

## Marketing Potential for Commercial Sorghum Malt in Northern Ghana

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### Abstract

The study was conducted in four districts in the Northern and Volta regions of Ghana, to investigate the commercial potential of sorghum malt and the quality of sorghum and sorghum malt that small scale brewers prefer. The constraints these small scale maltsters and brewers encounter in their work were also investigated. Purposeful sampling technique was employed to select the communities and snowball sampling was used to identify the brewers and maltsters in the communities. Two hundred and fifteen (215) respondents were interviewed in the four districts; three of the districts are located in the Northern Region and one district in the Volta Region of Ghana. The quality attributes of sorghum and sorghum malt preferred by the small scale breweries and maltsters include; good germination rate, presence of a characteristic flavor of malt, and that the malt should not look mouldy. The sorghum grain should not contain foreign materials, whole/undamaged grain and that the grain should not look powdery. The quality factors of malt are very important as they determine the quality of the end product (pito) which is a determinant for good market. The common variety of sorghum used in the northern part of Volta region is the 'Konkomba' sorghum variety. While Naga red is most commonly used variety of sorghum in the Northern region followed by Chere and the mixture of Naga red and Chere. The constraints brewers and maltsters encountered in these areas include; shortage of sorghum, increase in sorghum price, malt losses due to bad weather during the raining season, poor market for pito during the raining season and lack of financial institutions to support them with funds. The commercial prospect for sorghum malt as revealed by the study indicates that 85% of the respondents were willing to purchase commercial sorghum malt.

**Key words:** Sorghum varieties, Commercial sorghum malt, Marketing potential

### INTRODUCTION

Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives (American Marketing Association, 1964). This definition reveals that marketing involves more than just an individual activity such as a sales or promotion. Effective marketing requires that managers recognize the interdependence of these various activities and how they can be combined to develop a marketing program.

Sorghum (*Sorghum bicolor*) is a tropical cereal grass which is cultivated in southern Africa over 3000 years. Today, sorghum is cultivated across the world in the warmer climatic areas. In terms of volume it is the world's fifth most important cereal grain, after wheat, maize, rice and barley. Sorghum is still largely a subsistence food crop, but is increasingly becoming the foundation for successful food and beverage industries (Taylor, 2003). In Africa, the major sorghum growing areas run across the West Africa, south of the Sahara to the coast and eastward into Sudan, Ethiopia and Somalia (House, 1995).

In West Africa sub region among other uses sorghum is malted and used to brew various traditional beers (Demuyakor and Ohta, 1991). Beer production from sorghum grain or malt is an economically viable option for countries in the West Africa sub region since barley cannot be cultivated in tropical Africa (Mugode, 2009).

Malts are produced when cereals are subjected sequentially to steeping, germination and kilning under controlled conditions. In spite of the availability of several cereal types, barley has traditionally been the grain of choice when it comes to malting. In tropical Africa, however, barley cultivation has not seen any success. Thus, industries that use barley malt as their major raw materials have to rely on imports of this grain. This has not been a problem only to the industries concerned, mostly brewing industries, but also to the economies of mostly Tropical African countries. Therefore, some tropical cereals including sorghum have been investigated for their malting properties (Beta, *et al.*, 1995, Dufour *et al.*, 1992).

The potential of sorghum as an alternative substrate for lager beer brewing has been cited in several parts of Africa, particularly in Nigeria and elsewhere (Agu and Palmer, 1998; Owuama, 1997).

Malting is largely a cottage industry, usually performed at home by women, and one that requires great expertise. Maltsters and brewers most parts of Ghana are faced with challenges such as shortage of sorghum within certain period of the year, inadequate sunshine during the raining season, high price of sorghum between March and August, these affect their production levels. Malting is a tiring and tedious work which brewers have to repeat any time they want to prepare a batch of their brew. Also, the traditional techniques used for malting are ill suited to markets. The risks for human health are serious and the malt technological quality is uneven when these traditional brewers prepare their own malt. The development of cyanogenic compounds, enterobacteria or moulds can impair the organoleptic qualities and healthfulness of sorghum malt prepared by the traditional maltsters.

Quality requirements for malting sorghum are reasonably strict and are directly related to processing efficiency and product quality in the malting and brewing industries. The major quality criteria for malt are noted to be taste and presence or absence of roots in the malt. The parameters affecting malt quality were perceived to be malt production period, proportions of grain and amount of water entering the malt, presence of pesticide residues in malt grains and age of grain.

