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DIETARY CONSEQUENCES OF CHANGES IN TRADE AND AGRICULTURE FOR THE NANKANE OF NORTHERN GHANA

ROBERT TRIPP

INTRODUCTION

There is no doubt that the social and economic changes that have occurred in Africa during the colonial and postcolonial eras have been responsible for significant shifts in dietary practices and patterns. These shifts are most often associated with either the introduction of commercial agriculture (Fleuret & Fleuret 1980) or the results of rapid urbanization (Sai 1976). The present paper, however, will outline dietary changes in a part of northern Ghana that, although certainly not isolated, has not been as subject to the pressures of commercial agriculture or urbanization as many other areas of Africa. Nevertheless, it is possible to trace several instances of dietary change in that region and to examine their consequences. In particular, examples will be presented regarding dietary outcomes of changes in trading and labor migration, and the evolution of the cropping system. Although these represent relatively subtle changes in social and economic life, they have left their mark on the diets of the area's people.

THE AREA

The people who are the subject of this chapter will be referred to as Nankane (Rattray 1932). They are one of several patrilineal, acephalous groups that inhabit northeast Ghana and speak closely related languages. The Nankane live just to the east of Navrongo in Ghana's Upper Region. Other related groups include the Frafra, who live around Bolgatanga; the Namnam, based at Nangodi; and the Tallensi, the subject of Fortes' (1945, 1949) classic studies. These names are in fact the product of a colonial penchant for distinguishing "tribes" and "languages" in an area that had previously been distinguished more by gradients than by boundaries. But because they have achieved currency in modern Ghana, they will be employed here.

The Nankane live in a series of dispersed settlements in the savannah that marks the transition between the Guinea Zone and the Sudan Zone of West Africa (Baker 1962). It is low, fairly flat country, crossed by a number of small streams that flow only in the rainy season, which extends from April to October. Rainfall averages about 1,000 mm per year, but there is great variation. Perhaps the most outstanding feature of the area is that despite uncertain rainfall and relatively poor soils, the population density is very high, averaging about 150 persons per square kilometer. This high concentration of population can be explained by both natural and historical factors. The area is removed from the riverine regions where onchocerciasis (river blindness) is a serious problem. Its

soils are better suited to permanent farming than are many of the others in the region. Additionally, it served as an area of refuge during the slave raiding that was common until the end of the last century.

The Nankane are farmers whose principal staples are millet, sorghum, and groundnuts. Because of the high population density, much of the farming is done on continuously cropped land. The system has been referred to as "compound farming" (Wills 1962), in which every compound sits in the middle of a field that is planted each year and receives (ideally) a yearly dressing of manure. These fields are supplemented by bush farms who are at some distance from the compound. In previous times, these fields were part of a fallow rotation, but now they are likely to be cropped every year. In the settlement that provides the basis for this study (Tripp 1978), the average farming unit contained about seven people and farmed a little more than one hectare of land. A farming unit is formed by one or more adult males and their dependents who work as a single economic unit. A compound may contain one or more farming units.

Table 1 provides a list of the major food crops grown by the Nankane. The compound farm is usually planted with early-maturing millet (*nara*) and sorghum. The bush farms may be used for sorghum as well, but the principal grain planted

