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

**Shalini Pandey<sup>a++\*</sup> and Neelma Kunwar<sup>b#</sup>**

<sup>a</sup> College of Home Science, C.S. Azad University of Agriculture and Technology, Kanpur, India.

<sup>b</sup> 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.*

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## **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.*

<sup>++</sup> Research Scholar;

<sup>#</sup> 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) |
| $\chi^2$      | 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) |
| $\chi^2$      | 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 <sub>6</sub>      | –             | 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.

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