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## Nutritional and therapeutic properties of barley broth (Talbinah): recent updates

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### ABSTRACT

Barley broth (Talbinah) is prepared by combining barley syrup, milk, and honey. The Prophet Mohammad (PBUH) recommended Talbinah for sadness and heart relief in sorrows. Talbinah has a promising nutritional and therapeutic impact on human health. It is a rich source of many nutrients and some bioactive moieties. Regular consumption imparts in maintaining better gut and acts as anti-depressive, anti-diabetic, anti-oxidant, anti-inflammatory, anti-diabetic and antihypercholesterolemic. Moreover, it is the most effective food for supplying nutrients and removing toxins from human cells. In this review, the production technology, nutrition, therapeutic potential, proposed prospects, role as a functional food and current knowledge on the subject have been discussed comprehensively. Conclusively, Talbinah as functional food could be a way in preventing various health maladies.

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## Introduction

Bio-preservation is gaining popularity as a sustainable way to extend the duration of consumption and ensure the quality standards of food products. The use of bioprotective for hygienic safety is a promising technique, but it can only be used in conjunction with good production, packaging, storage, and delivery practices. Because of their protection for humans and the presence of microorganisms during storage in food products, Lactic Acid Bacteria (LAB) has shown a positive role for use in bio-preservation foodstuff. Organic acids, diacetyl, hydrogen peroxide and bacteriocins are antimicrobial metabolites and these metabolites are manufacture by LAB. These antimicrobial actions can help to ensure microbiological protection by inhibiting pathogenic bacteria and regulating the development of other microorganisms such as *Listeria monocytogenes* and *Clostridium sp.* Probiotic cultures have been used widely in milk products such as milk, yogurt, and cheese for their nutritional and therapeutical benefits.<sup>[1]</sup> The dairy industry has widely used probiotic bacteria as a method for the manufacture of nutritional and therapeutical products. Different lactic acid bacteria have been used because of their tolerance to host gastrointestinal conditions, adhesion to host intestinal epithelium, and prevention of pathogenic microorganisms' production or penetration into the animal intestine.<sup>[2]</sup> *L. gasseri* followed by *L. reuteri* was able to minimize fungal growth in barley broth (Talbinah).<sup>[3]</sup> The health effects of probiotic bacteria on gastrointestinal diseases, lactose metabolism, serum cholesterol reduction, immune system activation, antimutagenic properties, anti-cancer properties, anti-diarrheal properties, improvement in inflammatory bowel disease, and suppression of *Helicobacter pylori* infection through adding

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chosen strains to food items.<sup>[4]</sup> For the removal of aflatoxins and other mycotoxins probiotics, bacteria have been used widely. Recently in some studies, *Lb. gasseri*, *Lb. reuteri* were added to Talbinah to produce Probiotic barley broth (Talbinah) having a longer shelf life.<sup>[5]</sup> Barley broth acts as an anti-inflammatory, antiseptic and absorbent agent. Furthermore, it is also effective for tackling gastrointestinal discomfort.

The findings of studies depicted that Unhappiness is linked to the deficiency of vitamin B. Talbinah is a rich source of vitamin B. Vitamin B is helpful in the nervous system for producing various chemicals that ultimately affect the mood and psychological expression in humans. This may understand why the prophet Mohammed, grace be upon him, said that Talbinah takes away some of the sorrow. Talbinah is an Arabic word derived from the word “Laban” which means yogurt, and it may also refer to barley grains that have reached the milky level, so the inside of these grains is white and liquid resembling milk. Since our bodies cannot store B vitamins, they must be consumed regularly. It is evident from various scientific research that barley and barley products help prevent cardiovascular diseases.<sup>[6]</sup> Buffalo milk isn't regularly served around the world. It does, however, several health benefits, including promoting bone growth, stimulating circulation, protecting the heart, and lowering blood pressure. Buffalo milk is rich in vitamins A and B, which are essential for our immune system and body protection to function properly. Zinc and certain other trace minerals have a variety of antioxidants that act as immune system boosters.<sup>[7]</sup>

