

# THE SMALL-SCALE RURAL FOOD-PROCESSING INDUSTRY IN NORTHERN NIGERIA

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## THE SMALL-SCALE RURAL FOOD-PROCESSING INDUSTRY IN NORTHERN NIGERIA†

Every day, in the hundreds of villages, hamlets, towns, and cities of northern Nigeria, many tons of grains, grain legumes, and starchy roots are processed for sale as convenient ready-to-eat foods. The "industry" which accomplishes this daily food-processing task is characterized by its small scale, simple technology, and orientation toward its consumers. In most cases, the final product is produced from raw materials by only one person, perhaps with the assistance of a young child, using only ordinary household equipment, and it is sold at the place where the consumer finds it most convenient to eat. No formal standards of quality or quantity are observed by the producers; every producer judges production performance directly by sales and profits. Gainful employment for thousands of rural people, primarily women, and a substantial amount of locally-generated income result from the functioning of this processing industry.

This paper explores two aspects of this industry: the economic viability of the average firm and its characteristic self-employment pattern. The paper concludes with a brief essay on the probable future of the rural small-scale food processor in northern Nigeria.

### ECONOMIC VIABILITY AND SMALL-SCALE FOOD PROCESSING

No rural food processor keeps accounts of her firm's operation; few, in fact, can specify exact amounts of profits and losses. In order to quantify certain aspects of the small-scale operations, a survey of rural processors was carried out in two villages of Zaria Province in 1971 and 1972.<sup>1</sup> An accounting system for each food enterprise<sup>2</sup> was set up and about 45 women in each village questioned once a month, from February through May each year. Some of these women produced two or more commodities each day throughout the survey period; others pro-

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<sup>1</sup> These two villages, Hanwa and Dan Mahawayi, are described in detail in 7, 8, and 9. Their distinguishing characteristic is their differing degree of urban access. Hanwa is within an hour's walk of the urban marketplaces in Zaria city, while Dan Mahawayi is more isolated. It can be reached easily by motor vehicle only during the dry season. This food-processing survey was subsidiary to a larger consumption survey done in the same villages.

<sup>2</sup> "Enterprise" is here used to designate all firms producing the same product.

cessed only one commodity sporadically during that time. General information on the week's activity preceding the interview and specific data on the last day's activity were sought.<sup>3</sup>

From the detailed information gathered, average economic data for a number of firms in six major enterprises were developed. These data proved to be less precise than desired, so additional participant observation with certain firms was carried out in April 1973. Comparable figures for each of six rural small-scale food-processing enterprises are thus available from the sample data: amount of raw material processed, costs of raw materials and purchased services, estimated value of sales, wages-profits,<sup>4</sup> return on cash investment, and value per ton of primary raw material processed.

Food-processing enterprises can be usefully grouped according to their primary raw materials, that is, those which are grain-based, those incorporating cowpeas (black-eyed peas), and those using groundnuts (peanuts). In this way, inputs for all enterprises within a group can be compared on the basis of costs and returns per ton of primary ingredient used. As the products are little known outside of the West African savanna, the various stages in their processing are described in some detail.

#### *Grain-Based Processing Operations*

The two foodgrains of prime dietary importance in Hausa and Fulani families of northern Nigeria are sorghum and millet; both can be made into the staple evening meal of *tuwo*, a stiff porridge over which a soup or stew is poured. Other foods eaten during the day may also be made from these grains; *fura*, *ko'ko*, and *ƙunu* are the most common among the many different recipes prepared. While *tuwo* is normally cooked at home from grain produced on the household farm, the other products are most often commercially prepared for sale in a ready-to-eat form. Both the raw materials and the finished products enter into the intravillage trade.

*Fura*.—*Fura* is perhaps the single largest-selling food product consumed as a midday meal in many villages in the Zaria area. It accounted for 5.5 percent of the average daily cash expenditures on food in three villages surveyed and 3.7 percent of the average daily per capita intake in 1970/71.<sup>5</sup> *Fura* preparation consists of four steps: (1) preparation of flour from millet, and, in some cases, sorghum; (2) boiling of loosely compacted flour balls in water; (3) pounding of the cooked flour balls with some of the cooking water and spices until a smooth, slightly elastic, coherent lump is formed; and (4) formation of smaller balls—in which form it is sold.<sup>6</sup>

<sup>3</sup> The sample was intentionally biased to include the more regular processors. Preliminary surveys had indicated a substantial number of occasional producers. The four survey months were chosen for the detailed interviewing work as raw materials for all processed foods were available and their price levels were at neither seasonal highs nor lows. Extensive pretesting with the interviewer forms indicated that the period of recall for detailed information was very short.

