

**FOOD INSTRUCTION BOOKLET DESIGN FOR THE NIGERIA FOOD CONSUMPTION AND NUTRITION SURVEY 2001-2003**

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**ABSTRACT**

In 2001-2003, the International Institute of Tropical Agriculture (IITA), in collaboration with the federal government of Nigeria, USAID and the US Department of Agriculture (USDA), conducted a nationwide food consumption survey. Since the last national survey occurred in 1963, a major objective was to establish national baseline data for women and children under 5 years old. To ensure the accuracy and quality of detailed food intake data, IITA adapted the USDA Food Instruction Booklet (FIB), a compilation of foods consumed in the country, divided into food groups and subgroups. A Nigerian food composition database formed the basis of the Nigerian FIB, whereby, food groups, probes, a food index, and measurement guides with conversion tables were compiled. The Nigerian FIB included 18 major food groups and 79 subgroups compared to 16 food groups and 100 subgroups in the USDA FIB. For both countries, these food groups highlight how food is categorized and consumed. A typical example was how each country grouped grains and cereals. The Nigerian FIB included four separate groups (cereals, cereal products, confectionaries, and pasta). In the USDA FIB, breads and sweet breads were put together as one group. Cereal, pasta and rice were together as a second group. Examples of these food groups and probes are presented. While both FIBs contained measurement guides (cups, spoons, thickness sticks, rulers), the Nigerian FIB also included indigenous guides. These guides allowed for food weight conversions using local utensils, weights of foods cooked at home and purchased away from home, weights of foods with different sizes, and weights of food items with different measuring tools. Another unique element in the Nigerian FIB was the inclusion of scientific names for foods, their English names, and local names in the three Nigerian languages (Hausa, Yoruba, Igbo). The FIB highlights cultural similarities and differences in food consumption and demonstrates how one country's survey instrument can be adapted to meet the needs of another.

**Key Words:** food instruction booklet, survey instrument

## INTRODUCTION

For a very long time nutritionists and dietitians in Nigeria had little to work with in terms of current information on the nutritional status of Nigerians. The last official national survey conducted in Nigeria was in 1963. For this reason nutritionists have had to depend on data from various area specific surveys, which did not have nutrition indicators as their major objectives [1-3].

In 2001-2003, the International Institute of Tropical Agriculture (IITA), in collaboration with the federal government of Nigeria, USAID and the US Department of Agriculture (USDA), conducted a nationwide food consumption survey. One objective of the survey was to establish a national baseline reference of food and nutrition status among women and children under 5 years old to facilitate future food-based strategies and interventions [4]. The IITA adapted three USDA survey instruments to conduct the Nigeria survey: the survey operations plan, interviewer's manual, and the food instruction booklet (FIB) [5-7]. This paper demonstrates the adaptation of the USDA FIB to meet the needs of the Nigeria survey.

The accuracy and quality of a food survey depend on how much detail interviewers can obtain from their respondents. Just as the quality assurance procedures in controlled diet studies or the standardization of coding diet records minimize errors, efforts are needed to enhance the collection of food intake data [8-9]. An interviewer's ability to objectively prompt and probe the respondent to recall as much as possible is extremely important. To facilitate this aspect of the survey the FIB serves as a compilation of foods consumed in the country, divided into food groups and subgroups. For each food, key words are provided to probe or jog the respondent's memory about specific details.

## METHODS

The nationwide survey covered 4 zones, 12 states (representing a third of the total states of the federation), 72 Local Government Areas (LGAs), 216 Enumeration Areas (EAs) and 30 households from each EA. The survey design considered relationships among (a) the agroecology and type of farming systems; (b) crops grown and food consumed; and (c) type of food consumed and micronutrient deficiencies. Thus, Nigeria was stratified according to major agroecological zones and predominant food crops within these zones. A total of 6,480 respondents were expected in the survey and the response rate was 81.2 percent (N=5,264). Specific details on survey design and operations may be found elsewhere [4].

### *FIB Design*

A Nigerian food composition database provided the frame from which the food groups were derived for the Nigerian FIB [10]. Additionally, the Nigerian FIB contained several elements: 1) table of contents, 2) food groups, 3) probes, 4) a food index, and 5) measurement guides with conversion tables. Similar to the USDA FIB, the Nigerian FIB was organized on each page with three columns (Table 1). Column

1 was the food/drink category. Column 2 contained a list of probes (key questions) for describing the food item such as the kind, type, form, brand of food; additions to the food; and whether the food was purchased or home made. Column 3 contained additional probes to enhance the respondent's memory and obtain information on how much food was consumed in terms of volume, size, number, or weight.

