

CEREAL AND GRAIN VALUE ADDED PRODUCTS



PRODUCT PROFILE

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Table of Contents

1.0	Introduction	2
2.0	Processing of Selected Cereals in Uganda	4
A.	Maize	4
	Profitability	
	Markets and Marketing for Maize	
B.	Wheat	7
C.	Rice	8
	Markets and Marketing for Rice	
	Rice Imports and Exports	
3.0	Annexes	11
	List of Grain Traders and Exporters	
	List of Wheat Millers in Uganda	

Introduction

Grain milling is the most widespread power-driven small-scale industry in Uganda, in both urban and rural areas. Maize mills account for more than 70% of all the grain milling activity. However, contribution to the gross value of industrial output is quite small, compared with their relative numbers within the industrial sector. According to one survey (conducted by UBOS in 2001), grain mills accounted for only 6% of the value of industrial output but for 15% of the total number of establishments in the industry. The gross value added in the milling industry is also low. For example, the survey reported that the ratio of value added to gross output in this industry was only 19.5%.

In Uganda, farmers grow food crops such as finger millet, maize, sorghum, rice and wheat. These cereals and grains are processed into flour for subsistence consumption or for commercial purposes for sale to regional markets that exist within East Africa and globally.

Maize:

Maize is the most important cereal crop, widely grown and consumed in Uganda. The crop occupies a strategic position in the country's food security alongside bananas, cassava and sweet potatoes. It is a major part in the diet of both rural and urban communities mainly as a source of carbohydrates.

The Eastern region of Uganda had the highest production of 1,070,000 MT which was 44% of national production. The lowest production was reported by the Northern region i.e. 239,000 MT and this accounted for 10% of national production. (*Report on the Agricultural module, 2005/06*)

The bulk of the maize produced in Uganda is milled into flour for human consumption, while use of maize as animal feed is also on the increase. However, there are many ways of converting maize into interesting and acceptable forms that could increase the consumption and marketability of maize products.

The ability to pay milling charges is an important factor in the choice between manual and mechanized milling. This is normally a big incentive for subsistence farmers to produce a marketable surplus.

Sorghum and Finger millet

Production of finger millet was at 189,000 MT with the Western region producing 98,000 MT which is 52% of national production. The Central region reported the lowest production of 5,000 MT accounting for 2.6% of the national production.

Sorghum production is predominant in both Eastern (58,000 MT) and Western (66,000 MT) regions of Uganda. Only 3,000 MT of sorghum was produced in the Central region which is 2% of the total national production which was at 162,000 MT. (*Report on the Agricultural module, 2005/06*)

Although Finger millet production figures are higher than those of sorghum, annual sorghum production is increasing at a higher rate partly due to its relative ease of production and better threshing out-turn. Finger millet production has been declining in the recent years as a result of a decline in cotton production; millet depends on cotton for opening the land. Further, the emergency of alternative food crops, land pressure in some areas and decline in use of draught power also contribute to this trend.

Rice

Rice is increasingly an important source of income for rural households. Having been introduced in the country on experimental basis based on implementation of several rice development schemes such as Kibimba and Olweny schemes, rice is now widely grown in many parts of Uganda especially in the Eastern and Northern regions. The main reason why rice production has been readily adopted in these areas is the relatively high price fetched on the market, and the big demand for it. Because of the increasing population, especially urban populations which are the major consumers of rice, the national demand per year is far greater than the estimated production and as such Uganda continues to depend on imported rice.

The total national output for rice was at 180,000 MT according to the Uganda National Housing Survey (UNHS) 2005/06 which shows a dramatic increase from 42,000 MT recorded in UNHS 1999/2000. The production of rice was almost a one region affair with Eastern region producing 131,000 MT which accounted for 72% of national production.

Wheat

Wheat production figures over the years have remained low compared with other cereals. Due to the deliberate Government drive to increase its production to meet local requirements, the production increased to 19,000 MT in 2007 compared to 15,000 MT in 2003. In the past, wheat production used to be promoted by Uganda Grain Millers Ltd, Ankole Unga Ltd, Cooperative Unions, Fort Portal Catholic Mission and other buyers.

