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Research Article

Fresh Herbage Marketing at Kwalkwalawa Market during Dry Season in Sokoto, Nigeria

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Abstract

This study was conducted to document the supply and use of fresh herbage of various types for dry season feeding of animal by livestock farmers in kwalkwalawa, Sokoto, Nigeria. The objective of the study was to study socio-economic characteristic of the fresh herbage sellers and buyers at kwalkwalawa village market, to identify the types, source and mode of transportation of fresh herbage sold at kwalkwalawa village market and describe the patterns of supply and demand of the fresh herbage at the kwalkwalawa village market. The study was conducted at kwalkwalawa village of Dundaye district of wamakko local government area where the herbage market is located. Information of this research was collected using two different questionnaires. A and B questionnaires was administered to sellers and buyers of fresh herbage respectively. A total of 44 respondents were covered with 22 from each sellers and buyers randomly selected at herbage selling point. The study revealed that all of the herbage sellers were from kwalkwalawa and the surrounding village while 73%of the herbage buyers come from kwalkwalawa and surrounding village the remaining 26% come from Sokoto metropolis, all the herbage sellers and buyers were male with their age vary from less than 20 to above 40 years, most of the herbage sellers are single while 81% of the herbage buyers are married, their level of education vary with majority from both side acquired non-formal education. Eighty one percent (81%) of the herbage sellers drive more than N150 while 78% of the herbage buyers spent more than N150 in a day, most of the herbage sellers 86% brought farm weed they all source the herbage from fadama and transport it using head, camel, donkey and motorcycle. Most of the herbage buyers preferred farm weed and bought from 4 to above 40kg, 81% give the herbage as supplementary feed, other source of feed include wheat offal, cowpea husk, legume hay and cereal bran.

Keywords: Neuroendocrine carcinoma; immunohistochemistry; Chemotherapy

Introduction

The ruminant livestock, such as cattle, sheep and goat are among the most important livestock species in most part of the tropics. The animals are grazed on natural pastures in the range and follow lands, browse plants, farm weeds, crop residues and agricultural by-products. These feed resources are considered to be of poor quality compared to the artificially grown pastures in temperate region. They are generally inadequate to meet the nutritional demands of the animals as they are wild and grow on poor soils [1]. Feeding of ruminant livestock in the tropics using these feed resource become more critical during the dry season when the feed resources become much more reduced in quantity, low in quality; especially protein and energy contents and less digestive [2]. This imposes more serious constraints to the productivity of livestock in the dry tropics.

The ruminant livestock in Nigeria are estimated at about 16 million cattle, 35.5 million sheep and 56.5 million of goats in the Country [3] and Sokoto state accounts for about 26.7, 51.6 and 36.8% of the total populations of cattle, sheep and goats respectively (FDLPCS, 1992). The animals are produced mainly for meat and milk production, they provide income to the farmers and contribute significantly to the nation's economy. Shaib et al. (1996) reported that ruminant livestock production in Nigeria influences the socio-cultural and religious life of about 70% Nigerians living in the rural areas, where the animals are considered as an integral part of the family unit and play a significant role in the agricultural production system in the country.

Several reports [4, FDLPCS, 1992; 5,6,3] have indicated that most of the ruminant livestock in Nigeria are located and produced in the

savanna zones of the country. According to FDLPCS (1992), [5,6] over 90% of the cattle and 70% of sheep and goat are found in the savanna zone of the country. They are being produced under various extensive production systems that include pastoral, agro-pastoral and sedentary. The sedentary production system is increasingly becoming more important and includes such sub-systems as free-range, tethering and village-based herding. However, in all the aforementioned production systems, the livestock farmers relied almost entirely on the natural feed resources for feeding of their animals. FDLPCS, 1992, [4-7].

