Economics of Urban Dairies in Southern State of Nigeria

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INTRODUCTION

THE nutrition problem in Nigeria has received increased public attention in recent years. In real terms, there are two aspects to the problem. The first is total food intake which is essentially inadequate since the average daily calorie intake of about 2,200 per caput is below the recommended level of 2,500 calories per person per day (FAO, 1957). The second is the inadequacy of the protein content of the ingested/available food. It has been estimated that the national average supply is 54 grams per person per day of which 8 grams are from animal sources. These fall far short of officially estimated minimum requirements of 70 grams of total protein and 35 grams of animal protein per person per day. The proportion of milk protein in total animal protein supplies is about 6.25 per cent. Within this average, considerable variations exist between states whilst conspicuous differences exist between southern and northern parts of the country.

The protein problem goes beyond what the low overall average intake may indicate. It becomes more critical when one examines the vulnerable groups, especially in the southern, root-eating economy, where prevailing under-nourishment and malnutrition are accompanied by low intakes of some vitamins, calcium and iodine. Included in the vulnerable groups are pregnant and lactating mothers, infants and weanlings and the sick, most especially

those suffering from PCM (protein-calorie malnutrition) and oedema.

The obvious solution to this problem, especially the animal protein problem lies in the modernisation and expansion of livestock production. Considering the fact that milk has very high biological value, its importance in nutrition cannot be overemphasised.

At present, the Agege dairy in Lagos State with a capacity of 200 litres per hour and the Iwo Road (Ibadan) dairy with a capacity of 500 litres per hour are the only two major urban dairies in southern Nigeria. There are also two milk recombining plants: The Fan Milk plant at Ibadan with a capacity of 2,500 litres per hour and the Samco Foremost Dairy in Lagos State, also, with a capacity of 2,500 litres per hour. It is proposed to set up during the 1975 — 1980 plan period, four more urban dairies. These are the Nguro dairy and the Nkwelle dairy both in the East Central State, the Ikotafanga dairy in the South-Eastern State and the Onne dairy in the Rivers State, each with a capacity of 500 litres per hour. In addition, a Co-operative Condensfabriek recombining plant for evaporated milk will be established in Lagos. It is unlikely, however, that, even with these proposed new dairies, domestic milk supply will meet a significant proportion of the effective demand.

As of now, milk production has been of minor importance when compared with meat production. It is also known that only a small proportion of the available

milk supply is being utilised; the rest goes largely into waste or secondary uses of less economic and nutritional import. The country has, as a result of this and several other reasons, been forced to import a substantial proportion of its milk requirements in liquid and powdered forms.

In this predicament, the objectives of milk production scheme have realistically been defined as the need:

1. To meet the increasing demand for milk and milk products throughout the year;
2. to ensure and promote increased consumption of milk and milk products among all groups of the population, more especially the vulnerable groups at the national average target level of 25kg of milk and milk products (in milk equivalent) per person per annum by 1980;
3. to ensure an optimal development and rationalisation of the dairy industry with the objective of providing adequate return on investment and reasonable price to consumers bearing in mind technical and economic efficiency;
4. to integrate domestic reconstitution/recombination and packaging of milk with the policy of expanded dairy industry.

It is within the context of these objectives that this study takes abroad look at the economics of urban dairies in Southern Nigeria. For purposes of this study, "Southern Nigeria" shall be defined to cover the six Southern States — Lagos, Western, Mid-western, East-Central, South-Eastern and Rivers States. Here the problems of livestock production are complex and formidable and the region controls only about 5% of the country's cattle population which is currently estimated at 10.414 million (Olayide, 1974.)