<sup>4</sup> Since the processor is both sole proprietor and worker in the usual rural small-scale food-processing establishment and frequently acts as retailer as well, wages are inseparable from profits and are thus referred to as wages-profits in this paper.

<sup>5</sup> For all expenditure and calorie figures see 8 and 9.

<sup>6</sup> It is nearly always eaten mashed into sour milk, although water and sugar may be substituted.

The processor may perform all product preparation operations herself, but it is likely that she will employ another woman to prepare the flour from the grain by hand-pounding, particularly if a large amount is needed. For this contract processing service, flour processors receive a fixed rate per measure of grain in cash as well as the separated bran, which they can then sell as animal feed. The mechanical preparation of flour in a motor-driven milling machine is rare as the resulting flour is felt to be unsuitable for fura.

The woman who owns the grain normally carries out the three other steps in the manufacture of fura by herself. The heavy physical labor of pounding the hot cooked flour balls to the proper consistency may take from 15 minutes to an hour, depending on the size of the batch. About 12 pounds of grain results in a lump of fura weighing over 20 pounds.

The formation of the smaller balls of fura for consumer purchase is also usually done by the processor herself, for this is an important step economically. Two factors must be balanced: (1) the competition in the market and (2) the cost of the raw materials. The latter is the more variable and requires the manufacturer to estimate the cost per ball of fura, its size, and the price level she will charge, in such a way that she makes a profit. At any given time, there is a conventional market price per unit of fura.<sup>7</sup> Experience guides the calculations made. Producers can articulate the pitfalls of making the pieces of fura too large or too small in terms of consumer preference and competitive position, but most are unable to do any sort of mental arithmetic to check their work for profitability. Measurement is done strictly on the basis of feel; each ball is pinched off the lump and hand-rolled.

The actual sale of the fura may or may not demand employment of another person. Where the Muslim practice of wife seclusion is strictly observed, the producer may send the fura out with a small girl, who then sells it directly to the consumers in the streets, in their houses, and in the marketplace. Such a seller is usually a dependent (daughter, granddaughter, or niece) of the processor and receives only occasional gifts as remuneration for service. In Hanwa, however, the proximity of the village to the large market of Zaria city itself and the access to milk supplies<sup>8</sup> have led many women to specialize in the production of fura and its accompaniment, soured milk, and to sell both products themselves. As these women have such a large market, they produce substantial amounts of fura and frequently employ children, either their own or young Koranic students, simply to help them carry their products to the point of sale.

As the fixed equipment for fura manufacture is only normal household equipment (wooden mortar, pestle, kerosene tins, calabashes) and is not used exclusively for this product, it is impossible to compute a cost for the use of this capital. The most significant capital outlay cost is that needed for the purchase of millet and sorghum (Table 1). However, as even large processors of fura do not

<sup>7</sup> In Zaria, in 1973, this price was either one kobo, one and a half kobo, or three kobo per ball. Adjustment of the relationship between unit size and unit price appears to follow closely changes in the prices of the grains used to make fura. Customer preferences are also taken into some account. One kobo was equivalent to 1.5 U.S. cents in 1973; one naira = 100 kobo = U.S. \$1.50.

<sup>8</sup> Milk cows are owned by nearly half the village households; all owners are Fulani. Thus, only Fulani women have easy access to both milk supplies and the city and participate in the fura and soured milk sales themselves.

TABLE 1.—COSTS AND RETURNS TO PRODUCTION OF GRAIN-BASED PRODUCTS  
(Hanwa and Dar Mahawayi villages, 1971 and 1972)\*

	Fura				Koko or kunu <sup>b</sup>	Dan wake <sup>b</sup>
	Hanwa <sup>a</sup>		Dan Mahawayi			
	1971	1972	1971	1972		
Number of observations	40	32	16	13	18	20
Average amount of grain processed daily (lbs.) <sup>c</sup>	17.6	17.9	9.0	11.1	10.4	6.4
Costs (kobo):						
Grain	58.5	68.0	28.9	38.4	38.7	23.4
Other ingredients	6.2	5.2	3.1	4.2	2.4	37.4
Services	8.7	9.2	1.0	1.2	2.7	—
Total costs	73.4	82.4	33.0	43.8	43.8	60.8
Average daily estimated value of sales (kobo) <sup>d</sup>	103.1	111.3	41.5	59.2	51.5	58.9
Average daily wages-profits (kobo)	29.7	28.9	8.5	15.4	7.7	-1.9
Estimated hours to produce and sell	8	8	5	5	3 to 4	3 to 4
Wage-profit per hour (kobo)	3.7	3.6	1.7	3.1	1.9 to 2.6	loss
Return on investment (percent)	40.5	35.1	25.8	35.2	17.6	-3.1
Retail value of product per long ton of grain used (naira)	131.2	139.3	103.3	119.5	110.9	206.2
Value added per long ton of grain used <sup>e</sup> (naira)	56.7	54.2	31.4	42.0	27.5	124.3

\* Data from E. B. Simmons, "The Economics of Consumer-Oriented Food Processing Technology in Northern Nigeria," *Samaru Agricultural Newsletter* (Zaria), Dec. 1973.

