

A SURVEY ON TRADITIONAL PRACTICES AND PERCEPTION ON TYPES OF KENKEY PRODUCTION IN THREE REGIONS OF GHANA

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Abstract

Two hundred and forty eight producers (248) of Ga kenkey, Fanti kenkey and *Akporhie* kenkey from 21 communities from the Greater Accra, Central and Eastern region of Ghana were interviewed on the practices, perception and experiences on kenkey production. Majority of producers (84.5%) learnt trade from family and gave same reason for production. Fanti and Ga kenkey producers gave family trade as reason for production. *Akporhie / nsiho* producers were in the trade because it was a source of employment. Production of types of kenkey was mainly on small scale artisanal level; majority processed 1-3 bags of 50kg maize. Few however processed 10-12bags of 100kg maize and more than 25bags of 50kg maize. Majority of respondent processed maize into kenkey 1-3times in a week. Sixty- eight and sixty-six producers produced kenkey 7-10times and 4-6times respectively. This could be attributed to the laborious and time consuming for kenkey production. Quality of maize was assessed by physically examining grains (size, shape, and weight, mould- free and insect free).

In increasing order of labour intensive unit operations, mixing of *Aflata* with fresh dough, *aflata* preparation and molding of kenkey were difficult unit operations in kenkey production.

Kenkey producers indicated that the shelf-life of Ga kenkey is 1-3days, *Akporhie*(*nsiho*) is 4-6days and Fanti kenkey is 7-14 days. Kenkey production is a profitable trade, there is the potential of using unpurchased products.

Introduction

Kenkey may be described as a sour tasting stiff porridge with moisture content of between 52-55 %, pH of 3.7 and a shelf life of 3-4 days prepared from fermented maize meal. It plays an important socio-economic role in African economies in terms of employment potential. Kenkey producers come from diverse backgrounds, majority are female heads of households. Most of these vendors employ other people to assist with the business and thus consider themselves as employers (Halm *et al.*, 2004). The process of kenkey-making is lengthy and laborious; therefore it is more often purchased from a commercial kenkey producer rather than cooked at home. Kenkey producers are mainly women with little or no formal education. They carry out commercial production as a family-acquired art. Processors who are mostly small-scale carry out activities either as individuals or as a family business in the household often depending on family labor to produce and retail the product (Halm *et al.*, 2004). In a survey conducted in Accra, Allotey (1996) found that at most production sites the amount of maize processed weekly ranged from 0.05 to 1.2 metric tons with an average of 0.3 tons of maize processed into 0.5 tons of kenkey. There are however, a few large production sites with weekly capacities of several tons (up to 5 tons) of maize. Such large production sites do not only produce kenkey for sale but also sell the intermediate product, the fermented dough, which is also used to prepare other products such as *koko* and *banku*. The production of kenkey is based on traditional technologies that have been handed down in generations. Production costs, apart from the raw material, maize, are minimal because the family labor employed is often not perceived as costs. This makes the product affordable, providing food for a large part of the urban population especially the low-income group.

Socio-economic profile of kenkey processors and retailers

Traditional processing of foods including the production of indigenous fermented foods is an important activity in the informal sector of the Ghanaian economy. It provides a means of livelihood for a large number of traditional food processors in the rural areas and increasingly in urban areas in recent times. (Amoa-Awua *et al.* 2007).

The informal food processing sector in Ghana including kenkey production is dominated by traditional food processors that operate on a cottage level or rural /small-scale level. Traditional food processors produce bulk of processed foods consumed in Ghana using traditional methods to produce indigenous foods. (Amoa Awua *et al.* 1998). The aim of this study was to collate the traditional practices and perception on kenkey production.

Materials and methods

Random Survey

Radom survey of twenty-five (25) producers of kenkey was conducted. A simple questionnaire was designed (Appendix 1). A total of One hundred and forty-two (142) respondents were interviewed.

Design of Questionnaire

A questionnaire was designed for kenkey producers.

Pretest of Questionnaire

The designed questionnaire was pre-tested on twenty (20) producers, twenty-eight (28) consumers and twenty-one (21) sellers. Based their responses, the questionnaire was modified to make it suitable for producers. Structured questionnaire was developed to collect data from kenkey producers. The questionnaire was pre tested for clarity and validity. Results of the pre-test were used in revision of the initial survey questionnaire. The final version of the questionnaire contained 38 questions which were used to collect data from 248 producers. Consent was obtained from respondents for the interview affirming that the data would be treated confidentially.

SURVEY METHODOLOGY

A semi-structured questionnaire was administered to producers of kenkey. The questionnaire was administered to gather information about production of kenkey in three regions in Ghana and to identify the major problems which could be investigated and solutions proposed.

The total sample size of the respondents to be interviewed for the whole geographical region was calculated using

$$N_i = 4X p_i(1-p_i)/d^2$$

N_i being the total number of respondents to be surveyed for the study (Chadare *et al*, 2008).

$$p_i = n_p / N_t$$

$p_i = n_p / N_t$; the proportion n_p of the product producer, seller and consumer among the N_t randomly interviewed and d the expected error margin fixed at 0.05 (Dagnelli, 1998). Based on the formula, the total number of producers to be interviewed was two hundred and thirty two (232).

Respondents Interviewed

A total of one hundred and five (105) producers were interviewed from Greater Accra. For Central and Eastern regions, eighty five (85) and sixty-seven (67) producers were interviewed respectively.

Criteria used in selection

Producers were interviewed at their production sites. Each respondent was given information and consent form to sign to seek his/her approval before questionnaire administration.

Language used

The interviews were conducted in English, Twi, Ewe, Ga, Guan and Fanti, depending on respondent's preference. Enumerators translated other languages and wrote answers in English language.

Enumerators used

Fifteen enumerators were used in Greater Accra Region and ten enumerators each for Central and Eastern Regions.

Training of Enumerators

Enumerators went through a day's training on how to administer questionnaires and the ways to address actors to bring out necessary answers.

Token for Kenkey Producers

A pack of iodated salt was given to each producer.

1.2 Statistical analyses of survey data

All the information obtained was collated. The data was entered into the SPSS software. All data from the survey were analyzed using the Statistical Package for Social Scientists (SPSS) for Windows, version 16.0. Frequencies and percentages of

both the demographics and the actual questions were analyzed and charts developed. Frequencies were generated for the variables and significant associations were tested at $p \leq 0.05$ using Chi-square.

Results

1.0 Demographics of producers

1.1 Regions, districts and communities surveyed

Table 1: Breakdown of producers in three regions

Region	Respondents	Percentage (%)
Eastern Region	62	24.0
Greater Accra	105	40.7
Central region	91	35.3
Total	258	100

Table 1 shows that one hundred and five (105) producers were interviewed in Greater Accra, ninety-one(91) in Central region and sixty-two(62) in Eastern region.

Table 2: Surveyed districts in the three regions and number of producers

Districts	Respondents	Percentage (%)
Eastern Region		
Asuogyaman	55	21.3
Manya Krobo	7	2.7
Greater Region		
Ga	45	17.4
Tema Municipality	18	7.0
Accra Metropolis	43	16.7
Central Region		
Cape- coast	48	18.6
Abura Asebu Kwamankese	18	7.0
Mfantsiman	14	5.4
Awutu Efutu Senya	10	3.9
Total	258	100.0

The breakdown of respondents interviewed in the various districts of the regions is shown in table 2.