SUPPLY OF DAIRY PRODUCTS

As mentioned earlier, estimates of Nigerian cattle population show that about 95% of the country's cattle are in the six Northern States whilst only 5% are in the six Southern States. Of those in the Southern States, about 46,000 are estimated to be lactating at an average yield of 230 kg per cattle per year. Total milk supply at this rate for the 1972 estimate comes to some 10,580 metric tons. Per caput available milk supply for the estimated southern states population (39.951 million) is about 0.26 kg per year. Assuming that this supply was available only to urban dwellers (11.006 million), per caput availability would be 0.96 kg per year. This very low available supply is largely augmented by substantial importation of tinned milk and powdered milk. Besides the very low productivity of the local herd the milk problem is further complicated by the inflationary prices of imported dairy products. The milk problem is made still much worse by the usually long calving intervals of the local herd, very low calving percentage (usually about 40%), mortality of about 25%, stock death of about 10% scarcity of improved grazing pasture and insignificant utilisation of concentrate supplementation to pasture. As a matter of fact, organised commercial dairy for the supply of milk and milk products to the urban population in Southern Nigeria is a rarity.

Importation of milk products into Nigeria in 1972 is presented in Table 1. The table shows that importation of dairy products into Nigeria totalled 323,846 metric tons in milk equivalents. This amount works out to a per caput availability of 4.57 kg per year. Assuming that 60% of the imports was consumed by urban dwellers, the per caput availability would be 11.78 kg per year. Total per caput availa-

ble supply for urban dwellers would be 12.75 kg/year, of which 92.39% was met from imports.

This supply situation is unsatisfactory in many respects. First the available supply falls far short of per caput minimum dietary requirements for healthy urban living (FAO, 1965). Second, it puts the pregnant and lactating mothers as well as the vulnerable group in a very precarious situation. Third, that more than 92.1% of available supply is met from imports poses health hazards arising from shortages due to export restrictions, port congestion inflationary prices, intransit contamination etc. Fourth, involved in this supply pattern is the problem of resource misallocation arising from the failure to upgrade and/or tap the potentials of the domestic dairy industry in terms of establishment of urban dairies.

and or comprehensive cross sectional data. To get around this difficulty, a population approach to demand pattern was adopted. The urban population of Southern states of Nigeria was estimated from those towns and cities with population greater than or equal to 20,000 persons. Using the 1963 census, this information is presented in table 2 as consisting of 114 towns with a total population of 7.580 million. Projections are then made on the basis of given assumptions regarding number of towns and rates of growth of those towns up to 1985 as shown in table 3.

Assuming an income elasticity of demand of 1.2 for milk and/or dairy products following Olayide (1974), demand projections can be made on the basis of equation 1.

EQ.1: $Q_D = Q_0 + EYPQ_0 + E_NNQ_0$; where Q_D is the projected demand level

TABLE 1
Imports of Milk Products to Nigeria, 1972

Items	Metric tons	Milk Equivalent Coefficient	Milk Equivalent Metric tons	Percentage break-down	Value (N) million C.I.F.
Condensed Milk — "unsweetened"	12,325	3.4	41,905	12.94	3.590
Evaporated Milk — "unsweetened"	49,568	2.6	128,877	39.80	14.540
Dry Milk	15,279	9.5*	145,151	44.82	6.450
Milk and cream	452	1.0	452	0.14	0.170
Butter	437	10.4	4,545	1.40	0.430
Cheese and curd	324	9.0	2,916	0.90	0.420
Total	—	—	323,846	100.00	25.600

Source: F.O.S., Nigeria Trade Summary, December, 1972.

* The coefficient used is the mean value of whole milk powder (coeff. 8.0) and skim milk powder (coeff. 11.0) since exact quantities of each are not known.

DEMAND FOR DAIRY PRODUCTS

The pattern of urban demand for dairy products is very difficult to determine in the absence of recorded time series data

Q_0 is available dairy products in the base period, E_Y is the income elasticity of demand for dairy products, P is the percentage change in the index of Gross National Product (GNP) at market prices,

TABLE 2

Southern Nigeria: Urban Population in 1963 (Million)

States	1963 State Population (million)	Population of Towns $\leq$ 20,000 Persons		
		No. of Towns	Population (million)	Per cent of State Population
1. East-Central	7.228	19	0.879	12.16
2. Lagos	1.444	6	1.042	72.16
3. Mid-Western	2.536	6	0.284	11.20
4. Rivers	1.545	4	0.249	16.12
5. South-Eastern	3.623	7	0.283	7.81
6. Western	9.488	72	4.843	51.04
Total	25.846	114	7.580	29.33

Source: F.O.S. Annual Abstracts of Statistics, Lagos Nigeria, 1969.