<sup>a</sup> Hanwa is the village close to Zaria city. Because their market is not restricted to the village population, these producers make larger batches, charge slightly higher prices, and tend to take care of sales personally.

<sup>b</sup> Both 1971 and 1972 for both villages.

<sup>c</sup> Converted from the local volumetric measure: 2.5 pounds per *mudu* (1.13 kg.) of millet and sorghum.

<sup>d</sup> Daily sales were estimated by the producers and include amounts subsequently consumed free by household members.

<sup>e</sup> Value added is the difference between the cost of the grain and the value of the retailed product.

normally buy more than a sack or two of grain at a time and subsequently use it within a week or two, interest charges on investment in working capital are negligible and the amount invested in grain is considered here only as a variable cost.

Entry into commercial production of fura is not restricted by formal education requirements; nearly everyone knows the technique of fura manufacture through frequent observation. The amount of physical labor necessary does prevent ill and older women from continuing with this product line and physically weak women from taking it up. Further, entry seems to be informally restricted to Fulani women in villages where they are present, whether or not their husbands own cattle. This may be more convention than actual restraint, however, as in villages where there are few resident Fulanis, Hausa women do take up the processing of fura.

*Koko and kunu.*—Purchases of koko or kunu accounted for 4.2 percent of the average daily cash expenditures on food in the three Zaria villages in 1970/71. They were most often taken for the morning meals, which included one or the other 40 to 50 percent of the time.

Although these products are prepared in slightly different ways, they are similar in ingredients and in method and time of sales. Koko demands more planned preparation as the flour must be ground, mixed with water, and allowed to rest long enough to ferment slightly and form a thick sediment of paste. This sediment is then mixed with hot water and spices to form a somewhat thick and glutinous drink. Kunu preparation involves mixing the hot water directly with dry flour and can be done with only minimal advance preparation of the flour. Both are most often made from millet.<sup>9</sup> Most koko- and kunu-makers reportedly used mechanically ground flour.

Both koko and kunu are largely sold from the house of the producer; children are sent with bowls to buy them directly from the manufacturer when they are completed. Some of them are taken, however, to places more central for consumers, where they are dispensed by a young dependent of the producer. Sales are made in one-, two-, or three-kobo lots, measured with a calabash spoon by the seller.<sup>10</sup> Sugar cubes are frequently sold as a sideline.

Fixed equipment for koko- and kunu-making is again no different from household equipment although a few extra calabashes or enamel bowls for serving may be provided by the producer for on-the-spot consumption by customers outside their homes. Also, the clay pot which is used to hold the flour-and-water mixture for koko is rarely used for anything else as it is usually full of the liquid involved in some step of the koko preparation. A recent processing innovation, the straining of the flour-and-water mixture through a fine piece of cloth, has readily been adopted as the cloth can be an old head-tie of silk or nylon that is easily obtainable at no cost.

The production of koko and kunu has a small daily wage-profit margin compared to fura production (Table 1), but compares reasonably well on an hourly basis. While it cannot be quantified without energy expenditure studies, the physical energy for koko and kunu manufacture is considerably less than that required for fura. No discernible pattern of personal characteristics could, however, be assigned to koko or kunu processors.

*Dan wake.*—While fura, koko, and kunu are usually offered for sale daily, dan wake is a morning or midday snack food made by relatively fewer producers in a village and on a more occasional basis. The dan wake is a small dumpling composed of sorghum flour, cassava flour, and varying proportions of the flours of cowpeas, baobab leaves, sweet potato, and millet. It is served with groundnut oil and powdered hot peppers. It is difficult to do a complete cost analysis of dan wake because measurements of the cassava flour component were not included in the survey; in some cases this flour was of considerable importance on the basis of cost. As the sorghum component is the single largest ingredient, however, the analysis presented in Table 1 is based on the grain, and cassava flour is included with "other ingredients."

On the average, a firm producing dan wake would appear to be a failing business, yet women do produce it for sale and frequently insist that a profit has been achieved although the figures on ingredient costs and sales do not show

<sup>9</sup> The terms koko and kunu are not used to indicate the same recipes all over northern Nigeria. Kunu in some places is a highly fermented alcoholic drink, and *kamu* appears to be the term applied to the product that is here called kunu.

