CONSUMER PREFERENCE STUDY IN GRAIN UTILIZATION,

Maiduguri·Nigeria

IDRC—O22e

Abstract

In 1973, a consumer preference study in grain utilization was carried out in Maiduguri, an urban town located in North Eastern State, Nigeria. The purpose of this study was to determine the type and volume of flour to produce in an experimental mill built in 1973 in Maiduguri and to develop a consumer education program to improve household utilization of cereals and grain legumes in the diet. The study consisted of a major investigation of household preferences for grain and two minor investigations involving school children and maternal and child health clinics. Interviewers were home agents employed by the Ministry of Natural Resources. Results of the surveys indicate that there is a trend toward an increased use of rice and bread as well as prepared flour and new cereal foods by Maiduguri households, and an increase in snack foods purchased by school children. Attendance by an increasing number of Maiduguri women at maternal and child health clinics has improved the diets of both the mothers and the children, and these clinics could be a vehicle for education regarding cereal foods and cereal supplementation. The survey revealed that three areas show specific potential for further development and interaction: consumer education, food processing, and pilot mill and milling programs.

Résumé

Une étude des préférences des consommateurs en matière d'utilisation des grains a été effectuée en 1973 à Maïduguri, agglomération urbaine de l'Etat du Nord-Est du Nigeria. Elle avait pour but de déterminer le type et le volume de farine à produire dans une minoterie expérimentale construite en 1973 dans cette même ville et en même temps de mettre au point, au bénéfice des consommateurs, un programme éducatif destiné à améliorer l'utilisation ménagère des céréales et des légumineuses à grain. L'étude a comporté une enquête approfondie sur les préférences familiales relatives aux grains et deux enquêtes moins poussées portant sur les enfants scolarisés et les maternités et dispensaires infantiles. Ces enquêtes ont été effectuées par des agents des services familiaux du Ministère des Ressources Naturelles. Les résultats obtenus indiquent qu'il existe à Maïduguri, à l'échelon familial, une tendance marquée vers une plus grande consommation du riz et du pain, aussi bien que de la farine industrielle et des nouveaux aliments à base de céréales, en même temps qu'une augmentation de l'achat d'aliments pour collations par les écoliers. L'accroissement de la fréquentation par les femmes des maternités et des dispensaires infantiles s'est traduit par une amélioration des régimes alimentaires des mères et des enfants et ces établissements pourraient constituer un relais éducatif remarquable en ce qui concerne l'utilisation d'aliments à base de céréales et de céréales complémentées. L'enquête a également révélé que trois domaines offrent des possibilités particulières de développement et d'interaction: l'éducation des consommateurs, la transformation des denrées alimentaires et l'ensemble minoterie pilote/programmes de meunerie.

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Consumer Preference Study in Grain Utilization, Maiduguri, Nigeria*

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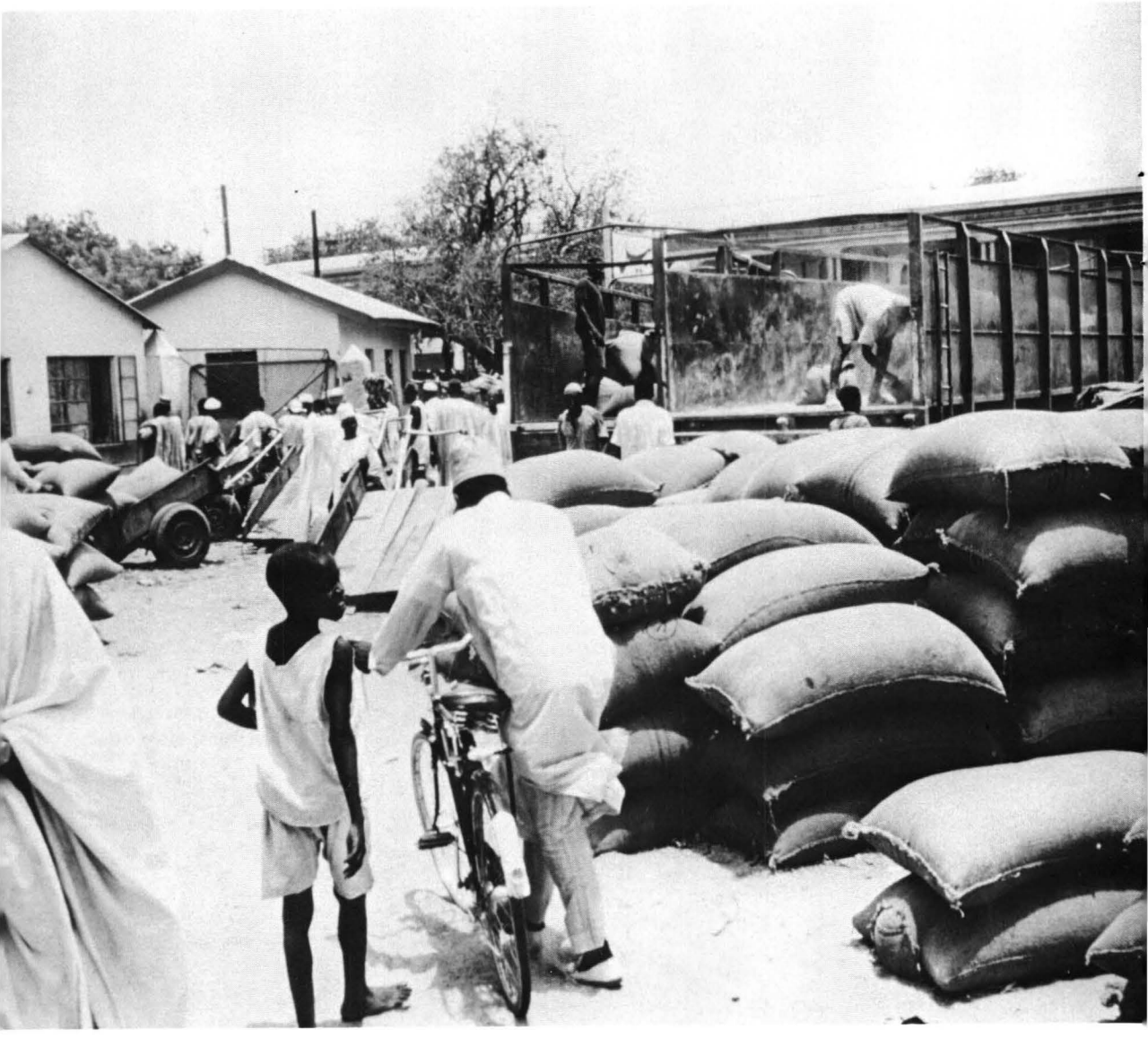

PREFACE

THE cereal grains, particularly millet and sorghum, are the staple foods in the diet throughout the Sahelian Zone of Africa. The production of these grains has traditionally met local demand, the processing of the grain to flour for domestic use being managed and controlled by each household.

In 1973, the Ministry of Natural Resources, North Eastern State, Nigeria, in conjunction with the Federal Ministry of Agriculture and Natural Resources, and the International Development Research Centre, established a pilot flour mill to process local grains. To guide production, a consumer preference study in grain utilization was conducted to find out the type and volume of local flours preferred in Maiduguri.

This study was the first of its kind conducted by the Ministry on consumer preference for food crops. The results of the study provide the information needed on consumer preference for grain products. Maiduguri consumers have a high preference for flours made from local grains for the traditional diet. The study shows food preferences vary, with different tribal groups having distinct preferences for a type and quality of flour for staple dishes. On the other hand, modernizing influences are strong, and there is a demand for convenience products and new products such as bread, taliya, and snack foods in the everyday diet.

The modernization of the milling industry will have an important effect on the role of women, who are currently involved in the processing of grain. The opportunities shown for alternative employment for women in this study emphasize handicrafts and the commercial preparation of snack foods and convenience foods. Training in these areas of interest and the development of these industries cannot be overlooked in the establishment of a local milling industry. Pilot studies in these areas are planned as an extension to the pilot studies in grain milling.

The Ministry of Natural Resources, on behalf on the Government of North Eastern State, wishes to express its gratitude to the International Development Research Centre of Ottawa, Canada, for the successful programing of the pilot mill and consumer preference study in grain utilization. Our special thanks also go to Jean M. Steckle, Linda Ewanyk, Bob Forrest, Bill Rolston, Elvina Pwausoko, and members of the mill committee, to mention a few who contributed a great deal to the realization of this project.

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INTRODUCTION

A consumer preference study in grain utilization was developed as one aspect of the experimental grain milling and utilization project in Maiduguri. It was considered important, not only for the future development of the food grains industry in the North Eastern State of Nigeria, but specifically for the development of the experimental mill and its products.

The preliminary investigation was carried out in July 1972 to identify the resources available to the North Eastern State to carry out the study and to learn of household methods of processing cereals and cereal products. The Ministry of Natural Resources, North Eastern State, made the necessary arrangements to carry out the study during January, February, and March of 1973. Home agents employed by the Ministry of Natural Resources were designated as the enumerators and IDRC was requested to assist in the design and implementation of the study.

Purpose of the Study

Information on consumer preferences for household food products prepared from cereals and grain legumes was required for two purposes: (1) to determine the type and volume of flour to produce in the experimental mill; and (2) to develop a consumer education program to improve household utilization of cereals and grain legumes in the diet.

The consumer preference study in grain utilization was the major study carried out in Maiduguri. The study was done to gain an insight into the household practices of grain storage, purchasing, processing preparation, and use of cereals for household meals, and the changes taking place in these practices. While the study was being done, it became evident that follow-up studies in schools and in maternal and child health clinics would be very useful. Of particular interest was information on school children's breakfast habits and the eating of snack foods. At the clinics, it was valuable to obtain more information from mothers on their child-feeding practices.

Background

The mill committee, made up of members of the Ministry of Natural Resources and the Ministry of Cooperatives and Community Development of the North Eastern State government, was established to build, install, and test the mill. Within the testing program the committee requested that the consumer preference study be limited to Maiduguri. It was recognized that the findings would refer to specific practices for grain utilization in Maiduguri; nevertheless, as well as providing the specific information required, it would be useful in providing some understanding of the practices operative in other rural market towns in northern Nigeria.

Maiduguri became the administrative capital of the North Eastern State government in 1968, but has been the traditional capital of Borno Emirate since 1908. It is well laid out with essential services and is nicely shaded with neem trees. The original villages were Mafoni and Bulamari. When it was established as the capital of Borno State, Yerwa Township was founded and Shehuri North (Bulamari) and Shehuri South were the new wards adjacent to the Shehu's Palace. Immediately, Lamanti, Fezzan, Zongo, and Hausari were established. Maisandare moved to Gambaru around 1940. Lamiséla was carved out of Mafoni a few years later. Bula Bulin (New Town) is the newest ward in Maiduguri. Gwange had been an old village but was merged with Maiduguri in the late 1950's.

These wards make up the present city of Maiduguri. The population is predominantly Kanuri; however, it has become a cosmopolitan city with a large population of Hausa, Fulani, and Shuwa Arab. Tribal groups considered to have common and

distinctive food habits were described by R. Cohen (Ahmadu Bello University, personal communication) and others and were classified throughout the study as follows: Kanuri: Manga, Bolewa; Hausa: Fulani, Bedde, Baburawa, Judawa, Kanawa, Jarawa; Shuwa: Arab; Banana: Guda, Gwoza; Mandora: Kilba, Buchama, Bura, Higgi, Jukeen, Kotako; Yoruba: Ibo, Idoma; Others.

The staple foods in this zone (Sudan and Sahelian Savannah) are millet and sorghum. Other important foodstuffs include wheat, rice, cowpeas, groundnuts, meat, fish, and milk. The major exports of the area, cotton and groundnuts, are handled by the Northern Nigerian Marketing Board.

Nutritional studies (Nicol 1959, 1965) show problems peculiar to the area. It is the only area in Nigeria reported to have a high intake of animal protein products, but it has inadequate supplies of essential vitamins and minerals lacking in a grain staple diet due to insufficient fresh fruits and vegetables. Since this study was done the situation has improved greatly and fresh vegetables are grown all year in irrigated gardens around Maiduguri. Generally, the meal pattern is based on cereals. Status foods (for example, quarasha, alkaki, taliya) known throughout the Moslem world are enjoyed in Kanuri society.

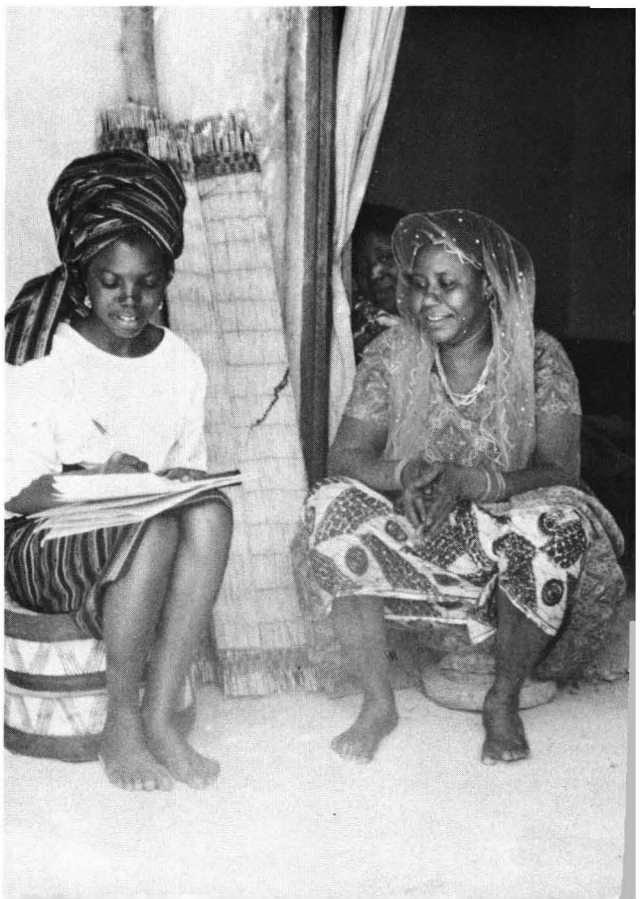
The northern states of Nigeria are predominantly Moslem. The Kanuri women, according to Islamic custom, practice seclusion during the childbearing period. In rural communities they play a major role in agricultural production, and also assume major responsibility for the preservation and processing of food crops and the preparation of food products within the household.

Preparation for the Study

The mill committee wanted all sectors of the town involved prior to the consumer preference study. It was the first time a questionnaire had been used to gather information from householders, and it was essential to proceed through recognized channels. Meetings were held with the local government through the district head and the ward heads to outline the purposes of the study, and this made it possible to visit and secure the cooperation of the households.