According to Raay and De Leeuw [6,8-10] Ileoje (2001) the savanna zone of Nigeria is characterized by long dry season ranging from about four month (November-March) in the wetter southern guinea savanna to eight months (October - May) in the dry Sahel/ Sudan (semi-arid) zone. As a result of this situation the ruminant livestock farmers and other stalk holders in the country exploit various ways that increase feed supply during the dry season, mainly using dry feeds, to improve livestock productivity. In recent time, the sedentary livestock farmers in Sokoto began to use fresh herbage of various types for dry season feeding of their animals. It is in line with this new development that it became necessary to examine the types of herbage utilized, sources of the herbage, types of animals fed and patterns of demand and supply of the herbage used, which form the bases for carrying out this research.

According to Raay and Deleeuw [5,7,8,11,12] Ademosun, Ogunbosoye and Babayemi and Ogedigbe et al. the ruminant animals in savanna zone of Nigeria usually gain weigh during wet (rainy) season, but lose much of the gained weight during dry season. This was attributed to mainly inadequate supply and low quality of the feeds during the dry season. The effects of seasonal weight losses on the animal include lose physical body condition, predisposing the animals to diseases, reduced rate of conception, increased rate of unsuccessful births (abortions) stunted growth and mortality of young and overall low productivity in the livestock enterprises [13]. The introduction of use fresh herbage of various types for dry season feeding of animals by livestock farmers in Sokoto, in recent times appeared as a welcome development. This practice, which requires proper examining and documentation, has not been reported yet.

The major objective of this study was to document the supply and use of fresh forage herbage of various types for dry season feeding of animals by livestock farmers in Kwalkwalawa, Sokoto, Nigeria.

The specific objectives include; describing the socio-economic characteristics of the fresh herbage sellers and buyers at the kwalkwalawa village market. To identify types, sources and mode of transportation of fresh herbage sold at the kwalkwalawa village market. Describe the patterns of supply and demand of the fresh herbage at the kwalkwalawa village market.

Due to the limitation from the seasonal supply of adequate and good quality feeds that meet the nutritional needs of the ruminant animals in the savannah zones of Nigeria during the dry season, feed supplementation has become an important feature of the animal production enterprise in the country. This is so especially in the semi-arid savanna of the country where the dry season is longer and feed scarcity is more severe [7,10]. Recently, the use of fresh herbage of various types for dry season feeding of animals by the livestock farmers in Sokoto, in addition to the dry feed, have been observed. It therefore sound justifiable to study and document the new development in the livestock production sector in the semi-arid zone of Nigeria where about 49,47 and 37% of the cattle, sheep and goat respectively, are found (FDLPCS, 1992).

Materials and Methods

Description of study area

The study was conducted to at kwalkwalawa village in Dundaye district of wamakko local government area of Sokoto state, Nigeria. Kwalkwalawa village is located along the road leading to the main campus of the Usmanu Danfodiyo University, at the northern bank of river the Rima, Sokoto. The entire Sokoto state is located within latitudes 120 00" - 130 05" N and longitudes 40 08" - 60 04" E, in the North-West geo-political zone of Nigeria [14]. The state has an estimated land area of about 25,973 km2 and human population was about 4.2 million people mainly of Hausa and Fulani ethnic groups [15]. Crop farming and livestock rearing constitute the major occupations of the Sokoto state people. The major crops cultivated in the state are millet, sorghum, cowpea and groundnut on the uplands while on the low lying (Fadama) rice and vegetables are also cultivated (SSD, 2013). The major livestock reared in Sokoto state include cattle, sheep, goats and poultry. The ruminant livestock in the state were estimated at 3.7 million heads of cattle, 11.4 million heads of sheep and 12.7 million heads of goat. The urban centres in Sokoto state were estimated to hold about 59.4, 30.7 and 37.0% of the cattle, sheep and goats in the state (FDLPCS, 1992).

Sokoto state falls within the Sudan savanna vegetation zone and two distinct seasons are recognized: the dry and wet (rainy) seasons. The rainy season covers normally a short period of 3-4 months (June/July – Sept.) with range of 400 - 800mm per annum. The dry season covers the remaining periods of 8 – 9 months of the year (Oct.-May/June). The mean monthly temperature ranges from a minimum of 140C during December/January and a maximum of 40°C in April/May with annual average of 28.3°C [16-20].