<sup>10</sup> As calabash spoons are not standard sizes, some measure of spoon juggling can be used to balance ingredient costs and selling price.

this. Part of the reason for the apparent losses is no doubt due to the inaccuracies of the survey technique and to insufficiently repeated participant observation. But it is possible, too, that women who specialize in such occasional products as *dan wake* are not as skillful businesswomen as those who produce the more routine products like *fura*, *koko*, and *kunu*, and, indeed, may lose money as frequently as they earn it.

#### *Cowpea-Based Processing Operations*

*Kosai* and *alele* are essentially similar in terms of ingredients and methods of preparation and differ only in the final cooking stage. Dried cowpeas are cracked, soaked, and washed to remove the outer skin, and then ground twice using a grinding stone. The very fine paste of cowpeas and perhaps peppers and onions is then mixed with a little water and fried in hot groundnut oil if it is to be *kosai*. *Alele* is made by adding a small amount of oil and water to the paste, pouring the batter into small tins, and stacking the tins in a four-gallon kerosene tin whose bottom is just covered with water and sticks. The kerosene tin is then covered tightly and the *alele* is steamed until solid. *Kosai* is ready for consumption as soon as it is fried; *alele* is removed from the small tins and coated with a few more spoonfuls of oil and spices before eating.

There is normally no contract or mechanical preparation of ingredients. *Alele* has perhaps the slightly larger commitment in special equipment in that the tins in which the batter is steamed are usually evaporated milk tins from which the tops have been removed. While a set of tins lasts a year or two, and this represents a negligible amount of capital investment on a daily basis, the acquisition of a set of tins may deter casual entry into *alele* production. A small girl is nearly always employed to sell both *kosai* and *alele* in the villages.

*Kosai* accounted for 1.9 percent of the average daily cash expenditures on food in the three-village consumption survey households in 1970/71. In Hanwa, it was primarily consumed as a breakfast food; about 25 percent of the reported morning meals included it. In Dan Mahawayi, however, *kosai* was an important midday food. *Alele* accounted for only 1.2 percent of the average daily cash expenditures and was included in 10 percent of the midday meals in Hanwa.

Table 2 contrasts the costs and returns for these two products, showing that while *alele* has a higher sales value for a similar input of cowpeas, the costs of production are also higher. *Kosai* would thus appear to give a better return on the investment in raw materials. The small size of the sample for *alele* production based on higher-priced cowpeas<sup>11</sup> should be noted, however; this may account for some of the apparent difference. Indications are that the average firm in both enterprises is an economically viable unit, earning a respectable rate of return on investment.

#### *Groundnut-Based Processing Enterprise*

In the rural processing industry, *kuli kuli* and groundnut oil are made in the same set of operations from the same input of groundnuts. *Kuli kuli* is the fried

<sup>11</sup> Because of the sampling technique used over two years, average prices of ingredients secured by the producers may be quite different.



TABLE 2.—COSTS AND RETURNS TO PRODUCTION OF COWPEA-BASED PRODUCTS  
(*Hanwa and Dan Mahawayi villages, 1971 and 1972*)<sup>a</sup>

	Kosai	Alele
Number of observations	42	6
Average amount of cowpeas processed daily ( <i>lbs.</i> ) <sup>a</sup>	5.5	3.6
Costs ( <i>kobo</i> ):		
Cowpeas	51.4	42.5
Other ingredients	28.0	20.4
Total costs	79.4	62.9
Average daily estimated value of sales ( <i>kobo</i> ) <sup>b</sup>	108.9	77.1
Average daily wages-profits ( <i>kobo</i> )	29.5	14.2
Estimated hours to produce and sell	5	5 to 6
Wage-profit per hour ( <i>kobo</i> )	5.9	2.4 to 2.8
Return on investment ( <i>percent</i> )	37.2	22.6
Retain value of product per long ton of cowpeas used ( <i>naira</i> )	446.8	474.5
Value added per long ton of cowpeas used ( <i>naira</i> ) <sup>c</sup>	235.9	213.0

<sup>a</sup> Data from E. B. Simmons, "The Economics of Consumer-Oriented Food Processing Technology in Northern Nigeria," *Samaru Agricultural Newsletter* (Zaria), Dec. 1973.

<sup>b</sup> Converted from the local volumetric measure: 2.6 pounds per mudu of cowpeas.

<sup>c</sup> Daily sales were estimated by the producers and include amounts subsequently consumed free by household members.

<sup>d</sup> Value added is the difference between the cost of the cowpeas and the value of the retail product.

edible presscake of the groundnuts. The groundnuts to be processed are shelled, skinned, and heated the afternoon before grinding. While the groundnut may be processed into a paste using the household grinding stone, most producers now utilize the services of the local milling machine. Children most often act as transporters of both nuts and paste, although, if the "engine" is far, the woman producer will go as well.