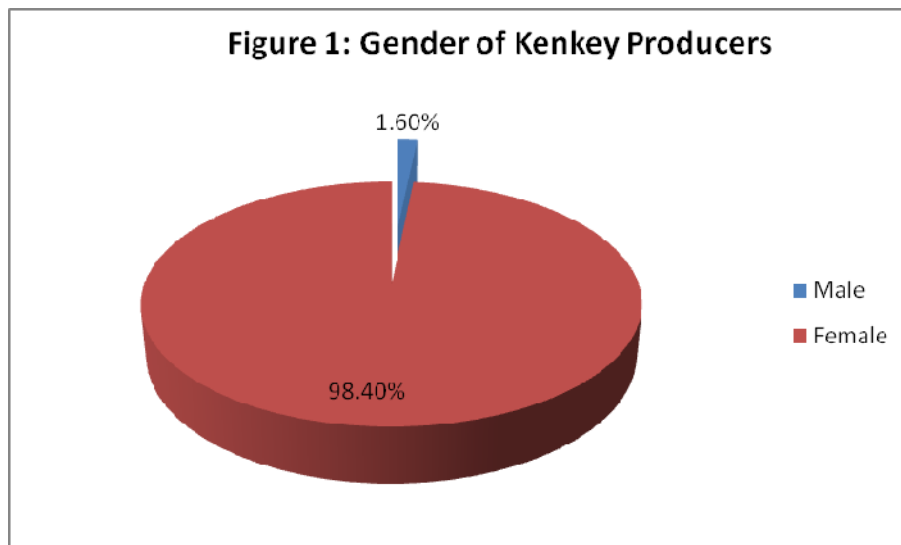
Table 3: Communities where kenkey producers were surveyed

Communities	Respondents	Percentage(%)
Eastern Region		
South Senchi	26	10.1
Somanya	3	1.2
Atimpoku	8	3.1
Central Region		
Kakumdo	10	3.9
Nkanfoa	26	10.1
Abura	7	2.7
Asebu	11	4.3
Akroma	7	2.7
Kasoa	10	3.9
Greater Accra		
Achimota	8	3.1
Sowutuom	21	8.1
Adenta	6	2.3
Madina	16	6.2
Darkuman	8	3.1

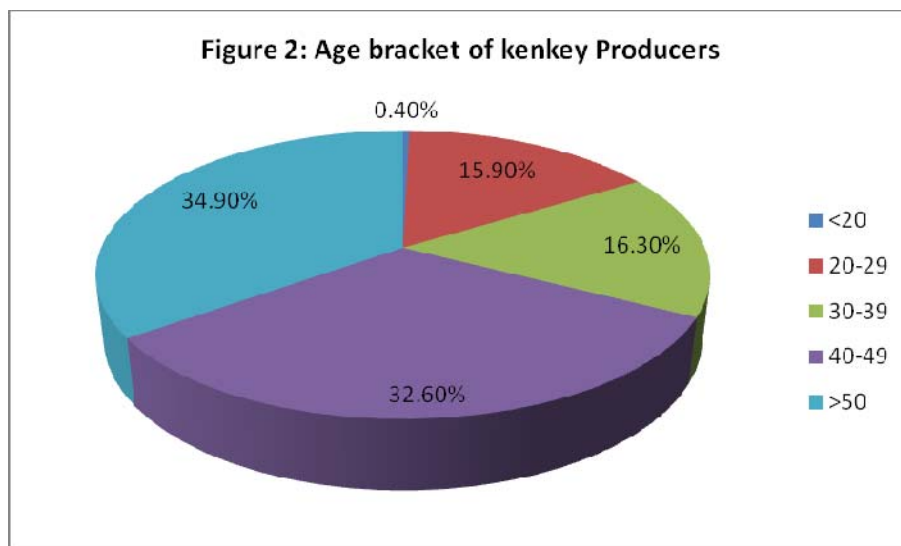
Tema	11	4.3
Ashiaman	7	2.7
Nungua	5	1.9
La	9	3.5
Osu	3	1.2
Chorkor	4	1.6
Jamestown	8	3.1
Total	258	100

In the Eastern region, majority of producers were interviewed in South Senchi community, few producers were interviewed in Somanya community (Table 3). For Central region, *Nkanfoa* recorded large proportion of respondents. *Akroma* and *Abura* recorded least number. Sowutuom community in the Greater Accra region recorded largest proportion of producers and Osu recording minority producers.

1.2 Gender, Age, language used and ethnic group of Kenkey producers



Majority of kenkey producers (98.40%) are females (Figure 1). Few male (1.60%) producers were recorded. Kenkey production is a female dominated job.



Producers in more than 50 age group were majority (Figure 2). Respondents in less than 20 age group were in the minority. Elderly women are involved in kenkey production.

Table 4: Languages used in survey and ethnic groups of respondents

Language	Respondent	Percentage (%)
Twi	100	38.8
Ewe	18	7.0
English	8	3.1
Ga	44	17.1
Fanti	73	28.3
Guan	15	5.8
Total	258	100.0
Ethnic group	Respondent	Percentage (%)
Ewe	46	17.8
Twi	24	9.3
Krobo	13	5.1
Ga	62	24.0
Fanti	81	31.4
others	32	12.4
Total	258	100.0

Twi language was the dominant language used. English was the least used (Table 4). Eighty- one (81) respondents were from Fanti ethnic group (Table 4). Producers from krobo ethnic group were thirteen (13).

