

Magnitude of foetal wastage and the monetary losses in sheep and goats slaughtered in Morogoro selected slaughter facilities, Morogoro Tanzania

L.A. Kilumbi and H.E. Nonga

Department of Veterinary Medicine and Public Health, College of Veterinary Medicine and Biomedical Sciences, P. O. Box 3021, Chuo Kikuu, Morogoro, Tanzania.

Email: nongahezron@yahoo.co.uk / hezron@suanet.ac.tz

SUMMARY

Foetal wastage in slaughter animals not only causes a loss to farmers and livestock traders, it's against animal welfare still information on the magnitude of slaughter of pregnant goats and sheep is scarce. This study evaluated the level of fetal wastage in goats and sheep slaughtered at Morogoro slaughterhouse and Mkongeni slaughter slab in Mvomero district between December 2016 and January 2017. Of the 351 goats slaughtered, 80.1% were female and 40.2% of them were pregnant. Likewise, 97 sheep were slaughtered, 80.4% were female of which 57.7% were pregnant. Of all the fetuses (n=163) recovered, 61.5% had ≥ 2 months of age and 61 (37.4%) were female. Four out of 113 (3.5%) of pregnant does and 1/45 (2.2%) of pregnant ewes had twins. A loss of 951,000 Tanzania shillings was calculated due to fetal wastage in 30 days. The results of this study demonstrate that there is significant flock wastage and losses which limits availability of animal protein to the people in Morogoro and elsewhere in Tanzania. It is therefore recommended that appropriate measures including legislation enforcement, capacity building on pregnant diagnosis for slaughter facilities staff be put in place to control the slaughter of pregnant stock. Stock owners and traders should be sensitized on the implication on losses of genetic materials and sustainability of meat production associated with continued slaughtering of pregnant animals.

Key words: sheep, goats, foetal wastage, slaughter facility, monetary loss

INTRODUCTION

The human population is increasing along with the increase for food rich protein. This rapid growth gives challenges to food security especially in developing countries like Tanzania. Tanzania has a population of 44.9 million people which has increased from 34.4 million in 2002 with an average growth rate of 3% per year (PHCT, 2013). Meanwhile, the livestock population growth shows that in 2006, there were 18.5 million cattle, 13.1 million goats, 3.6 million sheep and 1.2 million pigs (Njombe and Msanga, 2009). Currently there are 25.8 million cattle, 17.1 million goats, 9.2 million sheep, 42.0 million local chicken, 34.5 million commercial chicken and 2.7 million pigs (URT, 2016). Demand for animal protein which is propelled by population growth, urbanization, eating behavior and increased income is not matching with the slow annual growth rate of domestic livestock production, currently estimated at 2.5% compared to 2.7% human growth (URT, 2012).

Furthermore, there has been a global trend of human population towards preference to proteins of animal sources. The FAO projects a 73% increase in meat consumption by 2050 and that much of the future demand for livestock will be met by large-scale/intensive operations (Alexandratos and Bruinsma, 2012). To meet this demand, more

intensified livestock keeping coupled with increased number may be important. As a result of this slow growth and high demand, such trend attracts movement and trade of small stock within and outside the country and undesirable practices including slaughtering of breeding stock and pregnant animals is common (Nonga, 2015).

Meat is one of the sources of protein of animal origin which is obtained from slaughter of livestock. The common meat animals in Tanzania include cattle, sheep, goat, pigs and poultry. Sheep and goat production in Tanzania is under small scale farmers. Many households especially in rural areas keep goats and sheep (URT, 2012). Sheep and goat are the second major source of meat after cattle in Tanzania, but full utilization of these animals is not achieved due many reasons including losses which occur during slaughter in particular fetal wastage. Slaughtering of pregnant does and ewes has been a common practice which is unethical and also it cause fetal losses. In developing countries this practice has been noted in countries such as in Tanzania where by 38.9% of does and ewes slaughtered at Tanga abattoir were pregnant (Swai *et al.*, 2015). Kashoma and Melkiory (2016) also reported foetal wastage of up to 51.8% in sheep and goats slaughtered at Dodoma Municipal abattoir. In Sahel region in Nigeria foetal wastage of 22.8 % and 17.9 % was recorded in ewes and goats

slaughtered respectively (Bokko, 2011). Hence there is therefore an urgent need to salvage this unaccepted practice of slaughtering useful pregnant animals.

