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URBAN FOOD EXPENDITURE PATTERNS IN TROPICAL AFRICA*

Although tropical Africa remains overwhelmingly rural, rapid growth of urban centers has been a conspicuous feature of the past two decades. Twelve of the 23 important cities shown in Appendix Table I registered population increases of fourfold or more between the 1930's and the 1950's. Urbanization is, of course, a usual concomitant of economic development, and further substantial growth of African cities is to be expected in the future.

Means of satisfying the growing food requirements of these urban centers must clearly be found in order to ensure their orderly development. The rate of growth in total demand for food will be determined essentially by the increase in population, the rise in per capita incomes, and the extent to which additional income is devoted to increased expenditure for food. Patterns of demand for individual foodstuffs and the share of food expenditure allocated to different commodity groups can be expected to change considerably under the influence of rising incomes and as a result of the impact of urbanization on food preferences. In Africa as elsewhere the effect of enlarged income in enabling consumers to make effective their demand for preferred and more costly foods is probably the chief factor leading to changes in food consumption patterns. Changes in preferences also seem to be of considerable importance in African cities, although it is difficult to disentangle the influence of the two factors in observed changes in food consumption. Life in an urban community means increased familiarity with foods that are largely unknown in the predominantly subsistence economies of the villages with which most urban residents have only recently parted company. Urban living also tends to weaken traditional patterns and taboos in the realm of food consumption as in other aspects of life. Food expenditure and consumption patterns in most African cities will certainly change a good deal during the next decade or two. But the nature and extent of the changes that are to be expected require study.

During the past decade a number of budget studies of native African families and single men (not including Europeans and Asians) have been carried out

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in various cities of tropical Africa, and these provide a considerable body of quantitative evidence concerning present food expenditure patterns and their variation from city to city. Some of the surveys also show the variation in food expenditure patterns among groups within individual cities, notably the variation associated with level of income. Only a few surveys provide information concerning the quantitative pattern of food consumption as well as data on expenditures for food. The present study concentrates on the analysis of food expenditure patterns, giving some attention also to the relative importance of major foods or food groups according to their contribution of food calories.

In the following section the sources of data used for the present study are summarized and some of the limitations of the survey data are mentioned. In section II the relationship between food expenditure and total income—the so-called Engelian relationship—is examined. The position of cereals, starchy roots, and plantains in the expenditure patterns of urban households is considered in section III. The dominance of these starchy staple foods seems to be only slightly less in African cities than in the diets of the rural population, although the relative importance of the various staple foods is very different. Section IV focuses on regional variations in food expenditure patterns and also examines the evidence available concerning the structure or hierarchy of food prices and gives some indication of the way in which patterns of food consumption measured in calories differ from the pattern of food expenditure. The final section offers some tentative observations concerning prospective changes in food consumption that are likely to be associated with economic development. These observations are based primarily on such evidence as is provided by the surveys concerning the variation in food expenditure between lower and higher income categories, but the data available for this purpose are especially unsatisfactory. Brief attention is also given to some urban-rural contrasts in consumption which provide other evidence concerning changes in food consumption to be expected as a result of rising incomes and continuing urbanization.

I. SOURCES OF DATA AND CITIES STUDIED

The quantitative information here used was derived mainly from 25 budget surveys carried out in 19 cities in tropical Africa during the period 1950–59.[1] With the exception of Akuse in Ghana and Mbale in Uganda, which are towns of less than 5,000, the cities considered rank among the most important urban centers of tropical Africa. A brief description of the surveys is given in Table 1, and the cities covered by the surveys are identified in Map 1. There is wide variation in the type of information provided by the various surveys, and one or two of the survey reports are so lacking in detail that they receive virtually no attention in the description and analysis presented here. The breakdown of expenditures for major foods or food groups as a percentage of total food expendi-

[1] Budget surveys for Fort Portal in Uganda, Umtali and Gwelo in Southern Rhodesia, and in the main urban areas of Northern Rhodesia were received too late to be included in the present study (*15a, 34a, 34b, 43a, 43b*).

The report of budget surveys carried out in Enugu, Ibadan, and Lagos in Nigeria suffers from the lack of essential details such as income or total expenditure by income classes. Consequently the surveys were not used in the analysis (*34*).

tures is summarized in Appendix Tables II and III for 16 "communities."[2] The 16 communities (or 19 cities) are as follows:

Western Tropical Africa:	East and Central Africa:
Thiès–Dakar–Saint Louis (Senegal)	Kampala (Uganda)
Freetown (Sierra Leone)	Jinja (Uganda)
Abidjan (Ivory Coast)	Mbale (Uganda)
Accra (Ghana)	Nairobi (Kenya)
Akuse (Ghana)	Dar es Salaam (Tanganyika)
Kumasi (Ghana)	Salisbury (Southern Rhodesia)
Sekondi-Takoradi (Ghana)	Bulawayo (Southern Rhodesia)
Kaduna–Zaria (Nigeria)	
Leopoldville (Congo)	

Most of these urban budget studies were conducted by administrative authorities in order to determine appropriate weights for the preparation or revision of cost-of-living or price indices. We have thus been obliged to use data for the analysis of a problem that was not of much concern to those who planned and carried through the surveys and prepared the data for publication. Problems of course arise in using this information for a comparative study of food expenditure and consumption patterns. The concepts, procedures, and objectives of the various surveys differed considerably. The Leopoldville survey, for example, was confined to families of African *évolués* (the Congolese elite who in large measure adopted Western ways) receiving relatively high incomes, whereas the families included in the Uganda surveys include only employees in the lowest wage brackets.

Many of the surveys fail to give information concerning the size of the sample households and their age and sex distribution. And when such information is given, it does not lend itself to uniform treatment. Some surveys simply give the number of persons per household, without taking account of the age and sex distribution of the family members, whereas others use various scales for converting to "consumer units" or "man units."

Furthermore, the survey data examined here may not be representative of food expenditure patterns throughout the year. Most of the surveys were carried out during a thirty-day period and therefore may show considerable seasonal bias. Food consumption in many rural districts in tropical Africa is characterized by marked seasonal variations that often apply to the staple foods as well as to fruits and vegetables which are normally expected to show large seasonal fluctuations (*25*, pp. 210–12).

Poleman's analysis of a government study of the movement of staple foods into Accra during a twelve-month period (October 1, 1957 through September 30, 1958) indicates that seasonal variation in staple food supplies is considerable. A particularly clear-cut seasonal pattern characterizes the inflow of maize. Shipments during October–January, when the maize crop of the coastal savanna is harvested and supplies are also available from the second crop of the forest zone,

[2] The cities of Kaduna and Zaria in Nigeria, and of Dakar, Thiès, and Saint Louis in Senegal, are treated as individual "communities" because the survey reports do not give separate data for the individual cities. Examination of unpublished data on the Senegalese cities indicates that food expenditure patterns in the three cities are fairly similar, and the same is probably true of Kaduna and Zaria. (Sekondi-Takoradi is, of course, a single urban conglomeration.)

TABLE 1.—URBAN BUDGET SURVEYS, SELECTED CITIES OF TROPICAL AFRICA*

Country	City	Survey period	Number of households	Average monthly expenditure, U.S. $ per household[a]	Sample characteristics	Source
Nigeria	Kaduna Zaria	Sept. 1955–Sept. 1956 Dec. 1955–Dec. 1956	701	35	Low-wage workers	(33)
Ghana	Sekondi-Takoradi	Feb.–Mar. 1955	546	35	Low wage-earning households	(21)
	Kumasi	Mar.–Apr. 1955	570	39	Basic wage income £5–£15 a month	(20)
	Akuse	Aug.–Sept. 1954	163	29	Wage-earning households	(19)
	Accra	May–June 1953	453	44	Wage-earning households	(18)
Sierra Leone	Freetown	Nov.–Dec. 1951	383	25[b]	Wage-earning households	(37)
Ivory Coast	Abidjan	Aug.–Sept. 1956	560	84	Households with at least two adults, not more than two adults earning income	(22)
Senegal	Thiès–Dakar–Saint Louis	1954	136	116[c]	Wide range of occupation, income, and ethnic groups of Africans	(29)
Congo	Leopoldville	1957(?)	46	115	Congolese *évolués*	(2)
Uganda	Kampala	Sept. 1950	55	6	Unskilled African workers	(11)
	Kampala	Aug.–Sept. 1951	110	5	Unskilled African workers	(10)
	Kampala	Sept. 1952	155	6	Unskilled African workers	(9)
	Kampala	Aug.–Sept. 1953	175	8	Unskilled African workers	(8)
	Kampala	Jan.–Feb. 1957	171	11	Unskilled African workers	(7)
	Jinja	Nov.–Dec. 1951	96	6	Unskilled African workers	(14)
	Jinja	Nov. 1952	104	6	Unskilled African workers	(13)
	Mbale	Feb. 1958	111	14	Unskilled African workers	(15)
Kenya	Nairobi	1957–58	349	25	Africans in employment	(4)
Tanganyika	Dar es Salaam	Aug.–Sept. 1950	75	10	Africans in employment	(6)
Southern Rhodesia	Bulawayo	June 1958	159	36		
	Bulawayo	Oct. 1958	212	38	African families, single men excluded	(38, 39, 40)
	Bulawayo	Feb. 1959	214	34		
	Salisbury	July 1957	197	39		
	Salisbury	Nov. 1957	200	41	African families, single men excluded	(41, 42)
	Salisbury	Mar. 1958	243	37		

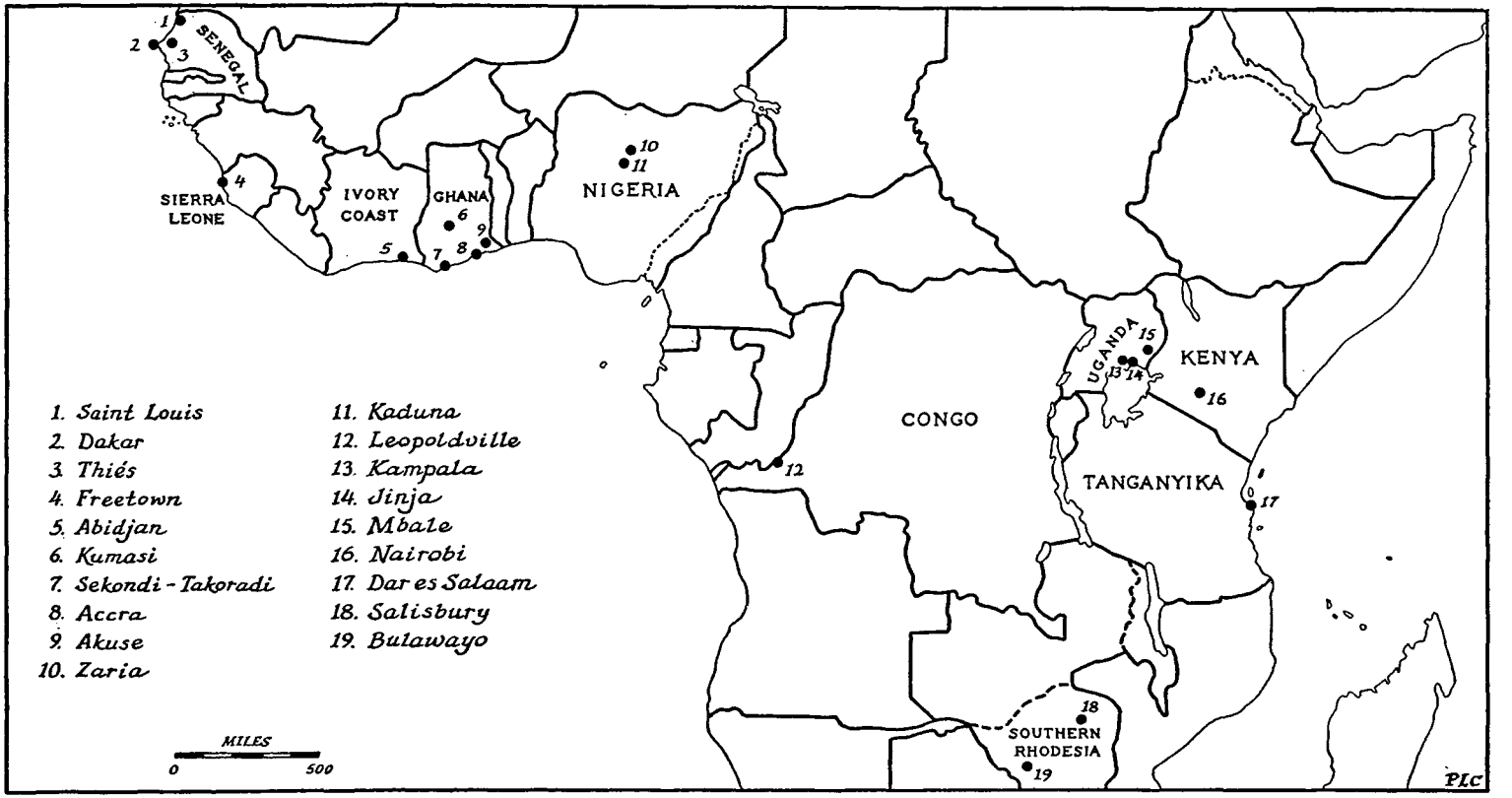
* Data from sources indicated by citation numbers. See notes to Appendix Table II for some further explanation.

[a] Converted at official exchange rates. This almost certainly means that the Thiès) are overstated.

[b] Applies to 264 households with income below 280 shillings per month.

[c] Average income.

MAP 1.—URBAN TROPICAL AFRICA: SELECTED CITIES



averaged something like twice as large as during the months of April through September. If this pattern is uniform from year to year, it means that maize consumption was exceptionally low during the budget survey period (mid-May to mid-June), whereas consumption of manioc products was above average since the produce movement census shows a clearly defined seasonal rise in the inflow of gari (manioc meal) and other manioc products at that time. This is presumably in response to the change in price relationships associated with the seasonal shortage of maize, the price of maize in May and early June being 50–100 per cent higher than in the October–November period, when maize supplies were large. There was also a tendency, though a weaker one, for the price of gari to vary inversely with the magnitude of the supplies reaching Accra. Because of this inverse relationship between supplies and prices of maize and manioc, the seasonal fluctuation in expenditures must have been a good deal less than the variation in consumption (*36*, pp. 170–72).

The budget surveys in Salisbury and Bulawayo provide some direct evidence on seasonal variation in food expenditure because these surveys were repeated several times during the year—June, October, and February in Bulawayo and July, November, and March in Salisbury.[3] Expenditures for the major staples—maize and bread—show very little seasonal variation; and it can be inferred that there was not much seasonal variation in consumption if our understanding is correct that prices of these commodities changed very little during the year. Expenditure on meat also showed little seasonal variation, but purchases of fish and vegetables in Bulawayo and of fruit in Salisbury varied considerably in the different survey months.

Finally, it must be emphasized that there are formidable statistical problems in carrying out this type of survey in African cities. Estimates of current population, to say nothing of the distribution of population with respect to occupation and income, are far from accurate and sometimes totally lacking. The urban populations in African cities tend to be notably heterogeneous, including members of a number of different tribal groups who also vary greatly in the extent to which they have made the transition from being strictly temporary migrant workers to permanent urban residents. Thus it is particularly difficult to obtain a representative sample of the population of a city or a well-defined subpopulation thereof. There are also major difficulties in collecting accurate data. The high rate of illiteracy and the fact that the "family" or "household" is often not a well-defined unit are especially troublesome. In most of the surveys an effort was made to determine the number of persons sharing each meal, but the problem of a varying number of guests may well have distorted the results in some of the surveys. There is probably a general tendency to understate consumption, particularly of items that are commonly acquired as snack purchases. Comparison of the survey estimates with import data for wheat flour in Ghana seems to indicate clearly that there is underreporting of bread purchases; but the data for the Senegalese cities suggest an error in the opposite direction (*24*, pp. 10–11). The considerable importance of home production and food gifts from relatives in

[3] The 1957/58 Nairobi survey was carried out in four stages to minimize seasonal bias; but only the average data are published, and it is not possible to analyze the extent of seasonal variation.

rural villages complicates the problem of estimating food consumption, although it does not affect the data on food expenditures.