The Northern Women's Association was approached and provided an advisory group to the Ministry of Natural Resources, giving information on ethnic differences in food habits and the recipes enjoyed in Maiduguri. The women of the Shehu's Palace also assisted by demonstrating the preparation of the traditional status foods of the Kanuri. Radio broadcasts kept people informed of the arrangements for the study. Maternal and child health centres and schools were approached through their respective ministries to enable a study of food preferences in these institutions. Resident research workers involved in local government and in studies on the Kanuri people were most generous in providing background information on the residence and occupation of the townspeople.

The home agents of the Ministry of Natural Resources were culturally acceptable and had the professional training necessary to visit the households to collect the relevant data for the study. Ahmadu Bello University, through the Extension Research Liaison Service, was interested in supporting the investigation and through the Home Economics Department pretested the questionnaire. They also provided accommodation to process the data in the analysis unit of the Institute for Agricultural Research.



METHODOLOGY

The study consisted of three parts: the major study on household preference for grain, and two minor studies involving school children and maternal and child health clinics.

Maiduguri Household Consumer Preference Study

Sample Design

A random sample of 1100 households in Yerwa Township (commonly known as Maiduguri) was made. The minimum sample size possible was 384 (Backstom and Hursh 1963) with a standard deviation of 5%. The sample size needed was the minimum size plus ample allowances for clustering error and noncompleted questionnaires.

Initially it was planned to sample the city using a city map and choosing random location for clusters. However, this proved unworkable as even recent maps of Maiduguri did not have accurate or complete street names or block shapes. Maiduguri is divided into 11 wards or districts for local government. Details regarding these wards are shown in Appendix 1. With this information, it was decided to sample on the basis of quota by population, using a cluster size of five.

The number of households sampled per ward is shown in Table 1. In eight wards there was a further division into hamlets. In these wards, a further sample breakdown was made to achieve approximately equal representation from each hamlet.

Sample Selection

In each ward the interviewers were instructed to proceed to a section of the ward, select a compound, and interview up to three households in that compound. If there were three or less households in the compound, all the households were to be chosen. If there were four or more households, only three would be chosen. The interviewer would then proceed to the next compound and choose households by the same method until a total of five households were chosen. This was the sampling plan used by Simmons (1972) in her rural consumption studies. Then the interviewer would choose a different area of the ward and proceed to do another cluster of five surveys. This procedure was continued until the sampling for the ward was complete.

TABLE 1. Sample selection of Maiduguri households.

Ward	Hamlet	Total households sampled
Limanti	Limanti Karriari Adam Kolo	100
Shehuri (North)		100
Shehuri (South)		100
Lamiséla	Garga Goderi Leberari	100
Mafoni	Mafoni Fulatari Bandari Fayo Aliaskeri	150
Fezzan	5 hamlets	50
Gwange	10 hamlets	150
Zongo	3 hamlets East, Centre, West	50
Gambaru		50
Hausari	4 hamlets Buba Shehuri, Unguran Sabia, Hanglefaya, Jedhi Jedibi	100
Bula Bulin	5 hamlets Lawanti, Adam Kolo, Bula Bulin, Dayamari, Mandwi	150

The interviewers were initially introduced to the households chosen for the samples by the ward head or a person appointed by him. At that time, the interviewer recorded the name of the household head, street name, compound number, and hamlet name (if applicable).

Interviewers

The interviewers were 26 home agents employed by the Ministry of Natural Resources, North Eastern State of Nigeria. Their training was varied, including university program graduates, posted home agents, and new recruits.

Interviewing Method

After the initial introduction of the home agent to her sample by the ward head, the home agent explained the purpose of the study and said she would return at a later time. In some instances where there were no street names or compound numbers, the ward head appointed a person who accompanied the interviewers to the designated households each day. Where the households spoke only Kanuri, and the interviewers did not, interpreters (usually health workers) were supplied by the district head. The demographic data was obtained from the head of the household or the person designated by him to answer (usually the senior wife). The remaining questions were asked of the senior wife. The questions were asked by the interviewer and the responses recorded by her on the questionnaire. Interviewing was completed in a 3-week period, 29 January to 18 February 1973.

Training Program for Interviewers

The training program was organized by the training unit of the Ministry of Natural Resources under the direction of the State Leader for Home Economics Extension. Home agents from the North Eastern State and those on field experience from Ahmadu Bello University were asked to come to Maiduguri to take part in the training. The training course was held at the farm centre of the Ministry of Natural Resources from January 17 to 27. Transportation was provided by the Ministry for the training program and subsequently in the field study.

Home agents were trained in the methodology developed in Ghana (Steckle 1972) for enumerators in household studies of food management. Home agents were not necessarily familiar with the food habits of the different tribal groups living in Maiduguri. During the training program they collaborated and exchanged information on their own tribal food habits in panel discussions. This knowledge was important prior to carrying out interviews. In addition to this, the Northern Women's Association, through its advisory committee, arranged for women from each of the major tribal groups to meet the home agents at the training centre to discuss the cultural food values of the tribe and demonstrate their staple cereal dish. Further training included learning local measurements and pricing patterns for cereals, and learning food habits and cooking methods for each tribe. Both household measurements and market measurements were studied, first through comparative measurements in the classroom, followed by a comparative price study in the major and suburban markets of Maiduguri.

Demonstrations were also given at the Shehu's Palace, where senior women prepared the status foods of the Kanuri people.

Data Analysis

Completed questionnaires were coded, and data punched on IBM cards for analysis by an IBM 360 computer at the University of Alberta, Edmonton. A duplicate tape of data was prepared for possible further analysis at Ahmadu Bello University. The interrelationship between factors was tested by chi-square (X^2) analysis of dependency between factors. The significance of relationships was expressed at levels of 0.1%, 1.0%, and 5.0% probability of occurring by chance.

Classes on the questionnaire were also included in the training program to ensure complete understanding of each question, its purpose, and the necessity of complete responses. An *Interviewer Manual of Question Explanation* was given to each interviewer. Role playing was used to teach proper interviewing procedure, with the other interviewers as the audience and chief source of criticism. These were the primary tools used in teaching interview techniques and schedule management.

Survey Format

The survey was in the form of a personal questionnaire made up of questions concerning: (1) demographic information — family composition, age, tribe, education, and occupation; (2) dietary information — food consumption and meal patterns, including feeding of babies; (3) grain storage and use; (4) flour use; (5) cereal food use. The questions were multiple choice, open-ended, and fixed alternative types.

The final questionnaire was in English. Initially, it was planned that the questionnaire would be in Hausa and Kanuri to ensure uniformity of presentation by the interviewers. However, after the questionnaire had been translated, it was found that the interviewers were not comfortable enough reading Hausa or Kanuri to achieve good results in an interview. Therefore, an English questionnaire was adopted.

The questionnaire was pretested initially in Samaru, through the Home Economics Department of Ahmadu Bello University, and in final form in the Farm Centre village, outside Maiduguri, by the interviewers.

Daily worksheets and daily checking of completed questionnaires were used to monitor survey completion and to correct any difficulties as they occurred.

School Children's Questionnaire

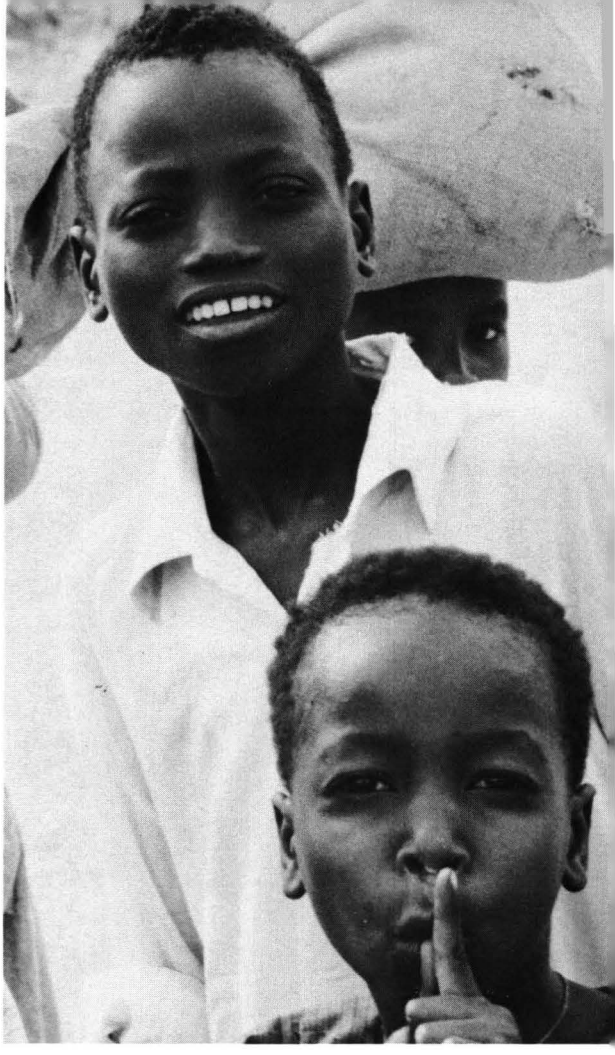
The purpose of this questionnaire was to explore the use of snack foods by school children in Maiduguri. The use of snack foods was thought to be related to breakfast consumption and the amount of money received by the children.

Sample Selection

Students from four schools in Maiduguri: Arabic Teacher's College, Yerwa Secondary School, Yerwa Practice School, and Lamiséla Primary School, were interviewed. To achieve a cross section of responses, students from every second class (i.e., I, III, V, VII) were chosen, as well as some children from the other classes.

Interviewers

Interviews were conducted by 13 home agents of the Ministry of Natural Resources, North Eastern State. In most instances, the children completed the questionnaire themselves, with the interviewer present in the classroom to give assistance where necessary. For the children in the first three classes, the interviewers completed the questionnaire according to the children's responses.



Maternal and Child Health Questionnaire

The purpose of this questionnaire was to assess the eating habits and baby-feeding practices of mothers attending the child health clinics in Maiduguri. Similar questions were asked in the consumer preference study.

Sample Selection

Women who attended the child health clinics at Yerwa and Gambaru wards were interviewed on clinic days as they waited for baby examinations.

Interviewers

Interviews were conducted by 13 home agents of the Ministry of Natural Resources, North Eastern State. The questionnaires were completed by the interviewers according to the women's responses.

RESULTS

Characteristics of Maiduguri Households

To classify the survey respondents, it was necessary to ask a number of questions that were descriptive or demographic in nature. The data resulting from the following questions are used: (1) to check the reliability of the sample by comparison with other demographic studies of Maiduguri; (2) to form profiles or descriptions of types of households in Maiduguri: and (3) to separate factors such as tribe and education from the results of other questions to detect influencing factors.

The length of residence of household heads can be used as a measure of community stability. The length of residence in Maiduguri varied over a large range of time (Table 2); however, length of residence varied significantly with the ward or part of the city in which the household lived (Table 2). Although most of the wards have been established for many years, the present residents of Shehuri North, Lamiséla, Gwange, and Gambaru were found to have moved in more recently (Table 2). In Zongo it is particularly interesting to note that 10 percent (%) of the people surveyed were very recent residents, the majority being long-term residents.

Approximately 75% of the respondents owned their own home (Table 3); however, only 15% of the household heads owned grain farms (Table 4). The ownership of homes and grain farms may be a socioeconomic indicator in the traditional society, as could number of wives of the household head. Most household heads had only one or two wives (Table 5).

The majority of households in Maiduguri had less than six members, 30% having one to three members. Therefore, the smaller household is important in Maiduguri (Table 6). The members of the household can be separated according to the relationship of its members to the head of the household. The nuclear or immediate family members comprised the majority of households in Maiduguri (Table 6). About 25% of the households had other members of the family (the extended or larger family) present in the household (Table 6); however, only 9% of the households contained members who were not related to the family in any way (Table 6).

The household head was generally older than his first wife, with an average age-group of 36 to 45 years; the first wife was generally 25 to 35 years old, and many wives were 18 to 24 years old (Table 7).

The tribes of the houehold head and the first wife were generally the same. Over one-half of the respondents were of the Kanuri or related tribes, whereas 21% were of the Hausa and Fulani tribes (Table 8).

Most household heads had a Koranic school education (34.8%) or had no formal education (33.8%). However, 12% of the household heads had attended primary school (Table 9). The education of the first wife followed the same trends (Table 9); however, a majority of wives had no formal schooling (64%). Tribe of the household head significantly influenced

TABLE 2. Length of residence of household head according to ward.[a]

	1 year		1–5		5–15		15–30		30 & more		Born here	
Ward	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Limanti	1	1.8	12	21.4	13	23.2	7	12.5	12	21.4	11	19.6
Shehuri North	5	5.3	29	30.5	19	20.0	19	20.0	3	3.2	20	21.1
Shehuri South	3	3.9	17	22.1	20	20.0	13	16.9	10	13.0	14	18.2
Lamiséla	5	5.1	37	37.8	21	21.4	21	21.4	14	14.3	0	0
Mafoni	6	6.0	27	27.0	32	32.0	13	13.0	7	7.0	15	15.0
Fezzan	3	6.4	5	10.6	8	17.0	11	23.4	9	19.1	11	23.4
Gwange	4	2.8	45	31.3	36	25.0	29	20.1	23	16.0	7	4.9
Zongo	5	10.6	6	13.0	5	10.6	17	36.2	14	29.8	0	0.0
Gambaru	1	2.0	12	24.0	16	32.0	12	24.0	5	10.0	4	8.0
Hausari	2	2.1	6	6.2	15	15.5	22	22.7	8	8.2	44	45.4
Bula Bulin	7	4.9	27	18.9	38	26.6	36	25.2	18	12.6	17	11.9
Total	42	4.2	223	22.5	223	22.5	200	20.1	123	12.4	143	14.4

[a] X^2 significant at the 0.1% level.

TABLE 3. Home ownership of respondents.

Home ownership	No. surveys	%
House owners	760	76.5
Renters	221	22.3
Not specified	12	1.2

TABLE 4. Ownership of grain farms by household head.

	No.	%
Household heads with grain farms	151	15.2
Household heads without grain farms	838	84.4
Not specified	4	0.4

TABLE 5. Number of wives of the household head.

No. wives	No. household heads	%
No wives (usually means female household head)	20	2.0
1	628	63.2
2	238	24.0
3	71	7.2
4	32	3.2
5	1	0.1
Not specified	3	0.3
Mean = 1.518		
Standard deviation 0.882		

educational level. The Mandora and Yoruba tribal groupings usually had government schooling, whereas the Kanuri, Hausa, and Shuwa household heads generally had Koranic schooling. The educational level of the household head appears to influence the educational level that his chosen wife would have attained (Table 10). The wives with primary or secondary schooling were more often married to husbands with comparable education.

The occupational classification of the household heads (Table 11) shows a predominance of traders (25.9%), skilled craftsmen (15.9%), and general labourers (11.5%). The household heads were asked about secondary occupations; only 10% had secondary occupations, mostly as farmers.