The problems associated with malting sorghum include; high malting losses estimated at 10–30% as against 8–10% for barley. Sorghum malt has high gelatinization temperatures which limit starch solubilization or hydrolysis by the amylolytic enzymes during mashing is a limiting factor in malting sorghum. Sorghum malts have low extract yield or low diastatic power (DP) due to inadequate hydrolytic enzyme activities especially  $\beta$ -amylase. This is attributed to poor endosperm modification caused by inadequate hydrolytic enzyme activities especially  $\beta$ -amylase (Dufour *et al.*, 1992, Palmer, 1989).

Pito brewing is a key off-farm economic activity that provides income for numerous households particularly women in Ghana. It is estimated that over 10,000 women in Northern Ghana depend on pito brewing as their main source of income (PSI-Sorghum, 2006). It has been observed that most of the pito brewers produce their own malt for brewing. Mean while some women entrepreneurs produce a limited amount of sorghum malt for sale to small scale brewers.

Therefore, the objective of this study was to investigate the commercial potential for sorghum malt in the northern region of Ghana and to find out if small scale brewers are willing to purchase industrially prepared sorghum malt.

## **MATERIALS AND METHODS**

### **DATA**

Primary data was obtained from the field through the administration of semi-structured questionnaires as well as personal observation.

The sample frame included all pito brewers and maltsters in the four districts under the study. Data collected include their brewing capacity per batch of brew, their ability to expand their business and their willingness to purchase commercial sorghum malt. The brewing capacity was measured using the five (5) litre 'frytol' gallon. The 5 litre 'frytol' gallon is the measuring material used by the local brewers to measure their brew. Nominal data was collected on their ability to expand their business and interest in purchasing commercial sorghum malt. These were tested by the use of closed question where possible answers were defined in advance for the respondents to choose. These variables were coded 'Yes' and 'No' for the respondents to choose to indicate whether they can expand their business and if they are willing to purchase commercial sorghum malt.

### **METHODS OF DATA ANALYSIS**

The data obtained was analyzed using descriptive statistics such as charts, means, frequency distribution tables and percentages with the aid of statistical package for social sciences (SPSS) version 16 and Microsoft excel 2007.

According to Texas State Auditor's Office, Methodology Manual, review.5 (1995), descriptive statistics are recommended when the objective of the study is to describe and discuss a data set more generally and conveniently than would be possible using raw data alone.

Descriptive statistics are routinely used in reports which contain a significant amount of qualitative or quantitative data. Descriptive statistics helps in summarizing and supporting assertions of facts. Furthermore thorough understanding of descriptive statistics it is essential for the appropriate and effective use of all normative and cause-and-effect statistical techniques, including hypothesis testing, correlation, and regression analysis.

Descriptive statistics is essential for arranging and displaying data, make data much easier to work with, interpret and discuss than raw data. It help examine the tendencies, spread, normality, and reliability of a data set and it include useful techniques for summarizing data in visual form. Therefore it is appropriate to use descriptive statistics to analyze the data collected from these four districts.

## RESULTS AND DISCUSSION

### CATEGORIES OF RESPONDENTS

Results of the research indicated that 2.3% of the respondents are brewers; that is people who only brew by purchasing malt, 0.5% were people who retail beer (pito) and 97.2% undertake malting and brew using their own malt.

**Table 1: Categories of respondents**

Categories	Frequency	Percent
Brewers	5	2.3
Maltster and Brewer	209	97.2
Others	1	.5
Total	215	100

### AGE OF RESPONDENTS AND PERIOD IN BUSINESS

Ninety two percent (92%) of the respondents in the local brewing industry in the study area are in the active age group between 20-40 years of age. It can be observe from Table 2 that most of the respondents within the active age group are between 0-20 years of experience in the local brewing industry. This affirms that they will have long time or period the business if all things being equal. Malting and brewing is labour intensive therefore, it requires more energetic people to carry out. As reveal by table 2 there is a good potential for growth of the local brewing industries as it is made up of people within the active age group.

**Table 2: Age of Respondents and Period in Brewing**

Period in business	Age of Respondent				
	20-25	26-31	32-37	38-43	44-49
0-5	21	15	0	0	0
6-10	6	21	19	0	0
11-15	0	12	29	19	0
16-20	0	2	29	14	17
21-25	0	0	0	9	6
26-30	0	0	0	2	4

### PERIOD OF RESPONDENTS IN THE LOCAL BREWING INDUSTRY AND THEIR BREWING CAPACITY

The table below shows the present brewing capacity of respondents and their respective number of years of experience in the local brewing industry. It could be seen from Table 3 that, the capacity of the respondents between 0-20 years of experience is the highest. Those within 21-30 years of experience have the least brewing capacity. The brewing capacity of the respondents is relatively proportional to their age (physical strength), financial strength and availability of labour. Respondents between 0-20 years of experience are within the active age group and are more energetic in terms of labour and financially capacitated than those between 21-30 years of experience which constitute the aged.

