

## Cattle reproductive wastage in Zambia: a case of Mongu abattoir

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### Summary

A survey was carried out to determine the incidence of calf wastage through the slaughter of pregnant beef cows at a local abattoir in Zambia. During August 2005- January 2006, the total number of animals slaughtered at two commercial abattoirs in Mongu, western province of Zambia, was recorded. A total of 5,278 head of cattle were slaughtered and 2,211 were cows. A total of 2,211 uteri were examined and 743 ( $35.7 \pm 1.9\%$ ) were pregnant. The results of the investigation showed that a large number of slaughtered cows were pregnant in Zambia. The unnecessary disposal of many pregnant cows represents a major economic loss to the industry, and gives the clear improvement to get more involved in fertility control and culling policy.

**Key words:** reproductive wastage, cattle, Zambia

### Introduction

Zambia has a human population of over 10.7 million and a cattle population of 2.6 million [3]. Cattle are one of the main sources of animal protein for many people in Zambia. Zambia is ravaged by a number of livestock diseases that hinder production of increased numbers of cattle. Apart from livestock diseases, nutrition poses a great challenge to the farmer in Zambia especially the resource poor traditional farmers that depend on livestock for their livelihood. This compounded with the presence of infectious diseases and helminths, leads to poor performance of cattle and infertility shown in delayed age at puberty, age at first pregnancy, early embryonic death, lack of estrus activity, poor performance by bulls etc.

It cannot be emphasised more than shown above how much Zambia needs to increase the cattle population. However, the slaughter of heavily pregnant cows at abattoir gives rise to the reproductive wastage within all these problems. The incidence of calf wastage through the slaughter of pregnant cows reported in several countries; Australia [4], Cameroon [6], Mali [10], New Zealand [5],

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Tanzania [2], and UK [7, 8]. Unfortunately, there is no report on the status of the slaughter of pregnant cows at abattoir in Zambia.

The objective of this study was to investigate the incidence of calf wastage through the slaughter of pregnant cows at a local abattoir in Zambia.

### Materials and Methods

During the months of August 2005- January 2006 the total number of animals slaughtered at two abattoirs in Mongu, western province of Zambia, was recorded. The traditional cattle (Fig.1) slaughtered come from the local and commercial farmers in western province. The recording was done by a trained meat inspector from the veterinary department. The total numbers of female animals slaughtered and those that were pregnant discovered after slaughter were recorded during each day of slaughter; the reproductive tracts that contained an apparently viable fetus were considered pregnant.

The crown rump length (CRL) was recorded for seven cases and the approximate age of gestation estimated using the following formula [1]:  $X = 2.5(y + 21)$  where X is the age (days) and y is the CRL in cm.

For statistical analysis, the percentage data were transformed to arcsine. The transformed values were assessed by one-way analysis of variance followed by Fisher's Protected Least Significant Difference as the post hoc test; P value less than 0.05 was considered to be statistically significant.

### Results

The proportion [mean % and standard error of the mean (SEM)] of pregnant cows slaughtered at two abattoirs was shown in Table 1. Fig. 2 showed pregnant uteri and fetuses of slaughtered cows at abattoir A. A total of 5,278 head of cattle were slaughtered and 2,211 were cows. A total of 2,211 uteri were examined and 743 were pregnant. Of the slaughtered cows, the overall rate of pregnant cows slaughtered was  $35.7 \pm 1.9\%$ . In addition, as shown in Table 1, the proportion of pregnant cows slaughtered was significantly higher ( $P < 0.01$ ) in January than in September to December at abattoir B.

CRL and approximate age of gestation of fetuses obtained from seven pregnant uteri at abattoir A after slaughter was shown in Table 2. The mean gestation age and SEM was  $143 \pm 18.9$  days.