Most of the wives were housewives (84.3%), with others doing handicrafts or food preparation (Table 11). Most of the farmers owned grain farms (79.6%). In addition, some Koranic teachers (25%) and professionals (17.6%) owned grain farms (Table 12). The tribe of the household head significantly influenced their occupation (Table 13). The Yoruba group tended to be civil servants, the Mandora group were skilled craftsmen or general labourers, and the Kanuri, Hausa, and Banana groups were traders.

The descriptive data on Maiduguri households yielded information on the influence of changing environment. The short-term residency, lack of grain farm and farm ownership, smaller household size, nuclear family composition of the household, changing educational and occupational qualifications all point to a movement away from traditional tribal patterns. Maiduguri is becoming cosmopolitan and people living there are undergoing changes from a rural to an urban environment.

TABLE 6. Household structure according to size.

Household size (no. persons)	Household structure: Nuclear		Extended		Nonfamily members		Total	
	No.	%	No.	%	No.	%	No.	%
1–3	391	39.3	197	19.8	79	7.9	301	30.3
4–6	346	34.9	30	3.0	8	.8	365	36.8
7–9	156	15.7	13	1.3	3	0.3	176	17.7
10–15	94	9.4	6	0.6			129	12.9
16 and over	5	.5					19	1.9
None			746	75.1	903	90.9		
Not specified	1	0.1	1	0.1			3	0.3
Total	992	100	993	100	993	100	990	100

TABLE 7. Ages of household head and his first wife.

	Household head		First wife	
Age-group	No. surveys	%	No. surveys	%
Under 18	4	0.4	35	3.5
18–24	70	7.0	350	35.2
25–35	332	33.4	366	36.9
36–45	227	29.9	143	14.4
Over 45	231	23.3	24	2.4
Not specified	59	5.9	—	—
No wife	—	—	75	7.5

TABLE 8. Tribe of the household head.

Tribal groups	No. surveys	%
Kanuri, Manga, Bolewa	572	57.6
Hausa, Fulani groups	211	21.2
Shuwa, Arab	75	7.6
Banana, Guda, Gwoza	17	1.7
Mandora, Kilba, Bura groups	68	68
Yoruba, Ibo, Idoma	15	1.5
Others	31	3.1
Not specified	4	0.4

TABLE 9. Education of household head and his first wife.

	Household head		First wife	
Type of education	No. surveys	%	No. surveys	%
Primary	121	12.2	58	5.8
Secondary	54	5.4	9	0.9
Government trade school	23	2.3	0	0
Post-secondary	25	2.5	2	0.2
Koranic	355	34.8	236	23.8
Literacy	76	7.7	19	1.9
No formal schooling	336	33.8	636	64.0
Not specified	3	0.3	—	—
No wife	—	—	33	3.3

Grain Use

1. Household Facilities for Grain Utilization

Processing of grain within the household by means of pounding and winnowing requires an outdoor area. The style of house is important for food processing; most houses in the study were compound-style and well suited to grain processing and the processing of primary products; however, 30% of the households in the study live in rented rooms, which may be more restrictive (Table 14).

Water and fuel are other essential items in the household preparation of cereals. Water is available in only 36% of the households from standpipes. In other households, it must be carried by family members or hired carriers from town standpipes (Table 15). Having water carried can cost as much as 30 Kobo per day (Table 16).

Firewood is the primary fuel used in Maiduguri, 98% of households using it for cooking (Table 17). A few households gather their own firewood (13.5%), but most households buy it, paying 4 Naira (100 Kobo = 1 Naira =$1.56) more (perhaps 15% of their income) for fuel for cooking (Table 18).

2. Meal Patterns and Grain Preferences

Meals are generally taken at home. About half the households follow a pattern of three meals a day, and the others a pattern of two meals a day (Tables 19 and 20). Households that take two meals a day prefer to take breakfast and supper at home. Some people in this group may take their lunch away from home in the form of snacks. Snacks do not appear to be important in the meal pattern of households (Table 20), however important they may be to businessmen and traders.

Meal attendance (Table 21) shows household members are away frequently at lunch time and visitors are most likely to attend the evening meal. Table 22 shows tribal differences in the number of meals served at home.

3. Foods Preferred in Maiduguri Meal Patterns

Information on food served at different meals was recorded during the interview with the senior wife, by asking what foods she served for meals the previous day. These foods are given in Table 23, showing preferences exhibited by the total population and also by individual tribal groups. There are tribal differences in the foods preferred for different meals. These are shown in more detail in Table 24. Tuwo is still the most popular food for most tribes, particularly for supper; however, the Yoruba prefer yams. Burabusko is primarily a Kanuri food, served 25% of the time in the evening or sometimes for lunch. The Hausa (59.8%) prefer a light breakfast of tea and bread or koko and kosai. The minority tribes (others) prefer more convenience foods, including semovita. Tea and bread, although relatively new foods, are very popular with all tribes for breakfast.

TABLE 10. Cross-tabulation of education of the first wife and the household head.[a]

Wife	Household head: Primary	Secondary	Govt. trade	Post-sec.	Koranic	Literacy	No formal schooling
Primary	15 (25.9)[b]	17 (29.3)	8 (13.8)	5 (8.6)	5 (8.6)	2 (3.4)	6 (10.3)
Secondary	1 (11.1)	4 (44.4)	1 (11.1)	2 (22.2)	1 (11.1)	0 (0)	(0)
Govt. trade	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	(0)
Post-sec.	0 (0)	0 (0)	0 (0)	2 (100.0)	0 (0)	0 (0)	(0)
Koranic	20 (8.5)	9 (3.8)	5 (2.1)	5 (2.1)	187 (79.2)	1 (0.4)	9 (3.8)
Literacy	3 (15.8)	0 (0)	0 (0)	0 (0)	4 (21.1)	12 (63.2)	0 (0)
No formal schooling	82 (12.9)	23 (3.6)	8 (1.3)	10 (1.6)	152 (23.9)	60 (9.4)	301 (47.3)

[a] X^2 significant at the 0.1% level.
[b] First number represents the number of surveys; number in parentheses is percent.

TABLE 11. Occupations of household head and his first wife.

Occupation	Household head: No. surveys	%	First wife: No. surveys	%
Farmer/fisherman	54	5.4	—	—
Trader	257	25.9	—	—
Businessman	67	6.7	—	—
Skilled craftsman	158	15.9	—	—
Koranic teacher	72	7.3	—	—
Civil servant	120	12.1	—	—
Clerical	53	5.3	3	0.3
Professional/Teacher	34	3.4	5	0.5
General labourer	114	11.5	—	—
Salaried job	9	0.9	—	—
Housewife	—	—	837	84.3
Trade — own business	—	—	28	2.8
Handicrafts	—	—	44	4.4
Food preparation	—	—	40	4.0
Other	5	0.5	4	0.4
Not specified	22	2.2	32	3.2
Not employed	28	2.8	—	—

TABLE 12. Cross-tabulation of ownership of grain farm and occupation of the household head.[a]

Occupation	Grain farms: No.	%	No grain farms: No.	%
Farmer	43	79.6	11	20.4
Trader	28	10.9	228	89.1
Businessman	8	11.9	59	88.1
Skilled craftsman	16	10.1	142	89.1
Clerical	6	11.3	47	88.7
Professional	6	14.6	28	82.4
Labourer	5	4.4	109	95.6
Salaried	1	11.1	8	88.9
Other	0	0	5	100.0
Not specified	3	14.3	18	85.7
Not employed	1	3.7	26	96.3
Koranic teacher	18	25.0	54	75.0
Civil servant	16	13.4	103	86.6

[a] X^2 significant at the 0.1% level.

Rice and stew are widely used; some tribal groups use them for breakfast, others prefer them for lunch or supper. They can no longer be considered luxury foods. Taliya and couscous are traditionally status foods in the community; however, with new processing methods they are more readily available and are becoming more popular. Koko and kosai, used by the Hausa as breakfast foods, are popular with most, tribes, but not always as breakfast dishes; for example, the Kanuri (19.6%) prefer them for lunch. These differences are worth noting (Table 24) when planning the consumer education program.

Amount of Grain Used in Cooking

Millet and sorghum are the major staple grains in Maiduguri; however, rice is now used in 50% of the households (Table 25). The quantity of rice used for cooking (i.e., number of cups to cook a meal) is

TABLE 13. Cross-tabulation of tribe and occupation of household head.[a]

	Tribes						
Occupation	Kanuri	Hausa	Shuwa	Banana	Mandora	Yoruba	Other
Farmer	42(7.3)[b]	8(3.8)	2(2.7)	0 (0)	2(2.9)	0 (0)	0 (0)
Trader	157(27.4)	73(34.6)	12(16.0)	4(23.5)	5(7.4)	2(13.3)	3(9.7)
Business	41(.2)	16(7.6)	4(5.3)	1(5.9)	2(2.9)	2(13.3)	1(3.2)
Skilled	96(16.0)	26(12.3)	13(17.3)	3(17.6)	15(22.1)	1(6.7)	4(12.9)
Clerical	29(5.1)	10(4.7)	3(4.0)	2(11.8)	7(10.3)	1(6.7)	1(3.2)
Professional	15(2.6)	7(3.3)	3(4.0)	0 (0)	5(7.4)	1(6.7)	3(9.7)
General	58(10.1)	26(12.3)	10(13.3)	1(5.9)	13(19.1)	1(6.7)	5(16.1)
Salaried	3(0.5)	0 (0)	2(2.7)	0 (0)	4(5.9)	0 (0)	0 (0)
Other	1(0.2)	0 (0)	2(2.7)	0 (0)	0 (0)	2(13.3)	0 (0)
Not specified	12(2.1)	4(1.9)	1(1.3)	2(11.8)	2(2.9)	0 (0)	0 (0)
Not employed	14(2.4)	3(1.4)	5(6.7)	2(11.8)	2(2.9)	0)0)	1(3.2)
Koranic mallam	46(8.0)	16(7.6)	7(9.3)	0 (0)	0(0)	0(0)	2(6.5)
Civil servant	58(10.1)	22(10.4)	11(14.7)	2(11.8)	11(16.2)	5(33.3)	11(35.5)

[a] X^2 significant at the 0.1% level.

[b] First number is the number of surveys; number in parentheses is percent.

generally less than the amount of millet or sorghum used to cook a meal. For example 20% of households use 1–3 cups of rice to cook a meal, whereas the same number of households use 6–20 cups of millet and sorghum to cook a meal.

Grain Preference for Tuwo and Kamu

Housewives were asked which grain they preferred to use in preparing tuwo and kamu[1], two popular foods. Millet is the preferred grain for both tuwo and kamu (Table 26). Guinea corn (sorghum) and rice also rank high for preparing tuwo. Rice and wheat follow millet as preferred flours for the preparation of kamu (or koko).

Cooked Food Purchasing

Of Maiduguri households, 23% buy some foods already cooked for their meals. Quite a variety of these cooked snack foods are available (Table 27): kosai is the most popular, but kamu, pancakes, cakes, and furah are also bought. The buying of cooked foods appears to be a new trend, especially for household meals.

[1]Kamu and koko are used interchangeably in this study, although they are slightly different products; see Appendix 3.

TABLE 14. Style of house.

Style	No. surveys	%
Self-contained compound	686	69.1
Rented rooms	178	17.9
Rented hall & room	85	8.6
Rented hall, shared bath or kitchen	37	3.7
Other	7	0.7

TABLE 15. Method of obtaining water.

Method	No. surveys	%
Standpipe in compound	358	36.1
Children bring from standpipe	152	15.3
Others bring from standpipe	83	8.4
Carriers bring in tins	394	39.7
Other	6	0.6

Cereal Food Preferences

Housewives were asked which cereals or cereal foods they would like to increase in their diet. Most households would like to have more of what they already have: millet is the most sought-after cereal, followed by rice (Table 28). The demand projections of the Federal Department of Agriculture (Appendix 4) show an increasing demand for rice throughout Nigeria.

A wide variety of cooked cereal foods is desired, the most popular being masa, kamu, kosai, pinkaso, and alkaki (Table 28). All but alkaki are considered breakfast foods.

4. Sources of Grain and Preparation of Flour

Practically all (92.5%) households in Maiduguri prepare their own flour from purchased grain (Table 29). Many households still buy grain in bulk and store it, particularly millet, rice, and guinea corn. In general, the rest of the grain is purchased when it is needed to prepare flour; a few households receive gifts or grow grain on their farms (Table 29).

Very few households (17%) have special grain stores for their grain in Maiduguri (Table 30). Most find other convenient places within the house to store one or two sacks of grain, such as the kitchen, bedroom, or provision room.

TABLE 19. Number of meals eaten daily.

No. meals per day	No. surveys	%
1	23	2.3
2	452	45.5
3	484	48.7
4	27	2.7
Not specified	7	0.7

TABLE 16. Cost of water carried in tins.

Cost per day (Kobo)	No. surveys	%
Not applicable	587	59.1
1–5	62	6.2
6–10	164	16.5
11–15	11	1.1
16–20	53	5.3
21–25	7	0.7
26–30	56	5.6
Not specified	59	5.9

TABLE 17. Fuel used for cooking.

Fuel	Mostly	Occasionally	Not used
Firewood	975(98.2)[a]	1(0.1)	17(1.7)
Charcoal	3(0.3)	13(1.3)	977(98.2)
Kerosene	8(0.8)	19(1.9)	966(97.3)
Other (cornstalk, propane)	4(0.4)	7(0.7)	982(98.9)

[a]First number is number of surveys; number in parentheses is percent.

TABLE 18. Cost of firewood for household use.

Fuel cost per month	No. surveys	%
No cost	132	13.5
0–50 Kobo	35	3.6
> 50 Kobo–1Naira	58	5.9
> 1–2 Naira	123	12.6
> 2–4 Naira	383	39.3
> 4 Naira	235	24.1
Not applicable	9	0.9

TABLE 20. Meals eaten by household.

Pattern	No. surveys	%
3 meals:		
Breakfast, lunch, supper	479	48.2
2 meals:		
Breakfast, lunch	7	0.7
Breakfast, supper	397	40.0
Lunch, supper	48	4.8
3 meals & a snack	27	2.7
2 meals & a snack:		
Lunch, supper, snack	1	.1
Breakfast, supper, snack	3	.3
Breakfast, lunch, snack	1	.1
1 meal:		
Supper	18	1.8
Lunch	4	.4
Breakfast	1	.1
Not specified	7	0.7

TABLE 21. Meal attendance and visitors at meals.

Meal attendance	Only household members	More than household members	Less than household members	Not applicable
Breakfast	649(65.4)[a]	173(17.4)	94(9.5)	77(7.9)
Lunch	383(38.6)	148(14.9)	64(6.4)	398(41.1)
Supper	661(66.6)	235(23.7)	75(7.6)	22(2.2)

[a]First number is the number of surveys; number in parentheses is percent.

TABLE 22. Daily meal patterns of Maiduguri tribal groups.