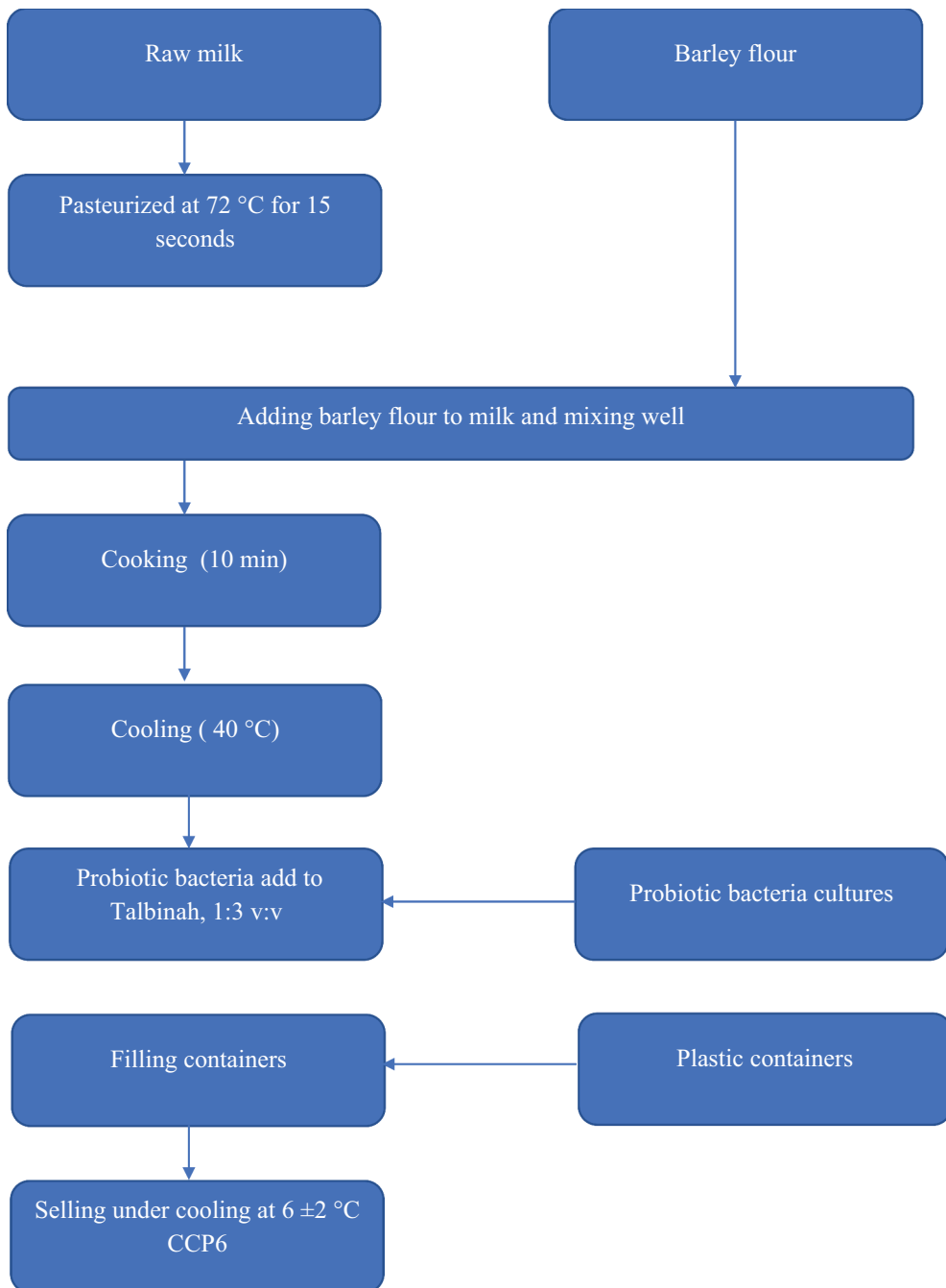
Studies have shown that Barley broth (Talbinah) is the food item by which mood and depression reduces.<sup>[8]</sup> Mood and cognitive function are influenced by macronutrients and micronutrients. Wurtman hypothesized that eating more carbohydrates is related to feeling less stressed and getting more capacity.<sup>[9]</sup> Carbohydrate consumption stimulates serotonin production by increasing insulin release, which promotes amino acid reuptake in plasma. Barley broth (Talbinah) rich in phytonutrients has been linked to its ability to defend against certain forms of cancer, cardiovascular disease, arthritis, diabetes, and hypercholesterolemia. It also enhances cellular energy to maintain the body in a state of homeostasis. As a consequence, the brain's supply of tryptophan increases, which is metabolized to serotonin.<sup>[10]</sup> The main objectives of this investigation were to determine the nutritional and therapeutic properties of barley broth (Talbinah) in human beings.

