Milk production capacity of dairy cattle under limited resources and distribution pattern in peri-urban area of southwest Nigeria

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Abstract

A study was carried out using 50 dairy cattle farmers to appraise the trend of dairy production and the distribution channels of milk and its products for local consumption. The study showed that the most favoured breed in the area was Bunaji cattle accounting for 80%, N'Dama (15%) and Keteku (5%). Grass and browse were major forages for feeding the cattle in the rainy season crop residues in the dry season. In the study area, milk collection was a must and average milk production/cow/d was 1.3 L and 1.02 L in the wet and dry seasons respectively totaling 240 d lactation length. 40% of total milk produced was consumed by farmer household during rainy season but increased by 10% in the dry season. The remaining 50-60% milk produced was processed into local cheese (*wara*) and distributed for immediate consumption. Sales person were house wives (59%) and female children (41%). Selling of the products was through hawking (52%), rural markets (37%), homestead (6%), urban markets (3%) and collection point (2%). Mode of distribution was by pedestrians (63%) and road (37%). Buyers were mainly the direct consumers (70%) and the traders (30%). Study showed that quantity of milk produced in the peri-urban area was affected by breed and the feeding pattern but the milk and its product are resourceful for rural consumption.

Keywords: Peri-urban, crop-livestock, dairy cattle, milk production, marketing

Introduction

Milk production in Nigeria is still developing due to a number of factors; systems of dairy husbandry, breeds of cattle, milking methods, storage system of dairy, its products and negative attitudes of the consumers. Agropastoralism is a traditional husbandry system embracing crop-livestock relationships as low inputs for dairy production. This method of animal farming by origin is probably induced by feed shortages due to reduction in expanse of grassland and difficulties in moving with large herds with expansion of crop production. Mohammed (1990) described agropastoralism as a low input farming system in which subsistence crop farming is combined with semi- commercial cattle husbandry. The basic husbandry system of the peri-urban cattle pastoralist was reported (Iyayi et al., 2003) while dairy production aspect is scanty in literature. The present study was designed to elucidate milk production capacity of dairy cattle under limited resources and distribution pattern in peri-urban area of southwest Nigeria.

Materials and methods

The study area was in the derived savannah of Oyo (Oyo West, Oyo East and Atiba Local Government areas of Oyo state) in the South West of Nigeria, located between latitudes 6° $10^{'}$ and 9° $10^{'}$ North of the equator and longitudes 3° and 6° East of Greenwich. Vegetation in the area was made up of Guinea savannah and semi deciduous forest. The annual precipitation of the area was between 1000-1350 mm. The temperature was 22-31 $^{\circ}$C and correlates negatively with humidity between the wet and dry seasons. A total of 50 Fulani farmers were selected in Oyo area by using stratified random sampling procedure. Selection was made from the existing ILRI frame list of the Fulani farmers in the area of study. Data were collected mainly from primary sources. The primary sources involved the use of interview schedule to the sampled farmers in the study area. Interview/dialogue with the head of the household was conducted. Meanwhile a translator who speaks Fulfulde, Hausa and Yoruba languages fluently was engaged. Answers to the questions

were recorded on the questionnaire in English language. Prior to the interview, the farmer were visited, briefed, and acquainted with the purpose of the survey. Visit to farmer's household was made in the morning (6.00 am to 10.00 am), before the cattle herd left for grazing. Descriptive method of statistical analysis was used in analysis of the data.

Results and discussion

Table 1 show that the favoured breed of cattle in the stock of the pastoralist in the study area was the Bunaji recording 80%. Keteku was the least (5%) breed of cattle kept by the Fulanis. The pastoralists in the study area seemed to be committed and are ardent to the keeping of Bunaji. Jabbar (1997) reported that Fulani pastoralist have preference for white Bunaji. The present study educed that these pastoralits have lasting conviction that the white Bunaji are highly regarded for relatively superior milk production, quicker growth rate, trouble-free for management, highly marketable and adaptable to consumption of variety of forages. Mohammed (1990) also established that the interest in the Bunaji breed in the zone despite their being susceptible to trypanosome infection is an index of less relevance of trypanosomiasis as a limiting factor to cattle breeding in the zone.

