

Full Length Research Paper

## Management practices and perceived training needs of small ruminant farmers in Anambra State, Nigeria

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The study was conducted to assess management practices and perceived training needs of small ruminant farmers in Anambra State, Nigeria. Interview schedule was used to collect data from sixty randomly selected farmers. Data was presented using descriptive statistics. Majority (68.3%) of the respondents were males. Fifty-five percent of the farmers kept goats only. Majority (96.7%) kept their animals under the intensive system of management. About 63% of the respondents kept their livestock in cement block houses. *Pennisetum purpureum* and *Panicum maximum* combination (61.7%) were the most commonly used forage fed to the animals. All the respondents had basic knowledge on how a healthy animal should look like. About sixty two percent indicated that diarrhoea was the most frequently observed health problem in their flocks. Majority (71.7%) selected animals for breeding on the basis of fast weight gain while 65.0% on the basis of high rate of multiple births. Respondents indicated training needs in the areas of: Improve carcass quality (80.0%), ration formulation (75.0%), stock density (80.0%) and forage management (81.7%). Great potentials exist for small ruminant production in the area and this can be achieved through sound extension education to the farmers.

**Key words:** Small ruminants, management, training, Nigeria.

### INTRODUCTION

In the humid zone of Nigeria, small ruminants fit into the smallholder production system, as they require low initial capital investment and low operational cost (Pollot and Wilson, 2009). Majority of rural owners of small ruminants are farmers involved in food and tree crop production, or women involved in food processing and marketing (Rivera et al., 2004). A large percentage of the rural people satisfy their subsistence needs through livestock production which involves the rearing and marketing of livestock (Oladele, 2004). Diseases and inadequate nutrition (in terms of quality or quantity) constitute serious constraints to small ruminant production in Africa (Tadesse, 2012). Good management practices in terms of adequate nutrition, disease prevention and control and

breeding, are essential for improved small ruminant production. Nigeria's small ruminant resources are estimated at 34,453,724 goats and 22,092,602 sheep (Ajala and Adesehinwa, 2008).

Although the productivity of small ruminants in Nigeria is low (Rivera et al., 2004), there is ample opportunity for improvement. Such improvement can be achieved through extension education and training of small ruminant producers. However, such extension education and training can only be effective if the training needs of the small ruminant producers are properly identified. Extension educators are responsible for helping farmers to accurately identify their educational needs. Programmes are most often successful when they focus

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on clearly defined needs of the target group (Harris, 2011). Proctor and Thornton (1961) defined training needs as skills, knowledge and attitude an individual requires in overcoming problems as well as avoiding creating problem situations. Numerous studies confirm the positive effects of agricultural education and extension in farm productivity (Alene and Manyong, 2007; Atreya, 2007), poverty alleviation (Dercon et al., 2009), decision-making capacity (Yang et al., 2008), acquisition of general knowledge about new methods and principles in agriculture and animal husbandry (Karbasioun et al., 2008) and development of environmental behavior (Balakrishnan, 2010). This study was therefore conducted to describe personal characteristics of small ruminant farmers, determine small ruminant management practices and ascertain small ruminant farmers' training needs in Anambra State, Nigeria.

## METHODOLOGY

The study was conducted in Anambra State, Nigeria. The state is located on latitude  $5^{\circ} 80^1$  and  $6^{\circ} 10^1$  North and longitude  $6^{\circ} 85^1$  and  $7^{\circ} 60^1$  East. Nnewi North and Idemili South Local Government Areas (LGAs) were selected from the twenty-one LGAs in the state using simple random sampling technique. Two town communities (Nnewi and Nnobi) were randomly selected from the LGAs. Out of the four villages in Nnewi town community, three (Otolu, Nnewichi and Umudim) were purposively selected because of their active participation in small ruminant rearing. All the three villages in Nnobi town community (Awuda, Ebenesi and Ngo) were used for the study. Ten farmers were randomly selected from each of these six villages; thus a total of sixty farmers constituted the sample size for the study.

Semi-structured interview schedule was used to collect data for the study. Information on the socioeconomic characteristics as well as small ruminant management practices (feeds and feeding, housing, health and disease preventive measures, breeding and record keeping) was sought from the respondents. Information on the perceived training needs of the small ruminant farmers was also elicited. Factors that could discourage their participation in the training programmes were obtained on a four-point Likert-type scale of strongly agree (4), agree (3), disagree (2) and strongly disagree (1). A mean score (2.5) was determined by adding 4, 3, 2 and 1 and dividing the sum by 4. Any factor with a mean score of 2.5 and above was taken as a discouraging factor. Data generated in the study were presented as percentage and mean scores.

