



Impact of Barley Product on Human Health and Inhibiting Factors for Consuming the Barley Product

Shalini Pandey^{a+++*} and Neelma Kunwar^{b#}

^a College of Home Science, C.S. Azad University of Agriculture and Technology, Kanpur, India.

^b C.S. Azad University of Agriculture and Technology, Kanpur, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2023/v41i71957

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc. are available here: <https://www.sdiarticle5.com/review-history/100083>

Original Research Article

Received: 11/03/2023

Accepted: 15/05/2023

Published: 19/05/2023

ABSTRACT

Barley is simply a grain, but scientists have given its importance to say that barley is also a nutritious cereal like Rai, Wheat, and Maize, which grows in India. Rice and wheat consumption is very high than other crops in India. As scientists researched Barley's golden benefits, the practice of eating barley started all over the world, otherwise barley was used only in *Hawan-Samagri* and beer preparation. Barley chapatti is very famous in Maharashtra. Barley product is now easily available in market as barley flour, barley bread, barley flakes, roasted barley etc. Foreigners use barley in their diet, but now Indian high and upper-middle class society use to consume barley in their diet. As it contains many nutrients, so it is very beneficial for health. It is said that people who use Barley in their daily diet do not suffer from constipation, and due to constipation, many diseases are born in the stomach, so we should use barley *Chapati* in our diet at least one time in a day.

Keywords: *Impact, product, inhibiting factors, consuming.*

⁺⁺ Research Scholar;

[#] Professor;

^{*}Corresponding author: E-mail: shalinipandey197@gmail.com;

1. INTRODUCTION

Barley is an excellent source of both soluble and insoluble fiber, which assures women's overall good health for long term. Before we move on to the health benefits, it is pleased to know that one can consume it in many kinds of preparations like salads, soups, and stews. Therefore, it does not only add value to one's health but also to their palate. Barley is used for skin care, boosting immunity, and preventing disorders such as osteoporosis, gallstones, and diabetes. Barley, being an excellent source of fiber, can help rid our body of toxins [1,2]. By keeping the intestine in proper health, it helps us increase the movement time of feces and also keeps our stomach clean. Due to its nutritional value barley is particularly helpful as it strengthens body's immune system and reduces the chances of cold and flu. Iron improves the blood volume and prevents anemia and fatigue [3-5]. Moreover, it aids in smooth functioning of the kidney and the development of body cells. It works as a diuretic that increases urination and flushes out toxins from the body. Barley water is an excellent solution for kidney stones and cysts too. This drink is recommended in children and adult age groups daily till the urine infection subsides [6,7]. Though fibre is essential to maintain good gut health and bowel movement, an excess can irritate the stomach. Barley is a rich source of essential nutrients that help to keep the body fit and healthy [8-11]. Drinking barley water every morning helps flush out all toxins from the body and improves the overall health. Applying barley water on the skin, it reduces acne and fights skin infection. Barley can also brighten the skin tone by acting as a gentle exfoliator and controlling oil secretion.

1.1 Objectives

1. To study socio- economic status of respondents and assess the nutrition parameter of selected women.
2. To find out the inhibiting factors for consuming the barley products and recipes.

2. METHODOLOGY

The study was conducted in Jaunpur district. District was divided into 13th localities. six localities were randomly selected, namely Mariahu, Shahganj, Kalichabad, Olandganj, Haripur, Sihipur. 300 sample sizes were

selected. Dependent and independent variables were used such as age, education, caste, knowledge, nutritional status etc. the statistical tools were used such as percentage, chi -square test, correlation- coefficient (r).

3. RESULTS AND DISCUSSION

Education widely effects the barley consumption among women. Today in this era, mostly women are educated. Educated women can understand better the benefits of barley. If a woman knows about health benefits of barley, she can give many type of barley product and recipes to her family members, as barley has many nutrients like selenium, copper, vitamins, protein, carbohydrate, iron etc. Women of any income group know about barley products, and she can prepare many barley products from her knowledge about it. Many women know about barley as it can be only use for *Pooja* purpose.

Barley is a rich source of essential nutrients that help to keep the body fit and healthy. Drinking barley water every morning helps flush out all toxins from body and improves overall health.

