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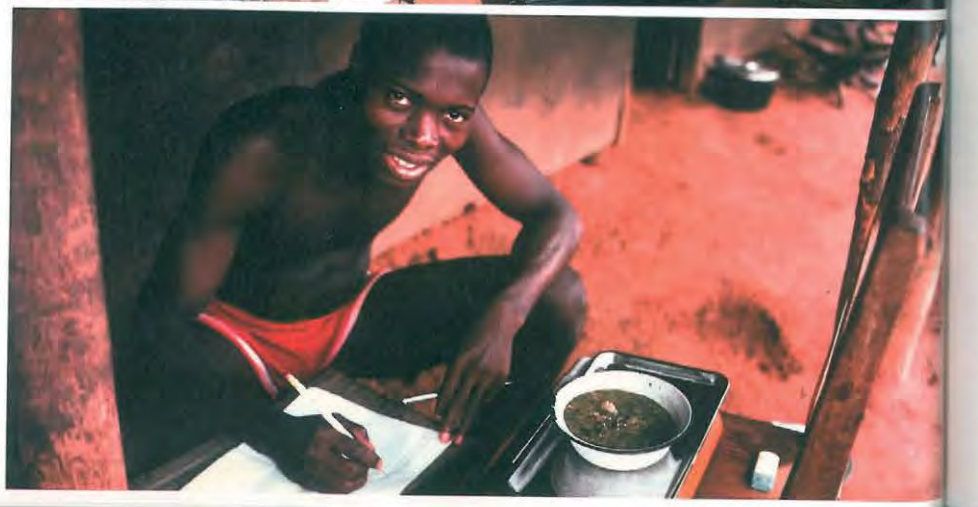


Measuring food consumption

by Georges KOPPERT and Claude Marcel HLADIK

Food consumption surveys aim at determining the nutritional value of the diet. The standard approach (1) consists in weighing the total amount of foodstuffs used for cooking in a number of families, which implies that a team of local assistants has to be hired and trained. This method is the most accurate but very costly as it has to be applied to a sufficiently large sample and be repeated to take account of seasonal variations.

In southern Cameroon, in each of the forest populations, Yassa, Mvae and Kola Pygmies, a sample of at least 30 families were visited at three characteristic periods of the year. As these communities respect a weekly schedule, it was necessary to weigh their food consumption for seven consecutive days (resulting in a total of 1,900 survey days), and to estimate with reasonable accuracy the amount of food consumed in between meals.

In the Central African Republic, in order to simplify this method, the total amount of food entering a Ngbaka village was weighed at characteristic periods of the seasonal cycle, and, at the same time, food consumption was measured in a small subsample of families. This method, derived from one that Lee (2) used with the Kalahari hunter-gatherers, allows a global estimate of the food consumption of a community to be made.

As we are interested in individual food consumption, a methodological problem arises when, as happens frequently (see chapter 5), several persons eat food from the same dish. A fast electronic scale connected to a micro computer permitted the accurate assessment

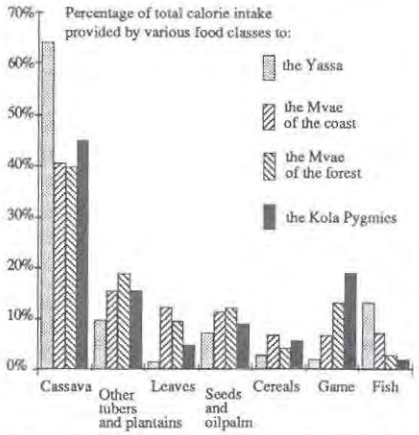
Facing page, upper: An indirect method for measuring food consumption by weighing all food entering the Ngbaka village of Mettè (in the Lobaye forest, Central African Republic). The particular spatial organization of this village favoured development of this method: as just one track links the fields to the houses, our team of local assistants could, with the voluntary participation of the whole population, record the exact origin and quantity of all food in the Ngbaka women's baskets at the entrance of the village. As this food is consumed within the next couple of days, a sample of six days per month allows for calculation of the average consumption of different family groups.

Centre: An accurate measurement of the individual food intake has been performed in the same Central African Republic village, in some family units, by studying the sharing of a communal dish. The dish is placed on a precision scale (one gramme for 30,000 g), this fragile instrument being protected in a trunk and totally wrapped in a thin PVC sheet with dessicator. The operator, whose micro computer is also protected against humidity by a large plastic bag, records the weight of each helping for each participant. Records show the exact quantity eaten by each consumer as well as individual patterns of food eating and food sharing. First results (3) specifically demonstrate that, within a family group, the communal dish system is adapted to the requirements of the youngest who, by choosing less carbohydrates, generally obtain the protein-rich diet they need for normal growth.

Lower: The standard method of food survey, by weighing all foods prepared in a household, is a necessary compromise in most cases, in order to study a sufficiently large sample of families. This last photograph shows the routine work of an enumerator weighing a dish in a compound where he stayed for one week, also in the village of Mettè where the two other survey methods were applied (photos by C. M. Hladik).

of the amount of food eaten by each participant from such a communal dish. This method was developed by our research team and the first results (3) show that the communal dish tends to provide food for everybody according to his or her needs rather than individual portions in which the amount given is necessarily and visibly influenced by the social status of the recipient.

