

Proximate Analysis of Wheat Grass Powder

1st Abhishek Pandey, 2nd Alok Mani Mishra

1st Junior Officer(Banaskantha Dist. Co-op. Milk producers), 2nd Project Head(Banas Dairy)Varanasi

Food technologist

Banaskantha Dist.Co-op. Milk producers' Union Ltd. Kanpur, India

Abstract : *The present work was aimed to prepare dried vegetarian product supplemented which is rich in micro-nutrient and is demand of any country. Phytochemicals and antioxidants are important constituents of this dried product and provide a considerable portion of dietary fibre, proteins, minerals and vitamins. It is the ready to eat dried product which is prepared from Grasses in the laboratory and can provide an improved nutritional status. This product is made by the drying process. The basic aim of this product is to formulate instant product. It contains approx 5-6 % moisture content according to the sample and the product is rich in crude fiber. This product is the combination of nutrition and pharmaceutical, hence it is called as nutraceutical product.*

1.)Introduction: *The trend in consumption of RTE product is increasing due to increasing number of working women population contaminant with the increase in per capita income. Lack of time, hectic schedules, easy commercially available, nutritive and minimally processed with longer shelf-life. Wheatgrass is a food made from Triticum aestivum plant. Fresh Wheatgrass juice is considered to be a "living food". Wheatgrass is usually consumed as a fresh juice, in powdered form (Food Science and Quality Management, 2011). Wheatgrass powder is low in calories but high in nutrients including antioxidants such as Glutathione, Vitamin C and Vitamin E. The main component in wheatgrass is chlorophyll, the pigment that gives green color to the plants. It acts like Hb which increases oxygen levels in the body. Wheat grass juice has chlorophyll that neutralizes infections, heals wounds, overcomes inflammations and gets rid of parasitic infections the three most important effects of wheat grass on the human body are: blood purification, liver detoxification and colon cleansing. The mature sprouts of Wheat seeds (Triticum aestivum) known as Wheat Grass and it is one grass that has been demonstrated to be of particular use to humans as a good nutritional source. Wheatgrass contains 17 AA, 8 live enzymes and chlorophyll pigment (<http://dx.doi.org/10.13040/IJPSR.0975-8232.7>). Wheatgrass comprises of at least 13 vitamins that include B12 and abscisic acid in addition to (SOD), cytochrome oxidase, and mucopolysaccharide (Ferruzia and Blakesleeb 2007; Wheat and Currie 2008). Wheatgrass can be consumed its own or the combination with other supplements. The main component in this powder is crude fibre which helps in weight loss and it is also known as the part of carbohydrate in food called non-soluble carbohydrate (Insoluble carbohydrates), which Its not digested by the digestive juices and do not degrade at the treatment by (acids and bases) diluted and in specific concentrations for a period of time is limited.*

Keywords: "RTE"= Ready to Eat

"Hb"= Haemoglobin

"AA"= Amino Acids

"SOD"=Sulphuroxide Distumase

2.)Methodology(Method and materials required):

Proximate analysis has been done to assess its nutritional value such as crude fibre, Ash content, Protein estimation, and moisture content according to market packaging labelling.

2.1)Extraction and processing of wheatgrass powder

Firstly after harvesting, the fresh wheatgrass cleaned, and then soaked in water for 12 hours. Due to soaking the grasses become tender which decreases the phytin level. After soaking the grasses were hanged in muslin cloth. Soon after that cutting it on a pounding basin and crushed it well. The wheatgrass can be crushed with electric juicer or mixer according to the need. For the sieving purpose an stainless steel sieve used. (Goldin, 2002)5. The length of wheat grass is about 15 to 18 cm in length; after harvesting and before processing. After that freeze drying method was used for the wheatgrass that preserved the maximum bioactive compounds and antioxidant activity.

2.2)Estimation of protein content

For this purpose, crude protein and amino acid composition were determined using standard analytical techniques. The method used for the protein method is Kjeldahl method. Firstly, Accurately weigh the sample and then place in the digestion tube. Add catalyst into it and then add concentrated sulphuric acid. Then after sometime placed in preheated digester and digest about 110-130 C for 15mins. Remove the test tube and leave to stand until sample is cooled. Then add NaOH solution into the digested sample. Then on steam supply valve to initiate distillation. Heat for approx 5mins. Until ammonia has passed over into the boric acid. Then heat the sample for approx 1 min. Then add few drops of indicator and titrate the sample with standard 0.1N sulphuric acid until solution changes its colour from green to pink. Then note down the value.