TABLE 3

Urban Southern Nigeria: Projected Urban Population 1970-1985 (Million)

Year	East-Central	Lagos	Mid-Western	Rivers	South-Eastern	Western	Total
1970	1.313	1.343	0.430	0.353	0.470	6.154	10.063
71	1.397	1.393	0.459	0.373	0.506	6.398	10.526
72	1.485	1.444	0.489	0.394	0.544	6.650	11.006
73	1.559	1.516	0.513	0.414	0.571	6.983	11.556
74	1.637	1.592	0.539	0.435	0.599	7.332	12.134
75	1.719	1.672	0.566	0.457	0.629	7.699	12.742
76	1.805	1.756	0.594	0.480	0.660	8.084	13.379
77	1.895	1.844	0.624	0.504	0.693	8.488	14.048
78	1.990	1.936	0.655	0.529	0.728	8.912	14.677
79	2.090	2.033	0.688	0.555	0.764	9.376	15.506
80	2.195	2.135	0.722	0.583	0.802	9.845	16.282
81	2.305	2.242	0.758	0.612	0.842	10.337	17.096
82	2.420	2.354	0.796	0.643	0.884	10.854	17.951
83	2.541	2.472	0.836	0.675	0.928	11.397	18.849
84	2.668	2.596	0.878	0.709	0.974	11.967	19.792
85	2.801	2.726	0.922	0.744	1.023	12.565	20.781

Source: Calculated from 1963 base — year data at annual growth rate of 4.5% up to 1970 and at 5.0% up to 1985.

E_N is the population elasticity of demand for the commodity, and "N" is the percentage change in population from base year to target year (Olayide, 1975). This equation enables us to obtain compounded annual rates of increase in demand. Such parameters have been employed to generate the estimated demand for dairy products presented in table 5.

Similarly, the estimated supply of dairy products was based on the trend elasticity of supply obtained from a linear regression equation of the form:

$$\text{EQ.2: } X = a + bT;$$

where X is output of dairy products and T is time trend measure in years. The trend elasticity of supply enables us to make predictions of supply as may be seen in table 4.

TABLE 4

Urban Southern Nigeria: Estimated Dairy Products Supply (1,000 tonne)

Year	East-Central	Lagos	Mid-Western	Rivers	South-Eastern	Western	Total
1968	8.439	0.399	3.385	2.989	7.971	8.873	32.056
69	8.523	0.403	3.419	3.019	8.051	8.962	32.377
70	8.608	0.407	3.453	3.049	8.132	9.052	32.701
71	8.694	0.411	3.488	3.079	8.213	9.143	33.028
72	8.781	0.415	3.523	3.110	8.295	9.234	33.358
73	8.869	0.419	3.558	3.141	8.378	9.378	33.691
74	8.958	0.423	3.594	3.172	8.462	9.419	34.028

Source: Calculated from 1968 base — line figures and parameters in *A Quantitative Analysis of Food Requirements, Supplies And Demands in Nigeria, 1968-1985*, by Olayide S.O., et al. University Press, Ibadan, 1972.

TABLE 5

Urban Southern Nigeria: Estimated Dairy Products Demand (1,000 tonne)

Year	East-Central	Lagos	Mid-Western	Rivers	South-Eastern	Western	Total
1968	8.965	0.424	3.596	3.175	8.467	9.425	34.052
69	9.619	0.455	3.859	3.407	9.085	10.113	36.538
70	10.321	0.488	4.141	3.656	9.748	10.851	39.205
71	11.074	0.524	4.443	3.923	10.460	11.643	42.067
72	11.882	0.562	4.767	4.209	11.224	12.493	45.137
73	12.749	0.603	5.115	4.516	12.043	13.405	48.431
74	13.680	0.648	5.488	4.846	12.922	14.384	51.968

Source: Calculated from Parameters in Reference Source of Table 2.

