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# Assessment of nutritional properties of rice flour chapatti

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**Abstract**
The study was carried out to evaluate "Assessment of nutritional properties of rice flour chapatti" during the year 2015-16 in the laboratory of the Institute of Food Sciences and Technology, Faculty of Crop Production, Sindh Agriculture University Tandojam. Two varieties of rice flour shadab and shua were used in this study. The result indicated that highest values in all parameters for pH content, moisture content, ash content, fat content, protein content, fiber and carbohydrate were significant ($P<0.05$) as compared to the shadab flour. The shua chapatti contained highest pH content 6.5, moisture content 12.32, ash content 1.20, fat content 0.96, protein content 2.87, fiber 2.21and highest carbohydrate 84.33 were recorded respectively. Whereas the results of shadab chapatti contained lowest pH content 5.58, moisture content 11.26, ash content 1.07, fat content 0.75, protein content 2.31, fiber 1.58 and highest carbohydrate 81.55 respectively. Sensory analysis showed the highest score 8.80 Color, Taste 8.43, aroma 8.30, texture 8.56 and 8.83 for overall acceptability respectively were recorded in shua rice flour chapatti as compared to the shadab rice flour chapatti.

**Keywords:** rice flour, chapatti, nutrition

## Introduction
Foods obtain from grain which includes cereals are used as dietary staples for many cultures in the world. Approximately 70 per cent of the staple food is rice. Production of rice in 2013, about 740 million tons most of it 271 million tons, was gown in Asia. America was on second with the production of 36 million tons and Africa was on third, with 28 million tons. In Pakistan it is mostly grown in provinces of Sindh and Punjab. In Sindh province of Pakistan major rice growing area are Dadu, Larkana, Qamber, Shikarpur, Shahdad-Coat, Jackabad and Kashmor districts of upper Sindh while Tando Muhammad khan and Badin are major areas in lower Sindh.

Rice is the 2nd most important food crop in Pakistan, not only in respect of local consumption but also in view of large exports. Chapatti is Indian origin history was date back also Indus valley in Pakistan Moen-jo-daro used as an unleavened flat bread is very much famous in majority in Malaysia households. It is obtained by using whole flour of wheat. Chapatti achieved with the help of baking for little time of period at medium temperature. Researchers' reported about wheat chapatti substitution such as adapting mixed or rice flour. It is improving therapeutic status diabetes by adding with rice bran (Singh *et al*., 2013) [19]. Products of rice are popular all over the world and chapatti one of them rice flour chapatti is main part of life. It does not contain cholesterol and it has fewer ratios of salt and fat. Rice flour chapatti is good source of vitamins and minerals such as nicin, thiamine, riboflavil, vitamin-D, iron and calcium. Rice flour chapatti is extremely low in fiber; hence it is easily to the digestive system of the body. Rice flour chapatti has good shelf life and it has a popular as long before the gluten free diet. Rice flour chapatti is best for celise disease. Rice flour chapatti is softer than the regular whole wheat chapatti and much whiter and more delicious the whole wheat chapatti. Rice is used as a staple food at about 70% of the world's population.

The quality and characteristics of chapattis are mainly depended on the quality of rice used and the processing condition employed for the converting into the flour. The major components of rice is carbohydrates are present in the rice flour, among these starch (carbohydrates) is the major compound for celiac disease (CD) permanent gluten is replaced by rice product like rice chapattis (Gallagher *et al*., 2004) [6]. It expressed that the mixing of chickpea with rice flour chapatti (Gupta and Kawatra, 2002) and also faba beans (Abdel-aal *et al*., 2003) to achieve delicious rice flour rice chapatti also with chickpea and lentils (Shahzadi *et al*., 2005) [17], spinach (Khan *et al*., 2013) [11] and also using of cereal brans (Dar *et al*., 2014) [4] was reported. It was noticed from the scientific studies that the textural characteristics and nutritional properties of rice flour chapattis were enhanced by adding faba beans and chickpea. Rice flour chapatti is the option for obtained gluten free products Gujral and Rosell, 2004 [8]; Neuman and Druemmer, 1997 [15]; Moore *et al.*, 2006 [14]; Cleric and El-Desh, 2006. Rice flour chapatti contains an important mineral like magnesium for regulating blood pressure and helping offsetting sodium in the body. Furthermore brown chapatti is naturally gluten free. Manganese also helps to get energy from carbohydrates and protein. Brown rice chapattis reduce the risk of cancer because of it contains manganese it also protest against free radicals which are cancer causing agents. It also associated to decrease the risk of harmful disease such as breast cancer, prostate

cancer and colon cancer. It overcomes the risk of many diseases such as type of diabetes. Therefore the present study was design to compare assessment of nutritional properties of rice flour chapatti shadab and shoha and to determine the sensorial properties of rice flour chapatti.

## Materials and Methods

The Study was carried out during 2015-16 to investigate nutritional value of two different varieties of rice flour chapatti. Raw rice varieties shadab and shoha was collected from NIA (Nuclear Institute of Agriculture), Tandojam Sindh province of Pakistan, it was grind into flour by milling process at Institute of Food Sciences and Technology. The experiments were conducted in the laboratories of Institute of Food Sciences and Technology, Sindh Agriculture University, Tandojam.

## Preparation of rice chapatti

The flour was mixed with hot water and dough was kneaded to soft and uniform consistency. About 100g of rice flour was taken for preparation of rotti. The dough was well kneaded on a wooden or metal platform and wrapped in 2 aluminium foils. About 80g of the dough was taken to roll each rice chapatti into round shape. The chapattis were rolled in flattened machine, baked on flat surface tava/pan) for 5 minutes and wrapped into the muslin cloth by (Shin *et al*., 2010) [18].