TABLE 1
Food Crops Cultivated by the Nankane

Common Name	Scientific Name	Nankane Name
Cereals		
Early millet	Pennisetum spp.	nara
Late millet	Pennisetum spp.	zea
Guinea corn	Sorghum spp.	ka molga
Rice	Oryza sativa	mui
Maize	Zea mays	kamana
Root Crops		
Sweet potato	Ipomea batatus	nanugle
Coleus potato	Coleus dysentericus	peese
Legumes		
Groundnuts	Arachis hypogaea	sumkaam
Cowpeas	Vigna spp.	tea
Roundbeans	Voandzeia subterranea	suma
Vegetables		
Sorrel (sour-sour)	Hibiscus sabdoriffa	bito
Kenaf	Hibiscus cannabinus	berenga
Okra	Hibiscus esculentus	ma'ana
Neri, egusi	Citrullus vulgaris	saane
Pumpkin	Cucurbita pepo	yogre
?	Cucurbita spp.	sambola
Garden egg	Solanum indicum	beo, kuma
Sesame	Seasnum indicum	sa'ari
Tomato	Lycoperiscum	tomakesi
Pepper	Capsicum spp.	nazusi
?	Gynandropsis	nangina
Tree Crops		
Shea	Butyrospermium parkil	ta'anga
Dawadawa	Parkia filicoidea	duwa
Baobab	Adansonia digitata	tua
Mango	Magnifera indica	mango

there is late millet (*zea*). The majority of the bush farms, however, are planted with groundnuts. Cowpeas are planted in the compound farm, intercropped with the cereals. Okra, garden eggs, and several types of squash are also intercropped with the cereals, and sorrel and kenaf are planted around the borders. Sweet potatoes and coleus potatoes are planted in separate beds near the house. The principal source of cooking oil is the nut of the shea tree. All farming units raise chickens and guinea fowl. About half the compounds own cattle, and more than half own sheep or goats, but more than one-third of the compounds own no animals.

In a good year there may be a surplus of grain or groundnuts to sell; in general, however, the crops produced are for household consumption. No other crops provide much income, as the area has been subject to only rather desultory campaigns to encourage production of cotton or kenaf as cash crops. Poultry, goats, and sheep, on the other hand, have long been a source of cash income, and the majority of these are exported to the south of Ghana.

Another major source of cash income is labor migration. From the beginning of British rule in the Northern Territories in the early part of this century, men were drawn to the south to find work as laborers on the cocoa farms, in the mines, and in the towns. Men continue to migrate during the dry season to work as agricultural laborers; many of them stay longer if they can find more permanent employment.

Although this migration, and the general opening up of the area over the last 60 years or so, has certainly been responsible for changes in the social and economic life of the Nankane, it would be fair to say that there have not been as large scale changes here as in many other parts of Ghana (Hart 1978). The patrilineal kinship system still assures access to land for all members of the community; the crops and farming methods have changed relatively little. And although the migrants bring back cash and new ideas, there is considerable stability and cultural continuity among the Nankane. It is against this background that the diet, and the changes that it has undergone, will be described.

Nankane Diet

The diet is based on flour prepared from sorghum or millet. The flour is usually ground at home on a stone, although there are grinding machines in most markets. The principal item of diet, which is called *sagabo*, is a thick porridge. Its preparation begins by boiling some water, known as *ku'um mi'isum* ("sour water"), which is obtained by soaking millet flour and letting it ferment for three days. A supply of this water is kept on hand in the house. To this boiling water is added a paste of flour and water, which is then boiled for 15-20 minutes. Handfuls of flour are added, and the mixture is stirred with a stick until the desired consistency is obtained. Portions of *sagabo* are placed in bowls, smeared with *shea* butter and served with a soup.

There are several other preparations made from flour, including flavored porridges, thin gruels, and steamed and roasted flour mixed with water. Sorghum is also used to prepare the rich, red beer that is an important element of every ceremony and market day. But *sagabo* is the basis of the diet, and it is always eaten with some kind of soup (*ziiro*). Leaves are a common constituent of soups; sorrel, kenaf and okra leaves, as well as young cowpea, pumpkin, or baobab leaves may all be used.

Soups may be thickened with groundnut paste or flour. Okra, garden eggs, pumpkin, and tomatoes may also be used in the soups, as well as ground pumpkin seeds. Condiments always include salt and dried pepper and usually fermented locust bean seeds. A bit of dried fish or dried guinea fowl meat may also be added for flavor.

Legumes are also important in the diet. Groundnuts may be eaten raw or used in soups. Roundbeans are boiled and served with salt, pepper and shea butter. Cowpeas may be cooked in the same manner, or may be prepared with rice. Cowpea flour is also used to make a number of snacks and ceremonial foods.