In Tanzania local breeds of sheep and goats are the mostly slaughtered and these animals are raised by pastoralist and agro pastoralists who sell their animals at the livestock market or to business people who ultimately send the animals to slaughter facilities. On average 2.71 million goats and 1.008 million sheep are slaughtered in Tanzania annually (NBS, 2012). It is required by law that all animals sent for slaughter in slaughter facilities have to undergo ante mortem examination. Unfortunately, pregnant diagnosis is not normally done and this has been among the reasons of slaughter of pregnant animals.

Morogoro slaughterhouse slaughters up to 15 sheep and goats per day. Similarly, at Mkongeni livestock market in Mvomero district, the slaughter of sheep and goats goes up to 40 on each Saturday. According to the Mvomero District Veterinary Officer, each slaughter is accompanied with a number of foetal wasted. Due to this reason, the study was conducted so as to establish the magnitude of foetal wastage and estimate economic losses due to slaughter of pregnant ewes and does at Morogoro slaughterhouse and Mkongeni livestock market in Mvomero district in Morogoro, Tanzania. The study has generated a baseline data that will be useful to different stakeholders including policy makers to combat the problem of slaughtering pregnant animals.

MATERIALS AND METHODS

Study area and study animals

This cross sectional study was conducted at Morogoro slaughterhouse and Mkongeni livestock market in Mvomero district, Morogoro Tanzania. The Morogoro region is located 196 kilometers west of Dar es Salaam. The Morogoro slaughterhouse provides the daily meat requirements of the inhabitants of Morogoro with the population of 2,218,492 (PHCT, 2013). The slaughterhouse serves as a slaughter place for cattle and small ruminants where the average of 100 cattle and up to 15 sheep and goats are slaughtered daily. Mkongeni livestock market in Mvomero slaughters between 30 and 40 sheep and goats per Saturday. Animals slaughtered at Mkongeni slaughter facility are obtained mainly from livestock markets including Mkongeni and Melela and mostly are local breeds. The study animals were sheep and goats brought for slaughter

from different districts of Morogoro. Some animals were transported to the slaughterhouse using vehicles and others were trekked.

Data collection

This prospective study was undertaken for 30 days (December 2016 to Jan 2017). It involved daily visiting at the Morogoro slaughterhouse and at Mkongeni livestock market every Saturday and participated in meat inspections. After evisceration the uterus of slaughtered sheep and goats were thoroughly examined for pregnancy. All gravid uteruses were opened in order to age and sex the foetuses. The recorded information also involved total number of slaughtered animal in that particular day, number of ewes and does slaughtered, number of pregnant ewes and does, presence of twins or not, the slaughter area, source of slaughter stock, age and sex of fetus and the breed of an animal.

Monetary loss was estimated using Babatunde *et al.* (2011), which calculates the monetary loss at birth (MLB) $MLB = N_0 \times P_0$; where N_0 = Number of fetuses at birth, P_0 = average price of kid and lamb at birth. The average price of a lamb was 5000/= and a male kid was 6000/= and for the ewe lamb was 6000/= and a female kid was 8000/= (Personal communication, Mr. Wera, 2017).

Data analysis

The collected data were entered, stored in Microsoft Excel spread-sheet and analysed by EPI-info statistical software. Descriptive statistics such as the proportion of all slaughters, frequency of pregnant slaughtered small ruminants and the extent of fetal wastage were generated.