Pattern	Kanuri	Hausa	Shuwa	Banana	Mandora	Yoruba	Others
3 meals:							
Breakfast, lunch, supper	244(43.4)[a]	124(59.0)	38(51.4)	11(64.7)	33(48.5)	8(53.3)	17(54.8)
2 meals:							
Breakfast, lunch	4(0.7)	2(1.0)	0(0)	0(0)	0(0)	1(6.7)	0(0)
Breakfast, supper	264(46.4)	54(25.7)	27(36.5)	5(29.4)	29(42.6)	4(26.7)	13(41.9)
Lunch supper	25(4.4)	17(8.1)	2(2.7)	1(5.9)	0(0)	0(0)	0(0)
3 meals & snack	15(2.6)	7(3.3)	3(4.1)	0(0)	2(2.9)	0(0)	0(0)
2 meals & snack							
Lunch, supper, snack	1(0.2)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Breakfast, supper, snack	2(0.4)	0(0)	1(1.4)	0(0)	0(0)	0(0)	0(0)
Breakfast, lunch, snack	1(0.2)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1 meal							
Supper	6(1.1)	5(2.4)	3(4.1)	2(2.9)	2(2.9)	1(6.7)	1(3.2)
Lunch	3(0.5)	1(0.5)	0(0)	0(0)	0(0)	0(0)	0(0)
Breakfast	1(0.2)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)

[a]First number is number of surveys; number in parentheses is percent.

TABLE 23. Summary of foods preferred in meal pattern of total population and tribal groups.

Tribal groups	Breakfast	Lunch	Supper
Total population	Tuwo/soup/stew	Rice/stew	Tuwo/soup/stew
	Tea/bread	Tuwo/soup/stew	Burabusko/stew
	Rice/stew	Burabusko/stew	Stew/rice
	Kamu/kosai		Yam/stew
Kanuri	Tuwo/soup or stew	Rice/stew	Tuwo/soup or stew
	Tea/bread	Tuwo/soup or stew	Burabusko/stew
	Rice/stew	Kamu/kosai	Rice/stew
Hausa	Tea/bread or chinchin	Rice/stew	Tuwo/soup/stew
	Kamu or koko/kosai	Tuwo/soup	Rice/stew
	Tuwo/soup or stew	Kamu/kosai	
Shuwa	Tuwo/soup or stew	Tuwo/soup/stew	Tuwo/soup/stew
	Tea/bread	Rice/stew	Rice/stew
	Rice/stew	Kamu/kosai	Yam/stew
Banana	Tuwo/soup or stew	Tuwo/soup or stew	Tuwo/soup/stew
	Tea/bread	Kamu/kosai	Burabusko/stew
	Yam/stew	Rice/stew	Yam/stew
Mandora	Tuwo/stew or soup	Tuwo/soup or stew	Tuwo/soup/stew
	Tea/bread	Rice/Stew	Rice/stew
	Rice/stew	Kamu/kosai	Yam/stew
Yoruba	Tea/bread	Rice/stew	Yam/stew
	Koko or kamu/kosai	Yam/stew	Tuwo/soup/stew
		Tuwo/soup or stew	Rice/stew
Others	Tea/bread	Rice/stew	Tuwo/soup/stew
	Tuwo/soup or stew	Tuwo/stew	Rice/stew
	Rice/stew	Yam/stew	Semovita

TABLE 24. Foods eaten in daily meals according to tribal groups.

Foods	Kanuri				Hausa				Shuwa				Others			
	Breakfast	Lunch	Supper	Snack	Breakfast	Lunch	Supper	Snack	Breakfast	Lunch	Supper	Snack	Breakfast	Lunch	Supper	Snack
Kamu with kosai	57(10.7)[a]	57(19.6)	5(0.9)	2(10.5)	37(20.1)	10(6.6)	0(0)	2(22.2)	7(10.0)	9(20.9)	0(0)	0(0)	2(6.6)	0(0)	1(3.2)	0(0)
Tea & bread or chin chin	108(20.2)	1(0.3)	0(0)	5(26.4)	73(39.7)	2(1.3)	0(0)	3(33.3)	15(21.7)	0(0)	0(0)	1(20.0)	10(33.3)	0(0)	0(0)	0(0)
Bournvita	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Yam & stew	7(1.3)	17(5.8)	19(3.5)	0(0)	3(1.6)	8(5.3)	18(8.8)	1(11.1)	1(1.4)	1(2.3)	5(6.6)	0(0)	2(6.7)	1(5.6)	3(9.7)	0(0)
Tuwo & stew or soup	181(33.8)	78(26.9)	278(50.1)	0(0)	32(17.4)	48(31.7)	118(57.6)	1(11.1)	27(39.1)	17(39.5)	46(61.4)	0(0)	9(30.0)	3(16.7)	12(38.8)	0(0)
Rice & stew with beans	76(14.3)	88(30.3)	73(13.2)	1(5.3)	21(11.3)	64(42.3)	38(18.6)	0(0)	10(14.5)	10(23.3)	11(14.6)	0(0)	5(16.6)	13(72.2)	6(19.4)	0(0)
Taliya or macaroni & stew	35(6.6)	16(5.5)	24(4.4)	0(0)	8(4.4)	7(4.6)	6(3.0)	0(0)	3(4.3)	4(9.3)	4(5.3)	1(20.0)	0(0)	0(0)	1(3.2)	0(0)
Burabusko & stew	56(10.5)	27(9.3)	141(25.4)	2(10.5)	4(2.2)	5(3.3)	14(6.8)	0(0)	4(5.8)	1(2.3)	7(9.3)	1(20.0)	1(3.3)	0(0)	3(9.7)	0(0)
Semovita & soup	3(0.6)	3(1.0)	7(1.3)	0(0)	3(1.6)	5(3.3)	8(3.9)	1(11.1)	1(1.4)	0(0)	0(0)	0(0)	1(3.3)	0(0)	3(9.7)	0(0)
Meat or chicken	11(2.1)	1(0.3)	1(0.2)	0(0)	2(1.1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Beans with vegetable stew	1(0.2)	0(0)	1(0.2)	0(0)	0(0)	0(0)	1(0.5)	0(0)	0(0)	0(0)	1(1.3)	1(20.0)	0(0)	0(0)	0(0)	0(0)
Gari & soup	0(0)	0(0)	3(0.5)	0(0)	0(0)	1(0.7)	1(0.5)	0(0)	0(0)	0(0)	1(1.3)	0(0)	0(0)	0(0)	2(6.5)	0(0)
Sinasin & soup	0(0)	0(0)	1(0.2)	0(0)	0(0)	0(0)	0(0)	0(0)	1(1.4)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Snack foods																
Furah or chin chin or teba or alkaki or waina or dan wake	1(0.2)	1(0.3)	1(0.2)	1(5.3)	0(0)	1(0.7)	1(0.5)	0(0)	0(0)	1(2.3)	0(0)	0(0)	0(0)	1(7.6)	0(0)	1(100.0)
Other foods																
Salad or fruits or sweet potatoes	0(0)	1(0.3)	0(0)	8(42.2)	0(0)	0(0)	0(0)	1(11.1)	0(0)	0(0)	0(0)	1(20.0)	0(0)	0(0)	0(0)	0(0)

	Banana				Mandora				Yoruba			
Kamu with kosai	0(0)	3(24.9)	0(0)	0(0)	6(9.4)	3(8.3)	0(0)	1(33.3)	2(15.4)	1(11.1)	0(0)	0(0)
Tea & bread or chin chin	4(25.0)	0(0)	1(5.9)	0(0)	20(31.3)	0(0)	0(0)	0(0)	7(53.8)	0(0)	1(6.7)	0(0)
Bournvita	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Yam & stew	1(6.2)	0(0)	2(11.8)	0(0)	1(1.6)	2(5.6)	8(11.8)	0(0)	1(7.7)	2(22.2)	5(33.3)	0(0)
Tuwo & stew or soup	8(50.1)	5(41.6)	12(70.6)	0(0)	16(41.0)	15(41.7)	40(58.9)	0(0)	1(7.7)	2(22.2)	5(33.3)	0(0)
Rice & stew with beans	3(13.3)	3(25.0)	0(0)	0(0)	8(20.4)	13(36.2)	12(17.6)	0(0)	0(0)	3(33.3)	2(13.3)	0(0)
Taliya or macaroni & stew	0(0)	0(0)	0(0)	0(0)	2(3.1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Burabusko & stew	0(0)	1(8.3)	2(11.8)	0(0)	2(3.1)	0(0)	4(5.9)	0(0)	0(0)	0(0)	0(0)	0(0)
Semovita & soup	0(0)	0(0)	0(0)	0(0)	4(6.2)	2(5.6)	4(5.9)	1(33.3)	0(0)	1(11.1)	1(6.7)	0(0)
Meat or chicken	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(33.3)	1(7.7)	0(0)	0(0)	0(0)
Beans with vegetable stew	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Gari & soup	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(1.7)	0(0)	1(6.7)	0(0)
Sinasin & soup	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Snack foods												
Furah or chin chin or teba or alkaki or waina or dan wake	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Other foods												
Salad or fruits or sweet potatoes	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)

[a] First number is number of surveys; number in parentheses is percent.

TABLE 25. Amount of grains used in meals.

No. cups used per day	Rice		Guinea corn		Maize		Millet		Wheat	
	No.	%	No.	%	No.	%	No.	%	No.	%
Not applicable	503	50.7	602	60.2	869	87.5	591	59.5	884	89.0
1–3	202	20.3	96	9.7	38	3.8	96	9.7	40	4.0
3–5	110	11.1	86	8.7	27	2.7	82	8.3	33	3.3
6–10	115	11.6	142	14.3	48	4.8	136	13.7	24	2.4
10–20	50	5.0	44	4.4	9	0.9	65	6.5	9	0.9
Over 20	13	1.3	23	2.3	2	0.2	23	2.3	3	0.3

TABLE 26. Type of grain used for making tuwo and koko or kamu.

	Tuwo		Koko or kamu	
	No. households	%	No. households	%
Rice	70	7.0	171	17.2
Guinea corn	289	29.1	135	13.6
Millet	423	42.6	353	35.5
Wheat	14	1.4	138	13.9
Not used	26	2.6	50	5.0
Not specified	171	17.2	146	14.7

TABLE 27. Type of cooked food bought (2 choices available).

Food	1st food bought		2nd food bought	
	No.	%	No.	%
None	823	82.9	210	92.5
Kosai	95	9.6	13	1.3
Koko or kamu	16	1.6	15	1.5
Furah	4	.4	0	0
Sweet potatoes or fruit salad or sugarcane or murriel	24	2.4	17	1.7
Eggs or groundnuts	4	.4	5	.5
Gari & soup	2	.2	0	0
Pinkaso or puff-puff or masa or chin chin or alele	4	.4	4	.4
Pancakes or cakes	15	1.5	14	1.4
Dan wake	2	.2	0	0
Taliya	1	.1	1	.1
Chicken			1	.1
Cocoa	1	.1		

TABLE 28. Type of cereal and foods desired (2 choices available).

Cereal food	Choice 1		Choice 2	
	No.	%	No.	%
Grains				
Wheat	44	4.4	17	1.7
Millet	211	21.2	109	11.0
Rice	152	15.3	112	11.3
Guinea corn	101	10.2	135	13.6
Maize	19	1.9	13	2.0
Semovita (maize)	19	1.9	20	2.0
Bread	38	3.8	9	.9
Millet foods				
Furah	1	.1	0	0
Akamu	2	.2	3	.3
Burabusko	1	.1	3	.3
Kamu	16	1.6	7	.7
Masa	21	2.1	16	1.6
Sinasin	2	.2	1	.1
Cowpea foods				
Kosai	41	4.1	13	1.3
Dan wake	5	.5	5	.5
Wheat foods				
Cakes	2	.2	2	.2
Alkaki	10	1.0	16	1.6
Pinkaso	15	1.5	22	2.2
Gurasha	2	.2	6	.6
Pan cakes	6	.6	11	1.1
Chin chin	0	0	6	.6
Taliya	1	.1	22	2.2

Preparation of Flour

Methods of preparing flour, frequency and cost of preparation, and time required for preparation are given in Tables 31–34. Some households prepare flour every day, but most prepare it two to three times a week. The most common practice is to husk

TABLE 29. Sources of grain for household use.

	Guinea corn	Rice	Millet	Cowpeas	Wheat	Maize
Bought (in storage)	398(40.1)[a]	460(46.3)	562(56.6)	46(4.6)	57(5.7)	72(7.3)
Grown	40(4.0)	17(1.7)	47(4.7)	17(1.7)	7(0.7)	4(0.4)
Gift	11(1.1)	9(0.9)	3(0.3)	3(0.3)	8(0.8)	3(0.3)
Not in store (buy when needed)	534(53.8)	495(49.8)	371(37.4)	916(92.2)	909(91.5)	905(91.1)
Won't tell	10(1.0)	12(1.2)	10(1.0)	11(1.1)	12(1.2)	9(0.9)

[a]First number is number of surveys; number in parentheses is percent.

the grain by pounding (Table 32). This is done either by the housewife (28%) or by paying someone to pound it (37%), and sending it to the engine for milling (81%).

The cost of this practice is shown in Table 33. Those who pay to have the grain husked before milling pay up to 30 Kobo per batch but most households pay 10 Kobo or less. The milling costs can run up to 30 Kobo per batch, but most households pay 5 Kobo or less. It was found that frequency of making the flour did not influence the cost of milling and therefore the size of the batch. Another factor contributing to the cost of household flour preparation is the transportation of the grain, first from the market place to the household for cleaning and husking, then from the household to the mill. Small quantities can be carried by children (Table 47) but larger quantities require commercial transportation.

The time required to prepare grain for milling ranges from 1 to 3 hours if the housewife does it herself (Table 34). Asked what she would do with the time saved (Table 35), most would rest or do other housework. Of particular interest is the group (9%) who would like to prepare foods for sale and the group (8%) who would like to do handicrafts. An educational program on food processing and handicrafts might be directed towards this group.

TABLE 30. Method of household grain storage.

Type of storage	No. households	%
Special grain store	170	17.1
Kitchen	242	24.4
Provision room	224	22.6
Bedroom	256	25.8
Other	45	4.5
Not specified	56	5.6

5. Purchasing Flour

The type of flour purchased in Maiduguri, frequency of purchase, and size of package are given in Tables 36–38. Fifty percent of households in Maiduguri do buy flour at some time. The type of flour purchased is primarily Golden Penny (wheat flour) and Semovita (coarse maize flour), although some households buy bulk flour of local grains from the market. As many as 18% of the households in the Maiduguri study bought flour once a week or more often (Table 37). The 5-lb package of flour is the most popular size (Table 38).

6. Bread Use

Sweet bread has been known in Maiduguri for the last 20 to 25 years, but only recently has western-type bread been available, and become widely available as more bakeries are being built.

Practices relating to bread use are shown in Tables 39–43. At the time of this study, 65% of households were buying bread, and over half of them buying bread daily (Table 39). Loaves are baked in the 5-Kobo size and the 10-Kobo size. The preference is for the 5-Kobo size loaf (Table 40), but about one-third of the households buy the larger size loaf (Table 41).

