



The Role of Wheat in Human Nutrition and its Medicinal Value

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Abstract: Wheat is an excellent health-building food and is considered as good source of protein, minerals, B-group vitamins and dietary fiber. The quality and quantity characteristic of protein called gluten has make wheat as the principal cereal, being more widely used for the making of bread than any other cereal. Gluten makes bread dough stick together and gives it the ability to retain gas. Wheat has several medicinal virtues; starch and gluten in wheat provide heat and energy; the inner bran coats, phosphates and other mineral salts; the outer bran, the much-needed roughage the indigestible portion that helps easy movement of bowels; the germ, vitamins B and E; and protein of wheat helps build and repair muscular tissue. The whole wheat provides protection against diseases such as constipation, ischaemic, heart disease, disease of the colon called diverticulum, appendicitis, obesity and diabetes. However, the wheat germ, which is removed in the process of refining, is also rich in essential vitamin E, the lack of which can lead to heart disease. The loss of vitamins and minerals in the refined wheat flour has led to widespread prevalence of constipation and other digestive disturbances and nutritional disorders.

Keywords: Triticum aestivum L.; Healthy Diets; medicinal properties of wheat; Wheat as treatment of Common Aliments.

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INTRODUCTION

Agricultural foods, particularly cereal grains, continue to play a central role in satisfying the food demands of a growing global population, especially in developing nutrienrecountries, where populations derive a significant proportion of their nutrient requirements from cereal-based foods [1, 2]. In this respect, wheat (*Triticum* spp.) is particularly important for several reasons.

1) Wheat is cultivated in nearly all regions of the world, from the equator to temperate lands (as high as latitudes 60°N and 44°S) and at altitudes as high as 3,000 m above sea level—totaling ~230–250 million ha [3]. Thus, it represents the main source of income for millions of smallscale farmers living in developing countries around the globe [4].

2) Wheat, like other cereal crops, can be stored for long periods of time, and throughout history, this has been fundamental to build up of food reserves to prepare for bad crop years (due to climatic conditions

and/or disease/pest infestations). Reserves also help to prevent extreme price increases that could make wheat-based foods unaffordable for most of the middle- and low-income sectors of the population.

3) Wheat is the most versatile grain among the cereals for the preparation of diverse foods, providing more calories and proteins to the global population than any other agricultural food [5, 6].

4) All of the qualities described above have made wheat the most traded cereal crop in the international agricultural food market, impacting the economy of farmers and other food-chain sectors in countries around the world [2].

Wheat is nutritious, easy to store and transport and can be processed into various types of food. It is considered a good source of protein, minerals, B-group vitamins and dietary fiber [7, 8]. Wheat flour is used to prepare bread, produce biscuits, confectionary products, noodles and vital wheat gluten or seitan. Wheat germ

and wheat bran can be a good source of dietary fiber helping in the prevention and treatment of some digestive disorders [8]. Lutein is the predominant carotenoids present in wheat [9] and the bran/germ fractions of wheat contained greater amounts of carotenoids and antioxidant activity than the endosperm fractions [10]. Lutein, along with zeaxanthin, is important for the health of skin and eyes in humans. The latest edition of the USDA's Dietary Guidelines for Americans clearly states that all adults should eat at least three servings of whole grains every day. It helps in preventing both heart diseases and cancer, therefore, lower death rates. The protection against heart disease may stem from whole grains, antioxidants, vitamins and phytochemicals, fiber or trace minerals. Apparently, by improving insulin sensitivity and decreasing the disordered insulin function people experience with metabolic syndrome, whole grains help prevent diabetes. The same substances in whole grains that protect against heart disease also seem to help prevent several kinds of cancer. Fiber and certain starches in whole grains ferment in the colon and form substances that may block the cancer-promoting effects of bile acids. Moreover, scientists believe that other substances in whole grains may affect hormone levels and possibly lower the risk of hormone-related cancers like breast cancer. In this review properties of wheat in different perspective is discussed.

