

Livestock Ownership and Unconventional Feed Resources from Refuse Dumps in Urban Metropolis of Semi Arid Zone

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Abstract: Two studies were conducted in Kano metropolis located in the semi arid zone. The objective was to determine category of urban dwellers involved in urban livestock rearing; determine the feed resources obtainable and ingested by scavenging ruminants, the species and breed of livestock raised in urban centres of the region. Study one was conducted using structured questionnaires that were designed and randomly administered to urban livestock rearers and animal's health workers in six local government areas within Kano metropolis. Study two, was conducted to identify major refuse dumps within the metropolis of Kano. Thereafter, inventory of materials eaten by ruminant livestock, species of ruminant livestock and number observed per replicate site were recorded. The results obtained in study one showed urban livestock rearers (34%) were within the ages of 31-40 years. Over 82% of the respondents were males and 62% of them married. Forty eight percent of the respondents attended tertiary institutions. Most of the respondents (51%) kept animals for 1-5 years. The species of animals kept in the area were 6% cattle; 48% sheep and 31% Goats. The number of animals kept varied between 1 and above 7 per individual with about 80% of the respondents keeping 3-6 animals. Most of the animals reared (72%) are sold for additional income. Livestock health workers were mainly males (100%) and 92.5% of them married. The data showed health workers were engaged in some part-time livestock rearing. Sixty three percent (62.9%) of the health workers attended tertiary education and 3.70% had Qur'anic education. In study two, fodder had the highest frequency of occurrence. This was followed by household wastes and feeding on rumen content or drinking of waste water were the least activities recorded. Goats were the most frequent animals seen at the refuse dumps. The number of female animals was twice that of males. White Fulani (95.8%) was the most encountered breed of cattle. Yankasa breed of sheep had the highest frequency of occurrence (48.2%) and Maradi breed of goat constituted 94%. The implication of the present finding is, urban livestock production provides job opportunity; augment the incomes of some urban dwellers and clear off unconventional feed material that may upon decay give pungent odour to the environment. Furthermore, animals raised in urban centres are likely to ingest non biodegradable material and heavy metals perhaps from industrial waste water that could be detrimental to both animals and consequently humans. It is therefore, advocated that livestock professionals and policy makers develop an awareness programme on the implications of raising livestock in urban centres while ruminant animals raised in urban centres be provided with clean drinking water, feed and mineral supplements to enhance their performance.

Key words: Refuse dumps, urban livestock, semi arid zone, ruminant livestock

INTRODUCTION

The environment of the semi arid region provides a very conducive habitat for production of several species of ruminant livestock and a host of cereal crops whose residues complement the natural feed resources from rangelands. National livestock population resources of Nigeria were estimated to be 16.3 million cattle, 14 million sheep and 24.5 million goats (RIM, 1992). Livestock play a vital role in the farmhouse economy, particularly in the semi arid region of Nigeria where cattle, sheep, goats and camel are sold locally and exported to the neighboring countries.

Kano is one of the highest populated cities in Nigeria according to 2005 national census. It is multi-ethnic yet dominated by Hausa-Fulani, which has traditionally; livestock rearing as an integral part of their livelihood. Livestock raised in Kano metropolis scavenge on agricultural waste materials from markets, industrial and residential estates. The objective of the present study is therefore to determine the category of urban dwellers involved in urban livestock rearing; determine the feed resources obtainable at refuse dumps and ingested by scavenging ruminants raised in urban centres. It is anticipated that the result would highlight to livestock professionals and policy makers the implication of raising livestock in urban centres.

MATERIALS AND METHODS

Description of the study location: Kano metropolis is located between latitude 11°N and 14°N that extend Northward to the international boundary of the Republic of Niger. It is in the semi arid zone where seasonal draught and the associated vagary weather conditions are prominent. Kano has a landmass of about 43,000 square kilometers. Kano has an average rainfall of between 600-1000 mm annually, 4 to 8 months of dry season, maximum and minimum temperatures of 43 and 15.18°C, respectively. Low temperatures of 10°C during hamattan have been recorded. The relative humidity when low is between 20 and 40% in January and rises to about 60 to 80% in July/August. The environment is conducive for production of different species of livestock. The main species of livestock found in the region include: Cattle, sheep, goats, rabbits, donkeys, horses and poultry.

