HAITIAN STREET FOODS AND THEIR NUTRITIONAL CONTRIBUTION TO DIETARY INTAKE

by

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(Abstract)

Street food is a common source of food eaten outside the home in developing countries. The contribution of street foods to the daily nutrient intake has not been adequately addressed in dietary assessment research, in spite of its universality. To establish a base of knowledge regarding street foods from a nutritional standpoint, a three month pilot study was conducted in Port-au-Prince, Haiti, during the fall of 1983. One hundred forty-six street food items were identified and classified. Market unit size, cost and caloric and protein values per market unit were determined. A food frequency questionnaire was developed and administered to Haitian secondary school children from varied school tuition categories to assess their street food consumption. Results revealed a wide range of consumption frequencies. The average consumption of calories and protein for the 174 person sample were found to be 401 kcals and 5.8g of protein. Significant differences in consumption values were found between socioeconomic levels. Little variation was found between age groups. Street food consumption was found to contribute 18% of the recommended dietary allowance for the Caribbean for calories and 15% for protein. Based on a daily nutrient intake of 1580 kcals and 37g of protein for urban school children, 25% of the calories and 16% of the protein in the overall diet were found to be provided by street foods.
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Map of Haiti
INTRODUCTION

Malnutrition represents one of the most important public health problems in Haiti today. Economic factors, lack of education, unavailability of food, diminishing land resources, inadequate public health policy, and the pressures of increasing urbanization have greatly exaggerated the problems of malnutrition throughout the country. In order to design corrective national health and nutrition programs to improve the nutritional status of the population, it is necessary to elucidate the etiology and extent of malnutrition in both urban and rural areas.

Dietary assessment methodology is one technique commonly employed to generate detailed knowledge on the current nutritional status and dietary practices of a population. Dietary assessment has traditionally concentrated on the evaluation of home food consumption in an attempt to quantify nutrient intakes of both individuals and populations. Within this established framework, little emphasis has been placed on the determination of foods eaten outside the home and their specific contribution to the overall daily intake of nutrients. Foods eaten outside the home often play an important role in the diet, especially under conditions in which food intake is at a marginal level and/or when the individual or group in question is at-risk.

In the developing areas of the world where malnutrition is a severe health problem and food availability is limited, a common source of food eaten outside the home is often "street food" sold by vendors in markets or along the streets. Consumption of street foods is a universal
practice and encompasses people of both sexes, all age groups, and varied economic levels. To date however, in spite of its universality, the contribution of street foods to the daily nutritional requirements of men, women, and children has not been adequately addressed in dietary assessment research.

The purpose of this study was to establish a base of knowledge for the nutritional analysis of street foods and to determine the potential contribution of street foods to the diet of a population living under marginal conditions, namely school children in Haiti.

Specifically, research efforts were directed toward:

1. the establishment of an organizational system and procedure for identifying and classifying street foods;

2. the identification and in-depth description of the varieties of street foods available in Port-au-Prince, Haiti, during the period September 1983 to December 1983;

3. the classification of the identified street foods based on ingredient composition according to the 14 category FAO food commodity grouping system;

4. the determination of the approximate nutrient composition of the identified street foods by use of a) food composition tables or b) proximate analysis;

5. the determination of the frequency of street food consumption by school children ages 11-23 in Port-au-Prince, Haiti;

6. the assessment of the nutritional contribution of street foods to the dietary intake of Haitian school children.
The current study explored the role of available street foods in the daily diet of school children in Port-au-Prince, Haiti.
REVIEW OF LITERATURE

HAITI: BACKGROUND INFORMATION

Geographic

Six hundred miles southeast of Florida, the Republic of Haiti occupies the mountainous western one-third of the Caribbean island Hispaniola which it shares with the Dominican Republic (A.I.D., 1982). (See Figure 1) The island is located between 18 and 20 degrees north of the equator in the sweep of trade winds which give it its predominantly tropical climate (Grant and Groom, 1958). The temperature in the main population centers of Haiti is warm, ranging from 21-32 C (70-90 F) year round (C/CAA, 1981). Haiti is predominantly semiarid since the mountains that divide it from the Dominican Republic cut off the moist trade winds (A.I.D., 1982). Humidity is high in the coastal areas and the rainy season is from May to November (C/CAA, 1981).

Haiti consists of a coastal plain, a central plateau and several fertile valleys (A.I.D., 1982). The country is divided into five regions, or departments, four-fifths of which are made up of mountainous terrain ranging from 5,000 to 10,000 feet (Sebrell et al., 1959). Only an estimated one-third of the total 10,714 square miles (27,749 square kilometers) of the country is considered tillable (A.I.D., 1982). Virtually all arable land is under cultivation. The average agricultural density per arable land area is currently in excess of five persons per hectare (Beckles, 1975).

The fertility and productivity of the land varies by region due to differences in soil composition, flatness, and rainfall. The land in
Map of Haiti

Figure 1

Israel et al., 1982
north and border areas is poor quality and of low productivity, while the southern peninsula is naturally more fruitful. Haiti has severe problems of soil erosion and agricultural land is overused without reinvigorating the soil with fertilizers. These difficulties greatly exaggerate the problem of attempting to sustain a growing population on diminishing land resources (A.I.D., 1982).

Demographic

The population, predominantly of African descent, is currently estimated to be over five million with an annual growth rate of 1.8% (A.I.D., 1982). Two distinct classes exist: the vast peasant population and a small, educated class whose language is French (Leyburn, 1941). The peasants speak Haitian Creole and are largely illiterate with an illiteracy rate estimated at 80% (Rickards, 1978).

Population density is high. In 1978, there were calculated to be 345 people per square kilometer of agricultural land or 173 people per square kilometer of the total land area. The population is predominantly rural as only 23.8% of the population is located in urban areas (A.I.D., 1982). Port-au-Prince, the capital city, and its environs represent the largest single population density in the country with approximately 500,000 inhabitants (Beckles, 1975). Migration from rural to urban areas is increasing, as seen in the urban population growth rate of 4.1% since 1970, as compared to the overall growth rate of 1.8%. In the urban areas, 50% of the population was found to be below the absolute poverty income level of US$71 per capita (A.I.D., 1982). In 1969, Haiti had the
lowest gross domestic product per capita in the western hemisphere (Wiese, 1976). In 1975, GNP per capita was US$230 (UNICEF, 1980). Per capita income was also the lowest in the western hemisphere: US$90.60 in 1970 (Rickards, 1978).

Health

Available data on the health status of the Haitian population is both inadequate and incomplete. However, it is known that the incidence and prevalence of communicable diseases are high (Beckles, 1975). Mortality rates are also high: an estimated 17/1000 in 1978. Infant mortality was reported to be 150/1000 live births in 1975 (A.I.D., 1980) and maternal mortality was estimated to be 137/100,000 (Beckles, 1975). The birthrate is also high at 42/1000 but life expectancy is low at 51 years (A.I.D., 1980).

Major causes of death in Haiti are pneumonia, tetanus, enteric diseases, tuberculosis and nutritional diseases. Typhoid and malaria are endemic in many areas and a high percentage of the population suffer from multiple nutritional deficiencies (A.I.D., 1982). Insufficient calories and protein are the most important deficiencies resulting in low body weight, short stature, poor development of muscles and a high total serum protein with relatively low serum albumin (Beckles, 1975). The health status of children is especially serious since high levels of malnutrition have been found in children between the ages of one and five.

Jelliffe and Jelliffe reported in their article, "the Nutritional Status of Haitian Children" (1961), that sixty-one percent of preschool
children suffered from some degree of malnutrition according to the Gomez Weight Classification. Thirty-seven percent had first degree malnutrition (seventy-five to ninety percent of the weight standard); twenty-one percent had second degree (sixty to seventy-five percent of the standard); and three percent had third degree (below sixty percent of the standard).

Low body weights-for-age were also found in the examination of school-aged children. A progressive decline in malnutrition was evident for school children, however, as indicated by an improvement in the distribution of malnourished children according to the Gomez scale. Of the school children surveyed, fifty-five percent were found to be of "normal" weight, thirty-five percent suffered from first degree malnutrition, ten percent from second degree and none from third degree (Jelliffe and Jelliffe, 1961).

In a 1963 study, the height and weight of urban and rural Haitian children were determined (King et al., 1963). A total of 5660 urban school children, classified either as wealthy or poor according to school tuition level, were measured with sixty percent of the total urban sample ranging in age from eleven to eighteen years. Overall findings indicated that the heights and weights of Haitian infants were equal either to the Iowa Standards or the Boston Children's Medical Center Anthropometric Charts. Older Haitian children exhibited distinctly lower height and weight measurements overall than did their United States counterparts. Among the urban Haitian children, a difference in growth levels was reported. For both sexes, the wealthy urban children were found to be
both taller and heavier than those from the poorer income category. For females, there was approximately one inch difference in height and from one to three pound differences in weight. For males, the height and weight differences were more pronounced at one to two inches and ten to fifteen pounds, respectively (King et al., 1963).

Apart from protein energy malnutrition, there is considerable seasonal vitamin A deficiency and keratomalacia. There is seasonal ariboflavinosis with cheilosis and moderate anemia is frequent whether from anchylostomiasis and malaria or from a deficiency of iron, protein or vitamins (Beckles, 1975).

Agriculture and Diet

Agriculture employs eighty-five percent of the Haitian working population with seventy percent of the total agricultural production being supplied by small holders. The total agricultural acreage of Haiti is estimated to be 650,000 hectares. Fifty thousand hectares are cultivated by large scale foreign enterprises which produce thirty percent of the total agricultural production on seven percent of the agricultural acreage. The figures point to the low yield of the Haitian peasant (Blume, 1974). Agricultural output is low due to small fragmented farms, poor irrigation and severe soil erosion caused by excessive forest defoliation and cutting (Rickards, 1978). The average land holding is 1.4 hectares (A.I.D., 1982). Nearly seventy percent of all farms are less than 2.6 hectares in size and ninety-eight percent are less than 25.7 hectares in size (Blume, 1974).
Large-scale farming is limited to sugar and sisal. Basic food crops account for about fifty-seven percent of the total cultivated area. Cash or export crops account for twenty-three percent and five percent is used for industrial crops for local processing. A wide variety of fruit, vegetable and legume crops are grown on the remaining fifteen percent (Beckles, 1975).

Modern farming techniques are rare: crop rotation and fertilizer use are unknown or prohibitively expensive (A.I.D., 1982). Cultivation is usually at a subsistence level. Surplus crops, when available, are sold in the local market, often in extremely small quantities (Blume, 1974). The supply of basic foods has essentially been in equilibrium with demand for the past ten years. However, from a nutritional point of view, the level of supply is still inadequate (Beckles, 1975).

The major crops are coffee, sugar, rice, corn, sorghum, millet, beans, cocoa, sweet potatoes, sisal, cotton, bananas, and citrus (C/CAA, 1981). Coffee and sisal are the most important export crops (Beckles, 1975).

Vegetables are seasonal, but there are many in season during all times of the year (Sebrell et al., 1959). Due to the climate, many temperate zone, subtropical and tropical vegetables are available in Haiti (Grant and Groom, 1958). The average Haitian does not often purchase vegetables. If vegetables are not grown at home, they are seldom eaten (Sebrell et al., 1959). The most commonly consumed vegetables include breadfruit, mirliton, plantain, yam, sweet potato and malanga. In addition, a wide variety of semi-wild and cultivated green
leafy vegetables are available (Jelliffe and Jelliffe, 1961).

Most common tropical fruit varieties such as oranges, starapples, and bananas are available in the Port-au-Prince area (Grant and Groom, 1958). Fruits are not normally eaten with meals, although large quantities of mangoes, oranges, grapefruits and avocados are eaten in season at any time during the day (Sebrell et al., 1959).

Animal protein is in limited supply in Haiti, as in most tropical regions (Jelliffe and Jelliffe, 1961). Beef, goat and pork are the major meats eaten and a few types of fresh or cured fish are available in the city markets (Grant and Groom, 1958). Chicken eggs are rarely eaten (Jelliffe and Jelliffe, 1961) and milk has limited use in Port-au-Prince (Grant and Groom, 1958). Poultry meat is eaten only a few times a year by the average family (Sebrell et al., 1959).

Vegetable protein is provided mainly by red and black beans, two important staples of the Haitian diet. Other legumes frequently eaten are black-eyed peas, lima beans and congo beans. Legumes are relatively expensive in Haiti and are the most expensive everyday food item in the Haitian diet (Jelliffe and Jelliffe, 1961).

The cereal grains found in Haiti are rice, millet, sorghum, corn, (A.I.D., 1982) and imported wheat flour (Grant and Groom, 1958). Maize (corn) is the cheapest and thus most important staple carbohydrate food. Rice is the most expensive oof the locally grown cereals, but also the most preferred (Jelliffe and Jelliffe, 1961).

Daily consumption of sugar is high (Sebrell et al., 1959). The sugar used is sold in three major forms: refined; brown; or dark cake
(rapadou). Sugarcane is a popular snack, especially for children (Jelliffe and Jelliffe, 1961) as are cola and candies of various types (Grant and Groom, 1958).

The diet is low in animal and vegetable fat, apart from avocado season (Jelliffe and Jelliffe, 1961). Even during avocado season, fat contributes only twenty-one percent of the daily caloric intake (Sebrell et al., 1959).

The variety of foods served at a Haitian meal is necessarily small (Grant and Groom, 1958). Foods are cooked outside the house, as no stoves are available to most peasants (A.I.D., 1982). The cooking fire is on the ground and fueled by either wood or charcoal (Jelliffe and Jelliffe, 1961). Metal pots are balanced on three stones for cooking (A.I.D., 1982).

Almost all dishes are boiled, and served in combined form such as vegetable stew. A few foods, however, such as corn-on-the-cob or yams, are cooked directly on hot ashes (Jelliffe and Jelliffe, 1961). Fried foods are not prepared in the home (Sebrell et al., 1959).

The typical peasant household has one or two tin pots for cooking. Inexpensive metal knives, wooden spoons, bowls, tin goblets, or glass/plastic cups are used for eating (A.I.D., 1982).

The average Haitian eats two or three meals each day. The main meal is prepared and eaten either at noon or late afternoon (Grant and Groom, 1958; Jelliffe and Jelliffe, 1961; A.I.D., 1982). The meal often consists of rice and beans or a vegetable stew, in addition to cornmeal, beans, or vegetables such as pumpkin, plantain, sweet potato or yam, when
available (A.I.D., 1982). The vegetable stew is a variable mixture of corn, beans, breadfruit, plantain, and rice and may include a small piece of meat or fish (Jelliffe and Jelliffe, 1961).