## Historical background

Aisha, the widow of the Prophet Mohammed (PBUH), used to prescribe Talbinah for the depression and also recommended of the people of bereft after the death of a loved one. “I heard the Messenger (PBUH) say, “The Talbinah brings rest to the patient's heart and makes it active, relieving some of his sorrow and grief.”<sup>[11]</sup> Among Arabs, Talbinah food has been used to relieve depression. Since barley can be used in a variety of healthy eating items, there has been an increase in research interest in its use in a variety of food applications in recent years.<sup>[12]</sup> Barley flour can be used in the manufacturing of different food products and is also used as a traditional Arabic, Kurdish, Persian, and Turkish food item including Talbinah, kashk and murri. Barley soup is usually served during Ramadan in Saudi Arabia. Barley has long been a staple food in Northern and Eastern Europe, as well as Asia. Behind wheat, maize, and rice, the fourth most important cereal crop is barley (*Hordeum vulgare* L.) and it ranks among the top ten crop plants on the planet.<sup>[13]</sup>

## General overview

Probiotic barley broth (Talbinah) is prepared by adding barley flour to the milk mix well then cook it for 10 to 15 mins. Adding probiotic bacteria (>10<sup>7</sup> CFU/g) to the mixture of Talbinah. The nutritional composition of barley broth (Talbinah) is mainly dependent on honey, milk and barley. All these are good sources of vitamin B (cobalamin, riboflavin, and pyridoxine), nutrients, glucan,



**Figure 1.** Process flow chart for Pro-Talbinah.

and antioxidants. The processing of Pro-Talbinah is revealed in [Figure 1](#). Final product with acceptable specifications, the sequence and relationships of all stages of Pro-Talbinah processing were obtained.

Fresh milk contains hazardous substances like pathogenic hazards (microorganisms), chemical hazards (antibiotics residues, pesticide residues and mycotoxins) and physical hazards (foreign material).<sup>[14]</sup> Pathogenic microorganisms such as *Campylobacter jejuni*, *L. monocytogenes*,

*Salmonella spp.*, and *Yersinia enterocolitica* have been found in milk in many surveys. Any of these pathogenic microorganisms can be found in the skin and gastrointestinal tracts of food-producing animals, as well as in the farm climate. During the milking process, these pathogens may invade milk products.<sup>[15]</sup> Bacteria from four genera, *Campylobacter spp.*, *Salmonella spp.*, *E. coli*, and *Listeria monocytogenes*, have been related to the majority of food poisoning.<sup>[16]</sup>

Animal feed is contaminated by various types of aflatoxins. Aflatoxin type-B1 is converted to M1 after absorption in the liver by the hepatic microsomal cytochrome P450.<sup>[17]</sup> If this milk is not properly treated, it causes various health issues in babies, children and adults. This type of aflatoxin cause nervous systems disorder, skin problems and cancer.<sup>[18,19]</sup> Antibiotic residues can inhibit the action of probiotic bacteria, lowering the quality of the finished product.<sup>[11]</sup>

Pasteurization is a vital step in the production of milk products because it reduces the amount of spoilage microorganisms obtained from raw milk, reduces public health risks from pathogenic microorganisms, and increases the shelf life of products by destroying all microorganisms present in fresh milk. High-Temperature Short Time (HTST) Provides the minimum temperature-time conditions at 72°C for 15 sec to fresh milk.<sup>[15]</sup> Establishing management protocols, such as maintaining the correct temperature and keeping time, should be used to monitor pasteurization performance.<sup>[20]</sup> Cross-contamination in pasteurized milk is very dangerous and must be avoided since the primary sources of contamination are air, water, appliances, humans, utensils, cultures, and packaging.<sup>[11]</sup>