Study one: A survey was conducted between May and August using structured questionnaires that were designed and randomly administered to urban livestock rearers and animal's health workers in Kano metropolis. Six Local Government Areas (LGAs) in Kano metropolis were considered as replicate sites for the study. The LGAs were Tarauni, Gwale, Nassarawa, Fagge, Dala and Municipal of Kano. In each LGA, 300 questionnaires were administered to livestock rearers who focused on autobiography farmer, species of livestock kept, number, duration and their experiences. Also, a hundred (300) questionnaires were targeted at animal health workers which requested from each of the staff his autobiography, educational qualification and work experience.

Study two: This study was conducted between July and November. In July reconnaissance survey was conducted to identify major refuse dumps units within the Kano metropolis. Following careful observation of what scavenging livestock at refuse dumps ingest, inventory of materials identified were made and coded. Peels from yams, potatoes and cassava peels were recorded as peels and coded 1; maize stalk residues, maize cob, sugarcane top and baggase, residues from groundnut and cowpea haulm disposed off were recorded as fodder and coded 2; paper and card board were recorded as paper and coded 3; rags, rope and jute bags were recorded as fibre and coded 4. Bio non degradable polythene bags and content were recorded as polythene bags with code 5. Remains from fruits such as orange, pine apple and melon were coded 6 as remains of fruits; Household wastes or remains such as cooked food, carrots, pumpkin, lettuce, cabbage and vegetable waste were coded 7 and categoridrzed as house hold waste. Waste water was coded 8 and licking of urine sports was coded as 9. Thereafter, from August to November daily visits were made to refuse dump areas

where animals scavenge such that, each replicate site was visited once per week. During the study period, inventory of material eaten by ruminant livestock were recorded. Species of ruminant livestock and number observed per replicate site were recorded. Records collected from both study one (290 questionnaires) and two (270 questionnaires) were stored in Microsoft Office Excel (2003). There after, record was analysed using simple descriptive statistic of frequency of occurrence and percentages.

RESULTS

Study one: Urban livestock rearers: The respondents vary in age group from less than 20 to above 61 years (Table 1). Most of them (34%) were within the ages of 31-40 years. Over 82% of the respondents were males, 62% of them were married. The least educated was primary (7%) while the highest were those that attended tertiary institutions (48%). Most of the respondents (51%) kept animals for 1-5 years, 34.48% kept animals for 6-10 years and 6.89% kept animals for 11-5years. Species of animals kept in the area were 6% cattle, 48% sheep, 31% goats. Number of animals kept varied between 1 and above 7 with about 80% of the respondents keeping 3-6 animals. Seventy two percent of the respondents sold their animals alive while 27% slaughtered theirs.

Animal health workers: Livestock health workers varied in age from 21 to above 61 years (Table 2). Those involved were males (100%) and 92.5% of them were married while 7.40% were not married. The data showed 85.2% of the health workers depended on their jobs and part time livestock rearing, 14.8% work along with in part-time trading. The livestock health workers were educated. Sixty three percent (62.9%) of them attended tertiary institution, 22. 2% acquired secondary school education, 7.4% had adult education and 3.7% acquired Qur'anic education. Working experience of the respondents vary from 2 to above 5 years.

Study two: Feed material available to scavenging urban ruminant livestock.

