Global Scientific JOURNALS

GSJ: Volume 10, Issue 2, February 2022, Online: ISSN 2320-9186

www.globalscientificjournal.com

Title: Pasta industries in Ethiopia, challenge and Opportunities

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ABSTRACT

7 local industries included in the study namely, kaliti food complex; K.O.J.J food processing complex PLC; Ahwan Food complex PLC; Asteco Food Complex PLC; Booze and Kebrone Flour Factory and food complex; Adea food complex PLC and Ahfan food complex PLC. Questionnaires needed for local industries were prepared as lead questions and the companies' heads or representatives have filled questions based on the willingness. Besides, focused group discussions have done following the lead questions lead by the researcher. Due to low volume of durum wheat grain, Ethiopian pasta industries continued to rely on bread wheat flour for pasta making by supplementing colorants and pasta zymes and affected by the huge import costs and by the recurrent shortage of hard currency in the country. Based on the study, local farmers are expanding durum wheat cultivation and providing the durum wheat grain with good quality. The weak supply chain from the producer to the factory is hurting both the producers and the industries due to the interference of brokers, inabilities of unions/cooperatives, and non-involvement of the Ethiopian Commodity Exchange.

Keywords: *Durum, Market, Industries, Pasta*

INTRODUCTION

Wheat (T. aestivum and T. durum) are the major nourishment components of the world. Millions of individuals in urban and provincial communities of Ethiopia depend on the nourishment items prepared from wheat. Bread wheat is majorly and produced for bread whereas durum wheat is majorly delivered for making pasta and macaroni. In spite of the fact that the statistics insights in Ethiopia seem not put the bread and durum wheat separately, both kinds of wheat are produced, investigate works were going on for progressing the varieties of both durum and bread wheat, and over 40 durum and 60 bread wheat varieties have been released in Ethiopia for the final 5 decades. In spite of the fact that a few of the ancient varieties are not in production due to stem rust races breakdown, later releases are way better in resistance and utilized for production. Durum wheat produced and released in Ethiopia isn't well taken by businesses due to passive value chain. Subsequently, the pasta makers have invested a lot for under-quality grain, colorants and pastazymes. Therefore, the aim of the study was to identify challenges and opportunities of pasta industry in Ethiopia.

RESULTS AND DISCUSSIONS

Based on the purposive sampling method, among 20 pasta-making industries in Ethiopia. Seven large and medium representative food complex companies have been selected.

Physical and chemical wheat quality characteristics

Both physical and chemical wheat quality parameters maters the end quality of pasta. Even though there are different standards worldwide, of these, impurity, hectoliter weight, protein content, gluten content, ash content, moisture content, and a falling number have found to be important (table 1**)**

Table1. pasta making quality parameters required by industries

Quality parameter	Acceptable by pasta making industries						
	Kaliti	**Booze**	**Asteco**	**Ahwan**	**Ahfa**	**K.O.J.J**	**Adea**
Impurity	≤10%	≤10%	≤9%	≤10%	≤10%	≤10%	≤10%
HLW	72-78%	72-80	76-78%	76-83%	72-76%	72-81%	70-78
Protein	10-12%	12%	10%	10-12%	10-12%	10-12%	>10
Gluten	>25%	32%	26-28%	30-40%	29-33%	27%	>26%-32
Ash	0.5-1%	<1%	1%	1%	<1%	1%	1%
Moisture%	12%	11.5%	12.5%	<12%	12%	<12%	<12%
Falling number	>300 sec.	280-350 sec	>300 sec.	>280 sec.	>300 sec.	>250 sec.	>300 sec.

According to the owners of the pasta factory, the weak supply chain from the producer to the factory is hurting both the producers and the industries although there is no shortage of wheat grain.

Facts that are holding back the growth of Ethiopian pasta industry, from the perspective of research and pasta manufacturers

1. Brokers

In Ethiopia, the main market system drivers are brokers. Industries bought grain through mediators (brokers). They are always suspicious of possible cheating by them. Added that brokers occasionally “skim” additional profits off the actual price that they obtain in the market as opposed to the price that they convey to the industries. This has been a source of conflict between industries and brokers or in general, every part of the country brokers has been building a strong linkage with producers in different aspects such as in religion, Ekub, family, and different social norms. The widespread use of informal mediation, rather than legal recourse, is consistent with the existence of generalized social norms that govern economic relations.