In most instances, however, a determined effort was made to overcome these statistical problems. This seems particularly true of the surveys by the government statisticians in the Ivory Coast, Ghana, Uganda, Kenya, and Southern Rhodesia. In the Ghanaian surveys, for example, each enumerator was responsible for only five households. The interviewers responsible for families included in a subsample for which quantitative data were obtained were equipped with scales for weighing items that were not purchased in clearly defined units; and an attempt was made to minimize underreporting by interviewing the housewives after each day's marketing. In our judgment the survey data probably give a reasonably accurate picture of current *patterns* of food expenditure. More serious reservations seem to apply to the analysis of variations in food expenditure by different income groups. Some of the special difficulties of trying to draw inferences from these data with respect to changes in food consumption likely to result from raising incomes are discussed below at the beginning of section V.

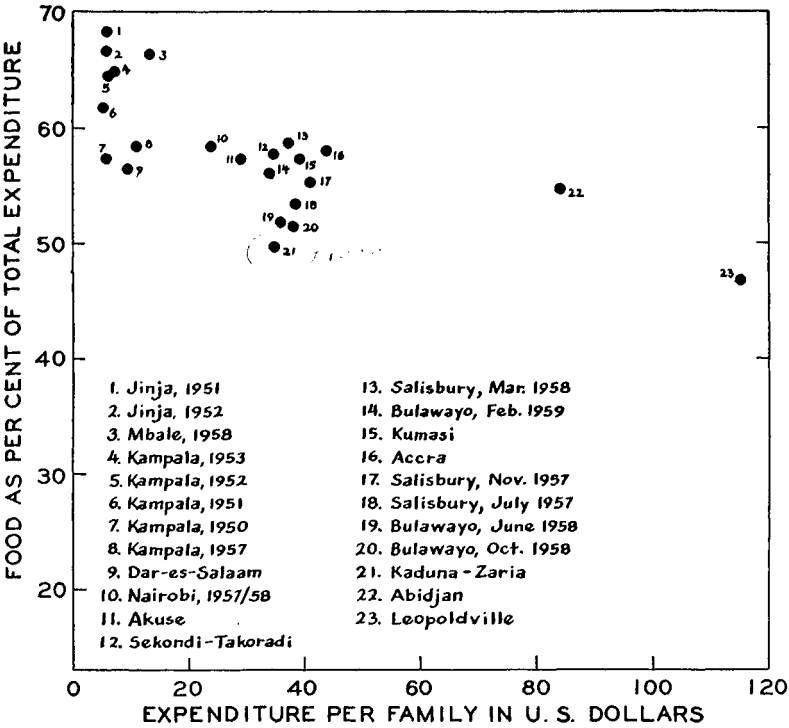
II. FOOD EXPENDITURES AS A PERCENTAGE OF INCOME

One of the important uniformities in the food expenditure patterns of the tropical African cities considered here is the high proportion of income that is devoted to food. This is hardly surprising, since low-income households the world over are obliged to allocate a large share of their income to the purchase of food.

For all but one of the budget surveys summarized in Appendix Table II food expenditure accounts for between 50 and 68 per cent of total household expenditure. (The data on total household expenditures tend to be more reliable in budget surveys and, particularly for low-income families, they are usually a fair approximation of income.) It is, of course, largely because food purchases claim such a large fraction of family income that a substantial rise in food prices has such a serious impact in an underdeveloped country.

It has long been recognized that the smaller the family income the greater is the proportion that is spent on food. In Engel's original formulation of this law, and in its usual application, it refers to the proportion of income spent on food by families at different income levels. Before turning to the evidence bearing on the validity of Engel's law within some of the African cities for which it is possible to compare food expenditures of different income classes, we may note that a statistically significant relationship can also be observed in the intercity comparison of average household income and the percentage of income spent on food. In spite of regional differences in preferences and other factors that might be expected to distort the relationship between income and the share of total expenditures devoted to food, a distinct inverse correlation is apparent in the intercity comparisons presented in Chart 1. The Leopoldville sample of *évolués* which was characterized by the relatively high income of U.S. $115 per month is the only city where the share of food in total expenditure falls below 50 per cent. (In Abidjan, where the survey group also had relatively high income, the percentage is 54.7 per cent if food consumption of household guests is included but 43.7 per cent if only family foods are counted.) In the various surveys in the Uganda cities of

CHART 1.—EXPENDITURE FOR FOOD AS PER CENT OF TOTAL EXPENDITURE, SELECTED CITIES OF TROPICAL AFRICA*



* Data from Appendix Table II.

Kampala and Jinja, the percentage of total expenditure devoted to food was about 64 per cent compared with 56 per cent in the cities in Southern Rhodesia and Ghana, where incomes are considerably higher.[4]

The more familiar Engelian relationship is shown in Table 2 for four of the communities for which it is possible to compare the proportion of total household expenditure devoted to food by families in different income (actually total expenditure) classes. These data, summarized in Chart 2, show a fairly clear tendency for the proportion of income spent on food to decline as total expenditure per capita rises.

The picture presented by the data for Kumasi calls for special comment on two counts. First, there is a clear indication of a tendency for the percentage of income to food to *increase* in rising from the very lowest income levels. This is a pattern that has been noted in surveys in other regions, and some of the reformulations of Engel's law refer to an initial increase at very low income levels as a possible variant of the usual tendency for food expenditure to increase absolutely but decline relatively as income increases. The two vertical segments of the line for Kumasi in Chart 2 are related to the other feature that invites comment. Columns 1 and 2 of Table 2 show that there is a strong positive correlation between total household expenditure and family size; the average household in the highest

[4] Comparing the mean for the seven surveys carried out in Kampala and Jinja between 1950 and 1957 and the mean for the four Ghanaian cities and the three surveys in each of the Rhodesian cities.

TABLE 2.—TOTAL MONTHLY EXPENDITURE PER HOUSEHOLD AND PER CAPITA, AND PER CENT SPENT FOR FOOD, BY INCOME CLASSES*

(Shillings, except as otherwise indicated)

Expenditure class[a] (1)	Persons per household[b] (2)	Per capita expenditure[c] (3)	Per cent spent for food (4)	Expenditure class[a] (1)	Persons per household[b] (2)	Per capita expenditure[c] (3)	Per cent spent for food (4)
A. Kaduna–Zaria, 1955–56				*B. Kumasi, 1955*			
164.3	2.43	67.6	61.6	124	2.83	43.8	56.2
216.4	2.76	78.4	52.5	162	3.03	53.5	57.4
272.0	3.15	86.4	46.6	187	3.45	54.2	57.0
321.0	3.75	85.6	43.2	211	3.72	56.7	60.9
463.2	5.25	88.2	43.6	237	3.80	*62.4*	*60.8*
				262	4.38	59.8	61.0
				288	4.62	*62.3*	*57.3*
				312	3.78	*82.5*	*57.8*
				339	4.46	76.0	55.0
				371	5.09	72.9	57.3
				443	5.38	*82.3*	*54.1*
				628	6.07	103.5	52.7
C. Nairobi, 1957–58				*D. Salisbury, 1957–58[d]*			
146.8	2.3	63.8	62.4	217.7	3.6	60.5	57.3
176.2	2.3	76.6	60.5	288.8	3.8	76.0	54.6
189.5	2.1	90.3	57.4	304.1	3.6	84.5	50.6
236.4	2.3	102.8	52.8	351.2	3.6	97.6	45.4
				441.7	4.0	110.2	46.0

* Data from budget surveys for the respective cities (*33, 20, 4. 41*). See Table 1 for number of households surveyed, and average family income in U.S. dollars.

[a] Average monthly expenditure for all purposes, per household, by income classes (expenditure classes for Kumasi).

[b] For Kaduna–Zaria and Kumasi, number of people; for Nairobi, consumption units according to the Oxford scale; and for Salisbury, "man units" according to the League of Nations' scale.

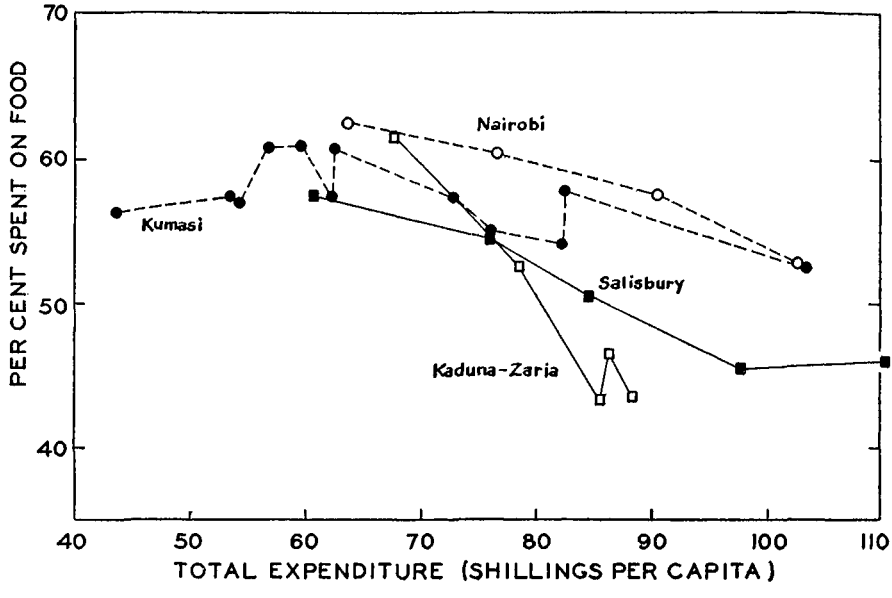
[c] Computed from unrounded data for the two preceding columns.

[d] Unrationed families in their own houses, average for July and November 1957 and March 1958.

expenditure class contains twice as many family members as the households in the two lowest expenditure classes.[5] The italicized figures in columns 3 and 4 of Table 2 (Kumasi) call attention to two instances in which the increase in household size almost exactly offsets the difference in total household expenditure of a higher and lower expenditure class. Thus it will be seen that there are two expenditure classes with total per capita expenditures of 62 shillings monthly; but the percentage of total expenditure devoted to food in the households with higher total income and a larger number of family members is appreciably lower than that for the other group. The same observation applies to the other two expenditure classes for which total expenditures per capita are equal. These apparent contradictions of Engel's law could be explained in part if it had been possible

[5] This sort of positive correlation between family size and total household income, which is evident in most of the African budget surveys, seems to be a characteristic feature of the early stages of economic development and of low-income social groups. Allen and Bowley found that the data from the 1904 budget enquiry of the working class in the U.K. showed a similar phenomenon, largely because children provided part of the family income (*1*, p. 8).

CHART 2.—EXPENDITURE FOR FOOD AS PER CENT OF TOTAL EXPENDITURE, BY CLASSES*



* Data from Table 2.

to take account of the age and sex structure of the sample households by expressing size in terms of "consumption units."

III. THE POSITION OF THE STARCHY STAPLE FOODS IN URBAN EXPENDITURE AND CONSUMPTION PATTERNS

The dominant position of starchy staple foods in the diets of low-income communities ranks with Engel's law as an almost universal characteristic of food consumption patterns. On the basis of a large number of food consumption surveys in rural areas as well as the available data on food production and land utilization, it appears that the starchy staple foods—cereals, roots, tubers, and plantains—account for 60–85 per cent of total calorie intake in tropical Africa.[6] The predominance of starchy staples in urban diets is presumably slightly less than in rural areas, but it appears that consumption in urban areas also falls within the range of 60–85 per cent. The estimates of calorie intake in Salisbury presented below in Table 4 indicate that staple foods account for 68–76 per cent of total calorie supplies in the various income classes. According to data presented by Poleman for Sekondi-Takoradi and Kumasi, the share of the starchy staples in total calorie intake is 64 and 70 per cent, respectively (*36*, p. 147).

Intercity comparisons of the starchy staples in food expenditure patterns.—It is thus no surprise to find that the starchy staple foods occupy a prominent position in the food expenditure patterns of the cities under consideration. The percentage of total food expenditure devoted to the starchy staples in the 16 communities represented in Appendix Table III varies from a low of 27 per cent in Leopoldville to roughly 50 per cent in the cities of Uganda. The percentages for Salisbury,

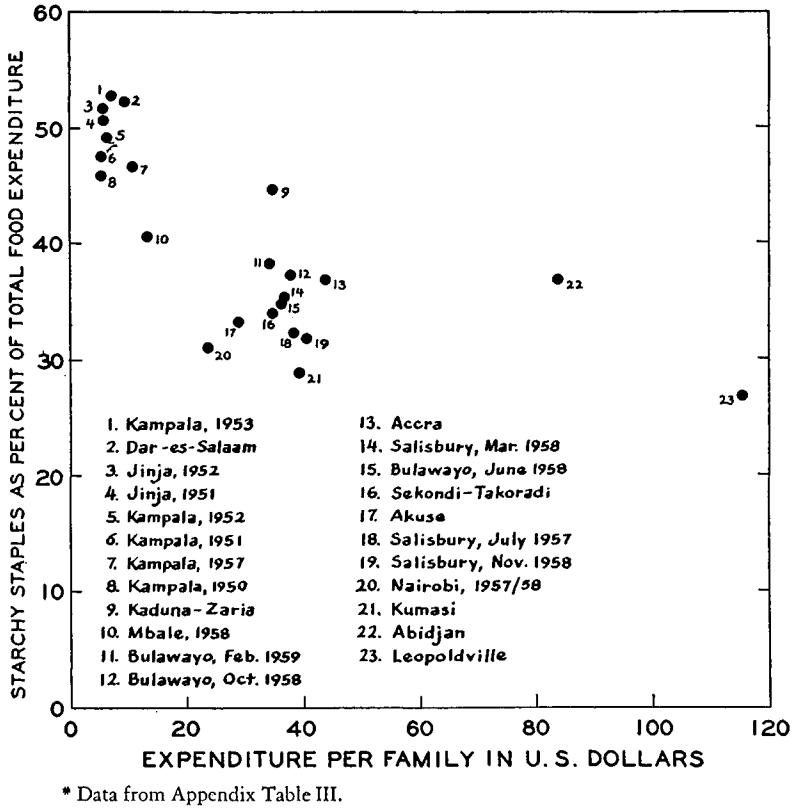
[6] Some of the evidence is summarized in *25*, pp. 8, 193–203.

Sekondi-Takoradi, and Kumasi are 33, 34, and 29 per cent, respectively. It is to be expected that the share of the starchy staples in food expenditure would be considerably smaller than in total calorie intake since these foods tend to be the cheapest source of food calories. Indeed, this is precisely the reason that they almost invariably occupy such a commanding position in the diets of low-income nations or households.

In international comparisons of diet patterns, Bennett has found a rather close inverse relationship between the fraction of total calories derived from the starchy staples and the level of per capita income (*3*, pp. 214–222). This decline of the "starchy staple ratio" as incomes rise reflects the tendency for families to consume increasingly large quantities of meat, dairy products, and other relatively costly foods as enlarged purchasing power allows them to modify their diet patterns. This shift toward more expensive foods is largely responsible for the fact that food expenditures rise in absolute terms as incomes rise, even though, in accordance with Engel's law, the proportion of income spent on food declines.

