Indian J. Dairy Sci,.46 (8), 1993, 363-370

DEMAND FOR DAIRY PRODUCTIS AMONG THE INDIGENOUS POPULATION OF SOUTHERN NIGERIA

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A survey was conducted of 982 indigenous households in Southern Nigeria between October 1988 and March 1989. Results show that 70 percent of the sample households consumed some dairy products. Consumption prevalence and regularity of consumption of local products was higher around the points of production but lower elsewhere while the regularity of consumption for imported products was high everywhere. The type of products consumed and quantity of consumption and expenditure on dairy products differed markedly between ethnic groups, urban and rural populations and between southwest and southeast regions. Per caput income of dairy consuming and non-consuming households did not differ significantly in any of the locations. Among the consumers, income elasticity was higher for rural households in the southeast.

INTRODUCTION

The indigenous Yoruba and Ibo populations living respectively in the southwest (SW) and southeast (SE) regions of Nigeria traditionally did not produce and consume milk. Cattle rearing in the southern humid environment was impossible due to the prevalence of trypanosomiasis, a disease caused by tsetse fly (Jahnke 1982).

The small numbers of trypanotolerant cattle reared in the area were not milk breeds. However, in recent times, with increased population pressure, jungle clearance, crop cultivation and tsetse control measures, the degree of tsetse challenge has been reduced. Consequently there has been an influxes of transhumant and semi-settled cattle rearers in some parts of the region and some domestic dairy products have become available and acceptable to the local people. A taste has also developed for various foreign dairy products which become available either through food aid and/or through imports.

Since the 1940s, an increasing proportion of consumption of dairy products in Nigeria have been met by imports, a large part of them is consumed in the urban areas in the South (Nwoko 1986, p. 34). During the oil boom years of 1960s and 1970s, consumption of dairy products increased rapidly but the domestic dairy production sector suffered due to deliberate government policies of cheap imports. After the rapid devaluation of the local currency since the early 1980s, dairy products have become dearer and import levels have continuously declined.

The effects of these changes on dairy consumption and on the domestic dairy production sector are not clearly known. A survey was conducted between October 1988 and March 1989 in Southern Nigeria to determine the present dairy consumption patterns of various segments of the population and factors shaping these patterns. The objectives were to help predict future demand, particularly for domestic products, and help devise production and marketing strategies to develop the domestic dairy sector. The sampling and survey methods used are described in section II, the results are presented in section III with conclusions at the end.

SAMPLING AND DATA COLLECTION

A non-probability sample of 982 households was interviewed in Oyo State in the SW and in Anambra and Imo States in the SE Urban and rural samples were drawn separately. First, two urban centres were chosen purposively from each region-Ibadan and Oyo in the SW and Engugu and Umuahia in the SE. Then each urban centre was divided into several sections according to density and categories of inhabitants. Out of these, numbers of sections were chosen purposively followed by households chosen randomly. Any expatriate in the sample was replaced by a local inhabitant. Secondly, several Local Government Areas (LGA) around each selected urban centre were chosen randomly to sample rural populations. A number of villages were chosen purposively from each LGA and households were then chosen randomly.

The distribution of the sample according to major strata is shown in Table 1. However, it needs to be emphasized that in the absence of full population lists, the size of sample for each strata may not represent the true weight of its population. Preliminary analysis revealed no major differences between the Enugu and Umuahia based samples, so they were combined into one SE unit but the rural urban divisions for the unit remained.

The major sampling units revealed specific ethno religious characteristics. Eighty-one percent of Ibadan urban, all of Ibadan rural and Oyo samples were Yoruba and all SE samples were Ibo. Nearly all the SE samples and a majority of Ibadan rural and Oyo samples were Moslems. Generally religious division was not found to be important in dairy consumption.

A detailed pre-tested questionnaire was used for data collection. Most rural and some urban samples did not speak English at all or well, so the English version of the questionnaire was translated into Yoruba and Igbo languages, and the enumerators put questions in those languages whenever needed.

Data were collected on family composition and income, how often each household consumed various dairy products, how much they consumed during the week before the date of interview, from where they obtained dairy products, the form in which they were used and their prices. Data on monthly expenditure of different food items and ownership of selected assets including cattle were also collected.

