Foetal Wastage of Goats Slaughtered in Zaria Abattoir

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ABSTRACT

The study was carried out with the aim of determining the percentage wastage of foetus due to the slaughter of pregnant does in Zango Abattoir, Samaru - Zaria, Nigeria. Out of a total of 680 female goats slaughtered during three months (January to March, 1998), 275 (40.4%) of them were pregnant. From the pregnant uteri, 413 foetuses were recovered. Out of the recovered foetuses 41.7%, 32.9% and 25.4% were singles, twins and triplets, respectively. It was observed that multiple birth accounted for about 37.4% of the lost foetuses. The highest percentage (57.6%) of the foetuses recovered fell within the first trimester of pregnancy, while the second and third trimesters had 27.4% and 15% respectively. The correlation between the weight and length of the foetus was positive and significant ($r = 0.928$, $p<0.001$) while the relationship between the weight and age as well as that between the length and age were positive and significant ($r = 0.909$ and 0.990, $p<0.001$, respectively). The regression equations and the results of the correlation analysis showed that the gestational age of the local breeds of goats can be accurately estimated by crown-rump length measurement. It was concluded that the slaughter of pregnant does in the nations abattoirs as a result of indiscriminate sales of female goats by livestock farmers as well as lack of pregnancy diagnostics tests by the veterinary personnel before slaughter has led to heavy loss of foetuses with consequent decrease in the available of animal proteins in the country

Key words: Fetal wastage, pregnant goats, slaughter

INTRODUCTION

The survival of goats under harsh tropical environment, together with their fertility and reproductive rates, efficiency in food conversion, the variety of feeds on which they can subsist and their relative resistance to diseases are some of their potentials that make their keeping by the rural populace profitable (Ademosun, 1988). The ownership of small ruminants in Nigeria is regarded as an investment. They are sold to meet compelling family financial obligations or slaughtered for consumption at home, especially during festivals. It has been observed that with all the aforementioned potentials of the goat, shortage of animal protein supply still remains a major problem confronting the ever-increasing human population in the country (Ademosun, 1992). One of the major factors contributing to this insufficiency in animal protein is foetal wastage (Ojo *et al*., 1977). A source of wastage well recognized by abattoir personnel but perhaps overlooked by government, Veterinarians and stockowners is the sales and slaughter of pregnant animals (Ladds *et al*., 1975; Ojo *et al*., 1977). Regrettably, studies on wastage as a result of foetal losses received little or no attentions, hence the reason for this study. The aims of the present study were to determine the degree of foetal losses from slaughter of female pregnant goats, and to estimate gestational ages of the foetuses.

MATERIALS AND METHODS

Five visits per week were made to the Zango abattoir, Samaru-Zaria, Nigeria during the study period of three months. Observations and recordings of the number of foetuses recovered from uterus of each slaughtered pregnant goat were made. A total of 680 uteri were opened with scalpel blade and examined for foetus(es). Foetuses were recovered from pregnant uteri and their weights as well as crown-rump lengths were measured and recorded, using Mettler balance (Model AE 200) and string respectively. For the crown-rump length measurement, each foetus was stretched out on a flat tray such that the nasal bones were at right angle to the long axis of the body. A string was then used to take the length from the medial canthus on the skull to the sacrococcygeal joint (that is, between the last sacral and the first coccygeal vertebral bone) following the contour of the back. The string was then measured

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out with a meter rule to obtain the length of the foetuses to the nearest millimeter (mm). For the measurement of the weight, the foetuses were cleaned and dried of blood and fluid using a clean blotting paper. Thereafter, each foetus was placed on a weighing balance and the weight was taken to the nearest milligram (mg). Data obtained were subjected to statistical analysis using Student's *t*-test and correlation analysis. The weight and crown-rump length values were used to estimate the gestational ages of the recovered foetuses using regression equations.

RESULTS

Out of a total of 680 female goats slaughtered during the 3 month period of study, 40.4% (275) were pregnant. From the number of pregnant uteri, 413 fetuses were recovered. Pregnant uteri examined and containing twins and triplets constituted 24.7% and 12.7% respectively (that is to say 37.4% were of multiple birth respectively (Table 1). Table 2 shows the mean values and ranges of the weight and crown-rump length as well as the estimated gestational ages of the recovered fetuses. It was observed that 57.6% of the recovered fetuses fell within the first trimester, while 27.4% and 15.0% fell within the second and third trimesters, respectively (Table 3). The correlation between the weight and length of the foetus was positive and significant ($r = 0.928$, $p < 0.001$). There was a positive and significant correlation between the weight and age ($r = 0.909$, $p < 0.001$) as well as between the length and age ($r = 0.990$, $p < 0.001$) of the foetus.