However, during the nineties these companies opted for imported wheat, which was relatively cheaper. They stopped providing seed, fertilizers and other inputs to the farmers. They also started paying low prices to the farmers. The reduced demand for locally produced wheat, therefore, accounts for the decline in its production. The other reported constraints in the production of wheat in addition to lack of markets and low prices, were fungal diseases, pests such as birds and termites, and high labour costs.

At the moment, wheat is grown in Kapchorwa, Mbale, Kabarole, Kabale, Kisoro and Mbarara.

Table 1: Production of Cereals ('000 tones), 2003-2007

Cereal	2003	2004	2005	2006	2007
Finger Millet	640	659	672	687	732
Maize	1,300	1,080	1,237	1,258	1,262
Sorghum	421	399	449	440	458
Rice	132	121	153	154	162
Wheat	15	15	15	18	19

Note: Estimates are of ECONOMIC production, i.e. after making allowance for post harvest losses, not of HARVESTED production.

Source: MAAIF and UBOS

Processing of selected cereals in Uganda

A. Maize

Uganda's grain marketing was liberalized since the mid 1990's. Controls on movement of Agricultural products and on pricing policy were abolished. Liberalization of Agricultural markets encouraged private traders to penetrate into rural and urban areas to buy process and export different crops. However, despite the liberalization efforts, the grain marketing system has still continued to perform poorly because the grain marketing chain has remained very long. There are many intermediaries operating between farmers in surplus producing areas and consumers in deficit areas of Uganda and neighboring countries such as Rwanda, Kenya, Sudan, Tanzania, Burundi and DRC.

The grain marketing system has been structured so that grain moves from farmers to grain assemblers, to local wholesalers, to regional wholesalers, then on through market brokers to local and regional wholesalers (in deficit areas), then to retailers and finally to consumers. The long marketing chain affects farm gate prices negatively, increases transaction costs, reduces profit margins, and increases consumer prices, the longer the marketing chain, the higher the level of inefficiency. The ware house receipt system is anew system that is coming up in a bid to eliminate the inefficiencies in the supply chain.

The Uganda commodity exchange runs the warehouse system. This system improves on the quality of the commodity. When stocks are collected and stored in the warehouse, the price drops. When the market price is low, they buy from the farmers at a boasting price. Store this stock then re-sell when the market price is higher.

This system encourages price stability for the farmers.

At the processing level, there are three observed milling channels in Uganda.

- a) Traditional milling using manual method is carried out at the homestead. It is labour intensive, but requires little cash and can easily handle a large variety of products especially for finger millet and sorghum.
- b) Custom milling, which is done by private millers in exchange for payment of milling fees, which is still the dominant form of maize processing in the country. It involves transport costs and milling charges.
- c) Commercial milling is more common in large urban areas. It has big built-in costs of purchasing, transport, grain storage, milling, packaging, storage of milling products and marketing.

Table 2: Producer prices for Maize flour (Grade 1), 2004-2007 (UGX/Kg)

Year	Quarter			
	1	2	3	4
2004	-	-	453	447
2005	419	461	454	411
2006	438	568	520	577
2007	485	461	529	613

Source: Statistical Abstract 2008

1) Profitability

The cost of milling in Uganda is based on the three categories of mills namely small, medium and large- scale millers. Details of the analysis are summarized in table 3 below for trade and custom based milling respectively.

With trade based milling, millers buy and stock grain, which they sell as milled products. In this way, millers profit by taking advantage of the price spread between seasons and the higher capacity utilization of their mills to make profit. Large scale operators with adequate capital to keep stocks for longer periods tend to profit from this strategy. Small millers who can not keep adequate grain stocks for a reasonable period were more likely to make loses.

Table 3: Costs and profitability of trade based maize milling

Parameter	Small Scale	Medium Scale	Large Scale
Selling price per metric ton	368,000	368,000	354,600
Total variable costs	416,177	356,560	301,135
Net margin per metric ton	(48,177)	11,840	53,465
Percentage margin	-13%	6%	15%

Source: Survey results, 2008

Trade based milling increases the link between processors and producers and has the potential of increasing farm gate prices by eliminating some of the profit centres created by middlemen.

Contract or Custom Milling is the most common form of commercial milling transaction, where millers process grain for a third party who may be a trader, farmer or consumer. They avoid committing funds to stocking grain and the hustles of marketing the milled products. Small millers have no choice but to engage in custom milling because of their limited capital. They actually achieve greater profitability in this way by diverting high milling loses and low quality outputs to third parties.