There is also a widespread tendency for consumers to shift toward consumption of the relatively more expensive items within the staple food category, so that one would expect the fraction of total food expenditure devoted to the starchy staples to decline somewhat more slowly than the starchy staple ratio, the fraction of total calories provided by these foods. Nevertheless, the intercity comparisons as shown in Chart 3 reveal a fairly strong inverse correlation between income and

CHART 3.—EXPENDITURE FOR STARCHY STAPLES AS PER CENT OF TOTAL FOOD EXPENDITURE, SELECTED CITIES OF TROPICAL AFRICA*



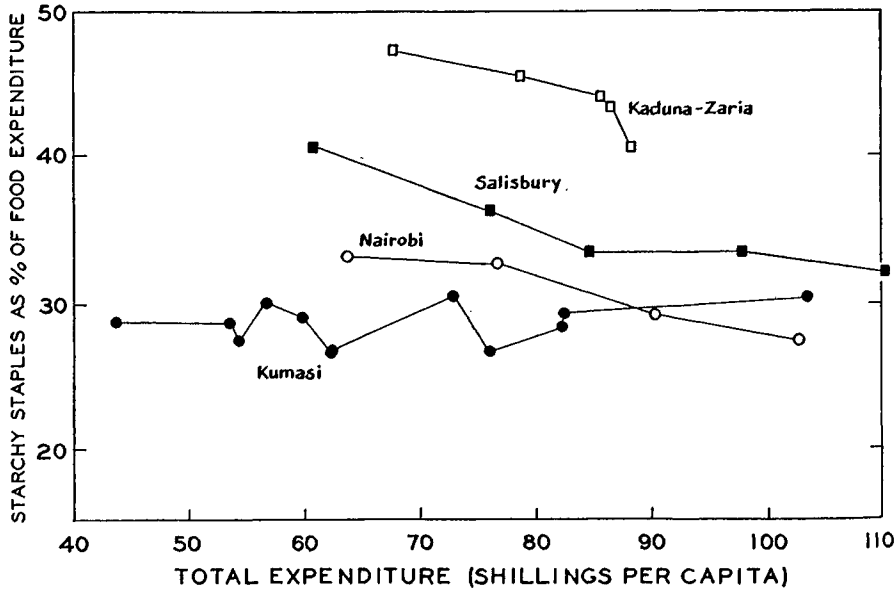
* Data from Appendix Table III.

the percentage of total food expenditure allotted to the starchy staples. For most of the cities of West Africa and Southern Rhodesia, where incomes are relatively high, the share of total food outlay claimed by the starchy staples is between 30 and 40 per cent, but for the cities in Uganda and Tanganyika, where the households surveyed had very low incomes, the percentage lies between 45 and 50.[7]

Variation in staple food expenditure among income classes.—Comparison of the share of food expenditure allotted to the starchy staples by different expenditure classes within individual cities also reveals a tendency for this percentage to decline in moving from lower to higher income levels. Among the four communities for which the comparison is made in Appendix Table IV and Chart 4, Kumasi stands out as a distinct exception, for the percentage devoted to the starchy staples appears to be more or less constant if not actually increasing in moving from lower to higher levels of total per capita expenditure. The data for Accra and Sekondi-Takoradi also show a considerable constancy in the share of total food outlay spent on the starchy staples in contrast with the situation in the cities in other African countries for which such a comparison is possible.

Analysis of expenditure patterns for staple foods in the Ghanaian cities is complex because an exceptionally large number of different food products are of considerable importance. In Kumasi and Sekondi-Takoradi ten different staple food products claim an appreciable share of the household food budget. The calorie contribution of these items and their price per 1,000 calories is shown in Table 3.

CHART 4.—EXPENDITURE FOR STARCHY STAPLES AS PER CENT OF TOTAL FOOD EXPENDITURE, BY CLASSES*



* Data from Appendix Table IV.

[7] The equation of a line of regression between expenditure on starchy staples as a percentage of total food expenditure and total household expenditure is $Y_o = 48.13 - .28X_o$ with $r_o = -.58$. The equation for a corresponding line of regression between food expenditure as a percentage of total expenditure and the fraction devoted to food is $Y = 63.34 - .23X$ with $r = -.74$.

TABLE 3.—DAILY PURCHASES EXPRESSED IN CALORIES, AND PRICE PER 1,000 CALORIES OF SELECTED STAPLE FOODS, KUMASI AND SEKONDI-TAKORADI, 1955*

Commodity	Kumasi		Sekondi-Takoradi	
	Purchases (*Calories per person per day*)	Price (*Pence per thousand calories*)	Purchases (*Calories per person per day*)	Price (*Pence per thousand calories*)
Manioc and products:				
Fresh roots	243	2.25	456	2.29
Gari (meal)	46	2.47	64	2.71
Kokonte (dried roots)	212	1.37	57	2.26
Plantains	389	2.56	168	3.63
Yams	123	4.97	49	6.42
Maize and products:				
Kenkey[a]	50	4.82	188	4.48
Dough	43	...	49	...
Rice	101	4.37	111	4.44
Cocoyams	98	3.16	15	4.22
Bread	27	9.26	47	9.83
All starchy staples[b]	*1,364*	...	*1,260*	...

* Data from T. T. Poleman, "The Food Economies of Urban Middle Africa: The Case of Ghana," *Food Research Institute Studies*, May 1961, pp. 148, 150.

[a] Fermented dough balls.

[b] Includes minor foods not shown separately.

Poleman has analyzed the variation in purchases and consumption of staple foods in the Ghanaian cities in detail, so it is sufficient to point out that the rather constant share of total food expenditure which the Ghanaian cities represent seems to be due to the substitution of more for less expensive items within the staple food category (*36*, pp. 154–59).[8] In Kumasi, the quantity of staple foods consumed, measured in calories, rises somewhat between the first and third expenditure classes but then declines. In Sekondi-Takoradi the per capita supply of starchy staples in terms of calories is virtually the same for all of the expenditure classes, the increase in expenditure thus clearly implying a shift toward more costly products in the staple food category. Roots and tubers, which are exceptionally important in Kumasi diets, show a slight tendency to decline in relative importance with rising income, the decline affecting mainly purchases of gari (manioc meal) and kokonte (dried manioc roots). Purchases of cereal products, however, rise sharply, accounting for 10–12 per cent of total food outlay in the highest expenditure classes compared with only about 7 per cent in the lower income brackets (Appendix Table IV). The increase in purchases of bread is especially sharp, but the increase for maize products is also considerable.[9] Table 3

[8] The figures on the percentage of food expenditure devoted to the starchy staples by different expenditure classes in the Ghanaian cities are expressed in terms of expenditure on local foods only. Since the expenditure on imported food rises with income, there may in fact be a slight tendency for the share of expenditure on staple foods to decline with a rise in per capita income, since staple foods are a very small component of purchases of imported food. Although bread is made with imported flour, it is included among "local foods" in the survey data.

[9] Poleman suggests that the highest income elasticity coefficients for bread in Kumasi and Sekondi-Takoradi are of only limited significance; the income elasticity of bread is as high as 2.0 in Kumasi and 1.7 in Sekondi-Takoradi because of the evidence that the survey estimates of bread consumption are underreported (*36*, p. 158n). There does not seem to be any reason to suppose, however, that the unreported purchases of bread are significantly less responsive to differences in income level than the purchases that appear in the survey data.

TABLE 4.—ESTIMATED CALORIE CONTRIBUTION OF THE STARCHY STAPLES BY EXPENDITURE CLASSES, SEKONDI-TAKORADI AND SALISBURY*

A. Sekondi-Takoradi, 1955, Subsample of 96 Households

Monthly expenditure per household (*Shillings*)	Manioc		Maize		Plantain	Rice	Yams	Bread	Total[a]
	Fresh	Kokonte	Dough	Kenkey					
	Calories Per Capita Per Day								
100–199	482	138	42	126	190	116	50	23	1,167
200–249	402	56	70	190	156	154	35	39	1,102
250–299	491	46	43	187	160	98	61	59	1,145
300 and over..	453	10	37	240	187	68	48	43	1,086
All classes	456	57	49	188	168	111	49	47	1,125
	Per Cent of Starchy Staple Calories								
100–199	41	12	4	11	16	10	4	2	100
200–249	36	5	6	17	14	14	3	4	100
250–299	43	4	4	16	14	9	5	5	100
300 and over..	42	1	3	22	17	6	4	4	100
All classes ...	41	5	4	17	15	10	4	4	100

B. Salisbury, 1957–58, Unrationed Families in Their Own Houses

Monthly expenditure per "man unit" (*Shillings*)	All foods[b]	Maize meal	Bread	Rice	Buns	Total starchy staples	
						Calories	Per cent of all food
	Calories per "Man Unit" per day, except as indicated						
59.2	2,360	1,255	514	23	5	1,797	76.2
73.6	2,534	1,245	559	15	10	1,829	72.2
83.9	2,460	1,053	585	21	10	1,669	67.9
95.9	2,627	1,218	565	34	12	1,829	69.7
109.0	2,450	985	606	58	19	1,668	68.1
	Per Cent of Starchy Staple Calories						
59.2	...	69.8	28.6	1.3	.3	100	...
73.6	...	68.1	30.6	.8	.5	100	...
83.9	...	63.1	35.1	1.3	.6	100	...
95.9	...	66.6	30.9	1.8	.6	100	...
109.0	...	59.0	36.3	3.5	1.1	100	...

* The Sekondi-Takoradi data are for the subsample for which quantity data were obtained (*21*, Table 37). The Salisbury data were computed on the basis of average expenditure for the months of July and November 1957 and March 1958 using average prices for the three months (*42*, Table 9). This report, used also for Table 9 (p. 259) and Appendix Table IV, differs slightly from the one used for Tables 2, 6, and 10 (pp. 237, 246, and 263) (*41*).

[a] Excluding gari, shelled maize, and cocoyams, which in the aggregate contributed about 10 per cent of total staple food calories, but are not included in the data which give a breakdown by expenditure class.

[b] Including calories contributed by beer, both African and European.

indicates that bread is by far the most costly of the starchy staples and that the price per 1,000 calories for kenkey (fermented dough balls), the principal maize product, is 50–100 per cent higher than for manioc products.[10]

The pattern of staple food consumption in Sekondi-Takoradi is summarized in Table 4A in terms of the changes in calorie contribution of the various staples in different expenditure classes. The most conspicuous change with rising income is the sharp decline in consumption of kokonte, whereas consumption of fresh manioc, a considerably more expensive source of calories than kokonte at the time of the Sekondi-Takoradi survey, shows little change. Here also consumption of bread and kenkey, two of the more expensive starchy staples, rises considerably in the higher income categories. A puzzling feature of the changes in staple food consumption that appear in the Sekondi-Takoradi data, is the decline in consumption of rice, a relatively expensive staple food that is generally considered to be highly regarded by urban consumers in tropical Africa. The change in staple food consumption in Salisbury with rising income, summarized in Table 4B, differs from the situation in Sekondi-Takoradi in a number of respects. Particularly germane at this point is the fact that the share of the staple foods in total calorie intake shows a fairly considerable decline in moving from the lowest to the middle expenditure classes. There is an irregular but appreciable decline in the consumption of maize meal, and bread purchases rise only a little. Other staple foods are of small importance in Salisbury, but rice rises sharply from a very low level.

Response to changes in food prices in a low-income community (Kampala).— It was noted in section II that a substantial rise in food prices has an especially severe inflationary impact in an underdeveloped economy because such a large fraction of income must be spent on food. The prominence of the starchy staple foods in diets of low-income communities also has a significant bearing on the inflationary repercussions of food shortages leading to rising food prices. It has been argued elsewhere that the demand response to price changes for "all food" in an underdeveloped country is very low and probably lower than in economically advanced countries, at least in the case of an increase in food prices (*26,* p. 340). The basis of the argument is simply that the cheap starchy staple foods occupy so dominant a position in the diets of communities like those being considered here that there is relatively little scope for offsetting an increase in food prices by shifting from expensive to less costly foods. It was also suggested that the demand response to price changes for individual foodstuffs, at least those that claim a considerable share of the household budget, is probably fairly high, because low-income families are under strong pressure to shift away from expensive items when relative prices change.

Very little data are available to permit the study of the effects of price changes on food consumption patterns in underdeveloped economies, but the budget surveys carried out in Kampala (Uganda) each year from 1950 through 1953 and again in 1957 provide a fairly good picture of changes in one low-income community. Poor crops in late 1952 as a result of inadequate rainfall caused a marked increase in food prices in Kampala markets during 1953. The effect of the short-

[10] Food price comparisons in tropical Africa are subject to serious qualifications. These are mentioned in section IV, in which food price relationships are examined in some detail.

age of food supplies was amplified by boom conditions associated with high prices for Uganda's chief exports—cotton and coffee—and a high level of urban employment (*12*, p. 10). The prices of plantains, sweet potatoes, and manioc doubled or trebled compared with those in previous years (Table 5B). Maize, however, was subject to government controls and its price was kept fairly stable.

Total household expenditure increased more than 25 per cent over the previous year and income per household by about the same proportion. The effect of the rise in food prices is evident in the fact that the percentage of total expenditure devoted to food in 1953 was equalled only by the 1952 figure, and the proportion of the food budget devoted to the starchy staples was the highest of any of the five years in which budget surveys were carried out (Table 5A). The proportion of the food budget spent on fish and, more markedly, on meat conversely showed

TABLE 5.—FOOD EXPENDITURE PATTERNS AND RELATIVE PRICES, KAMPALA, 1950–53 AND 1957*

A. Expenditures

Date of survey	Total expenditure per household (*Shillings*)	Per cent spent for food	Expenditure on starchy staples as per cent of total food expenditure					
			Total	Maize meal	Matoke (plantain)	Manioc	Sweet potatoes	Bread
Sept. 1950	41.34	57.3	45.9	2.7	15.8	11.7	13.5	2.2
Sept. 1951	38.41	61.8	47.6	4.5	17.4	14.7	6.9	4.1
Sept. 1952[a]	43.50	64.9	50.5	5.5	24.2	9.7	7.4	3.7
Sept. 1953	55.13	64.9	52.8	22.6	8.9	6.3	9.7	3.6
Feb. 1957	77.39	58.3	46.7	15.0	21.1	2.3	4.8	2.3

B. Prices

Date of survey	Maize meal	Matoke (plantain)	Manioc		Sweet potatoes	Bread	Peanuts	Sugar
			Fresh	Flour				
	Shillings Per 1,000 Calories							
Sept. 1951	.12	.26	.10	.19	.20	...	.34	.25
Sept. 1952	.18	.24	.14	.20	.20	...	.34	.26
Sept. 1953	.17	.62	.34	.27	.43	...	.37	.35
Feb. 1957	.16	.21	...	.20	.23	.51	.48	.31
	Relatives: Maize Price Per 1,000 Calories = 100							
Sept. 1951	100	217	83	158	167	...	283	208
Sept. 1952	100	133	78	111	111	...	189	144
Sept. 1953	100	365	200	159	253	...	218	206
Feb. 1957	100	131	...	125	144	319	300	194

* Data from the survey reports for the years indicated (*7, 8, 9, 10, 11*). The comparability of the five surveys may have been affected by changes in the tribal composition of the samples from year to year, and some of the changes in 1957 may reflect seasonal factors since the survey was carried out in February instead of September, as in previous years. Prices per 1,000 calories computed using the factors in Appendix Table V.

[a] Weighted average of families in lower income group and those in higher income group as given in the survey report.

a decline from the levels of the previous years. Other major items such as groundnuts, beans, and sugar, whose prices did not change much, maintained about the same proportion of total expenditure as before. Although maize consumption increased substantially, it appears that this did not entirely offset the effect of the reduced availability of other staples, and the total calorie contribution of purchased food fell in 1953 below the levels of the previous years.

The observed facts demonstrate clearly that when the Kampala consumers were pressed by high prices of staple foods they had to lower their levels of living significantly in spite of the boom conditions and increase of money incomes. They were obliged to increase the normally large share of their income allocated to foodstuffs, particularly to the starchy staples, and they had to switch to less expensive and less preferred items in an attempt to maintain appropriate levels of calorie intake.[11] Moreover, the presumption seems strong that the considerable increase in consumer outlay for food (staple food expenditure rose by a third as compared to 1952) was due, at least in part, to the fact that there was not much room to cut back on expenditures for meat and other costly foods, although curtailment of purchases of meat and fish did occur. The most striking feature of this episode is the extent to which the usual pattern of staple food consumption was altered in response to the change in relative prices. The rise in food expenditure would, of course, have been much greater if it had not been for the stocks of maize available and the success of the measures taken to hold maize prices stable despite the sharply increased demand.

IV. REGIONAL VARIATIONS IN FOOD EXPENDITURE PATTERNS

The examination of the relationships between income and food expenditure and between total outlay on food and expenditures on the starchy staples in sections II and III has revealed a good deal of similarity in urban food consumption patterns in tropical Africa. Quite apart from differences in preference patterns or in the average income of families in the various cities, considerable variation in these food expenditure relationships was to be expected simply because the segments of the population represented in the various survey samples included quite different income strata (Table 1, p. 232). For example, the large difference between the share of income spent on food in Leopoldville and in the Uganda cities of Kampala and Jinja is probably largely due to the fact that the survey sample in Leopoldville was confined to a small group at the top of the income scale whereas the sample populations in the Uganda cities were restricted to very low-income workers. The one noteworthy irregularity that did appear was the situation in the Ghanaian cities, where the survey data suggest a surprising constancy in the percentage of income spent on food at various income levels and in the share of total food outlay allotted to the starchy staples.