Table 1. Number of fetuses recovered and percentage of multiple births from pregnant does slaughtered

Birth type	No. of pregnant uteri	Total No. of Foetuses	% of foetuses recovered	% of birth type
Single	172	172	41.7	62.6
Twins	68	136	32.9	24.7
Triplets	35	105	25.4	12.7
Total	275	413	100.0	100.0

Table 2. The weight, crown-rump length and estimated age of foetuses

Number of foetuses (n)	Foetal weight (gm) (mean ± SEM)	Crown-rump length (cm) (mean ± SEM)	Estimated age (Days)
130	2.4 ± 1.3 (1.5 - 4.0)	5.2 ± 0.7 (4.5 - 6.0)	1 – 30
98	33.3 ± 27.0 (7.5 - 61.2)	8.5 ± 1.8 (6.4 - 10.6)	30 – 60
87	166 ± 87 (76 - 306.5)	20.3 ± 5.0 (15.0 - 25.6)	60 – 90
64	627.3 ± 168 (416 - 860)	28.6 ± 20 (26.2 - 31.0)	90 – 120
34	1345.0 ± 310 (1055 - 1660)	37.8 ± 5.3 (32.3-4.3.3)	120 – 150

Values in parenthesis indicate the ranges

Table 3. Number and percentages of foetuses per trimester

Trimester (weeks)	No. of foetuses	Percentage (%)
1st (1 – 7)	238	57.6
2nd (8 – 15)	113	27.4
3rd (16 – 22)	62	15.0
Total	413	100

The regression equation describing the relationship between the length and age of the foetus is shown in equation 1 below:

$$Y = .448 + 20.762\ X \qquad (1)$$

where x is the length and y is the age of the recovered foetuses. Equation (2) below describes the relationship

between the weight and age

$$Y = 56.317 + 0.0769 \, X \qquad\qquad (2)$$

where y is the age and x is the weight of the recovered foetuses.

DISCUSSION

The fact that 275 (40.4%) pregnant uteri were found among the 680 female goats slaughtered in one abattoir in three months showed that wastage through this means contributed considerably to the inability of Nigeria to meet the animal protein requirement as a nation. The magnitude of this foetal wastage can be better appreciated by extrapolating the figure in the present study. On the basis of the figure obtained the number of slaughtered pregnant does annually will be 1,100 from only one source out of so many sources in the area of study. The figure becomes even more significant when extrapolated to expected results from other slaughter establishments (both recognized and unrecognized ones) around the country. Since goats are kept, especially by the rural populace, principally as a source of domestically generated rural cash, they are sold by farmers regardless of their physiological status in order to overcome periods of cash shortages in the family (Hunter, 1989). The high percentage of slaughtered pregnant female was attributable to the important role played by goats during cropping activities, especially in the rural areas of the country (Ikwuegbu *at al.*, 1992). It has been observed that goats are usually sold at the beginning of the rainy season, and the cash earned is used for the purchase of farm imputs such as fertilizers and herbicides, and clearing of land for planting (Von Kaufmann *et al.*, 1986). They are also sold during the dry season when their feeding becomes very difficult as a result of feed scarcity (Ademosun, 1988). This assertion is in line with the results of the observation which was carried out during this period (January - March). The finding that about 37.4% of the wasted pregnancy are of multiple birth confirmed the prolificacy of goats and emphasized its potential in the quest of the nation to be self-sufficient in animal protein as reported by Osuagwuh and Aire (1986), Ademosun (1992) and Sivachelvan *et al.* (1996). The potentials of prolificacy and attainment of sexual maturity at a very early age may be another reasons that encourage the act of slaughtering female goats, regardless of their reproductive status (Wilson, 1989). The finding that 57.6% of total foetuses were recovered within the first trimester suggests the ineffectiveness or lack of adequate pregnancy diagnostic method at the abattoir. That 42.4% of the pregnant goats slaughtered fell within the second and third trimester, when mere normal ante-mortem inspection of the animal and abdominal ballottement will reveal pregnancy, was an evidence of the desperate situation the rural farmers found themselves, and the inability of the Veterinary personnel to do their job as well as government to enforce polices that will prevent the practice. Equations 1 and 2 gave the estimated age of the foetus without   applying the method described by Osuagwuh and Aire (1986). The equations complemented the method of Sivachelvan *et al.* (1996) and proposed an alternative to the conventional method of estimating age of foetus. The correlation analysis indicates that for the purpose of estimating age of foetus in the local breeds of goats in the Northern Guinea Savanna zone of Nigeria, length rather than weight gives a more accurate value. The results agree with the findings of other investigators (Dun, 1955; Dhingra and Tyagi, 1974; Richardson *et al.*, 1976). Given the important role and potential of goats in meeting the animal protein demand of our nation, it is suggested that government should give monetary incentive to the rural farmers, especially during dry and planting seasons to prevent the high slaughter of pregnant animals. Alternatively, pregnant goats brought to the abattoir should be bought off the owners by government and kept in lairage till parturition. The sale of pregnant goats can be reduced or eradicated completely, if government provides goat farmers with subsidized farm imputs such as fertilizers and herbicides and also subsidize the cost of farm clearing, to discourage them from selling their pregnant animals at the commencement of the rainy season. Also pregnancy test should be made mandatory at the abattoir and Veterinary personnel should be made to do their job by giving them the necessary tools including enactment of enforcement laws.