The presence of *Penicillium spp.*, *Alternaria spp.*, and *Cladosporium spp.* was reported in barley samples. Barley affected with fungi increases the chances of contamination by mycotoxin under warm climatic conditions. During milling, one or more mycotoxins may contaminate barley flour. Barley flour must be free from mycotoxins. These Lactic acid bacteria strains of *Lb. gasseri*, *Lb. reuteri* were applied to the Pro-Talbinah production. The purity of the strains is considered an essential step in case of impurity of these LAB strains may harm the final product's consistency, resulting in slower acid production and a higher amount of moisture.<sup>[11]</sup> Filling containers must be clean because any disruption in them or the occurrence of harmful residues in them will contaminate the finished product. Since goods may be infected by various fungi and/or microorganisms at higher temperatures, keeping them at 62°C throughout their shelf life is critical.<sup>[11,15]</sup>

### Nutritional composition

Barley broth (Talbinah) is honey-sweetened barley syrup cooked with milk. It is a well-known natural remedy as well as a nutritious breakfast meal.<sup>[10]</sup> It is an Arabic term that was given to it because of its nutritional composition. Nutraceuticals, or functional diets, have sparked a lot of curiosity in the last ten years.<sup>[21]</sup> Barley broth being the source of micro and macronutrients has high nutritional value as can be seen in Table 1. Furthermore, fermentation of stuff has a positive impact on the nutritional profile of barley broth.<sup>[22]</sup> Some important aspects of nutritional importance are summarized as follows:

Tables 1 and 2 recorded the chemical composition percentage of barley grains powder and the mineral contents in dry bases. The obtained data results showed that 11.9% of moisture, 8.8% protein, 2.6% fat, 3.8% crude fiber, 81.85% carbohydrate, 2.85% ash and 386.74 kcal energy as macronutrients

**Table 1.** Nutritional value of Talbinah.

Talbinah	Protein (g)	Fat (g)	CHO (g)	Calorie's (kcal)	Zn (mg)	Mg (mg)	Na (mg)	K (mg)
cup (200 ml)	7.7	12.5	27.8	254.5	6.7	122.8 5	523.4	1428.2
2 cups (400 ml)	15.4	25.1	55.7	510.3	13.4	245.5 1	1046.8	2856.5

**Table 2.** Macronutrients (%) and minerals contents (milligram/ 100gram) in dry barley grains.

Moisture %	Crude Protein %	Crude Fat%	CHO %	Caloric (Kcal)	Zn (mg)	Mg (mg)	Na (mg)	K (mg)
11.90	8.8	2.7	81.85	388.75	5.67	1.8	47.25	3.2

and caloric value. While, micronutrients recorded 8.41 mg iron, 5.67 mg zinc 1.8 mg manganese, 47.25 mg sodium and 3.2 mg potassium/100 g of barley grain powder. Whole barley grains are rich in soluble fibers as  $\beta$ -glucans and pectin, which are useful in the reduction of the glycemic index (GI).<sup>[23]</sup>

Buffalo milk is high in vitamins A and B, which are essential for the proper functioning of our immune system and body defense. Zinc and other trace minerals contain several antioxidants that help to strengthen the immune system. Buffalo milk is not commonly consumed around the world. However, it has numerous health benefits, including promoting growth, strengthening bones, stimulating circulation, protecting the heart, and lowering blood pressure. Serum ferritin levels can be used to diagnose iron deficiency and excess. Since iron deficiency may occur before anemia develops, detecting iron depletion is critical in the treatment of nutritional anemia. The calculation of serum iron, total iron-binding potential (TIBC), and transferrin has historically been used to estimate iron stores in patients. Many researchers have confirmed the use of Talbinah in recipes.<sup>[24]</sup>

Honey consists of a complex mixture of sugars especially fructose and glucose. Honey has antioxidant and antimicrobial properties. Natural honey reduced plasma glucose, homocysteine, and blood lipids in diabetic patients.<sup>[25]</sup> Owing to its nutritional composition, honey is added in barley broth as a natural sweetener.

## Therapeutic properties

### Anti-Microbial activity

Lactic Acid Bacteria are considered essential microbiota components that perform a wide range of health-promoting functions. *Lactobacillus* strains have long been used as probiotics and functional ingredients in a variety of foods. In comparison to Talbinah samples treated with UHT milk, fresh milk samples were heavily polluted by fungi. Filamentous fungi are not found in UHT milk, since fresh milk is treated to 135°C for few secs to kill all types of microorganisms. Furthermore, UHT treated milk is often referred to as “long-shelf-life milk” and it is also kept at room temperature (unopened) for longer periods. Oppositely, raw milk may have many hazardous substances, which could hinder LAB growth in dairy goods. The microbial quality of foods items is influenced by conditions, especially temperature, and excessive storage temperature may increase the growth of microorganisms.