Crude protein content= N*6.38

2.3) Estimation of Ash content

Weigh the sample into tared dish. Pour ethanol into it and ignite it. When ethanol is burnt off, heat the dish carefully over a small flame to char the material. Then ignite in a muffle furnace at 550 C for approx 2-3 hrs. Cool and wet the ash with a few drops of cooled water, evaporate carefully to dryness and heat in the muffle furnace again for further 1 hr. If the wetting shows ash to be carbon free, remove the dish to a desiccator contain an efficient desiccant, allow to cool and weigh without delay. Cool the dish, add the filtrate and evaporate to dryness on a waterbath. Heat in muffle furnace again, cool in a desiccator and weight as previous one. Heat again in the muffle furnace for 1hr. Repeat this process until the difference in weight between two successive weight. Then record the lowest weight.

$$\text{Total ash on (dry basis)\% by wt} = \frac{W_2 - W}{W_1 - W} * 100 * 100 / 100 - M$$

2.4) Estimation of moisture content

Uncover a dish and place the dish and its lid in a hot air oven at 102C for 1hr. Place the lid on the dish, transfer the covered dish from the hot air oven to the desiccator. Allow it to cool to room temperature and then weigh it. After that put the sample cover the dish with the lid and weigh the covered dish. Uncover the dish and put it with its lid in the hot air oven maintain at 102 C for 2hrs. After that replace the dish, transfer the covered dish to desiccator, allow it to cool to room temperature for approx 30 mins. And then weigh accurately. Heat the uncovered dish and lid in the hot air oven at 102 C for further 1hr, replace the lid allow the covered dish to cool to room temperature in the desiccator and weigh it. Repeat the process till successive difference. Drying is complete after first 2hr.

$$\text{Moisture \% by mass} = 100(M_1 - M_2) / M_1 - M$$

2.5) Estimation of crude fibre

Weigh out defatted, dry sample. Place in the flask and add boiling sulphuric acid solution concentration (1,25%), when the acid concentration 5% should be taken (50 ml) of acid and (150 ml) of distilled water until the concentration reduces. Attach the condenser and bring to boiling point in one minute; if necessary, add antifoam. Boil for exactly 30 minutes, maintaining the volume of solution constant by add heat distilled water and swirling the flask periodically to remove particles adhering to the sides. Lining the Buchner funnel with the filter paper and boiling water. At the same time, at the end of the boiling period, remove the flask, let rest one minute and filter the contents carefully, using suction or vacuum. Filtration should be carried out in less than 10 minutes. Wash the filter paper with boiling water. Transfer the residue to the flask using a retort containing boiling NaOH solution and boil for 30 min. as in step 2nd the usefulness of the base solution is to analyze the parts of nitrogen in proteins and making Saponification with the fat. Preheat the filtration crucible with boiling water and carefully filter the hydrolyzed mixture after letting it rest for 1 min. Wash the residue with boiling water, with the HCl solution and then again with boiling water, finishing with three washes. Place the crucible in a oven set at 105°C for 12 hours then cool in dryer. Quickly weigh the crucible with the residue inside (do not handle them) and place in the crucible furnace at 550° C for 3 hours. Leave to cool in a dryer and weigh them again.