The Nigerian FIB had 18 major food groups and 79 subgroups compared to 16 food groups and 100 subgroups in the USDA FIB. In many ways these food groups typify how food is consumed and categorized in each country. For example, the USDA FIB grouped breads and sweet breads together as one group and cereal, pasta, and rice as a second group; whereas, the Nigerian FIB contained four separate groups (cereals, cereal products, confectionaries, and pasta). Fruits and vegetables are grouped together in the USDA FIB, but grouped as five separate groups (fruits, starchy fruits, legumes, roots and tubers, and vegetables) in the Nigerian FIB. The USDA FIB contained more processed food varieties (chips, puffs, twists, potato sticks; crackers; dip; popcorn; pretzels, breadsticks; nuts, seeds) compared to the Nigerian FIB snacks group (wheat-based, maize-based, other). Conversely, the USDA FIB included only one group for spreads, salad dressings, and oil. Whereas, the Nigerian FIB contained two separate groups; one for fats and oils and a second for oil seeds. A striking cultural difference occurred where the USDA FIB contained 6 separate groups for baby food, candy, desserts, pizza, sandwiches, and sauces, but there were no comparable food groups listed in the Nigerian FIB. Apendices A and B highlight these similarities and differences in the food groupings for both booklets.

The usual measurement guides (cups, spoons, thickness sticks, rulers) were used along with the probes to elicit the best estimate of how much food was consumed by the respondent. However, the Nigerian FIB also included a section on the use of indigenous measurement guides [10]. Table 2 lists examples of these guides, including conversions for weights of foods measured with local utensils, weights of foods cooked at home and purchased away from home, weights of foods with different sizes, and weights of food items with different measuring tools.

Another element of the Nigerian FIB was the general order of presentation for the foods in the booklets. In the USDA FIB the index included the food item name, the page number where the food could be found in the FIB, and the food group category. In the Nigerian FIB, the index included the scientific names for the food items, the English names, and local names in the three major Nigerian languages (Hausa, Yoruba, Igbo).

## DISCUSSION

A concerted effort was made to assure the collection of quality food intake data for the Nigeria Food Consumption and Nutrition Survey. The FIB facilitated the training and standardization of the procedures used by the interviewers to solicit detailed information on the type, quality and quantity of foods eaten and fluids taken by the respondents. An unforeseen consequence of the FIB also was in the area of capacity

building. Several Nigerian universities now use the instrument as a research and teaching tool to train future nutritionists.

While the USDA FIB was used as a model, the Nigerian FIB reflects African foods and eating patterns. In the Nigerian context, there are distinct groupings of foods. Fruits are consumed copiously when fresh and in season in Nigeria. Very little fruit is consumed as processed or packaged. Starchy fruits, legumes, and roots and tubers are viewed as separate groups because they constitute staples in various parts of the country. Oil seeds hold a prominent position in the diet and are grouped separately from fats and oils.

There are Nigerian foods that are essentially the same, but they have different names depending on the region of the country. Likewise, different foods may be called the same name. Additionally, there are regional variations in recipes and methods of preparation. The FIB helped to capture these diverse characteristics with its various probes and use of the 3 major languages in the country.

In recent years, new ingredients, flavor enhancers, and pre-packaged foods have been introduced. They are gradually changing traditional food recipes and preparation methods. Within the context of the survey, using the FIB to elicit more detailed information in turn meant revising and updating the existing Nigeria food composition database to analyze the 24-hour recall data.

## CONCLUSION

The FIB highlights cultural similarities and differences in food consumption and demonstrates how one country's survey instrument can be adapted to meet the needs of another. Most studies on health and nutrition in Nigeria do not provide detailed information on foods eaten by the population. Nutritional status is presented either in terms of socio-cultural practices, height, weight, wasting, stunting, or clinical and biochemical attributes [11-16]. For food-based approaches to ameliorate malnutrition and support nutrition program policy, more information on actual foods consumed is needed. It is hoped that this description and discussion of the Nigerian FIB will be useful in the design and implementation of other African food consumption surveys and future studies.