The whole grain products are good for human health, apart from the 1 percent of the population who suffer from celiac disease and another 1 percent who suffer from sensitivity to wheat (Lillywhite and Sarrouy 2014). Eating wholegrain wheat products is positive, improves health and can help maintain a healthy body weight, the authors report. Scientific evidence regarding wheat- and carbohydrate-free diets is thin and selectively used, they state, and a low cereal and carbohydrate diet "may cost more but deliver less." Additionally, an economically viable industry has developed around so-called "free-from" diets and may be persuading consumers to switch from staple foods to specialist foods created especially for those who need to avoid gluten, a protein found in wheat and other grains, they add.

Healthy diets

A healthy diet helps prevent malnutrition as well as non-communicable diseases (NCDs) and conditions (FAO). However, increasing production of processed food, rapid urbanization and lifestyles have shifted dietary patterns (WHO). A healthy diet for adults includes fruit, vegetables, legumes, nuts and whole grains. Adults should eat at least 400 grams (14 ounces), or five portions, of fruit and vegetables daily, while less than 10 percent of total energy should come from free sugars and less than 30 percent of total energy from fat, according to the WHO. Unsaturated fats are better than saturated fats, and Trans fats should be avoided, the U.N. health agency reports. Whole grains

make up an important part of healthy diets. The 2005 Dietary Guidelines for Americans recommend eating at least three 1-ounce servings of whole grains to reduce the risk of diabetes and coronary heart disease and to maintain a healthy weight. Whole grains are especially important for their fiber content. Refined grains have benefits in the diet as well, namely, added nutrients, such as B vitamins (thiamin, riboflavin, niacin) and iron. Additionally, important nutrients like copper and iron are more easily absorbed when eaten with refined grains. For children in particular, good nutrition is vital to prevent the risk of death or developing noncommunicable diseases and to ensure healthy growth and development. As well as taking into consideration the guidelines for adults, breastfeeding plays an important role in ensuring a nutritional beginning to life.

Medicinal properties of wheat

- The wheat, as produced by nature, contains several medicinal virtues. Every part of the whole-wheat grain supplies elements needed by the human body. Starch and gluten in wheat provide heat and energy; the inner bran coats, phosphates and other mineral salts; the outer bran, the much-needed roughage the indigestible portion which helps easy movement of bowels; the germ, vitamins B and E; and protein of wheat helps build and repair muscular tissue. The wheat germ, which is removed in the process of refining, is also rich in essential vitamin E, the lack of which can lead to heart disease. The loss of vitamins and minerals in the refined wheat flour has led to widespread prevalence of constipation and other digestive disturbances and nutritional disorders. The whole wheat, which includes bran and wheat germ, therefore, provides protection against diseases such as constipation, ischaemic, and heart disease, disease of the colon called diverticulum, appendicitis, obesity and diabetes [11].
- There are many reports of the association of wheat, and particularly wheat proteins, with medical conditions, ranging from improbable reports in the popular press to scientific studies in the medical literature [12]. Not surprisingly, they include autoimmune diseases such as rheumatoid arthritis which may be more prevalent in coeliac patients and relatives [13]. It is perhaps easier to envisage mechanisms for relationships between such diseases which have a common immunological basis [14] than to explain a well-established association between wheat, coeliac disease, and schizophrenia [15] other reported associations include ones with sporadic idiopathic ataxia (gluten ataxia) [16], migraines [17], acute psychoses, and a range of neurological illnesses [18]. Soluble fibre is considered to have health benefits that are not shared by insoluble fibre and these may therefore be reduced by the phenolic acid cross-linking. However, insoluble fibre may also have benefits in

delivering phenolic antioxidants into the colon: these benefits may include reduction in colo-rectal cancer [19-21]. An association with autism has also been reported with some physicians recommending gluten free; casein-free diet [22]. Some of these effects may be mediated via the immune system but effects that are not immune-mediated are notoriously difficult to define and diagnose. However, they could result from the release within the body of bioactive peptides, derived particularly from gluten protein. Thus, gluten has been reported to be a source of a range of such peptides including opioid peptides (exorphins) [21] and an inhibitor of angiotensin I-converting enzyme [23]. However, these activities were demonstrated *in vitro* and their *in vivo* significance has not been established. Natural medicines are often tried for many conditions based on tradition, anecdotes, or marketing, but not all of these uses are supported by reliable or credible scientific research. Different parts of wheat which have the medicinal properties discussed below.