TABLE 6

Urban Southern Nigeria: Dairy Products Commodity Balances (1,000 tonne)

Year	East-Central	Lagos	Mid-Western	Rivers	South-Eastern	Western	Total
1968	-0.526	-0.025	-0.211	-0.186	-1.496	-0.552	-1.996
69	-1.096	-0.052	-0.440	-0.388	-1.034	1.151	-4.161
70	-1.713	-0.081	-0.688	-0.607	-1.616	-1.799	-6.504
71	-2.380	-0.113	-0.955	-0.844	-2.247	-2.500	-9.039
72	-3.101	-0.147	-1.244	-1.099	-2.929	-3.259	-11.779
73	-3.880	-0.184	-1.557	-1.375	-3.665	-4.079	-14.740
74	-4.722	-0.225	-1.894	-1.674	-4.460	-4.965	-17.940

Source: Obtained as difference between tables 4 and 5.

To examine the pattern of commodity balances or gaps, the predictions in table 5 were subtracted from those in table 4 to obtain the information in table 6. This table shows that a very serious deficit exists for dairy products in Southern Nigeria.

FUTURE COMMODITY BALANCES

To assess the significance of future dairy product balances, a macro framework of projections was made in terms of aggregate supply predictions and three levels of aggregate demand projections. These results are presented in table 7. It is clear from the table that the negative balances which were evident in the 1968-74 period will become worse in the period 1975-1985. When it is realised that minimum urban requirements for dairy products average 18.3 kg per caput per year, the extent of the seriousness of the commodity balances can be fully appreciated. Continued re-

liance on imports appears to be a very dangerous agricultural policy under conditions of rapid economic development. For example, it can be seen that projected demands at the annual rate of growth of 7.3% per annum and those at 15 kg per caput year fall far short of minimum requirements.

Second, the commodity balances presented in table 7 have considerable economic and socio-political effects on the development process. Four of these merit attention in this report. The first economic consequence of attempting to wipe out the negative balances is the number of dairy cattle that will be required in each year up to 1985. The estimates for Friesian crosses and for Friesian cows are presented in table 8 under the three levels of demand for dairy products. It must be stressed that our breeding programmes can hardly cope with such a large number of dairy Cattle.

TABLE 7

Urban Southern Nigeria: Projected Supply, Demand and Balances

Year	Projected Supply At Current Trend	Projected Demand Levels At			Commodity Balances At		
		Annual rate of 7.3 percent	15 kg/ Caput/ year	20 kg/ Caput/ year	Annual rate of 7.3 percent	15 kg/ Caput/ year	20 kg/ Caput/ year
1975	35.375	55.762	191.130	254.840	-20.387	-155.755	-219.465
76	36.259	59.833	200.685	267.580	-23.574	-164.426	-231.321
77	37.165	64.201	210.720	280.960	-27.036	-173.555	-243.795
78	38.094	68.888	220.155	293.540	-30.794	-182.061	-255.446
79	39.046	73.917	232.590	310.120	-34.871	-193.544	-271.074
80	40.022	79.313	244.230	325.640	-39.291	-204.208	-285.618
81	41.023	85.103	256.440	341.920	-44.080	-215.417	-300.897
82	42.049	91.316	269.265	359.020	-49.267	-227.216	-316.971
83	43.100	97.982	282.735	376.980	-54.882	-239.639	-333.880
84	44.178	105.135	296.880	395.840	-60.957	-252.702	-351.662
85	45.282	112.810	311.715	415.620	-67.528	-266.433	-370.338

Source: Parameters for supply trend projections and demand at annual rate of growth of 7.3 per cent were from Olayide, S.O., et al. *opt. cit.* 1972. Others are assumed per caput requirements.