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**Table 1: Example of FIB Page**

Food/Drink Category (C <sub>1</sub> )	Description of Food/Drink (C <sub>2</sub> )	How much of this (Food) did you actually (eat/drink)? (C <sub>3</sub> )
<p><b>Maize</b></p>	<p><b>VARIETY:</b> What type of maize did you take (white or yellow)?</p> <p><b>FORM:</b> In what form was it consumed? (roasted, whole boiled, papped, or as meal etc)?</p> <p><b>PREPARATION:</b> How was it prepared?</p> <p><b>LIQUID:</b> Was it made with milk, water? Was the milk whole milk, low fat, or skimmed?</p> <p><b>SALT:</b> Was salt used in the preparation?</p> <p><b>FAT:</b> Was any kind of fat or oil used in the preparation?</p> <p><b>OTHER INGREDIENTS:</b> What other ingredient was used in the preparation?</p> <p><b>IN A MEAL:</b> Was the maize consumed as part of a meal? If “Yes,” what are the other components of the meal?</p> <p><b>ADDITION:</b> Did you add anything to it? (water, sugar, honey, etc) Record each addition on a separate line in the category column...</p>	<p><b>IF VOLUME:</b> State the amount (cup, bowl, bottle) taken.</p> <p><b>IF WEIGHT:</b> State the quantity (cup, tsp., g., kg., etc.). Use weight on label of packet if available.</p> <p><b>IF PLATE/BOWL:</b> How many?</p>

**Table 2: Indigenous Measurement Guides**

	Measuring Tool	Measure Conversion
Weights of foods measured with local utensils	<ul style="list-style-type: none"> <li>• EMT (evaporated milk tin)</li> <li>• DTT (Derica tomato tin)</li> <li>• FSP (Family Support Program bowl)</li> <li>• Re-packaged food by price used to denote quantity</li> <li>• Schnapps bottle</li> <li>• Ragolis water bottle</li> </ul>	<ul style="list-style-type: none"> <li>• 1 kongo = 10 EMT</li> <li>• 1 EMT = ~ 2 DTT</li> <li>• N5, N10, N50, N100, etc.)</li> <li>• ¼ or full (.75 liter)</li> <li>• 1.5 or .75 liter</li> </ul>
Weights of foods cooked at home and purchased from canteen/restaurants	<ul style="list-style-type: none"> <li>• Re-packaged food by price used to denote quantity</li> <li>• Foam models representing 3 model sizes also used</li> </ul>	<ul style="list-style-type: none"> <li>• N5, N10, N50, N100, etc.)</li> </ul>
Weights of foods with different sizes	<ul style="list-style-type: none"> <li>• Small</li> <li>• Medium</li> <li>• Large</li> <li>• Extra large</li> </ul>	<ul style="list-style-type: none"> <li>• Based on weight food type</li> </ul>

**Appendix A: Comparison of Food Groups in USDA FIB and Nigerian FIB:  
All Groups**

USDA FIB	Nigerian FIB
<ol style="list-style-type: none"> <li>1. Baby foods, formulas, juices</li> <li>2. Beverages, milk, cream</li> <li>3. Breads, sweet breads</li> <li>4. Candy, syrups, sweeteners</li> <li>5. Cereals, pasta, rice</li> <li>6. Cheese, eggs, yogurt</li> <li>7. Desserts, ice cream, frozen yogurt</li> <li>8. Fruits, vegetables</li> <li>9. Meat, poultry, fish, shellfish</li> <li>10. Pizza, tacos, frozen meals</li> <li>11. Mixed dishes, macaroni and cheese, spaghetti with sauce</li> <li>12. Sandwiches</li> <li>13. Salads, soups</li> <li>14. Sauces, gravies</li> <li>15. Snacks</li> <li>16. Spreads, salad dressings, oil</li> </ol>	<ol style="list-style-type: none"> <li>1. Beverages</li> <li>2. Cereals</li> <li>3. Cereal products</li> <li>4. Confectionaries</li> <li>5. Pasta</li> <li>6. Milk and dairy products</li> <li>7. Fats and oils</li> <li>8. Fruits</li> <li>9. Starchy fruits</li> <li>10. Legumes</li> <li>11. Meat and meat products</li> <li>12. Oil seeds</li> <li>13. Poultry and eggs</li> <li>14. Roots and tubers</li> <li>15. Sea foods</li> <li>16. Vegetables</li> <li>17. Snacks</li> <li>18. Dishes</li> </ol>