Methodology

The primary data used in this research was collected using two sets of structured questionnaires 'A' and 'B', administered to 22 each of the sellers and buyers of the fresh herbage sold at the Kwalkwalawa village market, respectively. All the 44 respondents

were selected purposively at the herbage selling point of the market (Plate 1). The questionnaires were administered using oral interview and responses were recorded on the questionnaires during the interviews.

Plate 1: Fresh herbage displayed for sale at the kwalkwalawa village market.

Data collection and analysis

This research collected information on the socio-economic characteristics of the sellers and buyers of the fresh herbage, such as name, sex, age, marital status, village location, level of education, quantity of herbage sold and income derived or spent daily on the fresh herbage. Information on types, sources and mode of transportation of the herbage were also collected from the herbage sellers while information on the type of herbage prepared, mode of feeding, types of alternative feedstuff and type of animals kept/fed the herbage were collected from the herbage buyers. The data collected from both the sellers and buyers of the fresh herbage was collated and analyzed using simple descriptive statistics; such as mean, range and percentage.

Result and Discussion

Socio-economic characteristics of respondents

The results on the socio-economic characteristics of the fresh herbage sellers and buyers at the Kwalkwalawa village market, such as village location, sex, age, marital status, level of education and income derived from or spent on the fresh herbage are presented on (Table 1).

Table 1: Socio-economic characteristic of fresh herbage sellers and buyers at the Kwalkwalawa village market, Sokoto state, Nigeria.

Parameter	Sellers (n = 22)		Buyers (n = 22)	
Village location	Frequency	%	Frequency	%
Kwalkwalawa	11	50	4	18.18
Gidan-yaro	3	13.64	3	13.63
Bakin-gulbi	3	13.64	2	9.09
Dundaye	2	9.09	1	4.54
Sayya-Gidan-gada	2	9.09	2	9.09
Gumtau-dan-gara	1	4.54	2	9.09
Unguwar-lalle	0	0	1	4.54
University staff quarters	0	0	1	4.54
Gidan-igwai	0	0	2	9.09
Gidan-dare	0	0	2	9.09

Runjin-sambo	0	0	1	4.54
Gidan-haki	0	0	1	4.54
Sex				
Male	22	100	22	100
Female	0	0	0	0
Age				
< 20	11	50	-	-
21- 30	7	31.82	14	63.64
31- 40	3	13.64	3	13.64
> 40	1	4.54	5	22.72
Marital Status				
Single	14	63.64	4	18.18
Married	8	36.36	18	81.82
Level of educational				
Non formal education	12	54.55	15	68.18
Primary education	6	27.27	0	0
Secondary education	4	18.18	4	18.18
Tertiary education	0	0	3	13.64
Quantity of herbage (kg)				
< 10	9	40.91		
20-Oct	6	27.27		
21- 30	5	22.73		
> 30	2	9.09		
Income derived/spent (naira)				
< 150	4	18.18	5	22.73
150 – 250	6	27.27	10	45.45
251- 500	5	22.73	5	22.73
501- 750	2	9.09	2	9.09
> 750	5	22.73	0	0

Source: Field survey 2013/2014 dry season. 'n' indicates number of observations.

Distribution of fresh herbage sellers and buyers on village locations

The distribution of the herbage sellers and buyers in the study area on the villages they came from showed that most of the herbage sellers (50.0%) were from the Kwalkwalawa village where the fresh herbage market is located (Table 1). The remaining sellers were from Gidan-yero (13.6%), Bakin-gulbi (13.6%), Dundaye (9.1%) and Gumtau Dan-gara (9.1%) villages, all within Dundaye district of Wamakko local government area. However, the herbage buyers were well distributed over a wider area, with about 73% of the buyers from the Kwalkwalawa and the surrounding villages of Gidan-yero, Bakin-gulbi, Dundaye, Sayya-gidan-gada, Gumtau-dangara, Unguwar-lalle, and staff quarters of the Usmanu Danfodiyo University (UDU) Sokoto, all within Dundaye district of Wamakko local government area (Table 1). The remaining buyers (26%) came from the neighboring Gidan-igwai, Gidan-dare, Runjin-sambo and Gidan-haki areas within the Sokoto North local government area in the Sokoto metropolis [21-25].