1.3 Respondents' education level, marital status and number in household

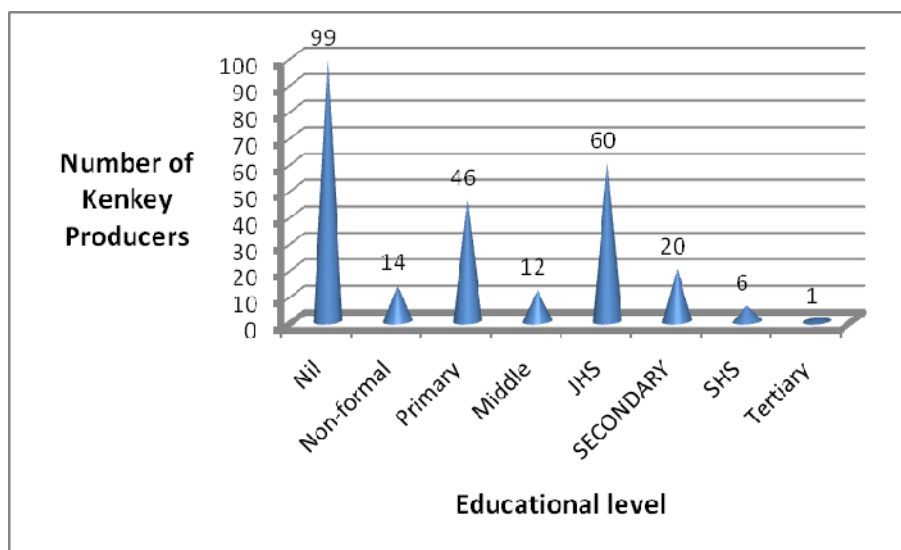


Figure 3: Education level of Kenkey Producers in three regions of Ghana

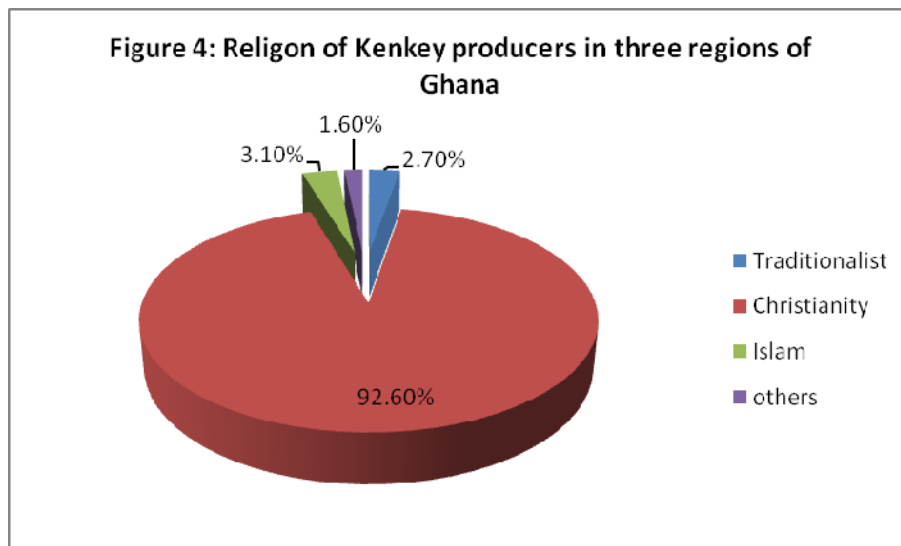
On the whole majority of producers (99) had no education. Just one producer had tertiary level education (Figure3). Sixty (60) had JHS level of education implying they were drop-outs.

Table 5: Marital status and number of persons in Kenkey producers' household

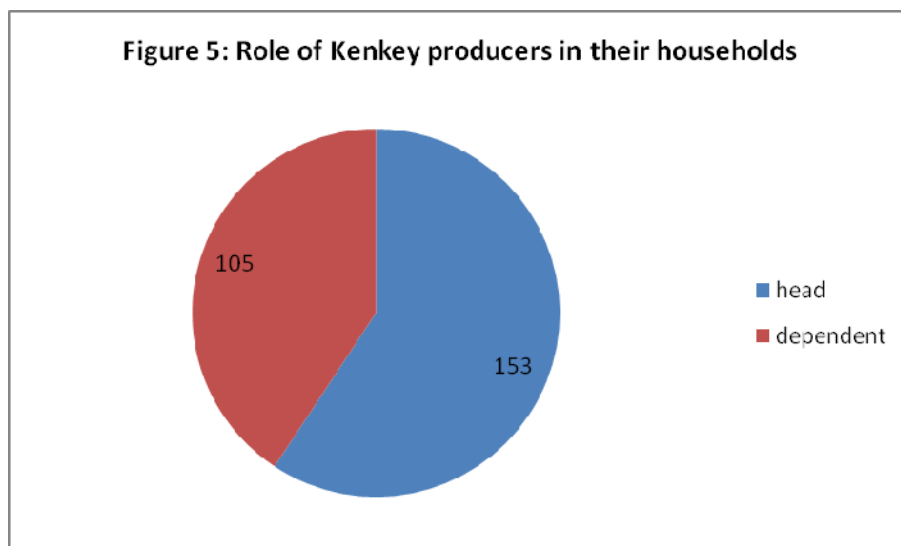
Marital Status	Respondents	Percentage(%)
Single	38	14.3
Married	168	65.1

Divorced	43	16.7
Widowed	9	3.5
Total	258	100.0
Number of persons	Respondents	Percentage(%)
<3	14	5.4
3-5	97	37.6
6-9	102	39.5
10-13	31	12.0
>14	14	5.4
Total	258	100.0

A greater part of producers (65.1%) were married. The widowed producers were few (3.5%) (Table 5). One hundred and two (102) respondents had 6-9 persons in their household. Fourteen(14) respondents each had less than three and more than fourteen persons in their household.



Christian producers formed the majority recording 92.60%. The other types of religion apart from those mentioned were the least (Figure 4).



From figure 5 above, one hundred and fifty-three producers were head of households and one hundred and five were dependent. This indicated that although they were married some of them were providing for the needs of the family.

1.4 Other Categories producers are involved , number and relationship to workers

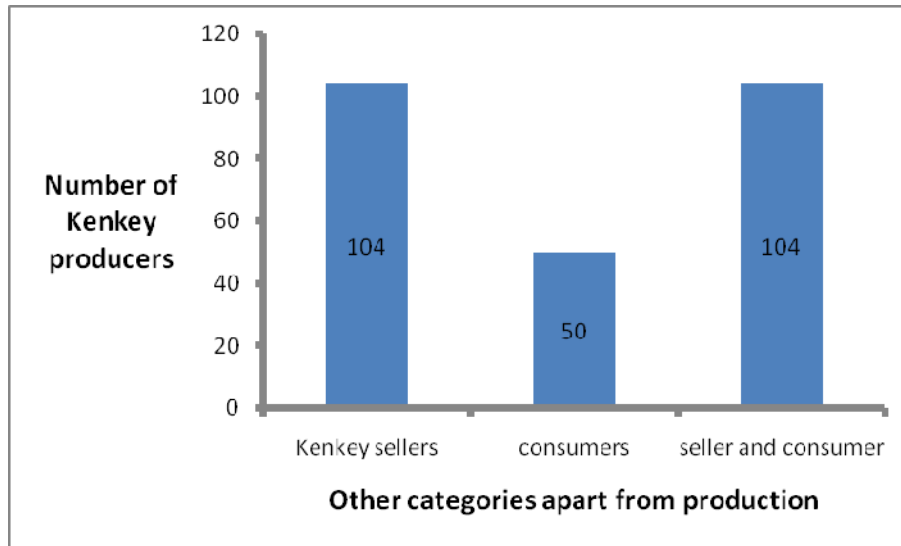


Figure 6 : Other categories apart from production

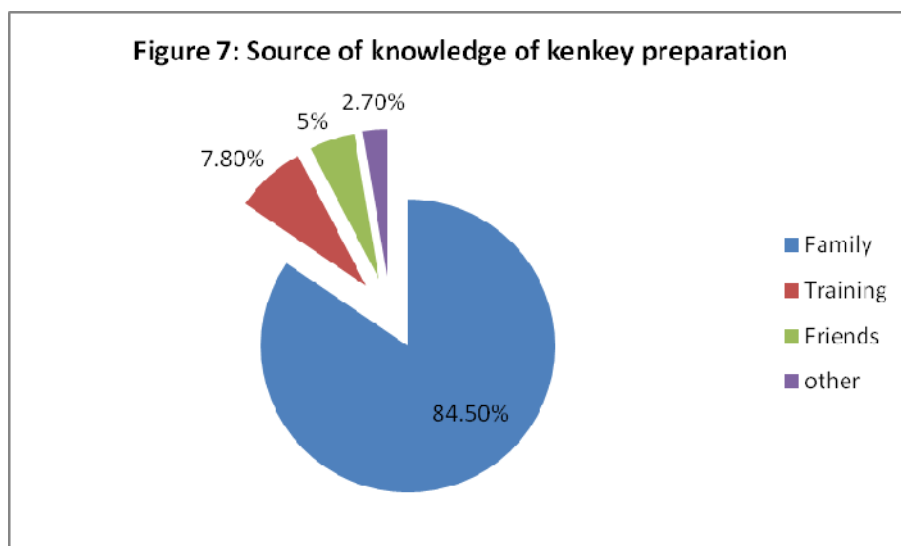
From the survey results, one hundred and four(104) producers were both sellers and consumers of kenkey. Fifty respondents were only consumers but not sellers of kenkey(Figure 6).