When attention is directed to individual commodities, as in the present section, very large regional differences in food expenditure patterns stand out. The important differences in the socio-cultural circumstances of the various cities would, of course, lead one to expect considerable differences. Moreover, the

[11] But considering the staple foods as a group, the episode is an example of "Giffen's paradox," in which an increase in the price of bread resulted in increased consumption because the income effect outweighed the substitution effect.

TABLE 6.—EXPENDITURE ON INDIVIDUAL STARCHY STAPLE FOODS AS PER CENT OF TOTAL FOOD EXPENDITURE, SELECTED CITIES*

Country	City	Total starchy staples	Maize and products	Rice	Millets and sorghums	Bread and biscuits	Cereals subtotal	Manioc and products	Yams	Sweet potatoes	Plantains	Roots, tubers, and plantains subtotal
Nigeria	Kaduna–Zaria	*44.6*[a]	...	8.0	5.7	2.9	*16.6*	9.3	8.5	...	...	*17.8*
Senegal	Thiès–Dakar–Saint Louis[b]	*29.1*	...	19.0	2.9	7.2	*29.1*	...	...	...	...	...
Ivory Coast	Abidjan	*36.9*	3.0	16.2	.6	3.1	*23.4*	4.0	4.8	...	4.6	*13.5*
Ghana	Sekondi-Takoradi	*33.6*	8.2	4.3	...	3.8	*16.3*	10.5	1.9	...	4.3	*17.3*
	Accra	*36.9*	13.5	4.3	...	6.2	*24.0*	7.9	1.7	...	2.4	*12.9*
Congo	Leopoldville	*26.8*	.4	4.7	...	7.6	*12.6*	10.8	.2	.3	2.3	*14.2*
Uganda	Kampala, 1957	*46.7*	15.0	1.2	...	2.3	*18.5*	2.3	...	4.8	21.1	*28.2*
	Mbale	*40.5*	13.5	2.9	.8	1.2	*18.4*	1.0	...	.5	20.6	*22.1*
Kenya	Nairobi, 1957–58	*31.0*	18.7	1.9	.1	6.5	*31.0*[c]	...	...	...	...	...
Tanganyika	Dar es Salaam	*52.2*	25.4	9.7	...	10.6	*45.7*	5.2	...	1.3	...	*6.5*
S. Rhodesia	Salisbury[d]	*33.3*	12.5	1.0	...	19.8	*33.3*	...	...	...	...	...

* Averages for the survey samples in the various cities (*33, 29, 22, 21, 18, 2, 7, 15, 4, 6, 41*).

[a] Including expenditures on unspecified starchy staples.

[b] For the 2,500–3,000 francs (CFA) income class, a class in the middle range of income groups included in the survey.

[c] Includes wheat flour, which accounts for 3.8 per cent of total expenditure.

[d] Average of families in their own house and those in accommodation, unrationed, average for July and November 1957 and March 1958.

regional variations in agricultural production and food consumption in rural districts in tropical Africa is probably greater than for any other region of the world, at least in the degree of variation in the starchy staple foods that are dominant in local diets (*25*, pp. 14, 57–86). It is to be expected that this great variability in patterns of food production would be reflected to a considerable extent in the diet patterns of urban areas, especially since most of the food intake of urban consumers in tropical Africa is supplied by nearby rural areas. In only a few cities do imported foods account for a substantial fraction of the food supply, and there is little shipment of major foodstuffs over long distances.

Attention is directed first at the important similarities and contrasts in the food expenditure patterns of the various cities with respect to each of the major commodity groups—the starchy staples, meat and fish, milk and milk products, vegetables and fruits, and legumes and other foods. An attempt is then made to review a few of the many factors responsible for the regional differences in food expenditure patterns—the influence of regional differences in patterns of food production, the influence of preferences associated with tribal origin on urban diets, and food price relationships in different cities. This examination of relative prices throws a little light on differences in food expenditure patterns but is of primary interest in suggesting the way in which food *consumption* patterns expressed in calories differ from food *expenditure* patterns.

Similarities and Contrasts in Food Expenditure Patterns

The starchy staples.—An indication of the variation in the position of individual staple foods in food expenditure patterns in 11 communities located in nine different countries is provided by Table 6.[12] The variation in the percentage of total food expenditure devoted to cereals (column 6) is much larger than the range represented by the figures showing expenditure on all staple foods (column 1). Similarly, there is enormous variation in the relative importance of roots, tubers, and plantains as shown in column 11, the proportion varying in the figures shown from less than 7 per cent in Dar es Salaam to 28 per cent in Kampala. Actually, the range is even greater because data are not available concerning expenditure on roots or plantains in Salisbury, Nairobi, and the Senegalese cities simply because those items are so small an element in the local diets.[13] But in six of the eleven communities (or five of the nine countries) represented in Table 6, roots or plantains are of substantial importance. In Kaduna–Zaria, Sekondi-Takoradi, and Leopoldville, there is an approximate balance between expenditure on cereals on the one hand and on roots, tubers, and plantains on the other; and in all three of those communities manioc and its products stand out as the largest single category of expenditure among the staple foods. The Uganda cities are unique in that expenditures on plantains alone exceed expenditure on cereals, a situation which reflects the well-known preference of the Baganda and several other tribal groups in Uganda for "matoke" (plantains steamed and mashed) as a staple food.

[12] As explained earlier, the cities of Kaduna and Zaria in Nigeria and Dakar, Saint Louis, and Thiès in Senegal are treated as individual "communities" because separate data on the individual cities are not available.

[13] Sweet potatoes and manioc are of modest importance in Dakar, but those items are included in the "vegetable" category in the survey report.

Among the cereals, maize is the principal item of expenditure in the staple food category in Nairobi and Dar es Salaam and rice dominates in the Senegalese cities and in Abidjan. Bread is the principal item of staple food expenditure in Salisbury, but maize contributes a much larger fraction of total calories (Table 9, p. 259).

Expenditure on bread is of some importance in all of the cities, but its share of food expenditure ranges from only about 2 per cent in Kampala to 20 per cent in Salisbury. There is an indication that expenditure on bread may be influenced more by the attitudes toward food that hold sway in the various cities than by the level of income. The fraction of food expenditure devoted to bread in the cities of Southern Rhodesia is substantially larger than in Leopoldville, Abidjan, or Senegal, where the average incomes of the survey samples were higher. Particularly interesting is comparison of the situation in Salisbury and Bulawayo with bread consumption in the Ghanaian cities of Sekondi-Takoradi and Kumasi. Estimates of per capita annual consumption of bread, biscuits, and wheat flour in these four cities and Nairobi is presented in the following tabulation along with figures showing monthly per capita income and expenditure on these items as a proportion of the total food budget.[14]

City	Per capita monthly expenditure (*Shillings*)	Per capita annual consumption and share of food expenditure					
		Bread		Biscuits and buns		Wheat flour	
		Kg.	Per cent	Kg.	Per cent	Kg.	Per cent
Salisbury	83.9	71.8	19.4	1.2	1.1	...	...
Bulawayo	61.0	49.0	14.7	1.4	1.4	1.8	.7
Sekondi-Takoradi ..	62.2	6.4	3.5	.2[a]	.3[a]	...	.1[a]
Kumasi	68.0	3.4	2.4	.6[a]	.4[a]	...	.2[a]
Nairobi	79.1	20.0	6.0	1.8	.5	17.3	3.8

[a] Imported.

Inasmuch as Ghana's wheat flour imports in 1955, the year of the Kumasi and Sekondi-Takoradi surveys, were equivalent to about 6 kilograms per person per year for the entire country, there is undoubtedly substantial underreporting of bread purchases in the survey data since bread consumption tends to be concentrated in urban areas (although it is less important in these two cities than in Accra).[15] Even making allowance for considerable underestimation in Kumasi and Sekondi-Takoradi, the indication is strong that bread consumption is much higher in the Southern Rhodesian cities. The same is undoubtedly true of Nairobi if account is taken of the substantial purchases of wheat flour as well as bread. A comparison between bread consumption and consumption of milk and milk products presented below seems to give additional support to the proposition that,

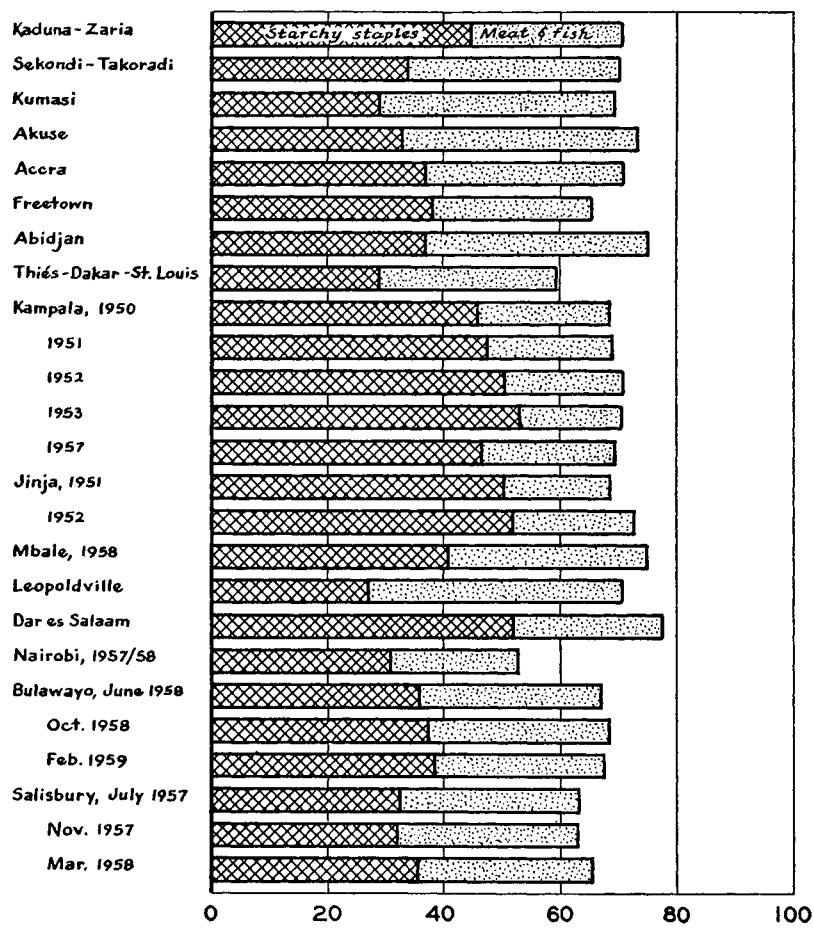
[14] Except for the Ghanaian cities, the quantity figures were derived from expenditure data using the average prices ruling in the respective markets as given in the survey reports. The figures on bread consumption in Sekondi-Takoradi and Kumasi are based on subsamples of 96 and 120 households for which quantity data were collected, but the expenditure estimates relate to the full samples of 546 and 570 households, respectively. For Bulawayo and Salisbury the figures are for unrationed families in their own houses, in the middle income group, per "man unit." For Nairobi figures are per consumption unit. See Appendix Table II for sources of data.

[15] Ghana's flour imports in 1957 were 34 thousand tons and the population was probably something like six million. The ruling official estimate of the country's population in mid-1959 was 4.9 million, but the provisional figure for 1960 according to the census carried out that year was 6.7 million.

with respect to families at income levels considered here, differences in bread consumption may be influenced more by prevailing food preference patterns than by differences in income level. Preferences in Southern Rhodesia and Kenya are perhaps more influenced by European tastes than elsewhere.

Meat and fish.—Expenditures on meat and fish and the outlay on starchy foods dominate the food budgets considered here. The two categories together account for around 70 per cent of total food expenditure in most cities. Chart 5 indicates that in most cities there is an approximate balance between expenditure devoted to the starchy staples on the one hand and to meat and fish on the other. In a few cities, notably Kaduna-Zaria, Kampala, Jinja, and Dar es Salaam, expenditures on the starchy staples are much more important than outlays for meat and fish. Only among the relatively high-income group of *évolués* in Leopoldville does the share of expenditure devoted to meat and fish exceed the outlay on starchy staples by a substantial margin. Although the proportion of food expenditure spent on

CHART 5.—EXPENDITURE FOR STARCHY STAPLES AND MEAT AND FISH AS PER CENT OF TOTAL FOOD EXPENDITURE, SELECTED CITIES OF TROPICAL AFRICA*



* Data from Appendix Table III.

meat and fish is variable, the modal value is in the neighborhood of 35 per cent.

In the cities of East and Central Africa, meat occupies a much more important position in the food budget than fish. Only in the coastal city of Dar es Salaam and in Jinja, on the shore of Lake Victoria, does expenditure on fish rival the outlay for meat. In the West African cities, however, expenditure on fish and shellfish is generally greater than the outlay for meat. Among the coastal cities, it is only in Abidjan that expenditure on meat exceeds that allotted to fish and there only by a slight margin. In the inland cities of Kumasi and Kaduna–Zaria, however, meat purchases are considerably larger than the expenditures on fish.

Milk and milk products.—Expenditure on milk and milk products ranges from only about 1 per cent of total food outlay in Abidjan to 10 or 11 per cent in Salisbury and Nairobi. In most of the cities considered, imported condensed or evaporated milk is the principal item in this category; but in Salisbury purchases of fresh milk are of equal or greater importance, and the same is undoubtedly true of Nairobi, although the survey report does not give this breakdown.

Data on this food group are lacking for some cities, so that generalization is precarious. Nevertheless, the data seem to suggest an interesting relationship between the percentage of expenditure devoted to bread and that devoted to milk and milk products in communities where such a comparison is possible. A tendency for the proportion of expenditure devoted to milk and milk products to be large where that devoted to bread is large is in evidence in the following tabulation.[15a]

City	Per capita monthly expenditure (U.S. dollars)	Per cent of food expenditure spent for	
		Bread, flour biscuits	Milk, milk products
Kumasi	9.5	3.0	1.8
Abidjan	27.1	3.1	1.4
Sekondi-Takoradi	8.7	3.8	2.2
Akuse	6.3	4.5	3.0
Accra	10.4	6.2	4.5
Freetown	...[a]	6.9	3.7
Thiès–Dakar–Saint Louis	...[a]	7.2	3.5
Leopoldville	...[a]	7.6	4.9
Nairobi	11.1	10.3[b]	10.8
Bulawayo	8.5	16.8	6.4
Salisbury	11.7	19.4	8.3

[a] Per capita income cannot be computed because family size is not given; Leopoldville and the Senegalese cities rank at the top of the communities studied on the basis of income per household, whereas the households included in the Freetown survey had the lowest average income of any of the West African cities considered here.

[b] Of this, 3.8 per cent is accounted for by wheat flour.

Since urbanization is a fairly recent phenomenon in most of tropical Africa, there is reason to expect that food consumption patterns would depend a good deal on the degree of exposure to unfamiliar foods and the acculturation that has taken place. This would, of course, be especially true of such foods as bread and milk products. Bread does not figure at all in the traditional diets of the region, and milk consumption was largely restricted to some of the nomadic pastoralists.

15[a] See note 14, p. 248. Data for Abidjan are per consumption unit.

As was suggested earlier with respect to bread, the nature and extent of urbanization and acculturations seem to rival or exceed the influence of income level *per se*. And the similarity in the way in which the position of bread and of milk products varies from city to city suggests that the influence exercised on native diets by European dietary habits probably has a good deal to do with the local expenditure patterns for these commodities.

Vegetables and fruits.—The share of vegetables and fruits in total food expenditure ranges from approximately 13 per cent in Sekondi-Takoradi and Kumasi to only about 3 per cent in the Uganda cities (Appendix Table III). It is not possible to compare the position of individual fruits or vegetables because many of the budget reports simply give a total for "vegetables" or "fruits." The data for some of the West African cities indicate that garden eggs (eggplant), okra, onions, tomatoes, and in particular peppers are the vegetables most commonly used.