They are financially strong. Hence, brokers provide money and production inputs prior to crop harvest. The illegal or oral nature of contracts and no legal enforcement of contracts are all factors that contribute to the difficulty that industries encounter in attempting to trade directly with an unknown partner. Adulteration; mixing low quality (soft and shriveled grain) with the good grain, impurities (stone, nails, soils &others), and increasing moisture level (adding water

in few quintals) were common practices. Sometimes had a chance to get malted grains, out of the truck at unloading time.

2. Agricultural cooperatives/Unions

The establishment of agricultural cooperative /unions in Ethiopia is significantly associated with and responsible to overcome the problems that individual farmers could not solve solely. Proclamation No.47/1998 states that cooperative societies shall aim to solve social and economic problems by coordinating their knowledge, wealth, and labor (see details in FDRE 1998). Ethiopian government has also made efforts for cooperatives/union development that can be taken as opportunities. Studies showed that the growth of cooperatives in different parts of the country is increasing. Industries clams that the objective of establishment of unions was to make ease of market system through; supplying quality inputs (grains) to the industries with reasonable price. However, with unclear proclamation and rules, some of the agricultural unions are transformed to flour factories. This factually appreciable improvement and development for themselves and for the betterment of the country's industrialization-led policy. However, for pasta makers, the market system and authorization has been disturbed and discouraged.

The interferences of the government, brokers, and other development partners in decision making on matters of cooperatives, unauthorized intrusions and the use of cooperatives for political purposes by local governments, absence of an established exit strategy by cooperative initiators and supplying grains at a high price.

3. Durum wheat market is not under Ethiopian commodity exchange (ECX)

The issue was the concern of all pasta-making industries. Due to the big share of Ethiopian wheat product and role to the large society, the wheat market system should be operated under ECX like coffee, chickpea, and other commodities to ensure the development of an efficient modern trading system that would protect buyers, sellers, and intermediaries. ECX has developed strategies benefiting smallholder farmers in particular, facilitating financial and other logistics, promoting traceability in the trading system for the private traders, creating a regulatory platform for controlling the illegal traders, brokers operating in the system, and capacitating the cooperative unions in the value chain.

Only a small amount of durum wheat grains reaching the market, with the risk of being cheated. Most of the wheat grain market does not have owners; government could not collect tax from a huge resource. ECX also developed a new method of exchange; a marketing system that coordinates better links faster and protects both sides of the trade. It is a modern trading system based on standard crop contracts, establishes standard parameters for commodity grades, transaction, size, payment and delivery, and trading order matching, while at the same time, preserving the origins and types of crops as distinct unlike the previous (Dejen and Mathews 2016).

4. Making pasta from bread wheat flour

A quality pasta product begins with high-quality raw material. Durum wheat (*Triticum durum*) is ideally suited for pasta because of its unique properties like relatively high yellow pigment content, low lipoxygenase activity, and high protein content favorable for good cooking quality (Aalami et al., 2007). The dough made from durum wheat semolina ideally suited to the pasta manufacturing process. The content and composition of proteins, gluten strength, in particular, are important for the cooking quality of pasta Durum wheat had been cultivated in Ethiopia for thousands of years, although it has gradually been displaced by bread wheat. However, the demand for pasta has shown steady growth. “The high demand of the pasta factories estimated to be between 1000 to 1500 quintals per day. According to Ethio-Italy project unpublished report (March 2019), in three Zones of Oromia (Bale, West Arsi, and Arsi), small- and large-scale farmers could able to produce 2.3 million quintals main production season. This ensured that Ethiopia can export durum wheat to the world market.

The survey result depicted that; few pasta makers are seeking bread wheat flour for pasta making due to; 1) In the milling process durum wheat takes long conditioning time (24 hours) than bread wheat (17 hours). 2) Intervention of new technologies (enzymes), some pasta makers are using new enzymes which enabled pasta makers to make pasta only from bread wheat flour (soft wheat).3) Soft wheat relatively has a low price. 4) No national policy or rules which enforce pasta makers to make pasta only from durum wheat. 5) Limited awareness of customers about quality products; industries have high market demand; they can sell both high quality and poor quality at the same price. This has been a challenge for the durum wheat value chain and value through the above-mentioned reasons.