Root crops are not very common, but they provide a welcome supplement to the diet near the end of the rainy season. Sweet potatoes are boiled in their skins, and the tiny coleus potatoes are scrubbled to remove the skins and then boiled and served with salt, pepper, and *shea* butter.

Seasonality of Diet

There are seasonal variations in both the quality and quantity of the diet. The variety of foods available in the dry season is less than in the period after the harvest. Many vegetables are only used fresh, although okra and many types of leaves may be dried and stored. The dry season, on the other hand, is a time of more ceremonial activity and, hence, more meat consumption. Tomatoes are primarily a dry-season garden crop, and mangoes ripen in the dry season as well.

Much more important than these variations in the composition of the diet are the seasonal changes in food availability. The character and consequences of the "hungry season" in northern Ghana have been well described elsewhere (Fortes & Fortes 1936; Hunter 1967). The severity of the shortages varies from year to year, but people usually find it necessary to ration their supplies during the last few months before harvest. At harvest time, if one approaches a house and finds the owner eating, there will surely be an invitation, *wa ti di* ("come, we eat"). During the hungry season, the person who is eating is more likely to give the polite, but circumspect, *mam gure la loko* ("I am holding a bowl"). Granaries are carefully monitored, and sometimes a decision has to be made about whether to eat the grain and groundnuts that have been stored for seed. At times grain must be purchased in the market to carry the household over; if a household is particularly short of cash, cassava flour, imported from the south, may be purchased rather than sorghum or millet.

During the hungry season, activity shifts to finding alternative sources of food. Boys hunt lizards and other small animals, and children may borrow their fathers' hoes and go to the fields to see if they can unearth a few groundnuts or a small sweet potato overlooked in last year's harvest. Of the wild foods that are available, the baobab is the most utilized during the hungry season. The young leaves are used in soups and the fruit yields a pulp when it is young or a white, slightly-sour powder when it is mature.

The first important source of food during the agricultural season is early millet, which is planted near the compounds. The immature heads may be roasted and provide a welcome end to the privations of the hungry season. These may be ready by the end of July. In September, early-maturing groundnuts are ready for harvest. By the end of October, sorghum and late millet can be harvested.

Meal Schedules

The main meal is in the evening. The exact timing depends in large part on what other tasks the woman has had to perform during the day. Although a compound

may contain several farming units and each man may have more than one wife, each woman generally prepares a meal for her husband, her children, and herself. there are some instances of sharing of cooking duties, but the most common practice is for each woman to be responsible for her own water and firewood (usually late millet and sorghum stalks) and to maintain her own kitchen utensils.

A man with several wives will receive a bowl from each wife and will eat at least a bit from each. These bowls may then be passed on to children or to other men in the house. Men often eat with their youngest child, but this is not always the case. Children who are not yet weaned will sit with their mothers and share the food from their bowls. Older children eat by themselves, often two or three sharing one bowl.

Some *sagabo* may be saved from the pot for the following morning meal. It is often eaten cold, for people hardly ever cook in the morning. The morning meal, if it is eaten at all, is usually a perfunctory one.

The afternoon meal is quite variable and is the one that is most subject to the time and resources of the individual woman. A woman may cook an afternoon meal in which everyone partakes, or she may simply provide some flour water. If a woman has a young child, she will try to prepare something for him or her, even if no one else gets a chance to eat, but this is not always possible.

Infants rarely receive solid food for the first six months. Instead, they are breastfed on demand. There are no special weaning foods; children are likely to get a little *sagabo* as their first food, although mothers also make thinner paps for children. Weaning is usually very gradual and quite late, and is often not complete until the child is three years old or more.