As would be expected because these products are costly sources of calories, the data suggest a loose relationship between percentage devoted to fruits and vegetables and the level of income. The proportion is low where household incomes are low, as in the Uganda cities, and high where incomes are comparatively high, as in Ghana. It should be recognized, however, that in some cities in tropical Africa, and this is particularly true of Kampala and Jinja and still more of the town of Mbale, home food gardens (*shambas*) play an important role in supplying fresh vegetables and legumes as well as some starchy staples to households. Data concerning purchases of vegetables and fruits may therefore not give a satisfactory indication of the actual importance of these foods in some communities.

Legumes and other foods.—Among the remaining foods that play a part in African urban diets, sugar, beans, peanuts, and other oilseeds attract attention. Data concerning these commodities are not available for some of the cities, so that generalization is somewhat difficult. Nevertheless, sugar clearly is considerably more important in the cities of East Africa and Southern Rhodesia, where it accounts for some 4 to 10 per cent of the total food budget, than in West Africa or the Congo, where expenditure on sugar ranges from 1 per cent in Abidjan to about 5 per cent in the Senegalese cities. In terms of quantities, sugar consumption per capita in the West African city of Sekondi-Takoradi is only a little over 5 kilograms annually compared with approximately 33 kilograms in Salisbury (*36*, p. 149 and Table 9, p. 259). Tea drinking appears to be a good deal more prevalent in East and Central Africa than in West Africa, and this probably accounts in part at least for the large difference in sugar consumption.

Beans and peanuts (groundnuts) are conspicuously important in the diets of the East African cities. Especially in the Uganda cities of Kampala and Jinja, where food purchases are not so strongly influenced by supplies obtained from home food gardens, the percentage of food expenditure devoted to these items exceeds 10 per cent, peanuts accounting for most of the expenditure in this category. In Nairobi and Dar es Salaam, however, peanuts appear to be of slight importance in urban diets. On the other hand, palm nuts, and to a lesser extent coconuts, bulk much larger in West Africa than in the cities of East and Central Africa. The Sekondi-Takoradi data indicate that palm nuts and other oilseeds account for as much as 6 per cent of total food expenditure.

Factors Responsible for Regional Differences in Expenditure and Consumption Patterns

Many factors are responsible for the observed regional differences in food expenditure and consumption patterns. Among these, the following are probably of prime importance:

1. Regional differences in the physical environment that determine, or at least strongly influence, the food crops that can be grown in the hinterland supplying a particular city.
2. Storage, transportation facilities, and the development of marketing systems which affect the extent to which urban centers are able to draw upon distant producing centers.
3. The degree of reliance on imported food.
4. Differences in income levels that determine the extent to which consumers can afford to include substantial quantities of the more costly foods.
5. Cultural and historical factors that influence food preference patterns.
6. The degree to which diet patterns have been modified as a result of exposure to external influences and the nature of the acculturation that has taken place.

The first three factors affect the supply of foods available for consumption, whereas the last three all condition the demand for various foods in a community. The supply and demand factors together determine the structure of food prices, and the relative prices of competing foods also influence consumer demand. It is clearly impossible to unravel the effect of these complex and interdependent factors on the observed differences in food expenditure patterns considered here. Nonetheless it is of interest to review certain evidence relating to (1) the supply of foods available to different cities, (2) tribal differences in food preferences, and (3) the structure of food prices, each of which throws some light on the existing regional variation in food expenditures and consumption.

Regional differences in food production and imports.—For the rural population of tropical Africa, variations in food consumption are largely a direct result of the variation in crops grown. The regional variations in food production, a distinctive feature of agriculture in tropical Africa, are in turn mainly the result of regional differences in climate and soil conditions that determine the crops that can be successfully grown. Within the limits set by the physical environment, however, food preferences related to historical and cultural factors exert their influence. The factors responsible for the preferences that prevail in different localities are complicated and often obscure. Thus it is usually impossible to say whether, in a particular district, a certain combination of crops is grown because those commodities are preferred—or that they are preferred because they are grown and therefore familiar.

In urban centers the dependence on locally produced food is obviously less than in a rural village. Particularly with respect to the starchy staples, however, the bulk of urban supplies in tropical Africa is usually drawn from nearby producing areas. Thus the proximate explanation for the dominance of plantains in Kampala and Jinja is simply that they are located in areas where plantains are the chief staple food produced. Much the same can be said with respect to the importance of manioc in Leopoldville; of manioc and maize in Accra, Sekondi-

Takoradi, and Akuse; of manioc and plantains in Kumasi; and of maize alone in Dar es Salaam, Nairobi, Salisbury, and Bulawayo. In the cities where rice is dominant the situation is more involved. Rice production is of substantial importance in the hinterlands supplying Freetown and Abidjan, but imported rice has satisfied a considerable part of the expanding food requirements in those cities. In Senegal, the rice consumed in Dakar, Saint Louis, and Thiès is mainly imported. Millets and sorghums are by far the dominant staple foods produced in the country, but with the development of peanut exports over the past half-century Senegal has come to depend to a considerable extent on imported supplies of rice. And in the urban areas consumers exercise a preference for rice to the extent that their purchasing power permits. Among the lower income survey families expenditures on rice were about five times as large, and among the higher income brackets rice purchases were nearly ten times as large as the outlay for millets and sorghums.

Influence of tribal origin on food expenditure and consumption patterns.— There is reason to suppose that the tribal origin of urban consumers is one of the cultural and historical factors which exerts an especially important influence on food consumption patterns and regional variations in those patterns. This is suggested by the differences in the traditional diets of various tribal groups and by general knowledge concerning the persistence of food habits. To cite one important example, it is virtually certain that the importance of roots and tubers in the cities of Kaduna and Zaria in northern Nigeria is to be attributed to the large numbers of Ibo and other groups from southern Nigeria employed as clerks and in other skilled or semiskilled jobs in the Northern Region. Kaduna and Zaria lie in a region where millets and sorghums are by far the dominant food crops, but in the survey sample manioc and yams accounted for nearly 20 per cent of total food expenditure and the millets and sorghums for only 6 per cent of the total.

The only quantitative data available that provide specific information concerning the variation in food expenditure and consumption patterns of different tribal groups are provided by the budget surveys for Kampala and Mbale in Uganda. The comparison of food expenditure and consumption patterns by tribal group in Table 7 is limited to Kampala because the Mbale data are so strongly influenced by home production.[16]

It will be seen in Table 7 that expenditure and consumption patterns for sugar and meat do not display such pronounced differences among tribal groups as can be observed for the starchy staples and legumes and fish. The unusually important position of peanuts in the Uganda cities has already been mentioned; but the Kenya tribes are a notable exception, for their expenditure on peanuts amounts to only about 2 per cent of total food outlay compared with 10–15 per cent for the other tribal groups. It is also of interest that the Kenya tribes, with small expenditure for both peanuts and beans, and the Baganda with the lowest

[16] Even for single men without dependents, home garden production is of considerable importance in Mbale, although its importance varies tremendously from tribe to tribe. Thus, the imputed value of home-produced food amounted to 25 shillings per month for single men of the Bukegi tribes (Badama, Banyole, and Bagwere), while the expenditure for food averaged 38 shillings per month. But for single men of the Acholi and Sudanese tribes and of the Kenya tribes the imputed value of *shamba* production was only six shillings compared with food purchases of 39 shillings monthly.

TABLE 7.—TRIBAL COMPARISON OF TOTAL EXPENDITURE, FOOD EXPENDITURE, AND FOOD CONSUMPTION PATTERNS, KAMPALA, 1957*

A. Total Expenditure and Outlay on Food

Tribe	Number of budgets	Expenditures (*Shillings*) Total	Food	Per cent spent for food
Baganda	12	68.12	36.30	53
Batoro	11	63.90	32.65	51
Banyankole	19	65.62	33.81	52
Kenya tribes	11	68.18	33.37	49
Ruanda-Urundi and Congo tribes	13	57.62	34.17	59
All tribes[a]	94	65.26	36.21	56

B. Food Expenditure and Consumption Patterns

Tribe	Maize meal	Matoke (plantain)	Manioc[b]	Sweet potatoes	Sugar	Peanuts	Beans	Meat	Fish[c]
				Per Cent of Total Food Expenditure					
Baganda	4	30	2	2	7	11	2	17	9
Batoro	10	11	10	11	6	13	7	13	2
Banyankole	29	15	1	2	6	15	3	15	2
Kenya tribes	33	3	1	2	11	2	2	13	14
RUC tribes[d]	6	24	5	11	9	10	6	11	4
All tribes[a]	17	17	3	6	7	10	5	14	6
				Estimated Calories Per Capita (Man) Per Day					
Baganda	337	1,792	123	97	267	266	101	74	40
Batoro	675	593	681	530	208	285	355	52	6
Banyankole	1,998	806	78	117	212	354	187	62	10
Kenya tribes	2,300	178	57	114	380	52	108	54	56
RUC tribes[d]	412	1,310	378	541	316	226	329	47	17
All tribes[a]	1,275	1,013	241	334	258	255	285	60	26
				Relatives: Calories Per Capita (Man) Per Day for All Tribes = 100					
Baganda	26	177	51	29	103	104	35	123	154
Batoro	53	58	282	159	81	112	125	87	23
Banyankole	157	80	32	35	82	139	66	103	38
Kenya tribes	180	18	24	34	147	20	38	90	215
RUC tribes[d]	32	129	157	162	122	89	115	78	65
All tribes[a]	100	100	100	100	100	100	100	100	100

* Data for men without dependents in the lowest ("A") income group; i.e., up to 79 shillings per month. Expenditures and prices (used to compute quantities) from 7, Tables 3, 5, 7, and VI. For calorie factors used, see Appendix Table V.

[a] Includes tribes not shown above.

[b] Quantity and calorie estimates derived using the price and calorie value of manioc flour.

[c] Quantity and calorie estimates obtained using the price of smoked fish (*ngege*) and a corresponding calorie conversion factor.

[d] Ruanda-Urundi and Congo tribes.

expenditure for beans, purchase substantially more fish than the other groups. The exceptionally low proportion of food expenditure devoted to fish by the Batoro and the Banyankole also merits attention. Fallers has pointed out that the low consumption of fish among the Batoro reflects their taboo against eating fish, and the survey data give rise to a suspicion that a taboo against fish may also prevail among the Banyankole (*17a,* p. 27).

The Baganda, who comprise the largest single tribal group in Uganda, inhabit Buganda Province, which includes the city of Kampala. Matoke (plantain) is the staple food par excellence of this tribe, supplying over half of the total calorie intake.

The Batoro, who live south of Lake Albert adjacent to Buganda, are an interesting example of a group in Kampala for which the percentage of food expenditure devoted to each of the starchy staples is similar. Maize meal, plantains, cassava, and sweet potatoes are all about equally important in terms of calorie contribuition as well as in terms of expenditure.[17] Peanuts and beans occupy important proportions in food expenditure and assume the role of major sources of protein.

The Banyankole in Kampala, who come from the extreme southwestern part of Uganda, where plantains are not widely grown, appear to continue to prefer maize meal to matoke, the former contributing about half of the total calorie intake.

Among members of Kenya tribes living in Kampala, the dominant staple is clearly maize meal, a result that is scarcely surprising in view of the dominant position of maize in diets in Kenya. Other starchy foods are of only slight importance. In contrast, for members of the tribe from Ruanda-Urundi and the Congo, plantains and root crops are the major staples and maize meal is of only limited importance.

The present discussion has been limited to a comparison of food expenditure and consumption patterns in 1957, the most recent year for which information is available. It should also be noted that there were marked tribal differences in the response of Kampala consumers to the sharp rise in food prices in 1953 which was considered in section III. For example, the Banyankole and Batoro reduced their consumption of plantains more sharply than the Baganda, and additionally relied almost entirely upon increased purchases of maize meal to compensate for the reduced purchases of plantains. The Baganda, however, relied mainly on increased purchases of sweet potatoes, which were considerably cheaper than plantains in 1953 but a much more expensive source of calories than maize in that year. They appear to have placed a high premium on obtaining a substitute that could be prepared in much the same way as plantains (*28,* pp. 117–19).

In the comparison of tribal food consumption patterns in Table 7 (p. 254) use was deliberately made of data pertaining to men without dependents belonging to a single income group. Consequently, the variations in expenditure due to income and family status were substantially eliminated; but at the same time this meant that each tribal group was represented by a very small number of

[17] The Batoro tribesmen living with dependents in Kampala, however, show a distinct preference for plantains over maize, manioc, and sweet potatoes. The fraction of food expenditure devoted to plantains is about 21.5 per cent, while that devoted to each of the other three staples is only about 8 per cent.

budgets. For the survey sample as a whole, the average total income of the Baganda was appreciably higher than for the other groups because the Baganda had greater opportunity to secure additional income from the sale of food crops and beer. This difference was apparently not so pronounced with respect to the single men considered here, since they were not living with dependents who could tend food gardens and brew beer.

To a considerable extent the variation in expenditure shown in Table 7 (p. 254) reflected differences in saving among the various tribal groups. For the Kampala sample as a whole, average expenditure was very nearly equal to average income, but the differences in current saving per head of different tribal groups is nonetheless appreciable (*7,* p. 8):

Baganda	2 shillings per head per month
Batoro	6 shillings per head per month
Banyankole	9 shillings per head per month
Ruanda-Urundi and Congo tribes	9 shillings per head per month

A prevalence of "target" working to accumulate a certain amount of savings is suggested by the relatively high figures for the Ruanda-Urundi and Congo tribes and the Banyankole, whose homes were far from Kampala. Under such circumstances, consumption patterns will obviously be affected not only by the incomes that various groups receive but by factors that determine how much of their income will be saved.

Food price relationships.—Food expenditures, being the product of quantity and price, may be influenced by differences in either the commodity composition or differences in relative food prices. It appears, for example, that the comparatively small share of the food budget devoted to the starchy staples in Kumasi and the relatively large share spent on meat and fish can be largely explained on the basis of price relationships. Price data summarized in Table 8 indicate that staple food prices are relatively low in Kumasi, whereas prices for meat and fresh fish are comparatively high. Comparison of the quantity data available for Kumasi and Sekondi-Takoradi suggests that it is this difference in price relationships that accounts for the fact that the share of staple food expenditure is only 28.6 per cent in Kumasi as compared with the more typical figure of 33.0 per cent for Sekondi-Takoradi, whereas the proportion devoted to meat and fish is 41.0 and 36.5 per cent, respectively. Estimated per capita consumption of staple foods among the quantity subsample in Kumasi was equal to 1,364 calories daily, or slightly more than the 1,260 calories contributed by starchy staples in Sekondi-Takoradi. Meat consumption, expressed in calories, was somewhat larger in Kumasi than in Sekondi-Takoradi, but this was almost exactly offset by the higher intake of fish in Sekondi-Takoradi (*36,* p. 148).

Careful analysis of food price relationships in the various African cities might also reveal some instances in which relatively high prices discouraged, or low prices encouraged, consumption of particular commodities. Casual scrutiny of the relative prices shown in Table 8 for eight cities (and five countries) does not seem to indicate any very plausible examples of this type of price influence on consumption. It could perhaps be argued that the relatively high consumption of sugar among the low-income sample in Kampala is due in part to the fact that sugar is relatively cheap there. On the other hand, the same price of sugar is

TABLE 8.—THE STRUCTURE OF MAJOR FOOD PRICES, SELECTED CITIES*

A. Food Prices in Shillings Per Pound

City	Maize[a]	Manioc		Plantain	Rice	Meat	Peanuts	Sugar	Fish		Onions	Tomatoes
		Fresh	Gari[b]						Fresh	Dried		
Sekondi-Takoradi	.34	.09	.35	.10	.60	1.35	.44	.77	1.50	1.72	.97	1.19
Kumasi	.24	.09	.32	.06	.59	1.75	.62	...	2.44	.96	.83	.79
Akuse	.23	.09	.24	.11	.96	1.58	.42	...	1.19	1.14	.66	.41
Salisbury	.26	...	...	...	1.33	1.70	...	.77	1.70[c]		1.00	1.00
Bulawayo	.27	...	...	...	1.33	1.42	...	.78	1.70[c]		.80	.70
Nairobi	.32	...	...	.20	1.00	1.52	...	.62	...	...	.22	...
Dar es Salaam	.20	.12	.22	...	.54	.70	...	.44	2.85	2.43	.66	...
Kampala:												
1951	.20	.05	.29	.09	...	1.10	.59	.43	...	1.92[d]	...	...
1952	.30	.07	.30	.08	...	1.22	.60	.45	...	2.84[d]	...	...
1953	.28	.17	.41	.21	...	1.50	.65	.62	...	...	...	...
1957	.26	...	.30	.07	...	1.99	.85	.54	...	2.46[d]	...	...