5. Pastazym as a quality booster

Economically speaking, the use of soft wheat flour for pasta production could be advantageous; however, the poor sensory attributes and cooking quality of such products have dictated that durum semolina be used. Attempts to overcome the poor quality of non-conventional pasta have primarily relied on the use of additives and enzymes (Bergman et al., 1994). Haber et al. (1978) found an increase in soft wheat farina pasta firmness. Bergman et al. (1994) conducted experiments to develop high-temperature-dried soft wheat pasta supplemented with cowpea and estimated its cooking quality, color, and sensory characteristics. During pasta cooking, there is competition between starch and protein for water (Pagani, 1986). Also, when less protein surrounds starch granules, they swell and gelatinize faster. Thus, it is postulated that legume addition, along with its greater amount of protein, results in slower starch swelling and, subsequently, a longer time requirement for gelatinization to occur, resulting in a longer cooking time

The disadvantage of pasta zymes

1) Affects allergens protein profile
2) Low immune reactivity
3) Lower sensory attributes
4) Low firmness, cream color, and taste

6. Color additives as a colorant

A yellow color additive is any dye, pigment, or substance which when added or applied to pasta of imparting color to satisfy consumer expectations (yellow pasta). Color is one of the most significant factors that directly affect consumers' food choices and eating desires. Color that affects taste recognition and product acceptability might have an influence on both actual and perceived nutritional value of food Color additives are used in foods for many reasons (Martins et al., 2016). Hence, Ethiopian few pasta makers are using colorants on bread wheat flour to make pasta yellow.

However, colorants can cause reactions such as, digestive disorders – diarrhea and colicky pains; nervous disorders – hyperactivity, insomnia and irritability; respiratory problems – asthma, rhinitis and sinusitis and skin problems – hives, itching, rashes and swelling (https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/food-additives)

Table 2. Some Ethiopian Pasta making industries profile

Industry name	Year of establishment	Address	Product Name	Output per day(qt)	Customer
Kaliti food complex S.C	1930	A.A	Ceralia & Knick knack	1500	Organizations and retailers
Asteco food complex L.C	2004	A.A	Tena,Altan &Shafe luka	1200	Organizations and retailers
K.O.J.J food complex L.C	1994	A.A	K.O.J.J	1400	Organizations and retailers
Kebrone complex L.C	2001	A.A	Booze	1000	Organizations and retailers
Booze food complex L.C	2001	A.A	Booze	1000	Organizations and retailers
Ahfa food complex L.C	NA	A.A	Oche	250	Organizations and retailers
Adea food complec	NA	Debre zeit	Adea	NA	Organizations and retailers
Ahwan food complex L.C	2001	Adama	Ahwan	NA	Organizations and retailers

Table 3. Potential wheat supplier areas for pasta makers.

Area	Quality property	Impurity level	Remark
Arsi	Good protein and Hard	<10%	Very good
West Arsi	Good protein and Hard	<10%	Very good
Bale	Good protein and Hard	<10%	Very good
Minjar	Very hard and high protein	<2%	Excellent
Ejere	Good protein and Hard	<10%	Some pocket areas
Arsi Negele	Good protein and very hard	<10%	Belg season wheat does not have good quality.
Western Hararge	Good protein and Hard	<10%	Excellent
Northern Somali	Very hard and high protein	<5%	Excellent
East Gojam	Hard and good protein	10-15%	Red color of soil has bad effect on the pasta quality

North Shewa	Hard and good protein	10-15%	Dust (threshed on traditional '*awudma'*)
Meskan/Mareko	Very hard and high protein	<10%	Very good

CONCLUSIONS

Seven large and medium representative food complex companies have been selected. The purpose of the study was to identify challenges and opportunities of pasta industry in Ethiopia. Due to low volume of durum wheat production in Ethiopia, industries still relied on soft and hard bread wheat flour by using pastazymes and colorants. Brokers, mis-use of unions/cooperatives, market systems and use of expensive additives were major factors which affected of the growth of Ethiopian pasta industry.

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