There are several dietary restrictions observed by Nankane. The most important of these is a ban on women consuming chicken or chicken eggs. This restriction is common in much of northeast Ghana. It does not apply to guinea fowls, and the restriction on eggs is of little importance because no one eats them anyway. There are a series of other restrictions, usually applied to particular lineages or persons. These usually regulate the consumption of unusual foodstuffs or particular eating situations, and have very little dietary significance. In fact, the interpretation of these food restrictions is quite pragmatic. The story is told of one lineage that forbids the consumption of the head of the dog. It is said that previously all dog meat was forbidden to them, but during a famine a man of the lineage killed all of the dogs in his compound cut off their heads, and "convinced" the others that the bodies were those of goats.

From the descriptions above it can be seen that the diet of the Nankane is relatively simple, based on a limited range of foodstuffs and prepared under considerable restrictions of time, water, and fuel. Needless to say, food is a constant topic of conversation, a source of enjoyment, and a focus of social interchange. There have also been several dietary changes in the past 60 years, and it is the purpose of the following sections to describe them.

CHANGES IN TRADING PATTERNS

At the beginning of this century there were very few markets in the Nankane area. The British encouraged the establishment of markets, and now every settlement of any size has a market place, which usually functions every third day. During this same time period, the Nankane began to travel as migrant laborers and traders. This general opening up of the area to greater exchange has had an impact on diet.

The Nankane have probably always lived under the threat of food scarcity. Although land was not always as scarce as it is now, drought, locusts, and wind storms have been responsible for serious shortages in some years. At times the problems have been very localized so that people from one community could use their affinal ties with other communities to obtain enough grain to tide them over (Fortes & Fortes 1936). There have been other years, however, when food shortages have been more general and widespread famine conditions led people to more desperate measures. There are instances of children being exchanged for grain, either locally or to slave traders (Rattray 1932). With the establishment of colonial rule, food shortages were met by the purchase of grain, which often meant traveling to the north to French territory. However, by the late 1930s grain was also being brought by truck into Bolgatanga and Navrongo markets from areas of the south.

In addition to increasing food security, the opening up of the area has brought new food items into the market and into people's diets. Foods from southern Ghana, such as yams, bananas, and oranges, can be found in Nankane markets, although they are generally luxury items that don't play a very large part in the diet. Imported cassava flour may be an important item during the hungry season. Rice is becoming increasingly popular. It is easy to buy cooked rice from food sellers markets day, but it is still an unusual element of household diet.

There have been some changes in the basic ingredients for preparing soups. Dried fish, which is used for flavoring soups, was unknown in the area 60 years ago, although the neighboring Tallensi regularly fished in the Volta River (Fortes & Fortes 1936). The salt that is now sold in Nankane markets is sea salt, brought from the coast, 800 km away. The Nankane had previously obtained their salt from traders who got it from deposits near the desert. The Nankane also obtained salt by extracting it from the ashes of early millet, a practice still carried out.

With respect to diet, the changes that have occurred in the *organization* of trading are at least as important as the changes in the items traded. In particular, women's role in trading has undergone an evolution that has had consequences for local diet. Long-distance trading in animals or manufactured goods is mostly run by men, but in any Nankane market the majority of the traders are women. This was not always the case; rather, women have gradually assumed more responsibilities in local trading. Women have traditionally cooked food and brewed beer for sale, as well as made pottery and *shea* butter to trade. It also appears that men would give their own grain to a woman in the household who would sell it in the market. But now that the grain trade involves exchange between neighboring areas and towns, women have a virtual monopoly on this activity in the Nankane markets. They have also taken over the sale of soup ingredients and malt, both of which were once the province of males.

This increase in trading activity by women, in conjunction with increased monetization of exchange, has led to a somewhat greater control of their own food supplies. It will be recalled that a woman generally manages her own kitchen, and although the bulk of her supplies comes from her husband's granary, an independent income will allow her to supplement the diet she provides for her children. Women who trade spend the majority of their income on food, which results in a better diet for the family. The nutritional effects are striking: in one Nankane settlement, mother's income from trading was the best predictor of above average nutritional status of children (Tripp 1981).