B. Price Relatives: Price of Maize Per 1,000 Calories = 100

Item	Sekondi-Takoradi	Kumasi	Akuse	Salisbury	Bulawayo	Nairobi	Dar es Salaam	Kampala		
								1952	1953	1957
Maize[a]	100	100	100	100	100	100	100	100	100	100
Manioc:										
Fresh	86	120	129	...	...	...	200	78	200	...
Kokonte	86	80	71	...	...	...	...	...	...	...
Gari[b]	105	140	114	...	...	...	116	111	159	125
Cocoyam	171	173	314	...	...	...	...	...	...	...
Plantain	138	120	228	...	...	310	...	133	365	131
Rice	176	140	421	515	482	320	275	...	...	...
Yam	257	280	436	...	...	...	...	...	...	...
Bread	390	507	528	284	270	289	317	...	...	319
Sweet potatoes	...	...	...	...	...	...	...	111	253	169
Meat	886	1,607	1,557	1,526	1,153	1,131	800	961	1,247	1,756
Peanuts	119	233	171	...	...	...	...	189	218	300
Sugar	...	...	...	274	259	184	208	144	206	194
Fish:										
Fresh	2,390	5,440	2,842			...	7,942	...	...	...
Smoked	957	1,453	1,021	1,150[c]	1,082[c]	...	...	1,616[d]	...	1,656[d]
Dried	886	693	879			...	2,192	...	...	...
Onions	2,747	3,293	2,800	3,719	2,800	655	3,266	...	...	...
Tomatoes	6,590	6,127	3,407	7,269	4,788	...	...	...	...	...
Cabbages	...	...	...	4,056	3,818	1,755	...	...	...	...
Peppers	3,933	4,706	3,929	...	...	...	...	...	...	...

* Prices in shillings per pound from respective surveys (*21, 20, 19, 42, 40, 4, 6, 7, 8, 9, 10*). See Table 1 (p. 232) for dates, and Appendix Table V for calorie factors used to compute price relatives.

[a] Shelled maize or maize meal.

[b] Flour.

[c] Fish, unspecified.

[d] Smoked (*ngege*).

reported for Sekondi-Takoradi and Salisbury, but consumption in the latter city is some six times higher.

The principal purpose of this brief examination of food price relationships is to point out that there seems to be a fairly stable hierarchy of food prices at least

among these cities for which fairly comparable price data are available. Bennett has suggested that there is probably a "world hierarchy of price per 1,000 calories," and it is to this sort of relationship that attention is directed in Table 8 (*3*, pp. 127–28). It will be seen that there are very large differences in the costliness of various foods and food groups as sources of food energy. Thus meat is from 8 to 18 times as expensive as the cheapest starchy staples in terms of its price per 1,000 calories, and tomatoes are from 35 to 70 times as costly on a calorie basis. This means, of course, that there is a marked difference between the pattern of food *expenditure* and the pattern of food *consumption*. The contrast is illustrated by the data for Salisbury shown in Table 9. It will be noted, for example, that although the starchy staples account for nearly 70 per cent of the calorie intake they claim not quite a third of the food budget. Conversely, meat, fish, and eggs contribute only 7 per cent of the calorie supply but account for close to 30 per cent of total food expenditure.

Analysis of food price relationships in tropical Africa is handicapped by the fact that more or less comparable price data are limited to a small number of cities and by the lack of accuracy and comparability that characterizes the data that are available. Collection of price data in African cities encounters a number of difficulties. Much of the produce is not sold by weight or standard volume but in a variable "heap" or "bunch." The Salisbury survey report notes that many purchases are made by Africans not in terms of quantities but in terms of what a fixed sum of money will buy. Thus meat is not bought by the pound but in one-shilling or two-shilling parcels; and mealie meal, sugar, and other foodstuffs are purchased in a similar fashion. Since neither buyer nor seller knows exactly how much such a "heap" or "bunch" contains, there is scope for irrational price variation. It was also observed in both Salisbury and Bulawayo that families purchased an appreciable portion of their maize meal in 100-pound bags at a lower price than when purchases were made in small quantities (*42*, p. 52; *40*, p. 47).

A further difficulty is that produce is not, in general, sorted into recognized grades, so that there is difficulty in obtaining consistent prices over time and space. Furthermore, a report of the Uganda Unit of the East African Statistical Department observes that "the individual relationship between buyer and seller, arising out of the transaction, affects the price. Bargaining is a form of social activity as well as a means of fixing prices" (*12*, p. 1). According to the Kampala survey report for 1951, prices fluctuated greatly, not only between the two dates at which purchases were made but also among the five markets in the city, and even according to the time of the day. Although the conditions in these Kampala markets may be extreme, it can be suspected that similar conditions prevail in varying degrees in all the markets.[18]

In Table 8A (p. 257) are shown prices derived from selected budget surveys whose standard accounting unit is the pound or shilling. The price data included

[18] The Nairobi survey of 1950 states that there were very few price fluctuations from purchase to purchase and concludes that price fluctuations were not of importance in Nairobi (*5*, p. 14). On the other hand, monthly average wholesale market prices of major staples as reported by the Ghanaian Department of Agriculture show fluctuations of considerable magnitude from month to month. In Accra markets, for instance, the wholesale price of maize doubled between January and December of 1955, with another distinct peak in May. In 1957/58 the price of maize nearly doubled between its low point in December and its seasonal peak in June. The range of variation for gari, however, was considerably less (*36*, p. 171).

TABLE 9.—COMPARISON OF FOOD EXPENDITURE AND CONSUMPTION PATTERNS IN SALISBURY, 1957–58*

Item	Monthly expenditure per household		Daily consumption "man unit"		
	Pence	Per cent of total	Quantity (pounds)	Calories	Per cent of total calories
Bread	364	18.9	.430	585	23.8
Buns	20	1.0	.007	10	.4
Maize meal	220	11.4	.652	1,053	42.8
Rice	24	1.2	.013	21	.9
Total	628	32.5	...	1,669	67.9
Jam	16	.8	.008	10	.4
Sweets	...	...	.001	2	.1
Sugar	210	10.9	.201	353	14.3
Total	226	11.7	...	365	14.8
Rape and beans	...	...	.057	87	3.5
Peanuts (groundnuts)	...	...	.007	12	.5
Total	...	...	...	99	4.0
Cabbage	...	...	.042	3	.1
Green mealies	...	...	.032	5	.1
Tomatoes	...	...	.015	1	—
Garden vegetables	...	...	.014	1	—
Total	94[a]	5.0[a]	...	11	.4
Fruits	30	1.6	.048	9	.4
Meat	499	26.0	.215	152	6.2
Fish	22	1.1	.010	3–5	.2
Poultry, eggs	24	1.2	.007	4–5	.2
Total	545	28.3	...	159–162	6.6
Cooking oil	24	1.2	.007	28	1.1
Margarine, butter	59	3.1	.019	62	2.5
Total	83	4.3	...	90	3.6
Milk, fresh	104	5.4	.131	39	1.6
Milk, tinned	52	2.7	.019	12	.5
Total	156	8.1	...	51	2.1
Beer, African	20	1.0	.053	5	.2
Beer, European	30	1.6	.011	1	—
GRAND TOTAL	1,921[b]	100.0[b]	...	2,459–2,462	100.0

* Averages for July and November 1957 and March 1958, for unrationed families in their own houses in median income class (monthly household income ranging from £14 12*s.* 6*d.* to £17 9*s.* 4*d.*), with 3.7 "man units" per household (*42*, pp. 40, 50). The source cited computed "man units" on the basis of FAO estimates of calorie requirements by age group (*42*, pp. 11–15, 48). The monthly quantity per household figures given in the source were derived on the basis of market prices prevailing at the time of the expenditure surveys. Daily quantities and calories per "man unit" are our computation, using calorie factors in Appendix Table V and sources cited therein. Per cents spent do not agree exactly with those in Appendix Table IV, because beer is included here.

[a] Probably includes rape and beans, and peanuts.

[b] Includes expenditures for tea, meals away from home, and "other foodstuffs" (60, 36, and 13*d.*, respectively) not shown above or taken into account in daily consumption figures.

in these survey reports were obtained, in general, by making actual purchases in markets, weighing the purchased commodities, and sometimes consulting experts in the grading of these commodites. Despite these efforts to obtain as much accuracy as possible, the data must be treated with reserve. A certain number of extreme and apparently erratic price variations are apparent in the table, but in general there seems to be a rather surprising degree of similarity among the prices that prevailed in different places and in different periods. The sharp rise in prices in Kampala in 1953 was due to the drought and ensuing food shortage discussed earlier. Many of the large geographical variations also seem reasonable in relation to local conditions affecting costs of production or transportation, for example, the high cost of plantains in Nairobi, which is located in an arid zone some distance from areas well suited to the production of plantains or bananas.

Table 8B (p. 257) also shows price relatives for 20 foods or food products, based on their price per 1,000 calories and taking the price of maize as equal to 100. Examination of these price relatives seems to suggest that there exists a reasonably consistent hierarchy in the prices of different foods in these cities for which price data are available. In general, the prices of starchy roots, tubers, and plantains and of first-processed starchy staple products (particularly maize meal and manioc flour or meal) tend to be the lowest and fresh fish and vegetables the highest per 1,000 calories. (Fruits also rank very high in price per 1,000 calories because, like vegetables, they have a high water content and low calorie value.) The general price hierarchy seems to run about as follows in ascending order:

1. Manioc, maize, and their products
2. Plantains, cocoyams, sweet potatoes, peanuts, and sugar
3. Yams, rice, and bread
4. Meat and smoked or dried fish
5. Fresh fish and vegetables

The variability of relative prices from city to city tends to increase for those commodities higher in the hierarchy. The price relatives for rice range roughly from 150 to 500, of yams from 260 to 430, and of bread from 300 to 500. The price per 1,000 calories of meat varies widely from some 800 to roughly 1,800, perhaps reflecting variations in grade or quality which it was not possible to consider in these comparisons.

V. PROSPECTIVE CHANGES IN FOOD CONSUMPTION WITH ECONOMIC DEVELOPMENT

Continuing urbanization and rising incomes will unquestionably lead to significant changes in food expenditure and consumption patterns in tropical Africa during the decades ahead. The nature of these prospective changes in urban demand will obviously have an important bearing on the pattern of expansion of crop, livestock, and fish production, and also on the food distribution and processing facilities that will need to be expanded and modernized.

The effort made in this study to obtain insight into prospective changes in food expenditure and consumption patterns in tropical Africa by comparative analysis of urban budget surveys has not yielded fully satisfying results. The evidence with respect to the responsiveness of different foods and food groups to

changes in incomes is rather contradictory and does not inspire great confidence. Some significant findings do emerge, however, and an important lesson is suggested which merits consideration in planning future budget studies in African cities.

Estimates of income elasticity of demand.—Under favorable conditions estimates of the elasticity of expenditure with respect to income provide a valuable indication of changes in consumption to be expected in response to rising incomes. The concept of income elasticity of demand is a simple one. The coefficient of elasticity, which is independent of units of measurement, can be thought of as indicating the percentage increase (or decrease) of expenditure corresponding to 1 per cent increase (or decrease) in income. A variety of complex problems are involved, however, in the calculation and interpretation of elasticity coefficients.

Several of the factors that make it difficult to draw valid inferences from income elasticity estimates have been suggested in previous sections. First and foremost is the fact that variations in food expenditure and consumption are associated not only with variation in income, but also with variations in family size and composition and with food preference patterns. Moreover, comparison of elasticity coefficients worked out from different budget surveys is risky because of the lack of parallelism in the concepts and procedures used. Again, elasticity coefficients derived from cross-section data provided by budget surveys of the type under consideration here, which refer to differences in income and consumption at a single point in time, may or may not yield useful inferences relative to the dynamic behavior of expenditures over time. The studies of consumer demand in the United States by Duesenberry, Friedman, and others have emphasized that the determinants of expenditure patterns of a household in a dynamic situation may well be a complicated function of past, present, and expected future incomes. Those considerations are probably relatively unimportant in considering food expenditure patterns in African cities. But factors such as the effect of moving from a rural to a city environment, the length of urban residence, the strength of the influences modifying traditional attitudes, and the degree of familiarity with novel foods such as bread, tea, and sugar are all likely to be of considerable importance.

Ideally, the estimation of coefficients of income elasticity from cross-section data should be based on groups as homogeneous as possible except for the differences in income level. Otherwise it is hazardous to infer that the observed differences in consumption patterns are mainly associated with differences in income level. In most of the surveys considered here there were substantial differences in the average size and structure of the families in the various expenditure classes and a strong positive correlation between income and family size. The Kumasi data on food expenditure as a percentage of total per capita expenditure presented in Table 2 (p. 237) indicated rather clearly that economies of scale characterize food purchases. There is a presumption that this is true of some of the other cities as well, so that per capita data relating to groups of households of different size and composition are not strictly comparable.

The importance of tribal variations in food expenditure and consumption patterns, illustrated by the Kampala data considered in section IV, is another

factor that may obscure the specific effect of increased income on food expenditure. The representation of various tribal groups in the different income classes of the survey samples may have been unequal, so that the changes in food expenditure from class to class may be strongly influenced by intercorrelation between tribal origin and income as well as the effect of differences in income *per se*.

In addition to dictating caution in drawing conclusions from the income elasticity estimates presented here, the above considerations emphasize a problem that calls for close attention in planning future budget surveys in tropical Africa. If the resources devoted to collecting expenditure data are to be of maximum value in clarifying the nature of the changes in food expenditure patterns likely to result from rising per capita incomes, it is essential to design the surveys so that comparisons can be made between groups as homogeneous as possible in all respects except level of income. This will pose difficult problems in sample design in order to minimize the influence of such factors as the size and the age and sex structure of households, tribal origin, and length of residence in an urban center, all of which may be responsible for variation in the expenditure patterns of different income classes unrelated to the effect of the level of income.[19] Since for most cities there is only a presumption that these factors are significant, it is no doubt desirable to conduct pilot surveys to determine whether they are sufficiently important in a particular city to justify a sampling procedure that seeks either to eliminate or to control their influence.

Estimates of income elasticity of expenditure for "total food," total starchy staples, meat and fish, milk, and bread are presented in Table 10 for seven cities. The cities selected are those for which it is possible to express expenditure of different income classes on a per capita basis or preferably, in terms of some sort of consumer unit. For reasons indicated earlier, *total expenditure* rather than income has been used as the independent variable. Apart from bread and milk, the estimated coefficients of elasticity in Table 10A refer to rather large groups of commodities, since aggregation reduces the seriousness of the problem of substitution among closely related commodities. The data for these seven cities cover mostly low-wage workers. In fact, the surveys in the Ghanaian cities and Mbale were so restricted, except as wages were supplemented by outside sources of income or by sale of home garden produce. A slightly wider range of African workers is represented in the data for Abidjan, Nairobi, and Salisbury (see notes to Table 10). These cities seem to be fairly representative of the ones under review in this paper, although the choice has been dictated by the nature of the data available. The coefficients were determined by a linear regression between the logarithms of total expenditure and expenditure on total food and the foods and food groups mentioned above; preliminary studies of the data by plotting on double-log scales seemed to confirm the reasonableness of the assumption of constant elasticity.[20] The values of the elasticity coefficients were computed from

[19] Measurement of income elasticity can, of course, be highly useful even though the changes in consumption are due to differences in income and concomitant variation in other factors that affect consumption patterns of different income groups, provided that there is a reasonably consistent association between income and these other factors. Under the conditions prevailing in African cities, however, there is reason to suspect that the association between level of income and some of the other variables likely to influence consumption, such as tribal origin or length of urban residence, is unstable, so that it is important to try to isolate the influence of variation in income *per se*.

[20] The technique of calculating the elasticity coefficients was adapted from Wold and Juréen (*46*, pp. 216–18).