The percentage of fetal wastage was calculated as the total number of fetuses recovered divided by the total number of ewes and does slaughtered. For the purpose of this study, the number of male kids was $75 \times 6000 = 450000$ while that of male lambs was $25 \times 5000 = 125,000$. The female kids were $32 \times 8000 = 256000$ and the ewe lambs were $20 \times 6000 = 120000$. A total loss of 951,000 Tanzania shillings was encountered due to fetal losses during the study.

RESULTS

General results

A total of 448 sheep and goat were slaughtered between December 2016 and January 2017. Of the slaughtered small ruminants 351 (78.4%) were goats

and 97 (21.6%) were sheep. The results of the proportion of males, females and pregnant does and ewes slaughtered are shown in Table 1. Out of 351 slaughtered goats 281 (80.1%) were females of which 113 (40.2%) were found to be pregnant. Consistently, of 97 slaughtered sheep 78 (80.45%) were females and 45 (57.7%) were also found to be

pregnant. In total, (sheep and goats) 359 female animals were slaughtered during this one month and 44.01% were pregnant. Four out of 113 (3.5%) of pregnant does and 1/45 (2.2%) of pregnant ewes had twins. Overall, (n=359; 80.1%) female goats and sheep were slaughtered than males (n=89; 19.9%) during the study period.

Table 1. Proportions of small stock (goats and sheep) slaughtered at Morogoro slaughter facilities

Species	Parameter	Frequency	Percent
Goat	Total goats slaughtered	351	78.3
	Male goats slaughtered	70	19.9
	Does slaughtered	281	80.1
	Pregnant does slaughtered	113	40.2
	Twin pregnant does	4	3.5
Sheep	Total sheep slaughtered	97	21.7
	Male sheep slaughtered	19	19.6
	Ewes slaughtered	78	80.4
	Pregnant ewes slaughtered	45	57.7
	Twin pregnant ewe	1	2.2

Proportions of fetuses retrieved by age and sex

Results of the proportions of male and female fetuses and stage of gestation are shown in Table 2. In goats, 38 (33.6%) and 75 (66.4%) of the fetuses were females and males respectively. A total of 62 (60.2%) of the retrieved fetuses were estimated to be in their advanced stage (≥ 2 months) of their

gestation while 41 (39.8%) were in their early stage of gestation (≤ 2 month). In sheep, 20 (44.4%) of the fetuses were females and 25 (55.6%) males. Up to 32 (71.7%) pregnant sheep slaughtered were at the advanced (≥ 2 month) stage of gestation while 13 (28.3%) were in their early stage of gestation (≤ 2 month). In both species, there were more male fetuses than females.

Table 2. Proportions of fetuses retrieved by age and sex at Morogoro slaughter facilities

Species	Parameter	Frequency	Percent
Goat	Male fetuses	75	66.4
	Female fetuses	32	28.3
	Male fetuses ≤ 2 months	35	31.0
	Female fetuses ≤ 2 months	27	23.9
	Male fetuses ≥ 2 months	40	35.4
	Female fetuses ≥ 2 months	11	9.7
Sheep	Male fetuses	25	56.9
	Female fetus	20	43.1
	Male fetuses ≤ 2 months	10	22.2
	Female fetuses ≤ 2 months	9	20.1
	Male fetuses ≥ 2 months	15	33.3
	Female fetuses ≥ 2 months	11	24.4

Financial losses incurred due to fetal losses

The summary of financial losses incurred due to fetal losses is in Table 3. It was found that 951,000 Tshs is lost in the two slaughter facilities due to

fetal loss in one month period. This implies that in one year a total of 11,412,000= is lost due to fetal wastage.