Table 6: Number of workers involved in kenkey production and relationship

Workers	Respondents	Percentage(%)
1-2	146	56.6
3-5	98	38.0
Above 5	14	5.4
Total	258	100.0
Relatives	Respondents	Percentage(%)
Yes	190	73.6
No	68	26.4
Total	258	100.0

Producers who had 1-2 workers helping were the majority recording 56.6%. Those who had above 5 workers were 5.4% (Table 6). Most of the workers(190) were related to the producers. Sixty-eight were non-relatives.

1.5 Source of knowledge and reasons for kenkey production



A greater proportion of kenkey producers(84.50%) learnt the trade from their family. The minority(2.70%) learnt the trade from other sources not mentioned .

Table 7: Reasons which respondents gave for kenkey production

Reason	Respondent	Percentage(%)
Family trade	113	43.8
Profitability	31	12.0
Employment	56	21.7
Family trade+profitable	12	4.7
Family trade+Employment	11	4.3
Profitable + Employment	25	9.7
Family trade + profitable+employment	10	3.9
Total	258	100.0

Table 7 gives a breakdown of the reasons producers were in the kenkey business. The dominant reason was the fact that it was a family trade which had been handed down from generation to generation . The combination of family trade + profitable+employment recorded the least percentage.

1.6 Types of kenkey produced and reasons

Table 8: Types of kenkey respondent produced

Types of Kenkey	Respondents	Percentage(%)
Fanti	91	35.3
Ga	94	36.4
<i>Akporhie/Nsiho</i>	62	24.0
Fanti+Ga	6	2.3
Fanti+ <i>Nsiho</i>	2	.8
Ga+ <i>Nsiho</i>	2	.8
GA+ <i>Nsiho</i> + Fanti	1	.4
Total	258	100

Producers who produced Ga kenkey were in the majority with a percentage of 36.4%. Fewer percentage of producers produced all three types of kenkey.

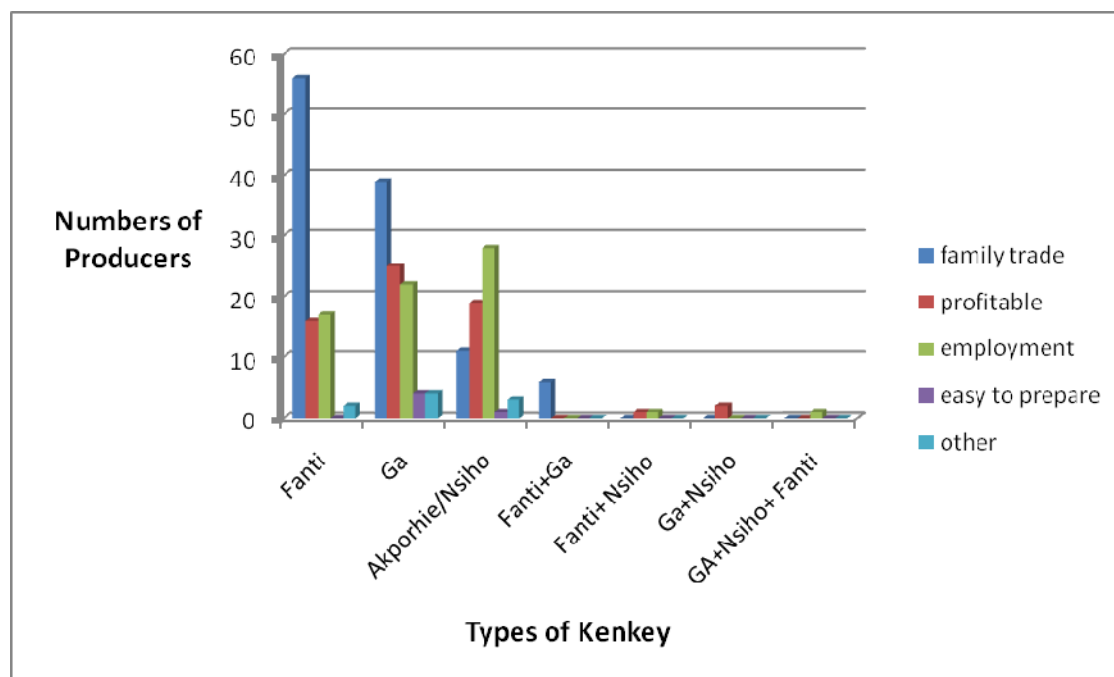


Figure 8: Reasons producers gave for producing particular types of kenkey

Fifty-six (56) and thirty-nine producers of Fanti and Ga kenkey respectively gave family trade as the reason for producing kenkey. Producers of *Nsiho/Akporhie* were in the production of kenkey as a source of employment (Figure 8). Easy to prepare was the least response given by producers for all types of kenkey.

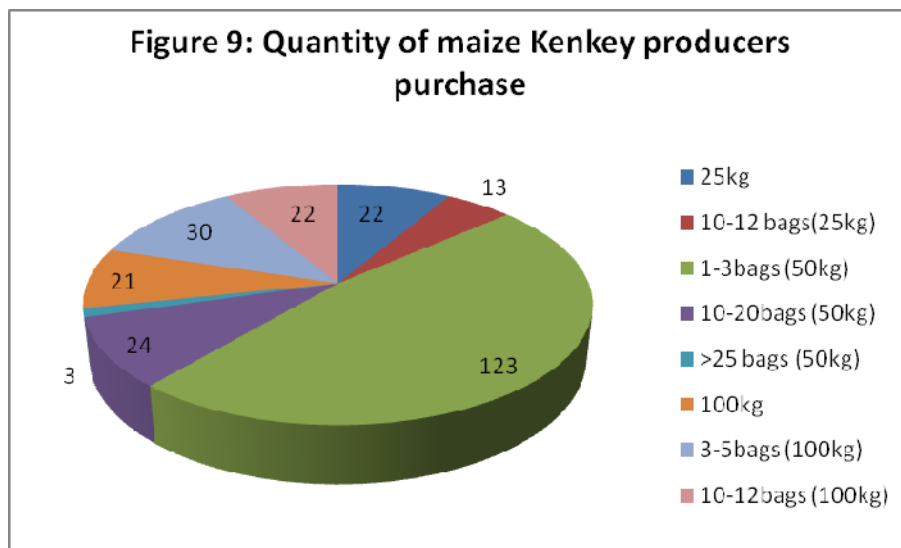
1.7 Minimum number of balls produced by Kenkey producers and profitability of trade

Table 9: Minimum balls produced, and profitability of trade

Minimum Balls of Kenkey	Respondents	Percentage
10-30	46	18.1
35-55	40	15.9
60-80	17	6.7
100-200	83	31.2
250-350	59	2.3
>400	13	5.1
Total	258	100
Profitability of Trade	Respondent	Percentage(%)
Yes	242	93.8
No	16	6.2
Total	258	100.0
Selling of fish	Respondent	Percentage(%)
Yes	148	57.4
No	110	42.6
Total	258	100.0

Two hundred and forty –two respondent agreed that Kenkey production business was profitable. Just sixteen did not agree to its profitability. Majority of producers sold fish alongside the kenkey and this was mostly for the Ga and Nsiho kenkey but not the Fanti kenkey.

1.8 Quantity of maize purchased and cost per maxi bag



One hundred and twenty-three (123) producers bought 1-3bags of the 50kg maize. Few producers (3) bought more than 25 bags of the 50kg maize(Figure 9).