## Physicochemical Analysis

pH value was analyzed according the method as reported by (Ockerman 1985) [16]. The sample at about (10g) mingled with (90 ml) distilled water and transfer it into the beaker and electrodes accompanied with the temperature probe were inserted to sample and reading was noted.

The proximate composition of pulses include moisture, ash, fat, protein were analyzed by AOAC (2012) [2] and total carbohydrate was calculated by difference.

## Statistical Analysis

The data obtained was analyzed according to statistical process of analysis of variance (ANOVA) and significant differences of the mean were more computed using least significant difference (LSD) test at 0.05% level of probability through computerized statistical package (Statistix 2006) [20].

## Results

The present study was carried out on the assessment of nutritional properties of rice flour chapatti of two rice varieties shadab and shua. In order to compare their quality characteristics for their physicochemical and sensorial composition during the year of 2015-16 in the Institute of Food science and Technology, Faculty of crop production, Sindh Agriculture University, Tandojam. The results obtained of physiochemical and sensorial characteristics of rice flour chapatti such as: pH, moisture (%), ash (%), fat (%), protein (%), crude fiber and total carbohydrates.

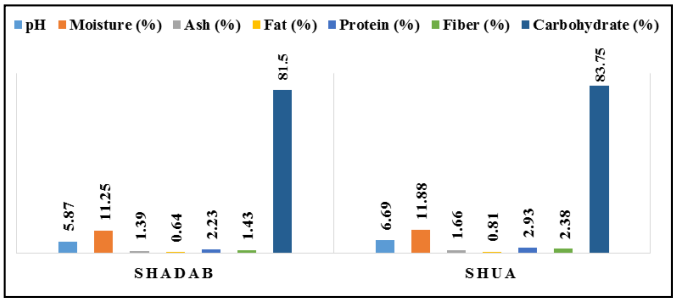


**Fig 1:** Physicochemical Analysis

The data obtained for each parameter were analyzed statically. Mean square results showed there were highly significant difference at (p>0.05) probability level.

## Sensory evaluation

The sensory attributes of rice flour chapattis such as color, taste, aroma, texture and overall acceptability. The analysis of variance for color which was sensed by trained panel of (six judges) in three experimental batches to using 9-point hedonic scale9 point's hedonic scale was used as per method described by (Larmond 1997) [12].

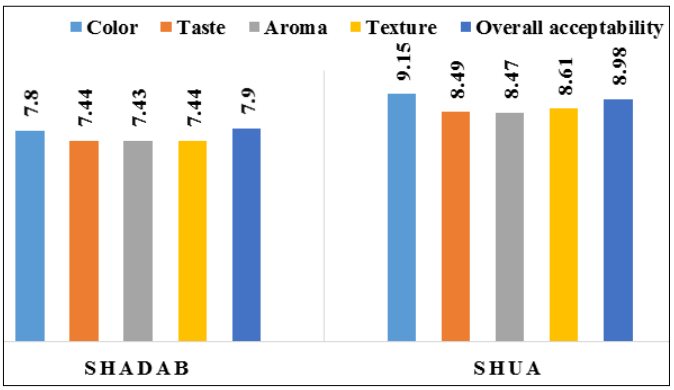


**Fig 2:** Sensory Evaluation

The data obtained for each parameter were analyzed statically. Mean square results showed there were highly significant difference at (p>0.05) probability level.

## Discussion

The nutritional value of rice flour chapatti was (ph, moisture (%), ash (%), fat%, protein (%) crude fiber (%) and carbohydrates (%) of rice flour of two varieties shadab and shua. The analyses of rice flour chapatti are shown in Fig 1 to7. Nutritional value of all parameters were significantly high (p<0.05) in shua rice flour chapatti. pH of rice flour chapatti of shadab and shua showed a significant difference (P>0.05) after processing. pH content were significantly high (6.6) in shoha. The many studies has mentioned about pH (Cheng *et al*., 2015) [3]. The moisture content were significantly high (11.88%) in shua (Elaf *et al*., 2015) [5]. The Ash content were significantly high (1.66 %) in shua. It showed that shua

contain highest amount of minerals then that of shadab. The results obtained from present study are in agreement with the finding of (Hardeep *et al*., 2012) [10]. The fat content were significantly high (0.81) in shua. The many studies has mentioned about fat (Ghufran *et al*., 2009) [1]. The results showed that protein content was high (2.93) in shua rice flour chapatti. More than 12% of their calorific value from protein has been provided by plants (rice) so they are good source of protein (Aashitosh *et al*., 2015) [1]. It showed that protein is most common nutrient analyzed in rice and protein content was found to different significant by variety (Gujral *et al*., 2004) [8]. The crude fiber were significantly high (2.38) in shua. Crude fiber reduce the constipation (López *et al*., 2004) [13]. The total carbohydrates were significantly (P>0.05) high in shua at about (83.75). Carbohydrates are good source of energy and rice varieties content (80.14 – 83.75) the carbohydrates (Shin *et al*., 2010) [18].

## Conclusions

It is concluded that nutritive value of rice flour chapatti which is made from two rice flour varieties shadab and shua. It was observed that the nutritional properties of shua rice flour chapatti (i.e. pH, moisture, ash, fat, protein, crude fiber and carbohydrates) were significantly high as compare to the shadab rice flour chapatti.

## Suggestion

The use of rice flour chapatti should be increased for the gluten allergic patients.

Further study should be conducted on micronutrient of rice flour chapatti.

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