The ground paste, or *kulu*, still warm from the heat of the grinding, is then placed into a wooden mortar where it is pounded gently and stirred until the oil begins to surface. Several small additions of hot water apparently further facilitate the separation of the oil. When the producer estimates the maximum amount of oil has risen (25 to 50 minutes after beginning of stirring), the oil is skimmed off, put in a pan over a wood fire, and heated. The *tunkuzza*, or raw presscake, is then removed from the mortar in convenient amounts and forcibly rolled into long sausage-shaped pieces. This is done on a grinding stone which has been positioned for additional runoff and collection of oil. Smaller chunks are pinched off the long rolls and fried in hot groundnut oil for 10 to 20 minutes, becoming *kuli kuli* in the process. The oil is clarified by frying and "sweetened" by the addition of a few pieces of onion at the very end.

Groundnut oil is used primarily for the preparation of other food items. The groundnut oil purchased for household cooking accounted for 2.3 percent of daily cash expenditures on food and 1.4 percent of the average daily calorie intake. It is impossible, however, to compute the value of the oil component of foods purchased in ready-to-eat form, such as dan wake, kosai, and alele. *Kuli kuli* is normally eaten in chunks as a snack food or as a condiment, that is, powdered and sprinkled on cooked starchy roots or vegetables, both leaves and

onions. It is also an essential ingredient for barbecued meat. Kuli kuli purchases for household consumption were reported to be less than 1 percent of both daily cash expenditures and daily calorie intakes, but it is likely that consumption as a component of other food items was considerably higher.

A producer who is observing wife seclusion can sell both products from within the confines of her own house as the products keep well. Those who have children, and particularly new producers, find that the advertisement of their products by door-to-door selling assists in the disposal of their products. Some women who make oil sell to regular makers of other products that use substantial quantities of oil; some women occasionally prepare kuli kuli on contract for butchers to the specifications required.

Processing of the two products seems to be a weekly or twice-weekly affair for the majority of producers. Table 3 presents the data on groundnut processing

TABLE 3.—COSTS AND RETURNS TO PRODUCTION OF GROUNDNUT OIL AND KULI KULI  
(*Hanwa and Dm Mahawayi villages, 1971 and 1972*)<sup>a</sup>

	Retrospective accounting 1971-72	Detailed observations 1973
Number of observations	72	5
Average amount of groundnuts processed at a time ( <i>lbs.</i> ) <sup>a</sup>	35.4	33.6
Costs ( <i>₧obo</i> ):		
Groundnuts	158.8	183.4
Other ingredients	6.6	8.3
Services	14.8	11.5
Total costs	180.2	203.2
Average estimated value of sales ( <i>₧obo</i> ): <sup>b</sup>		
Groundnut oil	160.3	150.4
Kuli kuli	67.8	64.0
Both	228.1	214.4
Average wages-profits ( <i>₧obo</i> )	47.9	11.2
Estimated number of hours to produce	5 to 6	5 to 6
Wage-profit per hour ( <i>₧obo</i> )	8.0 to 9.6	1.9 to 2.2
Return on investment ( <i>percent</i> )	26.6	5.5
Costs per long ton of groundnuts used ( <i>naira</i> ):		
Groundnuts	100.5	122.3
Products	114.0	135.5
Retail value of product per long ton of groundnuts used ( <i>naira</i> ):		
Groundnut oil	101.4	100.3
Kuli kuli	42.9	42.7
Both	144.3	143.0
Value added per long ton of groundnuts used ( <i>naira</i> ) <sup>c</sup>	43.8	20.7

<sup>a</sup> Data from E. B. Simmons, "The Economics of Consumer-Oriented Food Processing Technology in Northern Nigeria," *Samaru Agricultural Newsletter* (Zaria), Dec. 1973.

<sup>b</sup> The average mudu of shelled groundnuts was taken to equal 2.3 pounds.

<sup>c</sup> The total retail value of products was estimated by the producers and included amounts subsequently consumed free by household members. It should be noted, however, that many husbands paid cash to their wives for oil used for household cooking.

<sup>d</sup> Value added is the difference between the cost of the nuts and the value of the retailed product.

in a form comparable with that used for grain and cowpeas. Both the relatively larger capital investment in raw materials and the possible larger wage-profit are indicated, particularly by the 1971/72 figures. The difference between the two time periods is rather striking. Part of it is due to the problems of accounting for detailed inputs and outputs the day after production which affect the 1971/72 figures, and part to the small sample size in 1973. But the figures to some extent reflect the producers' expressed opinions. They felt that the price increase in groundnuts in 1973 had not yet been accepted as inevitable by their customers; they reported that their buyers complained bitterly when they tried to raise the price for oil in order to compensate for higher ingredient costs. Producers had thus, in 1973, decided to absorb some of the raw material price increase themselves and profits were, as a consequence, severely cut. Comparison of cost of groundnuts and sale value of product bears this out dramatically. The producers, however, felt that the long-term situation on wages-profits could be expected to approximate more closely the situation of 1971/72.