Table 10: Price range of 1 maxi bag(50kg) of maize

Price range	Percentage(%)
GH¢50-100	53.9
GH ¢110-150	45
Less than GH¢50	1.2

Majority of producers (53.9%) gave GH ¢50-100 as the price range of 50kg of maize. Just 1.2% of producers gave the price range as less than ¢50 (Table 10). This however depends on whether the maize is bought at the farm-gate or the urban markets.

1.9 Storage facilities of Kenkey producers who store purchased maize

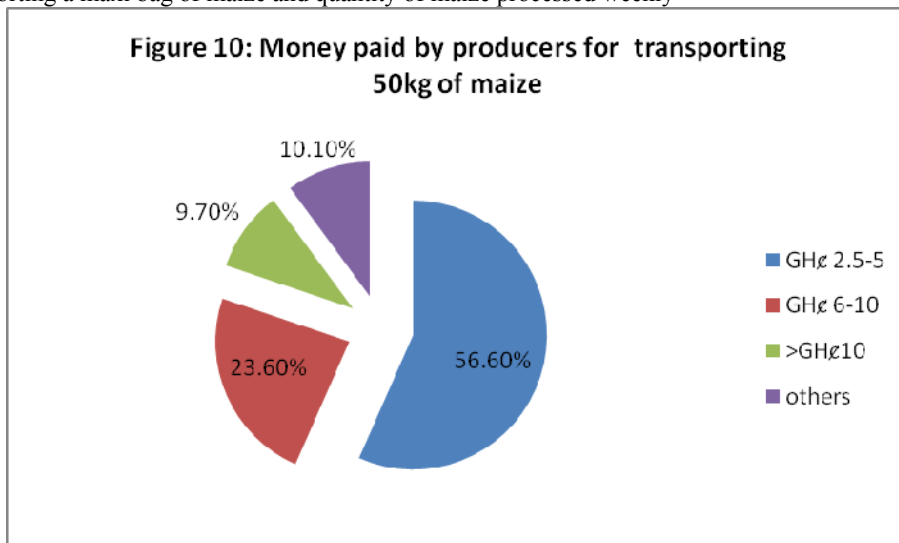
Table 11: Storage facilities producers keep their maize and weeks of storage

Response	Frequency	Percentage (%)
Yes	231	89.5
No	27	10.5
Total	258	100.0
Storage Facility	Frequency	Percentage (%)
Store-room	183	70.9
Container	12	4.7
Commercial mill	34	13.2
Market place	2	.8
others	27	10.5
Total	258	100.0
Weeks of storage	Frequency	Percentage(%)
1-4weeks	183	70.9
5-8 weeks	44	17.1
9-14weeks	16	6.2
others	15	5.8
Total	258	100.0

Survey indicated that a large proportion of respondents stored their maize (Table 10). Just twenty-seven (27) did not store their maize. Storerooms were the dominant places (70.9%) where respondents stored their maize. Few producers (0.8) stored maize

at the market place. One hundred and eighty-three producers (183) stored their maize for 1-4weeks. Producers who stored their maize for less than one week were in the minority (Table 10).

2.0 Cost of transporting a maxi bag of maize and quantity of maize processed weekly



Greater percentage of respondents (56.60%) paid GH ¢2.5-5 for transporting 50kg of maize. Producers who paid more than GH ¢10 were the least with 9.70%.

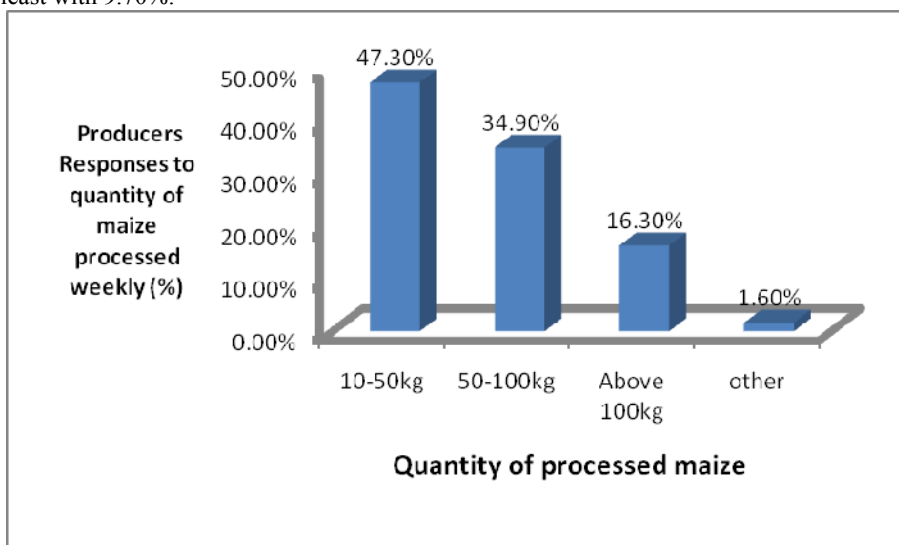


Figure 11: Quantity of maize processed weekly

Majority of producers (47.30%) processed 10-50kg of maize per week. Producers who processed less than 10kg of maize were in other category with 1.6% (Figure 11).

2.1 Location of kenkey production and frequency of production

Table 12: Locations where kenkey producers produce kenkey

Location	Frequency	Percentage (%)
At home	248	96.1
Factory/ location outside home	10	3.9
Total	258	100.0

A large proportion of producers (248) produced kenkey at their homes. Ten (10) producers produced the kenkey at a factory which is mostly a location outside their homes (Table 12).

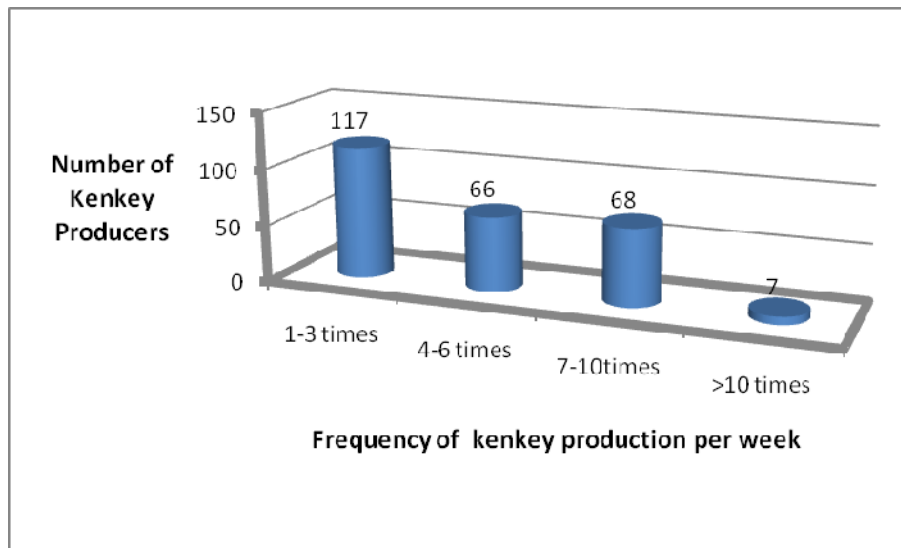
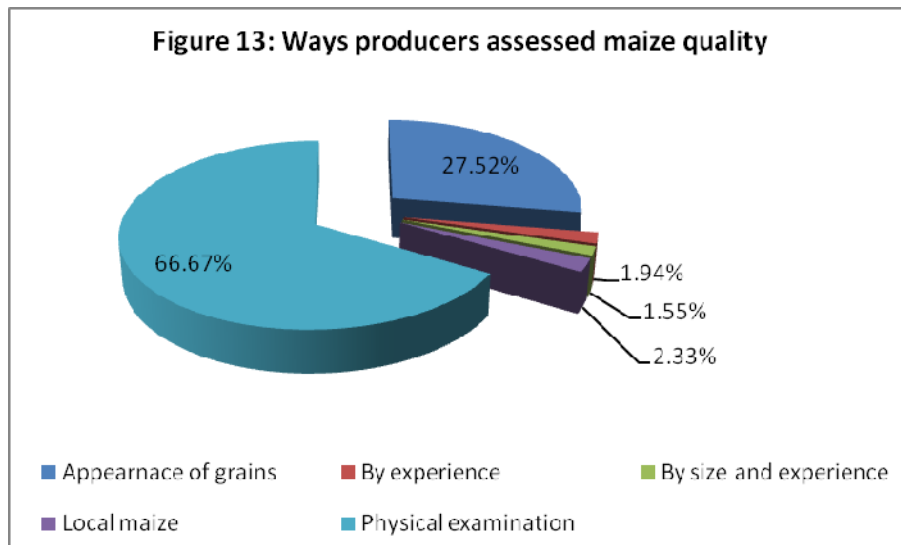