Another study showed that different varieties of bacteria and their multiplication in numbers during usage play a vital role as a preservative agent, extending the shelf life of Talbinah. Talbinah with a total bacterial count of *L. gasseri* or *L. reuteri* had over 107 CFU/g (7.00 log<sub>10</sub> CFU/g) after processing. In barley broth Talbinah, *L. gasseri* and *L. reuteri* can decrease and/or delay fungal infection or contamination. These results may be attributed to the bacteriocins gassericin A and reuterin 6 being generated by *L. gasseri* LA39 and *L. reuteri* LA6, respectively. The antimicrobial activity of the bacteriocin gassericin A. was the strongest against *Listeria monocytogenes* and *Staphylococcus aureus*, which are gram-positive food-borne pathogenic bacteria. *Lactobacilli* growth increased during the production of the storage period at 6 ± 2°C, according to previous analysis. The lower LAB count (ratio 1:3) estimated 7.681 and 7.301 log<sub>10</sub> CFU/g after 7 days of storage for *L. gasseri* and *L. reuteri*, respectively. The shelf life of samples processed by *L. gasseri* and *L. reuteri* was reduced to 14 and 7 days by using a higher LAB count (ratio 1:1). When storage temperatures are increased at 12 ± 2°C, the fungal count in processed also increased in Talbinah. The total viable count of *L. gasseri* and *L. reuteri* continuously increased in Talbinah during the storage period as shown in Table 1. Increasing storage temperature to 12 ± 2°C increased total fungal count and greatly changed fungal profile. In Talbinah use of probiotics may stop the activity of common food spoiling agents like fungi.

Fungi pose some open challenges for the bio-preservation of foods. The storage temperature was also found to be the most important factor influencing the preserving action of LAB in the product, which is higher at  $6 \pm 2^\circ\text{C}$ , followed by the amount of Lactic Acid Bacteria used, which is dependent on the bacteriocin's preservation action.<sup>[5]</sup>

### **Anti-Carcinogenic**

According to epidemiological evidence, diet/lifestyle is responsible for 20–80% of human cancer mortality. Dietary factors, especially those that reduce the impact of reactive oxygen species, can protect DNA and boost the immune system, lowering cancer risks. Talbinah comprises bioactive compounds that have antioxidative and immunomodulatory properties and are related to cancer prevention. The majority of Talbinah's carcinogenesis chemoprevention studies have been in vitro and have primarily focused on the effect of barley fiber, especially  $\beta$ -glucan, on disease moderation. Investigated Germinated barley foodstuff (GBF), a prebiotic heterogeneous mixture of approximately 80% hemicellulose and insoluble glutamine-rich protein fiber, has anticarcinogenic properties. GBF also includes phytochemicals in the form of free or bound phenolic acids, which contribute to its health benefits.<sup>[26]</sup> On the impact of different fiber-rich sources from wheat and barley in diets on tumor incidence, tumors burden, tumor mass index, and dimethyl induced tumors, dietary insoluble fiber from barley was found to be more successful than other soluble fiber-rich commercial bran from barley.<sup>[27]</sup>

Polyphenols can also have more health benefits than previously believed, such as improved endothelial function, improved cellular signaling, and critical intestinal defense from undigested polyphenols associated with fiber, according to new studies. Barley's high content of phenolic compounds indicates that it may be a good source of natural antioxidants with antiradical and antiproliferative properties in the diet. Barley broth (Talbinah) has been shown to have tumor-inhibiting properties in many studies. It can inhibit large bowel carcinogenesis.<sup>[28]</sup>