Middle class is a very large class, so the people of the middle-class group neither come in the lower-class group nor in the high-class income group. The food of the middle group is very good. Another characteristic of the middle class is that they spend most of their income on their food. And give good food to the kids too, like high class women eat capsicum red, yellow, but middle-class women like to buy green capsicum. Similarly, when the food is out of season and expensive, the middle-class women avoid buying it, whereas when the fruits are seasonal, they will use to consume it more. High class women do not cook their food themselves. They get it made by the servants. Nowadays the trend of different type of diet has come in the market, such as Paleo diet, Keto diet, Boiling and Roasted food, which high class women like to eat more, because this diet is protein rich. Apart from this, 7 types of diet trends have come for health and fitness, such as sugar sucks (keto), immunity rocks, eat plants, go paleo, don't eat, the mind diet, low FODMAP. All these food trends are consumed by high class women. One, they have to show themselves high class, on the other hand some high-class women keep such diet in their diet chart.

Table 1. Distribution of women according to education

Education	Low income	Medium income	High income	Total
Intermediate	33 (11.0)	12 (4.0)	5 (1.7)	50 (16.7)
Graduate	24 (8.0)	54 (18.0)	8 (2.7)	86 (28.7)
Post Graduate	18 (6.0)	36 (12.0)	54 (18.0)	108 (36.0)
Other Diploma	5 (1.7)	18 (6.0)	33 (11.0)	56 (18.7)
Total	80 (26.7)	120 (40.0)	100 (33.3)	300 (100.0)
χ^2	99.219**			P < 0.01

(Figures in brackets denotes the percentage of respective values)

Table 2. Barley recipes and their nutritional value and health benefits for human being

Barley recipes	Frequency	Nutritional value	Health benefits
Barley Lassi	153 (51.0)	CHO-50g, protein-12 g, vit.-C-2.5 mg, vit.-A-48 mg	Support healthy skin, lower risk in heart attack, improves anaemia
Barley kheer	141 (47.0)	CHO-67.3g, Protein-317g, Fat 67.9g, Ca-33mg	Maintain bones and blood level
Barley Paratha	221 (77.0)	Fibre-13g, Protein-16g, CHO-77.7g, Na-12mg	Lower LDL, cholesterol, decrease kidney disease
Barley Sattu Juice	285 (95.0)	Protein-206g, Fat-72g, CHO-652g	Control weight, boost mood, improves blood sugar
Barley Vegetable Soup	198 (66.0)	Protein-14g, CHO-40.5g, Vit.-A-223mg, Fe-6mg	Lower cholesterol, lower heart problem, good skin health
Barley Apple Cinnamon	24 (8.0)	Calories-348 Kcal, CHO-47g, protein-16g, fibre-14g, Fe-31mg	Reduces weight, help in digestion
Barley Vegetable Khichdi	66 (33.0)	Protein-8g, Fibre-8g, Mg-1.56mg, K-11.2mg	Maintains blood pressure, lower bad LDL Cholesterol, reduces constipation
Grain in Herby Butter Milk	75 (25.0)	CHO-67.3g, Protein-317g, Fat-67.9g, Ca-33mg	Reduces diabetes, reduces heart problem, improves digestion
Barley Lemon Water	15 (5.0)	Vit.-C-12mg, CHO-10g	Increases muscle, helps in loose weight
Barley flour Uttapam	93 (31.0)	CHO-20.13mg, Protein-9.02g, Fibre-7.9g	Reduces night snacking
Barley Laddu	126 (42.0)	Protein-49g, Ca-521mg, Fe-9.8mg, CHO-19g, Fibre-1.4g	Prevents diabetes, improves digestion, helping wounds heal.
Barley Papadi	27 (9.0)	CHO-8g, Fat-3g, Na-40mg, K-50mg, Vit.-C-1mg, Fe-1mg	Protect eyes, boosts immunity, reduces arthritis, promotes healthy bones and teeth.
Barley Rava Idli	78 (26.0)	K-150mg, Fe-1.7mg, CHO-80g, Protein-13g	Maintains blood level, reduces kidney damage.
Barley Rissoto	18 (6.0)	Energy-1062Kcal, CHO-171.9g, Protein-35.7g, Fat-25.8g	Maintains blood level, reduces kidney damage