Figure 1. A traditional cattle in Zambia (Barotse Breed)

**Table 1. Proportion of pregnant cows slaughtered at two abattoirs in Mongu, Zambia.**

Abattoir	Month (No. of days inspected)	No. of cattle slaughtered	No. of cows slaughtered	No. of pregnant cows slaughtered	Mean % $\pm$ SEM of pregnant cows slaughtered
A	August (5)	314	148	41	29.4 $\pm$ 6.3
	September (13)	686	302	100	34.4 $\pm$ 3.0
	October (18)	712	330	113	34.7 $\pm$ 4.2
	November (21)	634	273	84	29.1 $\pm$ 4.1
	December (20)	657	254	103	41.1 $\pm$ 4.7
	January (4)	235	82	26	34.8 $\pm$ 6.5
	Sub-total (81)	3,238	1,389	467	34.5 $\pm$ 2.0
B	August (2)	86	35	12	34.2 $\pm$ 4.7
	September (8)	328	141	37	27.2 $\pm$ 4.6 <sup>a</sup>
	October (13)	418	195	58	30.6 $\pm$ 3.5 <sup>a</sup>
	November (21)	445	169	54	34.0 $\pm$ 8.6 <sup>a</sup>
	December (19)	605	225	87	40.5 $\pm$ 4.6 <sup>a</sup>
	January (6)	158	57	28	65.1 $\pm$ 12.4 <sup>b</sup>
	Sub-total (69)	2,040	822	276	37.1 $\pm$ 3.4
Total (150)		5,278	2,211	743	35.7 $\pm$ 1.9

a vs. b;  $P < 0.01$ **Figure 2. Pregnant uteri and their fetuses from slaughtered cows at abattoir A.**

## Discussion

The results of this study showed that a large number of slaughtered cows were pregnant (35.7%) in Zambia and is just an example showing the extent of reproductive loss.

The proportion of cows slaughtered pregnant varied considerably among countries and breed; 62.9% in Australia (dairy cow) [4], 22.1% in Cameroon (traditional cow) [6], 15% in Mali (zebu cow) [10], 38.7% in New Zealand (dairy cow) [5], 54% in Tanzania (zebu cow) [2], and 23.5% in UK (dairy cow) [7, 8], respectively. However, the incidence of pregnant cows slaughtered in Mongu, Zambia was higher in comparison with the other reports. The incidence of pregnant cows slaughtered

**Table 2. Crown rump length and approximate age of gestation of fetuses obtained from seven pregnant uteri at abattoir A after slaughter.**

Fetal number	Crown rump length (cm)	Gestation age (days)
1	43	160
2	53	185
3	18	97.5
4	67	220
5	15	90
6	41	155
7	18	97.5

The mean gestation age and standard error of the mean was  $143 \pm 18.9$  days

in January at abattoir B (65.1%) was the highest and was significantly higher than the incidence of pregnant cows slaughtered in the other months. Ndi et al. [6] reported that one possible factor contributing to the high rate of slaughter of pregnant cows was season or period of the year. The periodic rainfall that Zambia depends on to feed animals has become very uncertain, some years the rains are good others the rains are not adequate sometimes even to grow maize the staple food for Zambians. In the dry season that runs from April to October the resource poor traditional farmers have inadequate feed for their cattle. January is at the peak of rainfall in Zambia, meaning increased availability of feed for animals and hence the time most of them could be pregnant.

The reasons why so many pregnant cows are slaughtered at abattoirs include disease eradication schemes, economic factors such as the calf price, the cash flow of an individual farm, nutritional factors such as the availability of pasture and the effects of a dry season [7]. However, these factors would be different among livestock production situation, breed and area. In Zambia it is not allowed to slaughter cows that are pregnant and or any female animal under the age of 10 years (No person shall slaughter any number of immature cattle or female cattle under the age of 10 years [9]). A veterinary officer or persons representing him are supposed to check all animals before sell and eventually before slaughter. Unfortunately this is compounded with disease control measures that may not allow animals to leave the slaughterhouse premises once they have come for slaughter. In contrast, if a cow is not slaughtered but purchased to be fattened by another farmer, then the presence of cows calving unexpectedly may be able to disrupt the flow of cattle through the fattening system. On the other hand, the compensation payment structure indirectly encourages the slaughter of pregnant cows. Animals sent to the market are weighed live, and the farmer is compensated per kilogram. Therefore, cattle that can be diagnosed pregnant by palpation per rectum are sold and slaughtered just because they look fat and weigh more therefore attracting a larger price. The majority of farmers do not even realize whether cows are pregnant or not before sell because of the lack of inspector and/or methods (palpation or ultrasound *per rectum*) for accurately determining pregnancy. A severe wastage occurs if a cow is culled on the assumption that it was not pregnant. The high proportion of cows that had run with fertile bull indicating that natural service was used extensively is one of the reasons why so many farmers were mistaken that their animal was not pregnant [7].