TABLE 8

Urban Southern Nigeria: Dairy Cattle Population Required to Meet Demand 1975-1985 (Thousands)

Year	Milk Production 1600 kg/yr. Friesian crosses			Milk Production at 2500 kg/year by Friesian Cows		
	For Demand growing at 7.3%/yr.	For Demand at 15 kg/ caput per yr.	For Demand at 20 kg/ caput/yr.	For Demand growing at 7.3 per cent per yr.	For Demand at 15 kg/ caput/year	For Demand at 20 kg per caput per year
1975	34.851	119.456	159.275	22.305	76.452	101.936
76	37.396	125.428	167.238	23.933	80.274	107.032
77	40.126	131.700	175.600	25.680	84.288	112.384
78	43.055	137.597	183.463	27.555	88.062	117.416
79	46.198	145.369	193.825	29.567	93.036	124.048
80	49.571	152.644	203.525	31.725	97.692	130.256
81	53.189	160.275	213.700	34.041	102.576	136.768
82	57.073	168.291	224.388	36.526	107.706	143.608
83	61.239	176.710	235.613	39.193	113.094	150.792
84	65.709	185.550	247.400	42.054	118.752	158.336
85	70.506	194.822	259.763	45.124	124.686	166.248

Outright purchase will involve substantial sums of money. Investment of such a magnitude will have to take full cognisance of alternatives open to the government and people of southern Nigeria.

The second economic implication is the amount of supplementary feed that will be required to maintain optimal lactation. The projections for concentrate, presented in table 9 must be seen as substantial even though based on a simple assumption of about 950kg of concentrates per dairy cow per year (Olayiwola, 1974). Unless the feed-mix industry is fully supported, modernised and provided with effective packaging and efficient distribution network, feed supply, which normally accounts for about 70-80 per cent of the costs in dairy industry, may thwart all our efforts in years ahead.

The third economic implication is the amount of silage that will be required especially during the dry season. Based on a rather simplistic assumption of 2,700 kg of silage per dairy cow for the

six months of dry season (November-April), the silage projections are shown in Table 10 (Reaves and Henders on 1964). Again, ensilage and haylage require efficient storage systems difficult to come by in the hot and humid climate of southern Nigeria. This is not to imply that silage from maize and elephant grass cannot be produced economically for feeding dairy cattle in the dry season in addition to the provision of concentrate and grazing facilities on irrigated pastures.

The fourth implication is that of pasture land required for grazing the dairy cattle. Assuming that 4.2 dairy cattle will require one hectare of improved pasture land, acreage required by the estimated dairy cattle population may be predicted (Olu-bajo, 1974). These predictions are presented in table 11 for Friesian, crosses and Friesian cows. The table shows that considerable acreage of tried and improved pasture under irrigation can be meaningfully used in urban dairies in Southern Nigeria. However, the irrigation practices will be of a supplemental format

The cost of obtaining land in urban centres and/or urban peripheries may be too high. In this respect it will be essential to acquire such sites under long leaseholds.

The size of each urban dairy will, however, differ from town to town depending on the size and population of each type. But since urban centres are those

TABLE 9

Urban Southern Nigeria: Estimated Concentrates Needs of Dairy Cattle (1,000 tonne)

Year	Friesian Crosses			Friesian Cows		
	Demand growing at 7.3 per cent per year	Demand at 15 kg/caput/year	Demand at 20 kg caput/year	Demand growing at 7.3 per cent per year	Demand at 15 kg/caput/year	Demand at 20 kg/caput/year
1975	33.108	77.646	151.196	21.196	72.629	96.839
76	35.526	120.107	158.876	22.741	76.260	101.680
77	38.120	125.115	166.820	24.396	80.074	106.765
78	40.902	130.717	174.290	26.177	83.659	111.545
79	43.888	138.101	184.134	28.089	88.384	117.846
80	47.092	145.012	193.349	30.189	92.807	123.743
81	50.530	152.261	203.015	32.339	97.447	129.930
82	54.219	159.876	213.169	34.700	102.321	136.428
83	58.177	167.875	223.832	37.233	107.439	143.252
84	62.424	176.273	235.030	39.951	112.814	150.419
85	66.981	185.081	246.775	42.868	118.452	157.936

Source: Calculated from table 7 on the basis of 950 kgs of concentrates per dairy cow per year.