Barley recipes	Frequency	Nutritional value	Health benefits
Barley Stuffed Peppers	15 (5.0)	Na-268mg, Protein-860mg, Fibre-13gm	Reduces anaemia, reduced cataracts.
Barley Vegetable Pullav	78 (26.0)	Energy-354Kcal, Fibre-17.3g, Protein-12g	Reduces constipation, reduces kidney stone, makes strong bones.
Barley Malt	12 (4.0)	Vit-D-12.5mg, Na-364mg, Fibre-9g, Protein-26g	Prevent diabetes, increase muscle mass
Barley Milk and Honey Porridge	69 (23.0)	P-221mg, Fibre-18g, Protein-10g, CHO-18g	Boost metabolism, lower high bold pressure
Barley Halwa Recipes	168 (56.0)	Fat-2.14g, Fibre-4g, Vit-C-9.7mg, Ca-15.9g	Reduces constipation, boost immunity
Barley Vadai	66 (33.0)	Energy-354Kcal, Carbs-73g, Fat-10g, Protein-12g	Reduces bad blood cholesterol, lower high blood pressure
Barley Cutlet	69 (23.0)	Protein-31g, Fat-4g, Cho-23g, Energy-241Kcal.	Boosts immune system, keeping intestine healthy
Barley Corn Salad	165 (55.0)	Protein-g, CHO-19g, Vit-C-3.6mg, Fibre-1g	Prevents diabetes, wound healing, improves digestion
Barley Mushroom Khichda	51 (17.0)	Potassium-318mg, Fibre-1g	Prevents heart problem
Barley Paneer Soup	99 (33.0)	Fat-33g, Calorie-402Kcal, Protein-25g	Boosts immune system, maintains cholesterol level
Barley Dosa	78 (26.0)	Fibre-2.73g, K-210mg, Mg-20mg, Vit-B-20mg	Reduces cholesterol level, supports healthy heart.

(Figures in brackets denotes the percentage of respective values)

Table 3. Distribution of women acceptability of developed recipes according to their socio-economic status

Acceptability	Low income	Medium income	High income	Total
Daily	18 (6.0)	39 (13.0)	57 (19.0)	114 (38.0)
Weekly	27 (9.0)	48 (16.0)	27 (9.0)	102 (34.0)
Monthly	26 (8.7)	30 (10.0)	13 (4.3)	69 (23.0)
Seasonally	9 (3.0)	3 (1.0)	3 (1.0)	15 (5.0)
Total	80 (26.7)	120 (40.0)	100 (33.3)	300 (100.0)
χ^2	30.467**			P < 0.01

(Figures in brackets denotes the percentage of respective values)

Table 4. Distribution of women awareness regarding nutritive values in barley recipes according to their socio-economic status

Nutrients in barley recipes	Awareness (%)		
	Low income	Medium income	High income
Protein	2.0	45.0	50.0
Energy	5.0	40.0	60.0
Fat	–	–	10.0
Carbohydrate	–	35.0	70.0
Fibre	–	25.0	70.0
Calcium	2.0	15.0	50.0
Iron	–	10.0	35.0
Vitamin B ₆	–	15.0	25.0
Sugar	–	–	–
Sodium	–	1.0	5.0
Potassium	–	–	5.0
Magnesium	–	–	–
Zinc	–	1.0	4.0
Vitamins	–	5.0	25.0

Barley's high fiber content helps food move through own gut and promotes a good balance of gut bacteria, both of which play important roles in digestion. Barley is high in fiber, which is necessary for proper digestion. Due to its nutritional value barley is particularly helpful as it strengthens body's immune system and reduces the chances of cold and flu. Iron improves the blood volume and prevents anemia and fatigue. Moreover, it aids in smooth functioning of the kidney and the development of body cells. It works as a diuretic that increases urination and flushes out toxins from the body. Barley water is an excellent solution for kidney stones and cysts too. This drink is recommended in children and adult age groups daily till the urine infection subsides. Though fibre is essential to maintain good gut health and bowel movement, an excess can irritate the stomach. Barley is a rich source of essential nutrients that help to keep the body fit and healthy. Drinking barley water every morning helps flush out all toxins from the body and improves the overall health. Then apply barley water on the skin, it reduces acne and fights skin infection. Barley can also brighten the skin tone by acting as a gentle exfoliator and controlling oil secretion. As the age of women increases, their weight also increases. There are many reasons for this like as heredity, lack of exercise and yoga, over- eating etc. sometimes

cholesterol level in blood increases, which can grow in any kind of person thin or fat, which is harmful for health. Barley water and barley roti is very useful to reduce cholesterol level in body.

