

CULTURAL DIET PATTERNS IN BENIN, WEST AFRICA

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BENIN. Benin (also known as Dahomey) is a country about the size of Tennessee, with a population of three million. It is located on the West coast of Africa, a few degrees above the Equator. It is home to more than 20 distinct ethnic groups, speaking more than 15 major languages (1). An independent nation since 1960, Benin was formerly a province of French West Africa. A strong French influence continues to permeate political organization, economic ties, sociocultural life, and the direction of development within the country (2). The economy of Benin is predominantly agricultural, though staples and other crops vary between three distinct environmental zones (3) that change from equatorial on the coast to tropical in the North. In northern Benin, millet, sorghum and corn are staple crops. In the central region major foods are yams, cassava, and plantains. In the southern coastal region there are a wide variety of crops, including yams, cassava, rice, beans and corn. Throughout the country, on a seasonal basis, other fruits and vegetables are available, and in places milk and cheese can be obtained.

If you take the train from the coast, some 400 miles to the northern end of the line, you arrive at Parakou--a city of 60,000 that is the political, commercial and economic center of the Province of Atakora. It is subject to a variety of cultural influences (4), and its markets provide a wide selection of foods and other trade goods. Although precise figures on the distribution of cultural groups in Parakou are not available, it is known that the Bariba and the Dendi comprise a majority of the population. The casual visitor might note that a great majority of adults are illiterate and could claim little formal education. A second look however would show that most speak two languages and some are fluent in 5-6 languages. There are deeply ingrained patterns of belief and performance that pervade all aspects of life. Without a clear understanding of these, one can have little hope of understanding eating habit patterns. For example, many are Moslem--and, as you might expect, do not eat pork.

DIET RECORDS. Now, let us turn to a note on methodology. A frequent pattern, advocated by some beginning nutritionists, is to send a scientist in to a community to work for 2-3 weeks and get a sample of diet records to use for nutritional evaluation purposes. Since the scientist does not speak the language, arrangements are made for a translator to use in getting the diet records.

To picture the nature of some of the problems involved, let us reverse the situation for a moment. Let us assume that a scientist from Benin was sent to south Georgia to study the relationship between diet and some of the known health problems of this area. Let us further assume that this foreign scientist did not understand English--but had found a local person that spoke both English and one of the six languages known to him. The translator, the wife of the local Baptist preacher, had spent some time in the mission field, and thus had some limited linguistic ability. Now, let us go to the first

home and introduce everyone. The family happens to be one of the staunch supporters of the Baptist church. The scientist pulls out his questionnaire and asks the first question -"How frequently do you drink beer? wine? and whiskey?" Well, the translator now has a problem. Her husband constantly preaches on the evils of alcohol and is leading a movement to vote the county "dry"--and this family is a prime supporter of the church. What to do! The scientist will disappear in two weeks, but she must live and work with this family for some years! So, in English, she asks "What do you usually drink with your meals?", and reports to the scientist that they never drink beer, wine or whiskey, but frequently have ice tea or coca cola with meals. Now, all of this may or may not be the total truth--but it helps to demonstrate some of the hazards involved in getting diet records by relying on translators. Much can be lost in the "translation", and even more importantly, many crucial questions are not asked because the visitor does not have the insight required to ask them.

In saying all of this, it should also be mentioned that help and assistance from local collaborators is a practical necessity. Success requires not only some knowledge of nutrition but, above all, a clear understanding of the local language and culture (5-7). Okere (8), an Igbo working among the Igbo of Nigeria, describes some of the problems of diet research he encountered. For a non-African, the problems multiply. The researcher must gain the trust of the community, become as fluent as possible in the languages of the area, be able to establish rapport with informants, and cope with the ethnic problems of field work. Like Okere, I had to deal with the problem that most Parakou residents initially see anyone with papers in hand as a government representative--probably a tax collector. In order to gather accurate data, I had to convince them that it would not be used for tax assessment. A related problem, encountered early in the study period, was that of respondents tending to under-report their diet in the hope that "the wealth American" would give them money to help supplement their obviously inadequate diet. This feeling was further complicated with local etiquette that demanded that any "visitor" present some form of gift. On the other hand I was faced with certain economic realities and problems of professional ethics. A certain amount of finesse was necessary to elicit data that seemed reasonable--when evaluated in terms of the material goods visible within the home. My Beninese assistants were often useful in providing me with inside information about the family, and helping me to evaluate the accuracy of the information that we had obtained.

One could pursue other aspects of this topic, but let me jump to the process that I used. I do not pretend that it is perfect, but after a little experimentation with translators, this is what I turned to. First of all I learned enough of some of the major languages that I could converse after a fashion. Then, I moved into the community and got acquainted. I visited the home and kitchens during food preparation, and ate with them. At my home I had a collection of bowls and containers, plus a small spring scales. So I rushed home, repeated the food preparation and wrote down the serving sizes and ingredient weights. After a little experience of this type I felt that I could get reasonable diet histories that reported both the identity of the foods consumed and the serving sizes involved.

NUTRIENTS AND FOOD PATTERNS. Once I had the diet records in hand, I still had a number of serious problems ahead before I could evaluate the records and organize the data for interpretation by health and cultural groups. I do not

have to detail for this group the needs for detailed international diet tables giving the nutrient composition of the various foods. Before I am through, However, I want to add some footnotes to this topic.