TABLE 31. Frequency of household flour preparation.

Frequency	No. households	%
No answer/not specified	447	45.0
Every day	136	13.7
Once every 2 days	131	13.2
3 times a week	87	8.8
Once a week	133	13.4
Once a month	2	0.2
Occasionally	17	1.7
Rarely	1	0.1
Do not prepare	39	3.9

Table 41 shows a significant relationship between the number of loaves purchased by a household and the size of loaf purchased. The greater number of loaves purchased per household is usually the smaller size loaf. This may be a convenient size for household distribution to each member.

Also significant are ethnic differences in bread buying (Table 43): the Hausa, Yoruba, and Mandora buy significantly more bread than the Kanuri.

Correlations between household family structure and the use of new products, particularly packaged flour and bread, indicate that households with non-family members and extended family members buy these products more frequently than nuclear family member households.

TABLE 32. Methods of flour preparation (how do you prepare flour?).

Method	Method: Dehulling	Method: Milling
Pound — own grain	8(0.8)[a]	0(0)
Pound — bought grain	280(28.2)	36(3.6)
Others pound — own grain	0(0)	0(0)
Others pound — bought grain	369(37.2)	27(2.7)
Mill — own grain	1(0.1)	8(0.8)
Mill — brought grain	6(0.6)	806(81.2)
Do not prepare	43(4.3)	42(4.2)

[a] First number is number of surveys; number in parentheses is percent.

TABLE 33. Cost of pounding and milling household grains.

Cost range (Kobo) (per batch)	Pounding: No. households	Pounding: %	Milling: No. households	Milling: %
Not pounded/milled	40	4.0	39	3.9
Not specified	27	2.7	39	3.9
1–5	119	11.9	389	39.1
6–10	147	14.7	303	30.5
11–20	37	3.7	40	4.3
21–30	13	1.3	9	.9
Over 30 Kobo	14	1.4	15	1.5
No answer	596	60.0	156	15.7

7. Livestock in Maiduguri

Some livestock is kept in Maiduguri, mostly poultry, but also some cattle and horses. Most of these households (18%) feed their livestock grain (18%) and bran (17%) (Table 44).

Summary

Maiduguri is an urban market town, and offers many new opportunities for domestic grain processing and use. Facilities that were available in rural subsistence economies are disappearing. For example, although compound housing is still the most common, many households now live in rented rooms that no longer include large grain stores or facilities for processing primary agricultural produce. Water and fuel, which in rural communities are free to

TABLE 34. Time required to prepare flour.

	No. households	%
Not prepared	174	17.5
>1 h	181	18.2
>1–2 h	124	12.5
>2–3 h	24	2.4
>3 h	79	8.0
Not specified	411	41.4

TABLE 35. Use of time saved from preparing flour.

Use of time	No. households	%
Not saved	8	0.8
Sleeping, resting	302	30.4
Recreation, visiting	11	1.1
Prepare foods	90	9.1
Do housework	263	26.5
Do handicrafts	84	8.5
Other	23	2.3
Personal care	20	2.0
Not specified	192	19.3

TABLE 36. Type of flour purchased.

Type of flour	No. households	%
Not used	481	48.4
Bulk flour	51	5.1
Golden Penny	202	20.2
Imported (tins)	2	0.2
Semovita	254	25.6
Not specified	3	0.3

fetch, are shown in this study to be costly items associated with food preparation. The household practice of pounding grain to prepare flour is fast disappearing, and other choices for processing grain are now available. The dehulling of grain is still done by pounding, but in this study, many households arrange to pay others to provide this service. Most of the households in Maiduguri get the milling of their flour done at the neighbourhood mills. Some flour (wheat or maize) is available in packages in Maiduguri, particularly the flour milled by the Nigerian Flour Mills of Lagos. This is available in 100-lb bags and 5-lb bags, and 50% of the households were buying this kind of flour as often as once a week or once a month.

The costs of processing local grain points to an increasing demand for locally processed flour. The preference for local grains and flour prepared from local grain is evident in this study from the quantities used in the daily meal preparation. Millet has the highest local preference, followed by sorghum.

The demand for bread baked from imported wheat flour is also high. Already over 60% of the households are using bread and this number is likely to increase.

TABLE 37. Frequency flour purchased by households.

Frequency	No. households	%
Not used	483	48.6
> 1 per week	187	18.8
> 1 per month	20	2.0
< 1 per month	76	7.7
Occasionally	177	17.7
Rarely	17	1.7
Not specified	34	3.4

TABLE 38. Size of package purchased.

Size of flour package	No. households	%
Not used	480	48.3
5 lb	332	33.4
2 lb	72	7.3
100 lb	52	5.2
Other	5	0.5
Not specified	52	5.2

TABLE 39. Frequency of purchasing bread.

	No. households	%
Not applicable	357	36.0
Every day	446	44.9
Once every 2 days	49	4.9
Once every 3 days	20	2.0
Sometimes, occasionally, rarely	95	9.6
Not specified	24	2.4

TABLE 40. Size of loaves purchased.

	No. surveys	%
None purchased	357	36.0
5 Kobo (small size)	402	40.5
10 Kobo (large size)	218	22.0
Not specified	16	1.5

TABLE 41. Number and size of loaves purchased by households daily.[a, b]

	Size of loaf			
	5 Kobo		10 Kobo	
No. loaves	No.	%	No.	%
1	38	46.3	43	52.4
2	103	55.1	82	43.9
3	67	82.7	14	17.3
4	49	81.7	11	18.3
5	5	55.6	4	44.4
6	13	100.0	0	0
7	1	50.0	1	50.0
8	4	80.0	1	20.0
9	3	75.0	1	25.0
Total households	283		157	

[a]Only those households using bread daily.
[b]X^2 significant at the 0.1% level.

TABLE 42. Number and size of loaves purchased by households once every 2 days, three times a week, and sometimes/occasionally.

	Size of loaves					
					Not applicable	
No. loaves	5 Kobo		10 Kobo			
	No.	%	No.	%	No.	%
	Once every 2 days					
1	6	50.0	5	41.7	1	8.3
2	14	58.3	10	41.7	0	0
3	5	71.4	2	28.6	0	0
4	3	100.0	0	0	0	0
5	2	100.0	0	0	0	0
	Three times a week					
1	3	75.0	1	25.0	0	0
2	7	58.3	4	33.3	1	8.3
3	2	66.7	1	33.0	0	0
	Sometimes/occasionally					
1	19	65.5	10	34.5	2	4.9
2	25	61.0	14	34.1	1	11.1
3	6	66.7	2	22.2	1	10.1
4	7	70.0	2	20.2		
5	3	100.0				
6	3	100.0				

TABLE 43. Ethnic differences in buying of bread [a]

Tribe of head	Yes No.	Yes %	No No.	No %
Kanuri	325	57.3	242	42.7
Hausa	153	73.9	54	26.1
Shuwa	52	70.3	22	29.7
Banana	10	58.8	7	41.2
Mandora	52	77.6	15	22.4
Yoruba	14	93.3	1	6.7
Other	22	71.0	9	29.0

[a] X^2 significant at the 0.1% level.

TABLE 44. Number of households keeping livestock[a] and type of feed.

Households	Yes	No	No response
Keeping livestock	185(18.6)[b]	799(80.5)	9(.9)
Feeding grain to livestock	180(18.1)	805(81.1)	8(.8)
Feeding bran to livestock	164(16.6)	818(82.4)	10(1.0)

[a] Livestock: mostly poultry, some cattle, goats, and horses.
[b] First number is number of households; number in parentheses is percent.

Children in Maiduguri

The data on children in Maiduguri were obtained from two surveys, the consumer grain preference study and the survey of specific schools in Maiduguri. The importance of education of children was apparent from the results of the survey. The increasing number of children in school will influence their attitudes and values and eventually their occupations and opportunities in Nigeria. On the other hand, children being in school means that they are not available for work within the home. This will affect the household labour, and, specifically of interest in this study, the labour involved in grain and flour distribution and preparation.

TABLE 45. Type of school attended by children.

Type of school	Attendance No.	Attendance %
Koranic	139	34.8
Government	221	55.4
Both types attended	35	8.8
Not specified	4	1.0

Children can be an economic advantage in the developing society. However, 23.7% of the Maiduguri households did not have any children under 14 years of age, and many of the households (40.9%) had school-age children attending school; only 22% of the households had children from 6 to 14 years who were not attending school. The school attended by children was generally government (55.4%), although Koranic schools accounted for 34.8% of the children (Table 45). The education of the household head significantly affected the type of school that his children attended (Table 46).

Children can be an important labour resource in the household. As previously noted, 15.3% of the households relied on children to bring the water supply from the community standpipe (Table 15). Children were also used for household work (Table 47), particularly taking grain to the neighbourhood engine (39.8%), washing plates (34.8%), and shopping (26.0%). Children are also involved in the selling of foods in the streets or the market. However, the study shows that with regard to selling

TABLE 46. Cross-tabulation of education of the household head and type of school attended by his children.[a]

Education of head	Type of school: Koranic	Gov't.	Both	Not specified
Primary	10(20.4)	33(67.3)	5(10.2)	1(2.0)
Secondary	0(0)	31(96.9)	1(3.1)	0(0)
Gov't. trade	0(0)	13(100.0)	0(0)	0(0)
Post-secondary	0(0)	13(100.0)	0(0)	0(0)
Koranic	85(57.0)	44(29.5)	18(12.1)	2(1.4)
Literacy	9(22.5)	26(65.0)	4(10.0)	1(2.5)
No formal education	35(34.0)	61(59.2)	7(6.8)	0(0)

[a] X^2 significant at the 0.1% level.

TABLE 47. Children's work in the household.

Type of work	Yes	No	Households with no children	Or not answered
Shopping	258(26.0)[a]	485(48.8)	227(22.9)	23(2.3)
Fetching water	216(21.8)	534(53.8)	225(22.7)	18(1.8)
Cooking	91(9.2)	656(66.1)	227(22.9)	19(1.9)
Washing plates	346(34.8)	402(40.5)	227(22.9)	18(1.8)
Selling food	58(5.8)	629(69.4)	224(22.6)	12(2.2)
Husking grain	47(4.7)	701(70.6)	224(22.6)	21(2.1)
Washing grain	42(4.2)	705(71.0)	225(22.7)	21(2.1)
Sending grain	395(39.8)	354(35.6)	227(22.9)	17(1.7)
Pounding grain	56(6.6)	683(68.8)	227(22.9)	17(1.7)

[a]First number is number of surveys; number in parentheses is percent.

food, fetching water, and sending grain to the engine, there is a significant difference in the children's involvement, depending on the tribe of the head of the household.

The meal patterns of Maiduguri households create the need for snacking during the day. Many households give money to children to spend (38.7%), generally for snack foods. The amount of money varies, generally, from 1 to 7 Kobo per day (Table 48).

TABLE 48. Amount of money given to children — household survey.

No. Kobo	No. surveys	%
Not specified	197	19.8
1	29	2.9
2	28	2.8
3	103	10.4
4	21	2.1
5	80	8.1
6	32	3.2
7	3	0.3
More than 7 Kobo	3	0.3
Not applicable	497	50.1

The school children's questionnaires gave results regarding the breakfast- and snack-eating habits of school children. Most of the children surveyed were boys (74.5%) and their ages ranged from under 6 to over 18 years (Table 49). Most of the children ate breakfast before coming to school (81.2%). The breakfasts were usually based on bread (33.8%), or rice (18.5%), with tea, tuwo, yam, and semovita also acting as breakfast bases (Table 50).

Most of the school children (76.4%) had received money for snacks, usually 1 to 7 Kobo, although 31.0% received over 7 Kobo (Table 50). Two items of snack foods were recorded per student (Table 52) and the most popular included rice, bread, cakes, and pancakes, although there was a wide variety given.

TABLE 49. Age of school children — school questionnaire.

	No. children	%
Not specified	12	2.0
Under 6	24	4.1
6–9	101	17.4
10–13	195	33.6
14–18	170	29.3
Over 18	78	13.4

TABLE 50. Type of breakfast foods of school children — school questionnaire.

Food	No. children	%
No breakfast	120	20.7
Bread etc.	195	33.8
Rice etc.	107	18.5
Tea	24	4.1
Yam etc.	22	3.8
Tuwo etc.	18	3.5
Semovita	16	2.7
Kosai	14	1.9
Others[a]	53	9.3

[a]Includes: taliya, gari, burabusko, kamu, meat, koko, corn, fruits, teba, sweet potatoes, beans, pancakes, cornflakes, ice cream, couscous, beancakes, groundnuts, dan wake, fish.

TABLE 51. Amount of money received for snacks — school questionnaire.

No. Kobo	No. surveys	%
None	138	23.8
1	6	1.0
2	17	2.9
3	63	10.9
4	32	5.5
5	118	20.3
6	17	2.9
7	9	1.6
More than 7 Kobo	180	31.0

TABLE 52. Snack foods purchased by school children (2 selections offered).

Snack food	Choice 1	Choice 2
Rice etc.	153(25.4)[a]	29(5.0)
Bread etc.	37(6.5)	20(3.5)
Cakes	41(7.1)	4(.7)
Pancakes	32(5.5)	18(3.1)
Sugarcane	18(3.1)	15(2.6)
Yams etc.	20(3.5)	8(1.4)
Beancakes	13(2.2)	4(.7)
Fish	10(1.7)	7(1.2)
Ice cream	10(1.7)	7(1.2)
Sweets	9(1.6)	10(1.7)
Fruits	8(1.4)	7(1.2)
Others[b]	67(11.5)	55(11.0)

[a]First number is number of surveys; number in parentheses is percent.

[b]Includes tea, groundnuts, vegetables, milk, cassava, nuts, chin chin, sweet potatoes, teba, kosai, kamu, dan wake, tuwo, beans, gari, soft drinks, pinkaso, egg, millet, meat, semovita.

The eating habits of school children emphasized the importance of snacks in their diets. Children are receiving money for snacks during the day and are very often choosing cereal-based foods. It becomes important to have contact with the food sellers of these snack foods to influence the type of food available. Educational programs are needed within the schools to teach adequate eating habits, especially regarding choices of breakfast and snack foods.

Maternal and Child Care

The data of maternal and child-care practices in Maiduguri were obtained from two surveys, the consumer grain preference study and a survey of women attending two maternal and child health clinics in Maiduguri.

The household surveys yielded data on the special foods that mothers eat while breastfeeding (Table 53), special foods that the mothers feed to their babies while still breastfeeding (Table 53), age of weaning of the baby (Table 54), foods fed to babies after weaning (Table 55), and foods bought especially for feeding the baby (Table 55).

For the questions regarding food choices, two responses were coded. Most respondents did not eat special foods themselves or give special foods to their babies while on the breast. Staples and cereals, as well as high-protein foods, were the most popular foods fed to babies after weaning. However, most mothers did not feed babies foods that differed from the family diet. The high-protein foods (especially milk) and the special baby foods (lactogen, glucose) were most often purchased especially for the babies.