*Economic Viability: Summary*

The various firms in the rural food enterprises of the Zaria area appear to have certain economic features in common. All enterprises except dan wake have been shown to be profitable, earning returns on initial investments of from 6 to 40 percent. The largest proportion of costs in all cases was attributable to the purchase of raw materials; the variable costs of the grains or other major ingredients accounted for nearly 90 percent or more of the daily cash operating costs. In no firm did the wages-profits account for more than 30 percent of total revenue.

While the processing of groundnuts into groundnut oil and kuli kuli is the enterprise most likely to earn a substantial wage-profit on an hourly basis for its producer, assuming 1971/72 profit margins, it also demands a substantially larger amount of working capital than any other enterprise. Kosai and fura seem to be equally attractive product lines, involving similar capital inputs and daily wages-profits, but the Fulani ethnic preference for entry into the fura enterprise may be a restraint for Hausa women who might have chosen it.

All firms in the rural food-processing industry were shown to need minimal amounts of production labor in addition to that of the principal producer, but assistance from unpaid young girls was in all cases preferred for handling product sales. Indeed, observation indicates that this assistance in selling is essential for a relatively new entrant into the production of any given food item. If the producer is trying to observe the social norm of wife seclusion and to break into a fairly competitive market, advertisement by display of product is necessary.

EMPLOYMENT IN THE RURAL FOOD-PROCESSING INDUSTRY

The extent of female self-employment in the various food-processing enterprises at any given time varies not only with the economic parameters at that time, the availability and price of raw materials and the availability of capital, but also with individual skills in balancing costs and prices and personal and family circumstances. It is rare, however, to find a rural woman who has never set up production in some food-processing enterprise. In surveys conducted in three

Zaria villages between 1970 and 1973, 465 women were questioned. Five percent reported at the time of interview that they were not working at any independent economic activity, but of the 95 percent reporting such employment, 90 percent were engaged in at least one food-processing activity. Other studies have shown similar involvement of women in the rural food-processing industry (1, 3); there is little doubt of the prevalence of the pattern of female self-employment for economic gain. The food-processing industry is well diffused throughout the countryside.

Self-employment in the industry offers the prospective owner-operator advantages other than a means for accumulating wages and profits. First, married Muslim women may maintain wife seclusion and related social patterns while earning money. Most raw materials are available in the village; husbands and children can arrange for their purchase and delivery to the processor in her house. Second, educational qualifications for entry into the industry are perhaps easiest for all women to acquire in that cooking is a normal unpaid activity as well. Third, the amount of equipment and capital needed to take up employment in the industry is minimal. While weaving and trading, for example, may demand relatively large investments in stock or equipment, food processing can be profitably done in fairly small amounts with normal household utensils. A small loan or gift is sufficient to provide the basic materials for many food-processing enterprises.

Ease of entry into employment in the food-processing industry also implies ease of exit from it. Figures support this implication; many women are only sporadic processors.<sup>12</sup> The competition among new entrants works to keep consumer prices at minimum levels and the fairly direct relationship between the producers and consumers in the same village makes informal observance of quality and quantity control mandatory for the producers.

On the other hand, the sporadic nature of self-employment indicates some of the problems of both business maintenance and business development even in a situation where operating firms can be, as has been shown, economically viable organizations. As these problems illustrate more clearly the conditions for employment in the food-processing industry, it is perhaps well to discuss them in greater depth.

First, the firm depends on the acumen of the single owner-operator for survival. Many women can deal successfully with fluctuations in the price of raw materials, the basic economic variable which must be coped with, and maintain year-round production. Others, however, appear to be unable to balance the ingredient mix, size of sales unit, and price to the consumer in a profitable way and thus go out of business.

Related to this is a second restraint on business development, the apparent lack of willingness of women to band together around one processor whose business skills have been proven to be above average. Self-employment, even if precariously maintained, seems to be preferable to working for someone else. While few hard data can be brought to support this observation, women have said many times

<sup>12</sup> When the interviews were repeated in 1972 from January to May, 133 processors indicated their specialties in January. Yet tabulation over the next four months showed that only 104 processors actually produced their specified products at least once during this time.

that they value personal business initiative in the pursuance of economic activities and eschew not only the giving of direct advice but also the formation of co-operative units. Loans are common sources of capital, but those that come from husbands or parents are preferred to those from sisters or co-wives. Children are virtually the only source of additional labor that an expansion-minded woman has available to her. She can, it is true, have certain operations done on contract or she may send some materials to the grinding engine, but the hand operations quickly limit the extent to which this is useful. Mechanization has neither replaced nor assisted in many of the operations which the processor must do by hand. On speculation, however, this limit on expansion of food processing may be to some extent self-imposed in the interests of wide employment and village harmony, although such a balance was never articulated by the processors themselves.