Although small millers have smaller fixed costs in real terms, their costs per ton are much higher because of their low milling capacities. Large processors can still also be competitive at lower capacity utilization.

Generally, the profitability of maize milling is limited and this is not likely to improve given the increase in number of mills and substitute staples. The average milling cost varies between UGX 30 and 90 per Kg, depending on milling specifications, location, and season. However, there is a noted general upward shift in milling charges following the recent crack down on power thefts. Processors concede that increased competition among millers gives them little room for increasing milling charges and that profitability will in future be mainly driven by increased efficiency and capacity utilization. It is also important to note that milling costs are generally much higher for small-scale operators both as contract and trade based millers.

Table 4: Proportion of crop sales to output, 1999/00- 2005/06

Crop type	1995/1996	1999/2000	2005/2006
Maize	44	14	52
Finger millet	18	4	29
Sorghum	23	6	18

Source: UNHS report, 2007

The general trend of the proportion of crop sales to output increased in 2005/06 compared to that of 1999/2000.

Demand trends

Demand is going up mainly because of Sudan. The demand in Sudan has caused the prices to sky rocket. At the moment the crop is bought at Ug shs 500. However Sudan does not guarantee the market.

2) Markets and Marketing for Maize

The liberalization policy adopted by government led to the determination of prices by market forces and an end to the PMB monopoly thereby introducing private participants into the marketing of maize. Traders and exporters bring their Lorries and buy maize from agents who are located in buying centres. The biggest percentage of maize sales is handled by middlemen/agents who buy from farmers at farm gate level or in rural market centres and bulk it for the big maize traders and exporters (local and foreign). Traders and suppliers in Kampala include; Mat Procurements, UMOJA Veterans Joint association, Bataaka Stores, Kafumbe Road Producer Buyers Association and Kisenyi Millers Association.

Key exporters include UNGA Millers, Tropical Commodities Ltd, SAAD Investments, MAHDVANI Oil Industries Ltd, MUKWANO Industries, MINAR Trading Ltd, Commodity Trading International; OUTSPAN Enterprises, Bencher Investments among others. The exporters are both local and foreign owned enterprises

In Uganda, maize markets can be characterised as being thin and volatile in terms of prices and trading volumes as well as the little liquidity. This absence of large well-developed maize marketing system explains the inadequacy of viable market outlets, high costs of transaction as well as minimal value addition. Hence, maize markets do not always function to the best interest of a broad cross section of participants, especially, where markets are highly segmented and access to marketing participants is greatly restricted. Besides, poor access to markets in terms of long distances, limited information flows and inadequate transportation means constrain efficient market exchanges. Negotiations between market participants are most often prolonged because contracts are not routine and standardized.

Uganda does have a comparative advantage within the region for export of maize because of good rainfall patterns and good soils. However, tapping into such regional markets requires the supply of maize at the right volumes and quality, an efficient and effective private sector performance, and prices, which can generate farmer incentives. This is further complicated by the fact that there is hardly any quality control system in place and as such there was no quality specifications being adhered to.

B. Wheat

Wheat milling is the process of grinding the wheat into flour or semolina. To make white flour, the bran and germ must be carefully separated from the endosperm. *Gluten* is the protein in wheat flour that helps yeast breads stretch when they rise. Gluten works like bubble gum. The gluten traps the air bubbles from the yeast and keeps them in the dough. The tiny holes in a slice of bread are formed by gluten bubbles. When durum is milled, the product is called *semolina* rather than flour. Semolina resembles fine sand or sugar and is a yellow or amber color. Semolina and water are mixed together to make pasta dough. The dough is kneaded and then forced through dies (metal disks with holes) to create more than 300 pasta shapes. The wet pasta is carefully dried before packaging and shipping. When good quality pasta is cooked in water, it retains its yellow color, its shape and its firmness.

In Uganda, the listed processors of wheat are; PanAfric Commodities (U) Ltd, Bakhresa Flour Millers, Uganda Grain Millers Ltd, Kengrow Industries Ltd, Mt. Elgon Millers Ltd, Bajaber Millers Ltd and Ntake Bakeries Ltd.