Barley has a direct impact on the socio-economic status, because people of low-income group reduce its use due to lack of awareness. People of middle- and high-income group have more awareness of barley, so they use it more. Millets International Day – 2023 has been declared, in which barley is included in millets, so the ration that will be given to the poor by the government, barley is also included in it.

Barley is one of the most highly adapted cereal grains with production occurring in climates ranging from sub-Arctic to subtropical. Because of its use in malt production, barley is grown in many areas of the world for cultural as well as economic reasons. Barley is affected by environmental factors as climate, soil, area, pesticides use. In 2017, barley was ranked fourth among grains in quantity produced (149 million tonnes or 330 billion pounds) behind maize, rice and wheat. Barley is more tolerant of soil salinity than wheat. Barley has a short growing season and is also relatively drought tolerant.

Table 5. Impact of barley product and developed recipes nutritional benefits on women according to their socio-economic status

Barley products recipes	Knowledge (%)		
	Low income	Medium income	High income
Barley Lassi	36 (12.0)	84 (28.0)	60 (20.0)
Barley Kheer	27 (9.0)	90 (30.0)	66 (22.0)
Barley Paratha	30 (10.0)	69 (23.0)	72 (24.0)
Barley Sattu Juice	24 (8.0)	66 (22.0)	75 (25.0)
Barley Vegetable Soup	21 (7.0)	60 (20.0)	72 (24.0)
Barley Apple Cinnamon	3 (1.0)	24 (8.0)	48 (16.0)
Barley Vegetable Khichdi	9 (3.0)	42 (14.0)	69 (23.0)
Grain in Herby Butter Milk	–	33 (11.0)	60 (20.0)
Barley Lemon Water	–	30 (10.0)	57 (19.0)
Barley Flour Uttapam	–	33 (11.0)	63 (21.0)
Barley Laddu	3 (1.0)	36 (12.0)	60 (20.0)
Barley Papadi	–	30 (10.0)	66 (22.0)
Barley Rava Idli	–	30 (10.0)	72 (24.0)
Barley Risotto	–	6 (2.0)	18 (6.0)
Barley Stuffed Pepper	–	9 (3.0)	21 (7.0)
Barley Vegetable Pullav	6 (2.0)	39 (13.0)	63 (21.0)
Barley Malt	–	12 (4.0)	27 (9.0)
Barley Milk and Honey Porridge	–	3 (1.0)	21 (7.0)
Barley Halwa	6 (2.0)	48 (16.0)	57 (19.0)
Barley Vadai	3 (1.0)	24 (8.0)	42 (14.0)
Barley Cutlet	–	6 (2.0)	39 (13.0)
Barley Corn Salad	–	6 (2.0)	42 (14.0)
Barley Mushroom Khichda	–	39 (13.0)	60 (20.0)
Barley Paneer	–	30 (10.0)	66 (22.0)
Barley Dosa	–	18 (6.0)	36 (12.0)

(Figure in brackets denotes the percentage of their respective values)

Table 6. Distribution of women according to inhibiting factors for consuming the barley products and recipes as per their socio-economic status

Inhibiting factors	Low income	Medium income	High income	Total
Environmental factors (cold, climate, pesticides and harvesting)	27 (9.0)	39 (13.0)	45 (15.0)	111 (37.0)
Lack of awareness	21 (7.0)	18 (6.0)	21 (7.0)	60 (20.0)
Cost ratio	33 (11.0)	21 (7.0)	18 (6.0)	72 (24.0)
Health hazards	36 (12.0)	24 (8.0)	24 (8.0)	84 (28.0)
Allergic reactions	33 (11.0)	21 (7.0)	24 (8.0)	78 (26.0)
Marketing problems	42 (14.0)	33 (11.0)	18 (6.0)	93 (31.0)

(Figures in brackets denotes the percentage of respective values)

4. CONCLUSION

Barley being full of nutrients can sometimes be harmful due to swearing in excessive amount. Sometimes it causes severe allergic health hazards when it is consumed by any particular person; in this condition one should not include barley in their diet. It is also important that people who want to increase their fiber intake do so gradually. This is because suddenly adding lots of fiber to the diet may lead to temporary

digestive problems, such as bloating, as the body adjusts to the change.