The maternal and child health questionnaire focussed on the women who were attending baby clinics sponsored by the local government in Maiduguri. The mothers were surveyed regarding age, tribe, education (Table 56), and number of children born and alive (Table 57). Many women surveyed were of the Kanuri tribe (34.6%), although various tribes were represented. Most of the women were under 25 years of age and had no formal education.

The same questions as in the household survey were asked regarding special foods eaten while breastfeeding (Table 58), extra foods given to the baby while on the breast (Table 58), age of weaning of the baby, foods fed to the baby after weaning (Table 59), and special foods bought for the baby (Table 59). As in the household survey, most women did not supplement their own diet while breastfeeding. However, most did supplement the baby's diet while on the breast. Many women gave their babies extra milk or eggs (37.7%), or staples and cereals (23.1%). Again, 18 months was the most popular age (56.4%) for weaning. Most women fed their babies staples and high protein foods for this purpose. However, fruits and vegetables and high protein foods were among those especially bought for the babies.

Rice (61.1%) was preferred as a grain for baby food as compared to guinea corn (57.0%) and millet (52.3%) (Table 60).

The results show that the clinics are able to influence the child-feeding practices of women who attend. The importance of these clinics in influencing the maternal- and child-eating habits and in influencing the practice of seclusion of women during child-bearing years is very important in adult education programs. The coordination of home economics extension and clinic activities will be beneficial.

TABLE 53. Special foods eaten by mother while breastfeeding and special foods for baby on the breast — household survey (2 selections offered).

	Breastfeeding mother		Baby on breast	
Food group	Choice 1	Choice 2	Choice 1	Choice 2
None	665(67.0)[a]	821(82.7)	685(69.1)	830(83.6)
Fruits & vegetables	35(3.5)	31(3.1)	32(3.2)	21(2.1)
Fats	7(0.7)	4(0.4)	11(1.1)	33(3.3)
Drinks	5(0.5)	7(0.7)	7(0.7)	6(0.6)
High carbohydrate	12(1.2)	10(1.0)	2(0.2)	2(0.2)
High protein	64(6.4)	62(6.2)	68(6.8)	49(4.9)
Staples/cereals	203(20.4)	51(5.1)	114(11.5)	27(2.7)
Biscuits	1(0.1)	4(0.4)	0(0)	0(0)
Stews/soups	0(0)	2(0.2)	6(0.6)	2(0.2)
Special foods	1(0.1)	1(0.1)	67(6.7)	23(2.3)

[a]First number is number of surveys; number in parentheses is percent.

The late weaning age of babies emphasizes the importance of supplementation of baby's diets before weaning (i.e., while still on the breast). Breast milk, especially after 8 months of feeding, is low in calories, iron, and some vitamins. Therefore, supplementation is important. In many instances, women interviewed in both surveys were doing a good job of supplementing their babies' diets. It was particularly evident that the women attending the clinics realized the importance of supplementation of breast milk with other foods.

TABLE 54. Age of weaning of babies — household survey.

Months	No. households	%
Not applicable	349	35.1
3–12	28	2.8
13–18	463	46.6
19–24	132	13.2
26–36	10	1.0
Still breastfeeding	9	0.9
Not breastfeeding	2	0.2

TABLE 56. Age, tribe, and education of the mother — clinic study.

	No. surveys	%
Age (years)		
Under 18	89	27.7
19–25	137	42.7
26–35	51	15.9
Over 35	3	0.9
No response	41	12.8
Tribe		
Kanuri	111	34.6
Hausa	40	12.5
Shuwa	20	6.2
Fulani	19	5.9
Baburawa	21	6.5
Others	110	34.3
Education		
Primary	50	15.6
Secondary	3	0.9
Post-secondary	0	0
Literacy	2	0.6
Koranic	10	3.1
No formal education	232	72.3
No response	24	7.5

TABLE 55. Foods fed to babies after weaning and foods bought especially for babies — household survey (2 selections offered).

	Weaned babies		Especially for babies	
Food group[a]	Choice 1	Choice 2	Choice 1	Choice 2
None	512(51.6)[b]	714(71.9)	668(67.3)	82(8.4)
Fruits & vegetables	28(2.8)	37(3.7)	46(4.6)	38(3.8)
Fats (butter)	12(1.2)	20(2.0)	12(1.2)	17(1.7)
Drinks	7(0.7)	11(1.1)	4(0.4)	9(0.9)
High carbohydrate	6(0.6)	10(1.0)	2(0.2)	3(0.3)
High protein	133(13.4)	83(8.4)	123(12.4)	56(5.6)
Staples/cereals	271(27.3)	84(8.5)	52(5.2)	23(2.3)
Biscuits	1(0.1)	1(0.1)	0(0)	1(0.1)
Stews/soups	5(0.5)	11(1.1)	29(2.9)	13(1.3)
Special baby foods	18(1.8)	22(2.2)	57(5.7)	19(1.9)

[a] Food classification: *fruits and vegetables* — bananas, lemons, oranges, pineapples, tomatoes; *fats* — cow fat, cow butter, palm oil: *drinks* — bournvita ovaltine, tea; *high carbohydrate* — potatoes, yam, gari; *high protein* — bean liver, heart, kidney, eggs, milk, fish; *staples and cereals* — tuwo, corn, rice, millet, guinea corn, kamu, burabusko, taliya, macaroni, teba, koko, bread, maize, akamu; *biscuits* — biscuits, sweets, chin chin, cereals, pancakes; *stews and soups* — various; *special baby foods* — glucose, lactogen, custards.

[b] First number is number of surveys; number in parentheses is percent.

The supplementation of the mother's diet during pregnancy and while breastfeeding is important. The increased needs of the fetus and then the baby require more nutrients from the mother. It is important

TABLE 57. Maternal and child health survey on number of children born and number of children alive.

Children born	Children alive								
	1	2	3	4	5	6	7	8	9
1	112(100.0)[a]	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
2	16(19.5)	66(80.5)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
3	1(1.9)	12(22.2)	41(75.9)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
4	1(3.0)	4(12.1)	6(18.2)	22(66.7)	0(0)	0(0)	0(0)	0(0)	0(0)
5	0(0)	5(22.7)	4(18.2)	4(18.2)	9(40.9)	0(0)	0(0)	0(0)	0(0)
6	0(0)	0(0)	0(0)	1(12.5)	1(12.5)	6(75.0)	0(0)	0(0)	0(0)
7	0(0)	1(33.3)	0(0)	0(0)	0(0)	1(33.3)	1(33.3)	0(0)	0(0)
8	0(0)	0(0)	0(0)	1(25.0)	0(0)	1(25.0)	0(0)	2(50.0)	0(0)
9	0(0)	0(0)	0(0)	0(0)	0(0)	1(33.3)	2(66.6)	0(0)	0(0)

[a] First number is number of surveys; number in parentheses is percent.

TABLE 58. Special foods eaten by mother while breastfeeding (2 selections) and special foods for baby on the breast (3 selections) — clinic study.

Food group	Breastfeeding mother		Baby on breast		
	Choice 1	Choice 2	Choice 1	Choice 2	Choice 3
None	211(65.7)[a]	294(91.6)	61(19.0)	222(69.2)	301(93.8)
Fruits & vegetables	21(6.5)	0(0)	27(8.4)	1(0.3)	1(0.3)
Fats	2(0.6)	0(0)	8(2.5)	0(0)	0(0)
Drinks	6(1.9)	0(0)	7(2.2)	0(0)	0(0)
High carbohydrate	42(13.1)	9(2.8)	3(0.9)	0(0)	0(0)
High protein	33(10.3)	10(5.0)	121(37.7)	19(5.9)	0(0)
Staples/cereals	2(0.6)	0(0)	74(23.1)	60(18.7)	6(1.9)
Biscuits	0(0)	1(0.3)	0(0)	1(0.3)	0(0)
Stews/soups	0(0)	0(0)	0(0)	1(0.3)	2(0.6)
Special foods	4(0.9)	1(0.3)	20(6.2)	17(5.3)	11(3.4)

[a]First number is number of surveys; number in parentheses is percent.

TABLE 59. Foods fed to babies after weaning and foods bought especially for babies — clinic study (3 selections offered).

Food group	Weaned babies			Especially for babies		
	Choice 1	Choice 2	Choice 3	Choice 1	Choice 2	Choice 3
None	58(18.1)[a]	189(58.9)	287(89.4)	158(49.2)	270(84.1)	318(99.1)
Fruits & vegetables	61(19.0)	3(0.9)	0(0)	73(22.7)	1(0.3)	0(0)
Fats	2(0.6)	0(0)	0(0)	1(0.3)	0(0)	0(0)
Drinks	12(3.7)	0(0)	0(0)	1(0.3)	0(0)	0(0)
High carbohydrate	13(4.0)	2(0.6)	0(0)	0(0)	0(0)	0(0)
High protein	43(13.4)	41(12.8)	0(0)	47(14.6)	27(8.4)	0(0)
Staples/cereals	126(39.3)	62(19.3)	27(8.4)	14(4.4)	9(2.8)	1(0.3)
Biscuits	1(0.3)	1(0.3)	1(0.3)	3(0.9)	2(0.6)	0(0)
Stews/soups	0(0)	8(2.5)	5(1.6)	0(0)	2(0.6)	1(0.3)
Special foods	5(1.6)	15(4.7)	1(0.3)	24(7.5)	10(3.1)	1(0.3)

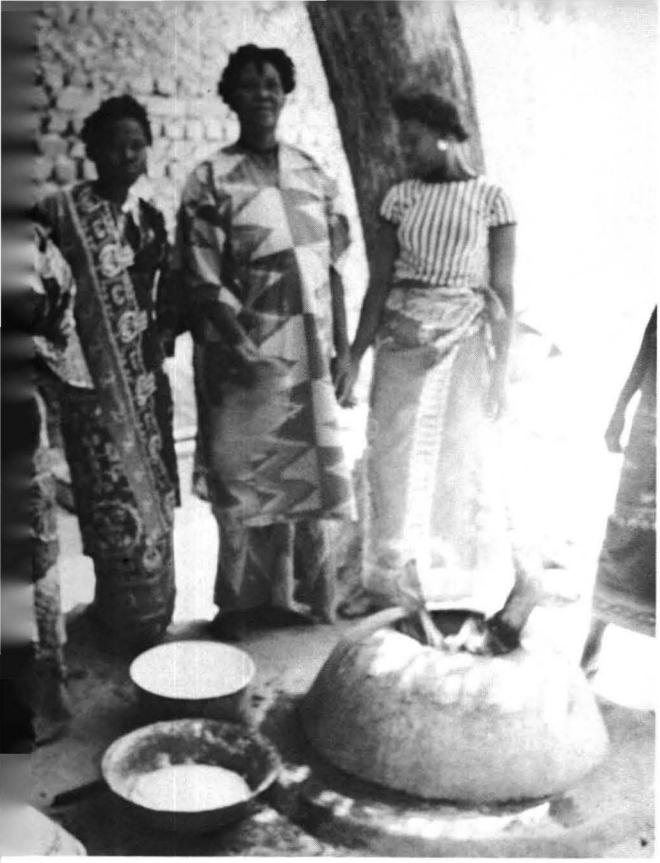
[a] First number is number of surveys; number in parentheses is percent.

TABLE 60. Grain preferred in cooked food for babies — clinic study.

Grain	Yes		No	
	No. surveys	%	No. surveys	%
Guinea corn	183	57.0	138	43.0
Millet	168	52.3	153	47.7
Rice	196	61.1	125	38.8
Wheat	49	15.3	272	84.7
Maize	11	3.4	3.0	96.6

that women be encouraged to meet these increased needs by changes in their diets.

A potential use for specialized types of cereal foods, such as paps, could be foods fed to babies after weaning. Sufficient calories must be provided without excess bulk in the intake as well as essential vitamins and minerals plus protein in sufficient amounts.



Women of Maiduguri

Women are the prime concern of the consumer education program in grain utilization. They determine the foods to be fed to their families in accordance with the wishes of their husbands. Their attendance at maternal and child health clinics will provide a vehicle for transmission of education regarding maternal- and child-feeding practices. Women also prepare and sell most of the snack foods sold to school children and in the town. To have nutritious, high-quality snack foods for school children, practical demonstrations in their preparation and handling could be directed to the women who are commercial food processors and sellers.

Demographic factors, such as tribe, age, occupation, and education of women, can be used to differentiate groups according to food usage, knowledge of cooked foods, and practices with regard to flour preparation and use. In Maiduguri, women are usually of the Kanuri or Hausa tribe, are generally under 35 years of age (75.6%) and have no formal schooling. The younger wives have significantly more education than the older ones. Education of wives is also affected by tribal origin, although most wives in every tribe are without formal schooling (58.8–81.8%).

The vast majority of women are housewives, with no secondary occupation. This could be related to the large number of one- or two-wife families in Maiduguri. However, 13.2% of the women have trading, handicrafts, or food preparation as a primary occupation, and 6.1% have these as secondary occupations. Only eight respondents (0.8%) were in clerical or professional fields. This is a relatively small number compared to employment opportunities for women in other parts of the northern states.

Other studies done in the northern states on women's employment show them to be actively engaged in remunerative occupations. Studies at Ahmadu Bello University indicate that 95% of the women in three villages near Zaria have some occupation and 90% of these are in food processing. Earlier studies (Abell 1962) show that in all households surveyed the wives of the head of the household were employed in one or more money-earning activities. A current study in Benue Plateau State shows Moslem and non-Moslem women alike are engaged in wage-earning activities, particularly trading, food processing, and mat making. One would expect the women of Maiduguri to follow this trend.

The wives were questioned regarding their knowledge and preparation of a number of cooked foods, mostly based on grain products (Table 61). The use of cooked foods varied considerably, with alkaki (45.3%), pinkaso (43.7%), taliya (49.0%), and sinasin (30.0%) being the most popular cooked foods. The majority of cooked foods were prepared for household use, and not for sale. Taliya (1.6%), kosai (1.4%), and furah (1.3%) were the most popular cooked foods prepared for sale. Most women who cooked these foods for household use were taught the recipe by their mothers, but food sellers were more often taught by other women in the community. For women who did not prepare the cooked foods, "no interest or no money" was the main reason, followed by "do not know how" or "husband does not allow."

The method of preparing snack foods is shown to be different among women of various tribal origins (Table 62). Among the Kanuri, sinasin, pinkaso, alkaki, and taliya are the best-known recipes used in household meals and for sale. Among the Hausa, kosai, dan wake, furah, and masa are the best known. The Mandora specialize in cowpea products, particularly kosai, alele, dan wake, and some wheat products, especially pancakes and chin chin.

TABLE 61. Number of households preparing special recipes from cereals, indicating nature of use and source of knowledge for preparation.