Table 1: Distribution of sample households according to location, ethnic origin and religion

Sample location		Total Sample	Ethnic group		Religious group	
			Yoruba	Ibo	Moslem	Christian
% sample households by location						
Ibadan	Urban	248	81.0	19.0	36.7	63.3
	Rural	119	100.0	–	78.2	21.8
Oyo	Urban	162	99.3	0.7	80.9	19.1
	Rural	118	100.0	–	57.7	42.3
SE	Urban	163	–	100.0	1.8	98.2
	Rural	172		100.0	1.8	98.2
All locations		982	61.0	39.0	39.6	60.4

Source: Field survey 1988-89

RESULTS AND DISCUSION

Quantity of consumption: Two major groups of products were considered, domestic products which included fresh milk, sour milk (*nono*), yoghurt (*Kindirmo*), butter (*Manshanu*) and wara (a soft cheese), and imported and/or import based products which included evaporated and condensed milk, powdered milk, baby milk, ultra heat treated (UHT) sterilized milk, yoghurt, ice-cream, butter and cheese. Since several types of dairy products were consumed, they were converted into Liquid Milk Equivalent (LME) in order to get total consumption. The following conversion factors were used to get LMEs: fresh and sour milk = 1, powdered and skim-milk = 7.6, evaporated and condensed milk = 2.0, butter = 6.6, cheese and curd = 2.5, other products = 2.0. All the conversion factors except for cheese and curd were taken from FAO (1978). For cheese and curd, FAO suggested a factor of 4.4 but a recent study among Fulani in the Oyo State taking actual measurements of production and processing shows that for wara the conversion factor is about 2.5 because of high water content (Gherzi 1990).

Seventy percent of the sample households consumed some dairy product during the period covered by the survey but only 30 percent consumed local products. The average quantity of consumption and its distribution between local and imported products are shown in Table 2. Two main features emerge. First, none of the consumers in SE consumed local products while very little local products were consumed in Ibadan and over 40% of consumption in and around Oyo town was local products. These differences may be explained by the fact that the people in the SW, particularly in and around Oyo, came in contact with cattle rearers and developed a dairy consumption habit much earlier than their SE counterparts. Inhabitants in Ibadan area also reported that they would like to consume more local products if they were available.

Table 2: Average dairy consumption of dairy products and share of local products and milk in total consumption by ethnic origin and location

Sample location		Average daily consumption gm LME			% total consumption	
		Local	Imported	Total	Local products	Milk
Ibadan	Urban	7.1	73.3	80.4	8.8	67.4
	Rural	1.8	20.6	22.4	8.0	59.7
Oyo	Urban	15.1	22.1	37.2	40.6	42.1
	Rural	16.4	18.7	35.1	46.6	37.4
SE	Urban	–	48.3	48.3	–	67.8
	Rural	–	23.6	24.6	–	70.9
All locations		6.3	39.1	45.4	13.9	61.2

Secondly, in Ibadan and SE, over 60 percent of consumption was in the form of milk (fresh, evaporated, powdered, sterilized) but in Oyo, about 40% was in the form of milk. This is because in Oyo, most consumers consume wara, which is a locally made soft cheese.

Thirdly, urban consumption was nearly four times the rural consumption in Ibadan area, twice in the SE but about the same in Oyo. Using FAO production data, Seyoum (1989) found per caput daily consumption of 16 and 60 gm LME respectively in the rural and urban areas of West Africa. So the results of this survey may be considered reasonably accurate. The lack of rural-urban difference in consumption in Oyo is explained by the fact that this area has access to dairy products supplied by local cattle rearers while this is not so in the other areas.

Product combinations and their sources: Among the four forms of milk, most households in both SW and SE consumed only evaporated or evaporated and powdered milk which are imported; 10-15% of the households in the SW consumed evaporated and fresh milk or evaporated and powdered milk, and another 4-7 percent consumed other combinations (Table 3). Responses on form of use of products revealed that consumers of fresh milk drank it alone in over 90 percent of the cases; others used it with some food e.g. bread. Over 90 percent of the consumers of evaporated and powdered milk used these with some food or drank them alone. Only in a small number of households, fresh, evaporated and powdered milk were used for both drinking and in coffee, tea or bournvita (a chockolate drink).

Almost all the yoghurt consumers consumed imported yoghurt. Among the small number of butter consumers, nearly all consumed only imported butter and only a few consumed either local butter or both local and imported butter. Among the cheese consumers in Ibadan, about 60 percent of the urban and 82 percent of the rural users consumed both local and imported cheese. The rest consumed only imported cheese, none consumed only local cheese. In Oyo, nearly all cheese consumers consumed local cheese (wara).

Table 3: Distribution of households according to combination of fresh, evaporated and powdered milk consumed by location.

