Wheat grass: The Healthy Super Food

Nookaratnam G.[1], Vimala Beera[2], Srinivas T.[3] and Greeshma sree[4]

[1]Former Teaching Associate, Dr NTR CFST, ANGRAU

[2]Scientist, RARS, Anakapalli, Acharya N.G. Ranga Agricultural University

[3] M.Tech Student, NIFTEM, Kundli,

[4] Food Safety Officer, Paderu Division, Andhra Pradesh

The *Triticum aestivum* plant, which belongs to the Poaceae family, is the source for obtaining young and tender shoots, popularly known as wheatgrass. It is also referred to as Green blood, wheat sprouts, and young wheat plant. Wheatgrass is obtained from sprouted seeds of wheat grains, harvested between 7 to 10 days after germination when it has grown to a height of around 6-10 inches. This can be done either hydroponically or on the land using trays or open-field systems. The average temperature for the crop to be grown is between 20-25 °C with moderate humidity.

It is consumed as fresh juice, dried powder or capsules for both animal and human consumption. The cultivation and processing of wheat grass occur in various countries on different scales. However, the exact origin of wheat grass remains uncertain. Triticum aestivum is the major source of wheat in India whereas *Agropyron spicatum* (bluebunch wheat grass), *Agropyron cristatum* (Crested wheatgrass,), *Agropyron trachycaulum* (slender wheatgrass), *Elytrigia, Eremopyrum, Pascopyrum, and Pseudoroegneria* are commonly found in temperate regions of Europe and the United States (Rana, Kamboj and Gandhi, 2011).

Table 1: Nutritional composition of Wheat Grass

Component	Quantity
Carbohydrates	361.00 mg/g
Total sugars	17.75 mg/g
Reducing sugars	13.00 mg/g
Ash content	14.00 %
Moisture content	3.50 %
Crude protein	21.87%
Crude fibers	1.40 %
Crude fats	5.45%
Iron	66.83 ppm
Magnesium	64.107 ppm
Zinc	32.93 ppm
Manganese	26.89 ppm
Potassium	25.54ppm
Calcium	17.238 ppm

(Source: Tamraz *et al.*, 2024)

Nutritional Value

Wheatgrass acts as a nutrient powerhouse, containing all the important vitamins such as Vitamins A, C, E, and the B complex. In addition, wheatgrass has an excellent supply of chlorophyll, with other minerals like magnesium, selenium, zinc, chromium, iron, folic acid, and pyridoxine in addition to many other minerals, amino acids, and enzymes including protease, transhydrogenase, lipase, amylase, cytochrome oxidase, and superoxide dismutase (SOD) that display considerable nutritional and therapeutic value. Sanjeevini and Chetna (2017) therefore refer to the crop as healthy super food due to its wide nutrient composition.

Health Benefits

a) Anaemia and Thalassemia treatment

Wheatgrass contains more than 70% chlorophyll which is an essential part of the diet. The chlorophyll molecule in wheat grass is very similar to the haemoglobin molecule in human blood. The only difference is the central atom; chlorophyll has magnesium while haemoglobin has iron. It has become known as 'Green Blood' because of the resemblance in molecular structure between chlorophyll in wheat grass and the haemoglobin molecule in the human body (Padalia et. al., 2010). This can increase red blood cells and haemoglobin concentration by 70-83%. Thus, Wheatgrass is useful in anaemia reduction. Wheatgrass is also a good alternative to blood transfusion as it increases the interval between blood transfusions and decreases the amount of total blood transfused in thalassemia major and intermediate patients (Rana, Kamboj and Gandhi, 2011).

b) Anti-cancer activity

Wheat grass is a rich source of chlorophyll responsible for inhibiting the metabolic activation of carcinogens. Till date, wheat grass juice, tablet, and powder are alternative medicine approaches to anticancer therapy, due to their high antioxidant content, chlorophyll, and antioxidant enzyme super oxide dismutase (SOD) which converts dangerous reactive oxygen species into hydrogen peroxides and an oxygen molecule. Gore et al. (2017) reported that wheat grass showed an inhibitory effect on oral squamous cell carcinoma.

c) Metabolic and Cardiovascular Support

Its regular consumption is believed to reduce cholesterol, control blood sugar levels, and improve metabolism.

d) Digestive diseases

Wheat grass therapy is very effective for digestive disorders. It provides fast results against a number of diseases related to the digestive system. Some of the main illnesses include constipation, indigestion, flatulence, nausea, vomiting, acidity, ulcers of the stomach and intestine, along with intestinal odor and worms. It is also used as a fine laxative for severe rectal bleeding (Mujoriya, R and Bodla, R. B., 2012).

e) other diseases and their Treatment

Wheat grass therapy is indicated for patients diagnosed with chronic illnesses such as Asthma, Atherosclerosis,

Parkinson's disease, Joint pains, TB, Constipation, Hypertension, Diabetes, Dental problems, Bronchitis, Insomnia, Eczema, Sterility, Hemorrhage, Obesity, and Flatulence (Padalia et. al., 2010).

Food Applications

It can be incorporated into a wide variety of food products, including fresh wheatgrass juice, powder, and concentrates.

a) Fresh wheat grass juice in the form of fresh juice and smoothies.
b) Powders can be consumed as supplements in shakes, health drink mixes, herbal teas, energy bars, functional and fortified bakery products, which include breakfast cereals, biscuits, cookies, noodles amongst others.
c) Concentrated can be consumed as Capsules and tablets.

Fig.1: Wheat grass juice

Fig. 2: Wheat grass powder

Processing and Value Addition

Various unit operations and processes are involved while applying wheatgrass in food products. The processes are briefly described in the following.

a. Juicing

Wheatgrass is thoroughly washed and then ground or crushed for juice extraction with the help of a juicer or cold-press juicer to retain the enzymes. It must be consumed immediately because it has a very short life. To preserve it, the juice is to be aseptically bottled and kept frozen, where its life can be stretched up to 12 to 24 months.

b. Drying and Powder Preparation

Wheatgrass, after harvesting, sorting, cleaning, cutting and washing; can be dried by different methods like shade-drying, Hot air oven, microwave, freeze-drying. The temperature and time is different for each type of drying among which shade drying is considered the cheapest method and freeze drying the expensive one with considerable amount of nutrient conservation compared to other methods. The temperature used for drying leaves in dehydrator was about 30-35ºC for time of 24 hours (Borkar, S 2021). The dried material is then pulverized into fine powder for long shelf life and used in different formulations.

c. Packaging and Storage

Powder or juice is packed into airtight, moisture-proof containers to avoid oxidation.

d. Value-added Products

Value added products that can be prepared from wheat grass are Wheatgrass juice concentrate, Ready-to-drink beverages, Instant wheatgrass powder mixes, Herbal tablets and capsules, Wheatgrass-enriched bakery and confectionery items etc.

Market Potential and Trends

With growing consumer awareness for natural and functional foods, plant-based diets have great market potential in India. Wheatgrass-based product demand is high in emerging nutraceutical, health, and wellness markets. The demand for wheatgrass powder and juice is expected to increase across the globe due to increasing preventive healthcare and clean-label nutrition among urban populations, specifically through online channels.

Conclusion

Wheatgrass stands out as a potential source of nutrition and wellness, bridging traditional healing and modern health science. Its inclusion in day-to-day diets can complement detoxification, disease prevention, and general vitality. Expanding production and processing technologies can further foster wheatgrass as a sustainable and profitable functional food ingredients. Because of its wide health benefits, novelty, and easy production through hydroponics in small areas, it is quite easy for small-scale entrepreneurs to take up this new venture in wheat grass processing.

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