Cereal foods	Household use or sale and source of knowledge				
	Household use, mother taught	Household use, other taught	For sale, mother taught	For sale, other taught	Not specified
Millet foods					
Furah	174(17.5)[a]	112(11.3)	13(1.3)	32(3.2)	0(0)
Masa	185(18.6)	109(11.0)	8(0.8)	24(2.4)	0(0)
Sinasin	208(20.9)	145(14.6)	11(1.1)	23(2.3)	1(0.1)
Acha patten	71(7.2)	64(6.4)	4(0.4)	8(0.8)	0(0)
Wheat foods					
Alkaki	229(23.6)	174(17.5)	11(1.1)	36(3.6)	0(0)
Gurasha	95(9.6)	71(7.2)	5(0.5)	16(1.6)	0(0)
Taliya	229(23.1)	186(18.7)	16(1.6)	56(5.6)	1(0.1)
Cakes	56(5.6)	56(5.6)	2(0.2)	20(2.0)	0(0)
Pancakes	93(9.4)	104(10.5)	6(0.6)	28(2.8)	0(0)
Pinkaso	227(22.9)	168(16.9)	10(1.0)	29(2.9)	1(0.1)
Chin chin	132(13.3)	108(10.9)	6(0.6)	26(2.6)	1(0.1)
Cowpea foods					
Kosai	135(13.6)	92(9.3)	14(1.4)	37(3.7)	0(0)
Alele	74(7.5)	63(6.3)	10(1.0)	21(2.1)	0(0)
Dan wake	121(12.2)	92(9.3)	9(0.9)	32(3.2)	0(0)
Rice product					
Aswan	75(7.6)	40(4.0)	1(0.1)	14(1.4)	0(0)
Cassava product					
Gari	107(10.8)	60(6.0)	6(0.6)	16(1.6)	0(0)

Cereal foods	Recipes not used and reason			
	Not interested, no money	Don't know how	Husband does not allow	No answer
Millet foods				
Furah	371(37.4)	219(22.1)	34(3.4)	38(3.8)
Masa	374(37.7)	228(23.0)	33(3.3)	32(3.2)
Sinasin	310(31.2)	233(23.5)	33(3.3)	29(2.9)
Acha patten	434(43.7)	307(30.9)	36(3.6)	69(6.9)
Wheat foods				
Alkaki	299(30.1)	181(18.2)	31(3.1)	32(3.2)
Gurasha	391(39.4)	327(32.9)	35(3.5)	53(5.3)
Taliya	271(27.3)	172(17.3)	34(3.4)	28(2.8)
Cakes	429(43.2)	324(32.6)	36(3.6)	70(7.0)
Pancakes	395(39.8)	283(28.5)	36(3.6)	48(4.8)
Pinkaso	301(30.3)	192(19.3)	33(3.3)	32(3.2)
Chin chin	388(39.1)	256(25.8)	36(3.6)	40(4.0)
Cowpea foods				
Kosai	373(37.6)	259(26.1)	33(3.3)	50(5.0)
Alele	422(42.5)	305(30.7)	34(3.4)	64(6.4)
Dan wake	382(38.5)	268(27.0)	34(3.4)	55(5.5)
Rice product				
Aswan	430(43.3)	346(34.8)	34(3.4)	53(5.3)
Cassava product				
Gari	426(42.9)	281(28.3)	35(3.5)	62(6.2)

[a]First number is number of surveys; number in parentheses is percent.

TABLE 62. Preparation of snack foods by senior wife for household or commercial use (tribal distribution).

Foods		Tribal group of senior wife						
		Kanuri	Hausa	Shuwa	Banana	Mandora	Yoruba	Others
Millet foods								
Furah	Yes	175(33.0)[a]	107(52.2)	11(14.0)	2(18.2)	18(31.0)	1(11.1)	9(29.1)
	No	356(67.0)	98(47.8)	68(86.0)	9(81.8)	40(69.0)	8(88.0)	22(70.9)
Masa	Yes	195(36.5)	79(38.2)	16(20.3)	1(9.1)	17(29.3)	1(11.1)	8(25.8)
	No	340(63.5)	128(61.8)	63(79.7)	10(90.9)	41(70.7)	8(88.8)	23(74.2)
Sinasin	Yes	299(55.0)	38(18.8)	27(33.7)	1(9.1)	7(11.0)	1(11.1)	3(10.3)
	No	244(45.0)	165(81.2)	53(66.3)	10(90.9)	51(87.9)	8(88.9)	26(89.7)
Acha	Yes	64(12.6)	41(20.5)	12(15.2)	2(18.2)	12(2.1)	1(11.1)	7(24.1)
patten	No	444(87.4)	159(79.5)	67(84.8)	9(81.8)	45(79.0)	8(88.9)	22(75.9)
Wheat foods								
Pinkaso	Yes	292(54.2)	78(38.0)	30(37.5)	2(18.2)	16(27.6)	1(11.1)	7(24.1)
	No	248(45.8)	126(62.0)	50(62.5)	9(81.8)	42(72.4)	8(88.9)	22(74.9)
Pancakes	Yes	94(18.0)	73(35.8)	13(16.4)	1(9.1)	25(42.4)	6(66.7)	7(24.1)
	No	429(82.0)	131(64.2)	66(83.6)	10(90.9)	34(57.6)	3(33.3)	22(75.9)
Chin chin	Yes	109(20.6)	205(42.0)	19(23.7)	3(27.3)	29(49.1)	7(77.8)	10(32.3)
	No	418(79.4)	119(58.0)	61(76.3)	8(72.7)	30(50.9)	2(22.2)	21(67.7)
Alkaki	Yes	297(54.8)	83(41.2)	32(40.0)	2(18.2)	18(31.0)	1(11.1)	4(13.7)
	No	245(45.2)	119(58.9)	48(60.0)	9(81.8)	40(69.0)	8(88.9)	25(86.3)
Garusha	Yes	133(25.5)	22(11.0)	15(19.0)	1(9.1)	7(11.9)	1(11.1)	1(3.6)
	No	390(74.6)	179(89.0)	64(81.0)	10(90.9)	51(88.1)	8(88.9)	27(96.4)
Taliya	Yes	329(60.4)	75(36.9)	37(46.3)	2(18.2)	20(34.0)	1(11.1)	9(30.9)
	No	215(39.6)	128(63.1)	43(53.7)	9(81.8)	39(66.1)	8(88.9)	20(69.1)
Cakes	Yes	54(10.6)	43(21.5)	10(12.7)	1(9.1)	13(22.1)	3(33.3)	4(14.3)
	No	453(89.4)	158(78.5)	69(87.3)	10(90.9)	46(77.9)	6(66.7)	24(85.7)
Cowpea foods								
Kosai	Yes	96(18.5)	102(50.0)	12(15.0)	3(27.3)	37(62.8)	2(22.2)	16(50.0)
	No	422(81.5)	102(50.0)	68(85.0)	8(72.8)	22(37.2)	7(77.7)	16(50.0)
Alele	Yes	46(9.0)	68(33.1)	5(6.4)	1(9.1)	24(41.4)	4(50.0)	12(41.3)
	No	463(91.0)	137(66.9)	73(93.6)	10(90.9)	34(58.6)	4(50.0)	17(58.5)
Dan wake	Yes	92(17.7)	109(53.5)	14(19.8)	2(18.2)	24(41.3)	1(12.5)	5(17.9)
	No	427(82.3)	95(46.5)	65(82.2)	9(81.9)	34(50.7)	7(87.5)	23(82.1)
Rice product								
Aswan	Yes	88(16.8)	15(7.5)	10(12.7)	1(9.1)	7(12.0)	1(11.1)	3(10.0)
	No	435(83.2)	105(92.5)	69(87.3)	10(90.9)	51(88.0)	8(88.9)	27(90.0)
Cassava product								
Gari	Yes	113(22.0)	34(16.8)	12(15.5)	2(18.2)	15(25.5)	3(33.3)	6(21.4)
	No	401(78.0)	168(83.2)	67(84.5)	9(81.8)	44(74.5)	6(66.7)	22(78.6)

[a] First number is number of surveys; number in parentheses is percent.

The Yoruba specialize in wheat products, particularly cakes, pancakes, and chin chin. Alele is the cowpea product shown to be a specialty of the Yoruba.

As previously mentioned, most women do some flour preparation in the household, although there has been a significant trend towards using the small mill or engine for final flour preparation. Because flour preparation occupies a significant amount of time for the women, the question arises as to how they will utilize the time saved if they buy prepared flour. This question was difficult for the women to answer, as it required speculation of the unknown. As discussed previously, the women who would prepare food (9.1%) or do handicrafts (8.5%) would appear to be the most receptive group for consumer education programs in these fields. In any case, the

leisure time produced by availability of prepared flour will provide opportunity for educational programs. The fact that 50% of the households are already buying flour (usually Golden Penny or Semovita) is some indication that the transition to purchased flour is already taking place.

The practice of purdah or seclusion during childbearing years makes consumer education difficult. Seclusion is still practiced by women in Maiduguri, yet certain exceptions can be made if programs or activities are considered worthwhile to the community or within the role of women. It will be necessary to prove this worthiness before beginning any new program. The attendance of many women at maternal and child health clinics shows that exceptions can be made if the programs are considered worthwhile.

Summary

Some women are already engaged in occupations, particularly in food processing and handicrafts. The number is likely to increase to follow the trend in other parts of the northern states. Other occupational changes in grain processing are also taking place; many women now choose packaged flour and flour milled at the neighbourhood mill rather than pounding it themselves. In the preparation of food for sale the study shows that women learn the commercial recipes from others rather than from their mothers, again showing they are going outside the home for new ideas. These practices indicate women are taking advantage of new trends and certain aspects of modernization that suit them, including attendance at maternal and child health centers.

Consumer education programs and demonstrations for food sellers may also prove to be worthwhile to women in Maiduguri. The tribal differences exhibited in food preferences and in the snack foods prepared indicate that special consideration must be given to tribal groups in planning educational or demonstration programs.

TRENDS AND IMPLICATIONS

Maiduguri is changing under the effects of urbanization. The community is relatively cosmopolitan, with Kanuri, Hausa, and other tribes together. Contrary to previous indications about family life in the northern states, the trend seems to be to smaller families and fewer wives. The compound-style of housing is being replaced somewhat by single-family units, where cooking practices must change. Few families have special grain storage areas, reflecting the low amounts of grains on hand. The meal pattern reflects the urban influence through buying lunch away from home. The increased cosmopolitan nature of Maiduguri creates a milieu for exposure to new ideas.

The household survey revealed that many households in Maiduguri have added rice and bread to the traditional diet of staple cereal foods, such as tuwo, kamu, and burabusko. In particular, rice is replacing tuwo and burabusko to some extent at lunch, and bread is becoming a popular breakfast food. These changes represent increased choice in diet, in spite of high cost.

Changes have also taken place in grain use. Because of daily or weekly wages, most households in Maiduguri are forced to purchase grains in small quantities for household processing. At present, the husking of the grain must be done by the housewife or by paying others to do it for her. However, milling is being done almost exclusively by the small neighbourhood mills. This represents a shift from traditional home processing of grains to more technological processes. Many households in Maiduguri are presently purchasing packaged flour. Therefore, prepared flour and new cereal foods will be a continuation in a gradual shift towards processed foods.

It is necessary to study more closely consumer preference for flours for particular products. The flour preference for tuwo was millet, then sorghum, wheat, maize, and rice; millet was preferred for burabusko and millet and rice for koko. The consistency of flour for koko appears to be finer than for tuwo. However, relative preferences must be tested by sensory evaluation techniques.

Consumer satisfaction with the flour mill products will need to be monitored to ensure product acceptance. Controlled marketing of new products, along with the study of packaging and household use factors, will facilitate new product introduction in Maiduguri.

The life style of women in Maiduguri appears to be undergoing change. The maternal and child health clinic attendance illustrates a growing involvement in the community. Further involvement will depend on the husband's reaction, plus the influences of increased education. Use of convenience products may result in increased leisure time. However, this influence may be balanced to some extent by increased work because more children will be going to school and will be thus unavailable for work. The use of convenience products in the household is contrasted to the traditional methods of transferring knowledge regarding cereal foods. More information is needed concerning the introduction of new cereal products and their acceptance by the community (e.g., taliya, bread). Providing information about methods of preparing traditional cereal foods could be the basis of a consumer education program. The maternal and child health clinics could be a vehicle for education regarding cereal foods and cereal supplementation.

Three areas show specific potential for further development and interaction: (A) consumer education; (B) food processing; and (C) a milling program to meet the needs of the consumer and the food processor.

(A) Consumer Education

The increased choice offered by the new convenience foods in Maiduguri plus the continuing preference for traditional cereal foods points toward a consumer education program based on:

(*a*) supplementation of traditional cereal dishes (tuwo, taliya) with high-protein dishes (e.g. groundnut butter, fish, daddawa, etc.);

(*b*) making products from millet and sorghum flour, which were traditionally made of wheat or other cereals;

(*c*) making new dishes using millet, sorghum, and cowpea flour;

(*d*) making convenience products based both on new ideas and traditional recipes;

(*e*) discovering the characteristics of flour most suitable for different purposes; and

(*f*) choosing convenience products based on good nutrition and factors operative in the management of Maiduguri households.

(B) Food Processing

The consumption of snack foods by many school children, businessmen, and labourers points to the opportunity of working with food processors and sellers, education authorities, and public health officials to encourage the production of high-quality nutritious snack foods for school children and the market place. The use of cereal foods in residential school meals and other government institutions requires further study.

The cereal foods used in the diets of babies also require further investigation. Already many women are using cereals as supplements during weaning and after weaning. The use of baby cereals related to weaning age is an important relationship to be investigated; also, more study concerning the consistency and nutritive value of the flour being used for babies is required. The maternal and child health centres are particularly concerned with this problem and offer a controlled sample for this investigation.

Further study and development work is proposed, particularly along the following lines:

(1) to study the snack foods that are presently available to school children;
(2) to find out what the schools are doing to encourage, discourage, or control food sellers in the sale of snack foods to school children;
(3) to find out the teachers' attitudes towards food sellers and the snack foods being sold to school children;
(4) to find out the current conditions of the food processor in such factors as securing ingredients, the use of modern equipment and practices in the preparation and the marketing of snack foods;
(5) to introduce new ideas and technology to the food processors (through product demonstrations in the test kitchen) for the economic preparation of snack foods achieving better nutrition and more hygenic methods of food handling;
(6) to consider what help would be useful to the food processor regarding supplies of flours or composite flours for their business operations;
(7) to bring small parties of school children and food sellers to the test kitchen to see demonstrations on new products prepared from local flours or composite flours;
(8) to study the relationship between weaning age and cereal supplements being used to satisfy good nutrition in babies.

(C) Pilot Mill and Milling Program

There is considerable evidence that the demand for flour processed from local grains will increase, if it is the right kind. Many factors associated with urbanization point to this trend. However, it should be stressed that local grains (millet and sorghum) are preferred in the staple dishes prepared for household use.

The experimental mill needs to expand its test on flours prepared from local grains. The following suggestions are based on the preferences identified in the consumer study.