It is interesting to note that the fresh herbage business and products utilization attracted patronage of sellers and buyers not only from the Kwalkwalawa village, but also from a number of villages around the Dundaye district and the neighboring district areas of Gidan-igwai, Gidan-dare, Runjin-sambo and Gidan-haki in the Sokoto North local government area of Sokoto state. These may be indications that the there is good prospect for fresh herbage utilization and business in the study area and the future might be brighter.

Distribution of herbage sellers and buyers on type of sex

The distribution of the herbage sellers and buyers at the Kwalkwalawa village market on the type of sex (male or female) showed that all the herbage sellers and buyers (100%) were

males (Table 1). This indicates that female do not partake at least in the fresh herbage selling. This may be due to Pudah (a religious seculation of females from public activities) practiced by the Muslim faithful, especially in villages.

Distribution of fresh herbage sellers and buyers on age classes

The distribution of the herbage sellers and buyers at the Kwalkwalawa village market on age classes showed that up to half of the herbage sellers (50.0%) were below the age of 20 years (Table 1). These are children and young men of school age that engaged themselves in the fresh herbage selling business, most probably on part-time bases. About 45.5% of the herbage sellers were between the ages of 20 to 40 years. These are adults who might have engaged themselves in the fresh herbage selling business to supplement and improve their income base. The remaining 4.5% of the herbage sellers were above the age of 40 years (Table 1). The results also showed that majority of the herbage buyers (63.6%) were between the ages of 20-30 years (Table 1). These are adults within the productive age that engage in livestock production. The remaining 36.4% of the herbage buyers were more than 30 years old, also practicing livestock production. The fresh herbage selling business and utilization in the study area may be said to be dominated by children and young men within the age brackets of less than 20 years and not more than 30 years of age, respectively.

Distribution of herbage sellers and buyers on marital status

The distribution of the herbage sellers and buyers at the Kwalkwalawa village market on marital status showed that 63.6% of the herbage sellers were not yet married (single) and the remaining 36.4% were married (Table 1). This result is in line with the earlier finding in this report that 50% of the herbage sellers were below the age of 20 years. The result also showed that about 82% of the herbage buyers are married and the remaining 18% were single (Table 1). This is in line with the earlier finding in this report that all the herbage buyers (100%) were more than 20 years and most people living in the rural areas get married at early age.

Distribution of herbage sellers and buyers on level of education.

The distribution of the herbage sellers and buyers at the Kwalkwalawa village market on level of education showed that More than half (54.5%) of the herbage sellers had no formal education but acquired the non-formal education. Only about 27.3% and 18.2% acquired primary and secondary education respectively (Table 1). Also 68.2% of the herbage buyers had no formal education, but acquired non-formal education, while 18.2% and 13.6% acquired the secondary and tertiary education respectively (Table 1). This is common trend among in the Nigerian rural communities, where high proportions of the people living in the villages do not acquire formal education [26-35]. They are usually engaged in crop farming, livestock rearing and other income earning activities right at their early age. This could deter any effort to send the children and keep them in schools.

Distribution of fresh herbage sellers on quantity of herbage sold per day

The distribution of herbage sellers according to the quantity sold at the kwalkwalawa village market in a day shows that about 40% of the herbage sellers sold less than 10kg, 27% of them sold between 10-20k, 22% sold between 21-30 kg and 9% above 30kg. These indicate that most of the herbage sellers brought small quantity to the market.

Distribution of fresh herbage sellers and buyers on income derived/spent

The distribution of the herbage sellers and buyers at the Kwalkwalawa village market on daily income derived and spent, respectively, showed that about 45.5% of the herbage sellers generated ₦250 or less as their daily income from the herbage selling while the remaining 54.5% generated daily from ₦251 to 750 (Table 1). However, further inquiries on the level of income derived daily revealed that most of the herbage sellers engaged in other self or income generating activities during the daytime in the fadama and collect the fresh herbage in the evening to the market for sale [35-40]. The result also showed that up to 68.2% of the herbage buyers spent daily ₦250 or less, and the remaining 31.8% spent daily from ₦251 to ₦750 as expenditure on the fresh herbage used for dry season feeding in the study area (Table 1). Levels of both the income derived and expenditure on the fresh herbage were generally dependent upon the quantity of the herbage brought for sale and the quantity bought daily, which also depends on the number of animals kept and the purchasing power of individual buyer.