## RESULTS AND DISCUSSION

### Socio-economic characteristics of respondents

Majority (68.3%) of the small ruminant producers were males (Table 1), indicating that males are more actively involved in small ruminant production in Anambra State. The mean age of the respondents was 51.1 years, indicating that most of the farmers were middle aged. Majority (68%) of the respondents were married while 91.7% have some form of formal education and could be described as literates in terms of reading and writing. However, 56.7% were educated beyond primary school.

This relatively high level of educational status suggests that farmers may be willing to attend training programmes. An attempt to introduce new technologies may also be successful because of the high level of literacy. Only 30.0% of the respondents were full time farmers. The respondents had a relatively large household size (average of 7 persons). The larger the household size, the more likely the availability of farm labour.

### Small ruminant management practices in Anambra State

#### *Type of small ruminants kept*

Fifty five percent of the respondents kept goats only while 23.3 and 21.7% kept sheep only and both goat and sheep, respectively (Table 2). The observation that majority of the respondents owned goats only is similar to the finding of Aphunu et al. (2011) in Delta State of Nigeria. However, the finding contrasts that of Ajala et al. (2008) in the Northern Guinea Savannah region of Nigeria, where majority of the respondents kept sheep only rather than goats only. This observed difference in ownership of small ruminants may be due to the fact that in the southern parts of Nigeria, particularly southeast region (where Anambra State is located) goat head, popularly known as "*esi-ewu*", and goat meat pepper soup are delicacies. The goat and sheep kept by the respondents in the study area are the West African Dwarf goat and sheep. This breed has a high degree of adaptability and is trypanotolerant (Ebegbulem et al., 2011).

#### *Management system practiced*

Majority (96.7%) of the respondents kept their animals under the intensive system of management (Table 2). This is contrary to the findings of Adesehinwa and Okunlola (2000) who reported extensive system as the most common system of production in south western Nigeria. Intensive system is characterized by high productivity as it reduces losses due to accidents, diseases and theft.

#### *Housing type*

About 63% of the respondents kept their livestock in cement block houses, while 25.0, 5.0 and 3.3% kept their goats and sheep in mud, bamboo and wooden houses, respectively and 3.3% did not provide any form of house for their animals. Bamboo and wooden houses are fragile and therefore can easily be destroyed by the animals. Animals housed in wooden houses are prone to heat stress since wood is a good conductor of heat. Traditional barns, pole buildings and metal buildings are usually the

**Table 1.** Percentage distribution of respondents according to socio-economic characteristics.

<b>Socio-economic characteristics</b>	<b>Percentage</b>	<b>Mean (M)</b>
<b>Sex</b>		
Male	68.3	
Female	31.7	
<b>Age (years)</b>		
20-29	15.1	
30-39	13.4	
40-49	31.8	
50-59	20.2	51.1
60-69	15.1	
70 and above	4.4	
<b>Marital status</b>		
Single	16.7	
Married	68.3	
Widow	15.0	
<b>Educational level</b>		
No formal education	3.3	
Primary education	40.0	
Secondary education	26.7	
NCE/OND/HND	21.7	
B.Sc./M.Sc.	8.3	
<b>Major occupation</b>		
Farming	30.0	
Others	70.0%	
<b>Households size</b>		
1-5	43.2	
5-10	48.4	6.5
11-15	8.4	

most expensive, but they provide the best protection for the shepherd, feed, and equipment (Siardos and Lioutas, 2008). Inappropriate housing can affect the health and productivity of animals. Farmers in the study area should be educated on the best type of houses to be used for their animals. However, site location and ventilation should be considered necessary in the selection of housing site for goats and sheep.

### **Feeds and feeding**

Small ruminants in the study area were fed essentially with forage; elephant grass (*Pennisetum purpureum*) and guinea grass combination (61.7%) being the most commonly used. Individual forages contain specific nutrient elements unique to each one and combination of

forages will therefore aid in the attainment of balanced nutrient requirement for livestock (Smith, 1988). The forages used for feeding the animals were indicated by 65.0% of the respondents to be available all year round (Table 3). In addition to grasses, 63.3% of the respondents used browse plants as source of feed to their sheep and goats while 98.3% also provide their animals with household food scraps and crop residue as supplemental feeds (Table 3). Except when well fertilized and harvested young, tropical grasses alone cannot supply small ruminants with the nutrients required for a reasonable production level (Ademosun et al., 1988). Plants such as *Gliricida* species, *Leucaenia* species, *Manihot esculanta* (Cassava) and *Phyllostachys bambusoides* (bamboo) leaves, used by majority of the farmers in the study area contain more crude protein and organic matter (Kanenga, 2012; Wikipedia ND,