5. RECOMMENDATIONS

1. Barley is a very healthy grain. It's rich in vitamins, minerals, and other beneficial plant compounds.
2. It's also high in fibre, which is responsible for most of its health benefits, ranging from a better digestion to reduced hunger and weight loss.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Aly, Ahmed, El-Deeb, Fadl, Elazeem, Afnan, Hameed, Ahmed, Alfi, Alia, Alessa, Hussain, Al Refaei, Abdulmajeed. Addition of whole barley flour as a partial substitute of wheat flour to enhance the nutritional value of biscuits. *Arabian Journal of Chemistry*. 2021;14:103112. DOI:10.1016/j.arabjc.2021.103112.
2. Badea, Ana, Wijekoon, Champa. Benefits of Barley Grain in Animal and Human Diets; 2021. DOI:10.5772/intechopen.97053.
3. Nakov, Gjore. Quality evaluation of Cookies produced from wheat and Barley Flour. *Applied Researches in Technics, Technologies and Education*. 2019;7:138-143. DOI:10.15547/artte.2019.02.008.
4. Nakov, Gjore, Dimov, Ivan, Taneva, Ira, Stamatovska, Viktorija. Influence of sucrose and barley flour on some physical, texture and sensory characteristics of cookies. *IOP Conference Series: Materials Science and Engineering*; 2021. DOI:10.1088/1757-899X/1031/1/012110.
5. Maskey, Bunty, Paudel, Ashish, Shrestha, Nabindra Kumar. Effect of Incorporation of Oats and Malted Barley Flours on the Quality of Cookies. *Himalayan Journal of Science and Technology*. 2021;5:67-74. DOI:10.3126/hijost.v5i01.42142.
6. Moza, Jessy and Gujral, Hardeep. Mixolab, retrogradation and digestibility behavior of chapatti made from hullless barley flours. *Journal of Cereal Science*. 2017;79. DOI:10.1016/j.jcs.2017.11.003.
7. Rico, Daniel, Peñas, Elena, García, María, Martínez-Villaluenga, Cristina, Rai, Dilip, Birsan, Rares, Frias, Juana and Martín-Diana, Ana. Sprouted barley flour as a nutritious and functional ingredient. *Foods*. 2020;9:296. DOI:10.3390/foods9030296.
8. Tamura, Masatsugu, Takahashi, Naoya, Akutsu, Satomi, Hoshi, Yoshihiro, Okamoto, Takemi. Development of Dumpling Skin Rich in Barley Flour with Added Gluten. *Engineering in Agriculture, Environment and Food*. 2020;13:15-22. DOI:10.37221/eaef.13.1_15.
9. Vasan, Alka, Pinky, Boora, Khetarpaul, Neelam. Grab a healthy bite: Nutritional evaluation of barley based cookies. *Asian Journal of Dairy and Food Research*. 2017;36. DOI: 10.18805/ajdfr.v36i01.7464.
10. Zarroug Youkabed, Djebali Kais, Sfayhi Dorra, Khemakhem Maissa, Boulares Mouna, El Felah Mouldi, Mnasser Hassouna, Kharrat, Mohamed. Optimization of barley flour and inulin addition for pasta formulation using mixture design approach. *Journal of Food Science*. 2021;87. DOI: 10.1111/1750-3841.16009.
11. Zhou Xianglong, Yu Wenwen, Li Cheng. Protein content correlates with the in vitro starch digestibility of raw barley flour. *Food Bioscience*. 2021;43. DOI:101292. 10.1016/j.fbio.2021.101292.

© 2023 Pandey and Kunwar; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/100083>