Figure 12: Frequency of kenkey production in a week by Producers

Respondents who produced kenkey 1-3 times in a week were the majority. Those who produced more than ten times in a week were in the minority (Figure 12).

2.2 Methods for maize quality assessment



Majority of producers (66.67%) assessed maize quality by physically examining the size, shape and appearance of the grains. Few respondents (1.55%) assessed maize quality both by size and experience (Figure 13).

2.3 Production activities which affect quality of Kenkey and labour intensive activities during Kenkey production

For all the different types of kenkey and in all three regions, the producers confirmed that the following practices affected the quality of kenkey negatively.

Table 13: Processing activities that affect quality of Kenkey

Activity	How quality is affect
<ul style="list-style-type: none"> • Use of contaminated maize • Improper washing of utensils for steeping maize, cooking of pre-cooked dough (<i>aflata</i>), mixing of pre-cooked dough (<i>aflata</i>) with uncooked dough and cooking pot. • Putting hands into maize during steeping • Use of over- fermented dough • Use of contaminated water, use of dirty corn husk and plantain leaves for wrapping kenkey. • Use of unfermented dough 	<p>Smelly Kenkey</p> <p>Kenkey becomes discoloured</p> <p>Kenkey is uncharacteristically sweet</p>
<ul style="list-style-type: none"> • Improper Pre-cooked dough (<i>Aflata</i>) preparation • Mixing more pre-cooked dough with uncooked dough • Improper mixing of pre-cooked dough with dough • Too much water during steam cooking(dehulled kenkey) • Use of too much water during pre-cooked dough preparation. • Unmonitored cooking time • Improper milling(less steeping time) • Maize not steeped for 3 days in the case of dehulled kenkey 	<p>Poor texture (non-sticky)of kenkey</p> <p>Lumps in kenkey</p> <p>Kenkey which is too soft</p> <p>Hard kenkey</p> <p>Kenkey texture not smooth</p> <p>Kenkey flavour not adequately developed</p>
<ul style="list-style-type: none"> • Insufficient firewood • Too much water • Inadequate cooking time 	<p>Kenkey not properly cooked</p> <p>Kenkey too soft</p> <p>Watery Kenkey</p>

Table 14: Labour intensive unit operations during kenkey production

Operations	Percentage(%)
Making of slurry for cooking into <i>aflata</i>	5.1
<i>Aflata</i> preparation	27.9
Mixing of <i>Aflata</i> with fresh dough	21.0
Molding of Kenkey	25.6
Mixing of <i>Aflata</i> with fresh dough + Molding of Kenkey	8.9
<i>Aflata</i> preparation + molding of kenkey	11.5

From Table 14, *Aflata* preparation is an operation which producers considered to be more labour intensive. Molding of the kenkey was the second most labour intensive unit operation. The respondent who indicated that the making of slurry for cooking into pre-cooked dough (*aflata*) were the minority.

2.4 Shelf-life of kenkey

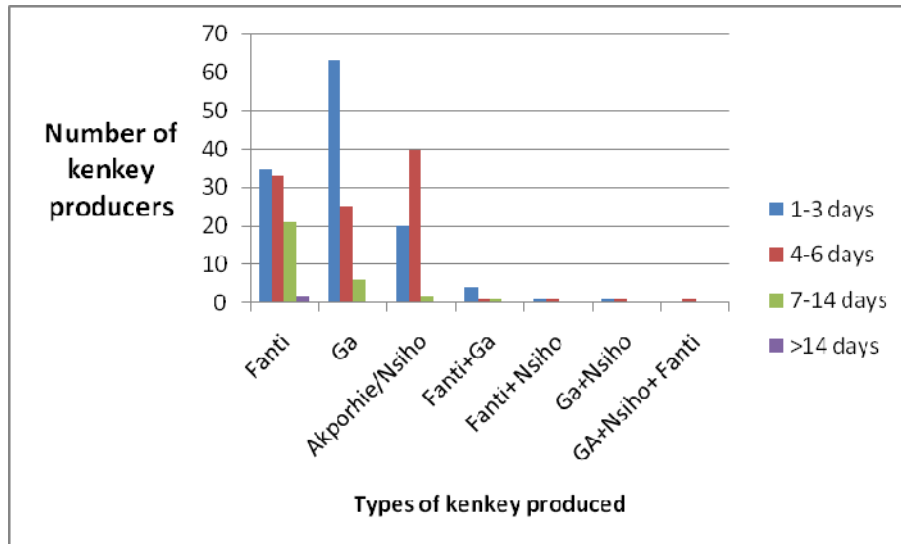
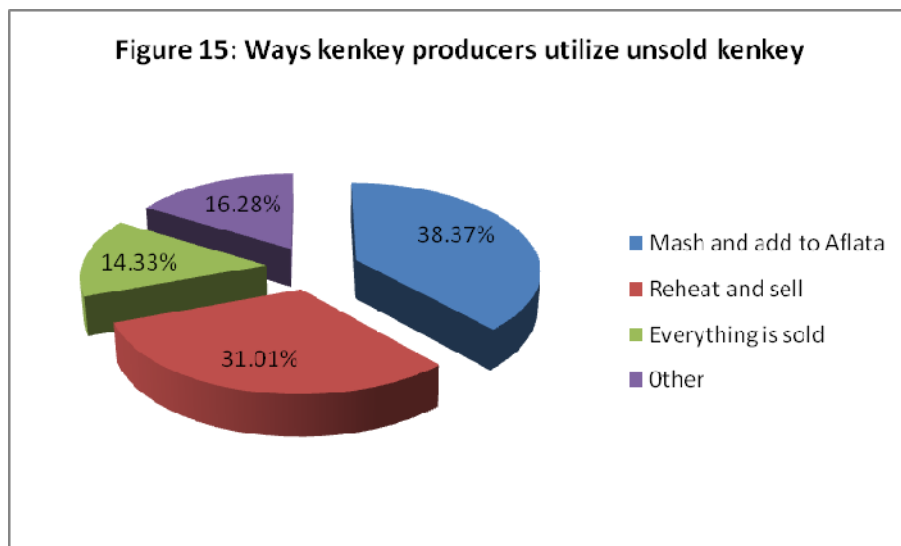


Figure 14: Producers responses to shelf-life of the types of kenkey

Majority of producers indicated that the shelf-life of all the types of kenkey was 1-3days. Sixty three producers indicated that the shelf-life of Ga kenkey was 1-3days. Majority of producers responded that the shelf-life of Akporhie kenkey was 4-6days and twenty one indicated that the shelf-life of fanti kenkey was 7-14days. Just two producers gave more than 14days as the shelf-life of Fanti kenkey (Figure 14). No producers gave more than fourteen days for shelf-lives for Ga and Akporhie kenkey. This was expected since these products have short shelf-life.