Types, sources and mode of transportation of fresh herbage

Results on the types, sources and mode of transportation of the fresh herbage sold at the Kwalkwalawa village market are presented on (Table 2)

Table 2: Distribution of herbage sellers (n=22) according to type of herbage and means of transportation to the market.'n' indicates number of observations.

Parameter	Frequency	Percentage (%)
Herbage type		
Farm weeds	19	86.36

Potato Leaves	2	9.09
Maize Stalk	1	4.55
Source of herbage		
Kwalkwalawa fadama	22	100
Mode of Transportation		
Head	16	72.72
Camel back	2	9.09
Motorcycles	2	9.09
Donkey back	1	4.55
Head and Motorcycles	1	4.55

Source: *Field survey*, 2013/2014 *dry season*.

Distribution of herbage sellers on types of herbage sold.

The result on the types of the fresh herbage sold at the Kwalkwalawa village market showed that great majority (86.4%) of the herbage sellers brought farm weeds (Plate 2), but few sellers (15.6%) brought fresh Potato leaves (Plate 3) and maize stalks (Plate 4) (Table 2). This may be due to relative abundance of the farm weeds in the irrigated fields in the fadama and were collected at no cost while the Potato leaves and the maize stalks have to be produced or purchased by the seller [41-45]. Most sellers of the Maize stalks and Potato leaves buy from the farmers to sell for profit except those children that collected the herbage from their family's farm.

Plate 2: Fresh farm weeds displayed for sale at the kwalkwalawa village market.

Plate 3: Fresh Potato leaves displayed for sale at the kwalkwalawa village market.

Plate 4: Fresh Maize stalks displayed for sale at the kwalkwalawa village market.

Distribution of fresh herbage sellers on sources of herbage sold

The result on the sources of the fresh herbage sold at the Kwalkwalawa village market showed that all the sellers (100%) sourced the herbage from the irrigated fadama farms, near the Dundaye and Kwalkwalawa villages located on the low-lying plains of the Rivers Rima and Sokoto [46-50]. Although the dry season irrigation has been considered antagonistic to ruminant livestock production by way of reducing land areas available for grazing in the north western Nigeria, this is one of the contributions from the dry season irrigation to the ruminant feed supply.

Distribution of fresh herbage sellers on mode of transportation

Plate 5: Fresh herbage transportation of to market on human head.

Plate 6: Fresh herbage transportation of to market on camel back

Plate 7: Fresh herbage transportation to market on motorcycle.

Plate 8: Fresh herbage transportation of to market on donkey back.

The result indicated that the herbage sellers used various means in order to transport their commodity to the Kwalkwalawa village market. About 72.7% of the herbage sellers carried their herbage, from point of collection to the market, on their heads (Plate 5). This category of the herbage sellers that constituted the majority usually brings small quantity that they can conveniently carry by head. The remaining herbage sellers (26.3%) used other means in transporting their fresh herbage to the market include 9.09% each that used camel and Donkey backs (Plate 6&7), 4.54% each that used motorcycle (Plate 8) and those that used both head and motorcycle.

Type of fresh herbage preferred, quantity bought, type of animal fed, purpose of feeding and alternative feed stuffs

The results on the type of herbage preferred, quantity of herbage bought, type of animal fed, purpose of feeding the fresh herbage and alternative feed stuffs used by the fresh herbage buyers at the Kwalkwalawa village market are presented on (Table 3).

Table 3: Distribution of fresh herbage buyers (n=22) on types of herbage preferred, quantity bought, types of animal fed, purpose of feeding and alternative stuffs.'n' indicates number of observations.