Other meals eaten are more in the form of "snacks" (Jelliffe and Jelliffe, 1961). The morning meal is frequently coffee and bread (A.I.D., 1982), although items such as corn-on-the-cob, cold leftovers, fruit, sugarcane and herbal teas are also consumed (Jelliffe and Jelliffe, 1961). Additionally, in the evening, another light meal may be eaten. It often consists of a beverage, with or without some breadstuff. For the poorest, however, sweetened water may be the only energy source during the evening (Grant and Groom, 1958).

Street foods have been mentioned briefly in the dietary descriptions of various Haitian nutritional surveys. Jelliffe and Jelliffe (1961) mention that prepared foods are available in Haiti "from roadside peddlers and in markets". They list bread, fried fritters, wheat flour buns, corn pudding and vegetable stews with rice as examples of the available items. Grant and Groom (1958) provided a more extensive list of "prepared foods sold at stands" including bread and rolls, cassava bread, cornmeal gruel, fried or boiled plantain, vegetable stews, rice and beans, fish, fried pork and fried cakes.

STREET FOODS: AN OVERVIEW OF CURRENT KNOWLEDGE

A street food is defined to be any edible item which can be consumed at the point of sale without further preparation. The majority of street foods are cooked on a charcoal stove, either prior to sale or on demand at the time of purchase. A number of items, though processed, require no
cooking (Cohen, 1984). In Guayaquil, Ecuador, it was found that thirty-one percent of the food vendors sold cooked food (EPOC, 1983). The processing of raw ingredients to yield a consumable product distinguishes a street food from fresh produce (Cohen, 1984).

Portion size is not determined through use of standard weights. However, conventional measures do exist for each given product with portion size per sales unit decreasing as the ingredient and preparation cost increases (Posner, 1983).

Street foods are classified as meals, constituents of meals or snacks (Posner, 1983). In Bogor, Indonesia, full meals were found to account for a quarter of the total street food purchases, with the remainder of purchases falling under the category of snacks (East-West Center, 1983).

Street foods are sold either from within defined trading sites or outside them (Cohen, 1984) by three major vendor types. First is the static vendor who sells from a permanent table or stall, often complete with stove and chairs (EPOC, 1984; Posner, 1983). The second type is the semi-static vendor who generally sells from the same site and who transports a limited amount of stock to the site on a daily basis (Posner, 1983). The semi static vendor may sell from a cloth on the ground (EPOC, 1984). The third vendor type is the ambulent entrepreneur who travels along a precise route with a bowl or tray of goods on the head, with a pushcart, a shoulder pole or on a bicycle (EPOC, 1984; Posner, 1983; Cohen, 1984). The ambulent vendor often sells door-to-door to a fairly regular clientele (Posner, 1983).

Throughout the developing world, the sale and purchase of street food
items is an activity widespread in cities of all sizes (EPOC, 1984). In order to be readily accessible to potential customers, street foods are sold in both business and residential areas. Although the exact distribution of vendors appears to vary somewhat by country, universally, marketplaces, bus/taxi stations, factories, schools, and shopping streets serve as focal points of activity (Posner, 1983; EPOC, 1984). It was found from the results of a survey conducted in Zinguinchor, Senegal, that street food operations were concentrated in both the commercial and the most populous neighborhoods (Posner, 1983). In Iloilo, Philippines, three marketplaces attracted a full quarter of the city's street food vendors. The other three-quarters were dispersed throughout the area (Barth, 1983). In contrast, the majority (90%) of the street food vendors in Bogor, Indonesia, were found to conduct their business in residential neighborhoods (East-West Center, 1983).

Due to their prevalence, street foods have come to be recognized as important sources of employment, income, and dietary intake for many urban dwellers, especially those within the poor sector. In Iloilo City, Philippines, eighteen percent of the urban labor force was found to derive an income from street food sales. One in every six urban workers were involved in the street foods trade, seventy-seven percent of which were women (Barth, 1983). In both Iloilo and Zinquinchor, women accounted for sixty-two percent and fifty-three percent of the street food vendors, respectively (Cohen, 1984). According to the 1983 census in Bogor, Indonesia, there were 16,500 street food vendors in the city; one vendor for every sixteen members of the population (EPOC, 1984).
In the Philippines, the daily earnings of a street food vendor equalled the minimum legal wage (Barth, 1983). In Senegal, the daily income of female street food sellers was nearly fifty percent greater than the legal minimum wage paid a domestic (Posner, 1983).

A high proportion of the urban household budget, often twenty-two to twenty-eight percent, has been found to be spent on the purchase of street foods according to estimates from Singapore, Peninsular Malaysia, the Philippines, and Accra, Ghana (EPOC, 1983; EPOC, 1984). In Peninsular Malaysia, the urban poor allocate approximately twenty-eight percent of their food expenditures for street foods, with this figure decreasing as income rises. It has been estimated that one million street food meals are purchased daily in Singapore. Thus, it has been inferred that, on the average, one street food meal is eaten daily by most adults in Singapore (EPOC, 1983).

Street foods play an important role in the diet of people living in developing countries, especially the urban poor, and have been found to contribute up to thirty-five percent of a given individual's daily food intake (EPOC, 1984). Increasing numbers of the urban poor are finding it advantageous to consume street foods, as opposed to purchasing the ingredients and fuel necessary to cook at home (Cohen, 1984). With the rapid urbanization occurring in the developing world, there has been a decrease in the space available for cooking due to overcrowding. The cost of fuel has risen dramatically and there is a lack of cold storage facilities for perishable food items. In addition, staple food dishes require long cooking times. Long cooking times require a considerable
amount of fuel. Due to rapid spoilage in the tropical climate, food cannot be prepared in large quantities and eaten over a period of days. In light of the above factors, it is increasingly more economical to purchase these foods ready-made (Cohen, 1984).

Urban school children have been identified as significant purchasers of street foods around the world (EPOC, 1984). This is readily apparent as vendors congregate in front of schools to sell their products to students of all ages. In a study of Nigerian schoolchildren, it was found that eight percent of the children who bought street foods purchased one street food meal, seventy-six percent purchase two meals and sixteen percent purchased three meals daily (Cohen, 1984). It was also found that ninety-six percent of the Nigerian schoolchildren bought breakfast from vendors before the start of the school day (EPOC, 1984). In some countries, this source of food is important to the students' daily diet (Cohen, 1984) and provides essential proteins and vitamins which are not readily obtainable in any other form (Posner, 1983). Though the nutritional contribution of such meals and snacks to the diet of schoolchildren is substantial, its significance is often overlooked in food consumption assessment efforts (Posner, 1983).

DIETARY ASSESSMENT METHODOLOGY

The diets consumed by a large percentage of the world's population do not satisfy their nutrient requirements. Accordingly, a major goal of development efforts is to raise levels of nutrition so that requirements are more fully met. In order to effectively pursue this goal, it is
necessary to collect detailed information regarding what people eat and why as this is the starting point for improvement (Reh, 1962). Jelliffe (1966) has stated that the collection of as much detailed knowledge of the foods actually eaten in the community is important for the assessment of nutritional status and the discovery of dietary etiological factors that are potentially amenable to correction. Food consumption surveys at both the household and individual levels are the principle basis for measuring patterns of dietary intake and nutrient supplies by food source and season, with respect to consumer characteristics and geographic areas. These measurements, in comparison with standards or recommendations for nutrient intake levels are important components of nutrition and health planning (Burke and Pao, 1980). Therefore, surveys of food consumption should be undertaken in order to provide a basis for measures to improve both food consumption and dietary practices (Reh, 1962).

By definition, food consumption surveys generate data on the consumption of individual foods, either separately or in combination (Burke and Pao, 1980). As in nearly all human societies, the individual family is the food consuming unit, the household is frequently the basic unit of analysis (Reh, 1962). During household dietary surveys, households are visited and quantities of all foods eaten during a given time period are recorded, according to well established techniques (Jelliffe, 1966). Household surveys generate dietary data including quantitative measures of actual food use (Burke and Pao, 1980) which can be utilized in the calculation of the nutritive value of food consumed.
and the comparison of the calculated nutritive values of the diet with nutritional allowances (Jelliffe, 1966). Although capable of generating valuable dietary information, household food consumption surveys are subject to a range of problems and limitations. One important shortcoming involves the assessment of food eaten away from home (Jelliffe, 1966). Also, essential information regarding the dynamics of food distribution among household members is often inadequate in these household surveys (Burke and Pao, 1980).

In spite of the shortcomings associated with this focus of analysis, many national food and nutrition surveys conducted in the developing world focus on household food consumption. In the National Food and Nutrition Survey of Guyana, household food consumption was determined strictly by a) direct weighing of all foods and beverages consumed at meals and b) inventory of household food supplies both before and at the end of the survey and including all foods brought into the house during the survey (PAHO, 1976). In the Barbados survey, records of the items consumed by the family during each of three meals were kept. However, foods taken between meals were noted and recorded with a main meal (PAHO, 1972).

As wide variations exist in the food intake of various household members, individual dietary surveys can generate dietary data which cannot be obtained from household food consumption data. Various established survey procedures for measuring both current and past food intakes of individuals have been developed and proven to provide valuable dietary information. Estimations of individuals' food intakes obtained
by various methods have been found to be comparable with collected household data. Differences do exist, however, as individual dietary surveys attempt to obtain estimates of food eaten outside the home, whereas contributions to the diet from such foods are excluded from household surveys (Burke and Pao, 1980). Accurate quantitative information (or reasonable estimates) of the foods consumed outside the home are often difficult to obtain. Such foods, however, may be a significant part of the diet (Reh, 1962).
METHODOLOGY

Phase I: DETERMINATION OF STREET FOODS AVAILABLE IN PORT-AU-PRINCE

For the purpose of the current study, a street food is defined as any edible food, processed or fresh, which is available on the street as opposed to a store, is sold at a stationary location or by a mobile vendor, and which is not purchased for home consumption. The varieties of street foods available on the streets and in the markets of Port-au-Prince, Haiti were identified using a combination of participant observation and descriptive survey techniques. A preliminary visual investigation to determine the range and availability of street foods was conducted by car and on foot along major streets and in the major markets of Port-au-Prince. A city map was obtained from the Department of Tourism and a systematic survey of both business and residential areas was conducted on foot. Special attention was placed on market areas, public transportation stops, and schools.

IDENTIFICATION

Interviews with street vendors were conducted by the investigator and a native research assistant. Each vendor was asked a series of questions in an informal interview setting which sought to determine the name of the food being sold and whether it was a) home-made or b) commercially-produced and purchased for resale. For home-made street foods, questions regarding the ingredient composition and preparation method used were posed. The informal interview was conducted during the
purchase of a representative sample of the street food being sold. Answers to the questions posed were recorded on a standard form (For sample form, see Appendix I) after the interview from notes, tape recordings, and memory.

CLASSIFICATION

The fourteen category FAO Commodity Grouping System was selected as the basis for classifying the identified street foods in the current study. Each food item was classified as one of the following:

1. Beverages
2. Cereal and Grain Products
3. Eggs
4. Fats and Oils
5. Fish and Shellfish
6. Fruits
7. Grain Legumes and Legume Products
8. Meat, Poultry, and Game
9. Milk and Milk Products
10. Nuts and Seeds
11. Starchy Roots, Tubers and Fruits
12. Sugars and Syrups
13. Vegetables and Vegetable Products
14. Miscellaneous

Food mixtures were classified according to the predominant ingredient which comprised 50% or more of the total mixture.

Phase II: DETERMINATION OF THE NUTRITIVE CONTENT

Representative samples of the most readily available street foods were purchased. Each was weighed in its consumable form to one decimal place (.1g) on an OHAUS Harvard Trip Balance with a 2kg-5lb capacity. Inedible portions were removed from fruit prior to weighing. Items such as fried and baked goods were weighed as purchased minus any packaging.
Samples were measured and described by the following characteristics: shape; color; texture; and temperature at the time of sale. Fried and baked products for which no exact or similar listing could be found in relevant food composition tables were stored in ziploc bags and labelled with the sample name, weight, and identification number, as well as, the date and place of purchase. The bagged samples were then frozen for storage and transported to the United States to be analyzed.

Protein and caloric contents of the identified street foods were determined in two ways. First, the Haitian Food Composition Table of the Haitian Bureau of Nutrition (Dominique, 1965) was utilized to determine the protein and calorie value of those street foods for which a listing was found. The Caribbean Food and Nutrition Institute's Caribbean Food Composition Tables (CFNI, 1974) were consulted for foods not listed in the Haitian tables. For foods which were not listed in either local table, the USDA Handbook 8 (USDA, 1975) was utilized. For foods with no exact listing in any food composition table, estimations of the protein and calorie contents were determined from the values of similar food items, where applicable. Approximate values for mixed food dishes were determined by summing the respective table value of each ingredient in the dish.

Second, street food samples for which no listing was found were analyzed by proximate analysis following the standardized procedures of the Forage Testing Laboratory of Virginia Polytechnic Institute and State University. The protein values for the analyzed foods were derived from the Kjeldahl test results. The carbohydrate content was determined by
Phase III: DETERMINATION OF DIETARY INTAKE

QUESTIONNAIRE DESIGN

The quantity and type of street foods consumed by selected Haitian secondary school students was assessed by means of a self-administered food frequency questionnaire. The technique was selected because it has been shown to be a feasible method for measuring usual food consumption (Mullen et al., 1984). Food frequency questionnaires require the respondent to estimate the frequency of consumption for specific food items during a given time period. This has been found to be useful not only in the assessment of particular food or nutrient consumption levels, but also has been valuable as a means of characterizing the intake of specific populations (Mullen et al., 1984). The questionnaire may either be given by an interview or it may be self-administered. To use this method of dietary assessment, it is necessary to establish standards, to identify food items eaten in definable serving sizes, to provide data for comparison and to conduct a preliminary investigation with a sample of the population to be studied (Young, 1981).

In 1962, Stefanik and Trulson utilized a 20-25 minute food frequency interview to qualitatively measure food intake. The collected data were compared to previously completed diet histories or 7-day records and were found to yield similar information. At both the individual and group levels, the method utilized yielded generally equivalent estimates of the qualitative consumption of food.
Abramson et al. (1963) reported a study designed to determine if food frequency could be used as an index of the usual quantity of food eaten each week. They found that their food frequency method proved to be a simple and economical tool for the examination of relationships between diet and health in groups of people.