Kenkey producers who mashed and added unsold kenkey to *aflata* formed the majority (38.37%). They were mostly the Ga kenkey producers. Others who reheated and sold the kenkey formed 31.01% and these were from Akporhie/ Nsiho sellers. Fanti kenkey, because of its long shelf-life compared to the other types of kenkey is not reused like the other types of kenkey and therefore fell in the other categories. Minority of producers indicated that all their kenkey was bought (Figure 15).

Discussion

Kenkey producers are mostly elderly females with age group in more than or equal to 50 years age bracket. Araba said the preparation of the kenkey required special skill and strength. “I can’t do it,” she admitted. According to her, it is done skillfully by women who have developed that skill over a long while. “Old women” who acquired the skills long ago now serve as trainers in the community (personal communication, Yamaransa).

Twi was the dominant language used for the survey this was because it is a language understood and spoken by all ethnic groups in the regions considered. The producers had little or no level of education. In a study by Halm *et al.*, 2003, it was concluded that kenkey producers were mainly women with little or no formal education. Majority of producers were married head of households with 6-9 persons in their household. This indicated that kenkey was a means of livelihood for producers and family. Kenkey producers who were vendors were in the majority. Majority of producers worked with 1-2 workers who were relatives. This goes to prove that kenkey producers carry out commercial production as a family-acquired art. The small-scale processors carry out their activities either as individuals or as a family business in the household often depending on family labor to produce and retail the product (Halm *et al.*, 2003). A greater proportion of producers (84.5%) learnt the kenkey trade from family and gave family trade as the reason for kenkey production. The production of kenkey is based on traditional technologies, that have been handed down in generations according to a survey by Allotey (1996). Family trade was the reason producers gave for Fanti and Ga kenkey production, akporhie / *nsiho* producers were in the trade because it was a means of employment. Few producers gave easy to prepare as reason for kenkey production. This indicated that producers were in business because of its profitability. Producers who produced minimum of 100-200balls of kenkey formed 31.2% while 18.1% produced minimum of 10-30balls. 5.1% produced a minimum of more than 400balls. This indicated that producers carried out the business on small-scale level. 93.8% of producers brought to the fore that kenkey production was profitable. Producers (57.4%) sold fish and sauce, 42.6% did not sell fish and sauce. Ga and Akporhie producer/ sellers sell fish and sauce this could be attributed to the fact that the products are often eaten with them. However, fanti kenkey sellers sell kenkey without sauce and fish. Majority of producers processed 1-3 bags of 50kg maize. Few producers processed 10-12bags of 100kg maize and more than 25bags of 50kg maize. This depicted that kenkey production was done on small scale artisanal level. However, in a survey conducted in Accra, Allotey (1996) found that at most production sites the amount of maize processed weekly ranged from 0.05 to 1.2 metric tons with an average of 0.3 tons of maize processed into 0.5 tons of kenkey. Producers of all types of kenkey indicated that GHC 50-100 was price range for 50kg of maize. A greater proportion of producers (70.9%) stored purchased maize in storerooms for 1-4weeks. This brought to the fore that producers did not keep the grains for longer periods and as a result had no problems with storage losses. Most producers indicated that the cost for transporting 50kg of maize was GHC 2.50-5. Those who paid more than GH C10 were in the minority. This could be attributed to the fact most producers bought maize from nearby markets and just few go to rural areas to purchase maize. From the survey results, it depicted that more producers processed maize into kenkey 1-3times in a week. Sixty-eight and sixty-six producers produced kenkey 7-10times and 4-6times respectively. This could be attributed to the fact that kenkey production is laborious and they had to go through 4-6days for each production. Producers who produced several times in a week had more workers and sold at vantage places. Physical examination of the grains (size, shape, weight, mould-free and insect free) was the dominant method kenkey producers assessed quality of maize. They had gained experience to assess good quality maize, because the use of poor quality maize affects the yield and texture of the kenkey.

Producers brought to the fore that kenkey smelt and become discoloured when the following practices are done, use of contaminated maize, hands immersed in maize steeped water, improper washing of utensils for steeping maize, pre-cooking dough (*aflata*), mixing of pre-cooked dough (*aflata*) with uncooked dough and cooking pot. They also attributed use of over fermented dough, contaminated water, dirty corn husk and plantain leaves to foul smell of kenkey. Kenkey is uncharacteristically sweet when unfermented dough is used for production. The producers indicated that the texture of kenkey was affected when pre-cooked dough (*Aflata*) was improperly prepared; more pre-cooked dough was mixed with uncooked dough or improperly mixing of pre-cooked dough with raw dough. In a sensory evaluation of the texture of kenkey, the highest score was given by panellists for kenkey prepared from a 1-to-1 *aflata* to uncooked dough mixture (Bediako-Amoa 1976). The study confirmed that aflatalization is necessary to produce kenkey of desired texture. Sefah Dedeh 1993 reported that *Aflata* act as a binding agent, giving kenkey its firm and semi-sticky consistency. When *aflata* is mixed with uncooked fermented dough it enables the product to be moulded into balls and other shapes (Sefa-Dedeh and Plange 1989). According to dehulled kenkey(*Nsiho*) producers, use of too much water affected the texture of kenkey. The use of insufficient firewood, too much water and inadequate cooking time resulted in improperly cooked, too soft and watery kenkey. All these practices suggested that to obtain good quality kenkey, quality of raw material and intermediates at each unit operation should be conducted with much care. Generally, kenkey producers agreed that molding of kenkey, *aflata* preparation and mixing of *Aflata* with fresh dough were difficult unit operations during kenkey production. This implied that a lot of energy is expended during these operations. Producers mostly counted on casual labour for *Aflata* preparation. Producers of various types of kenkey affirmed that shelf-life of Ga kenkey is 1-3days, Akporhie(*nsiho*) is 4-6days and Fanti kenkey is 7-14 days. This indicated that kenkey had short shelf-life. According to work conducted by (Hayford 1998), kenkey had shelf-life of about 3 to 4days with no refrigeration. However, fanti kenkey had a slightly longer shelf life and can be stored for about 5 to 9 days under ambient conditions. Ga kenkey producers brought to the fore that they mashed unsold kenkey and added to *aflata* for the next batch of production. Akporhie / *nsiho* producers mostly reheated and sold left over kenkey. Fanti kenkey as a result of its long shelf-life can be sold for subsequent days.

Correlation of Survey findings with Literature search

The literature search on the Fanti Kenkey producers showed that cooking time was 3 hours but from the survey conducted Fanti kenkey is cooked for 6 hours and more. The literature search and the survey confirmed that producers of kenkey are able to keep the dough for longer time by adding less amount of water during doughing process. The producers of kenkey never mentioned backsloping of their dough but literature talked about back-sloping. The producers processed fresh maize for each batch of production. Both the literature search and survey established that aflatalisation was important to produce kenkey of the desired texture. Also it was established by both literature search and survey that the portion of pre-cooked dough (*Aflata*) added to dough depends on the type of kenkey being produced. The literature search showed that indigenous Ga producers used 1:1 portion of precooked dough with uncooked dough but the survey did not show this fact. Some activities according to literature and survey that could affect the quality of kenkey were the use of contaminated maize, unclean corn husk and plantain leaves which make the kenkey smell. Also the survey established that use of improperly cleaned utensils, putting hands in steeped maize and the use of spent dough made the kenkey develop foul odour. The literature search and survey conducted established women with little or no formal education carried out commercial production as a family acquired art. They carried out their activities either as individuals or as a family, depending on family labor to produce and retail kenkey. A new innovation that has been added was the wrapping of Fanti kenkey in polythene before using dried plantain leaves. The producers claimed it improved shelf-stability of the kenkey.