TABLE 10.—"INCOME" ELASTICITY OF DEMAND FOR TOTAL FOOD, AND FOR SPECIFIED COMMODITIES, IN SELECTED CITIES*

A. Elasticity Coefficients for Seven Cities. Figures in Parentheses Are Per Cent of Total Expenditure

City	Total food	Total starchy staples	Meat and fish	Milk	Bread
Abidjan[a]	.69 (43.7)	.48 (16.1)	.82 (16.6)	2.34[b] (.6)[b]	...[c]
Sekondi-Takoradi[d,e]	.74 (57.7)	.62 (16.5)	.59 (18.6)	... (...)	1.99 (1.9)
Kumasi[d,f]	.86 (57.3)	.82 (15.0)	.64 (20.9)	... (...)	2.03 (1.3)
Accra[d,g]	.86 (58.0)	.76 (16.4)	.78 (14.3)	... (...)	.94 (2.9)
Mbale[h]	.69 (49.9)	—.16 (20.2)	1.77 (17.2)	... (...)	2.17 (.6)
Nairobi[i]	.69 (58.4)	.18 (18.1)	.80 (12.9)	.99 (6.3)	.63 (3.8)
Salisbury[j]	.58 (50.6)	.02 (15.2)	.60 (14.3)	1.16 (4.3)	.20 (10.0)

B. Elasticity Coefficients for Starchy Staples in Four Cities. Figures in Parentheses Are Per Cent of Total Food Expenditure

City	Total starchy staples	Bread	Manioc	Maize	Rice	Yams
Sekondi-Takoradi	.62 (31.6)	1.99 (3.7)	—.27 (9.1)	1.54 (8.4)	—.29 (4.2)	1.75 (2.1)
Accra	.76 (33.4)	.94 (5.8)	.70 (8.2)	.59 (12.2)	1.49 (3.1)	1.00 (2.1)
Nairobi	.18 (31.0)	.63 (6.5)	... (...)	—.10 (18.7)	... (...)	... (...)
Salisbury	.02 (30.1)	.20 (19.7)	... (...)	—.27 (10.4)	... (...)	... (...)

* The basis for converting to consumer units, the expenditure ranges, and sources shown in notes *a* and *d–j*.

[a] The Oxford scale of consumption unit; the monthly expenditure range 2,711–8,683 francs CFA per consumption unit (*22*).

[b] Includes such other dairy products as eggs and butter.

[c] Not separately shown. The per cent of expenditure for bread and cereals is 10.2, and the elasticity coefficient .46.

[d] Per capita basis without adjusting for age-sex structure. Except for total food, data by expenditure classes are available only for local food and its major components. Per cents shown above are in conformity with the elasticity coefficients computed from these data; see Table 6 (p. 246) and Appendix Table III for expenditure per cents made from more comprehensive data.

[e] The monthly expenditure range is 47.04–78.34 shillings per capita, using only the first 9 expenditure classes. Local food accounts for 52.3 per cent of total expenditure (*21*).

[f] The monthly expenditure range, 43.82–103.46 shillings per capita; all 12 classes; local food, 52.3 per cent of total expenditures (*20*).

[g] The monthly expenditure range, 37.19–112.48 shillings per capita; all 11 classes; local food, 49.2 per cent of total expenditures (*18*).

[h] The Oxford scale of consumption unit; the monthly *income* range, 30.44–50.18 shillings per consumption unit (*15*).

[i] The reported data on family composition were adjusted by the Oxford scale; the monthly expenditure per consumption unit, 63.82–102.76 shillings (*4*).

[j] Unrationed families in their own houses. The League of Nations' scale of man unit; the monthly expenditure range per man unit, 60.46–110.42 shillings (*41*). The per cents in parentheses are for the middle income group.

the data grouped according to family income and weighted by the number of persons or consumer units in the different expenditure classes.

The one really important conclusion to be drawn from Table 10 is that total expenditure on food tends to rise very substantially as income (total expenditure) rises. The lowest of the elasticity coefficients for "total food" is about .6 in Salisbury, and the figure is as high as .86 for two of the Ghanaian cities. This implies, subject to the qualifications mentioned earlier, that a 10 per cent rise in per capita

income in these cities could be expected to lead to an increase of some 6–9 per cent in total food expenditure. This represents an important characteristic of the demand for food in urban centers of tropical Africa and underscores the importance of ensuring that food supplies are expanded in pace with the growth of demand in order to avoid serious inflation.[21] Income elasticity estimates as high as .6 to .9 point up a significant difference in the demand for food in developing economies as compared to economically advanced countries where the income elasticity of demand for "total food" seems to be on the order of .2 or .3.[22] And since the effect of rising incomes is augmented by rapid growth of population in most underdeveloped countries, the expansion of food production is frequently an important and formidable problem.

The other elasticity coefficients shown in Table 10 (p. 263) are rather divergent and their meaning is far from clear. With the exception of the Ghanaian cities, the elasticity coefficients for total starchy staples are less than for "total food" while the coefficients for meat and fish are higher. This is, of course, in accordance with the usual expectation that the share of the starchy staples in food expenditure and consumption will decline while the more expensive products such as meat and fish increase in importance. In view of the previously observed constancy of the share of the starchy staples in total food expenditure in the Ghanaian cities, it would be expected that the data would yield high estimates for the income elasticity of demand for staple foods. In Kumasi, the coefficient for the starchy staples is even appreciably higher than for meat and fish, and in the other two cities the figures for meat and fish and the starchy staples is about the same. This is indeed a puzzling result. It partly reflects a high "quality" (as opposed to "quantity") elasticity since, as was noted in section III, there is a tendency to shift toward more expensive items within the starchy staple category. This unexpected result led Poleman to conclude that the usual expectation concerning changes in food consumption patterns with economic development might not be applicable to African cities, at least for the income categories represented in the Ghana surveys. In this regard Poleman cites an observation made by Hugh and Mabel Smythe in their recent study of the elite in Nigeria in which they report that "food has little relation to social status . . . . The elite may be able to afford a finer cuisine than the rest of the population, but they usually adhere to the standard dietary pattern" (quoted in *36,* p. 161n). If this statement simply means that higher income groups continue to consume substantial quantities of the traditional starchy staples, it is well confirmed by the food expenditure data analyzed in this paper—at least in so far as members of the elite are included in the income ranges encompassed by the various budget surveys that have been considered. But if it is intended to suggest that there are no significant changes

[21] A country may, of course, import all or part of the increased food supplies if foreign exchange, credit, or food grants make this possible. But it is usually desirable for a developing economy to satisfy a major part of the enlarged demand by increasing the productivity and output of domestic agriculture. For a brief consideration of some of the relevant considerations see *26a,* pp. 573–74.

[22] The estimates of income elasticity derived from urban budget data for these African cities are believed to be a reasonably good approximation of income elasticity with respect to food expenditure measured at the farm level, the concept that is relevant to assessing the growth of demand for agricultural products. This view is based on the fact that the processing, packaging, and marketing components incorporated in foods purchased at retail are relatively insignificant; the services embodied in the foods as purchased are simple and do not add much to the retail price, because wage costs are very low. In economically advanced countries, however, income elasticity estimates based on unadjusted cross-section data produce very substantial upward bias (*26,* p. 339).

in food expenditure and consumption patterns, the observation is difficult to reconcile with the evidence presented here. Even for the Ghanaian cities, the high coefficients of elasticity of food expenditure imply substantial substitution of more for less expensive products since the quantitative (calorie) increase in food consumption appears to account for only a small part of the increase in food outlay.

The negative coefficient of elasticity for the starchy staples in Mbale appears to be mainly a reflection of certain characteristics of the survey sample. In that community about half of the middle-income families and almost all of the top-income families had *shambas* (home gardens) producing food crops, whereas *shambas* were rare among the low-income families. Consequently, money expenditure on the starchy staples was relatively low in the higher income groups. The high elasticity coefficient for meat and fish for Mbale is in part a reflection of this same characteristic of the sample. Since the higher income households obtained a considerable fraction of their starchy staples from their *shambas,* they devoted a large share of their money outlay for food to purchases of meat—some 40 per cent of total food expenditure in the highest income group. A seasonal influence also appears to have contributed to the high elasticity coefficient for meat. The survey coincided with the harvesting and marketing of cotton, and many of the families with home gardens were producing cotton as well as food crops. Thus there is reason to suppose that meat purchases were seasonally high because of the income provided by the sale of cotton and the feasting of visiting relatives during the cotton season (*15,* p. 11).

The elasticity coefficients for milk are high in all three of the cities for which estimates could be made, and only Salisbury has a low coefficient for bread. Sekondi-Takoradi, Kumasi, and Mbale have extraordinarily high elasticity coefficients for bread of about 2.0, implying that bread expenditure rises twice as fast as the increase in total expenditure. The high figure for Mbale, however, is undoubtedly influenced by the factors just mentioned in relation to the similarly high figure for meat and fish. It was noted in section III that the figures on bread consumption in the Ghanaian cities are almost certainly underestimated; hence the high figures for Kumasi and Sekondi-Takoradi are to be treated with reserve.

The extraordinarily low coefficient for bread in Salisbury seems to reflect the fact that bread is already established as a major component of the diet at all income levels. Bread accounted for approximately 30 per cent of all calories from starchy staples in the two lowest income classes and only a slightly higher fraction for the higher income groups (Table 4, p. 242). This proposition that the elasticity coefficient for bread will decline as it becomes established as an important component of the urban diet is also suggested to some extent by the figures for Nairobi and Accra.

The elasticity estimates presented in Table 10 are obviously a very slender basis for assessing the changes to be expected in food expenditure and consumption in the cities of tropical Africa in the course of economic development. It is to be hoped that future budget surveys will to a greater extent than in the past obtain information on food expenditure by income or expenditure class and that the samples will be designed to facilitate comparison of fairly homogeneous groups of households representative of different income levels.

A preliminary consideration of urban-rural contrasts in food consumption.— Granted that it is extremely difficult to isolate the influence of different income levels and differences in other factors existing between urban and rural population, such as availability of certain foods and the extent to which food preference is oriented to traditional patterns, analysis of urban-rural contrasts in food consumption seems to offer a fruitful line of inquiry which can be pursued to some extent with data already available. With bread, it is obvious that consumption is very much higher among urban than rural communities. The fact that the income elasticity of demand for bread in Salisbury is only .2 is much less significant in relation to the future growth of demand for wheat flour than the fact that the African population in Salisbury is apparently consuming on the order of 70 kilograms of bread per person per year whereas the average per capita consumption of bread by the African population of the Federation of Rhodesia and Nyasaland is something less than 10 kilograms (*24*, p. 30). Recent trends in flour imports in tropical Africa and historical trends in flour consumption in other areas of the world also emphasize that enlarged consumption of bread will be one of the conspicuous changes in diet patterns in tropical Africa (*24* and *25*, pp. 242–49).

Another noteworthy contrast between rural and urban consumption in tropical Africa concerns the millets and sorghums. Throughout the huge arid Sudan zone and in many other drier areas of tropical Africa, the millets and sorghums are the overwhelmingly important foods in local diets. But it was pointed out in section IV that even in the Senegalese cities and in Kaduna and Zaria in northern Nigeria, all located in areas where the millets and sorghums are of great importance in rural diets, urban consumers devoted only some 3–6 per cent of their food budget to these cereals. In a prior attempt to assess prospective changes in the relative position of Africa's staple food crops the outlook for millets and sorghums was characterized as follows (*25*, p. 253):

> Of millets and sorghums, it can only be said that in other areas of the world those crops have not held esteem as human food in areas where they have faced competition from other cereals—rice, wheat, or maize. They will undoubtedly remain highly important as the local staple food crops in those drier areas where they now predominate, but it is unlikely that they will be of much importance in supplying the food needs of urban and industrial centers, where they would enjoy a relatively small price advantage even in comparison with rice.

This examination of urban budget data has provided some additional evidence supporting that conclusion.

Preliminary comparisons of estimates of meat consumption in rural areas with consumption estimates derived from urban budget surveys also point to very substantial differences. On the basis of data from various food consumption surveys carried out in rural areas as well as estimates of total production and per capita consumption, it is apparent that the over-all consumption of meat in West Africa is extremely low, commonly ranging from as little as 1 kilogram to 5 or 6 kilograms per person per year. As would be expected, meat consumption in rural areas varies a good deal depending on the local availability of game or the importance of stock raising in areas outside the tsetse zone. Estimates for a number of rural communities in Nigeria reported by Nicol range from less than 1 kilogram per year in Tangaza to as much as 27 kilograms for male adults and 14

kilograms for women in Tungan Maidubu in northern Nigeria, in a district where livestock are exceptionally important. In most of the survey communities in which Nicol has carried out surveys, per capita meat consumption amounts to no more than 5 or 6 kilograms annually (*32*). According to food consumption surveys carried out by Périssé in five districts of Togo, meat consumption amounted to 1.3, 5.0, 5.5, 6.4, and 9.3 kilograms per person per year, the last figure applying to a recently settled area where game is still relatively abundant (*35*).

In Ghana, over-all per capita consumption of meat is estimated at 9 kilograms per year, a relatively high figure for West Africa (*17*). But according to the budget survey estimates, meat consumption in the cities of Kumasi and Sekondi-Takoradi was 30 and 21 kilograms per year respectively; and in Sekondi-Takoradi consumption of fish was slightly larger than the consumption of meat.

Further evidence of a tendency to enlarge meat consumption as purchasing power permits is provided by consumption data for two agricultural districts characterized by unusually high incomes for rural communities in tropical Africa. Bongouanou district in the Ivory Coast, the object of an important sample survey in 1955/56, is an area of relatively high incomes owing to substantial exports of coffee and cocoa. The annual per capita consumption of meat in Bongouanou district is nearly 30 kilograms, according to the survey report, as compared with the national average per capita consumption in the Ivory Coast that has been estimated roughly at about 5 kilograms (*23* and *17*). The contrast is less marked but nonetheless considerable in comparing the national average consumption in Ghana with survey estimates for the Kumasi districts, a rural area that enjoys comparatively high incomes based on exports of cocoa. Average per capita meat consumption in rural Kumasi, according to the sample survey data, was close to 20 kilograms compared with the over-all average of 9 kilograms (*45*).

The contrast between urban and rural consumption of meat is apparently not as great in East and Central Africa as in West Africa owing to the greater prevalence of stock-raising and higher meat consumption in rural areas in that part of the continent. The available estimates of meat consumption in Kenya and Tanganyika are highly inconsistent, however, and require further scrutiny[23]

This brief review of some of the more significant urban-rural contrasts in food consumption serves to suggest that there are significant differences in urban and rural food consumption patterns and that more thorough and systematic analysis of those contrasts would be rewarding.

VI. CONCLUSIONS

This review of budget data for 16 urban communities of tropical Africa (representing 19 cities and 10 countries) has revealed some important similarities and contrasts. Noteworthy among the uniformities so revealed are the following:

1. Food expenditures claim a large share of total income in all cities. The percentage falls below 50 per cent in only one city, and in that instance the survey sample was limited to a comparatively high income group.

2. Starchy staple foods—cereals and root crops—occupy a very important

[23] Estimates of annual per capita consumption of meat in Kenya range from 11 to 25 kilograms (unpublished report by C. J. Martin, Director, East African Statistical Department, and *17*).

position in food expenditure and a considerably more dominant position as a source of food calories. The meat and fish category is roughly equal to the starchy staples in terms of food expenditure; but meat and fish expenditures show greater intercity variability, and their contribution to total calorie intake is perhaps only about one-tenth as great.

3. The income elasticity of expenditure for "total food" is very high (.6 to .9) in the seven cities for which a calculation could be made.

It has been emphasized that these three characteristics of the food expenditure patterns in African cities underscore the serious inflationary implications of food shortages leading to an appreciable rise in food prices.

It proved difficult to draw valid inferences from the comparison of food expenditure of families in different income classes because the sampling procedures used in the past have not been designed to yield data applying to households that are reasonably homogeneous in all respects except for differences in level of income. A preliminary attempt was made to throw some light on prospective changes in the demand for agricultural products by comparing consumption of important food items in urban and rural areas. The urban-rural contrasts considered confirmed the expectation that these differences are important; and it appears that more extensive study of such contrasts based on data already available could throw light on some of the important changes in demand for food likely to result from urbanization and rising incomes. Moreover, these marked contrasts between urban and rural consumption patterns suggest that further growth of the population of African cities will be a key factor leading to significant changes in the pattern of demand for crop and livestock products.