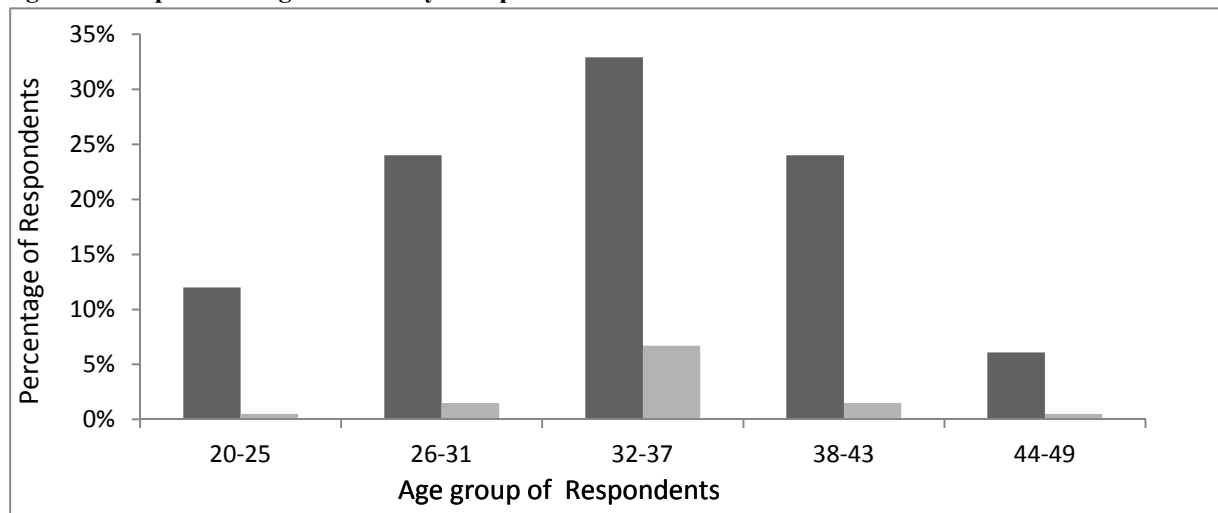
**Table 3: Period in Brewing and Brewing Capacity**

Period in Business	Brewing capacity in Litres (L) / batch			
	0-90 L	91.5-135 L	136.5-180 L	181.5-225 L
0-5	19	34	11	8
6-10	10	28	20	8
11-15	20	12	14	4
16-20	-	5	10	2
21-25	-	2	2	-
26-30	-	4	2	-
Total	49	85	59	22

### RESPONDENT AGE GROUP AND THEIR ABILITY TO EXPAND THEIR BUSINESS

The respondents in the various age groups that have the capability to expand their business are more than those who cannot expand. It is clear from figure 1 that most of the brewers in the active age group have the ability to expand their business. The median age group (32-37) which have the highest brewing capacity also have the greatest potential of expanding their brewing business. The financial capability of the respondents, availability of raw materials (sorghum) and labour determines the size of their business.

**Figure 1: Respondents age and Ability to expand their Business**

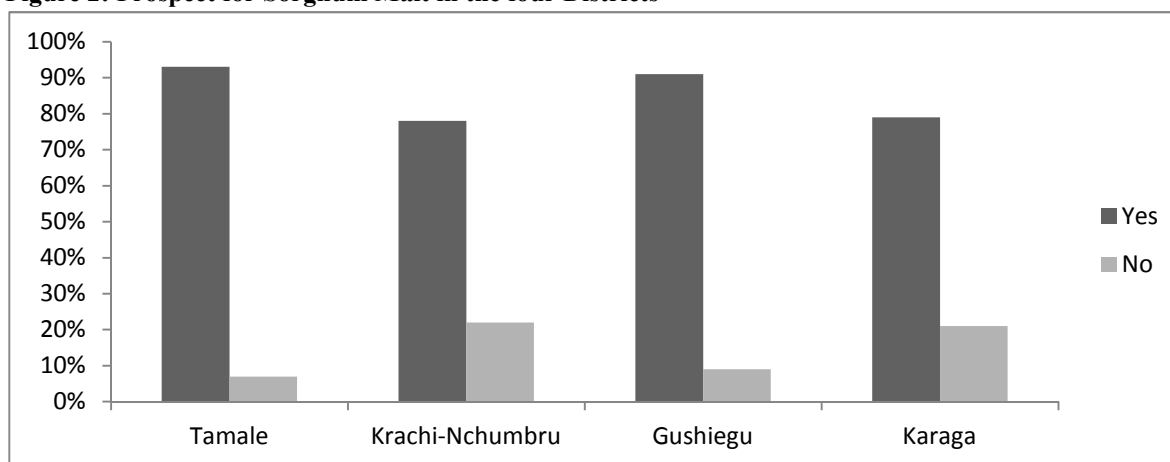


**PROSPECTS FOR SORGHUM MALT**

The research reveals that out of the 214 brewers interviewed from the four districts, 85% the respondents showed interest in purchasing commercial sorghum malt and 15% respondents were not willing to purchase sorghum malt from firms that may exist to produce and sell sorghum malt. From figure 2 in Tamale respondents willing and those not willing to purchase commercial malt were 93% and 7% respectively, Krachi- Nchumbru district also recorded 77.6% and 22.4% willing and not willing respectively. In Gushiegu 90% of the respondents were willing to purchase commercial malt and 10% were not willing. Karaga also recorded 79% against 21% willing and not willing respectively.