**Table 2.** Distribution of respondents according to type of small ruminants kept, management system and housing type.

Variable	Frequency	Percentage
<b>Type of small ruminants kept</b>		
Goat only	33	55.0
Sheep only	14	23.3
Both	13	21.7
<b>Management system</b>		
Intensive	58	96.7
Extensive	2	3.3
<b>House type</b>		
Bamboo houses	3	5.0
Cement block houses	38	63.4
Mud houses	15	25.0
Wooden houses	2	3.3
No confined house	2	3.3

[http://en.wikipedia.org/wiki/Leucaena\\_leucocephala](http://en.wikipedia.org/wiki/Leucaena_leucocephala)) and less fibre than tropical grasses (vegetables). According to Ademosun (1999) use of browse plants either as supplements to tropical forages or as sole feeds is a viable feeding system in humid West Africa. Most of the browse plants remain green all year round and if well managed could provide substantial amounts of foliage during the dry season. The fact that 37% of the respondents in the study area did not use browses suggests that it is necessary to educate these small ruminant farmers on the usefulness of browse plants in small ruminant feeding.

### Use of household food scrap and crop residues

In Nigeria, it is a common practice to feed animals with household scraps and crop residues. It is therefore not surprising that nearly all (98.3%) the respondents (Table 3) in the study area used these materials in feeding goats and sheep. As pointed out by Smith et al. (2009) many household food scraps and crop residues are low in protein, highly fibrous and therefore low in fermentable carbohydrates. Such feeds fail to maintain an efficient rumen ecosystem for their own degradation and/or that of other equally poor quality forages. Whereas household and crop residues (cereal straws, stovers) may not be suitable as supplements to poor quality forages, they could be used as basal feeds, supplemented with better quality feed materials such as browses. Forty percent of the respondents provided household food scraps/crop residues to their animals during the afternoon periods only while 23.3% during the morning periods only. The afternoon feeding regimen practiced by 40% of the respondents has been pointed out by Smith (1988) to be

advantageous in that rapidly degraded peels, brans and husks fed late in the afternoon or at night will better synchronize the release of energy and nitrogen they contain with those of the less rapidly degraded grasses.

During the period of excess forage, 76.7% of the respondents made hay with the excess forage while 60.0% increase animal numbers in the herd or flock and 56.7% lease extra pasture to other livestock producers (Table 3). However, 43.3% of the respondents did not have any defined strategy for dealing with excess forages. The use of hay as a method for conserving forages is a good practice since it can make feed available during times of forage scarcity. This practice is in line with the study of Jackson (2008) who stated that, by conservation (in form of hay or silage) and storage of feeds available during periods of surplus, livestock keepers can ensure that they have sufficient feed to offer their livestock throughout the year. Farmers should therefore be encouraged to prepare hay during periods when forages are in excess.

### Health management practices among small ruminants producers in Anambra State

#### Knowledge of good health

All the respondents indicated that they have basic knowledge on how a healthy animal should look like (Table 4). This implies that they are able to identify unhealthy animals in their farms. Signs of ill health that could be recognized by the farmers were diarrhea (61.7%), dull appearance (58.3%), weakness (91.7%), weight loss (38.3%), excessive bleating (93.3%) and lack of appetite (21.7%).

**Table 3.** Distribution of respondents according to feed and feeding practices use for small ruminants.

<b>Feeds and feeding practices</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Availability of forages all year-round</b>		
Yes	39	65.0
No	21	35.0
<b>Forage type*</b>		
Elephant grass ( <i>Pennisetum purpureum</i> ) and Guinea grass ( <i>Panicum maximum</i> )	37	61.7
<i>Cynodon plectostachyus</i> and Spear grass ( <i>Austrostipa stipoides</i> )	28	46.7
<i>Axonopus fissifolius</i> (Carpet grass) and <i>Austrostipa stipoides</i>	27	45.0
Bahama grass ( <i>Cynodon datylon</i> ), <i>Axonopus fissifolius</i> and <i>Pennisetum purpureum</i>	26	43.3
<i>Axonopus fissifolius</i> and giant star grass ( <i>Cynodon plectostachyus</i> )	26	43.3
<i>Pennisetum purpureum</i> and <i>Cynodon plectostachyus</i>	24	40.0
<i>Panicum maximum</i> and <i>Cynodon datylon</i>	20	33.3
<b>Use of browse plants</b>		
Yes	22	63.3
No	38	36.7
<b>Use of household food scrap or crop residues</b>		
Yes	59	98.3
No	1	1.7
<b>Time of the day of use of household food scraps</b>		
Morning only	14	23.3
Afternoon	24	40.0
Evening only	8	13.3
No specific time	12	20.1
Anytime	2	3.3
<b>Strategy for dealing with excess forage*</b>		
Prepare hay	46	76.7
Increase animal numbers	36	60.0
Lease extra pastures to other livestock producers	34	56.7
No defined strategy	26	43.3

\*Multiple responses.

