WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 7, Issue 10, 879-884. Research Article ISSN 2277– 7105

A COMPARATIVE STUDY ON THE NUTRIENT CONTENTS OF STANDARD AND VALUE-ADDED CHAPATTI DEVELOPED WITH MILLETS, PULSES AND CURRY LEAVES FLOUR MIX

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Article Received on
31 March 2018,

Revised on 21 April 2018,
Accepted on 11 May 2018,

DOI: 10.20959/wjpr201810-12326

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ABSTRACT

The significance of value addition to the habitually consumed staple diets lies in the nutritional enhancement of a community with great ease. Since the staple diets are accepted without any restraint for trials by the subjects, they serve as a vehicle for transporting the value additions, and prove food as medicine. Thus, this study is planned with the objective of incorporating the wellness of millets namely ragi, bajra, jowar and the pulses viz. green gram, horse gram whole Bengal gram (black) and curry leaves flour mix prepared from unprocessed, roasted and germinated techniques into the whole wheat flour and developing value added chapattis, the staple diet of majority of Indian population. The developed value-added chapattis were subjected to nutrient evaluation and compared with standard.

KEYWORDS: Value addition, Processing, Millets, Pulses, Curry leaves.

INTRODUCTION

The 68th National Sample Survey, conducted in 2011-12, states that in the past seven years the consumption of wheat by Indians has risen steadily. In the Indian sub-continent, the main form of consumption of wheat is chapatti. The composition of whole wheat flour indicates that the major nutrients present are carbohydrates, proteins and fibre. The micronutrients are present in negligible amounts. Hence, the addition of locally available low-cost ingredients like curry leaves improves the availability of beta – carotene and iron, millets aid to the nutraceuticals index and protein quality can be enhanced by adding pulses to the wheat flour.

Since chapatti is consumed at large by the obese, diabetic, and cardiovascular patients the presence of nutraceuticals will add furthermore beneficial health effects to the consumer. Moreover, the germination and roasting methods applied to the ingredients will also enhance the nutritional quality of the product.

OBJECTIVES

The study is framed with the following objectives:

1. To prepare value added flour mix with millets, pulses and curry leaves flour.
2. To develop flour mix incorporated value-added chapatti and standard sample.
3. To determine the nutritional parameters of value added and standard chapatti.
4. To compare the nutrients of value added chapatti with the standard.

METHODOLOGY

1. Preparation of Value Added Flour Mix

a. Preparation of Unprocessed Flour Mix

The millets ragi, bajra and jowar, the pulses green gram, whole bengal gram (black) and horse gram were cleaned, washed with water, dried in shade and ground separately.

b. Preparation of Germinated Flour Mix

The millets ragi, bajra and jowar, the pulses green gram, whole bengal gram (black) and horse gram were cleaned, washed with water, soaked individually for 12 hours at room temperature. The excess water was discarded and tied in a muslin cloth and allowed to germinate. The ingredients were dried under shade and ground separately.

c. Preparation of Roasted Flour Mix

The millets ragi, bajra and jowar, the pulses green gram, whole bengal gram (black) and horse gram were cleaned, washed with water, roasted at 130$^{\cdot}$ C for 5-7 minutes each, cooled and ground separately.

d. Preparation of Curry Leaves Powder

The curry leaves were cleaned, washed with water, dried in shade and ground.

2. Development of Value Added Chapatti Using Prepared Flour Mix

Table 1: Formula for preparation of value added chapatti and standard chapatti.

Ingredients	Quantity			
	Unprocessed Chapatti- Sample I (from unprocessed millets and pulses flour)	Sprouted Chapatti – Sample II (from sprouted millets and pulses flour)	Roasted Chapatti – Sample III (from roasted millets and pulses flour)	Standard Chapatti
Ragi flour	5g	5g	5g	-
Bajra flour	5g	5g	5g	-
Jowar flour	5g	5g	5g	-
Green gram flour	5g	5g	5g	-
Black channa flour	5g	5g	5g	-
Horse gram flour	5g	5g	5g	-
Curry leaves powder	5g	5g	5g	-
Whole Wheat flour	65g	65g	65g	100g

Method of Preparation

In a mixing bowl, add the millets flour (Ragi, Bajra,Jowar),pulses flour (green gram, black channa, horse gram) and curry leaves powder along with whole wheat flour in the proportion as mentioned in the Table 1, for each variation of Chapattis. Mix, add required salt to it, then add water little by little to make firm dough and knead well. Let it stand for half an hour. Divide into small balls and roll in dry flour. Dust a flat board with flour and with rolling pin, roll into a ball of dough into a chapatti. Cook lightly on both sides on a flat heated iron plate and puff over burning for preparing value added chapatti. Similarly, standard chapatti is prepared using whole wheat flour alone.