**Appendix B1: Comparison of Food Groups in USDA FIB and Nigerian FIB:  
Beverages, Dairy, Breads & Cereals**

USDA FIB	Nigerian FIB
<p>Beverages, milk, cream</p> <ul style="list-style-type: none"> <li>• Coffee, hot &amp; iced</li> <li>• Tea, hot &amp; iced</li> <li>• Milk</li> <li>• Flavored milks, milk drinks, chocolate milk, hot chocolate</li> <li>• Cream, creamers, cream substitutes</li> <li>• Whipped cream, whipped toppings</li> <li>• Orange juice (100%)</li> <li>• Juices (100%), nectars</li> <li>• Fruit flavored drinks, ades, punches, juice drinks (noncarbonated)</li> <li>• Sodas, pop, soft drinks</li> <li>• Water, carbonated water</li> <li>• Nonalcoholic and alcoholic beer, wine, cocktails, liquor</li> <li>• Powdered breakfast drinks, meal replacements, protein supplements</li> </ul> <p>Cheese, eggs, yogurt</p> <p>Breads, sweet breads</p> <ul style="list-style-type: none"> <li>• Bread (not sweet)</li> <li>• Rolls, buns, bagels, English muffins</li> <li>• Biscuits</li> <li>• Tortillas</li> <li>• Bread or rice stuffing, dressing</li> <li>• Dumplings</li> <li>• Cornbread, corn muffins, corn pone</li> <li>• Sweet breads, coffee cakes, sweet rolls, pastries, muffins (not corn), croissants, toaster strudel, pop tarts, toaster pastries</li> <li>• Pancakes/flapjacks, waffles</li> <li>• Doughnuts</li> <li>• Breakfast bars, granola bars, meal replacement bars</li> </ul> <p>Cereals, pasta, rice</p> <ul style="list-style-type: none"> <li>• Ready-to-eat cereals</li> <li>• Cooked cereals</li> <li>• Pasta: noodles, macaroni</li> <li>• Rice</li> </ul>	<p>Beverages</p> <ul style="list-style-type: none"> <li>• Carbonated</li> <li>• Cocoa-based</li> <li>• Coffee, tea (hot or cold)</li> <li>• Fruit juices</li> <li>• Fruit drinks</li> <li>• <i>Kunu n saki</i></li> <li>• <i>Sobo</i></li> <li>• Alcoholic drinks</li> </ul> <p>Milk and dairy products</p> <ul style="list-style-type: none"> <li>• Milk</li> <li>• Cheese</li> <li>• <i>Nono</i></li> <li>• Local yogurt</li> </ul> <p>Cereals</p> <ul style="list-style-type: none"> <li>• Acha (Fonio)</li> <li>• Maize</li> <li>• Millet</li> <li>• Rice</li> <li>• Sorghum</li> </ul> <p>Cereal products</p> <ul style="list-style-type: none"> <li>• Bread</li> <li>• Breakfast cereals</li> <li>• Agidi/Eko</li> <li>• <i>Egbo</i> (cereal gruel)</li> <li>• <i>Guguru</i> (popcorn)</li> <li>• <i>Kokoro</i></li> <li>• Cereal gruels</li> <li>• Semovita</li> </ul> <p>Confectionaries</p> <ul style="list-style-type: none"> <li>• Rolls, buns, cakes</li> <li>• Biscuits</li> <li>• Sweets</li> </ul> <p>Pasta</p>