### **Monitoring of animals**

Majority (95.0%) of the small ruminant producers monitored their animals daily. Daily monitoring of animals is important for early detection of signs of diseases in the flock.

### **Measures used to reduce disease incidence**

Majority (71.7%) of the respondents reduced disease incidence by use of cleaner pastures while 61.7% reduced disease incidence by reducing stocking rate through sale of mature and less productive animals. Half (50%) of the respondents indicated that they reduce

disease incidence by separating sick from healthy animals. Application of herbal dewormers and orthodox anthelmintic was used by 50 and 40% of the farmers, respectively to reduce disease problems in their farms (Table 5).

### **Health problems in the flocks**

Majority (61.7%) of the farmers indicated that diarrhoea was the most frequently observed health problem in their flocks. Fifty-five percent of the respondents reported "bloat" as a frequently encountered health problem. Other health challenges reported by the farmers included ectoparasitism, particularly fleas, mites and tick; ocular

**Table 4.** Percentage distribution of the respondents according to health management practices.

<b>Health management</b>	<b>Frequency</b>	<b>Percentage</b>
<b>knowledge on health of livestock</b>		
Yes	60	100
No	0	0
<b>Some symptoms recognized by farmers in unhealthy animals*</b>		
Diarrhoea	37	61.7
Dull appearance	35	58.3
Weakness	25	41.7
Loss of weight	23	38.3
Excessive bleating	20	33.3
Lack of appetite	13	21.7
<b>Daily inspection/check of animals</b>		
Yes	57	95.0
No	3	5.0
<b>Measures used to reduce disease incidence*</b>		
Use of cleaner pastures	43	71.7
Reduce stocking rate by selling off some of the animals	37	61.7
Isolating of sick animals	30	50.0
Use herbal de-wormers	30	50.0
Deworm animals with orthodox anthelmintics	24	40.0
Deworm all new animals	18	30.0
Strategic deworming just before parturition	15	25.0
Select animals that are resistant to disease	10	16.7

\*Multiple responses.

**Table 5.** Percentage distribution of respondents according to frequently observed health problems.

<b>Health problems*</b>	<b>Frequency</b>	<b>Percentage</b>
Diarrhea	37	61.7
Bloat	33	55.0
Fleas	29	48.3
Mites	23	38.3
Ticks	17	28.3
Ocular discharges	9	15.0
Dehydration	8	13.3
Anorexia	5	8.3

\*Multiple responses.

discharges, dehydration and anorexia. Diarrhea is a clinical sign usually associated with helminthoses and pestes de petits ruminants (PPR) (Özkul et al., 2002). Helminthosis and PPR have being identified as major disease problem of small ruminants in Edo State, Nigeria (Omoike, 2006). The dehydration reported by the

respondents probably results from diarrhea. Ectoparasitic infestation often leads to anaemia. These health challenges result in severe economic losses due to death of affected animals or reduced productivity and live weight gain. As noted by Otchere (2010) high standards of sanitation and management are essential to

**Table 6.** Percentage distribution of farmers according to perceive criteria used for selection of breeding animals.

<b>Selection criteria*</b>	<b>Frequency</b>	<b>Percentage</b>
Weight gain	43	71.7
High rate of multiple births (twinning)	39	65.0
Mothering ability	6	10.0
Ability to thrive on forage alone	5	8.3
Internal parasite resistance	9	15.0

\*Multiple responses.

**Table 7.** Percentage distribution of respondents according to record keeping practices.

<b>Record Keeping</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Keep farm records</b>		
Yes	45	75
No	15	25
<b>Type of record kept*(n=45)</b>		
Financial record	42	93.3
Litter size record	42	93.3
Mortality record	38	84.4
Record of individual animal identification	35	77.8
Health record	25	55.6
Record of breeding of animals	22	48.9
Record of labour used	15	33.3
Weight record	12	26.7
Parturition interval record	11	24.4
Record of age at first parturition	10	22.2

\*Multiple responses.

control these health problems.