Table 1: Breeds of cattle reared by the pastoralist in the peri urban area of Oyo

Parameters	Mean	S.D
Bunaji	22.61	±5.26
NDama	4.24	±1.50
Keteku	1.41	±0.51

SD=standard deviation; Source: field survey, 2007

Table 2 shows the feed that the pastoralist used in dry and wet seasons. Livestock owners employed more of browse in the rainy season as supplement to grass because crop residues were more abundant in the dry season. It was shown that 2% of farmers solely engaged their animals in grazing for the period of rainy season while 98% practiced grazing together with cut and carry. The locations of the pastoralists at the peri-urban necessitated the use of cut and carry as the arable crop farmers are well scatted all over the zone. Livestock farmers in this area were aware of the significant role of supplementing grazing with protein rich forages. The survey also revealed that table salt was the only supplement bought and this was done all year round, but with careful management especially in the rainy season, animals could get all their nutritional need from sole herbage. In Table 3 is the summary for the estimation of milk production, milk consumption and milk sales. The average milk yield of the cow per day was 1.4 L in rainy season and 1.0 L in the dry season. These values fell below the value of 1.8 L per day of local milk production reported (Ndambi *et al*., 2008) for local cow. The milk produced was predominantly highest in the wet season when compared to the dry season. This is expected as rainy season is characterized by abundant forages and water.

Table 2: Mode and pattern of cattle feeding by the pastoralist in dry and wet season

Parameters	Wet season		Dry season	
	[1]N	[2]F (%)	[1]N	[2]F (%)
Mode of feeding				
Grass only	9	18	-	-
Grass and browse	32	64	8	16
Grass, browse and crop residue	9	18	42	84
Feeding pattern				
Grazing only	1	2	-	-
Grazing, cut and carry	49	98	50	100

[1]N=number of respondent, [2]F=frequency Source: Field survey, 2007

It was observed that 40% of milk produced was consumed by the household, implying that 60% were sold in the rainy season. It is interesting to note that such consumption by the household tremendously increased during the dry season. High consumption of milk and milk products were orchestrated by the fact that the meals of the farmer are mainly cereal based and the short shelf-life and therefore, needed milk as sustainable source of protein. The increase of the consumption during the dry season probably emanated from the harsh condition (high ambient temperature), thereby inducing the animal handlers to excessive drinking of liquids.

Table 3: Average daily milk production, consumption and quantity sold

Parameters	Wet season		Dry season	
	Mean	S.D	Mean	S.D
Number of lactating animals	4.54	±1.75	2.56	±1.28
Lactation length (month)	7.92	±1.01	7.32	±1.04
Quantity produced per animal (litres)	1.38	±0.45	1.02	±0.24
Total milk yield (litres)	6.29	±0.79	2.61	±0.31
Quantity sold (litres)	3.76	±0.42	1.30	±0.15
Quantity consumed (litres)	2.51	±0.31	1.31	±0.27

SD=Standard deviation; Source: Field survey, 2007

Table 4 shows the location, buyer, mode of transportation and type of dairy products on sale. Adult female formed the majority in the sales (Ndambi *et al*., 2008). Study revealed that there were two major ways for selling; hawking and rural market. Women and female children by pedestrian went about along major roads, town and cities to hawk. There were two important buyers comprising the direct consumers and traders. Milk business was not likely to be popular as percent for consumer (70%) was more than double for trader (30%). The reason for low business of fresh milk probably stemmed from the fact that sites of the production are often far away from buyers. Since the potential means of storing milk and its products are yet to be developed, people are skeptical of consuming such microbial susceptible animal product. In the study area, women were involved in the making and distribution of cheese locally called "*wara*" Women process the milk, market the products and in some cases milk the cow (Ndambi et al., 2008). The local cheese commonly called '*Wara*' in the local dialect is the only dairy product sold in the study area. Hawking of this dairy product by foot was mostly done.

Table 4: Sales, location, buyer, transportation mode and type of dairy product sold.

Parameters	[1]N	[2]F (%)
Sales person		
Adult female	33	59
Female children	23	41
Location of sale		
Homestead	4	6
Hawking	34	52
Collection point	1	2
Rural market	24	37
Urban market	2	3
Buyer		
Direct consumer	37	70
Trader	16	30
Transportation mode to sale point		
By pedestrian	36	63
Truck	21	37
Type of dairy product sold		
Cheese	40	100
Butter	-	-

[1]N=number of respondent, [2]F=frequency; Source: field survey, 2007

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