**Appendix B2: Comparison of Food Groups in USDA FIB and Nigerian FIB:  
Fruit, Vegetables, Meat, Poultry, & Seafood**

USDA FIB	Nigerian FIB
<p>Fruits, vegetables</p> <ul style="list-style-type: none"> <li>• Fruits, berries</li> <li>• White potatoes</li> <li>• French fries, tater tots</li> <li>• Sweet potatoes</li> <li>• Vegetables, dry beans</li> <li>• Pickles</li> <li>• Olives</li> </ul> <p>Meat, poultry, fish, shellfish</p> <ul style="list-style-type: none"> <li>• Beef, lamb, veal, game meats</li> <li>• Ham or pork</li> <li>• Deli meats, packaged lunch meats, meat spreads, potted meat</li> <li>• Liver, organ meats</li> <li>• Bacon</li> <li>• Sausage</li> <li>• Jerky, dried meat</li> <li>• Poultry</li> <li>• Fish, shellfish</li> </ul>	<p>Fruits</p> <ul style="list-style-type: none"> <li>• Citrus, mango, guava, papaw, pineapple, watermelon</li> </ul> <p>Starchy fruits</p> <ul style="list-style-type: none"> <li>• Plantain</li> <li>• Banana</li> <li>• Breadfruit</li> <li>• Baobab</li> </ul> <p>Legumes</p> <ul style="list-style-type: none"> <li>• Cowpea</li> <li>• Lima bean</li> <li>• Pigeon pea</li> <li>• Soybean</li> <li>• Walnut</li> <li>• Bambara</li> </ul> <p>Roots and tubers</p> <ul style="list-style-type: none"> <li>• Cassava</li> <li>• Cassava products</li> <li>• Yams</li> <li>• Potato</li> </ul> <p>Vegetables</p> <ul style="list-style-type: none"> <li>• Leafy vegetables</li> <li>• Non-leafy vegetables</li> </ul> <p>Meat and meat products</p> <ul style="list-style-type: none"> <li>• Meat</li> <li>• Meat products</li> </ul> <p>Poultry and eggs</p> <ul style="list-style-type: none"> <li>• Poultry</li> <li>• Eggs</li> </ul> <p>Sea foods</p> <ul style="list-style-type: none"> <li>• Fish</li> <li>• Shrimps, prawns, lobsters, crabs</li> <li>• Shellfish, periwinkles</li> </ul>

**Appendix B3: Comparison of Food Groups in USDA FIB and Nigerian FIB:  
Mixed Dishes, Snacks, Oils, Other Foods**

USDA FIB	Nigerian FIB
<p>Mixed dishes, macaroni and cheese, spaghetti with sauce</p> <ul style="list-style-type: none"> <li>• Mixed dishes, casseroles, stews – home recipe (recipe known)</li> <li>• Mixed dishes, casseroles, stews – commercial, restaurant or recipe unknown</li> <li>• Macaroni and cheese</li> <li>• Spaghetti, spaghetti and sauce, spaghetti with meatballs/meat sauce</li> </ul> <p>Snacks</p> <ul style="list-style-type: none"> <li>• Chips, puffs, twists, potato sticks</li> <li>• Crackers</li> <li>• Dip</li> <li>• Popcorn</li> <li>• Pretzels, breadsticks</li> <li>• Nuts, seeds</li> </ul> <p>Spreads, salad dressings, oil</p> <ul style="list-style-type: none"> <li>• Butter, margarine, spreads, butter replacements</li> <li>• Oil</li> <li>• Salad dressings, mayonnaise</li> <li>• Peanut butter</li> <li>• Jam, jelly, fruit spreads</li> <li>• Condiments</li> </ul> <p>Baby foods, formulas, juices</p> <p>Candy, syrups, sweeteners</p> <p>Desserts, ice cream, frozen yogurt</p> <p>Pizza, tacos, frozen meals</p> <p>Sandwiches</p> <p>Sauces, gravies</p>	<p>Dishes</p> <ul style="list-style-type: none"> <li>• Rice-based</li> <li>• Bread</li> <li>• Yam</li> <li>• Pounded yam</li> <li>• <i>Ikokore</i> (grated water yam)</li> <li>• <i>Amala</i> (yam flour dish)</li> <li>• <i>Tuwo</i></li> <li>• <i>Eba</i></li> <li>• <i>Foofoo</i></li> <li>• Porridges</li> <li>• Pap dish</li> <li>• <i>Agidi</i></li> </ul> <p>Snacks</p> <ul style="list-style-type: none"> <li>• Wheat-based snacks</li> <li>• Maize-based snacks</li> <li>• Other snacks</li> </ul> <p>Fats and oils</p> <ul style="list-style-type: none"> <li>• Animal fats</li> <li>• Oils</li> <li>• Other fats</li> </ul> <p>Oil seeds</p> <ul style="list-style-type: none"> <li>• Cashew nuts</li> <li>• Coconut</li> <li>• Pumpkin seed</li> <li>• Kolanut</li> <li>• Dika nut</li> <li>• Melon seeds</li> <li>• Groundnut</li> <li>• Benniseed</li> </ul> <p>(No similar or comparable foods listed as other food groups)</p>

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