### **Breeding practices among small ruminant farmers**

#### ***Criteria for selection of breeding animals***

Majority (71.7%) of the farmers selected animals for breeding on the basis of fast weight gain while 65.0% on the basis of high rate of multiple births (Table 6). Other factors that are taken into consideration when selecting breeding animals included productivity (60%), ability to thrive on forage alone (83%), mothering ability 91.0%) and resistance to internal parasites (15%). Selection of good quality breeding stock is an essential component for high productivity. However, it has always been recognized that to achieve good results and make the best of the selected characteristics, the animals must be provided with good nutrition, health care and husbandry techniques (Roberts, 2000).

#### **Farm record keeping among small ruminant farmers**

Majority (75%) of the farmers interviewed kept farm

records (Table 7). This indicates that farmers in the study area were aware of the innumerable importance of record keeping. Yami (2009) noted that record keeping is an important and necessary aspect of operating even the smallest farming enterprise; where by farm records can assist the farmer in making farm management and business decisions. Efficient and profitable farm operations depend on thorough and accurate record keeping. It is therefore essential that livestock extension agents in the area should educate farmers who do not keep farm records on the importance of such record keeping.

#### **Perceived training needs**

Although farmers need training in all the variables listed on Table 8, a high percentage of the respondents indicated training needs in the area of improve carcass quality (80.0%), ration formulation (75.0%), stock density (80.0%) and forage management (81.7%). Extension in the study area should therefore make efforts to organize training programmes that will cover these areas of needs

**Table 8.** Percentage distribution of respondents according to areas in which they would like to be trained.

<b>Training needs</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Willingness to be trained</b>		
Yes	44	73.3
No	16	27.7
<b>Livestock producer's perceived training needs</b>		
Treatment of animal diseases	38	63.3
Oestrus'/births' synchronization	36	60.0
Prevention of animal diseases	45	75.0
Products' disposal	42	70.0
Feeding animals	45	75.0
Genetic improvement	36	60.0
Managing pasture	36	60.0
Use of hormones/growth promoters	37	61.7
Ration's formation	45	75.0
Waste management	42	70.0
Artificial insemination	32	53.0
Improve carcass quality	48	80.0
Stock density	48	80.0
Forage management	49	81.7

**Table 9.** Perceive factors discouraging livestock farmers' participation in educational/training activities.

<b>Factors</b>	<b>Mean</b>	<b>Std.</b>
The content of education programs does not meet perceived needs	2.22	1.11
Lack free time to devote to training activities	2.33	0.91
Lack of trust in the extension agents who offer training programs	2.10	1.08
Not comfortable in an educational programme	2.23	0.93
Educational programmes are targeted to well highly educated farmers	2.65	1.07
Not all the farmers have free access to educational programmes	2.87	1.11
Lack of educational programmes for livestock farmers	2.92	1.05
Methods used in educational programmes are tailored to farmers' characteristics	2.42	1.03
Inability to pay for participation fee	2.70	1.23
Participation in a training programme will not really benefit me	2.38	1.14

of the farmers. Farinde and Ajayi (2005) reported that in order to sustain the interest and motivation of the rural population towards their economic empowerment, their felt needs should be addressed. Failure of agricultural extension training programmes to capture farmers' perceived training needs will result in huge loss of resources.

#### **Perceive factors discouraging farmers' participation in educational/training programmes**

Four perceived factors that could discourage farmers' participation in training programmes (Table 9) were identified viz: programmes that target highly educated

farmers (M=2.7), not all farmers have free access to educational programmes (M=2.9), lack of educational programmes for livestock farmers (M=2.7) and inability to pay for training fee (M=2.7).

To improve small ruminant farmers' participation in livestock training programmes in the study area, information on these programmes should be disseminated via the various forms of mass media particularly religious organizations and social groups. The training programmes should be designed in such a way that even the uneducated farmers will be actively involved in the training. Thus, training sessions can be conducted in both English and local languages. State and local governments should fully or partially fund the programmes so as to provide opportunities for all small

ruminant farmers to participate in the training.

## Conclusion

Great potentials exist for small ruminant production in Anambra State, Nigeria. Farmers need sound extension education to achieve these potentials. However, for these potentials to be achieved, the training needs and factors discouraging participation identified in this study should be taken into consideration in developing any livestock training programme in the area. The identified needs must be addressed by all stakeholders, that is, farmers themselves, government, livestock scientists, veterinarians and livestock extension agents.

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