

Upper Volta

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GRAIN CONSUMPTION AND PREPARATION

in

UPPER VOLTA, WEST AFRICA

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by

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## I. EXECUTIVE SUMMARY

An International Fellowship in Technical Assistance sponsored by the Center for Women in Development of the South East Consortium for International Development (CWID-SECID), made it possible to conduct a dietary survey of grain consumption and preparation patterns in rural Upper Volta, West Africa. The fellowship recipient, an Assistant Professor of Food and Nutrition at the SECID-member school, Lincoln University (Missouri), conducted the survey in a ten-week period of the summer session of 1983. From June 9 through August 12, the recipient implemented the survey with the cooperation of the Chief of Party of the SECID-Lincoln University Grain Marketing Development Project. With the assistance of an AID Mission-established advisory committee, the preliminary administration of the survey was achieved with minimal expenditure of time and resources.

Implementation required the hiring of a translator for local languages, securing transportation and housing facilities, selection of the survey area and sample population, adaptation of survey design and observational data collection. Observational data did not provide raw data adequate for existing computer program analysis. Broad estimates of nutrient sources were concluded from detailed daily observational notations.

Grain consumption was primarily millet and sorghum, with some supplementation from corn and rice. Preparations ranged from porridge to yeast cakes to fermented beverages. The grains were utilized in

the unrefined state and preparation waters were consumed. Foods supplementing the grains included cultivated and uncultivated vegetations, fowl, fruits, and oils. Seasonings were primarily salt, potash, powdered processed tomatoes, and soup seasonings. Generally the diet was high in carbohydrates and fiber. The protein sources were grains, vegetables and legumes with limited animal protein. Fat sources were vegetables. A variety of fruits contribute vitamins and minerals. Refined carbohydrates were minimal.

This survey indicates a need for further research into nutrient composition of locally consumed foods, quantitative measures of food intakes, energy expenditure studies, and nutritional status assessments.

Observations indicate a wide variety of nutrient sources coupled with limited availability of the foods. All observations are seasonal and locale related, and without implications for other time periods or regions of the country.

This cooperative effort, involving a SECID-member school, a SECID project and AID, made it possible for (1) a university faculty member to have a short-term Third World research experience, (2) a SECID project to receive supportive research findings, and (3) AID to realize immediate returns from a development investment in a WID program.

## II SURVEY INTRODUCTION

June, July and August on the Upper Volta plateau is pre-harvest (hungry) season. The dry season has left the effects of drought and the minimal rains are beginning to fall. The stores of grains and dried vegetables have been drained. If money or barter is available, foods can be purchased at high prices in the local markets. Over 95 percent of the nation's 6 million people live in the rural areas where the roadways are limited for the the transport of foods.

It is a busy season, with every available space being planted. Subsistence oriented agriculture accounts for over 98 percent of the economy.

OFNACER (Office National des Cereales), the supporting project for the survey has as its overall objective, the improvement of operational efficiency and managerial capabilities of Upper Volta's National Cereal Office. In order for OFNACER's marketing strategy for millet and sorghum to be more realistic in meeting the needs of this rural nation, the preparation and consumption patterns of the grains are to be considered. This survey is aimed at defining: (1) the amounts and types of grains consumed at the household level; (2) what preparation is given the grains; (3) what supplementary foods are consumed with the grains; and (4) do household level patterns correlate with national grain distribution patterns.

In this participatory observational survey, quantities were estimated by reproducing procedures used in the villages rather than conducting measurement techniques at the household level. Broad

estimates of quantity are the results. Food Composition Tables for Africa give some indication of nutrients supplied by local foods, but a large number of foods have no nutrient analysis or have limited research on the subject. Again, nutrient availability of the observed intakes are at best a broad estimate that can only indicate areas of further research needs.

The survey had three major phases. Phase One involved selection of the representative study site and study population. An effort being made to encompass major characteristics of the country: rural, majority ethnic group Mossi, on the plateau, arid climate. It was equally important to be in the area being given primary emphasis by AID Mission, and remain accessible to the capital city. Phase Two was the observation and collection of data. Phase Three was to analyze the findings and identify correlations between dietary patterns and marketing strategies.

### III. BACKGROUND INFORMATION

The Center for Women in Development has as one of its primary goals, to increase the participation of women at SECID institutions in international development. In achieving this goal, the Center sponsors international fellowships (2-3 month periods) for graduate students and faculty members to pursue an international research interest. The 1983 fellowships had to be associated with a SECID project, and complement on-going activities of that project. The fellowship recipient for this research selected the SECID-Lincoln University Grain Marketing Development Project in Upper Volta, West Africa. The recipient's interest in human nutrition complemented the project goals. Additionally, the project was headed by faculty members from the investigator's institution.