Use of food frequency questionnaires minimizes cost and respondent burden because a personal interview is not required as in other dietary history techniques. Since the researcher for the current study conducted the majority of the street food investigation alone, the use of a food frequency questionnaire to assess street food intake permitted a greater sample size than would otherwise have been possible.

The questionnaire was designed to determine which of the various types of street foods were consumed by secondary school students, how often various street foods were consumed, what time(s) of day street foods were usually eaten, and if the food served as a snack or meal substitute. The questionnaire consisted of a listing of 146 identified street food items. Blanks were inserted at the end of the food listing to allow the subject to write in any additional street foods that he/she ate which may have not been listed. (Sample questionnaire in Appendix II.) The street foods were listed alphabetically by Creole name in order to eliminate any potential bias arising from categorical groupings. Clear and simple instructions were written on the form in both French and Haitian Creole to insure participant understanding and to minimize teacher and respondent burden.

Food intake was estimated on either a weekly or monthly basis by
item. According to Mullen et al. (1984), different categories of frequency such as daily, weekly, and monthly are more appropriate in estimating the intake levels of different foods. In the current study participants were allowed to select the frequency category of weekly or monthly for each listed food item according to their individual preferences.

The questionnaire was pretested with a small sample of individuals chosen to represent a variety of socioeconomic and educational levels to insure that the instructions were clear and easy to follow, that the listed food names were correct and universal, and that the majority of commonly eaten street food items had been identified and included in the list.

SAMPLING PROCEDURE

As according to Sanjur et al. (1970):

"The basic assumption behind purposive sampling was that with good judgement and appropriate strategy, one could develop a sample that was satisfactory in relation to one's need and relevancy on the dimension to be studied."

Therefore, a purposive sampling method was used in the selection of participant schools and classes.

School tuition was selected as an indicator of socioeconomic level. Tuition was stratified into three categories. Category I (high tuition) included schools with monthly tuition over US$20. Category II (middle tuition) included schools with US$15-29 tuition per month. Category III (low tuition) includes schools with a monthly tuition of US$0-15.

A list of all secondary schools in Port-au-Prince was obtained from
the local phone directory and the listed schools were grouped into the three categories (I, II, or III) depending on their level. Several potential schools were selected from each category. In the school selection process, an attempt was made to include equal numbers of schools from each tuition category. An attempt was also made to survey a range of classes (and thus ages) within each tuition category. Attention was also paid to selecting both appropriate schools within tuition categories and appropriate classes in the school to yield a basically equal distribution of males and females.

Appointments were made with each school's principal in order to discuss the study and the possibility of including the school in the research project. In addition, several principals were contacted via personal contacts to request their participation. An explanatory letter of introduction was prepared in French with the help of a professional translator to assure that the principal fully understood the study purpose and specifics (See Appendix III).

Upon agreement to participate, the principal was given a packet including a set of standardized instructions in French to be read to the students in class and the appropriate number of blank questionnaires. A time schedule was established and the completed forms were collected later in the week.

Phase IV: DATA ANALYSIS

After collection, each questionnaire was assigned an identification number and responses indicating school attended, sex, and time of street
food consumption were coded into numerical form. Questionnaires were standardized to reflect the number of street food units eaten on a weekly basis for computational purposes. Subjects were deleted from the collected sample if the questionnaire was not fully completed or if the reported frequencies of consumption were obviously inaccurate indicating some excessive quantity that could not reasonably have been consumed during the given time period.

The data was then coded onto four Virginia Polytechnic Institute and State University research opscan forms following an established format. Completed opscan forms were read into the V.P.I. computer system via the campus Learning Resource Center's optical mark reader.

A supplemental survey was developed to yield specific information regarding 1) the amount of money available to secondary school students on a daily basis, 2) the total number of street food items purchased per week, and 3) the number of different street food items purchased per week. Results from the survey were used as criteria in the elimination of outlying subjects from the food consumption frequency survey. The survey was conducted at the request of the researcher in May 1984 by students of the International University of Haiti (Centre Universitaire International d'Haiti) under the leadership of Professor Willy J. Belotte. The collected data was reported by age group and by school classification depending on tuition level.

Both mean and range values were calculated for age groups within a given school category, for age groups across all school categories, and over all age groups and school categories combined.
The number of street food items eaten per day was found to range from 0 to 9, with an overall mean of 3.3 foods eaten per day. The number of different street foods eaten per week ranged from 0 to 30. The amount of money available to the student was estimated to be between US$.03 and US$4.00 per day.

The range values were used as criteria in the elimination of outlying subjects from the original street food consumption survey. Subjects who did not meet all three criteria were deleted from the sample. Computer analysis was conducted using SPSS-X, the Statistical Package for the Social Sciences (SPSS, Inc., 1983). The computer program tallied the total protein and caloric contribution of street foods for each student according to the indicated frequency of consumption. Mean values for both protein and calories were calculated for the entire sample and by the subcategories of sex, school tuition level, age and age category.

Tables of the Recommended Dietary Allowances of Nutrients for Use in the Caribbean (Caribbean Food and Nutrition Institute, 1979) and the FAO/WHO Recommended Dietary Intake Levels (Passmore et al., 1974) were used to estimate the level of protein and calories provided by the consumption of street foods. The Recommended Dietary Allowances for the United States (National Research Council, 1980) were also used for the purpose of comparison.

"Recommended Dietary Allowances", defined as "the levels of intake of essential nutrients considered to be adequate to meet known nutritional needs of practically all healthy persons" provide recommendations for population groups regarding the average daily amounts of nutrients that
should be consumed over a period of time (Committee on Dietary Allowances, 1980). The recommendations provide a "yardstick" against which the dietary intake of community groups can be measured (Caribbean Food and Nutrition Institute, 1979) and are especially useful in comparison with actual consumption figures determined by food consumption surveys (Passmore et al., 1974).
RESULTS AND DISCUSSION

One-hundred forty-six street foods were identified in the Port-au-Prince area during the fall of 1983. Each food was described according to appearance, ingredient composition and method of processing. The identified foods were next categorized by the predominant ingredient according to the FAO Commodity Grouping System. (For the distribution of identified street foods by category, see Table 1) Cereal and grain products were found to account for the largest number of street food varieties at 28.1% of the total or 41 individual items. Fruit was the next most extensive group at 18.5% of the total, with 27 different fruits being identified as sold on the street for ready consumption. Sugars and syrups was found to be the third largest street food category with 24 different items, accounting for 16.4% of the total number identified. Starchy roots, tubers and fruits and beverages were also predominant. (For a complete breakdown of the foods by category, see Appendix IV)

From observation and collected information, it was found that street foods cooked at the point of sale were prepared on small metal charcoal stoves. Disregarding beverages, fruits and commercially produced items, 54% of the street foods were processed by boiling, 27% by frying and 6% by roasting. These three processing methods were found to be the most prevalent due to the type of equipment available to the vendor. Home-baking was utilized for 8% of the non-commercially processed street foods. Fruits were eaten raw and were either peeled and/or sliced into individual serving portions prior to sale. The various beverages were prepared using a variety of methods such as boiling, juicing, and
<table>
<thead>
<tr>
<th>Food Category</th>
<th>Number of Identified Foods</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverages</td>
<td>16</td>
<td>11.0%</td>
</tr>
<tr>
<td>Cereal and Grain Products</td>
<td>41</td>
<td>28.1%</td>
</tr>
<tr>
<td>Eggs</td>
<td>2</td>
<td>1.4%</td>
</tr>
<tr>
<td>Fish and Shellfish</td>
<td>2</td>
<td>1.4%</td>
</tr>
<tr>
<td>Fruit</td>
<td>27</td>
<td>18.5%</td>
</tr>
<tr>
<td>Grain Legumes</td>
<td>2</td>
<td>1.4%</td>
</tr>
<tr>
<td>Meat, Poultry and Game</td>
<td>9</td>
<td>6.1%</td>
</tr>
<tr>
<td>Milk and Milk Products</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Nuts and Seeds</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Oils and Fats</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Starchy Roots, Tubers and Fruits</td>
<td>17</td>
<td>11.6%</td>
</tr>
<tr>
<td>Sugars and Syrups</td>
<td>24</td>
<td>16.4%</td>
</tr>
<tr>
<td>Vegetable and Vegetable Products</td>
<td>4</td>
<td>2.7%</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>146</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
fermenting. Table 2 presents the distribution of street foods by both category and method of processing.

Two important characteristics of the street food trade are on-site processing and sale of readily consumable products (Cohen, 1984). Many Haitian street food vendors were found to be purely resale operators. This type of vendor was found to purchase ready-made food items from local producers or commercial firms and resell them on the street. The ready-made products were purchased either from a middle man, a retail store or directly from the manufacturer. The food items were then sold either as is or in a modified form. For example, Chiclets gum was sold in the box as packed by the manufacturer. Prior to resale, however, the vendors were found to fry commercially manufactured sausages and often spread bread from the bakery with butter or peanut butter.

Of the one hundred forty-six identified street food items, 51 or 35% were found to be commercially produced, purchased by a vendor and resold. The most common resale items available in Port-au-Prince were baked goods, candies, frozen ices and desserts and carbonated beverages. Twenty-seven of the resale items, or approximately half, were commercially wrapped or bottled and were sold in their original form. The remainder of the resale products were generally found to be transported, stored, displayed and sold as unwrapped and usually uncovered loose items, as are most of the home produced items. In some cases, however, a piece of paper such as newsprint was provided with the food as a holder for ease in eating.

Portion size was generally found to be consistent among street
Table 2

DISTRIBUTION OF HAITIAN STREET FOODS BY FAO COMMODITY GROUP AND METHOD OF PROCESSING

<table>
<thead>
<tr>
<th>Food Category</th>
<th>BK</th>
<th>BL</th>
<th>FM</th>
<th>FR</th>
<th>JC</th>
<th>FPL</th>
<th>RT</th>
<th>OT</th>
<th>COMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverages</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cereal and Grain</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish and Shellfish</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Fruit</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Grain Legumes</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Meat, Poultry and Game</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
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<tr>
<td>Milk and Milk Products</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
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<tr>
<td>Nuts and Seeds</td>
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<td></td>
<td>1</td>
<td></td>
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<td>Oils and Fats</td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Starchy Roots, Tubers</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>and Fruits</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugars and Syrups</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Vegetable and Vegetable</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>4</td>
<td></td>
</tr>
<tr>
<td>Products</td>
<td></td>
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<tr>
<td>Miscellaneous</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL BY PROCESSING METHOD 3 34 3 16 4 29 4 3 51

PERCENT OF OVERALL TOTAL 2.1 22.6 2.1 10.9 2.7 19.2 2.7 2.1 35.6

BK=Baked   BL=Boiled   FM=Fermented   JC=Juiced
FPL=Fresh and/or Peeled RT=Roasted   OT=Other
COMM=Commercially-made
vendors selling home-produced food items since informal conventional measures existed for each street food item. An informally established and accepted unit price was found for each street food item. Underwood (1970) also reported that traders asked a fixed price per measure for their products. Very little variation in price for the same size sales unit was noted, although price for an item fluctuated according to variations in sales unit size. Some price fluctuations were noted for certain foods, namely resale items, depending on the distance from the point of initial sale to the vendor's established sales territory and/or the affluence of the neighborhood.

Of the total sample, one hundred twenty-five representative samples of the most readily available street foods were purchased, weighed and described. Twenty-seven of these were chemically analyzed to determine caloric and protein content. Food composition tables and weight data were utilized to estimate the content of the remaining ninety-eight purchased samples. Twenty-one foods identified during the survey were assigned approximate values since no sample was purchased. (For a complete listing of Haitian street foods, see Appendix V. A description of each identified street food is found in Appendix VI.)

Although the main objective of this portion of the study was to identify, describe and quantify street foods, supplementary information was collected through both observations and vendor interviews. This information included gender division of sales, frequency of sales, site location and sales method.

Haitian street food vendors were found to be women, men and children
entrepreneurs of all ages. Women traders were predominant. This finding was consistent with Underwood's 1970 report that Haitian women were responsible for the marketing of both garden surplus and homemade products and were predominant in the marketing system of Haiti. It was found from observations in the current study that many street food items were characteristically sold by one sex or the other. Some foods, however, were found to be sold by both sexes. In general, women were found to sell breads, most fruit varieties, homemade sweets and foods that were cooked at the point of sale. Only men were found to sell sugarcane, frozen ices and desserts and commercially fried chips. Also, men usually sold certain types of baked goods and certain beverages, especially those sold from a cooler. Both sexes were found to sell commercial cookies and candies, certain bread and baked items and specific fruits. As consistent with Underwood (1970), a tendency for each vendor to specialize in one type of product was noted in the current study.

Most Haitian street food vendors were found to be either ambulatory or semi-static, with the latter appearing more predominant. Underwood (1970) mentioned in his report that roadside selling of cooked food and beverages by vendors was seen daily throughout Haiti. In the current study, however, it was found that most vendors in the Port-au-Prince area sold their products daily from the same site, with the exception of Sunday. Some semi-static vendors were found in their usual sales position on Sunday, but the overall number of vendors was greatly reduced. Sales positioning appeared to operate on a stringent informal
system based on informal rank according to vendor and product status. Vendors were most frequently seen along the sidewalks of major streets or grouped together at the corners. The density of vendors was greater near shopping areas and markets, schools, public transportation stations, cinemas and tourist attractions. Fewer vendors were noted in residential areas. Ambulatory vendors were found to follow set routes, crying out their wares as they traveled, to alert potential customers to their presence in the neighborhood. Vendors were found to have regular customers with whom they did business, as well as customers who only occasionally purchased their wares. Underwood (1970) mentioned house-to-house trading as an everyday feature of urban life in Haiti.

Several types of sale displays were found to exist in Port-au-Prince. These included: flat, shallow and round woven trays; shallow rectangular metal bins; wooden trays; baskets; metal pots and bowls; plastic bowls; portable wooden boxes that opened up for display; tables; wheelbarrows; portable box carts on wheels; coolers; and cloths laid on the ground.

In general, it was noted that informal conventional methods of display existed for a given street food item or type of item sold. For example, peanuts were found to be sold from round trays which were placed directly on the ground, on the vendor's lap or on a low table. Fried and selected boiled foods were usually found to be displayed in a metal bin. Several types of food were found at the same time in many bins, arranged in piles by food item. Hot dishes, such as vegetable stews or mixed dishes were usually found in metal pots placed directly on a charcoal
stove. Fruits were sold from tables, wooden trays, or a cloth spread on the ground. Breads were found most often stacked on a table or piled in a basket placed on the ground. Other baked goods, depending on the variety, were sold from carried baskets or round trays. Assortments of commercial cookies and candies were usually sold from a portable wooden display box or a round tray. Homemade sweets were found to be sold from round trays. Sugarcane was stacked and sold from wheelbarrows. Frozen ices and desserts were sold from portable coolers or carts on wheels which held ice for cooling. Beverages were often sold from a cooler, a metal pot or a plastic bowl, depending on the type of beverage. Alcoholic beverages were displayed in bottles on tables.