Table 5: Import and Export values and quantities for Wheat/ Meslin flour, 2003-2007

		2003	2004	2005	2006	2007
Imports	Value (US\$)	1,519,067	2,076,814	6,236,663	129,728	186,317
	Net weight (Kg)	4,795,302	5,774,602	1,627,903	632,011	589,964
Exports	Value (US\$)	606,532	1,315,028	457,492	1,07,802	3,526,061
	Net weight (Kg)	2,236,629	4,859,805	1,463,971	5,124,610	14,705,789

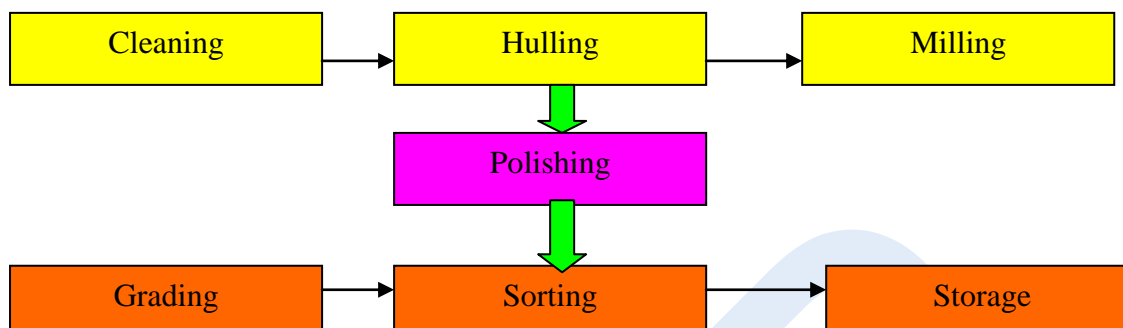
Source: UN Statistics database, 2008

2007 registered the highest net export values and quantities for wheat/ Meslin flour when compared to the other export figures over the last 5 years. Uganda has recently embarked on promoting the growing of wheat especially in the Western region districts.

The net export quantities of wheat/ meslin from Uganda are far greater than the imports, a trend which has been consistent for 2006-2007.

C. Rice

The basic goal of industrial rice milling is transforming paddy rice into white rice, while giving it a good appearance and selecting the best quality grain for human consumption. When rice is harvested, it has a non edible husk or hull surrounding the kernel. At the rice mill, all stalks and other foreign material are removed from the rough rice by a variety of specialized machinery. The processes are outlined below;



There are two levels of investment in the rice milling industry i.e. toll milling (contract milling) and Trade based milling.

1) Profitability

Toll milling involves milling rice which belongs to other parties for a fee. The investment in this case is relatively small constituting the capital costs of procurement and installation and operational costs only. The cost of mills vary from as low as UGX 5 million for small diesel engine run mills to over UGX 300 million for the larger category. Due to competition under toll milling, these mills endeavor to lower their overheads and operate at a capacity of about 30-40%. In most cases the milling fee is based on a charge per kg of rice milled currently in the range of UGX 60-100 due to the high energy charges. The margins realized range between UGX 20-40 per Kg of milled rice. The average toll milling costs and margins are shown in table 6 below

Table 6: Average toll milling costs and Margins for Rice (UGX/Kg)

	UGX/Kg	UGX/Ton
Milling charges per Kg payable	75	75,000
Cost of milling per Kg	50	50,000
Margin per Kg	25	25,0000

Source: Survey data, 2008

The trade based millers are involved in procurement, milling and marketing of milled rice. There is thus the need to access timely crop finance to procure paddy at competitive prices. The margins are significantly higher compared to merely toll milling in Table 7.

Table 7: Average trade based milling costs and margins for rice (per ton)

Price of Paddy (UGX /Ton)	450,000
Cost of Milling (UGX/Ton)	50,000
Milling Out- turn	70%
Quantity of Milled (Kg)	700
Price of Milled rice (UGX/Kg)	900
Income (UGX/Ton)	630,000
Gross Margin (UGX/Ton)	130,000

Source: Survey data, 2008

The milling costs of large millings vary greatly due to a number of factors. These have been noted to range as low as UGX 11 to UGX 150 per Kg of milled rice.

These factors include, but not limited to, automation/mechanization of operations, overhead costs, time of milling, efficiency of machinery, cost of finance and volumes of paddy and depreciation of machinery.