The Grain Marketing Development Project's purpose is to assist the government of Upper Volta to establish a set of conditions within the country that will lead to food self-sufficiency by improvements in the operational efficiency and managerial capabilities of Upper Volta's National Cereals Office (OFNACER). A specific goal to which the dietary survey was directed was to improve the marketing and distribution of grains for the purpose of providing food security, especially to grain deficit areas and during the pre-harvest (hungry) season. An understanding of the grain preparation and consumption

patterns may be directional in planning for distribution of grains and supplementary foods. All survey findings represent an additional source of information for the host nation to use in health and nutrition planning. In the macro area of combating world hunger, each step taken to understand food use and food needs is a step toward defining solutions to the mammoth problem.

#### IV. METHODOLOGY

Orientation to the AID Mission in Ouagadougou was managed by the OFNACER project Chief of Party. An advisory committee was established to guide the development of the survey. This committee consisted of the US-AID Assistant Deputy Director, Director of SECID Projects, Chief of Party-OFNACER Project, Chief of Project-Agriculture Research Project, Technical Staff of SECID Office, AID Mission WID Representative, and AID Mission Child Nutrition Representative. The committee represented the spectrum of areas related to the survey and provided a wide foundation of base information. The committee facilitated the meeting of Upper Voltaic government personnel of importance to the project's progress. Logistical and methodological considerations were discussed by the committee, which hastened the project's organizational phase. Professional contacts of significance to project progress outside the US Embassy include: World Food Programs of the United Nations, World Health Organization, U.S. Peace Corp, Baptist Center, Purdue Agricultural Project, Swiss Pentacostal Mission, Save the Children, Catholic Relief Fund, and Africare. Personnel from each of these agencies provided insight and/or local contacts which were useful in the project organization and implementation. Assistance for the fieldwork included a female national from the University of Ouagadougou for translation of local languages. She was an English major with capabilities in French and the two major Voltaic languages. Special assignment status was received for

a local American Peace Corp volunteer. She assisted with cultural interpretation and dietary observations. Both women had motorcycles, which provided transportation to and from the observation site.

The observation site was selected after visits to four areas suggested by resource persons. The area of Koudougou was selected because it is on the Mossie Plateau and borders two major ethnic groups, Mossie and Guerunse. The area was rural, arid and of special interest to US-AID. Koudougou is 75 km northeast of Ouagadougou. The population sample was selected from villages surrounding Koudougou. Persons residing in a single compound or homestead were designated a family or household. Table 1 shows the seven sample households from six villages, were Mossie (M) and Guerunse (G), Christian (C), and Moslem (M), polygamist and had a compound size range from 5 to 63.

TABLE 1: SURVEY SAMPLE DEMOGRAPHY

Household	Village	Ethnic	Religion	No. of Wives	Total in Number
#1	Reo	G	C	4	29
#2	Ramingo	M	C/M	2	6
#3	Sinkau	G	C	4	29
#4	Banyalo	G	C	6	63
#5	Kouhoumde	M	C/M	3	38
#6	Kassen	M	C	6	30
#7	Reo	G/M	C	2	12

Ethnic: G = Guerunse  
M = Mossie

Religion: C = Christian  
M = Moslem

Each household was observed on three separate days; a market day, a fieldwork day, and a day in the compound. Generally one adult woman served as the guide, source of information, and demonstrator. Other household members were observed for general dietary intake information. Special attention was given pregnant and lactating women, and children under five.

An observation day began in the morning as the compound was waking, and concluded before sunset to allow adequate time to return to the central station before total darkness. After the first observation day, an attempt was made to return unannounced<sup>ST</sup> for the second and third observations. Generally, the households requested scheduling of observations and anticipated the survey days.

Observations were made of the types and amounts of foods eaten, gathered, purchased or exchanged at the market. All types of foods and beverages consumed during the day were recorded. Preparation methods were recorded in detail. Quantitative information was taken by duplication of the preparation in the central station.

## V. OBSERVATIONS

The general pattern of food intake included an early morning intake, midmorning, midday, and an evening intake. The pattern was altered frequently with generous intakes of foods between the pattern segments. This was most obvious on market day when a wide variety of prepared foods was available for purchase or barter. Food intake outside the household was frequent. Street vendors and uncultivated foods added significantly to the intake of all persons.

### Grain

Sorghum and millet were used interchangeably in preparation of the diet staple; sagabo (Lele language) or tō (French language). This is a boiled porridge of ground meal. The grain, traditionally ground between heavy stones, could be ground at a village mill. The preparation of this boiled meal required 2-3 hours. Corn meal was available from government sources, given to female heads of household and elderly. This program was reported to be a seasonal provision to combat the pre-harvest shortage of sorghum and millet. Corn meal was used in place of sorghum and millet meal. All grain meals were used in making doughs for fried cakes and yeast cakes resembling pancakes and doughnuts.