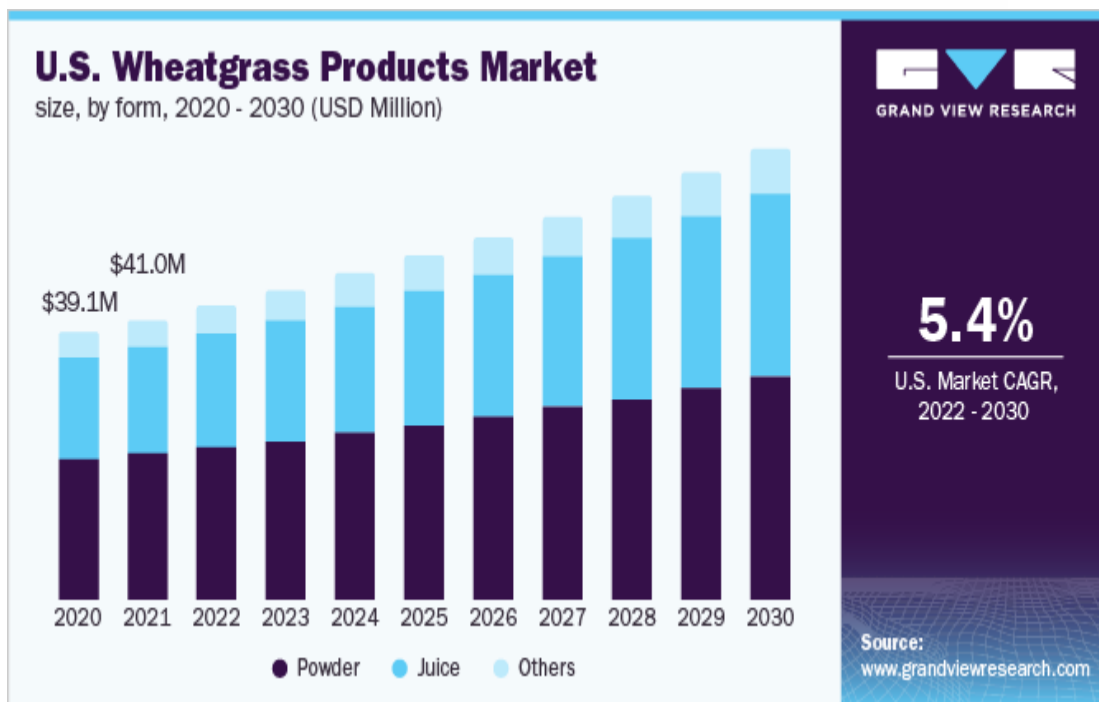
$$\text{Crude fibre content\%} = 100 (A - B) / C$$

Where: A = weight of crucible with dry residue (g) B = weight of crucible with ash (g) C = weight of sample (g)

3.) Result and Findings :

The result obtained after proximate analysis of the wheat grass powder is as follows:

When we provide 1kg of fresh *Triticum aestivum* (T. aestivum) grass then approx. 100 gms of wheat grass powder is prepared in the laboratory by the following of drying process. It is rich in dietary fibre and essential amino acids like lysine, tryptophan, arginine, aspartic acid, histidine and so many phytochemicals like Terpenoids, sterols, flavonoids etc. They all contain plant chemicals which helps in cell and tissue regeneration, boost up immunity and prevent from diseases like Alzheimer's disease, obesity etc. According to the study 100 gms of wheatgrass powder contains 23.67gm protein which is complete protein containing over 20 essential and non-essential amino acids which is required in the body. Moisture content of wheatgrass powder was 6.12% Crude fiber in wheatgrass is about to 29.89gms which is high because this powder have high amount of antioxidant property and easily digestible. Ash content is about to 4.78gms.



S.No.	Nutrient Composition	Per 100gms serving
1.	Protein	23.67gms
2.	Crude fibre	29.89gms
3.	Ash content	4.78gms
4.	Moisture content	6.12%

4.) Conclusion: The study suggest that the use of what grass powder could be of immense help in leading a healthy life.This product as an nutraceutical product in market demand. The amount of chlorophyll in grass is very high ,it suggest that wheatgrass having a more wound healing capacity, boosting immunity, blood regeneration and helps in mutagenic process. Atleast 1Tablespoon wheatgrass powder is recommended for daily bais. The awareness among peoples of this powder occur after it occurs as an ingredient in the market and easily available.It plays major role in the body like antioxidants fight free radicals in the body,reducing oxidative stress and protecting against cancer,arthritis,neurodegenerative diseases.

Bibliography: 1.) Food Science and Quality Management

www.iiste.org

ISSN 2224-6088 (Paper) ISSN 2225-0557 (Online)

Vol 2, 2011

2.) Bar-Sela G, Cohen M, Ben-Arye E, Epelbaum R. The Medical Use of Wheatgrass: Review of the Gap Between Basic and Clinical Applications. Mini Rev Med Chem. 2015;15(12):1002-10. doi: 10.2174/138955751512150731112836. PMID: 26156538.

3.) International Journal of Pharmaceutical Sciences and Research

4.) <http://dx.doi.org/10.13040/IJPSR.0975-8232.7>

(Ferruzia and Blakesleeb 2007; Wheat and Currie 2008).

5.) :<http://ijmer.in/pdf/e-Certificate%20of%20Publication>

6.) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6342778/>

7.) <http://cvet.tu.edu.iq/>