Feed material observed and recorded at the refused dumps were peels from yams, potatoes and cassava; maize stalk residues, maize cob, sugarcane top and baggase, residues from groundnut and cowpea haulm; paper and card board; rags, rope and jute bags; bio non degradable polythene bags and content; remains from fruits such as orange, pine apple and melon; cooked food, carrots, pumpkin, lettuce, cabbage and vegetable waste; drinking of waste water and licking of urine spots. As shown in Table 3, feed material categorized as fodder were the most encountered feed stuff (28.4%) available

Table 1: Autobiography of owners of ruminant livestock scavenging at refuse dumps in Kano metropolis in semi arid zone

Variables	Frequency	(%)
<20 years	50	17.2
21- 30 years	70	24.1
31- 40 years	100	34.5
41- 50 years	30	10.3
51- 60years	30	10.3
61 and above	10	3.5
Gender		
Male	240	82.8
Female	50	17.2
Marital status		
Married	180	62.1
Single	110	37.9
Occupation		
Farming	180	34.5
Trading	60	20.7
Civil servant	110	37.9
Other	20	6.9
Education		
Quranic school	40	13.8
Primary school	20	6.9
Secondary	60	20.8
Tertiary	140	48.3
Adult	30	10.3
Years of keeping live stock		
0-5 years	150	51.7
6-10 years	100	34.5
11-15 years	20	6.9
16 and above	20	6.9
Species of livestock kept		
Cattle	20	6.9
Sheep	140	48.3
Goats	90	31.0
Others	40	13.8
No. of small ruminants		
1-2	50	17.2
2-4	100	34.5
4-5	100	34.5
5 and above	40	13.8
Sale or slaughter the animals		
Sale	210	72.4
Slaughter	80	27.6
How frequent		
Very frequent	40	13.8
Moderate	70	24.1
Rare	180	62.1

to scavenging ruminant animals in the urban centres. This was followed by house hold waste (18.7%). Scavenging on dried rumen content or drinking of waste water were the least (1.3%) grazing activities recorded.

A summation of 1839 animals was recorded (Table 4). The population of small ruminant animals noticed were higher (1427) than that of large ruminant animals (412). Goat had the highest population (762) encountered. This was followed by sheep (665) and cattle had the least. The data revealed female animals were higher than number of male animals. The trend is increasing significantly ($p < 0.05$) as described by the regression equation $y = 142.5x + 145.67$; $R^2 = 0.9628$ for females and $y = 32.5x + 117.33$ for males; $R^2 = 0.7845$.

Table 2: Autobiography of livestock health workers in Kano metropolis in semi arid zone

Variable age	Frequency	(%)
21-30 year	30	11.1
31-30 years	40	14.2
41-50 years	110	40.7
51-50	70	25.9
61 and above	20	7.4
Gender		
Male	270	100.0
Female	0	0.0
Marital status		
Married	250	92.68
Single	20	7.4
Occupation		
Farming	20	7.4
Trading	30	11.1
Civil servant	220	81.5
Level of education		
Quranic school	10	3.7
Primary school	10	3.7
Secondary school	60	22.2
Tertiary school	170	62.9
Adult education	20	7.4
Working experience		
0-1 year	0	0.0
2-3 "	50	18.5
4-5 "	90	33.4
5 and above	130	48.2
Frequency of antemortem and postmortem inspection		
Very frequency	0	0.0
Moderate	140	51.9
Rare	130	48.2

Table 3: Ruminant livestock unconventional feed resources at refuse dumps in Kano Metropolis, semi arid zone

	Frequency	(%)
Remains of fruits	199	18.2
Root and tuber peels	166	12.1
Fodder	243	28.4
Polythene with some contents	137	6.8
Rumen content	114	2.6
Papers and cartons	150	9.2
House hold waste	202	18.7
Rags, ropes and jute bags	112	2.2
Waste water	107	1.3
Urine	115	2.8

Table 4: Structure of ruminant livestock raised at Kano metropolis in the semi arid zone

Species	Males	Female	Total
Cattle	140 (34.0)*	272 (66.0)	412
Sheep	202 (30.4)	463 (69.6)	665
Goat	205 (26.9)	557 (73.1)	762

*Figures in parenthesis are percentages

Table 5: Species and breed of ruminant livestock raised at Kano metropolis in the semi arid zone

Species	Frequency	(%)
Cattle		
White Fulani	121	87.5
Red bororo	102	8.3
Sokoto Gudali	101	4.2
Sheep		
Yankasa	126	48.2
Uda	116	29.6
Balami	112	22.2
Goat		
Crosses of Maradi and Kano brown	149	94.2
West African Dwarf	101	5.8

Data presented in Table 5 revealed species of animals identified to include cattle, sheep and goats. White Fulani breed of cattle and Sokoto Gudali were observed but White Fulani (95.8%) was the most encountered. Species of sheep observed were Uda, Balami and Yankasa. Amongst the breed of sheep observed, Yankasa had the highest frequency of occurrence (48.2%). Maradi breed of goat (94%) and some few cases of West African dwarf goats were spotted.