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APPENDIX TABLES

TABLE I.—PREWAR AND POSTWAR POPULATION, SELECTED CITIES OF TROPICAL AFRICA*

(Thousand persons)

City	Country or territory	Prewar[a]	Postwar[a]	Per cent increase
Abidjan	Ivory Coast	10 (1931)	128 (1955)	1180
Accra	Ghana	70 (1931)	165 (1954)	136
			388 (1960)	454
Addis Ababa	Ethiopia	150 (1939)	400 (1952)	167
Bamako	Mali	20 (1931)	100 (1951)	400
Bangui	Ubangi-Shari	14 (1937)	85 (1957)	507
Brazzaville	Middle Congo	40 (1937)	99 (1957)	148
Bulawayo	Southern Rhodesia	29 (1936)	112 (1956)	286
Conakry	Guinea	7 (1931)	53 (1951)	657
Dakar	Senegal	93 (1936)	231 (1955)	148
Dar es Salaam	Tanganyika	34 (1937)	99 (1952)	191
Douala	Cameroun	28 (1931)	118 (1951)	321
Freetown	Sierra Leone	55 (1931)	77 (1956)	40
Ibadan	Nigeria	387 (1931)	459 (1952)	19
Kano	Nigeria	89 (1931)	130 (1952)	46
Khartoum	Sudan	45 (1938)	93 (1956)	107
Kitwe-Nkana	Northern Rhodesia	2 (1931)	78 (1956)	3800
Lagos	Nigeria	126 (1931)	312 (1956)	148
Leopoldville	Congo	36 (1938)	300 (1955)	733
Luanda	Angola	40 (1934)	190 (1955)	375
Lusaka	Northern Rhodesia	2 (1931)	54 (1956)	2600
Monrovia	Liberia	10 (1938)	41 (1956)	310
Nairobi	Kenya	65 (1939)	210 (1956)[b]	223
Salisbury	Southern Rhodesia	32 (1936)	168 (1956)[b]	425

* Estimates for Southern and Northern Rhodesia from material made available by the Central African Statistical Office. Postwar data for other cities from UN, *Demographic Yearbook 1957* (1957), pp. 150–51, with the following exceptions: Bangui from French Equatorial Africa, High Commis., *L'A. E. F. Économique et Sociale 1947–1958* (Brazzaville, 1959), p. 8; Accra from Ghana, Off. Govt. Stat., *Quarterly Digest of Statistics,* June 1960, p. 1 (1960 is the provisional estimate from the 1960 census; the mid-1959 estimate of Accra's population given in Ghana, Min. Fin., *Economic Survey 1959,* 1960, p. 47, was 208,000); and Bamako, Conakry, and Douala from France, Min. de la France d'Outre-Mer, *Inventaire social et économique des territoires d'outre-mer 1950 à 1955* (1957), p. 27. Prewar data are from Walter Yust, ed., *Encyclopædia Britannica World Atlas* (Chicago, 1942), pp. 182–211, except for Abidjan, Bamako, Conakry, and Douala, which are from France, Min. de la France d'Outre-Mer, *Inventaire social et économique des territoires d'outre-mer 1950 à 1955* (1957), p. 27, and Accra, which is from Gold Coast, Off. Govt. Stat., *Census of Population, 1948, Report and Tables* (1950).

[a] Figures in parentheses are the year of census or estimate.

[b] These figures apply to the urban agglomeration.

TABLE II.—EXPENDITURE, TOTAL AND PER CENT FOR FOOD, SELECTED CITIES OF TROPICAL AFRICA*

Country and city	Monthly average expenditure per family: Domestic currency Unit	Amount	U.S. dollars[a]	Expenditure for food (*Per cent of total expenditure*)	Source
Nigeria:					
Kaduna–Zaria	Shillings	251.1	35	49.8	(*33*)
Ghana:					
Sekondi-Takoradi	Shillings	249	35	57.7	(*21*)
Kumasi	Shillings	282	39	57.3	(*20*)
Akuse	Shillings	208	29	57.2	(*19*)
Accra	Shillings	314	44	58.0	(*18*)
Sierra Leone:					
Freetown[b]	Shillings	180	25	62.4	(*37*)
Ivory Coast:					
Abidjan	Francs (CFA)	14,699	84	54.7[c]	(*22*)
Senegal:					
Thiès–Dakar–Saint Louis[d]	Francs (CFA)	20,277	116	75.2	(*29*)
Congo:					
Leopoldville	Congo francs	5,766.8	115	46.8	(*2*)
Uganda:					
Kampala:					
1950	Shillings	41.3	6	57.3	(*11*)
1951	Shillings	38.4	5	61.8	(*10*)
1952[e]	Shillings	43.5	6	64.9	(*9*)
1953	Shillings	55.1	8	64.9	(*8*)
1957	Shillings	77.4	11	58.3	(*7*)
Jinja:					
1951	Shillings	43.3	6	68.4	(*14*)
1952	Shillings	44.1	6	66.7	(*13*)
Mbale, 1958	Shillings	97.0	14	66.4[f]	(*15*)
Tanganyika:					
Dar es Salaam	Shillings	69.4	10	56.3	(*6*)
Kenya:					
Nairobi, 1957/58	Shillings	181.9	25	58.4	(*4*)
Southern Rhodesia:[g]					
Bulawayo:					
June 1958	Shillings	259.3	36	51.8	(*38, 39, 40*)
October 1958	Shillings	270.2	38	51.5	(*38, 39, 40*)
February 1959	Shillings	244.8	34	56.0	(*38, 39, 40*)
Salisbury:					
July 1957	Shillings	276.8	39	53.6	(*41, 42*)
November 1957	Shillings	292.8	41	55.1	(*41, 42*)
March 1958	Shillings	264.6	37	58.7	(*41, 42*)

* Data from sources indicated by citation numbers. See text, Table 1 (p. 232), for some further information on the expenditure surveys cited, and comment on conversion to U.S. dollars.

[a] Converted at official exchange rates.

[b] Average expenditure is for 264 households with incomes below 280 shillings per month; the per cent spent for food applies to 383 households and is an unweighted average of families in Index I (comparatively poor) and those in Index II (comparatively wealthy).

[c] Includes food consumption by household guests; total for "family foods" is 43.7 per cent.

[d] Average *income* for all 136 families; per cent spent for food for the 2,500–3,000 franc (CFA) income class only, a class in middle range of income groups.

[e] Weighted average of families in "higher income group" and those in "lower income group."

[f] Includes imputed value of home-produced food; the per cent excluding home-produced food and food obtained in exchange for work on *shambas* is 49.9.

[g] Unweighted average of families in their own houses and those in accommodation, unrationed.

TABLE III.—PER CENT OF TOTAL EXPENDITURE FOR FOOD REPRESENTED BY DOMINANT STARCHY STAPLE, AND BY SPECIFIED FOOD GROUPS, SELECTED CITIES OF TROPICAL AFRICA*

Country and city	Starchy staples: Total	Dominant staple: Food	Dominant staple: Per cent	Bread	Meat, fish	Sugar	Milk products	Vegetables, fruit	Beans, peanuts: Total	Beans, peanuts: Peanuts
Nigeria:										
Kaduna–Zaria	44.6	Manioc	9.3	2.9	26.1	...	...	...	...	...
Ghana:[a]										
Sekondi-Takoradi .	33.6	Manioc	10.5	3.8	36.5	1.6	2.2	12.8	1.3	.7
Kumasi	28.6	Manioc	7.5	3.0	41.0	1.4	1.8	12.6	2.1	.8
Akuse	33.0	Maize	11.0	4.5	40.7	1.8	3.0	10.2	1.3	.7
Accra	36.9	Maize	13.5	6.2	34.3	2.1	4.5	11.5	...	...
Sierra Leone:										
Freetown[b]	38.2	Rice	25.2	6.9	27.5	3.0	3.7	8.9	...	1.1
Ivory Coast:										
Abidjan	36.9	Rice	16.2	3.1	38.1	1.0	1.4	6.1	1.4	...
Senegal:										
Thiès–Dakar–Saint Louis[c]	29.1	Rice	19.0	7.2	30.5	4.7	3.5	...	...	...
Congo:										
Leopoldville	26.8	Manioc	10.8	7.6	43.8	2.5	4.9	8.1	2.6	.6
Uganda:										
Kampala:										
1950	45.9	Plantain	15.8	2.2	22.4	6.1	...	...	13.1	9.8
1951	47.6	Plantain	17.4	4.1	21.3	3.4	...	3.9[d]	12.5	7.7
1952[e]	50.5	Plantain	24.2	3.7	20.5	4.0	...	3.1[d]	12.4	8.1
1953	52.8	Maize	22.6	3.6	17.8	4.9	...	2.8[d]	13.0	8.6
1957	46.7	Plantain	21.1	2.3	22.8	7.2	...	2.8[d]	12.9	9.0
Jinja:										
1951	50.7	Maize	23.4	2.7	17.6	6.1	...	3.6[d]	11.4	5.3
1952	51.8	Plantain	25.4	3.1	20.8	6.3	...	3.3[d]	9.7	7.0
Mbale, 1958	40.5	Plantain	20.6	1.2	34.5	8.5	...	2.5[d]	4.2	3.4
Tanganyika:										
Dar es Salaam	52.2	Maize	25.4	10.6	25.5	3.1	...	6.6	1.9	...
Kenya:										
Nairobi, 1957–58 ..	31.0	Maize	18.7	10.3[f]	21.9	6.8	10.8	9.2	4.0	...
Southern Rhodesia:[g]										
Bulawayo:										
June 1958	36.0	Maize	19.9	15.3	30.9	10.6	8.3[h]	5.7	...	...
October 1958 ...	37.1	Maize	19.5	16.8	30.9	10.6	7.2[h]	4.8	...	...
February 1959 ..	38.3	Maize	20.5	16.8	29.3	10.1	7.8[h]	5.6	...	...
Salisbury:										
July 1957	32.4	Bread	20.2	20.2	30.6	10.9	10.2[h]	6.6	...	...
November 1957 .	31.9	Bread	19.6	19.6	31.3	10.0	11.0[h]	6.6	...	...
March 1958	35.4	Bread	19.5	19.5	30.2	10.3	9.2[h]	6.9	...	...

* Data from sources cited for Table II.

[a] Computed from a detailed list of local and imported foods (not available by expenditure classes) and thus preferable to the per cents in Table 10 (p. 263). The latter are necessarily restricted to the shorter list available by expenditure classes which excludes minor components of local food and all imported food.

[b] Unweighted average of families in Index I (comparatively poor) and those in Index II (comparatively wealthy).

[c] For the 2,500–3,000 franc (CFA) income class, a class in middle range of income groups.

[d] Vegetables only.

[e] Weighted average of families in "higher income group" and those in "lower income group."

[f] Includes wheat flour.

[g] Unweighted average of families in their own houses and those in accommodation, unrationed.

[h] Includes margarine.

TABLE IV.—EXPENDITURE FOR STARCHY STAPLES AS PER CENT OF TOTAL FOOD EXPENDITURE, BY EXPENDITURE CLASSES, SELECTED CITIES OF TROPICAL AFRICA*

Expenditure class[a]	Total[b]	Maize and products	Rice	Millets and sorghums	Wheat flour, bread, biscuits	Cereals subtotal	Manioc and products	Yams	Roots, tubers subtotal[b]
				Kaduna–Zaria, 1955–56					
67.6	47.4	...	7.9	8.8	2.0	*18.7*	6.1	7.1	*28.7*
78.4	45.7	...	8.4	7.9	2.1	*18.4*	8.2	7.6	*27.3*
86.4	43.5	...	8.6	5.5	3.6	*17.7*	9.5	8.5	*25.8*
85.6	44.2	...	8.0	3.0	3.5	*14.5*	12.7	10.3	*29.7*
88.2	40.7	...	6.9	.9	4.4	*12.2*	12.5	10.3	*28.5*
				Kumasi, March–April 1955[c]					
43.8	28.9	2.7	2.4	...	1.4	*6.5*	9.5	3.8	*22.4*
53.5	28.8	2.8	2.8	...	1.9	*7.5*	8.3	3.6	*21.3*
54.2	27.6	3.7	2.0	...	1.3	*7.0*	7.8	3.9	*20.6*
56.7	30.1	3.2	2.3	...	1.5	*7.0*	10.3	4.3	*23.1*
62.4	26.9	4.1	2.1	...	2.2	*8.4*	7.7	3.8	*18.5*
59.8	29.1	3.4	2.1	...	2.1	*7.6*	9.1	4.0	*21.5*
62.3	26.8	3.4	2.1	...	2.2	*7.7*	7.6	4.4	*19.1*
82.5	29.4	3.6	3.0	...	3.1	*9.7*	6.7	4.4	*19.7*
76.0	26.8	4.8	2.0	...	2.4	*9.2*	6.6	3.8	*17.6*
72.9	30.6	3.9	3.6	...	3.6	*11.1*	6.5	4.8	*19.5*
82.3	28.6	4.7	2.8	...	2.8	*10.3*	6.6	4.6	*18.3*
103.5	30.4	4.8	3.5	...	3.5	*11.8*	7.4	3.9	*18.6*
				Nairobi, 1957–58					
63.8	33.2	22.1	1.2	.1	9.8	*33.2*	...	...	...
76.6	32.8	19.7	1.9	.2	11.0	*32.8*	...	...	...
90.3	29.3	16.3	2.1	...	10.9	*29.3*	...	...	...
102.8	27.5	15.7	2.3	...	9.5	*27.5*	...	...	...
				Salisbury, 1957–58					
59.2	40.8	17.4	1.2	...	22.2	*40.8*	...	...	...
73.6	36.5	15.6	.9	...	20.0	*36.5*	...	...	...
83.9	33.6	11.8	1.3	...	20.5	*33.6*	...	...	...
95.9	33.6	12.4	1.9	...	19.3	*33.6*	...	...	...
109.0	32.0	10.5	2.9	...	18.6	*32.0*	...	...	...

* Data for Kaduna–Zaria from *33*, for Kumasi from *20*, for Nairobi from *4*, and for Salisbury, unrationed families in their own homes, July and November 1957 and March 1958, from *42*.

[a] Monthly average expenditure by income classes (expenditure classes for Kumasi): shillings per capita for Kaduna–Zaria and Kumasi; shillings per consumption unit according to the Oxford scale for Nairobi; shillings per "man unit" based on FAO calorie requirements by age groups for Salisbury and thus in agreement with Table 4 (p. 242), rather than Table 2 (p. 237) which is from *41*.

[b] Includes items not shown.

[c] Expenditure on the starchy staples as per cent of total expenditure on local food. Data including imported foods not available by expenditure classes.

TABLE V.—CALORIES PER POUND FOR SELECTED FOODS*

Food	Calories	Food	Calories
Manioc:		Meat	726[a]
Fresh	494	Peanuts	1,760[b]
Kokonte	1,533	Beans	1,520
Gari/flour	1,533	Sugar	1,755
Cocoyam	390	Fish:	
Maize	1,615	Fresh	299[c]
Plantain	340	Smoked	925[d]
Rice	1,619	Dried	925[d]
Yam	408	Onions	168
Bread	1,360[e]	Tomatoes	86
Sweet potatoes	440	Cabbages	77
		Peppers	109

* Data for foods "as purchased" from FAO, *Food Composition Tables for International Use* (1953), Table 1, except as otherwise specified.

[a] Lean tropical (thin carcass); from Lucius Nicholls, *Tropical Nutrition and Dietetics* (3d ed., 1951), Table LXX, p. 420.

[b] Peanuts in shell.

[c] Including 33 per cent waste; based on B. S. Platt, *Tables of Representative Values of Foods Commonly Used in Tropical Countries* (Gr. Brit., Med. Res. Coun., Spec. Rpts. 253, 1945), pp. 28–29.

[d] Average values are assumed from Platt, *op. cit.*

[e] For the Ghanaian cities, a factor of 1,143 calories per pound was used (72 per cent of flour, following Platt, *op. cit.*).