2) Markets and Marketing for Rice

In Uganda, the domestic rice commodity marketing is classified into two markets, namely for paddy rice and for processed rice. For paddy rice, the major potential market is the processing industry. The demand from the processing industry for paddy rice is derived from the demand for milled and polished rice, mostly in the urban areas.

The rice marketing outlets are categorized into three main stages namely primary, secondary and tertiary. The primary stage involves farmers, rural traders/ processor agents as the key players. The secondary stage consists of processors and semi-urban traders, while the tertiary stage consists of urban traders and importers. Today, the Government's role in marketing and trade is mainly facilitating the private sector. Trade policy is the responsibility of the Ministry of Tourism, Trade and Industry, while marketing falls under the Directorate of Trade, Cooperatives and Marketing.

In 2004, rice imports accounted for 50,000 MT of cereals and cereal importations which was the third or even the second largest import into Uganda, costing a staggering US \$ 12 million per year (FAO 2004b). The two major potential markets for the imported rice are for commercial processing and for household consumption.

3) Rice Imports and Exports

The main sources of imported rice to Uganda are Vietnam, Pakistan and India which together accounted for nearly 80% of total imports in 2002. Tanzania is also an important regional supplier.

Table 7: Import and Export values and quantities of semi-milled/ wholly milled rice, whether or not polished/ glazed, 2003-2007

		2003	2004	2005	2006	2007
Imports	Value (US\$)	2,977,392	4,421,490	4,502,532	1,868,717	4,987,448
	Net weight (Kg)	9,972,304	14,734,030	16,320,982	7,199,457	20,332,055
Exports	Value (US\$)	185,400	703,051	1,445,595	301,621	926,085
	Net weight (Kg)	625,430	245,329	5,733,006	926,085	1,260,466

Source: COMTRADE database, UN Statistics division, 2008

According to UBOS and FAO databases, between 1999- 2003, over 4,000MT (an average of about 889MT per annum) were exported from Uganda to Kenya. This implies that a huge opportunity exists for the Uganda's rice industry in the region if it can expand production to surplus levels.

The net imported and exported quantities of rice have been increasing over the years (Table 7 above). This can be attributed to the population growth in Uganda and hence a need to grow and more food so as to avert possible starvation.

Rice imports into Uganda are far greater when compared to the exports (20 million Kilos in 2007 compared to 1.3 million Kilos respectively). A study to strengthen the marketing of rice based on building a strong value chain for the rice industry carried out in August 2007 found that the majority of Ugandans prefer to consume imported rice because of their individual taste preferences.

Table 8: Uganda's Imports and Exports of Cereals and Cereal preparations ('000 US\$)

	2003	2004	2005	2006	2007
Import value	106,698	134,471	141,194	156,768	158,779
Export value	17,592	26,360	31,040	36,689	40,736

Source: Customs Strategic Planning Unit, URA

Uganda continues to depend on imported cereals and cereal preparations. The import values over the last 5 years have been far greater than the export values. However, the export values for these cereals and cereal preparations have been on an increasing trend from US\$ 17.6 million in 2003 to US\$ 41 million in 2007 indicating a difference of more than US\$ 23 million.

ANNEXES

A. LISTED GRAIN TRADERS AND EXPORTERS

1. Afro Kai Ltd
2. Biyinzika Traders Ltd
3. Bombo Agricultural Enterprises
4. Commodity Export International
5. Corban Ltd
6. Commodity Trading International Ltd
7. Magric (U) Ltd
8. MIG International Ltd
9. Outspan Enterprises
10. SOLOT Food Industries
11. SAAD Trading Co Ltd
12. Value Added Enterprises
13. Roka Ale Trading Company Ltd
14. UNGA Millers
15. Tropical Commodities Ltd
16. SAAD Investments
17. MADHVANI Oil Industries Ltd
18. MUKWANO Industries
19. OUTSPAN Enterprises
20. Bencher Investments

B. LISTED WHEAT MILLERS IN UGANDA

1. PanAfric Commodities (U) Ltd
2. Bakhresa Flour Millers Ltd
3. Uganda Grain Millers Ltd
4. Kengrow Industries Ltd
5. Mt. Elgon Millers
6. Bajaber Millers
7. Ntake Bakeries Ltd