Arrangements to participate in the street food study were made with fifteen schools in Port-au-Prince. The schools were distributed among three tuition categories. The high tuition category (over US$20 per month) included three schools: College Canado Haitian; Institution Sainte Rose de Lima; and Saint Louis de Gonzague. The middle tuition category (US$15-10 per month) was also comprised of three schools: College Omega; College Mixte Jonas Augustin; and Saint Patrick. In the low tuition category (US$0-15 per month) were nine schools run by the Salesian Fathers: l'Ecole Sainte Helene; l'Ecole Etoile de la Paix; l'Ecole Sainte Catherine; l'Ecole Frere Dorlas; l'Ecole Republicaine; l'Ecole Saint Bosco; l'Ecole de la Foi; l'Ecole Lancombe; and l'Ecole Bienvenue.

The questionnaires completed by the low tuition schools were not self-administered as with the other schools. An aid to the schools' director was assigned to interview the children and record their
responses.

Collected questionnaires were analyzed and both incomplete and obviously inaccurate questionnaires were eliminated from the sample. Two schools were eliminated from the study. First, Saint Louis de Gonzague was eliminated as the collection date was missed and no forms were returned. Second, College Saint Patrick was excluded as over 90% of their returned questionnaires were found to be highly inaccurate. Approximately half of the low tuition schools' questionnaires were also eliminated due to incompleteness. After coding, the initial sample data was computer analyzed and initial results obtained using the criteria program. Forty-eight additional subjects were deleted from the sample as they did not meet all three criteria outlined in the methodology chapter. The revised sample was then run with the original computer program for analysis of the data and results were obtained.

The daily mean caloric intake from street food consumption over all age groups and school categories was calculated to be 401 kcal. Table 3 presents the daily mean caloric intake values from street foods broken down by age group. Group III (ages 16 to 19) was found to have the highest mean caloric intake from street foods at 535 kcal per day. Age group I (ages 10 to 12) had the next highest mean caloric intake at 415 kcal per day. Group IV (ages 20 to 23) was found to have a mean of 383 kcal per day and the mean for Group III (ages 13 to 15) was 313 kcal per day. No significant difference in mean caloric intake values at p<.05 were found between age groups except for the comparison of Group II (ages 13 to 15) with Group III (ages 16 to 19) (t-value -2.83, p<.01).
Table 3

COMPARISON OF DAILY CALORIC INTAKE FROM STREET FOODS BY AGE GROUP

<table>
<thead>
<tr>
<th>Group</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Range(yrs)</td>
<td>(10-12)</td>
<td>(13-15)</td>
<td>(16-19)</td>
<td>(20-23)</td>
<td></td>
</tr>
<tr>
<td>Range(kcal/day)</td>
<td>0-1458</td>
<td>0-1315</td>
<td>0-1387</td>
<td>0-1152</td>
<td>0-1458</td>
</tr>
<tr>
<td>Mean (kcal/day)</td>
<td>415</td>
<td>313*</td>
<td>535</td>
<td>383</td>
<td>401</td>
</tr>
<tr>
<td>Std Dev</td>
<td>405</td>
<td>341</td>
<td>380</td>
<td>295</td>
<td>369</td>
</tr>
<tr>
<td>N</td>
<td>51</td>
<td>61</td>
<td>34</td>
<td>28</td>
<td>174</td>
</tr>
</tbody>
</table>

* Between Group II and III  \(p < .01, \text{t-value} = -2.83\)
When school categories were analyzed, however, wider variations in the daily mean caloric intake values from street food consumption were found. (See Table 4) The high tuition schools had a daily mean caloric intake value of 547 kcal. The middle tuition category had an average of 540 kcal per day. The low tuition schools had a daily mean of 100 kcal. The daily mean caloric intake value for Group III (low tuition) was found to be significantly different from both Group I (t-value=8.41, p<.001) and Group II (t-value=9.27, p<.001). However, the mean caloric intakes of the high and middle level schools were not found to be significantly different at the p<.05 level.

The mean daily protein intake from street food consumption was determined to be 5.8g of protein per day. Table 5 presents the daily mean protein intake values broken down by age group. Group III (ages 16 to 19) was found to have the highest average daily protein intake from street foods at 7.3g. Group I (ages 10 to 12) had the second highest consumption value at 6.3g per day. Group IV (ages 20 to 23) had an average protein intake from street foods of 5.7g daily. Group II was found to have the lowest daily protein intake of the four age groups at 4.4g. No significant differences were found between the mean protein intake values of any age group at p<.05, with the exception of Group II (ages 13 to 15) and Group III (ages 16 to 19) (t-value=-2.33; p<.05).

When school categories were examined, the mean protein intake levels between school categories showed greater variation than those between age groups. Category I (high tuition) had a mean protein intake of 8.2g per day. Category II had 7.6g per day and Category III (low
### Table 4

**COMPARISON OF DAILY CALORIE INTAKE FROM STREET FOODS BY SCHOOL CATEGORY**

<table>
<thead>
<tr>
<th>Category</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition Range</td>
<td>US$20+</td>
<td>US$15-20</td>
<td>US$0-15</td>
<td></td>
</tr>
<tr>
<td>Range(Kcal/day)</td>
<td>0-1458</td>
<td>0-1315</td>
<td>0-549</td>
<td>0-1458</td>
</tr>
<tr>
<td>Mean (kcal/day)</td>
<td>547</td>
<td>540</td>
<td>100**+</td>
<td>401</td>
</tr>
<tr>
<td>Std Dev</td>
<td>368</td>
<td>359</td>
<td>123</td>
<td>369</td>
</tr>
<tr>
<td>N</td>
<td>53</td>
<td>65</td>
<td>56</td>
<td>174</td>
</tr>
</tbody>
</table>

* Between Category I and III p<.001, t-value 8.41
+ Between Category II and III p<.001, t-value 9.27
Table 5

COMPARISON OF DAILY PROTEIN INTAKE FROM STREET FOODS BY AGE GROUP

<table>
<thead>
<tr>
<th>Group</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Range (yrs)</td>
<td>(10-12)</td>
<td>(13-15)</td>
<td>(16-19)</td>
<td>(20-23)</td>
<td></td>
</tr>
<tr>
<td>Range (g/day)</td>
<td>0-41.1</td>
<td>0-25.6</td>
<td>0-23.2</td>
<td>0-17.9</td>
<td>0-41.1</td>
</tr>
<tr>
<td>Mean (g/day)</td>
<td>6.3</td>
<td>4.4*</td>
<td>7.3</td>
<td>5.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Std Dev</td>
<td>7.8</td>
<td>6.0</td>
<td>5.7</td>
<td>5.7</td>
<td>6.6</td>
</tr>
<tr>
<td>N</td>
<td>51</td>
<td>61</td>
<td>34</td>
<td>28</td>
<td>174</td>
</tr>
</tbody>
</table>

* Between Group II and III  p<.05, t-value = -2.33
tuition) was found to have 1.3g per day. (See Table 6) The daily mean protein intake value for Category III was found to be significantly different from both Category I (t-value= 6.66, p<.001) or Category II (t-value= 7.50, p<.001). Categories I and II were found not to be significantly different from each other at p<.05.

The differences in the daily mean intake values for both protein and calories were to be due to several factors. First, the children attending the schools in the low tuition category were from a lower socioeconomic level than were those students attending the other schools. Less money was available to them on a regular basis and thus they were able to purchase fewer street food items than children attending the schools with higher tuition levels. Therefore, it follows that the findings indicated significantly lower protein and caloric intake values within the low tuition category as compared to the higher tuition schools. Secondly, a trend was observed during the study that with increasing income level, there was an increasing social stigma placed on the consumption of street foods. Many children from higher socioeconomic levels were socialized to believe that certain street foods available were more in the nature of food for the poor than viable food sources for themselves. Some foods, however, such as candies, commercial cookies, ice creams and frozen desserts were considered acceptable foods. It follows that the difference between the high and middle tuition categories was found to be less than that between either the high or middle category as compared with the low tuition category. No significant difference was found between the caloric and protein intake
Table 6
COMPARISON OF DAILY PROTEIN INTAKE FROM STREET FOODS BY SCHOOL CATEGORY

<table>
<thead>
<tr>
<th>Category</th>
<th>I (US$20+)</th>
<th>II (US$15-20)</th>
<th>III (US$0-15)</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition Range</td>
<td>Range (g/day)</td>
<td>0-41.1</td>
<td>0-25.6</td>
<td>0-5.2</td>
</tr>
<tr>
<td></td>
<td>Mean (g/day)</td>
<td>8.2</td>
<td>7.6</td>
<td>1.3*</td>
</tr>
<tr>
<td></td>
<td>Std Dev</td>
<td>7.6</td>
<td>6.3</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>53</td>
<td>65</td>
<td>56</td>
</tr>
</tbody>
</table>

* Between Category I and II  p<.001, t-value 6.66
+ Between Category II and III  p<.001, t-value 7.50
values from street foods between the high and middle tuition categories. Both of these tuition categories had significantly higher mean caloric and protein intake values as compared to the low tuition category, however.

The calculated mean caloric and protein intake values were next compared with three standards by sex and age group: the Recommended Dietary Allowances of Nutrients for use in the Caribbean/(RDAC) (Caribbean Food and Nutrition Institute, 1979): the Food and Agricultural Organization-World Health Organization's Energy and Protein Requirements/(FAO) (Passmore et al., 1974): and the Recommended Dietary Allowances for the United States/(RDA) (National Research Council,1980). For calories, the RDAC and FAO standards were the same. For protein, all three standards had varying recommendations. The RDAC was used preferentially for protein comparisons due it its having been adjusted to NPU=70 for the average Caribbean diet (CFNI, 1979). The RDA was given for the purposes of comparison. As the RDA is a United States-based standard, it was not appropriate for sole application in a developing country situation, such as Haiti.

As shown in Table 7, it was found over all age groups and both sexes, that 15% of the daily recommended dietary intake values for calories established by the RDAC and FAO were met in the current study via street food consumption. By age group and sex, the range of the percent of RDAC and FAO standards met by street food consumption was found to be between 8% and 24%. According to the RDA, 16% of the daily caloric need was met by street food consumption, with a range of 8% to 27% daily.
Table 7

COMPARISON OF MEAN DAILY CALORIC INTAKES FROM STREET FOODS WITH STANDARDS

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Sex</th>
<th>Standards (kcal/day)</th>
<th>Calories from Street Foods</th>
<th>Percent of Std</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RDAC</td>
<td>FAO</td>
<td>RDA</td>
</tr>
<tr>
<td>10 - 12</td>
<td>M</td>
<td>2600</td>
<td>2600</td>
<td>2700</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>2350</td>
<td>2350</td>
<td>2200</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>2475</td>
<td>2475</td>
<td>2450</td>
</tr>
<tr>
<td>13 - 15</td>
<td>M</td>
<td>2900</td>
<td>2900</td>
<td>2700</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>2490</td>
<td>2490</td>
<td>2200</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>2695</td>
<td>2695</td>
<td>2450</td>
</tr>
<tr>
<td>16 - 19</td>
<td>M</td>
<td>3070</td>
<td>3070</td>
<td>2800</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>2310</td>
<td>2310</td>
<td>2100</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>2690</td>
<td>2690</td>
<td>2450</td>
</tr>
<tr>
<td>20 - 23</td>
<td>M</td>
<td>3000</td>
<td>3000</td>
<td>2900</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>2200</td>
<td>2200</td>
<td>2100</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>2600</td>
<td>2600</td>
<td>2500</td>
</tr>
<tr>
<td>Overall</td>
<td>both</td>
<td>2615</td>
<td>2615</td>
<td>2463</td>
</tr>
</tbody>
</table>
As seen in Table 8, 18% of the RDAC for protein was met from street food consumption over all age groups and both sexes. Twelve percent of the FAO protein standards were met as compared to 10% for the RDA. By age and sex categories, the range of average intake of protein on a daily basis from street food consumption was determined to be 10% to 27% for the Caribbean standard, 17% to 19% for the FAO standard and 7% to 18% for the RDA.

According to the average of the Haitian food consumption surveys from 1951 to 1959 (Barkhuus and Daly, 1979) and the reported dietary intakes values during the period 1970 to 1980, the average daily caloric intakes in Haiti were reported to be 1728 kcal and 1845 kcal, respectively. (See Table 9) Comparing these figures with the three standards selected for use in the current study, the following was determined. During the 1950's, the Haitian diet provided 66% of the recommended dietary allowance for calories according to the RDAC and FAO standards. With respect to the RDA, 69% of the calories were being provided by the diet. During the 1970's, this figure rose to 71% of the RDAC/FAO standards or 74% of the RDA for calories being met by the diet. The results of the current study indicated that 8% to 24% of the daily caloric need according to RDAC and FAO standards were being furnished by street food consumption. In light of the estimated 66% to 71% adequacy of the total Haitian diet in terms of caloric intake, the percentage found to be provided by street food consumption indicates a substantial contribution to meeting the overall caloric needs of the population.

