Small holder herd structure of West African Dwarf goats in a derived savannah environment area of Nigeria

T.A. Adedeji, L.O. Ojedapo, O.O. Ojebiyi, T.B. Olayeni and A.O. Akinwumi

Department of Animal Production and Health, Ladoké Akintola University of Technology, P.M.B. 4000. Ogbomoso, Nigeria

Abstract

The herd structure of small holder farmers engaged in the keeping of West African dwarf goats in Surulere Local government area of Ogbomosho, a derived Savannah zone of Oyo State, Nigeria was surveyed. 30 flock owners having a total number of 273 goats were randomly selected and studied using structured questionnaire, on farm visit and personal interviews. The parameters measured include, age, sex and occupation of the farmers; Age, sex and number of animals kept, sources of foundation stock, housing type; major problems facing the farmers; time, mode, ease, peak and age of animal disposal. The result indicated that middle age men and married women were more into goat rearing. The herd size ranged from 6.67 – 12.33 goats per farmer with an overall average of 9.10. Goats kept were fairly young. In most cases, foundation stocks were acquired through gift and purchase from neighbours. Semi-intensive system of management was mostly embraced because it is less risky, low labour and cost inputs are involved. The major limiting factor is the health problem.

Keywords: Smallholder, West African Dwarf goat, derived savannah, Nigeria

Introduction

Small ruminants are widely distributed in the tropics especially in rural, peri-urban and urban areas, representing about 63.7% of the total grazing domestic animals in Nigeria (Doma *et al.*, 1991). They are increasingly becoming a major source of dietary animal protein in Nigeria and they contribute as high as 30% of the total meat consumed (Ademosun, 1976). The animals convert low-cost inputs, household wastes, combined with cassava peels or other crop by-products of small-scale commercial food processing into high valued products (Meat, milk and skin). Goats are owned by a large proportion of the rural population (predominantly women) with relatively limited skills in livestock husbandry in the tropical zone (Wilson *et al.*, 1987).

Estimates from the Federal Department of Livestock and Pest Control Services (1991) showed that goats are second largest producer of animal protein in the country. The ownership distribution in favour of goats was attributed to their hardiness, better survival rate, and prolificacy and resistance to worm infestation (Umeh *et al.*, 1999 and Gefu *et al.*, 1994). Gefu *et al.*, (1994) reported 14.2% mean flock size per household in the South Eastern Nigeria. Investigations (Momoh and Ochaba, 2002) revealed that smallholder kept more female goats than their male counterparts with the population of the breeding buck ranging from 6 – 8% to 42.0% and breeding does from 0.2% to 45.5% with average mating (Buck:Doe) ratio of 1:3.

Owners also culled their goats as a result of emergency need for money and an estimated 42% (combined sexes) leave the herd yearly with 3 to 4 years age group being most affected.

However, the profitability of goats depends largely on its management and health (Lakpini, 2002). The smallholder farmers will therefore do all within their power using the available resources to ensure continuity because these small ruminants play an important role in their economic life. There is need for a good database upon which to build ideas and make recommendations aimed at improving the herd structure of smallholder of WAD goats. This study investigates the herd structure vis-à-vis differences in management skills of caring for WAD goats in the natural grazing condition of the derived savannah zone with the aim of making recommendations for boosting goat production in the country.

Materials and Methods

The study was carried out in Surulere Local Government of area of Ogbomoso, Oyo State, Nigeria. The area is situated approximately 600 meters above sea level with mean annual rainfall of 1247mm, 28-30°C temperature and 80-90% relative humidity. It falls within longitude 4°16'E and latitude 8°07'N (Akinbola, 1998). The vegetation is an interphase between the tropical rainforest and derived savannah (Ogun-Osun RBDA, 1995). The local government occupies an area of about 975km² with a population of about 126,692 people (Population Census, 1991) and has ten (10) wards namely, Iresaadu, Oko, Iresa apa, Iregba, Orile Igbon, Gambari, Abode, Ajase, Iwofin and Arolu.

Animal management

Goats were allotted to scavenge during the day with occasional offers of cassava peels, crop residues, kitchen wastes etc. majority of the animals were not housed at all rather they sleep outside their owners compound at night.

