to future livestock populations [5]. The frequency of fetal wastage through slaughtering of pregnant animals has been reported for several animal species, including cattle [6-8]. There are few reports regarding the magnitude of fetal losses due to the slaughter of reproductively active dams amongst both large (cows) and small (ewes and does) ruminants from several abattoirs in Ethiopia. However, related researches were not yet conducted in Gambella. Therefore, this study was aimed at evaluation of the incidence of fetal wastage due to the slaughter of pregnant cows and the associated economic

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implication at Gambella Municipality Abattoir.

2. Materials and Methods

2.1. Study Area

The study was conducted in Gambella town municipal abattoir of Gambella regional state, Ethiopia from October to December 2019. Based on the 2013/2014 Census conducted by the Central Statistical Agency of Ethiopia (CSA), the Gambela Region has total population estimation of 406,000 [9] and livestock population of 253,389 cattle, 39,564 sheep and 83,897 goat [10]. The Gabella town abattoir is administered under Gambella town municipality. The abattoir is the only source of inspected beef for all inhabitants of the town. The average number of animals slaughtered per day is about 25 with all 100% of the slaughtered animals being cattle [11].

2.2. Study Animals and Design

The study animals were cattle brought for slaughter from all districts of Gambella region and nearby districts of Oromia and south western Ethiopia. An active abattoir survey was used as the study design. The data on breed, origin and number of the cattle slaughtered at the abattoir were used.

2.3. Data Collection

2.3.1. Assessment of Fetal Wastage

Data on the total number of male and female cattle slaughtered, pregnant cows slaughtered and numbers of the fetuses found were collected on a daily basis.

2.3.2. Extrapolation of Economic Losses Due to Fetal Wastage

Extrapolation of the magnitude of economic losses due to fetal wastage in cattle slaughtered at Gambella municipality abattoir was calculated as described by [12-14]. It was assumed that:

- 1) 1 fetus wasted = average adult cow=10,000.00 ETB (Ethiopian Birr) (Current Ethiopian Market Value (CEMV)/ or local market price) of a mature large ruminant estimated);

- 2) the exchange rate at the time of the assessment=0.031

2.3.3. Assessment of Routine Ante-Mortem Inspection

Assessment was done to check the practice of physical examination of animals before they are slaughtered and routine meat inspections in the abattoir using recommended standard procedures [15].

2.4. Data Analysis

Data were entered, stored and analyzed using Microsoft Excel and SPSS version 20. The results were presented in tables using frequency and percentage distribution. Association between categorical factors and outcomes was analyzed using Chi-square tests. Differences were considered statistically significant at $P < 0.05$.

3. Results and Discussions

3.1. Level of Fetal Wastage in Cows Slaughtered at Gambella Municipality Abattoir

3.1.1. Breeds and Origin Distribution of Slaughtered Cattle

Table 1 presents the breed and origin distribution of slaughtered cattle at Gambella Municipality Abattoir. There was significant ($P < 0.05$) higher proportion (70.5%) of the slaughtered cattle of Nuer (Abigar) breeds followed by Horro (16.6%). The proportion of cattle slaughter originated from Gambella (69.4%) was higher than those from the surroundings (30.6%) but with no significance difference observed ($P > 0.05$).

Nuer (Abigar) cattle are the most dominant in Gambella region [16]. Horro cattle are distributed in Horro Gudru of Eastern Welega, in Western Shewa, and adjoining areas of Illubabora and Shewa [17] in which the distribution belt also encompasses Gambella. The Sheko breeds are reared in the south-western part of Ethiopia [18]. In the findings of [19], it was indicated that herders prefer to keep the Nuer (Abigar) breed to Felata (Fulani) breed.

Table 1. Breed and origin distribution of slaughtered cattle at Gambella Municipality Abattoir.

Variables	Frequency	Percentage	Chi-Square	P-value
Breed				
Nuer (Abigar)	339	70.5		
Horro	80	16.6	255.575	0.000

Variables	Frequency	Percentage	Chi-Square	P-value
Sheko	15	3.1	3.771	0.066
Falata (Fulani)	45	9.8		
Origin				
Gambella	334	69.4		
Surrounding	147	30.6		

3.1.2. Slaughtered Cattle and Incidence of Fetal Wastage

Table 2 reveals the monthly slaughtered cattle and incidence of fetal wastage at Gambella Municipality Abattoir.

There was significant difference ($P < 0.05$) in the rate of fetal wastage among the studied months with the highest value (46.67%) observed in November.

Table 2. Slaughtered cattle and incidence of fetal wastage at Gambella Municipality Abattoir.