CONCLUSION

It was concluded that the indiscriminate sales of does by livestock farmers regardless of their physiological status in order to overcome cash shortage during the dry and planting seasons, the inadequate or lack of pregnancy diagnosis by the Veterinary personnel before slaughter as well as lack of adequate governmental policies or enforcement of the existing laws to curb sales of pregnant does are some of the factors that brings about foetal wastage encountered in our abattoir which then led to reduction in the availability of animal protein in the country. The regression equation and the result of the correlation analysis showed that the gestational age of the local breeds of goats can be accurately estimated by crown-rump length measurement.

REFERENCES

Ademosun, A. A. (1988). Trends in small ruminant production for the last two decades and its future in West and Central Africa. Keynote address. *In*: Adeniyi, K .O. (ed.). *Improvement of Small Ruminants. O.A.U. Organised Conference,* Nairobi, Kenya

Ademosun A. A. (1994). Constraints and prospects for small ruminants research and development in Africa,

Proceedings of the Second Biennial Conference of the Africa Small Ruminants Research Network AICC, Arusha, Tanzania, 7-11 December, 1992. (Food and Agriculture Organization of the United Nation). pp. 1-6.

Dhingra, L. D. and Tyagi, R. P. S. (1974). A study on the prenatal growth pattern of some long bones of the goats. *Ceylon Vet. J.* 22: 21-24.

Dun, R. B. (1955). Ageing the Merino foetuses. *First Vet. J.* 31: 153-154.

Hunter, J. P. (1989). Small ruminants in the household economy of Lesotho; Towards a dynamic functional perspective. In: Willson, R.T. and Melaku, A (ed.). *African Small Ruminant Research and Development. Proc. Conf.* Bamenda, Cameroon, 18 - 25 January, 1989. pp. 60-67.

Ladds, P. W, Summers, P. M. and Humphrey, J. D. (1975). Pregnancy in slaughtered cows in North-Eastern Australia. Incidence and relationship to pregnancy diagnostic, season, age and carcass weight. *Austr. Vet. J.* 51: 472-477.

Ikwuegbu, O. A., Tarawali, G. and Njwe, R . M. (1994). The role of the West African Dwarf goat in the economy of the small holder arable farmer in the sub humid zone of Nigeria. *Proceeding of the second Biennial Conference of the Africa Small Ruminants Research Network AICC,* Arusha, Tanzania 7-11 December, 1992 (Food and Agriculture Organization of the United Nation) pp. 19-22.

Ojo, S. A.,Dennis, S. M., Leipold, H. W. (1977). Pregnancy in slaughtered cows in Zaria. Relationship to age, season, and stage of gestation. *J. Nig. Vet. Med. Assoc.* 6: 66-72.

Osuagwuh, A. I. A and Aire, T. A. (1986). Studies on the estimation of the developmental age of caprine fetus –1. External; measurements and appearance *Trop. Vet.* 4: 39-51.

Richardson, C. Herbert, C. N. and Terileki, S. (1976). Estimation of the developmental age of the ovine and lamb. *Vet. Rec.* 99: 22-26.

Sivachelvan, M. N., Ghali, M. and Chibuzo, G. A. (1996). Foetal age estimation in sheep and goats. *Small Rumin. Res.* 19: 69-76.

Von Kaufmann, R. R., Wilson, R. T. and Reynolds, L. (1986). The economic role of small ruminants in agricultural communities and land use systems in Africa. C.T.A. pp. 183-192.

Wilson, R. T. (1989). Livestock production in Central Mali: Long term studies on cattle and small ruminants in the agro-pastoral system. ILCA Research Report No. 14.