For protein, similar findings resulted. During the 1950's, the
Table 8

COMPARISON OF MEAN DAILY PROTEIN INTAKES FROM STREET FOODS WITH STANDARDS

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Sex</th>
<th>Standards (g/day)</th>
<th>Protein from Street Foods Average Intake (g/day)</th>
<th>Percent of Std</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RDAC</td>
<td>FAO</td>
<td>RDA</td>
</tr>
<tr>
<td>10 - 12</td>
<td>M</td>
<td>30</td>
<td>43</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>29</td>
<td>41</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>30</td>
<td>42</td>
<td>54</td>
</tr>
<tr>
<td>13 - 15</td>
<td>M</td>
<td>37</td>
<td>53</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>31</td>
<td>45</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>34</td>
<td>49</td>
<td>54</td>
</tr>
<tr>
<td>16 - 19</td>
<td>M</td>
<td>38</td>
<td>54</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>30</td>
<td>43</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>34</td>
<td>49</td>
<td>60</td>
</tr>
<tr>
<td>20 - 23</td>
<td>M</td>
<td>37</td>
<td>53</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>29</td>
<td>41</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>33</td>
<td>47</td>
<td>60</td>
</tr>
<tr>
<td>Overall</td>
<td>both</td>
<td>33</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Study Date</td>
<td>Authors</td>
<td>Dietary Intake average kcalories</td>
<td>average g protein</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>----------------------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>1951</td>
<td>Institute Haitien de Statistique</td>
<td>2450</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>1954</td>
<td>Boulos</td>
<td>2096</td>
<td>45.4</td>
<td></td>
</tr>
<tr>
<td>1955</td>
<td>Cesar</td>
<td>2236</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>1956</td>
<td>Grant and Groom</td>
<td>1383</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>1958</td>
<td>Sebrell et al.</td>
<td>1580</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td><strong>average</strong></td>
<td><strong>1951-59</strong></td>
<td><strong>Barkhuus and Daly</strong></td>
<td><strong>1728</strong></td>
<td><strong>39.2</strong></td>
</tr>
<tr>
<td>1970</td>
<td>Beghin, Fougere and King</td>
<td>1700</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>Beckles</td>
<td>1850</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>World Bank</td>
<td>1900</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>DIFPAN</td>
<td>2073</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td><strong>average</strong></td>
<td><strong>1970-80</strong></td>
<td><strong>1845</strong></td>
<td><strong>40</strong></td>
<td></td>
</tr>
</tbody>
</table>

a King, J. M., 1978  
b Grant and Groom, 1958  
c Sebrell et al., 1959  
d Barkhuus and Daly, 1976  
e Beghin, Fougere and King, 1970  
f Beckles, 1975  
g World Bank, 1976  
h UPAN, 1982
average daily protein intake was reported to be 39.2g. During the 1970's this figure was determined to be 40g per day. In comparison with the standards, during the 1950's, 83% of the RDAC, 117% of the FAO and 65% of the RDA for protein were met by the Haitian diet. During the 1970's, however, 85% of the RDAC, 121% of the FAO and 67% of the RDA were fulfilled by the average Haitian diet. The findings of the current study indicate 10% to 27% of the daily RDAC protein recommendation was met by street food consumption. With respect to the FAO standards, 7% to 19% of the daily protein needs were met from the consumption of street foods. According to the RDA, 7% to 18% of the standards for protein were furnished. Again, in comparison with the 83% to 85% adequacy of the Haitian diet in terms of the dietary recommendation for protein, the 10% to 27% of the RDAC standard found to be provided by street foods is substantial.

The national nutrition survey conducted by Sebrell et al. (1959) took into account the consumption of street foods in the determination of the overall per capita caloric and protein intake values provided by the Haitian diet. They determined 1,580 kcalories and 37g of protein per capita were consumed daily in Haiti.

Assuming that Sebrell et al.'s average daily per capita calorie and protein intake figures currently hold for urban secondary school children in Port-au-Prince, the students are consuming 25% of their daily calories and 15% of their daily protein via street foods, based on the findings of the current study. Therefore, a substantial portion of the children's diet is derived from street food consumption.
SUMMARY AND CONCLUSIONS

The high incidence of malnutrition among all population sectors is considered to be one of the principle public health problems in Haiti. In order to combat its occurrence, detailed information regarding the nutritional status and dietary practices of the people are necessary to develop and evaluate corrective national health and nutrition programs. It is believed that current estimates of dietary adequacy as determined by food consumption surveys are inaccurate and thus of limited use as a result of the lack of emphasis placed on foods eaten outside the home, especially those in the form of street foods. However, in light of the widespread availability of these foods in developing countries, it is important to develop an understanding of the role of street foods in the diet.

It was with these points in mind that a study to determine first the types of available street foods and their nutrient content and second, the frequency of consumption of these foods by secondary school children was implemented in Haiti in 1983. One hundred forty-six street foods were identified, described and their caloric and protein contents determined. The information collected was used to develop a food frequency questionnaire to be completed by secondary school students between the ages of 10 and 23 attending private schools from three levels of tuition.

Results of the study indicated that the consumption of street foods provided a substantial amount of both calories and protein to the diet.
An average of 401 kcalories per day was found to be contributed to the diet of the secondary school students via street food consumption. According to Caribbean standards, this level of consumption provided 15% of the daily recommended dietary intake for calories. The average protein intake from street foods was determined to be 5.8g per day and provided 18% of the recommended daily allowance for protein, according to Caribbean standards. Significant differences in the average daily caloric and protein intake values from street foods were found between socioeconomic levels. Little difference was found between age groups, however. In general, the level of street food consumption for children enrolled in low tuition schools was found to be lower than that for children attending more expensive schools. This difference was felt to be due to economic constraints within the low tuition category students. Little difference was found between children attending the high and middle tuition level schools in terms of street food consumption.

Overall, 25% of the calories and 15% of the protein provided daily in the diet of urban Haitian school children were suggested to result from the consumption of street foods. Thus, the contribution of street foods to the diet is substantial and warrants further research.

It is recommended that due to the difficulty of comparing age-specific data with per capita consumption estimates, further research would benefit from conducting food consumption surveys of the population in question in conjunction with the street food research. This would allow for a more accurate determination of the percent of the total diet supplied by street food consumption.
It is also recommended that when working in a developing country where school students may be less familiar with filling out forms that personal interviews be conducted to provide the data for the study. In addition, efforts should be made to focus on the role of street foods in the diet of other groups such as factory workers and rural-urban migrants, as well.

The conclusions drawn from this study suggest that street foods could serve as a potential means to improve nutritional status either by fortification of certain frequently consumed foods or by the introduction of new nutrient-dense food items.

Limitations of the current study include the use of a self-administered food frequency questionnaire and the seasonal nature of food availability in Haiti. In addition, since the current study was conducted in an urban area among children attending school, the results cannot be generalized to the entire Haitian population.
BIBLIOGRAPHY


APPENDIX I

STREET FOOD SURVEY QUESTIONNAIRE

Location:_________________________ Number:_____

Site:_________________________ Date:_____

FOOD NAME:_________________________ (local name)

_________________________ (English translation)

CLASSIFICATION: Check one. In case of foods that are a mixture, classify by predominant group.

___ Beverage  ___ Milk and Milk Products

___ Cereal and Grain Products  ___ Nuts and Seeds

___ Eggs  ___ Oils and Fats

___ Fish and Shellfish  ___ Starchy Roots, Tubers and Fruits

___ Fruit  ___ Sugars and Syrups

___ Grain Legumes  ___ Vegetable and Vegetable Products

___ Meat, Poultry and Game  ___ Miscellaneous

INGREDIENTS: Approximate Yield per Recipe:__________

<table>
<thead>
<tr>
<th>Name</th>
<th>Approx. Amount Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
</tbody>
</table>

Source of Ingredients: ___ Home Grown

___ Purchased

___ Other

DESCRIPTION OF PREPARATION METHOD:
PREPARATION METHOD:

___ Fresh, raw ___ Fried
___ Dried ___ Grilled
___ Salted ___ Juiced
___ Baked ___ Peeled
___ Boiled ___ Pickled
___ Fermented ___ Roasted

WHERE PREPARED: ___ On Site ___ At Home ___ Commercially
___ Other:______________________________

BY WHOM: ___ Seller ___ Family Member
___ Other:______________________________

WHEN PREPARED: ___ Same Day ___ Day Before
___ Morning ___ Midday ___ Night

SOLD BY: ___ Piece ___ Weight:____________
___ Volume:___________ ___ Bunch:___________
___ Other:______________________________

DISTRIBUTION: ___ As is ___ Wrapped:____________
___ Other:______________________________

COST PER UNIT:_____________________________________

METHOD OF SALES DISPLAY:__________________________

___ Stationary Unit ___ Mobile Unit

VENDOR: ___ Male ___ Female Approximate Age:_________

NAME:___________________________

___ Alone or Accompanied by:_______________________

FREQUENCY OF SALES: ___ Daily
___ Weekly: days=_______________________
___ Other:___________________________
___ Year Round
___ Seasonally:_______________________

NUMBER OF ITEMS SOLD:_____________________________

SEASONALITY OF ITEMS SOLD:_______________________
MAJOR SALES TIME: ___ All Day ___ Morning ___ Noon ___ Eve
REASON FOR PURCHASE: ___ Snack ___ Meal Substitute

FOOD DESCRIPTION:

Weight: ______________________
Size: _______________________
Shape: ______________________
Taste: ______________________
Color: ______________________
Texture: ____________________
Temperature: ___ Hot ___ Cold ___ Other: _______
APPENDIX II

STREET FOOD FREQUENCY QUESTIONNAIRE

Nom de l'école: ________________________________________________

Classe: ____________________________  
Age: _______________  Sex: _______________

Dejeuner-vous à l'école? ____ Oui _____ Non

Si vous avez répondu oui, est-ce que vous mangez:
____ 1) dans la cantine scolaire
____ 2) la nourriture de chez vous
____ 3) quelque chose acheté dans la rue

Combien de repas mangez-vous chaque jour à la maison?

0  1  2  3  4  5 repas

Sur le papier suivant, vous trouverez une liste des aliments qui sont vendus dans la rue dans les environs de Port-au-Prince. Lisez les instructions et remplissez la fiche en écrivant le nombre de fois par semaine ou par mois sur la ligne indiquée. Si vous mangez l'aliment moins qu'un fois par mois, laissez la ligne vide et avancez à la prochaine ligne.

Quand je mange les aliments qui sont vendus dans la rue, c'est d'habitude:
____ 1) en allant à l'école
____ 2) durant l'école
____ 3) après l'école
____ 4) en fin de semaine

Si vous mangez quelque chose acheté dans la rue et que vous avez répondu oui, faites un type de liste et remplissez la fiche en écrivant le nombre de fois par semaine ou par mois sur la ligne indiquée.

Fe youn ti ron lan manje nou  oue pl ba ke ou manje lo ou pa lakay ou, e ki pa soti lakay ou. Pou sa ou con maje de si ou manje li souven e kombyin fwa ou manje li. Si ou manje youn bagay shak seminn fe youn ti ron lan mo seminn e ekri kombyin fwa pa seminn sou lign-la. Si ou manje youn bagay mwins ke youn fwa shak seminn, fe ti ron la mo mwa e ekri kombyin fwa pa mwa sou lign-la.

--Carmel manje pate 3 fwa pa seminn _______ fwa pa ( seminn mwa )
-- Rony manje tablet pistache 2 fwa pa mwa ______ fwa pa ( seminn mwa )
ENGLISH VERSION

Name of School: ________________________________________________

Grade: ____________________________

Age: ____________________________  Sex: _________________________

Do you eat at school?  ___ Yes  ___ No

If you answered yes, do you eat:
   ___ 1) in the school cafeteria
   ___ 2) food brought from home
   ___ 3) something purchased in the street

How many meals do you eat each day at home?
   0 1 2 3 4 5 meals

On the following paper, you will find a list of the foods which are sold in the streets of Port-au-Prince. Read the instructions and answer the questionnaire by circling the names of the street foods that you have eaten and writing the number of time per week or per month on the given line. If you eat a food less than once a month, leave the line blank and go on to the next food.

When I eat street foods, it is usually:
   ___ 1) on the way to school
   ___ 2) during school
   ___ 3) after school
   ___ 4) on the weekends

Circle the names of the foods that you eat away from home that you do not carry with you from home. For each food that you eat, please indicate how many times you eat it usually. If you eat the food each week, circle the word week (seminn) and write the number of times that you eat it each week on the line. If you eat the food less than once a week, circle the word month (mwa) and write the number of times per month on the line.

Example:
Carmel eats pastry 3 times a week.  ___ fwa pa  seminn  mwa

Rony eats peanut brittle 2 times a month.  ___ fwa pa  seminn  mwa
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<td>fwa pa seminn mwa</td>
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<tr>
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| QUENEPE                     | fwa    | pa seminn mwa
| RIZ                         | fwa    | pa seminn mwa
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| SAUCISSON                   | fwa    | pa seminn mwa
| SUCRE                       | fwa    | pa seminn mwa
| SURETTE                     | fwa    | pa seminn mwa
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APPENDIX III

INTRODUCTORY LETTER TO SCHOOL DIRECTORS

Monsieur le Directeur:

Diplômée de l'Institute Polytechnique de Virginie (Virginia Polytechnic Institute) en Nutrition Communautaire et de Santé Publique avec une concentration en développement international, je passe quatre mois à Port-au-Prince afin d'étudier sur place l'alimentation et les habitudes alimentaires des haïtiens.

Le projet sur lequel je travaille concerne la nourriture qui est vendue et se mange dans la rue; il comprend deux parties. Dans la première, j'ai identifiés le plus d'aliments possibles vendues dans les rues. J'ai recueilli des informations basée sur chacun, et en ai achetés pour avoir des échantillons devant servir à des analyses chimiques. À mon retour aux États-Unis, je pourrai aussi déterminer les niveaux de protéines et des calories qu'ils fournissent.

Dans la deuxième parti, j'ai l'intention de mener une enquête basée sur un questionnaire afin de déterminer la contribution de la nourriture des rues dans le régime alimentaire journalier. Le group vise par ladite enquête comprend les enfants de 11 à 23 ans. J'espère pouvoir faire remplir ces questionnaires par les élèves des deux sexes, d'écoles privées, en vue de déterminer la fréquence de la consommation par ces élèves des aliments vendus dans les rues.

J'aimerais beaucoup que vos élèves participent a mon étude aussi je vous envoie ci-joint un exemplaire de formulaire qui sera utilisé. Il est direct et facile à remplir, je vous saurais gré de les examiner. Les questionnaires sont plus valides quand ils sont remplis à l'école par tous les enfants d'une classe donnée. Cependant si votre horaire est chargé, on peut les distribuer pour être remplis, et les remasser le lendemain afin de ne pas gêner vos heures de cours.

Je prendrai à nouveau du contact avec vous bientôt afin de voir si vous accepter de participer à mon étude, et je vous ferai parvenir une copie de mes conclusions. Tout en vous remerciant de votre attention, et des suites que vous voudrez bien donnez à la présente, je vous pris a'agréer, Monsieur le Directeur, mes salutations distinguées.