Month	TCS	SC	PC	FWR (%)	SC: PC (Ratio)	Chi-square	P- value
October	174 (36.17)	27 (15.52)	4 (2.3)	14.81	6.75: 1	287.887	0.000
November	203 (42.2)	30 (14.78)	14 (6..90)	46.67	2.14: 1	9.781	0.008
December	104 (21.62)	21 (20.19)	3 (2.88)	14.29	7: 1	11.274	0.000
Total	481 (100)	78 (16.22)	21 (4.37)	26.92 -	3.71: 1 -		

Values in bracket represent proportion (%); TCS= Total cattle slaughtered; SC=Slaughtered Cows; PC=Pregnant Cows; FWR= Fetal Wastage Rate;

According to various findings the potential reasons for the indiscriminate sale and slaughtering of pregnant cows could be cash constraint [20-22]; inefficient pregnancy diagnosis system in use [21]; scarcity of livestock extension services, [22]. The highest proportion of fetal losses in the months of November (46.67%) in the current study is in agreement with

the finding of [13] conducted in Nigeria.

3.1.3. Pregnancy Status of the Cows Slaughtered

There was significant difference ($P < 0.05$) in the pregnancy status among the studied trimesters (Table 3).

Table 3. Trimesters at Gambella Municipality Abattoir.

	Trimesters			Chi-square	P-value
	1 st trimester	2 nd trimester	3 rd trimester		
Frequency	6	9	6	471.694	0.000
Percentage	28.57	42.86	28.57		

Due to lack of ante-mortem inspection in the abattoir, the higher proportion of fetal wastages observed in this study accounts for a considerable loss of animal protein and future national herd at large. [21] Reported that the high percentage during second trimester is most likely due to the fact that pregnant cows have a better body condition score than non-pregnant cows. [23] Noted out that a drop observed in the third trimester, possibly because, at this stage, the pregnancy is too big closer to calving, and most farmers who want to

increase their herds will not sell their animals before calving.

3.2. Economic Implications of Fetal Wastage

Table 4 shows the estimated financial losses over a year period due to fetal wastage when the cost of an average adult cow is ETB 10000.00 (based on the local market price during the study period).

Table 4. Estimated financial losses of fetal wastage at Gambella Municipality Abattoir.

Duration	Number of cattle slaughtered (Mean)	Number of cows slaughtered (Mean)	Number of pregnant cows slaughtered/ fetus wasted (Mean)	Amount loss (ETB)	Amount loss (USD)
Daily	5.34	0.87	0.23	2,300.00	71.30
Monthly	160.33	26	7	69,000.00	2,139.00
Yearly	1923.96	312	84	828,000.00	25,668.00

1 fetus wasted = average adult cow=10,000.00 ETB (current Ethiopian Market Value (CEMV/ or local market price) of a mature large ruminant estimated); the current exchange rate=0.031.

These financial losses have significant economic implications at Gambella Municipality Abattoir on daily basis as 2,300.00 ETB (71.30 USD) with a monthly average of 69,000.00 ETB (2,139.00 USD). The annual average fetal wastage was estimated to be 828,000.00 ETB (25,668.00 USD). From the findings of this study, higher rate of fetal wastages were observed in bovine species due to the indiscriminate slaughters of pregnant animals. It is, therefore, necessary to implement the law prohibiting the slaughter of pregnant animals through thorough ante mortem inspection which will consequently improve the nation's livestock economy. [24] Suggested that the foreign exchange can be conserved through increased cattle production and prevention of high fetal wastage at abattoirs.

3.3. Status of Ante-mortem Inspection Routine

In the current study it was observed that there is no proper routine ante-mortem inspection of pregnancy. According to [25], farmers, traders and butchers should be enlightened on the importance and the different methods for pregnancy diagnoses in cattle as well as the implication of slaughtering pregnant cows. It is, therefore, necessary to implement the law prohibiting the slaughter of pregnant animals through thorough ante mortem inspection which will consequently improve the nation's livestock economy.

4. Conclusion

The results show that the slaughter of pregnant cattle is a

common and widespread practice in Gambella Municipality Abattoir studied. This can translate into large economic losses, loss of genetic potential and sustainability of meat production. There should be legislative reinforcement through sound surveillance. The implementation of suitable studies and detailed analysis of the current situation is indispensable to ensure the high standards in animal welfare.

Abbreviations

CSA	Central Statistical Agency of Ethiopia
ETB	Ethiopian Birr
CEMV	Current Ethiopian Market Value
SPSS	Statistical Package for Social Science
TCS	Total Cattle Slaughtered
SC	Slaughtered Cows
PC	Pregnant Cows
FWR	Fetal Wastage Rate
USD	United States Dollar

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Conflicts of Interest

The authors declare no conflicts of interest.

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