Those that were willing to purchase commercial malt are of the view that, existence of firms to produce and sell sorghum malt will help in reducing their work load as malting and brewing is labour intensive, and that it will reduce their cost of production which will in turn increase their production capacity. The respondents that did not show interest were of the view that commercial malt may be expensive and the quality may not be guarantee.

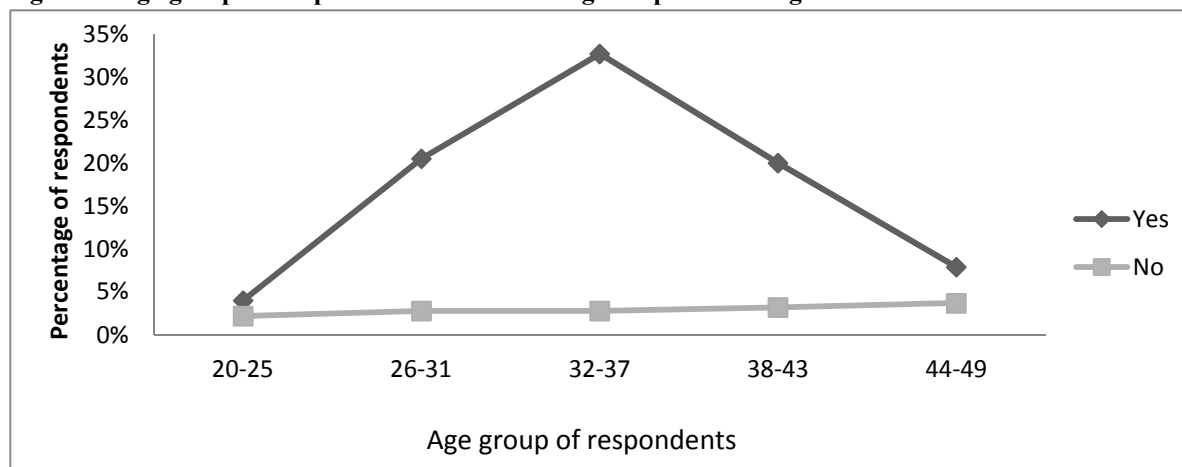
**Figure 2: Prospect for Sorghum Malt in the four Districts**



**AGE OF RESPONDENTS AND THEIR WILLINGNESS TO PURCHASE SORGHUM MALT**

Figure 3 below showed that the number of respondents that are willing to purchase sorghum malt increases between the age group 20-37 and declines from the age group between 38-49. The figure also showed that out of the 85% of the respondents that were willing to purchase sorghum malt was highest within the age group 32-37 which was the median age group. The lowest limits within the 20-25 and 44-49 age groups are as a result of their brewing capacity and financial strength. The age group between 20-25 is those within 0-5 and those between 44-49 are within 21-25 and 26-30 years of experience as shown in table 3.

Figure 3: Age group of Respondents and Marketing Prospect for Sorghum Malt



## CONCLUSION

The marketing prospect for commercial sorghum malt is very promising as revealed by the study. The study indicates that 85% of the respondents were willing to purchase commercial sorghum malt. The existence of firms that will produce sorghum malt for sale to small scale brewers according to the respondents will help in reducing their work load, it will reduce the cost of production, will be available all year round which will help solve the problem of sorghum shortage and the quality and hygiene of the malt will be assured. Fifteen percent (15%) of the respondents did not show interest in purchasing commercial sorghum malt. They were of the view that, the quality of commercial malt cannot be guaranteed, and that the cost of the malt will be expensive as compared to their self made malt.

There are presently maltsters who supply sorghum malt to brewers, but their numbers and the quality of malt is not adequate according to the respondents.

The result of the study showed that there exists a good market potential for sorghum malt for firms that may exist for selling sorghum malt. The promotion of malt with consistent quality will allow better use of sorghum in the small scale brewing industry in the Northern region and the Northern part of the Volta region of Ghana. The production of quality malt will generate new jobs, better income, facilitate the work of women and allow the small scale brewing industry to better serve the increasingly demanding rural and urban markets.

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