### **Antidepressant**

Depression is not only one of the most commonly recognized mental illnesses, but it has also been linked to an increased risk of cancer, dementia, obesity, diabetes, high blood pressure, atherosclerosis, epilepsy, and stroke. Glutamatergic and cholinergic receptors play an important role in the pathophysiology of depression.<sup>[29]</sup> Talbinah is a high carbohydrate product, and there was a positive response by carbohydrates consumed with depression or mood. This may be due to carbohydrates' impact on serotonin synthesis. Other studies have also discovered a connection between zinc deficiency and depression. This deficiency was overcome by the consumption of Talbinah.<sup>[30]</sup> Zinc serum levels are inversely proportional to depressed patients.<sup>[31]</sup> Thus, the zinc content of 5 mg per serving in Talbinah is present. Increasing zinc content in the diet may have also helped to alleviate depression. Magnesium, in the Talbinah (125–300 mg/day) recommended, can help in the rapid treatment of depression. Talbinah had a magnesium content of 14.4 mg per serving. Talbinah had an important impact on reducing depression and improving mood, according to the findings of the study. According to the literature review, Talbinah's nutritional composition, especially its high dietary fibers, differential amino acid ratio, zinc and magnesium content, may be the cause of this health benefit. Prophet Mohammed, heaven be upon him, used to prescribe Talbinah to relieve depression and stress. Folic acid and B vitamins also play pivotal roles in depression and dementia.<sup>[32]</sup>



### **Anti-Diabetic**

Non-starch polysaccharides, resistant oligosaccharides, lignin, and lignin complexes in plants are forms of dietary fiber, as are other analogous carbohydrates such as resistant starch, dextrins, and synthesized carbohydrate compounds such as polydextrose.<sup>[33]</sup> Dietary fibers can be found in abundance in cereals, fruits, and vegetables.<sup>[34]</sup> Regular dietary fiber consumption has been shown in research to help prevent several nutritional disorders, including cardiovascular disease, type 2 diabetes, and obesity.<sup>[34,35]</sup> Barley is a source of dietary fibers, particularly soluble fibers and pectin. Studies showed that the glycemic index (GI) and insulinemic response (GII) were reduced due to b-glucans present in barley. The b-glucans in the gastrointestinal tract prevents a-amylase from breaking down starch, by which b-glucans reduce the postprandial glucose level.<sup>[36]</sup> Furthermore, solubilized b-glucans were found to be linked with the health benefits such as decreasing blood serum cholesterol and controlling blood glucose levels in the gastrointestinal tract.<sup>[36]</sup> The consumption activity of barley was studied, and the results showed that barley consumption improved liver cells.<sup>[12]</sup> The majority of the results revealed that when barley was germinated, its apparent weight and b-glucans activity increased, study reveals that germination compacts the grains, which is related to an increase in anti-diabetic activity in human beings.<sup>[24]</sup>

### **Antioxidant activity**

Antioxidants have been one of the most critical attributes in the human immune system due to their high concentration of free radicals in food and after food intake. The nutritional composition of Talbinah has also been examined, including total antioxidant activity.<sup>[37]</sup> Not only barley in Talbinah increase the bioavailability of different minerals, vitamins, and dietary fibers, as well as the nutritional profile of the grains, but it also boosts some antioxidant factors.<sup>[38]</sup> Polyphenols are the most common form of phytochemicals contained in plant-based foods, and they've been linked to a variety of health benefits. As a result, because of their antioxidant properties and dietary polyphenols in Talbinah have gotten a lot of attraction from nutritionists, food technologists, and consumers.<sup>[39]</sup>

### **Immune system booster**

Talbinah can boost the immune system. Numerous studies have shown that fermented products generated by LAB can improve the specific immune system in both animals and humans. These probiotic microorganisms can work in two ways: they either directly perpetuate live microbial cells or indirectly provide useful properties by producing metabolites in a system that function as bioactive compounds. Biogenic are beneficial food components that emerge from the metabolic activities of microflora and have some health significance without depending on native intestinal bacteria's microbial activity, while disturbances in gut microflora function may lead to the production of a broad range of diseases.<sup>[40]</sup> Different studies have looked into the impact of probiotic bacteria on immune system activation. A variety of LAB species and strains has been evaluated for their ability to remove aflatoxins and other mycotoxins from an aqueous solution of food products. Talbinah contains probiotic bacteria that have been shown in research to help the immune system. The milk used in Talbinah is rich in vitamins A and B, which are essential for our immune system and body protection to function properly. Antioxidants contained in zinc and other trace minerals help to improve the immune system.<sup>[41]</sup>

### **Anti-Hypocholesterolemic**

High cholesterol diets cause brain damage by promoting inflammatory and oxidative reactions that trigger neuronal apoptosis, as shown by increased iron and homocysteine levels. This leads to neurodegenerative diseases like Alzheimer's disease, stroke, and vascular dementia.<sup>[42]</sup> As well as, a high-cholesterol diet induces substantial dysfunction of brain functions, as determined by dopamine,



serotonin, and -aminobutyric acid neurotransmitters loss, which is consistent with dopamine and serotonin depletion in the striatum and cortex of hypercholesterolemic mice, respectively. Individuals that are deficient in serotonin may be more prone to impulsive violence.<sup>[43]</sup>