Third, the Muslim practice of wife seclusion, which can be dealt with as far as securing local supplies is concerned, does limit social interaction and gathering of information from outside the housing unit. This may account for a certain lack of dynamism in the village processing industry. Every aspect of the processing operation must be carried out with information or materials which the processor can obtain without leaving her house. New products are slow to spread; women learn by watching other women, and if movement is restricted, they necessarily do not observe other women frequently.

Fourth, the small amount of capital available to most women limits their ability not only to expand operations but even to remain employed in current enterprises. The reason most often given for pursuing an occupation is to earn money for gifts and purchases of cloth, food, and the like. Because there is a great temptation and, in many cases, a need to use all of the profits for consumption purposes, the amount of capital invested is kept to a minimum. Indeed, it often appears necessary for women who have diverted working capital to consumption to renegotiate small loans or wait until gifts are received and a new start can be made. In any case, not many women buy more than a few days' worth of raw materials ahead and many operate on a day-to-day basis. Very few are able to buy sacks of groundnuts or grains at harvest time and store them for future use as ingredients.

Finally, self-employment in the home setting also poses special problems for the food processor. While provision of food for one's family is one of the reasons women give for continuing with only marginally profitable lines, it is also frequently the cause of losses and an exit from business. A few visitors can eat up the profits so quickly that unemployment may be forced on the producer until sufficient capital can be recovered to begin again. Too, there is a great deal of competition with other family obligations. A sick or even a fussy child may mean becoming unemployed for a time; family ceremonies similarly take their toll in time and profit.

#### ALTERNATIVE EMPLOYMENT OPPORTUNITIES

While food processing is the major commercial focus for most women, many also find gainful employment in one of the other fields open to them. Acceptable forms of employment are trading, crafts, like spinning and weaving, and medical

activities, such as the compounding of medicines and charms and midwifery. While the raising of small livestock provides another source of income for many women, this is not considered to be an occupation (*sana'a*) but simply good banking procedure.<sup>13</sup> Chickens, sheep, and goats serve as stores of value, bearing interest in the form of offspring and available for liquidation when cash is required. Agriculture provides virtually the only category of work available that is not self-employment; some women engage in the seasonal labor of the cotton, groundnut, pepper, and cowpea harvests if their husbands allow them to go out at these times. This work is not considered *sana'a* and is normally done by the poorer women in the society.

An occupational inventory of all women in Hanwa, in April 1973, illustrates a village working environment. Of the 271 women interviewed, 5 percent considered themselves unemployed and without *sana'a*. Several were girls of 12 to 14 years of age who had just gotten married and had not yet begun to assume adult roles. Some were old women who were weak and senile, and a few were new to the village. This would seem to reflect the expressed viewpoint that it is socially unrespectable not to have an occupation. The occupational distribution reported by the 257 employed women was as follows.

	<i>Percent</i>
One occupation	78
Food processing	62
Services to other processors	12
Crafts	4
Trading	11
Medicine	1
Two occupations	22
Food processing and services	5
Food processing and crafts	1
Food processing and trading	11
Food processing and livestock	2
Food processing and medicine	0
Crafts and trading	1
Services and trading	1

Similarly detailed information for Dan Mahawayi is not available, but in the more isolated village with its limited market for processed foods, more women find employment in several activities, typically food processing, crafts, and livestock production, working at smaller scales in each.

Factors which encourage women to take up employment instead of or in addition to food processing reflect the characteristic conduct of these occupations.

Trading generally requires larger capital inputs. Although a small trade in kolanuts or sugar cubes can be handled with fairly minimal investments, to begin the more profitable trade in grain, palm oil, kerosene, and soup ingredients re-

<sup>13</sup> For purposes of this study, livestock raising was classified as an occupation in order to get more information on its commercial aspects. Unfortunately, at the time of the Hanwa survey noted below, a poultry disease had just decimated the population of chickens, so many producers were "out of business" in that regard.

quires several naira. It also requires more effort in the securing of supplies. In Hanwa, women traders tended to be older women who did not observe seclusion and arranged to buy supplies in Zaria city themselves or who had sufficient capital to buy village produce in quantity for later resale. Dan Mahawayi women in trading tended to have wealthy relatives or husbands who handled both capital and purchase arrangements. These women are more strictly secluded in their houses; the village's isolation also limits their opportunities to engage more actively in trade.