Susan A. Hyatt
APPENDIX IV

CATEGORICAL DISTRIBUTION OF HAITIAN STREET FOODS

BEVERAGES
Ak-100                      Jus de chadek
Cafe                        Jus de citron
Clairin                     Jus d'orange
Coca cola                   Jus canne
Dlo                         Kola Haitien
Dlo sucre                   Konpe
Frescao                     Jus de papay ak lait
Fruit champagne             Trampe

CEREAL AND GRAIN PRODUCTS
Animal crackers             Mais bouilli
Biscuit                     Mais boucane
Biscuit ak mamba            Mais grille
Biscuit ak zaboka           Mais moulue
Biscuit ti beurre           Marinade
Bonbon blan                 Marinade ak haran-so
Bonbon canel                Milles feuilles
Bonbon carres               Pain
Bonbon chocolat             Pain ak mamba
Bonbon coclise              Pain beurre
Bonbon Marie                Pain mais
Bonbon miel                 Pate
Bonbon sel                  Pate ak haran-so
Bonbon sucre                Pate ak viande
Bonbon syrop                Pumkette
Comparette                  Riz
Croissant                   Riz ak jonjon
Du Riz ak poua              Salaise
Gateau                      Ti bouton
Macaroni                    Ti pousson
                           Victoria-Marie

EGGS
Ze bouilli
Ze fri

FISH AND SHELLFISH
Lambi
Poisson fri

FRUIT
Cachiment coeur bouef       Mango
Cachiment lachine           Melon dlo
Cachiment pomme cannelle    Melon franc
FRUIT (cont)

Caimitte
Cerise du pays
Chadek
Cocoyeur (morceau)
Cocoyeur (tout)
Corosol
Fig
Fig ti malice
Goyave
Grenade
Mandarine

GRAIN LEGUMES

Acra
Poua

MEAT, POULTRY AND GAME

Boudin sang
Boulette
Grillot
Hamburger
Pate burger

MILK AND MILK PRODUCTS

Creme cornette

NUTS AND SEEDS

Pistache

OILS AND FATS

STARCHY ROOTS, TUBERS AND FRUITS

Banane bouilli
Banane fr
Banane ak morue
Banane ak haran-so
Bonbon lamidon
Cassav
Cassav ak mamba
Ducunous
Labapin

Lam veritable bouilli
Lam veritable fr
Manioc bouilli
Pain patate
Papita
Patate bouilli
Patate fr
Pom de te fr

SUGARS AND SYRUPS

Alta
Bazooka blad
Boborie
Canne a sucre
Chiclet
Confiture

Methes
Pipop
Rapadou
Sucre
Surette
Tablet cocoyer
SUGARS AND SYRUPS (cont)
Creme Kimy
Dous cocoyer
Dous pistache
Drage
Fresco
Karamel

Tablet mais
Tablet noix
Tablet pistache
Tablet roroli
Tita
Toli

VEGETABLES AND VEGETABLE PRODUCTS
Bouillon
Consomme
Giraumond
Toufe legume

MISCELLANEOUS
# APPENDIX V

## HAITIAN STREET FOOD LIST

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137. TITA
138. TOLI
139. TOUFE LEGUME
140. TRAMPE
141. VICTORIA-MARIE
142. ZABOKA
143. ZE BOUILLI

YELLOW MOMBIN
BREAD
BREAD AND PEANUT BUTTER
BREAD AND BUTTER
CORNBREAD
SWEET POTATO BREAD
PAPAYA
PAPAYA JUICE WITH MILK
FRIED SWEET POTATO CHIPS
BOILED SWEET POTATO
FRIED SWEET POTATO
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PEANUTS
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POTATO CHIPS
BEANS
MUFFIN
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SUGARCANE SYRUP
BOILED RICE
BOILED RICE AND MUSHROOMS
FRIED DOugh AND FLATBREAD
SAPOdILLA
MEAT SAUCE
SAUSAGE
SUGAR
HARD CANDY
COCONUT BRITTLE
CARAMEL CORn
CASHEW BRITTLE
PEANUT BRITTLE
SESAME SEED BRITTLE
TAMARIN
FRIED BEEF
"LITTLE BUTTON" SODA CRACKER
SANDWICH COOKIE
HARD CANDY
STICK MINT
VEGETABLE SAUCE
ALCOHOLIC BEVERAGE
"VICTORIA-MARIE" PLAIN COOKIE
AVOCADO
HARD BOILED EGG
144. ZE FRI  FRIED EGG OMELET
145. ZICAQUE  COCOPLUM
146. ZORANJ (DOUCE)  SWEET ORANGE
APPENDIX VI
HAITIAN STREET FOOD DESCRIPTION

CREOLE NAME (ENGLISH NAME)

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<th>FAO CATEGORY</th>
<th>DESCRIPTION</th>
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<th>Caloric content per sales unit</th>
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Note: HFCT= Haitian food Composition Tables (Dominique, 1965)
CFCT= Caribbean Food Composition Tables (CFNI, 1974)
Handbook 8= Nutritional Contents of Foods (USDA, 1975)

1. ACRA
   (FRIED BEAN PASTRY)
   GRAIN LEGUMES
   FRIED BALL
   INGREDIENTS: BEANS; FLOUR; SALT; WATER
   .02/10g unit
   chemical analysis: 0.4g protein 49 kcal

2. AK-100
   (ACASSAN)
   BEVERAGE (MILK AND MILK PRODUCTS)
   INGREDIENTS; MILK: CORN: EVAPORATED MILK: SALT: SUGAR: NUTMEG
   $.40/345g unit (10 oz bottle)
   HFCT: 1.4g protein 72 kcal

3. ALTA
   (SQUARE MINT CANDY)
   SUGARS AND SYRUPS
   COMMERCIALLIY MADE AND WRAPPED CANDY
   $.01/5g unit
   estimated content: (using toli) 0 g protein 20 kcal

4. ANIMAL CRACKERS
   (ANIMAL CRACKERS)
   CEREALS AND GRAIN PRODUCTS
   COMMERCIALLIY-BAKED AND PACKAGED
4. ANIMAL CRACKERS (CONT)  
ANIMAL-SHAPED UNSALTED SODA CRACKERS  
(SHABISCO OF PORT-AU-PRINCE)  
$.12/37g unit  30 crackers/pkg  
chemical analysis:  3.5g protein  
162 kcal  

5. BANANE BOUILLI  
(BOILED PLANTAIN)  
STARCHY ROOTS, TUBERS AND FRUITS  
Peeled plantain boiled in water  
$.10/215g unit  
HFCT:  2.2g protein  
262 kcal  

6. BANANE FRI  
(FRIED PLANTAIN)  
STARCHY ROOTS, TUBERS AND FRUITS  
Plantain slices soaked in salt water, fried in oil, flattened and refried  
$.02/20g unit  
estimated content:  0.2g protein  
24 kcal  

7. BANANE AK MORUE  
(PLANTAIN WITH COD)  
STARCHY ROOTS, TUBERS AND FRUITS  
Boiled plantain with a piece of cod  
estimated price $.10/215g  
plantain and 5g cod  
estimated content:  4.4g protein  
314 kcal  
(using boiled plantain and fried fish)  

8. BANANE AK HARAN-SO  
(PLANTAIN WITH HERRING)  
STARCH ROOTS, TUBER AND FRUITS  
Boiled plantain with salted herring  
Estimated price: $.10/215g  
plantain and 5g herring  
Estimated content:  4.4g protein  
314 kcal  
(using banane bouilli and poisson fri)
9. BAZOOKA BLAD
(BAZOOKA BUBBLE GUM)
SUGARS AND SYRUPS
COMMERCIAL-MADE, INDIVIDUALLY
WRAPPED PINK BUBBLE GUM
$.05/5g unit
estimated content: 0.0g protein
16 kcal
(using CRCT: chewing gum)

10. BISCUIT
(FLATBREAD)
CEREAL AND GRAIN PRODUCTS
BREAD BAKED IN A LOCAL BAKERY IN
LARGE FLAT RECTANGULAR LOAVES.
TOP IS SCORED INTO
APPROXIMATELY 6X8 SQUARES. SOLD
BY THE CUBE.
$.01/7g unit
chemical analysis: 0.9g protein
28 kcal

11. BISCUIT AK MAMBA
(FLATBREAD AND PEANUT BUTTER)
CEREAL AND GRAIN PRODUCTS
FLATBREAD CUBE SPREAD WITH
HOMEMADE PEANUT BUTTER
$.05/7g flatbread and 31g peanut
butter
Estimated content: 8.9g protein
218 kcal
(using biscuit values and CFCT
values for peanut butter)

12. BISCUIT AK ZABOKA
(FLATBREAD WITH AVOCADO)
CEREAL AND GRAIN PRODUCTS
FLATBREAD CUBE WITH A SLICE OF
AVOCADO
$.05/7g flatbread and avocado
Estimated content: 1.1g protein
50 kcal
(using flatbread values and HFCT
values for avocado)

13. BISCUIT TI BEURRE
(FLATBREAD)
CEREAL AND GRAIN PRODUCTS
ROUND DRY FLATBREAD BAKED BY A
LOCAL BAKERY
$.05/24g unit
13. BISCUIT TI BEURRE (CONT)
   Chemical analysis: 2.8g protein 94 kcal

14. BOBORIE (ROUND SESAME SEED CANDY)
   Sugars and syrups
   Ingredients: Sesame seeds, sugar cane syrup, and spices
   Estimated price: $.02/10g unit (using tablet roroli)
   Estimated content: 1.7g protein 52 kcal (using tablet roroli)

15. BONBON BLAN (WHITE COOKIE)
   Cereal and grain products
   Locally baked by a bakery
   $0.05/9g unit
   Chemical analysis: 0.8g protein 36 kcal

16. BONBON CANEL (CINNAMON COOKIE)
   Cereal and grain products
   Locally baked by a bakery
   $0.05/15g unit
   Estimated content: 0.9g protein 67 kcal (using Handbook 8- sugar cookie)

17. BONBON CARRES (SQUARE COOKIE)
   Cereal and grain products
   Commercially baked and packaged by Shabisco Co. of Port-au-Prince
   $0.10/46g unit 6/pkg
   Estimated content: 2.4g protein 221 kcal (using Handbook 8- assorted, packaged commercial cookie)

18. BONBON CHOCOLAT (CHOCOLATE/VANILLA SANDWICH COOKIE)
   Cereal and grain products
   Commercially baked and packaged by Shabisco Co. of Port-au-Prince
   $0.30/108g unit
   Chemical analysis: 6.8g protein 503 kcal
19. BONBON COCLISE  
(PLAIN COOKIE)  
CEREAL AND GRAIN PRODUCTS  
COMMERCIALY BAKED AND PACKAGED  
$.10/32g unit  
Chemical analysis: 2.2g protein  
148 kcal  

20. BONBON LAMIDON  
(STARCH COOKIE)  
STARCHY ROOTS, TUBERS AND FRUITS  
CASSAVA COOKIE BAKED BY A LOCAL  
BAKERY  
$.02/15g unit (4cm x 4cm square)  
Chemical analysis: 2.2g protein  
62 kcal  

21. BONBON MARIE  
("MARIE" PLAIN COOKIE)  
CEREAL AND GRAIN PRODUCTS  
COMMERCIALY BAKED AND PACKAGED BY  
SHABISCO CO. OF PORT-AU-PRINCE  
$.27/112g unit 12/pkg  
Estimated content: 5.7g protein  
538 kcal  
(using Handbook 8- assorted  
packaged commercial cookies)  

22. BONBON MIEL  
(HONEY COOKIE)  
CEREAL AND GRAIN PRODUCTS  
COMMERCIALY BAKED AND PACKAGED BY  
SHABISCO CO. OF PORT-AU-PRINCE  
$.10/40g unit 3/pkg  
Estimated content: 2.0g protein  
192 kcal  
(using Handbook 8- assorted  
packaged commercial cookies)  

23. BONBON SEL  
(SALTINE)  
CEREAL AND GRAIN PRODUCTS  
COMMERCIALY BAKED AND PACKAGED BY  
MABRANO OF DOMINICAN REPUBLIC  
$.10/27g unit 4/pkg  
Chemical analysis: 1.9g protein  
117 kcal
24. BONBON SUCRE
   (SUGAR BUN)
   CEREAL AND GRAIN PRODUCTS
   LOCALLY BAKED BY A BAKERY
   $.05/41g unit (4 x 3 x 9cm)
   Chemical analysis: 3.7g protein
   163 kcal

25. BONBON SYROP
   (SYRUP BUN)
   CEREAL AND GRAIN PRODUCTS
   LOCALLY BAKED BY A BAKERY
   $.05/12g unit
   Chemical analysis: 0.9g protein
   48 kcal

26. BOUDIN SANG
   (BLOOD SAUSAGE)
   MEAT, POULTRY AND GAME
   HOMEMADE SAUSAGE, FRIED AND SERVED
   WITH HOMEMADE PICKLES
   INGREDIENTS: BLOOD, INTESTINES.
   SPICES
   $.40/74g unit (4" link)
   HFCT: 13.7g protein
   119 kcal

27. BOUILLON
   (VEGETABLE AND BEEF SOUP)
   VEGETABLES AND VEGETABLE PRODUCTS
   $.50/244g unit
   Estimated content: 15.6g protein
   217 kcal
   (using Handbook 8- canned
   vegetable beef soup)

28. BOULETTE
   (MEATBALL)
   MEAT, POULTRY AND GAME
   FRIED
   INGREDIENTS: BEEF, BREAD CRUMBS
   $.05/13g unit
   Chemical analysis: 1.9g protein
   68 kcal

29. CACHIMENT COEUR BOEUF
   (BULLOCKSHEART CUSTARD APPLE)
   FRUIT
   FRESH, PEELED
   Estimated price: $.20/155g unit
29. CACHIMENT COEUR BOEUF (using sugarapple) (CONT)
   HFCT: 2.9g protein
   116 kcal

30. CACHIMENT LACHINE (CHERIMOYA)
   FRUIT
   FRESH, PEELED
   Estimated price: $.20/155g unit
   (using sugarapple)
   HFCT: 1.7g protein
   127 kcal

31. CACHIMENT POMME CANELLE (SUGARAPPLE)
   FRUIT
   FRESH, PEELED
   $.20/155g unit
   HFCT: 2.5g protein
   149 kcal

32. CAFE (COFFEE)
   BEVERAGE
   BOILED
   INGREDIENTS: COFFEE, WATER, SUGAR
   $.05/105g liquid coffee and 7g sugar
   HFCT: 0.3g protein
   29 kcal

33. CAIMITTE (STARAPPLE)
   FRUIT
   FRESH, PEELED
   $.20/220g unit
   (estimated price and size)
   HFCT: 1.8g protein
   149 kcal

34. CANNE A SUCRE (SUGARCANE)
   SUGARS AND SYRUPS
   FRESH, PEELED BATON
   $.10/524g unit (45cm long, 4cm diameter)
   -156 of the above unit actually ingested-
   CFCT: 0.8g protein
   443 kcal
35. CASSAV
(CASSAVA FLATBREAD)