Phospholipids are abundant in the brain and play a role in signal transmission. Talbinah contains phospholipids, which transmit signals and relay from the membrane to cell compartments. Changes in phospholipid levels can lead to various pathogenic processes, such as Alzheimer's disease, depression, mood and anxiety.<sup>[44]</sup> The levels of analyzed phospholipid were substantially lower in the brains of people who consumed a high-cholesterol diet, close to findings in the hippocampus of Alzheimer's patients.<sup>[45]</sup> When Talbinah was applied to a hypercholesterolemic diet, it enhanced the assayed cerebral biochemical analysis. Numerous studies have shown that whole grains like oats and barley can help lower blood cholesterol levels due to their high soluble fiber content.<sup>[46]</sup> Barley has many important components, such as phenolic, flavonoids, and phytochemicals that have good antioxidant, antiproliferative, and cholesterol-lowering properties, so it can help prevent diseases like total stroke by raising HDL cholesterol medium and small particle levels.<sup>[47]</sup>

### ***Gastrointestinal proliferation***

The high viscosity of barley  $\beta$ -glucans inhibits  $\alpha$ -amylase from breaking down starch, which is believed to be the process by which  $\beta$ -glucans suppress the glucose reaction in the gastrointestinal tract. Moreover, the quantity and quantity of solubilized  $\beta$ -glucans in the gastrointestinal tract were shown to be associated with the health benefits.  $\beta$ -glucans have a variety of health benefits like lowering cholesterol levels and controlling blood glucose levels.<sup>[24,48]</sup> Honey in barley broth formulation can help to reduce plasma glucose, homocysteine, and blood lipids in diabetic patients.<sup>[49,50]</sup> Talbinah is an ancient traditional food that was recommended by the Prophet Mohammad (SAW) for its nourishing benefits in the treatment of seven diseases (Hadith), including sorrow, high cholesterol, heart disease, and hypertension. It acts as a good diuretic because can remove toxins from the body. It has the characteristic to excrete out toxin substances from the body by eliminating toxins, this mechanism is good for human health.<sup>[11]</sup>

### ***Effect of Talbinah on mood***

Talbinah has the potential to reduce depression and enhance mood among the subjects. Ingestion of functional foods such as Talbinah may provide a mental health benefit to elderly people. Total mood disturbances were significantly reduced by Talbinah. This is most likely due to Talbinah high nutritional value and sweetness; all of these have been shown to boost mood. Talbinah is recommending for those most patients that are deficient in nutrients e.g., magnesium, and zinc. The positive effects of Talbinah on mood may be attributable to these increased intake amounts.<sup>[10,32]</sup> Barley broth macronutrients and micronutrients affect mood and cognitive function. Higher intake of these nutrients is associated with less depressed feelings and more energy. So, Talbinah food has been used to relieve depression.

### ***Future prospective***

More research is needed to ascertain the cause of Talbinah's beneficial impact on depression and mood that is associated with high carbohydrate content or zinc content. Other research is needed to ascertain the efficacy of Probiotic Talbinah on mild, moderate, and severe depression levels by using more quantitative approaches of mood and depression evaluation. Moreover, for foodstuffs, better customer education on the storage of fermented food items, as well as improved manufacturing and expiry dates must be included. Talbinah, as a dairy product, is an excellent vehicle for delivering these beneficial bacteria to the human gut. It is a food with a lot of potential for use as a functional food. Population

growth and lifestyle changes are currently driving the most significant changes in agricultural and food product demand. Many food manufacturers are searching for alternative flours to replace wheat flour in new formulations with high nutritive value and bioactive properties.

## Conclusion

Barley broth (Talbinah) and related products are ranked first due to their high nutritional and therapeutic properties. A healthy food helps in depression and stress relief. It has high antioxidant activity as well as anti-inflammatory. Its consumption regularly proves to be an effective and safe strategy for treating different chronic diseases. It is a rich source of different essential nutrients and antimicrobials, both of which have been linked to a reduction in chronic disease.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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