Wheat Stem, Fruit and Seed

The young stems are used in the treatment of biliousness and intoxication. The ash is used to remove skin blemishes. The fruit is antipyretic and sedative. The light grain is antihydrotic. It is used in the treatment of night sweats and spontaneous sweating. The seed is said to contain sex hormones and has been used in China to promote female fertility. The seed sprouts are antibilious, antivinous and constructive. They are used in the treatment of malaise, sore throat, thirst, abdominal coldness and spasmodic pain, constipation and cough. The plant has anticancer properties also [24].

Wheat Bran

Wheat bran is used as a supplemental source of dietary fiber for preventing colon diseases (including cancer), preventing gastric cancer, treating Irritable Bowel Syndrome (IBS), reducing the risk of hemorrhoids and hiatal hernia, hypercholesterolemia, hypertension, reducing the risk of breast cancer and gallbladder disease, and type 2 diabetes [18, 11, 25, 26]. Wheat bran helps constipation by speeding up the colon and increasing stool output and bowel frequency. Wheat is an excellent source of iron and phosphorous. The outer layer of the barn provides fiber that gives bulk and regulates the absorption and excretion of nutrients from the body.

Wheat Germ

The germ contains riboflavin, thiamine, vitamin E and trace minerals such as zinc, copper, iron and magnesium. Wheat is the best nourishing food that can be easily given to patients and even babies. Wheat has antibilious, antihydrotic, antipyretic, antivinous, sedative, skin and stomachic properties. Wheat germ oil is a highly rich unrefined oil, richest sources of vitamin

E, A and D. It also has a high content of proteins and Lecithin. This oil is widely used for external application, as it helps a great deal in getting rid of skin irritation including skin dryness and cracking. Wheat germ oil is increasingly finding its way in the making of skin care products. The oil extracted from wheat germ has a shelf life of near about 6-8 months. It is a good source of fatty acids that are very vital for the healthy growth of the body. The germ forms only 3% of the weight of a wheat grain; nonetheless, contains about 25% of the protein, vitamins and minerals. Wheat germ oil is known for its antioxidant properties and this explains the reason why it is added to other carrier oils. When applied on the skin, it improves the circulation of blood and helps to repair the skin cells destroyed by the scorching heat of sun. It keeps away the symptoms of dermatitis, thereby preventing the skin from being victimized by various kinds of problems. Thick in consistency, its independent use for massaging the body is not usually preferred. Since it has exceptional nourishing qualities, it is used in lesser quantities for preparing the carrier oil blend.

Wheat as treatment of Common Aliments Digestive System Disorders

Wheat grass juice used as an enema helps detoxify the walls of the colon. The general procedure is to give an enema with lukewarm or Neem water. After waiting for 20 minutes, 90 to 120 ml of wheat grass juice enema is given. This should be retained for 15 minutes. This enema is very helpful in disorders of the colon, mucous and ulcerative colitis, chronic constipation and bleeding piles [27].

Circulatory Disorders the chlorophyll content present in wheat enhances heart and lung functions. Capillary activity also increases while toxemia or blood poisoning is reduced. Due to increased iron content in the blood and hemoglobin, lungs function better. Oxygenation improves and the effect of carbon dioxide is minimized. It is for this reason that wheat grass juice is prescribed for circulatory disorders [28].

Tooth Disorders

Wheat is valuable in the prevention and cure of pyorrhea. It takes time to eat wheat and as it is generally taken with other foods, it compels the chewing of other foods also. This not only provides the needed exercise for the teeth and gum but also a great aid to digestion. Wheat grass juice acts as an excellent mouth wash for sore throats and pyorrhea. It also prevents tooth decay and tooth aches. Therefore, it is beneficial to chew wheat grass which draws out toxins from the gums and thus checks bacterial growth.

Constipation

The bran of wheat, which is generally discarded in milling of the flour, is more wholesome and nourishing than the flour itself. It is an excellent laxative. The laxative effects of bran are much superior

to those of fruits or green vegetables as cellulose of the latter is more easily broken down by bacteria while passing through the intestine. The bran is highly beneficial in the prevention and treatment of constipation due to its concentration of cellulose which forms a bulk-mass in the intestines and helps easy evacuation due to increased peristalsis.