Sample Location		% households consuming combination						
		None	FM	EM	FM+EM	EM+PM	FM+EM +PM	Other combinations
Ibadan	Urban	8.5	–	34.8	3.2	43.3	4.1	6.1
	Rural	–	–	45.4	3.4	38.7	10.9	1.6
Oyo	Urban	4.9	3.1	49.4	11.1	19.1	4.9	7.5
	Rural	11.1	1.7	53.0	8.6	18.0	6.0	1.6
SE	Urban	20.9	–	40.5	–	33.1	–	5.5
	Rural	27.9	–	52.3	–	15.7	–	4.1
All locations		12.7	0.7	44.7	4.1	29.2	3.9	4.7

FM: Fresh milk (Local or imported) EM: Evaporated milk PM: Powdered Milk

Source: Field survey 1988-89

Theoretically, two goods are substitutes if a rise in the price of one causes an increase in the demand for the other. Such a relationship arises because the goods concerned perform a similar function or serve a similar taste. The nature and extent of substitution is generally indicated by the cross-price elasticity between the products. Available data did not permit estimation of cross-price elasticities because some products were consumed by very few households. However, from the foregoing it would appear that some local and imported products were used as substitutes in a few locations by some consumers. The degree of substitutability was possibly restricted by accessibility or by price or by some other factors such as product characteristics, keeping quality and hygiene, For example, *wara* is a soft cheese but it is not quite the same as any other imported cheese, so users consuming both wara and imported cheese may not actually treat them as close substitutes and their demand may not be influenced by changes in their relative prices alone.

Major consumers: Average consumption levels may not indicate the true intrahousehold consumption pattern. Therefore, dairy consuming households were asked as to who in the household were major consumers of each product. The responses summarized in Table 4 show that in a vast majority of the cases, all the household members had a share of the product consumed, but a significant proportion of the households reported that adult male members were the major consumers of several products. Older children were mentioned by some households as major consumers for imported liquid milk, yoghurt and ice-cream. Except in the case of baby milk, babies and infants (up to 3 years) were rarely mentioned as major consumers of other dairy products. The bias towards the adult male varied between products but it was pronounced among the Yoruba for local products and for some imported products. Among the Yoruba, males are traditionally responsible for buying

dairy products, among other things, and that might be a reason for them to consume a larger share of the product.

Table 4: Distribution of dairy product consuming households according to ethnic origin and major users

Product	Ethnic group	Major users of the product			
		All members of household	Adult male	Adult female	Children
		% households by ethnic group			
LOCAL PRODUCT					
Fresh milk	Yoruba	50.0	42.0	2.3	5.7
Sour milk	Yoruba	35.7	64.3	–	–
Butter	Yoruba	75.0	25.0	–	–
Wara	Yoruba	86.5	9.5	3.0	1.0
IMPORTED PRODUCT					
Evaporated milk	Yoruba	93.5	4.7	0.7	1.1
	Ibo	96.5	2.1	0.4	1.0
Powdered milk	Yoruba	93.0	4.1	0.4	2.5
	Ibo	94.4	1.6	0.8	3.2
Liquid milk	Yoruba	23.1	38.5	7.7	30.7
	Ibo	75.0	–	–	25.0
Yoghurt	Yoruba	40.0	40.0	8.1	11.9
	Ibo	35.3	17.6	11.8	35.3
Ice-cream	Yoruba	45.4	29.6	7.7	17.3
	Ibo	32.5	5.0	2.5	60.0

Source: Field Survey 1988-89

Income and dairy expenditure: Table 5 shows per caput monthly income, expenditure on dairy, and share of income spent on dairy products. Figures on income and share of income spent on dairy should be interpreted with caution because the share of income spent on dairy appears to be high. A household expenditure survey in Nigeria in 1980-81 found that the urban households spent 50% of expenditure on food and 2.1% on dairy products (Nigeria, 1983). In a recent study, Debrah et al. (1990) found that in urban and peri-urban Bamako, budget share of dairy products was 2.6%. This might have happened due to underestimation of income. The income figures were based on the reports of respondents about their monthly income rather than on the basis of detailed estimates by sources of income.

Estimated incomes were cross-checked with the value of assets owned by the households and with the general condition of the households calibrated by the enumerators. A high degree of correspondence was found on both criteria, indicating that the income estimates were consistent. However, the income might have been underestimated because the respondents probably did not report incomes of wife (ves) and other women members, Moreover, only cash income might have been reported in the rural areas.

Table 5: Average family size, per caput monthly income and expenditure on dairy by location

Sample	Location	Average family size	Per caput per month (N)[a]		
			Income	Expenditure on dairy	% income spent on dairy
Ibadan	Urban	7.6	132.19	9.23	7.0
	Rural	7.6	95.37	2.67	2.8
Oyo	Urban	8.0	62.72	3.88	6.2
	Rural	7.2	58.94	3.32	5.6
SE	Urban	7.6	97.75	7.97	8.1
	Rural	8.4	70.57	3.54	5.0
All location		7.8	90.96	5.64	6.2

Average exchange rate during Oct. 1988-Sept. 1989, $1=Naira 6.40.
Source: Field Survey 1988-89.