TABLE 10

Urban Southern Nigeria: Estimated Silage Needs of Dairy Cattle (1,000 Tonne)

Year	Friesian Crosses			Friesian Cows		
	Demand growing at 7.3% Year	Demand at 15 kg/caput/year	Demand at 20 kg/caput/year	Demand growing at 7.3% per year	Demand at 15 kg/caput per year	Demand at 20 kg/caput per year
1975	94.098	322.531	430.043	60.224	206.420	275.227
76	100.969	338.656	451.543	64.619	216.740	388.964
77	108.340	355.590	474.120	69.336	227.578	303.437
78	116.249	371.512	495.350	74.399	237.767	317.023
79	124.735	392.496	523.328	79.831	251.197	334.930
80	133.842	412.139	549.518	85.658	263.768	351.691
81	143.610	432.743	576.990	91.911	276.955	369.274
82	154.097	454.386	604.386	98.620	290.806	387.742
83	165.345	477.117	636.155	105.821	305.354	407.138
84	177.414	500.985	662.580	113.546	320.630	427.507
85	190.366	526.019	701.360	121.835	336.652	448.870

Source: Calculated from table 7 on the basis of 2,700 kgs. of silage per dairy cow for the six months of dry season (November — April).

TABLE 11

Urban Southern Nigeria: Pasture Land Needed by Dairy Cattle (1,000 ha)

Year	Friesian Crosses			Friesian Cows		
	Demand rising at 7.3 per cent per year	Demand at 15 kg/ caput/year	Demand at 20 kg/ caput/year	Demand rising at 7.3 per cent per year	Demand at 15 kg/ caput/year	Demand at 20 kg/ caput/year
1975	8.298	28.442	37.923	5.311	18.203	24.270
76	8.904	29.864	39.819	5.698	19.113	25.484
77	9.554	31.357	41.810	6.114	20.069	26.758
78	10.251	32.761	43.682	6.561	20.967	27.956
79	10.999	34.612	46.149	7.040	22.151	29.535
80	11.803	36.344	48.458	7.554	23.260	31.013
81	12.664	38.161	50.881	8.105	24.423	32.564
82	13.589	40.069	53.426	8.697	25.644	34.192
83	14.581	42.074	56.098	9.332	26.927	35.903
84	15.645	44.179	58.905	10.013	28.274	37.699
85	16.787	46.386	61.848	10.744	29.687	39.583

Source: Calculated from table 7 at 4.2 dairy cattle per hectare of developed and dry-season irrigated pasture per year.

towns or cities having about 20,000 inhabitants and above, an urban dairy may be located in each of the large cities with populations of 100,000 or more while other dairy establishments are so located as to serve groups of smaller towns depending on their combined population and their level of effective demand. It should be stressed once again that pasture is an essential ingredient of optimal lactation in dairy cattle. Its significance has been attested to by its contributions to the quality of milk produced (Glover and Dougall, 1961).

It is difficult to assess the overall financial implications of these four items for urban dairies. The use of constant prices may give fairly robust estimates, but these would mask important variabilities in situations from time to time and from one urban dairy to another. To assess the financial implications of urban dairies, there should be ecologically based studies backed by pilot projects, sound breeding programmes and the development of improved pasture land. Silage, haylage and concentrate-mix studies will also have to be undertaken as a matter of priority.

NECESSARY ACTION PROGRAMMES

In order to eliminate or minimize the negative dairy product balances, four types of action programmes should be embarked upon. First is the relocation of the national cattle herd. As at present, more than 95% of the Nigerian cattle population is located in the Northern States where the major problem is one of basic cattle nutrition. The shortage of dry season feeding has become a recurrent and grave problem. It is, therefore, necessary to promote the relocation of the national herd in the Southern guinea savannah zone of the country. About 30 - 40% of the national herd can be effectively relocated here. Backed by good breeding and feeding during the wet and dry seasons, the herd could be a source of dairy stock to the urban dairies.

The introduction and effective utilisation of artificial insemination programmes will help develop high yielding crosses of dairy cattle.