(1) Millet and Sorghum Flour

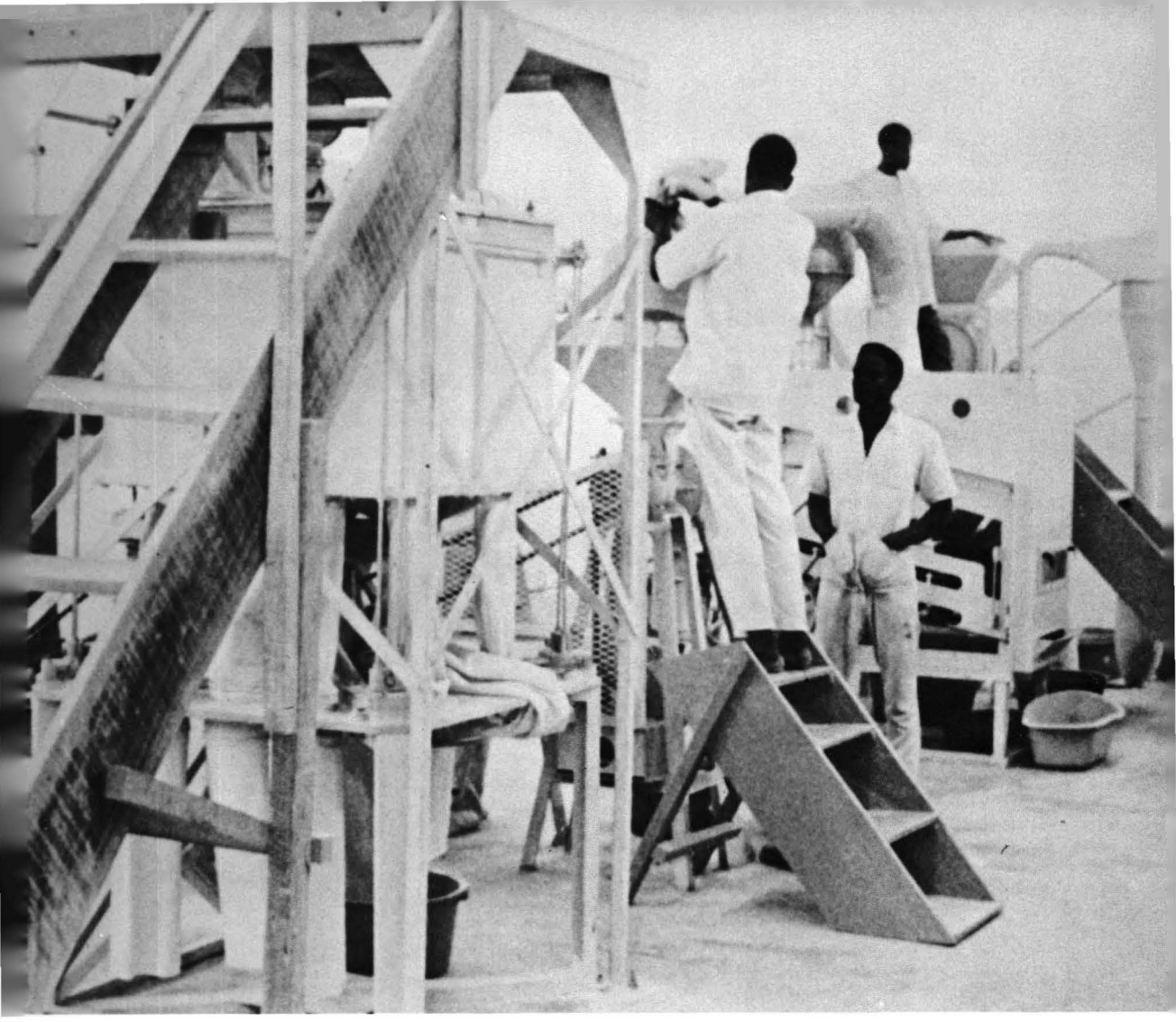
These are the flours preferred in the staple dishes. Millet flour is the most popular, and certain characteristics (colour, taste, and texture) are required by the consumer for specific products. To provide the type of flour required, cooking and taste acceptance tests in the kitchen will need to be carried out in conjunction with the pilot mill.

(2) Bread and Cereal Snack Foods

Snack foods are prepared primarily from millet, wheat, and cowpea flour. Flours to prepare these products are needed and should be made by the experimental mill if possible. Bread in Maiduguri is made primarily from hard wheat flour. The possibility of milling local wheat or combining local flours with wheat flour to prepare bread and snack food products needs to be explored. Some of this work could be done in the test kitchen and with local food processors. However, more basic research is required in this field.

(3) Milling and Utilization of Flour Fractions

The specific characteristics of the flour fractions available from this type of milling operation have already been shown to be popular for certain food products. Further investigation of the preferred dishes prepared from the various fractions milled requires systematic evaluation to tailor the flour fractions required to suit consumer preference. The fine fractions appear to be well suited for a baby cereal food. The grits appear to have a good texture for the preparation of tuwo. The middlings may be more suitable for preparing koko, kamu, or in the preparation of composite flour.



(4) Potential New Products

Burabusko (a specialty food common among the Kanuri) is prepared from cracked millet flour. The steaming and drying process prior to cooking is a tedious operation for small households or institutions. The possibility of preparing a convenient burabusko product in bulk should be explored. Other potentials for using flour in a local food processing industry should also be investigated.

Projections on Area and Regional Grain Consumption

Projections for the consumption of food grains on a regional basis might be developed using a consumer preference methodology.

This study in consumer preference in grain utilization provides information on the specific grains preferred in all local food products as well as the relative preference for these cereal products in meals by the various tribal groups in an urban community undergoing transition. Information indicating degree of urban transition (for example, occupation, tribal distribution, family structure of the household, household facilities, and services) is also available. The only information that is not available in this study is quantitative information on individual consumption. This could be provided by case studies of households selected, with specific characteristics shown to be representative of the population. Case studies of individual consumption carried out during the same season as the consumer preference study would overcome any seasonal differences in food consumption patterns. With this information it would be possible to develop a new methodology based on consumption to formulate projections for grain consumption on a regional or area basis.

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Appendix 1

WARDS OF YERWA TOWNSHIP[a]
(Total population = 127,314)

1. Limanti — Ethnic Kanuri
Population 8,862; 3,835 taxpayers

		%
Employment[b] :	Dependent employees	24
	Crafts	14
	Trade	21
	Female taxpayers	26
	Koranic malams	11

2. Fezzan
Population 4,211; 1,410 taxpayers

		%
Employment:	Dependent employees	29.9
	Crafts	15.5
	Farmers	1.06
	Traders	24.8
	Women	15.8
	Koranic malams	11.3
	Miscellaneous	1.5
Ethnic groups:	Kanuri	66
	Shuwa	21
	Margi	2.2
	Others	2

3. Shehuri North — Ethnic Kanuri
Population 11,676; 2,919 taxpayers

		%
Employment:	Dependent employees	26
	Crafts	8.5
	Farmers	10
	Traders	17
	Women	27
	Koranic malams	9.7
	Miscellaneous	7.6

4. Shehuri South
Population 8,596; 2,149 taxpayers

		%
Employment:	Dependent employees	26
	Crafts	12
	Farmers	1
	Traders	20
	Female employees	24
	Koranic malams	11
	Miscellaneous	2
Ethnic groups:	Kanuri	84
	Hausa	7
	Shuwa	4
	Yoruba	5

(Appendix 1 *continued*)

5. Lamiséla

Population 12,566; 2,434 taxpayers

		%
Employment:	Dependent employees	30.5
	Crafts	11
	Farmers	2.7
	Traders	21.5
	Women	22.8
	Koranic malams	10.4
	Miscellaneous	1.2
Ethnic groups:	Kanuri	70.4
	Hausa	7.1
	Fulani	6.5
	Bura	4.6
	Yoruba	1.5
	Ibo	18
	Others	9.2

6. Mafoni

Population 16,732; 4,183 taxpayers

		%
Employment:	Dependent employees	37
	Crafts	8
	Farmers	2
	Traders	18
	Women	15
	Koranic malams	8
	Miscellaneous	1
Ethnic groups:	Kanuri	67
	Hausa	14
	Bura	4
	Shuwa	3
	Fulani	4
	Others	4

7. Zongo

Population 8,204; 2,051 taxpayers

		%
Employment:	Dependent employees	21.1
	Crafts	13
	Farmers	.1
	Traders	31.6
	Women	25.6
	Koranic malams & administration	6.7
	Miscellaneous	1.7
Ethnic groups:	Hausa	43.3
	Kanuri	20.6
	Shuwa	9.7
	Ibo	8.8
	Yoruba	8.3
	Fulani	4.7

(Appendix 1 *concluded*)

8. Hausari

Population 10,625; 2,656 taxpayers

		%
Employment:	Dependent employees	25.2
	Crafts	17.0
	Farmers	.3
	Traders	29.1
	Women	16.3
	Koranic malams & administration	9.8
	Miscellaneous	2.1
Ethnic groups:	Kanuri	16.5
	Hausa	56
	Fulani	2.1
	Others	3.8
	Yoruba	12.1
	Ibo	6.4
	Shuwa	2

9. Gwange

Population 21,800; 5,252 taxpayers

		%
Employment:	Dependent employees	22.6
	Crafts	20.9
	Farmers	8.6
	Traders	29.9
	Women	6.0
	Koranic malams & administration	10.8
	Miscellaneous	.9
Ethnic groups:	Kanuri	49
	Hausa	29
	Fulani	5
	Shuwa	9
	Others	7.6

10. Bula Bulin — Ethnic: Kanuri/Hausa/Ibo/Mixture

Population 16,800

11. Gambaru/Liberty

Population 7,243

Ethnic groups:	Kanuri	4,000 = 55%
	Shuwa	1,300 = 1.8%
	Fulani	127
	Hausa	268
	Mandora	234
	Kabam	290

[a] From Dr. Wilhelm Seidensticker, October 1972, Preliminary field notes and statistics on Yerwa town.

[b] Definitions of employment groups: *dependent employees* — include those who receive wage or salary in return for their work; *crafts* — includes all persons whose employment is based on producing something; *traders* — all people who are living on buying and selling; *women* — gainfully employed: food processing, food selling, and handicraft.

Appendix 2

SELECTED FOOD PRICES, MAIDUGURI MARKET, JANUARY 1973

Cereal grains (220-lb sack)		
Guineacorn	9.50 Naira	
Millet	10.00	
Rice	33.00	
Maize	10.00	
Cowpeas	20.00	
Wheat	20.00	
Processed products		
Taliya, large sack	6.00	
Gari (rice sack)	12.00	
Semovita, 5 lb	.45 Kobo	
Cooked foods		
Bread	Small loaf	5 Kobo
	Large loaf	10
Kamu	1 tablespoon	1
Furah	2 balls	1
Kosai	2 small cakes	1
Pancake	1 small	1
Cake	1 medium	2 1/2
Oils		
Groundnut oil	Beer bottle	25 Kobo
Butter	Squash bottle	60
Vegetables		
Green vegetables	1 large bunch	3 Kobo
Tomatoes	4 large	10
Onions	4 large	10
Other		
Milk	1 pint	10 Kobo
Eggs	3	10
Meat	1 pound	20
Smoked fish	1 medium size	30

Appendix 3

GLOSSARY OF FOOD TERMS

Acha — Tiny threshed seeds, steamed as burabusko or couscous.

Akamu — Decanted fine rice flour, the settled fraction cut into cakes, for later use to prepare a very smooth soft gruel; served with kosai.

Alele — Cowpea pudding, steamed in tins.

Alkaki — A shortbread-type of wheat cake.

Akara — See kosai.

Aswan — Seasoned rice sausage used for festivals.

Burabusko — Millet couscous.

Cakes — Baked cupcakes.

Chin chin — Deep-fried cakes.

Dan wake — Dumplings prepared from cowpeas and guinea corn flour seasoned with spices and baobab flour.

Furah — Processed millet balls spiced and usually served with nono, the cultured fulani milk.

Gari — Convenience food prepared from cassava; grated and pan-fried.

Koko — Smooth gruel, prepared from sorghum or millet flour cooked with wet lumps of flour to make it chewy.

Kosai — Beancake, deep-fat fried.

Kamu — A variation of koko, usually more fluid and spicey.

Masa — Puff batter of sorghum flour, baked in masa tins, something like Yorkshire pudding.

Pancakes — Batter cakes, pan-fried.

Pinkaso — Local wheat bread, loaves are golden brown, deep-fat fried, the size of dinner plates.

Puff puff — Deep-fried yeast doughnut.

Sinasin — Leven pancake, a staple food like the Njera of Ethiopia; served with soup.

Taliya — Traditional wheat noodle.

Tuwo — Stiff millet or sorghum cooked dough, staple served with soup or stew.

Waina — Sorghum and rice paste, deep-fried snack.

Appendix 4

DEMAND PROJECTIONS FOR SELECTED FOOD CROPS IN NIGERIA[a]

Products	Quantity available in 1968/69 1,000 metric tons	Percentage increase		
		1975	1980	1985
Maize	831.883	24.3	44.3	71.1
Millet	1,909.213	24.3	44.3	71.1
Sorghum	2,985.106	24.3	44.3	71.1
Rice	333.964	36.5	66.4	106.6
Wheat	27.684	67.3	121.7	195.5
Acha	27.562	24.3	44.3	71.1
Cassava	7,521.667	12.2	22.1	35.5
Potatoes (sweet)	136.141	12.2	22.1	35.5
Potatoes (Irish)	13.939	12.2	22.1	35.5
Yams	7,239.028	12.2	22.1	35.5
Cocoyams	802.173	12.2	22.1	35.5
Plantains	1,250.559	12.2	22.1	35.5
Groundnuts	263.139	18.3	33.2	53.3
Beans (cowpeas)	430.709	18.3	33.2	53.3
Soya beans	38.914	18.3	33.2	53.3
Bambara nut	36.310	18.3	33.2	53.3
Melon seeds	52.510	18.3	33.2	53.3
Benni seeds	38.185	18.3	33.2	53.3
Cashew nuts	25.000	18.3	33.2	53.3
Kola nuts	107.286	18.3	33.2	53.3
Vegetables	1,164.067	36.5	66.4	106.6
Fruits	133.989	42.6	77.5	124.4
Palm oil	535.954	30.4	55.3	88.9
Groundnut oil	29.776	30.4	55.3	88.9
Melon seed oil	8.933	30.4	55.3	88.9
Butter	20.842	60.9	110.6	177.7
Cereal protein, %	38.7	37.5	36.9	36.3
Grain legume protein, %	13.8	12.6	12.0	11.4
Seed & nut protein, %	2.5	2.3	2.2	2.1
Fruit & vegetable protein, %	2.1	2.2	2.3	2.3
Fats & oil calories, %	10.1	10.9	11.3	11.6

[a] From Olayide et al. (1972).

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