Parameter	Frequency	Percentage (%)
Type of herbage preferred		
Maize Stalk	6	27.27
Potato Leaves	2	9.09
Farm weeds	14	63.63
Quantity bought (Kg/day)		
< 10	1	4.55
1 0- 20	10	45.45
21 – 30	3	13.64
> 30	8	36.36
Type of animal fed		
Cattle only	9	40.91
Sheep only	4	18.18
Goat only	1	4.55
Cattle and Sheep	5	22.72
Cattle and Goat	2	9.09
Sheep and Goat	1	4.55
Purpose of feeding		

Supplement	18	81.82
Main Feed	4	18.18
Alternative Feed stuff		
Wheat Offal	4	22.22
Cowpea Husk	6	33.33
Home Waste	4	22.22
Legume hays	3	13.63
Cereal bran	1	5.56

Source: *Field survey*, 2013/2014 *dry season*.

Distribution of herbage on type of herbage preferred

The results on the type of herbage preferred by the fresh herbage buyers at the Kwalkwalawa village market showed that 63.6% of herbage buyers preferred to buy farm weeds followed by maize stalks (27.3%) and least was the Potato leaves (9.1%). Reason advanced by most of the herbage buyers for their preference for the farm weeds was that it was abundantly available and was the cheapest among the fresh herbage displayed for sale in the market.

Distribution of fresh herbage buyers on the quantity of herbage bought

The results on the quantity of fresh herbage bought per day by the individual buyer at the Kwalkwalawa village market showed that 50.0% of the herbage buyers bought 20 kg or less while about 14% bought between 21 and 30. The remaining 36% of the buyers bought more than 30 kg of the fresh herbage per day [50-55]. The quantity of herbage bought per day by individual buyer normally depends on the type and number of animals kept and financial ability.

Distribution of fresh herbage buyers on type of animals kept

The results on the type of animals kept by the individual buyer of the fresh herbage sold at the Kwalkwalawa village market showed that most of the fresh herbage buyers (40.9%) kept and buy the herbage for their cattle (Table 3). This was followed by those who kept and buy for both cattle and sheep (22.7%). The remaining fresh herbage buyers (36.4%) include those who kept and buy for their sheep only (18.2%), for their goats only (9.1%) and for their sheep and goats together (4.5%). This result indicated that higher proportion of the herbage buyers kept cattle and then cattle and sheep, which may explain the farmers' efforts to reduce the higher cost of feeding the cattle and sheep by using the fresh herbage that cost comparatively lower than other feedstuffs that are available during the dry season [56-60].

Distribution of fresh herbage buyers on purpose of feeding

The results on the purpose of feeding the fresh herbage sold at the Kwalkwalawa village market by the buyers showed that majority of herbage buyers (81.8%) used the fresh herbage for supplementary feeding after range grazing. The remaining buyers (18.2%) used the herbage as the main feed for their animals [61].

Distribution of fresh herbage buyers on alternative feed stuffs

The results on the distribution of the fresh herbage buyers sold at the Kwalkwalawa village market on alternative feed stuffs used showed that 33% used cowpea husk as alternative to the fresh herbage. 22% fed wheat offal and home waste each, 13% used legume hay and the remaining 5% cereal bran [62]. Wheat offal's and cowpea husk have the highest percentage because they are the cheapest, available and widely used feed resources in the area during dry season when pasture are really available.

Conclusion and Recommendation

Conclusion

It has been found from this research that most of the herbage sellers and buyers come from kwalkwalawa and the surrounding village, they include both married and single and mostly acquired non-formal education, and they drive and spent between N40-N1500 in a day.

Farm weed, maize stalk and potato leaves are types of herbage normally brought for sale, it's found from fadama and transport using head, camel, donkey, and motorcycle.

Most of the herbage buyers preferred farm weed follow by maize stalk and potato leaves and bought from 5-above 30kg in a day.

Recommendations

1. Farmers should not use chemical in controlling weed so that can be used as feed.
2. Extension workers should inform farmers the importance of fresh herbage.
3. Government should provide other ways of having fresh herbage all year round.

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