Table 3. Financial loss due to fetal loss

Species	Sex	Number of fetus	Price (Tshs)	Monetary loss (Tshs)
Goat	Male	75	6000	450,000
	Female	32	8000	256,000
Sheep	Male	25	5,000	125,000
	Female	20	6,000	120,000
Total loss				951,000

DISCUSSION

The results in this study show that more female goats and sheep (80.1%) were slaughtered than males. This scenario also was noted by Swai *et al.* (2015) where 57.1% slaughtered small ruminants were female. The results of the current study are also in line with other studies in Tanzania and elsewhere (Kashoma *et al.*, 2016; Bokko, 2011; Borji *et al.*, 2011; Simenew *et al.*, 2011; Zulu *et al.*, 2013). The reasons could be female animals were being culled due to different reasons including infertility. Since the study was done during season, female animals may have appeared good and shiny because of pregnancy but farmers selected them for sell since they fetched good prices at the market.

Also it was noted that slaughter of pregnant does and ewes was rampant since (44.1%) of slaughtered does and ewes were found to be pregnant. This high incidence was also reported in a study done by Swai *et al.* (2015) where 38.5% of slaughtered does and ewes were found to be pregnant. The incidence of slaughter of pregnant sheep and goats was very high in the study done in West Africa where 60% of the 1,248 female goats slaughtered at an abattoir over a period of 1 year were pregnant (Goossens *et al.*, 1998). Differences in magnitude of foetal wastage in slaughter animals may be due to differences in sample size and the duration of study. The possible reasons could be pregnancy diagnoses is not routinely conducted during ante-mortem inspection in the slaughter facilities due to various reasons including poor infrastructures and lack of diagnostic tools for pregnancy diagnosis. Also another reason could be that the pregnant animals had good looking appearance compared to others hence sent for slaughter at higher numbers as the study was done during the dry period.

Slaughtering of pregnant ewes and does at Morogoro slaughterhouse and Mkongeni livestock market has been noted during the study. This causes fetal losses, it is against the Animal Welfare Act in Tanzania (URT 2008) and has a direct impact to the future sheep and goat flocks in Tanzania. Slaughter of pregnant animals provides meat of poor quality to the consumers but also causes losses to traders since

the carcass weight of a pregnant animal is less by ten percent (Nonga, 2015).

Another observation was that up to 60.2% of the retrieved fetuses in the two species were in their advanced stage (≥ 2 months) of pregnancy, which was also noted by Swai *et al.* (2015). The possible reasons for this could be that these animals seemed to be fatter than others (good looking) and this is easily noted at advanced stages of pregnant which make owners to select them for sell on thought of having more weight.

Also male fetuses were retrieved more than female fetuses. This observation was different from the study done by Swai *et al.* (2015) where more female (57.2%) fetuses were retrieved in slaughter small ruminants at Tanga, Tanzania. These observations may have happened by chance.

In Morogoro region more goats 351 are slaughtered than sheep 97 in a span of one month. The reason is that more goats are kept in Morogoro region than sheep. Nevertheless, the other possible reason could be on consumer preferences on goat meat against sheep meat. This could be supported by the price of these two species which indicates that goat meat is more expensive than sheep meat.

The average fetal wastage rate of 40.2% in goats and 57.7% in sheep revealed in this survey are more or less similar to that reported by Swai *et al.* (2015) in Tanga and Muhammad *et al.* (2009) in Nigeria. The reason for the rates observed is that pregnancy diagnoses are not routinely conducted during antemortem inspection in the slaughter premise due to various reasons including poor infrastructures and staff competency in carrying out pregnancy diagnosis.

The losses due to slaughter of pregnant does and ewes were about 951,000 Tanzania shillings due to fetal wastage in one month. If it is assumed that the same levels of losses are incurred each month, 11,412,000 Tanzania shillings are lost per year only from the two slaughter facilities in Morogoro region. The risk of this loss to increase is high as the

number of animals slaughtered increases in festival seasons. Therefore, it is important that such losses are minimized through routine antemortem examination of all slaughter sheep and goats.