To give some perspective on this matter, let me jump to the presentation of some of the core diet data that relates food data to nutrient data. The major part of the energy intake comes from: yams (pounded, boiled and fried), koko, dibu, beef, fried cakes, wasa wasa, pate de mais, manioc, ragout, akassa, rice, pasta and a group of gravies or sauces. We will talk more about some of these foods in a moment. Much of the diet resembles mush or gruel, and are based on specific grains. The gruel or porridge based on corn are koko and pate de mais. The one based on millet is called dibu or pate de mil. Sorgho is based on sorghum grain. The Bariba are typically known as millet eaters, and dibu is a substantial part of the diet. Between the yams and grain, the diet is decidedly starchy.

CARBOHYDRATES. When one looks at the list of foods providing the major part of the carbohydrate, therefore, it is not surprising that the list is very much the same as that seen for energy--except, of course, for beef. During the interview, many subjects identified yams and millet as "the true food of the Bariba" and as the foods that their parents and grandparents in the villeges ate exclusively. Despite the introduction of other foods into the diet, these two staples of the "traditional" diet endure in the hearts and kitchens of Parakou. Note that this yam is a white tuber, quite different from the yellow-orange sweet potato of southeastern USA.

The appearance of manioc in several forms in the diet is consistent with the general trend in West Africa for manioc to replace other tubers (10,15). Imported from Brazil around 1500, manioc grows in poor soil and yields a larger crop than some other tubers indigenous to the area. In Parakou, manioc appears in the form of wasa wasa (a greasy processed snack), as gari (a dry form), and as manioc flour that is added as a thickening agent to some gruels. Tapioca could be bought in the market but was rarely mentioned by Bariba or Dendi subjects as a diet item. Manioc is nutritionally inferior to yams, providing little but calories. The production of manioc in Benin now exceeds that of the yam (1) and in Nigeria it is second to the yam (8).

FAT. Fat comes from various sources. Beef is a major contributor, as are the fried foods: fried cakes and fried yams. The guyant, gombo, friture and senri are gravies and/or sauces used on other foods. Wasa wasa is an oily snack food made with manioc. In general, the subjects did not consider snack items as "real" food. In 24 hour-recalls they were routinely missed. The food frequency questionnaire, used at the same time, picked up these items consistently. This is in accord with other experience (11) with these tools. The ability to measure the intake of snacks (such as wasa wasa, fried cakes, gari and fried yams) is important because they can provide an appreciable part of the total caloric intake.

PROTEIN. The list of protein foods is led by beef and is followed by a series of grain-based foods. The fromage peul is a local fulani cheese. Other animal protein sources are eggs, fish and poultry. Milk occurs in various forms, including yogurt, curdled milk, powdered milk, partially evaporated milk and sweetened condensed milk. Pork is not a major food in this largely Moslem land.

The impact of Western foods on non-Western urban residents has been discussed widely in the literature (9,12-14). During the observation phase of the study, numerous Western foods were found in Parakou, and some of these items were included in the food frequency questionnaire. A few of these (such as macaroni, rice, coffee, white bread, green beans and salad) were found to be significant in urban populations but were either unknown or considered "foreign" and not appropriate food items in rural settings.

A special footnote is needed here in relation to koko. This is primarily a corn gruel with a variable composition. The nutrient values shown here are for the product made up with milk. This is significant. As we have looked over the nutrient composition of most diets, one would say that they are generally pretty good. They meet the RDA values fairly well--except for calcium and riboflavin. There are few sources of milk in the diet. Here it becomes important to look at the way koko is made up, and at the corresponding nutrient composition. Unfortunately, when one looks in areas with marked malnutrition, it is found that koko is a major diet component--but here the koko is made with water and with little or no milk. The food has the same name, but the composition is highly dependent upon the economic status of the household.

Now, it may be appropriate to call attention to one hazard encountered in the casual inquiry about food recipes. When you ask a local person for the ingredients and proportions required to make koko you are, in effect, asking for a statement concerning the person's status in the community. There may be a strong tendency to come out with an idealized recipe that could be very misleading when used as a basis for nutritional evaluation. Foods with the same names but different composition can also be misleading in the evaluation of diets on a foods basis--and in the search for distinct eating habit patterns.

The factor analysis plot shown here shows the different ethnic groups represented in this subsample. B indicates Bariba. D is for Dendi. And F is for Fon, a lesser ethnic group. Both the Bariba and Dendi, presumably, have their own characteristic and traditional diets. Here it appears in this urban setting that the diets are largely indistinguishable. Examination of individual diet records confirm that there are Bariba subjects eating predominantly millet. However, others are predominately corn eaters. Most eat both. Hence, whatever differences may have been observed in rural villages, once they moved to the city their habits changed and their choices broadened. The one distinct group is the Fon. Only two are represented in this sample, but the differences are statistically significant.

The Fon are different in culture, diet and religion. They are best known in this country due to the fact that they brought voodoo with them when they were imported as slaves into the West Indies. A small number migrated into Atakora from south Benin, and they constitute one of the minor ethnic groups in Parakou. Here we see that their diet differs from the average in that they eat corn but very little millet. They eat pork and more green peas and condensed milk than the general population.

Other groups stand out in a similar fashion, and their dietary differences can be characterized using the t-test. For example, there is a

small Christian community and their mean diet differs in that they also eat more corn than millet (dibu). They eat more fresh fish and pineapple, but less boiled yam and curdled milk. Another comparison showed that one group of trades-people had a diet that differed from the mean in that they ate more ragout, more mangoes and more wasa wasa. Currently we are working on health data relating the diet of the mothers to the health of their infants. The computer tools are available, but the health data from Benin are a little slow in arriving.

SUMMARY. In summary, we have taken a brief look at a diet study carried out in a distant land and under conditions that are somewhat beyond those routinely encountered in this country. I have emphasized methodology rather than results or experimental design because I believe that some of the problems and insights discussed here may have general utility and applicability in many situations. I think I will reserve further comment for the question period.

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