Income-consumption relationship: Among the sample households in each location, there were a significant number of households who did not consume any dairy product. Under such a situation generally Tobit Analysis is considered the most appropriate technique to measure income-consumption relationships. Tobit Analysis had gives the income elasticity for a product for those currently consuming the product and also the elasticity of the probability of consuming the produce with changes in income. The latter is often referred to as the entry/exit elasticity (for mathematical formulation and derivation of the Tobit model, for example, McDonald and Moffitt, 1980; Pitt, 1981; Kinsey, 1984).

The separation of basic and entry/exit elasticities implicitly presupposes that the non-consuming households are at the bottom of the income ladder. With increased income, one may enter the consuming group and with decreased income, one may exit from the consuming group.

In order to see whether the consuming households in the present survey lay at the bottom of the income ladder, average income of consuming and non-consuming households in each location were compared for following products: evaporated milk, all local dairy products, all imported dairy products, all milk products, and all dairy products. Average income was generally higher for consuming households in all the locations for all the products considered but, in no case did the incomes differ

significantly between consumers and non-consumers mainly because of high standard deviation of income of consuming households. This means that income was not the primary determinant of whether of not a household consumed dairy product(s). Therefore, Tobit was not considered an appropriate technique for the sample under study. Instead, an equation of the following form was used to measure the effect of income on the dairy expenditure of only consuming households:

$\text{Log } Y = \text{Log } A + b \text{ Log } X + E$

Where Y= total expenditure (Naira) on dairy products per caput per month
X= per caput monthly income (Naira)
E= random disturbance term

The function was estimated separately for each location mainly because there were some price differences for different products between locations. Consequently, it would be difficult to separate the effects of income and prices on consumption expenditure from the aggregate sample. Intra-location price variation was minimum, so price had no significant effect on demand.

Estimated parameters and related statistics are shown in Table 6. It appears that increased income will significantly enhance demand for dairy products. Income elasticities were higher for the rural consumers in the SW and for the urban consumers in the SE. Given the fact that ethnic origin, dairy consumption habit and access to dairy products were found to be important factors determining consumption, the differing income elasticities could be reasonably expected to hold.

Table6: Estimated parameters and related statistics for dairy consumption functions by location

Ethnic and location		Estimated parameters					
		Constant	Income	R^2	F	N	Prob
Ibadan	Urban	0.75127 (0.9281)	0.48252 (0.1310)	0.12	13.72	204	0.001
	Rural	-4.20246 (2.8838)	1.18055 (0.6254)	0.08	3.56	40	0.060
Oyo	Urban	-0.80905 (1.004)	0.45008 (0.2449)	0.09	3.38	128	0.070
	Rural	-2.85574 (1.1621)	0.89707 (0.2878)	0.09	9.71	101	0.002
SE	Urban	-3.20486 (0.7980)	1.05196 (0.1783)	0.23	34.78	123	0.001
	Rural	0.45.50 (1.6699)	0.63871 (0.30737)	0.15	9.17	104	0.001

Figures in the parentheses are standard errors

SUMMARY AND CONCLUSION

A survey was conducted among 982 indigenous households in Southern Nigeria between October 1988 and March 1989 to determine the dairy consumption patterns of various segments of the population and factors shaping this pattern. Results show that 70 percent of the households consumed some dairy products. Only 30 percent of the sample consumed some local products. The type of product consumed and frequency of consumption differ markedly between ethnic groups, urban and rural populations and between southwest and southeast regions. Regularity of consumption was generally higher for imported products but that for local products was very high near the points of production indicating that inadequate availability of products was a limiting factor for consumption. This would imply that short-run supply price exceeded demand price.

The sample households consumed 45 gm LME per caput per day of which 14% were local products, and 61% were consumed in the form of milk. Local fresh milk, yoghurt, cheese and butter were used as substitutes for similar imported products in some locations by some consumers.

Average income of consuming and non-consuming households did not differ significantly which indicated that non-income factors were important in determining whether or not a household consumed dairy products. Such factors could be inadequate availability of products and their poor hygiene.

Dairy consumption function estimated for only consuming households show that income elasticities for dairy products were higher for rural households in the SW and urban households in the SE.

Reduced imports and rising prices of dairy products due to the structural adjustment programme might have reduced the number of dairy consumers and/or reduced the regularity and quantity of consumption. The evidence of this survey indicates that the regularity and quantity of consumption have been affected. Whether the number of dairy consumers also decreased could not be ascertained in the absence of inter-temporal data. A significant shift toward local dairy consumption was still not visible, in spite of lower prices for local products, most probably because of limited supply beyond the production points. Appropriate production, processing and marketing strategies may have to be developed in order to increase production and to interest the consumers to shift toward domestic products.

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