The increase in trade and migration has been responsible for another important change in women's roles. As early as 1911, a district officer in Navrongo pointed

out that the women in the area did little farm work and asked what would happen once men started leaving for the south (Tripp 1978). Women have indeed taken on an increasing share of the farm work; for example, in one Nankane community, during the wet season women spent an average of 3.7 hours per day (compared to men's 5.1 hours) in farming activities (Tripp 1982).

Women participate in most of the grain-farming activities, including weeding. They have major responsibility for the care of vegetables and cowpeas as well. Quite often a woman may be given her own groundnut field. Both men and women work these fields together, but the harvest is the property of the woman.

These changes in women's roles in trading and farming have probably led to somewhat increased economic independence for women. But the gains have not been great, and the price in extra work is substantial. There have been some changes in the Nankane area that have saved labor for women, such as the introduction of a few water pumps and grinding mills, but these are not utilized sufficiently to offset the increased agricultural labor demands. Although there is no direct evidence that the extra time spent by mothers in farming or other economic activities is prejudicial to child nutrition (Tripp 1981), it is reasonable to believe that the additional labor that women perform may contribute to nutritional stress. One possible piece of evidence, the incidence of goitre, is discussed in the following section.

Changes in Agricultural Patterns

Although the Nankane area has not been a target of campaigns to encourage cash cropping, the farming system has seen some changes in this century. One of the most important of these is the introduction of the bullock plow. Although plows were not adopted very rapidly and only a minority of farmers own them, more than half the area's farmland is now prepared with bullock plows. The job of weeding is still done with hoes, however. Some chemical fertilizer is available in the area but is used on only a small proportion of fields.

From a dietary point of view, changes in the type of crop planted have had more important impact than changes in management. Two major changes during the past 60 years are the shift from sorghum toward millet and the substantial increase in the amount of groundnuts sown. The first change is fairly easy to understand, given the relative hardiness of the millets and their ability to produce some yield even on poor soils and with low rainfall. Reports from colonial dairies of the 1930s describe the harvest as "mostly guinea corn" (sorghum), but this is no longer the case. It is not certain how great the shift has been away from sorghum toward millet, but there is no doubt that less sorghum is being sown today than previously.

The decline in sorghum is particularly interesting in light of the fact that the red-grained types of sorghum are locally regarded as "real food" that gives one strength and increases the blood supply. Before a baby is brought out of confinement, it is fed a boiled infusion of sorghum. Sorghum is culturally defined as "male," whereas millets are "female." It is the only grain that is subject to ritual prohibitions after harvest. But despite the strong attachment to red sorghum, it is being replaced by other types of sorghum and, more importantly, by late millets. This kind of substitution is part of a process that has gone on for generations. Farmers in Nankane settlements can name many types of sorghum and millet that are no longer commonly grown, and they are continually observing the yields of varieties sown in neighboring areas and testing those which are attractive to them.

Thus, the Nankane have seen a gradual shift in their dietary staple from sorghum toward millet. The biological value of the protein in millet and sorghum is about the same (Adrian & Sayerse 1957), and the average protein content falls within the same range. One advantage that millet may have over red sorghum is a much lower tannin content; this is important because the tannins of sorghum interfere with its protein digestibility (Hulse et al.1980), and therefore a shift toward millets may improve protein status.

Another possible nutritional consequence of a shift to millet is an increase in the incidence of goiter, which is quite high among females of childbearing age in the Nankane area. This seems to be a problem only in a limited area of northern Ghana, around Sandema and Navrongo (Sai, personal communication). Several hypotheses have been put forward to explain the epidemiological picture, including the presence of a goiterogenic factor in water. It is interesting to note, however, that older informants in the Nankane area claim the problem is of recent origin. A possible explanation is the shift to millet. There is some evidence that millet may be associated with the incidence of goiter (Osman 1981; Klopfenstein et al. 1983).