Data collection

The study was carried out through structured questionnaires, on-farm visits and personal interviews. Three flock owners were randomly selected for the study in each ward thus making a total of 30 owners within the Local government with a total of 273 goats. The parameters considered include, Age of respondents, Sex, Marital status, Sources of foundational stock, Animal's age, Animal physiological state, Management system, Major problems, Time, Mode, Ease, Peak and Age of animal disposal. Ages of animal were recorded through the dentition (Sastry and Thomas, 1980). Animal covered by the study were grouped on the basis of age of 0 – 1, 1- 2, 2 – 3, 3 – 4, and > 4 years. The physiological groupings were kids, growers, breeding adult dry and breeding nursing adult.

Data analysis

The data collected were analysed using descriptive statistics (SAS, 1999) to generate tables, and cumulative frequency while Excel software package was used to generate the graphs.

Results and Discussion

Small holders sex distribution presented in Figure 1 (about 83.33%) is in favour of female owners indicating that more women are into the production than men (16.67%). The entire female engaging in goat production were married while 1 out of every 5 males engaged in goat keeping was single. This is in agreement with the work carried out in Ebonyi State of Nigeria by Omeje *et al.*, (1997). They noted that women own more goat than their male counterparts, since most women in the area are full time housewives with no other work. This makes it easier for them to acquire, manage and dispose off the goat. The majority of the men in the study area are actively engaged in farming activities and this leave little or no time for them to do some other things and more so they believed that rearing of livestock was not tasking therefore should be left for

Herd structure of West African Dwarf goats in derived savannah area of Nigeria

women folk. Those men having goats are part-time farmers who engage in other economic activities for living., however, the women folk were engaged in goat rearing because its management did not require decision making from men and it is a way of meeting emergency cash need of the family.

More people of middle age (51 – 60 years) are actively involved in rearing goats (Table 2) than other ages. This could be connected with the fact that their household economy is increasing and they cannot be actively engaged in any strenuous job other than to look for ways of complementing their income.

Table 1 Owners' age distribution

Age	Frequency	Percentage
20 – 30	2	7.14
31 – 40	-	-
41 – 50	9	32.15
51 – 60	13	46.43
61 – 70	4	14.28
TOTAL	28	100

Table 2 Small holders' population and distribution of goats in each ward of the local government area.

Ward	No of farmers	frequency	Herd size per farmer	Percentage
1	3	26	8.67	9.52
2	3	30	10.00	10.99
3	3	22	7.33	8.06
4	3	28	9.33	10.26
5	3	27	9.00	9.89
6	3	20	6.67	7.33
7	3	37	12.33	13.55
8	3	26	8.67	9.52
9	3	27	9	9.89
10	3	30	10	10.99
Total	30	273	9.1	100

Acquisition of foundation stock by livestock (Figure 2) in the study area was mainly by gift (68.75%). Other sources of foundation stock as shown in the table include market purchases, purchase from neighbours, inherited and borrowed and this accounted for 21.88%, 50%, 43.75% and 15.62% respectively. Gift and neighbour purchases as sources of foundation stock was not in agreement with the findings of Umeh *et al.*, (1999) in the old Bauchi State of Nigeria. However, gift as a major source of

foundation stock confirmed the spirit of friendliness among the people in the study area and further shows the ease of acquisition. Moreover, a major advantage of this source of foundation stock is the suppression of inbreeding problem that may likely result from bucks mating their mother does and this is common with small population of animals. The animal sex composition values of 79.49% and 20.57% in the herd studied constitute the female and male animals respectively with a male or female

Fig. 1. Owners' sex and marital status distribution

Fig. 2. Sources of foundational stock

mating ratio of 1:4. the higher number of female goats observed is an indication that the owners were interested in having more animals in their flock over time as a replacement for ageing does. This ratio agrees with the findings of Momoh and Ochaba (2002) but the mating ratio is lower than what Bayer (1986) reported. A lower ratio reported indicates that more breeding male than necessary are kept within these flocks. Also. In

an uncontrolled mating population found with traditional small holder, a high number of bucks to a few does would result in fighting among buck over does on heat. This could lead to injuries and does going off heat without being bred thereby leading to reduced reproductive rate. However, such a large number of bucks to does in a herd prevents inbreeding build-up and is suitable for small herd size typical of smallholder goat rearers.