Skin Diseases

It has been scientifically proved that chlorophyll arrests growth and development of harmful bacteria. Wheat grass therapy can be effectively used for skin diseases and ulcerated wounds as by retarding bacterial action, it promotes cell activity and normal re growth. By drinking wheat grass juice regularly, an unfavorable environment is created for bacterial growth. Poultice of wheat grass juice can be applied on the infected area, as it is an able sterilizer. Externally, wheat flour is useful as a dusting powder over inflamed surface as in burns, scalds and various itching and burning eruptions, Whole wheat flour, mixed with vinegar, boiled and applied outwardly removes freckles.

Wheat for Treating Boils

Boils having pus can be easily treated at home without the help of a surgeon's knife. Pound a little *Alse* (available at shops) to a fine powder. Take a tablespoon of wheat flour and fry it in a little oil to a golden color. Add ground *Alse* along with tablespoon of water. Keep on stirring until the mixture turns thick. Remove from fire and place it on a clean strip of cloth. When the mixture turns bearably hot, spread it over the cloth and bandage the boil. Within a day or two, the boil will burst giving instant relief. Clean the boil with warm water to which a little boric has been added and then apply sulphur ointment and bandage. Clean the wound and apply the ointment daily until the wound heals.

Wheat for Treating Scars

To remove scars roast wheat on fire until it turns black. Grind to paste. Put in a thin cloth and squeeze out the oil. Apply on the scars regularly for relief. Even itching disappears with this oil.

Wheat for Curing Chest Pain

Mix together wheat, barn and coarse salt in equal quantities, heat the mixture, put on a clean cloth and foment the chest for relief.

Internal Rejuvenation Wheat protein, which comprises up to eight per cent of the grain, has a special benefit as it has eight of the essential amino acids in delicately balanced proportions. A complete internal rejuvenation takes place when Wheat protein is metabolized into health-building amino acids. These amino acids build a resilient muscle that comes back to its original form after stretching and bending, healthy skin and hair and clearer eyesight and nourish the heart and lungs, tendons and ligaments, brain, nervous system

and glandular network. The B-complex vitamins, especially thiamin, riboflavin and niacin offered by natural brown Wheat promote youthful energy and nourishment to skin and blood vessels. An abundance of minerals in natural brown Wheat help to nourish the hormonal system, heal wounds and regulate blood pressure. Wheat also offers iron to enrich the bloodstream and phosphorus and potassium to maintain internal water balance along with other nutrients. Wheat thus helps restore internal harmony [19, 29].

Wheat for Tonsil Pain

Prepare a halwa with wheat flour and water, put in a cloth and foment the tonsils with it to get relief from pain.

Wheat for Treating Acne or Pimples

Make a fine paste of whole wheat. Apply this paste on pimples. Keep for 1 hour. Then wash off. Do this regularly. In 1998, scientists at Wayne State University in Detroit conducted a meta-analysis of data from more than 30 well-designed animal studies measuring the anti-cancer effects of wheat bran, the part of grain with highest amount of the insoluble dietary fibers cellulose and lignin. They found a 32 percent reduction in the risk of colon cancer among animals fed wheat bran; now they plan to conduct a similar meta-analysis of human studies. Whole-wheat flours are a good source of wheat bran. Wheat bran (WB) appears to inhibit colon tumorigenesis more consistently than do oat bran or corn bran. Reddy *et al.* [25] suggested an inverse relationship between the intake of dietary fiber, particularly fiber from cereal grains, and colon cancer risk.

CONCLUSION

Eating wholegrain wheat products is positive, improves health and can help maintain a healthy body weight. Wheat and other cereals should always be part of a healthy and nutritious balanced diet for most of the population. Its consumption is highly recommended to ensure an appropriate intake of dietary fiber, minerals, vitamins, and other beneficial bio- compounds present in the wheat grain. The approximately 1 percent of the population suffering from congenital immunological celiac disease incapacity should not consume wheat products or any product containing gluten. However, these groups should be aware that the gluten-free food they are going to consume has a composition that will not necessarily positively affect their health, starting with calorie intake from carbohydrates and sugar. For those with gluten sensitivity, it is important to be aware if they are truly gluten sensitive and, if so, to what degree, to determine whether they should eat gluten-containing foods.

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