Rice was used occasionally in combination with boiled beans. Rice and beans were more frequently eaten at the market and at restaurants than in the households surveyed. Beans were not readily

available at the season of this survey.

Millet and sorghum were used in preparation of a fermented beverage named dolo. The uncooked grains, the wash water, and the residue from several preparations were eaten and drunk.

#### Vegetation

A variety of greens, leaves and foliage was prepared by boiling in combination with meat, spices, herbs, and cultivated vegetables. These soups or sauces were eaten with grain staple, sagabo. Wild vegetation was boiled with potash, an alkaline mixture made by burning millet and/or sorghum stalks. Without this addition, most of the wild vegetation was bitter and fibrous.

#### Meats

The meats commonly eaten were guinea-fowl (pintade, fr.) and chicken. Dried fish was added to sauces and soups. Fresh river fish were available at vendors, although no fresh fish were observed in surveyed households. Beef and lamb were used infrequently in the households surveyed but more often eaten at the market, in a restaurant or at a roadside vendor. Beans and other legumes were not seasonable, but could be purchased at the larger markets. Eggs were not eaten or used in any observed food preparation. Eggs were exchanged or sold at the market. Small field rodents were reported

to be a meat source, but none were observed in households surveyed. A winged termite was fried in hot oil, salted and eaten as a "snack" or delicacy. This was a favorite among the children.

### Fruits

Mango and shea-butterseed were abundant. These were eaten raw. Wild berries and fruits were eaten, although the variety was limited at this season. Other fruits were available at the markets, although none of the sample population households purchased or bartered for market fruits. Children gathered the wild fruits for household consumption or for sale or exchange in the market.

### Milk Products

Milk and milk products were not consumed in any household surveyed. Children were breastfed for two years and no other milk intake was observed. A nomadic group made goat-milk yogurt for sale, but the households in this survey would not buy or exchange this food product.

### Fat

The shea-butter seed (karite, French) was processed for the oil content. A solid butter resulted from a three day pounding, crushing and boiling preparation of the dried seeds. Shea-butter was used to season vegetation and for frying.

### Sugar

Sweetening was seldom observed in household food preparation. Honey was used occasionally to sweeten a mixture of grain and water

(zumcum) or to sweeten the yeast cakes. Carbonated beverages, iced fruit drinks and various candies are available in the larger markets, village restaurants, and from street vendors.

#### Other Food

Cola nuts were chewed by older members of the households and adult men. Coffee and tea were not present in the households, but available commercially.

The surveyed dietary intake has positive characteristics. The diet was high in complex carbohydrates. Refined carbohydrates were limited. Amino acid sources were millet, sorghum, legumes and vegetations, generally known to be complementary. Grains were unrefined, and generally, washing and cooking water was ingested. Although animal protein sources were minimal, small rodents and insects could contribute to the protein available. Fruits and berries were consumed raw, providing a high fiber intake with vitamins and minerals.

A primary dietary disadvantage was the water supply reported to be the major source of infectious bacteria. The overall quantity of food available appeared to be minimal. Infants and children were small for their age, had extended abdomens and displayed little body fat. Adults worked long hours in the fields with minimum food intakes. Pregnant and lactating women appeared to consume the same quantities as non-pregnant and non-lactating women while maintaining similar work loads. Low energy density diets  
 X require greater bulk to meet nutrient quantity needs. This bulky diet coupled with low intake frequency contributes to infants' and children's inability to consume adequate amounts of the available foods.

## VI. RECOMMENDATIONS

This participatory observational survey of grain preparation and consumption patterns of a selected rural population in Upper Volta provided a broad overview of the dietary intake while indicating areas of needed nutritional research.

In order to determine whether intake is meeting expenditure needs, indepth studies of quantitative food ingestion and detailed energy expenditure research is necessary. Special attention must be given to foods consumed outside the household, since a large portion of intake was uncultivated or vendor provided. The nutrient composition information on many of these daily consumed items is not available and must be known to fully appreciate nutrient availability. Only utilization and bioavailability studies would further clarify dietary quality. Foods of common consumption by the study population requiring composition analysis include shea-butter seeds, uncultivated vegetation, potash, and wild berries.

The population studied received the majority of protein from non-animal sources. For maximum utilization of grain protein, amino acids are supplied from foods with complementary amino acids. Knowledge of the amino acids available from the vegetation eaten with the grain would allow for more effective food combinations.

Using the FAO/WHO Food Composition Table for Use in Africa, 1968 it can be seen that the daily intake of millet typical for the adult in the surveyed households (1000-1500 gm) provides the FAO recommend-

ation for all nutrients except niacin and protein from vegetable sources. This insufficiency could be eliminated with as little as 2 oz. of animal protein or increased millet consumption. This comparison emphasizes the importance of millet in the diet. It also emphasizes the role of OFNACER in the distribution of grains that substitute for the high nutrient concentration of millet.