STARCHY ROOTS, TUBERS AND FRUITS
INGREDIENTS: CASSAVA
GROUND CASSAVA IS SQUEEZED TO
REMOVE WATER AND PULP IS FLATTENED
INTO A CIRCLE AND BAKED
$.10/125g unit (30cm diameter x
3cm)
Chemical analysis: 0.8g protein
250 kcal

36. CASSAVA AK MAMBA
(CASSAVA FLATBREAD WITH PEANUT BUTTER)

STARCHY ROOTS, TUBERS AND FRUITS
INGREDIENTS: CASSAVA, PEANUTS, OIL
FLATBREAD IS SPREAD WITH HOMEMADE
PEANUT BUTTER
$15/125g cassava bread and 36g
peanut butter
Estimated contents: 10.0g protein
440 kcal
(using cassav and CFCT: peanut
butter)

37. CERISE DU PAYS
(BARBADOSCHERRY)

FRUIT
FRESH, PITTED
$.20/98g unit
HFCT: 0.4g protein
35 kcal

38. CHADEK
(GRAPEFRUIT)

FRUIT
FRESH, PEELED
$.10/375g unit
HFCT: 2.3g protein
143 kcal

39. CHICLETS
(CHICLETS CHEWING GUM)

SUGARS AND SYRUPS
COMMERCIALLyy MADE AND BOXED IN THE
DOMINICAN REPUBLIC
$.05/3g unit 2/pkg
Estimated content: 0.0g protein
10 kcal
(using CFCT: chewing gum)

40. CLAIRIN
(RAW RUM)

BEVERAGES (ALCOHOLIC)
HOMEMADE RUM FROM FERMENTED
SUGARCANE
$.20/43g unit (1 shot)
HFCT: 0.0g protein
105 kcal

41. COCA COLA
(COCA COLA)

BEVERAGE (SUGARS AND SYRUPS)
COMMERCIAL MADE AND BOTTLED
$.40/368g unit 12 oz. bottle
HFCT: 0.0g protein
145 kcal

42. COCOYER (MORCEAU)
(COCONUT (PIECE))

FRUIT
FRESH. SLAB OF MEAT ONLY.
$.05/40g unit
HFCT: 1.4g protein
118 kcal

43. COCOYER (TOUT)
(COCONUT (WHOLE))

FRUIT
FRESH. WATER AND MEAT/JELLY.
$.15/140g meat and 90g water
HFCT: 3.4g protein
392 kcal

44. COMPARETTE
(SWEET BUN)

CEREAL AND GRAIN PRODUCTS
BUN WITH A GLAZED TOP BAKED BY A
LOCAL BAKERY
$.20/92g unit 8cm x 6cm
Chemical analysis: 7.1g protein
375 kcal

45. CONFITURE
(PRESERVES)

SUGARS AND SYRUPS (FRUIT)
BOILED
INGREDIENTS: FRUIT, SUGAR
$.10/57g unit
45. CONFITURE (CONT)  Estimated content: 0.3g protein  110 kcal  
(usic HFCT: guava preserves)

46. CONSOMME  
(PUREED VEGETABLE SOUP)  
VEGETABLE AND VEGETABLE PRODUCTS  
$.50/estimated 200g unit  
Estimated content: 1.8g protein  64 kcal  
(using Handbook 8: vegetarian vegetable soup)

47. COROSOL  
(SOURSOP)  
FRUIT  
FRESH, PEELED  
$.20/415g unit  
HFCT: 4.2g protein  249 kcal

48. CREME CORNETTE  
(ICE CREAM CONE)  
MILK AND MILK PRODUCTS  
$.40/175g unit  
Estimated content: 5.9g protein  217 kcal  
(using CFCT: ice cream cones)

49. CREME KIMY  
(ICE CREAM ON A STICK)  
SUGARS AND SYRUPS  
COMMERCIALL Y MADE AND PACKAGED  
$.20/80g unit  
Estimated content: 0.0g protein  59 kcal  
(using Creamsicle)

50. CROISSANT  
(CROISSANT ROLL)  
CEREAL AND GRAIN PRODUCTS  
LOCALLY BAKED BY BAKERY  
$.30/60g unit  
Estimated content 4.4g protein  253 kcal  
(using Handbook 8: danish pastry)

51. DLO  
(WATER)  
BEVERAGES
51. DLO (CONT)  
$.02/8 oz cup  
Content: 0.0g protein  
0 kcal

52. DLO SUCRE  
(SUGAR WATER)  
BEVERAGES  
SUGAR DISSOLVED IN WATER  
$.05/20g unit  
Estimated content: 0.0g protein  
77 kcal  
(using HFCT: sugar and water values)

53. DOUS COCOYER  
(COCONUT FUDGE)  
SUGARS AND SYRUPS (fruits)  
INGREDIENTS: SUGAR, GRATED COCONUT, MILK  
BOILED, HARDENED AND CUT INTO BARS  
$.05/15g unit  
Chemical analysis: 0.2g protein  
67 kcal

54. DOUS PISTACHE  
(PEANUT FUDGE)  
SUGARS AND SYRUPS (nuts and seeds)  
INGREDIENTS: SUGAR, GROUND PEANUTS, MILK  
BOILED, HARDENED AND CUT INTO BARS  
$.05/26g unit  
Chemical analysis: 2.4g protein  
115 kcal

55. DRAGE  
(HARD CANDY)  
SUGARS AND SYRUPS  
COMMERCIALY MADE AND WRAPPED  
$.01/5g unit  
CFCT: 0.0g protein  
19 kcal  
(using CFCT: hard candy)

56. DUCUNOUS  
('SWEET LIKE US')  
STARCHY ROOTS, TUBERS AND FRUITS  
SWEET CASSAVA BOILED, WRAPPED IN BANANA LEAVES AND ROASTED ON HOT ROCKS
56. DUCUNOUS (CONT)

INGREDIENTS: CASSAVA, FLOUR, GRATED COCONUT, BROWN SUGAR, SUGARCANE SYRUP
Estimated price: $.05/unit
Estimated content: 0.3g protein
64 kcal
(using bonbon lamidon)

57. DU RIZ AK POUA
(RICE AND BEANS)

CEREAL AND GRAIN PRODUCTS (GRAIN LEGUMES)
INGREDIENTS: RICE, BEAN, NUTMEG BOILED. TWO PARTS RICE TO ONE PART BEANS
$1.50/150g rice and 100g beans
HFCT: 10.7g protein
283 kcal

58. FIG (BANANE JAUNE)
(BANANA)

FRUIT
FRESH, PEELED.
$.10/85g unit
HFCT: 1.0g protein
94 kcal

59. FIG (TI MALICE)
(FINGER BANANA)

FRUIT
FRESH, PEELED
$.05/42g unit
HFCT: 0.5g protein
47 kcal

60. FRESCAO
(CHOCOLATE DRINK)

BEVERAGE (MILK AND MILK PRODUCTS)
INGREDIENTS: MILK, EVAPORATED MILK, COCOA, NUTMEG AND SUGAR BOILED, BOTTLED, AND REFRIGERATED
$.40/345g unit 10 oz. bottle
Estimated content: 11.7g protein
293 kcal

61. FRESCO
(SLUSH CONE)

SUGARS AND SYRUPS
FLAKED ICE WITH A FLAVORED SUGAR SYRUP
61. FRESCO (CONT) ★★★
   $.20/unit
   Estimated content: 0.0g protein
   120 kcal

62. FRUIT CHAMPAGNE (FRUIT SODA) ★★★
   BEVERAGE (SUGARS AND SYRUPS)
   COMMERCIALY MADE AND BOTTLED IN HAITI
   $.30/310g unit
   Estimated content: 0.0g protein
   143 kcal
   (using CFCT: cabonated soft drinks, fruit flavored sodas)

63. GATEAU (CAKE) ★★★
   CEREAL AND GRAIN PRODUCTS
   INGREDIENTS: FLOUR, SUGAR, SALT, BAKING POWDER
   BAKED BY A LOCAL BAKERY
   $.40/35g unit (2 x 2 x 11/2")
   Estimated content: 1.6g protein
   127 kcal
   (using CFCT: plain cake without icing)

64. GIRAUMOND (SQUASH SOUP) ★★★
   VEGETABLES AND VEGETABLE PRODUCTS
   INGREDIENTS: SQUASH, WATER, SPICES, NOODLES
   Estimated $.50/unit
   Estimated content: 1.1g protein
   38 kcal

65. GOYAVE (GUAVA) ★★★
   FRUIT
   FRESH, PEELED
   $.10/70g unit
   HFCT: 0.4g protein
   40 kcal

66. GRENADE (POMEGRANATE) ★★★
   FRUIT
   FRESH, PEELED
   $.20/154g unit
   HFCT: 1.2g protein
   103 kcal
67. GRILLOT  
(FRIED PORK)  
MEAT, POULTRY AND GAME  
FRIED PORK PIECES  
$.60/25g unit  
Estimated content: 2.8g protein  
118 kcal  
(using CFCT: Pork, raw, thin)

68. HAMBURGER  
(HAMBURGER)  
MEAT, POULTRY AND GAME  
FRIED BEEF PATTY ON A BUN  
$.50/84g beef patty and 25g bun  
Estimated content: 23.2g protein  
314 kcal  
(using Handbook 8: cooked hamburger and hard roll)

69. JUS DE CHADEK  
(GRAPEFRUIT JUICE)  
BEVERAGE (FRUIT)  
INGREDIENTS: GRAPEFRUIT JUICE, WATER, SUGAR  
$.10/300g unit  
CFCT: 1.5g protein  
117 kcal

70. JUS DE CITRON  
(LEMONADE)  
BEVERAGE (FRUIT)  
INGREDIENTS: WATER, LEMON, SUGAR  
$.10/300g unit (8 OZ CUP)  
HFCT: 1.2g protein  
72 kcal

71. JUS D'ORANGE  
(ORANGE JUICE)  
BEVERAGE (FRUIT)  
INGREDIENTS: ORANGE JUICE, WATER, SUGAR  
$.10/300g unit (8 oz cup)  
(unit estimated using lemonade)  
HFCT: 1.2g protein  
120 kcal

72. JUS CANNE  
(SUGARCANE JUICE)  
BEVERAGE (FRUIT)  
COMMERCIALY JUICED AND BOTTLED
72. JUS CANNE (CONT)

LOCALLY
INGREDIENTS: SUGARCANE JUICE, WATER
$.30/300g
HFCT: 0.9g protein
219 kcal

73. KARAMEL (CARAMEL)

SUGARS AND SYRUPS
COMMERCIAL MADE AND WRAPPED BY KRAFT
$.10/7.5g unit (1 cube)
CFCT: 0.3g protein
30 kcal

74. KOLA HAITIAN (HAITIAN SODA)

BEVERAGE (SUGARS AND SYRUPS)
COMMERCIAL MADE AND BOTTLED IN HAITI
$.30/310g unit (10 oz bottle)
Estimated content: 0.0g protein
143 kcal
(using Handbook 8: cola soft drink)

75. KONPE (ALCOHOLIC BEVERAGE)

BEVERAGE (ALCOHOLIC)
$.20/43g unit (1 shot)
Estimated content: 0.0g protein
105 kcal

76. LABAPIN (BREADFRUIT)

STARCHY ROOTS, TUBERS, AND FRUITS BOILED
$.10/unit
Estimated content: 0.8g protein
99 kcal
(using lam veritable)

77. LAM VERITABLE BOUILLI (BOILED BREADFRUIT)

STARCHY ROOTS, TUBERS, AND FRUIT BOILED, THEN MASHED
$.10/96g unit
HFCT: 10g protein
99 kcal
78. LAM VERITABLE FRI  
(FRIED BREADFRUIT)  
STARCHY ROOTS, TUBERS AND FRUITS  
SLICED, SOAKED IN SALT WATER, AND  
THEN FRIED  
$.02/30g unit (10cm x 3cm wedge)  
Chemical analysis: 0.8g protein  
129 kcal

79. LAMBI  
(CONCH)  
FISH AND SHELLFISH  
BOILED (SOMETIMES IN A SAUCE)  
$.20/30g unit  
Estimated content: 3.8g protein  
24 kcal  
(using CFCT: unspecified molluscs in shell)

80. MACARONI (VERMICELLE)  
(PASTA NOODLES)  
CEREAL AND GRAIN PRODUCTS  
BOILED NOODLES  
$10/130g unit  
HFCT: 6.0g protein  
190 kcal

81. MAIS BOUILLI  
(BOILED CORN-ON-THE-COB)  
CEREAL AND GRAIN PRODUCTS  
$.05/85g unit (3-4" cob)  
HFCT: 3.5g protein  
110 kcal

82. MAIS BOUCANE  
(ROASTED CORN)  
CEREAL AND GRAIN PRODUCTS  
EAR OF CORN ROASTED ON A CHARCOAL STOVE  
$.05/100g unit (4-5" cob)  
HFCT: 4.1g protein  
129 kcal

83. MAIS GRILLE  
(POPcorn)  
CEREAL AND GRAIN PRODUCTS  
COMMERCIAL POPPED AND BAGGED  
$.20/18g unit  
CFCT: 1.7g protein  
82 kcal
84. MAIS MOULUE  
(CORNMEAL MUSH)
CEREAL AND GRAIN PRODUCTS  
INGREDIENTS: CORNMEAL, WATER, SALT  
$.20/240g unit  
Estimated content: 2.6g protein  
120 kcal  
(using Handbook 8: cornmeal,  
unenriched, cooked)

85. MANDARINE  
(TANGERINE)
FRUIT  
FRESH  
$.10/115g unit  
HFCT: 0.6g unit  
37 kcal

86. MANGO  
(MANGO)
FRUIT  
FRESH  
$.10/115g unit  
HFCT: 0.6g protein  
68 kcal

87. MANIOB BOUILLI  
(BOILED CASSAVA)
STARCHY ROOTS, TUBERS AND FRUITS  
INGREDIENTS: CASSAVA  
$.10/240g unit  
HFCT: 2.4g protein  
317 kcal

88. MARINADE  
(FRIED DOUGH)
CEREAL AND GRAIN PRODUCTS  
FRIED  
INGREDIENTS: FLOUR, OIL, WATER,  
SALT, PEPPER, GARLIC  
$.02/15g unit  
Chemical analysis: 1.3g protein  
79 kcal