Second is dairy ranching in the derived savannah belt of the Southern States. More extensive in Western State than in the Midwestern and East-Central States, this belt would seem to offer good opportunities for dairy ranching as well as beef production. Ranches jointly operated by private and public interests would supply consumers with fresh milk through collecting centres specifically established for processing milk meant for consumption in near-by urban centres. Dairy delivery vans can be effectively utilised in support of such a scheme. Agro-industrial by-products such as sugar cane molasses as at Bacita can be used to supplement dairy cattle feeding.

Third is the expansion of the existing urban dairies and the establishment of new ones in major cities and towns of Southern Nigeria. Urban dairies have considerable merit as a means of meeting the demand for fresh liquid milk in the areas of high population density. It should be stressed that such dairies can be established as a joint venture of the government and private interests. Local Government Administration and farmers' production cooperatives can be made interested in the establishment of urban dairies through the provision of basic infrastructure. This suggestion arises from the fact that after about 25 years of government sponsored urban dairies at Ibadan and Lagos, no private interest has yet considered the venture as a worth-while investment. If attempts are made to widen the scope of this commercial type of milk production system, urban dairies within commuting distance will make significant impact on the protein problem faced by the population of Southern Nigeria. In such a scheme, the milk processing component of urban dairies would have to be separated from the

dairy farms and located much nearer the market.

Fourth is the issue of animal health. Here the two major diseases, trypanosomiasis and streptotrichosis, constitute the main limiting animal health problems to beef and dairy cattle production. In the case of trypanosomiasis, rigorous studies and attendant documentation have been such as to make a sound control scheme possible especially in the light of recent technical advances and bilateral aid schemes on aerial spraying. In the case of streptotrichosis, its economic importance in local cattle production has been largely underrated, since facts and figures are much difficult to come by. Since the need arises for the importation of high milk-yielding exotic dairy cattle to generate crosses of great potential, attention has to be given to streptotrichosis which seriously affects them. In addition to the programme of breeding involving the importation and use of exotic breeds, the need arises to increase the use of artificial insemination (A.I.) as an economic and efficient method of upgrading domestic dairy animals as well as efficient method of controlling venereal diseases.

Our rough estimates of costs and benefits of urban dairies point to their economic feasibility and maximum profitability if the correct organisational framework in terms of cooperatives and governmental-private interest operations is adopted. The positive income, employment and nutritional effects of urban dairies cannot be over-emphasised.

POLICY IMPLICATIONS

It is known that per caput consumption of dairy products in southern states of Nigeria is very low. It is also contended that the animal protein problem can be

alleviated through enhanced consumption of liquid milk especially by pregnant and lactating mothers, infants and weanlings and other vulnerable groups. Urban dairies constitute an effective tool for meeting the high demand as well as the future requirements of the region for dairy products. To achieve the target or minimise the negative commodity balances through the aegis of urban dairies, two policy instruments will be involved (Olayide, 1973).

First is the comprehensive utilisation of "developmental" policy instrument. This will involve the establishment of new urban dairies as well as the expansion of existing ones. It will also involve the establishment of processing and packing plants, the provision of irrigated and improved pasture and the provision of inducement schemes in terms of basic dairy farm infrastructure and mixed-feed plants.

Second is the utilisation of "compensatory" policy instruments. Involved here are such tools as product price compensations, input subsidisation, land grant schemes and government livestock insurance scheme. There is also the need for an efficient extension education service to operators of urban dairies be they cooperatives, government corporations or private corporate dairy farms.

SUMMARY AND CONCLUSION

In this paper we have been concerned with a pre-feasibility and a pre-case-study assessment of the economics of urban dairies in Southern Nigeria. This assessment has shown that the

current supply of dairy products is inadequate and that there is a very strong dependence on imports. Secondly, we have found that demand for dairy products outstrips the supply from both internal and import sources. The negative commodity balances are so high that there is an effective demand for the products of new urban dairies in Southern Nigeria. There is also the required technology judging from accumulated research findings in Nigeria. It, therefore, behoves the governments of the various Southern States to revise their 1975 - 1980 plan and to put increased emphasis on urban dairies as a significant contributor to the solution of animal protein problem in the region.

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