3. Nutritional Parameters of Value Added and Standard Chapatti samples

The millets, pulses and curry leaves powder enriched chapatti samples and the standard samples were analysed for moisture, protein, fat, carbohydrates, iron, calcium, vitamin A and crude fibre, as per standard methods.

4. Comparative analysis of the nutrients of value added chapatti with the standard.

Table 2: Comparison between value added chapattis and standard (unprocessed, sprouted, roasted).

S.NO	Parameters	Sample I	Sample II	Sample III	Standard
1	Moisture content (%)	10.50	11.85	9.50	3.66
2	Crude fibre (%)	7.50	8.10	6.20	2.1
3	Protein (%)	25.50	32.18	30.25	2.88
4	Fat (%)	16.10	18.20	14.30	0.39
5	Carbohydrate (%)	6.20	9.50	8.40	16.74
6	Iron(mg /100g dry sample)	95.60	116.36	104.40	1.5
7	Calcium(mg/100g dry sample)	49.64	74.32	50.52	0.3
8	Vitamin A(IU /100g dry sample)	144.65	180.32	164.83	9.2

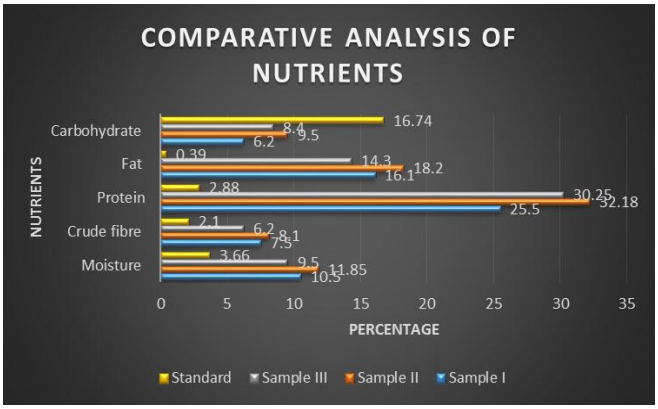

Figure -1.

From the figure -1 it is evident that the carbohydrate content was significantly reduced in unprocessed value-added chapatti than in standard, while the protein and fat content was improved by 23% and 6% respectively. The protein and fat were present in higher proportion in sample II, i.e. Sprouted value added chapatti. The fibre present in sample II was 8% which is the highest of all the variations. Hence, it can be said that the Sprouted variation of value added chapatti holds maximum nutrients in it as germination increases the nutrient density.

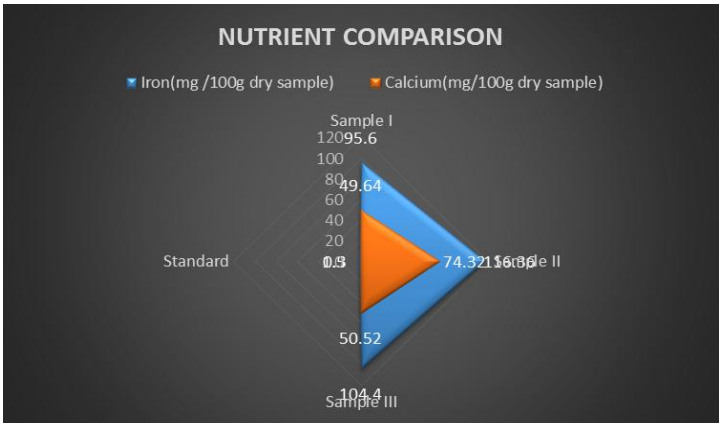

Figure- 2.

The above figure clearly shows that the iron and calcium are present at the highest ratio in sample II. Roasted value-added chapatti comes second in the row and there is high significance in the difference when compared with the standard one.

Similarly, Vitamin A is also highly present in sprouted value-added chapatti as it is apparent from table-2.

CONCLUSION

The present study has laid emphasis on improving the daily food intake by addition of locally available cost-effective millets, pulses and curry leaves and has proved successful as the content of all the essential nutrients have found a significant increase. Millets are highly nutritious, non-glutinous, non-acid forming and easily digestible, also rich in phytochemical, higher mineral profile in millets enriched flours with particular reference to iron and calcium whereas pulses provide some amount of calories and rich in protein, and curry leaves provide a substantial amount of iron, calcium and Vitamin -A and the sprouted value added chapatti is promising in terms of improving the micro nutrient status of the population.

More nutritional benefits can be reaped by following these recommendations:

- It can be used as a supplement in subjects with non-communicable disease to alleviate micronutrient deficiencies.
- Improving the marketing strategies of value added flour mix and its related product, through proper advertisements.
- Awareness about the nutritional and health benefits of value added flour mix should be created in the community.
- More innovative products using value added flour mix should be produced there by making sure that value added flour mix product is included in the daily diet.

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