Based on the findings from this study it is concluded that there is high fetal wastage in Morogoro region. Most of the wasted fetuses are were at the advanced stage of pregnancy and were males. The losses associated with such a high foetal losses are also high. It is important that the government and all stakeholders in livestock industry should make sure the habit of slaughtering pregnant animals is stopped immediately.

ACKNOWLEDGEMENTS

The authors acknowledge the Higher Education Student Loan Board for financing this study. The cooperation shown by the staff at Morogoro slaughterhouse and Mkongeni livestock market is appreciated.

REFERENCES

Alexandratos, N. and Bruinsma, J. World agriculture towards 2030/2050: the 2012 revision. ESA Working paper No. 12-03. Rome, FAO, 2012.

Babatunde, B. A. T., O. F. Adeleke, O. O. Ademola and A. A. Adesina. Frequency of slaughtering gravid cows and its economic implications in some selected parts of Ogun State, Nigeria. *J Food Agric Environ*, 9: 538-541, 2011.

Bokko P.B. Pregnancy wastage in sheep and goat in the Sahel region of Nigeria. *Nigerian Vet J*, 32: 120-126, 2011.

Borji H, Azizzadeha M and Kamelli M .A. Retrospective study of abattoir condemnation due to parasitic infections: economic importance in Ahwaz, southwestern Iran. *Iranian J Parasitol*, 98(5): 954-957, 2011.

Goossens B, Osaer S, Kora S, Chandler KJ, Petriell L, Thevasagayam JA, Woolhouse T, Andersan J. Abattoir survey of sheep and goats in The Gambia. *Vet Res*, 142(11):277–281, 1998.

Kashoma, I.P. and Melkiory, G.U. Foetal wastage and incidence of ovarian disorders in goats slaughtered at Dodoma Municipal abattoir, Tanzania. A paper presented at the 34th Tanzania Veterinary Association Annual Scientific Conference that was held at AICC Arusha between 6 – 8th December, 2016.

Muhammad, B. F., Haruna, I. Y., Abdulsamad, A.M. and Bichi, J.M. Foetal wastage in Northern Nigerian: The case of Gombe abattoir, Gombe State. Proceedings of the 13th Annual Conference of Animal Science (ACAS '08). ABU, Zaria 13:124–127, 2009.

NBS. National Bureau of Statistics: 2012 Census results, Tanzania, 2013.

Njombe A.P. and Msanga, Y.N. Livestock and Dairy Industry Development in Tanzania, 2009. www.mifugo.go.tz.

Nonga, H.E. (2015). Cattle foetal wastage during slaughter and its impacts to the future cattle herds in Tanzania. *Liv Res Rural Develop*, 27: 251, 2015.

Population and Housing Census of Tanzania (PHCT). The 2012 PHCT General Report. National Bureau of Statistics, Dar es Salaam, 2013.

Simenew K, Bekana M, Fikre L, Tilahun Z and Wondu M 2011 Major Gross Reproductive Tract Abnormalities in Female Cattle Slaughtered at Sululta Slaughterhouse in Ethiopia. *Global Vet*, 6(6): 506-513.

Swai ES, Ayubu H, Mhina BS. Incidence of foetal wastage in sheep and goats slaughtered at Tanga city abattoir, Tanga, Tanzania. *Liv Res Rural Devel* 27 (12), 2015.

URT (United Republic of Tanzania) Ministry of Livestock and Fisheries Development Budget Speech 2015/16. Government Printer, Dar-es-Salaam, 2016.

URT (United Republic of Tanzania). Ministry of Livestock and Fisheries Development Budget Speech 2013/14. Government Printer, Dar-es-Salaam, 2013.

Zulu V.C, Mwanza AM, Banda F C, Yasuda J and Oshida MY. Cattle reproductive wastage in Zambia: a case of Mongu abattoir. Bulletin of Faculty of Agriculture Kagoshima 63: 49-54, 2013.