Herd structure of West African Dwarf goats in derived savannah area of Nigeria

Fig. 3. Farmers age group distribution of goats

Fig. 4. Physiological spread of goat distribution

Fig. 5. Major problem encountered in the farmers' herd

Table 2 shows the small holder's population and distribution of goats in each ward of the LGA. The average herd size per farmer-household ranges from 6.67 to 12.33. wards 2 and 10 had the highest herd sizes followed by wards 5, 79 while ward 6 had the lowest herd size. An average herd size 9.10 was recorded in the study area per household. This does not agree with 11.0, 11.4, 12.0 and 14.2 herd size per household reported by Ayoade *et al.*, (1993), Momoh and Ochaba (2002), Ademolu (1997) and Umeh *et al.*, (1999) respectively. This reason for this could be due to different location and environmental factors. Moreso, the areas studied by these authors are in the Northern part of Nigeria known for ruminant animal production. Among many factors that limit increase in herd size in the study area, health problem ranked highest (Fig. 5).

Various diseases such as Mange, Bloat, Mastitis, Pneumonia, Foot rot and Abortion among others are the major health problem encountered by herd owners. These major limitations are in agreement with work of Umeh *et al.*, (1999). They reported that health problem was also the major problem of the stockowners in their area of study. Other

limiting problems discovered in the study area are housing, predator, motor accident, theft, feed and capital in decreasing order of extent of limitation.

The age group distribution of animals is shown in Fig. 4. Animals falling within age group of 1 – 2 years have the highest frequency followed by age group 3 – 4 years with the lowest frequency 31 (11.36%) recorded in 2- 3 years age group. The highest proportion of goats falling between ages of 1 to 2 years is a reflection of the stockowners favouring young goats as against the older ones. The advantage of this is the reduction of the generation interval, thereby increasing annual rate of genetic progress. However, a young breeding herd with few older animals would decrease herd productivity in terms of numbers of kids born (Momoh and Ochaba, 2002).

The physiological spread of the animal in the study area was in favour of breeding Adult Nursing (75) 27.47% closely followed by growers, kid and breeding Adult dry (74) 27.11%, (64) 23.44% and (60) 21.98%

Herd structure of West African Dwarf goats in derived savannah area of Nigeria

respectively (Fig. 4). This is a reflection of the holders favouring continuity of their herd by retaining does majorly. Management in a broad view encompasses total care given to an animal or a group in order to enhance productivity and survival. The management practice was in favour of semi-intensive, followed by extensive system of management. This is an indication that in the study area, the stockholders still care for their animals. They do not leave them entirely to fend for themselves. This agrees with the findings of Omeje *et al.*, (1997) in the eastern part of Nigeria.

Disposal of stock by the stockowners as presented in Table 3 revealed that they do not just release their goats until adult stage in order to fetch them

more money. The reason had been that they are mostly sold for meat after attainment of market size (males) or poor reproductive performance (female). Attainment of market size is closely linked with higher prices in the market than younger immature goats. The kids are not disposed probably because they are kept for breeding and possibly to reduce the generation interval. Culling goats at grower stage could reduce herd productivity as this could contain most productive animals. Mode of disposal was found to be usually at home that is live at home and this occurred mostly during the festival period. This is expected since goat command good prices both at the Muslim festival (*Id el Kabir*) and at Christmas period.

Table 3 *Frequency distribution of goats disposal from the herd.*

Variables	Frequency
State of disposal	
1. Kid	1
2. growers	25
3. Adults	28
Reasons for disposal	
1. Cash	10
2. Gift	13
3. Home consumption	3
4. Festival	18
5. Sacrifice	0
Mode of disposal	
1. Live at home	32
2. Slaughtered	0
3. Live at market	4
Period of disposal	
1. Any time	1
2. Festival	31

Conclusion and Recommendation

The WAD goats of Surulere local government are mainly owned and reared by middle age women and these animals are mostly acquired through gift, reared semi-intensively, threatened by health problems and are usually disposed off during festive periods. The observed lopsidedness in the herd structure of the study

area is a reflection of lack of awareness on the part of the men folk as regards the profitability of rearing goats and meeting the protein need of the farmer's family. It is recommended therefore, that extension programme on improved method of animal production be extended to the owners. When enlightened on marketing at an optimum age, the economy of smallholder farmers in the

study area could improve. Also, a programme should be organized to create awareness on the need for men in the study area to be actively engaged in goat rearing.