The nature and action of goiterogenic factors are still poorly understood, and one can only speculate about their possible role in the incidence of goiter among the Nankane. Perhaps it is due to the consumption of groundnut skins (Sreenivasan et al. 1957), the increase of which has been significant among the Nankane. A survey in the 1930s showed that for house compounds in the area of Navrongo and Bolgatanga, only 5% of the farmland was devoted solely to groundnuts; another 7% was used for a mixture of groundnuts and other crops (Lynn 1937). In a Nankane settlement in 1977, two-thirds of the bush farms were planted with groundnuts as either the only or the principal crop (Tripp 1978). Bush farms represented about half the cropped land in the settlement. The Nankane say that in the old days groundnuts were not very important; in fact, many farmers did not plant them. There are several reasons for the change. First, groundnuts can be planted in soils that produce little grain. Second, they require less weeding than grain and can be planted later, after the sowing of the compound farm is complete. Third, intercropping millet with groundnuts produces a better per-unit yield than for either crop planted alone (Reddy & Willey 1981). Fourth, the introduction of an upright variety of groundnuts, which is easier to harvest, during the colonial era may also have encouraged more groundnuts to be planted, although farmers continue to plant the runner type of groundnuts as well. Nutritionally, the increasing role of groundnuts has brought more variety to the diet and has provided extra oil and protein.

Dietary changes in the area also include the few farmers who grow a little rice in low patches with good moisture retention, as well as those who plant small amounts of maize around the house, where the soil is more fertile. This maize is roasted and eaten as a vegetable. Another change is the decrease in sources of animal protein. Domestic animals have never been used to any great extent in the daily diet, with the exception of guinea fowl. Eggs were rarely eaten, and larger animals were saved for trade, bridewealth, or ceremonial occasions. Curdled cow's milk used to be consumed but is now almost never utilized. Because of the high population density in the area, wild game has not been common for a long time, although people used to hunt in the early days of the colonial era. The only game now eaten are birds, rodents, and a few reptiles, but even these are not common elements in the local diet.

CONCLUSIONS

The Nankane have witnessed less change in their social and economic life than have many other people in Ghana. Their agricultural system has changed relatively little since precolonial times, and their contact with the urban areas of Ghana, although vital to their economic survival, has not served to incorporate them to any great extent into the modern sector of the country. The Nankane have, nevertheless, experienced a number of changes in their social and economic life; this is reflected in their diet.

When social scientists talk about change in Africa they sometimes adopt a model that presumes isolated, self-sufficient, precolonial societies. Nothing could be farther from the truth (e.g., Hart 1982). And although the colonial and postcolonial eras have seen broad changes in African societies, many of these are continuations of trends that have their origin in processes well underway before the time of colonial contact.

Nankane agricultural change is a case in point. Population growth and permanent farming in an area of poor soils and uncertain rainfall have been responsible for shifts from sorghum toward millet, and from grains toward groundnuts. The Nankane adjusted to these changing circumstances both in their farming practices and their diets. Beliefs regarding food and farming are treated pragmatically. The concept of traditional farmers blindly following the agricultural and dietary customs of their ancestors is here, as elsewhere, of little utility.

Another characteristic of some analyses of change in Africa has been the tendency to assume that all instances of contact have been for the worse. The evidence from northern Ghana presents a much more complicated picture. There are certainly examples of deterioration in some aspects of the Nankane diet. The animal component, for instance, is threatened by increasing population, which has eliminated hunting and severely restricted grazing. It is also affected by the demand for animal products from the south of the country such that animals raised by the Nankane are often exchanged for cash and are rarely included in the local diet. On the other hand, the increase in trade with the Nankane region has eliminated much of the threat of famine, provided more stability to the local food supply, and produced a more varied local diet.

Finally, the experience of the Nankane serves to remind us that changes in diet are due not only to the adoption of new crops and foodstuffs, but also to changes in the organization of the domestic economy. Nankane women have taken on increased roles in both trading and farming activities, which has given them greater control over the diets for their children and themselves. On the other hand, these increased responsibilities have meant more work for women, with possible deleterious consequences both for their own health and for the amount of time available for childcare.

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