Conclusion

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Random survey on Kenkey

1. Name of Respondent?.....

Product activity:

- a) Processor
- b) Vendor
- c) Consumer

Name of home village/town of respondent?.....

Random survey on Kenkey

1. Name of Respondent?.....

Product activity:

- a) Processor
- b) Vendor
- c) Consumer

Name of home village/town of respondent?.....

Random survey on Kenkey

1. Name of Respondent?.....

Product activity:

- a)Processor
- b) Vendor
- c) Consumer

Name of home village/town of respondent?.....

Appendix 2



KENKEY PRODUCERS



AFTER

African Food Tradition Revisited by Research



WP 1: CHARACTERISATION OF TRADITIONAL PRODUCTS AND KNOW-HOW

SURVEY QUESTIONNAIRE

CSIR-FOOD RESEARCH INSTITUTE

Introduction

After gathering information about the product via the literature review and the exploratory study, a survey will be done to point out the most relevant questions to be solved in the following phases of the project. Below are the objectives of the questionnaire for that survey. The different groups of stakeholders to be interviewed along the chain for each product are considered and the needed information from each group is specified.

Objectives of the survey

The present questionnaire aims at gathering information about the production of kenkey in Ghana and at identifying the major problems and bottlenecks related to this product in order to investigate some of them and propose adequate solutions.

PRODUCTION

Processor Identification

Background information	
Name of the investigator/pollster
Questionnaire Number
Date of survey/...../.....
Place of survey - village/area: - district: - region:
Language used during the survey	
Person to be interviewed	
Surname and first name	
Age old
Gender	Male <input type="checkbox"/> Female <input type="checkbox"/>
Ethnic /socio-cultural group	
Educational level	Highest level of education? Nil <input type="checkbox"/> Non-formal <input type="checkbox"/> Primary <input type="checkbox"/> JHS <input type="checkbox"/> Secondary <input type="checkbox"/> SHS <input type="checkbox"/> Tertiary <input type="checkbox"/>
Marital status	Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/>
Number of persons in the household

Religion	Traditionalist <input type="checkbox"/> Christianity <input type="checkbox"/> Islam <input type="checkbox"/> others <input type="checkbox"/>
Role in the household	Head of household <input type="checkbox"/> Dependent <input type="checkbox"/>
Apart from processing of kenkey which of the following activities are you engaged in?	Kenkey seller <input type="checkbox"/> Consumer <input type="checkbox"/> Other <input type="checkbox"/>

1. Is there any particular reason why you produce kenkey?

Family trade Profitable Employment others (specify).....

2. How did you learn how to produce kenkey?

Family training Friends others (specify).....

3. How many types of kenkey do you know?

Fanti Ga *Nsihu* *Asikyere dokono* *Akporhie* others specify.....

4. Which types of kenkey do you produce? ?

Fanti Ga *Nsihu*

5. Why do you produce these types?

Family trade Profitable Employment Easy to prepare other (specify).....

6. What quantity of kenkey do you produce per batch?

Type of kenkey	Quantity (specify the measuring unit)	
	Minimum	Maximum

7. How many workers are involved?

1-2 workers 3-5 workers Above 5workers

8. Are you related to these workers? Yes No

9. Do you find kenkey making profitable? Yes No

10. Do you sell fried fish and sauce with the kenkey? Yes No

11. Where do you buy the maize and other raw materials ?

Raw materials and	Source of raw material	Quantity of raw	Cost (GH¢)	Member of

other ingredients		material purchased at a time?		Association
Maize				
Corn husk				
Plantain leaves				
Others				

12. What quantity of maize do you buy?

50kg(Maxi bag)..... 25kg(mini bag)..... others specify.....

13. What is the price range for maize?

GH¢50-100 GH¢ 110-150

14. What type of maize do you prefer to use for the production of kenkey ? Why?

Local name of the maize	Most important quality criteria

15. What quantity of maize do you process in a week ?

10- 50kg 50kg-100kg Above 100kg

16. Do you store the maize after purchasing?

Yes No

17. Where do you store the maize?

Store room container commercial mill market place

18. Why do you store the maize?

Bulk purchase cost-effective Convenient others (specify).....

19 . How long do you normally store the maize?

1-4weeks 5-8 weeks 9-14week

20. If you store one maxi bag of maize what proportion/quantity are you likely to lose through spoilage? After

2month ----- , 3month..... 4month.....

21. What is the cost of transporting one maxi bag of maize ?

GH¢ 2.5-5 GH¢ 6-10 GH¢ > 10

22. How many times do you produce kenkey in a week?

1-3times 4-6times 7-10times >10 times

23. .. Where do you produce the kenkey?

At home Factory/location outside home others s_____fy.....

24.. What procedure do you use to produce kenkey?

Operations	Duration of the operation	Quantity of raw material used	Objective of the operation	Equipments used (Quantity and designation)	Labour (specify number and sex)	Products obtained

Operations	Duration of the operation	Quantity of raw material used	Objective of the operation	Equipments used (Quantity and designation)	Labour (specify number and sex)	Products obtained

25. For Intermediate and final products, indicate: the quality criteria used to appreciate the product and the quality problems met (fill the table)

Products	How do you assess the quality of the product	What problems do you face with regards to the quality of the product.
Maize		
Steeped maize		
Fermented dough		
Aflata		
kenkey		

26. Does the fermentation time vary with:

a) the type of maize used? Yes No

Specify

.....
.....

b) the soaking of the maize? Yes No

Specify

.....
.....

c) A particular period of the year ? yes No

Specify

.....
.....

27. How do you know when to stop steeping of the maize? How do you assess this?

Bite with teeth Experience

28. For how many days do you ferment the dough?

1 day 2days 3days others specify.....

29. How do you determine that the dough is fermented enough and can be used to make kenkey?

Texture Taste Smell Colour Change

30. For how many days longer can you use the same dough to make kenkey?

3-4 days 5-7days >7days

31. In your opinion, which activities if not carried out well will affect the quality of kenkey produced?

Activity	How does it affect quality

Activity	How does it affect quality

32. Which of the activities in the processing of maize into kenkey are difficult to carry out with respect to the labour required?

Making of mixture of dough for Aflata Aflata preparation

Mixing of Aflata with fresh dough Molding of kenkey

33. Does the selling price of kenkey vary during the year?

Yes No

34. If yes what are the reasons which explain this variation of price?

Cost of corn Cost of firewood Cost of Gas, Cost of charcoal

35. Variation of raw material cost during the year

Constant price : \longleftrightarrow

Increasing price \uparrow

Lowering price \downarrow

Factor of variation	January	February	March	April	May	June	July	August	September	October	November	December

36. How long can you keep kenkey and still eat it?

1-3days 4-6days 7-14days others

37. What do you do if you want to keep /store the maize dough for a longer period?

38. What do you do with kenkey which you are unable to sell?

Mash and add to Aflata Reheat and sell other specify.....

Thank you for your collaboration!!!!!!