This study showed the reproductive wastage due to slaughter of pregnant cows in Zambia and suggested the causes why so many pregnant cows are slaughtered at abattoirs. Clearly, this is an area of wastage that requires urgent resolution. The unnecessary disposal of many pregnant cows represents a major economic loss and an important source of herd wastage to the industry [8]. Further studies are needed to reduce or halt completely the incidence of slaughtering pregnant cows by giving clear information

and guidance in fertility control and culling policy.

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### References

- [1] Arthur, G. H., Noakes, D. E and Pearson, H.: Veterinary reproduction and obstetrics, 5th ed. p. 501, Bailliere Tindall, London, UK (1982)
- [2] Assey, R. J., Kessy, B. M., Matovelo, J. A. and Minga, U.: Incidence of gross reproductive abnormalities in small east african zebu cattle. *Trop. Anim. Health Prod.*, 30, 361-368 (1998)
- [3] Food and Agriculture Organisation of United Nations. In: Livestock sector briefs, Zambia, [http://www.fao.org/ag/againfo/resources/en/publications/sector\\_briefs/lsb\\_ZMB.pdf](http://www.fao.org/ag/againfo/resources/en/publications/sector_briefs/lsb_ZMB.pdf) , Food and Agriculture Organisation, Rome (2005)
- [4] Ladds, P. W., Summers, P. M. and Humphrey, J.D.: Pregnancy in slaughtered cows in north-Eastern Australia: incidence and relationship to pregnancy diagnosis, season, age and carcass weight. *Aust. Vet. J.*, 51, 472-477 (1975)
- [5] Lawton, D.E.B., Mead, .FM. and Baldwin, R.R.: Farmer record of pregnancy status pre-slaughter compared with actual pregnancy status post-slaughter and prevalence of gross genital tract abnormalities in New Zealand dairy cow. *New Zealand Vet. J.*, 48, 160-165 (2000)
- [6] Ndi, C., Tambi, N.E. and Aghari, A.E.: Reducing calf wastage from the slaughtering of pregnant cows in Cameroon. *World Anim. Rev.*, 77, 38-43 (1993)
- [7] Singleton, G. H. and Dobson, H.: A survey of the reasons for culling pregnant cows. *Vet. Rec.*, 136, 162-165 (1995)
- [8] Sheldon, I. M. and Dobson, H.: Reproductive challenges facing the cattle industry at the beginning of the 21st century. *Reproduction, Suppl.*, 61, 1-13 (2003)
- [9] The Laws of Zambia. Volume 15, Cap 250. (1995)
- [10] Wilson, R.T. and Traore, A.: Livestock production in central Mali: Reproductive performance and reproductive wastage in ruminants in the agro-pastoral system. *Theriogenology*, 29, 931-944 (1988)

## ザンビアにおける妊娠ウシの浪費：モング食肉処理場における事例

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### 要 約

本研究では2005年8月から2006年1月の期間、ザンビア共和国西部州モング市にある2カ所の食肉処理場で妊娠ウシの処分状況を調査した。同期間に総計5,278頭の在来種肉用ウシが食肉処理され、そのうち2,211頭は雌ウシであった。これらの雌ウシ子宮を調べた結果、743個 ( $35.7 \pm 1.9\%$ ) が妊娠子宮であり、多数の妊娠雌ウシがザンビアで食肉処理されていることが示された。多くの妊娠雌ウシの食肉処理は子ウシの浪費に繋がり、大きな経済損失を意味し、改善が必要であろう。

キーワード：妊娠子宮，ウシ，食肉処理，ザンビア

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