DISCUSSION

Urban livestock production system is a popular practice by dwellers of urban centres. This could be attributed perhaps to the fact that livestock production is a component of livelihood of inhabitant of the semi arid region. The results suggest the production system could have high sustainable prospect since most of the respondents involved in the production were within their early adult ages (31-40 years), males and married. While urban livestock production provides employment (Sawio and Spies, 1999), the practice was perhaps a means of augmenting income of some of the either civil servants or traders. It could possibly be that the urban dwellers involved have traditional lineage of livestock production which they find difficult to drop. The present studies showed that majority of the respondents are educated. Perhaps, it could be easy to encourage them into forming cooperatives such that they can take advantage of credit facilities, access to extension agents and acceptance of livestock development interventions that would improve their production system, including proper disposal of dung from animals for use in biogas production or better environmentally friendly disposal methods to keep the environment clean.

The disposal of remnants of spices, salts, sugar, flavour, detergent, grains or oils (Sani *et al.*, 1998; Lawal, 2002) remains of unconventional feed material, house hold waste wrappers of bakerys or confectionaries, wrappers of take away consumables that are either degradable or non biodegradable at open refuse dumps will continue to make the environment filthy or otherwise provide unconventional feed source for livestock raised in urban centres. However, repercussion for consumption of biodegradable materials by ruminant livestock has been reported indicating 40.3% of the animals slaughtered at the National Animal Production Research Institute, Shika Nigera had rumen impaction due to indigestible polythene materials (Mohammed and Muhammad, 2007), which, could constitute a serious limitation to scavenging

livestock in urban metropolis. Drinking of wastewater from unknown source would perhaps predispose animals to ingestion of heavy metals (Na, Cu, Pb, Cr, etc.) that would accumulate to leading to metabolic disorder in animals and consequently humans, since urban cities have large number of industries that may discharge wastewater containing heavy metals. Such industrial wastewater further pollute water from sewages and drainages of residential houses that terminate in ponds. Also, observed licking of urinary spots by animals could be an indicator for symptoms of mineral deficiency, which suggests that ruminant animals raised in urban centres would perhaps respond positively to mineral supplementation.

Higher number of small ruminant animals observed in the present study especially goats could be attributed to their ease of handling, little space requirement, higher fecundity and high twinning rate associated with small ruminants relative to cattle. The higher number of female animals noted in this study suggest that animals in the urban centre are kept for reproduction. Also, higher numbers of female animals were observed at the refused dumps, which is in aggrement with earlier data reported by Hassan and Kikisagbe (2001). The higher number of female animals scavenging at refuse dumps could connote high chances of ingesting biodegradable materials or heavy metals in wastewater.

The species of animals found (cattle, sheep and goats) are mainly indigenous to the country and environment of the study area, thus adapted to the vagaries of climatic and feed scarcity. This perhaps explains their ability to subsist on remains of unconventional feed materials obtainable at the refuse dumps of urban centres.

The implication of the present finding is that urban livestock production provides job opportunity, ugment the incomes of urban dwellers, clear off unconventional feed material that may upon decay give pungent odour. Further more, animals raised in urban centres and drink wastewater perhaps from industries are likely to ingest heavy metals that could lead to detrimental metabolic disorder in animals and consequently human. It is therefore suggested that ruminant animals raised in urban centres be provided with clean drinking water, feed and mineral supplements to enhance their performances. It is also advocated that livestock professionals and policy makers develop a comprehensive strategy for managing waste material, create awareness programme on the implication of raising livestock in urban centres.

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