References

- Ademosun, A.A. 1976.** The Livestock sub-sector in Third National Development Plan. *Nig. J. Anim. Prod.* 3: 10 – 17.
- Ademu, S.O. 1997.** Small Ruminant Production in Kogi State. A case study of Olamoboro local government area. Unpublished B.Agric. project submitted to the Department of Animal Production, University of Agriculture, Markurdi, Nigeria.
- Akinbola, G. 1998.** Housing condition and health: A case study of Ogbomoso, Nigeria (An unpublished undergraduate project in the urban and regional planning department, LAUTECH, Ogbomoso, Nigeria. 47 – 55.
- Ayoade, S.A., Adeleye, I.O.A. and Ogebe, O.F. 1993.** A case study of Ado local government area of Benue State. *The small ruminant research network newsletter Adis Ababa, Ethiopia* No 21611. 5 – 11.
- Bayer, W. 1986.** Traditional small ruminant production in the sub-humid zone of Nigeria. Paper presented at the 2nd ILCA/NAPRI symposium on Livestock System Research in Nigeria's sub humid zone at Kaduna, Nigeria. 29th October – 2nd November, 1984.
- Doma, U.D, Mohammed, L.K. and Umeh, A.P. 1991.** Observation on the characteristics of small holder sheep and goat management practices in old Bauchi State. Observed from Animal Production Programme. Abk Tafa Bal. University. *Trop. J. Ani. Sci.* 2(2):125 – 130.
- Federal Department of Livestock and Pest Control Services 1991.** Nigeria Livestock Survey. Ministry of Agriculture, Abuja, Nigeria. Vol. 2, 289 pp.
- Gefu, J.O., Adu, I.F., Alawa, C.B.I. and Mogaji, S.O. 1994.** Characteristics of small holder sheep and goat practices in south Eastern Nigeria. *Nig. J. Anim. Prod.* 21 (1 & 2):127 – 134.
- Lakpini, C.A.M. 2002.** Management of sheep and goats. In: NAPRI ABU, Shika Nigeria. *Proceedings of Small Ruminant Traditional Production Workshop.* January 13 – 18, 2002.
- Mack, S.D. 1983.** Evaluation of the productivity of West African dwarf sheep and goat in South West Nigeria. Humid Zone Programme. (1983).
- Momoh, O.M. and Ochaba, A.O. 2002.** herd structure of smallholder goat production in Otukpo L.G.A of benue State, Nigeria. *Trop. J. Anim. Sci.* Vol. 5 (2): 53 – 57.
- National Population Commission 1991.** Population Census. Federal Office of Statistics, Abuja.
- Omeje, S.I., Nwambe, R.N. and Otma, M.O. 1997.** A study of sheep and goat production in Ebonyi State. *Proceedings of the 22nd conference of the Nigerian Society for animal production held at Abubakar Tafawa Balewa University, Bauchi* 23rd – 27th March, 1997.
- OORDBA. 1995.** Ogun-Osun River Basin Development Authority (Department of Agrometrology).
- Umeh, A.P., Doma, U.D. and Mohammed, L.K. 1999.** Observation on the characteristics of smallholder sheep and goat. Management practices on old Bauchi State. *Tropical J. Anim. Sci.* 2 (20: 125 – 130.
- SAS 1999.** Statistical Analysis System, User's Guide. Statistical Analysis Institute, Inc. Carry, North Carolina.

Herd structure of West African Dwarf goats in derived savannah area of Nigeria

- Sastry, S. R, Thomas, C. K. 1980. Denition in Far Animals. Management Vicas. Publ. hous. PVT Ltd, India. Pg 39 – 45.
- Wilson, R.T., Traore, A., Peacock, C.P., Mack, S and Agyemang, K. 1985. Early mortality of lamb. In: Africa Traditional Livestock Production Systems. *Vet. Res. Common.* 9: 28 – 30.
- Wilson, R.T., Reynolds, L. and Armbuster, T. 1987. Management of sheep and goat flocks in the Humid Tropics of West Africa. In: Food and Agricultural Organization of the United Nation. Rome *Proceeding of A Seminar Held in Tamousoukro, Cote d'Ivoire.* 21 – 25th September 1987. pg 114 -- 127.

(Received 29 August 2005; Accepted 15 July 2005)