89. MARINADE AK HARAN-SO  
(FRIED DOUGH WITH HERRING FILLING)
CEREAL AND GRAIN PRODUCTS  
FRIED DOUGH WITH HERRING FILLING  
INGREDIENTS: FLOUR, YEAST, SALT,  
RED PEPPER, TOMATO, DRIED HERRING
89. MARINADE AK HARAN-SO $0.05/40g unit  
   (CONT) Chemical analysis: 2.7g protein  
   79 kcal

90. MELON DLO  
   (WATERMELON)  
   FRUIT  
   FRESH, SERVED AS A SLICE  
   $.20/160g unit  
   HFCT: 0.8g protein  
   35 kcal

91. MELON FRANC  
   (HONEYDEW MELON)  
   FRUIT  
   FRESH, SERVED AS A SLICE  
   $.20/129g slice  
   HFCT: 0.8g protein  
   35 kcal

92. MENTHES  
   (MINTS)  
   SUGARS AND SYRUPS  
   COMMERCIALLY MADE AND WRAPPED  
   $.01/10g unit  
   Estimated content: 0.0g protein  
   40 kcal  
   (using toli)

93. MILLES FEUILLES  
   (NAPOLEAN)  
   LOCALLY BAKED BY A BAKERY  
   $.50/130g unit  
   Estimated content: 10.0g protein  
   550 kcal  
   (using Handbook 8: danish pastry)

94. MOMBIN FRANC  
   (YELLOW MOMBIN)  
   FRUIT  
   Estimated $.20/unit

95. PAIN  
   (BREAD)  
   CEREAL AND GRAIN PRODUCTS  
   LOCALLY BAKED BY A BAKERY  
   $.05/100g unit  
   HFCT: 9.3g protein  
   307 kcal
96. PAIN AK MAMBA
   (BREAD WITH PEANUT BUTTER)
   CEREAL AND GRAIN PRODUCTS
   LOCALLY BAKED BREAD SPREAD WITH
   HOMEMADE PEANUT BUTTER
   $.05/100g bread and 36g peanut
   butter
   1 1/2 tsp peanut butter and 1 1/2" x
   3" oblong piece of bread
   Estimated content: 19.3g protein
   517 kcal
   (using HFCT: bread and CFCT:
   peanut butter)

97. PAIN BEURRE
   (BREAD AND BUTTER)
   CEREAL AND GRAIN PRODUCTS
   LOCALLY BAKED BREAD SPREAD WITH
   BUTTER
   $.06/100g bread and 17g butter
   Estimated content: 9.3g protein
   425 kcal
   (using HFCT: bread and CFCT:
   butter)

98. PAIN MAIS
   (CORNBREAD)
   CEREAL AND GRAIN PRODUCTS
   $.05/estimated 100g unit
   Estimated content: 8.7g protein
   267 kcal
   (using Handbook 8: Johnnycake)

99. PAIN PATATE
   (SWEET POTATO BREAD)
   STARCHY ROOTS, TUBERS AND FRUITS
   $.05/estimated 100g unit
   Estimated content: 8.7g protein
   267 kcal
   (using Handbook 8: cornbread)

100. PAPAY
     (PAPAYA)
     FRUIT
     FRESH, PEELED
     $.20/140g unit
     HFCT: 0.7g protein
     45 kcal
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| **101. PAPAY JUS AK LAIT**  
(PAPAYA JUICE WITH MILK) | **BEVERAGES** |   |
|   | PUREED PAPAYA WITH MILK AND SUGAR |   |
|   | $.40/240g unit | 100g papaya |
|   |   | 120g milk |
|   |   | 20g sugar |
|   | Estimated content: 3.1g protein | 201 kcal |
|   | (using HFCT: papaya, milk, sugar) |   |
| **102. PAPITA**  
(SWEET POTATO CHIPS) |   |   |
|   | STARCHY ROOTS, TUBERS AND FRUITS |   |
|   | COMMERCially FRIED AND BAGGED |   |
|   | $.20/42g unit |   |
|   | Chemical analysis: 1.1g protein | 223 kcal |
| **103. PATATE BOUILLI**  
(BOILED SWEET POTATO) |   |   |
|   | STARCHY ROOTS, TUBERS AND FRUITS |   |
|   | PEELED. BOILED |   |
|   | $.10/160g unit |   |
|   | HFCT: 2.1g protein | 186 kcal |
| **104. PATATE FRI**  
(FRIED SWEET POTATO) |   |   |
|   | STARCHY ROOTS, TUBERS AND FRUITS |   |
|   | FRIED SWEET POTATO SLICES |   |
|   | $.02/20g unit |   |
|   | Estimated content: 0.2g protein | 35 kcal |
|   | (using HFCT: sweet potato) |   |
| **105. PATE**  
(PASTRY) |   |   |
|   | CEREAL AND GRAIN PRODUCTS |   |
|   | LOCALLy BAKED BY A BAKERY |   |
|   | $.05/35g unit |   |
|   | Chemical analysis: 3.2g protein | 168 kcal |
| **106. PATE AK HARAN-SO**  
(PAstry with HERRING FILLING) |   |   |
|   | CEREAL AND GRAIN PRODUCTS |   |
|   | FRIED |   |
|   | INGREDIENTS: FLOUR, SALT, HERRING, WATER |   |
106. PATE AK HARAN-SO (CONT) $0.10/35g unit
Estimated content: 3.2g protein 168 kcal
(using pate)

107. PATE AK VIANDE (PAstry WITH MEAT FILLING)
CEREAL AND GRAIN PRODUCTS
LOCALLY BAKED BY A BAKERY
$0.10/35g unit
Chemical analysis: 3.0g protein 168 kcal

108. PATE BURGER (PAstry Burger)
MEAT, POULTRY AND GAME
LOCALLY BAKED BY A BAKERY
$0.20/estimated 109g unit
Estimated content: 23.2g protein 314 kcal
(using Handbook 8: hamburger)

109. PECHE (PEACH)
FRUIT
FRESH
$0.05/87g unit
HFCT: 0.7g protein 45 kcal

110. PIPOP (FROZEN SLUSH POP)
SUGARS AND SYRUPS
COMMERCIALy MADE
$0.05/95g unit
Estimated content: 0.0g protein 70 kcal

111. PISTACHE (PEANUTS)
NUTS AND SEEDS
ROASTED IN THE SHELL, SHELLED AND SOLD
$0.10/20g unit
HFCT: 5.3g protein 114 kcal

112. POISSON FRI (FRIED FISH)
FISH AND SHELLFISH
112. POISSON FRI (CONT) SMALL FISH ROLLED IN FLOUR AND THEN FRIED
$.02/5g unit
Chemical analysis: 1.1g protein
26 kcal

113. POM
(APPLE)
FRUIT
FRESH
$.60/150g unit
CFCT: 0.5g protein
87 kcal

114. POM DE TE FRI
(POTATO CHIPS)
STARCHY ROOTS, TUBERS AND FRUITS
COMMERCIALY FRIED AND BAGGED
POTATO SLICES
$.20/31g unit
Handbook 8: 1.6g protein
176 kcal

115. POUA
(BEANS)
GRAIN LEGUMES
BOILED
$.50/unit
HFCT: 15.0g protein
230 kcal

116. POULET
(CHICKEN)
MEAT, POULTRY AND GAME
FRIED
$.50/estimated 75g unit
HFCT: 12.0g protein
90 kcal

117. PUMKETTE
(MUFFINS)
CEREAL AND GRAIN PRODUCTS
BAKED BY A LOCAL BAKERY
$.05/30g unit
Chemical analysis: 2.2g protein
126 kcal

118. QUENEPE
(MAMONCILLA)
FRUIT
FRESH, PEELED
119. RAPADOU
(SUGARCANE SYRUP)
SUGARS AND SYRUPS
$.05/39g unit 13 fruits/bunch
HFCT: 0.4g protein
23 kcal

120. RIZ
(RICE)
CEREAL AND GRAIN PRODUCTS
BOILED
Estimated $.10/estimated 25g unit
HFCT: 0.1g protein
80 kcal

121. RIZ AK JONJON
(RICE WITH MUSHROOMS)
CEREAL AND GRAIN PRODUCTS
BOILED
Estimated $.30/150g unit
Handbook 8: 3.0g protein
169 kcal
(using cooked rice)

122. SALAISE
(FRIED DOUGH AND BREAD SANDWICH)
CEREAL AND GRAIN PRODUCTS
MADE OF FLATBREAD AND FRIED DOUGH
EATEN LIKE A SANDWICH
$.10/22g unit
Estimated content: 2.2g protein
107 kcal
(using flatbread and fried dough values)

123. SAPOTILLE
(SAPODILLA)
FRUIT
FRESH, PEELED
$.20/estimated 170g unit
HFCT: 0.9g protein
160 kcal
124. SAUCE VIANDE
   (MEAT SAUCE)
   MEAT, POULTRY AND GAME
   $.60/estimated 100g unit
   Handbook 8: 5.8g protein
   79 kcal
   (using beef and vegetable stew)

125. SAUCISSON
   (SAUSAGE)
   MEAT, POULTRY AND GAME
   COMMERCIALLHY MADE, FRIED ON PURCHASE
   $.50/87g unit (11cm x 3cm link)
   Estimated content: 8.3g protein
   433 kcal
   (using CFCT: pork sausage)

126. SUCRE
   (SUGAR)
   SUGARS AND SYRUPS
   $.10/25g unit
   HFCT: 0.1g protein
   88 kcal

127. SURETTE
   (HARD CANDY)
   SUGARS AND SYRUPS
   COMMERCIALLHY MADE AND WRAPPED
   $.01/10g unit
   CFCT: 0.0g protein
   38 kcal

128. TABLET COCOYER
   (COCONUT BRITTLE)
   SUGARS AND SYRUPS
   INGREDIENTS: COCONUT SHAVINGS, SUGAR, WATER
   BOILED, DROPPED BY SPOONFULS TO HARDEN
   $.10/45g unit
   Chemical analysis: 1.0g protein
   198 kcal

129. TABLET MAIS
   (CARAMEL CORN)
   SUGARS AND SYRUPS
   INGREDIENTS: POPCORN, SUGARCANE SYRUP
   $.10/10g unit
   Estimated content: 0.7g protein
129. TABLET MAIS (CONT)  
43 kcal  
(using Cracker Jacks)

130. TABLET NOIX  
(CASHEW BRITTLE)

SUGARS AND SYRUPS (NUTS AND SEEDS)  
INGREDIENTS: SUGARCANE SYRUP,  
CASHEWS  
BOILED, DROPPED BY SPOONFUL TO HARDEN  
$.10/40g unit  
Estimated content: 3.0g protein  
169 kcal  
(using HFCT: sugarcane syrup and cashews)

131. TABLET PISTACHE  
(PEANUT BRITTLE)

SUGARS AND SYRUPS (NUTS AND SEEDS)  
INGREDIENTS: SUGAR, PEANUTS  
BOILED, DROPPED BY SPOONFULS TO HARDEN  
$.10/40g unit  
Chemical analysis: 2.5g protein  
186 kcal

132. TABLET ROROLI  
(SESAME SEED BRITTLE)

SUGARS AND SYRUPS  
INGREDIENTS: SUGARCANE SYRUP,  
SESAME SEEDS, SPICES  
BOILED, HARDENED, CUT INTO SLICES  
$.02/10g unit  
Chemical analysis: 1.7g protein  
52 kcal

133. TAMARIN  
(TAMARIN)

FRUIT  
FRESH, PEELED  
$.20/estimated 10g unit  
HFCT: 0.5g protein  
25 kcal

134. TASSOT  
(FRIED BEEF)

MEAT, POULTRY AND GAME  
FRIED BEEF CHUNKS  
$.60/25g unit  
Estimated content: 4.1g protein
134. FRIED BEEF (CONT) 67 kcal
(using CFCT: beef, raw, fat)

135. TI BOUTON
("LITTLE BUTTON" SODA CRACKER)
CEREAL AND GRAIN PRODUCTS
ROUND SODA CRACKERS DECORATED LIKE
A BUTTON
COMMERCIALY PRODUCED
$.01/1.5g unit (2 crackers)
Estimated content: 0.2g protein
14 kcal
(using Handbook 8: soda crackers)

136. TI POUSCON
("LITTLE PEOPLE" SANDWICH COOKIE)
CEREAL AND GRAIN PRODUCTS
COMMERCIALY MADE AND PACKAGED BY
SHABISCO CO. OF PORT-AU-PRINCE
$.20/80g unit (6 cookies/pkg)
Estimated content: 3.8g protein
396 kcal
(using Handbook 8: sandwich cookie)

137. TITA
(HARD CANDY)
SUGARS AND SYRUPS
COMMERCIALY MADE AND WRAPPED
$.01/10g unit
Estimated content: 0.0g protein
40 kcal
(using toli values)

138. TOLI
(STICK MINT)
SUGARS AND SYRUPS
COMMERCIALY MADE AND WRAPPED
$.01/10g unit
Chemical analysis: 0.0g protein
40 kcal

139. TOUFE LEGUME
(VEGETABLE SAUCE)
VEGETABLE AND VEGETABLE PRODUCTS
$.30/estimated 50g unit
Estimated content: 1.5g protein
12 kcal
140. TRAMPE
(ALCOHOLIC BEVERAGE)
BEVERAGE (ALCOHOLIC)
$.20/43g unit (1 shot)
HFCT: 0.0g protein
105 kcal
(using raw rum)

141. VICTORIA-MARIE
("VICTORIA-MARIE" PLAIN COOKIE)
CEREAL AND GRAIN PRODUCTS
COMMERCIALY BAKED AND PACKAGED IN
THE DOMINICAN REPUBLIC
$.20/40g unit (7 cookies/pkg)
Estimated content: 2.4g protein
183 kcal
(using Handbook 8: butter cookies)

142. ZABOKA
(AVOCADO)
FRUIT
FRESH, PEELED
$.10/75g unit
HFCT: 1.5g protein
112 kcal

143. ZE BOUILLI
(BOILED EGG)
EGGS
BOILED WHOLE EGG
$.10/50g unit (1 egg)
HFCT: 5.7g protein
74 kcal

144. ZE FRI
(FRIED EGG OMELET)
EGGS
$.30/estimated 100g unit
Estimated content: 11.2g protein
173 kcal
(using Handbook 8: eggs, omelet)

145. ZICAQUE
(COCOPLUM)
FRUIT
FRESH
Estimated price $.20/53g unit
HFCT: 0.2g protein
25 kcal
146. ZORANJ (DOUCE)  
(SWEET ORANGE)  

FRUIT  
FRESH, PEELED  
$.05/131g unit  
HFCT: 1.0g protein  
55 kcal
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