**THE USE OF BITTERLEAF (VERNONIA AMYGDALINA) EXTRACT AS A MEANS OF EXTENDING THE SHELF-LIFE OF LOCALLY BREWED SORGHUM BEER**

**CHAPTER ONE**

**1.0 INTRODUCTION**

**The word beer derives from the Latin word bibere meaning to drink (Okafor, 2007). Beer is the world’s oldest and most widely consumed alcoholic beverage and the third most popular drink overall after water and tea. Grossman (1995) defined beer as a general name given to beverages resulting from the germination of a malt or cereal grain. The process of brewing beer is called brewing. It is produced by the brewing and fermentation of starches mainly derived from cereal grains most commonly malted barley, although wheat, maize (corn), and rice are widely used (Gutcho, 1976). In Nigeria today, barley has been replaced by some locally grown cereals such as sorghum or guinea corn, millet and maize as the principal raw materials. The tropical beers (African local beers) are known by different names in different part of the world; burukutu, otika and pito in Nigeria, maujek among the Nandi’s in Kenya, mowa in Malawi, kaffir beer in South Africa, merisa in Sudan, bouza in Ethiopia and pombe in some parts of East Africa (Okafor, 2007).**

**Burukutu is an indigenous alcoholic beverage. Burukutu, a popular alcoholic drink among indigenes of the middle belt region of Nigeria, is a local brew made from fermented sorghum and other protein enriched grains (Ekundayo, 1969). The age long drink, also known as BKT, serves as a source of alcohol for those who lack the financial means to patronize refined brew like beer and other foreign or imported drinks it is produced mainly from the grains of guinea corn (Sorghum vulgare and**

**Sorghum bicolor). The process of production of burukutu involves malting, mashing, fermentation and maturation as described by Ekundayo (1969).The production process of these indigineous drinks involves fermentation at its initial production stage and comes out as an alcoholic drink. The microorganisms associated with fermentation include Saccharomyces cerevisiae, Saccharomyces chavelieria and Leuconostocmesteroides (Faparusi et al., 1973).**

**Sorghum is a large variable genus with many cultivars (Ettasoe, 1972). The method employed in brewing sorghum beer here involves, malting, mashing, wort boiling with hops, fermentation, (using brewer’s yeast and bakers yeast) and packaging. The tropical sourced hop extracts used here is Vernonia amygdalina (Bitter leaf) which have been found to contain an anti bactericidal agent which is capable of extending the useful life of these indigenous beers (Okoh et al., 1999).**

**Chemical analysis on the prepared sorghum beer such as; ethanol content, PH value, specific gravity, fixed acidity, total acidity, total dissolved solids (TDS), total suspended solids(TSS) were analysed quantitatively, using different methods.**

**1.1 AIMS AND OBJECTIVES**

**The aim of the project is itemized into the following objectives;**

**1. To determine the shelf-life of locally brewed sorghum beer.**

**2. To check the effect of bitterleaf (Vernonia amygdalina) extract on the locally brewed sorghum beer.**

**3. To compare the results from the chemical analyses of locally brewed sorghum beer with bitterleaf extract and sorghum beer brewed with hop.**

#  STATEMENT OF THE PROBLEM

Worldwide the brewing industry is becoming more competitive and constantly looking for ways to improve beer quality and reduce manufacturing costs. In tropical countries, barley has to be imported from other temperate countries and this involves expenditure of scarce foreign exchange. Pearl Sorghum is a new potential substitute for barley which can be used as an alternate substrate and also raise economic benefits. With the continued increase in the Nigerian and western African population great emphasis has been placed throughout the region on increasing the production of beer, improving their nutritional qualities.

Celiac disease is a lifelong digestive disorder caused by a reaction to gliadin, a gluten protein found in wheat (and similar proteins of the tribe Triticeae which includes other cultivars such as barley and rye) and also known as gluten sensitive enteropathy (GSE). Upon exposure to gliadin, the enzyme tissue transglutaminase modifies the protein, and the immune system cross-reacts with the bowel tissue, causing an inflammatory reaction.

That leads to flattening of the lining of the small intestine. This interferes with the absorption of nutrients because the intestinal villi are responsible for absorption. One out of 133 people in the United States is affected with celiac disease and the only effective treatment is a lifelong glutenfree diet (Celiac disease foundation, www, 2009). Therefore, pearl Sorghum beer could be one choice for the celiac patient and the technique for pearl Sorghum beer production must be investigated under this research.

There are other drivers, which have the potential to increase pearl Sorghum usage. Very recent research efforts have concentrated on developing alternative beers and cereal-based beverages with the aim of fulfilling current consumer’s health needs and expectations. Both traditional and non-traditional adjunct materials will in the future play an important role in their recipe formulations are gluten-free beers and health promoting functional beers Therefore, the fulfillment of this data would be necessary to perform and it will be useful for further brewing of 100% pearl Sorghum as a gluten-free beer for celiac patient.

# SIGNIFICANCE OF THE STUDY

The beer made of Pearl Sorghum and sorghum is highly valuable in semi-arid regions because of their short growing season and higher productivity under heat and drought conditions. Both pearl Sorghum and sorghum grains are nutritionally comparable and even superior to major cereals with respect to protein, energy, vitamins and minerals. They are also a rich source of dietary fiber, photochemical and micronutrients.

For commercial brewing much of the malt used in Nigeria country is from barely**.** Since barely cultivation in Nigeria region is not generally economically feasible, the barley malt used in mostly imported from overseas which makes it very expensive ,therefore pearl Sorghum could be an alternative for increasing malt availability for both traditional and industrial use at low cost in Nigeria.

Among this, the low price beer made with adjunct was accounted at least 80% due to the economic problems made consumer chose them. Therefore, the low price beer is the favorite product and the alternative sources of carbohydrate are attractive for brewery. Utilization of pearl Sorghum and sorghum for novel product development will help in diversifying their use which will be beneficial for human health and increase profits to farmers. However, there is a need to popularize the new products developed from pearl Sorghum beer. Worldwide, the brewing industry is registering growth in both volumes and profits year on year. The potential for the industry to grow has become unquestionable.