Craft-workers are characterized by varying degrees of technical skill, usually acquired by living in a house where other women practice the craft. While the skills of vertical-loom weaving are limited to a fairly small proportion of women, most rural women know how to spin thread from cotton. Both crafts, however, are dying slowly from competition with modern factory cloth production. Spinning tends to be a time-filler with a low rate of productivity; weavers are still able to make profits, but little innovation in design and slow demand for the plain white cloth which most weavers produce have discouraged many from active production. Embroidery, mat-making, and other decorative crafts are practiced but not widespread; hair-dressing, here classified as a craft, flourishes.

Medical activity is also a matter of skill; practice of it was probably under-reported in the Hanwa survey as certain aspects of it are clandestine.

The advantages of the food-processing industry in terms of its adaptability to women's varying skill levels, interests, capital, and labor availability, social restrictions, and profit requirements are thrown into relief by consideration of the alternative employment opportunities open to women.

#### THE FUTURE FOR RURAL SMALL-SCALE FOOD PROCESSORS

Currently, the small-scale food-processing industry is well-suited to the productive capacity, income, and employment needs of rural women. Consumers in the society are well-served by the abundance of cheaply-produced, good quality food products manufactured daily at thousands of production points located in wide areas of northern Nigeria. The seeds of the industry's stagnation have already been sown, however; the demise of the spinning and weaving industries may be an example. Competition from the modern industrial sector has succeeded in replacing products of those crafts with quantities of attractive factory-woven cloth. Analysis of the consumption survey showed the income elasticity of demand for cloth and clothing to be the highest for any commodity in the three Zaria villages surveyed (9).

The competition for the rural small-scale food-processing industry comes from two sources: the large-scale modern industrial plant producing similar products, e.g., groundnut oil and milk, from similar locally produced raw materials, and urban-centered firms of all scales and levels of technology producing competitive products from largely imported raw materials, e.g., bread, biscuits, and hard, boiled sweets.

The costs of the sophisticated technology employed in the large-scale operations, plus the costs of transporting supplies from the hinterland and the products back out to it, have so far kept the prices of the products manufactured by this industry above those at which the rural small-scale producer can supply her

market with roughly the same product. Such price differentials and subsequent lack of effective competition will probably continue for some time to come. The competition for supplies of local raw materials should also be minimal as long as farmers assess their own consumption needs relative to local agricultural production or until pricing policy for exportable crops distorts the rural supply market to such an extent that local consumption is economically unreasonable and substitute products are sought.

The second source of competition presents the more immediate threat to the rural small-scale food processor. No data were collected on industries producing competitive products in the north of Nigeria<sup>14</sup> and the significance of these products in rural diets in northern Nigeria is still minimal (8). However, consumption information on such commodities as wheat bread and biscuits in various urban areas that can be supplied with the imported raw materials at reasonable cost shows high elasticities of demand (2).

The future of the rural food-processing industry looks somewhat uncertain, given potential increasing rural demand for "modern" products combined with governmental encouragement of industries producing such items in the form of small-scale industry loans and import assistance.<sup>15</sup> Relatively low income elasticities of demand for the products manufactured by rural women, e.g.,  $-0.11$  for *koko* and *kunu*, and  $0.41$  for *fura* (9), would appear to indicate that in times of increasing agricultural incomes, rural women are bound to receive a smaller share of the increase. This, combined with their inability to tap the resources needed to expand their own enterprises, completes the picture of an industry which has strong forces operating against it.

If one assumes no initial change in religious or social customs, the socioeconomic effects of decreasing production by the rural processing industry on the processors themselves and on the rural villages where they work can be delineated: women's ability to meet social and economic obligations on their own with earnings from their profitable commercial enterprises will be decreased; the village economy will become less self-sufficient as far as producing and consuming local production; and value added and income generated by the agricultural sector will migrate more directly to the urban sector. Nutrition may be adversely affected if the substituted products are more expensive per calorie or per gram of protein (as is the case with wheat bread vs. *fura*, for example). The deprivation of a substantial means for earning income will have the effect of downgrading women's independent and family roles, and a new balance will have to be worked out by rural households. The nation as a whole stands to lose if women are removed from productive employment in food processing, particularly as Islamic customs, lack of formal education, and limited financial resources restrict alternative employment opportunities for rural women.

<sup>14</sup> Peter Kilby has done extensive work on small-scale industries elsewhere in Nigeria, but few data are presented about northern Nigerian food-processing industries (5, 6).

<sup>15</sup> Both sugar and wheat flour were price controlled during the survey period. Imported wheat is milled in factories that are partially government-owned (see 4).



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