These various methods of measuring food consumption allowed us to calculate the energy and nutrient content of the diet using standard food composition tables. Unfortunately, the composition of many foodstuffs, especially those which are gathered, is unknown and we have had to analyze samples obtained locally (see chapter 1). The same is true for varieties of cassava and plantain: though specific values were given in the tables, analyses had to be carried out because slight differences in their content can have a great impact on the nutritional value of the diet as these are staple foods consumed in large quantities.



Relative importance of different food classes in four populations of southern Cameroon, expressed as percentages of the total energy content of the diet (source: preliminary results of the surveys conducted with the Institute of Human Sciences of Yaoundé).

FOOD CONSUMPTION IN FOUR GROUPS IN SOUTHERN CAMEROON

In southern Cameroon, depending on environment, history and culture, each ethnic group adopts a specific food strategy (as shown in chapter 2). The Yassa, living on the Atlantic coast, fish at sea and grow mainly cassava. The Mvae have a more elaborate agricultural system, based on various tubers and vegetables; they also hunt and fish in rivers and streams, and, depending on whether they live near the coast or inside the forest, they barter cassava "sticks" and flour for fish with the Yassa and game with the Kola Pygmies. The latter, though traditionally hunters, are nowadays growing more and more cassava themselves.

The graph above illustrates these differences in food choices. The main staple is the "bâton de manioc", bitter cassava soaked, ground, wrapped in leaves in a baton-like shape and cooked by steaming. This is the main food item for the Yassa, and, to a lesser degree, for the Kola Pygmies. The Mvae, however, have adopted a diet in which other tubers, plantain and fatty foods (oil palm, groundnuts and other seeds), together contribute as many calories as cassava. The Mvae use cassava flour (prepared from soaked cassava, dried as egg-shaped balls on a rack over the fire) to barter for game meat with the Pygmies. The Yassa use plantains to obtain meat from the Pygmies.

	YASSA	MVAE OF THE COAST	MVAE OF THE FOREST	KOLA PYGMIES
ANIMAL FOODS				
Game	26 g	86 g	201 g	288 g
Fish	220 g	120 g	45 g	19 g
PLANT FOODS				
Cassava tubers	660 g	412 g	438 g	520 g
Other tubers and plantains	129 g	212 g	275 g	250 g
Leafy vegetables	7 g	59 g	76 g	20 g
Seeds and oil palm	30 g	75 g	83 g	10 g
TOTAL CALORIES	1940 kcal	1710 kcal	1930 kcal	1905 kcal

Annual mean food consumption (in grammes *per capita* per day) and caloric intake observed in four ethnic groups of southern Cameroon. Preliminary results of the surveys conducted with the Institute of Human Sciences of Yaoundé.

Kola Pygmy woman returning to camp carrying in her basket a bunch of plantain bananas she just bartered with the Yassa for game (photo by A. Froment).

The differences in food choices also apply to animal foodstuffs. Although the Yassa eat almost exclusively sea fish, the coastal Mvae may use half fish and half game and the Mvae of the forest eat mainly game with some fresh water fish. Finally the Kola Pygmies consume game almost exclusively. For all of them, the total amount of animal food is quite high, with respectively 246, 206, 246 and 307 grammes of fish or meat *per capita*.

These ethnic groups of southern Cameroon enjoy a very high quality diet based on locally produced food, with a calory intake close to 2,000. The situation is better than in other parts of the Cameroonian rain forest previously surveyed (4), such as Evodoula, Center Province (1634 kcal), Batouri, East Province (1611 kcal), and Douala city (1714 kcal).

SEASONAL VARIATIONS OF FOOD CONSUMPTION

A comparison of the results from Cameroon with those obtained in Zaire by H. Pagezy (see table, page 40) shows a striking similarity in the distribution of caloric sources for various populations.

Seasonal variation of the food supply has also been observed in Cameroon, with apparently less drastic consequences than in Zaire. Although cassava, the staple, is available throughout the year, plant products such as "cucumber" seeds, groundnuts, and, to a lesser extent, palm nuts, are subject to seasonal production cycles.

As a result, there are variations of different degrees throughout the year in meeting the recommended caloric requirements (5) among the ethnic groups of the African rain forest. These variations are very small among the Yassa (from 93% to 98% of caloric requirements); but more obvious for the Mvae, with a low at 80% in July and August for those living near the Atlantic coast. However, *per capita* consumption does not reflect the differences which exist between age groups within a population. These will be detailed in the next chapter.

Such seasonal differences in the caloric adequacy of the diet, also observed in the Central African Republic, do not explain by themselves fluctuations in the nutritional status. In fact, variation in seasonal activity leading to large fluctuations in energy expenditure, and the periodicity of diseases, have to be taken into account as well.

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