



Value added product development incorporating olive leaves

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Abstract

Olive leaves (*Olea europaea*) powder was studied for the development of value added product i.e. *Khakhra* in various proportions (5%,7%). The product was evaluated by a panel of semi trained judges for sensory characteristics like colour, appearance, texture, aroma, taste and overall acceptability on nine point hedonic scale. The overall acceptability score of sample I (5%), sample II (7%) and control, recorded 6.8, 8.1 and 8.4 respectively. The developed product ranged from “liked moderately” to “liked very much” on the organoleptic parameter. Developed product contained 12.70, 13.01, 13.01, 2.55, 3.32, 71.82 percent moisture, crude protein, crude fat, crude fiber, ash, total carbohydrate and 450.5 kcal/100g and energy respectively.

Keywords: organoleptic evaluation, *khakhra*

Introduction

Globalization has seriously affected one's eating habits and enforced many people to consume fancy and high calorie fast foods, popularly known as Junk foods (Solomons and Gross, 1995) [12]. Plants and their products are in use to treat the diseases since ancient time and also has important place in *Ayurveda* and *Unani* medicine (Marwat *et al.*, 2009) [6]. The olive tree (*Olea europaea*) belongs to the family of *Oleaceae*. The olive fruit, its oil and the leaves of the olive tree have a rich history of nutritional, medicinal and ceremonial uses (Soni *et al.*, 2006) [13]. Olive leaves have been widely used as a remedy for the treatment of fever and other diseases like malaria in European and Mediterranean countries (Gucci *et al.*, 1997) [3]. According to The Times of India, 2015 Rajasthan is the leading state in olive cultivation in the country and has harvested around 120 tons of raw production of olive fruit. For this, 1.12 lakh plants of seven different olive varieties namely *Barnea*, *Arbequina*, *Cortina*, *Picholine*, *Picual*, *Coraniki* & *Frontoy* were imported from Israel. The olive leaves are well known for many useful pharmacological effects. Olive leaves extracts have antimicrobial, anti-inflammatory, anti-oxidant, anti-hypertensive, anti-hypercholestermic, anti-hyperglycemic, antithrombotic, diuretic and anti-tumor properties (Sabry, 2014) [10]. As a dietary component, the leaves have been consumed in the form of an extract and whole herbal powder (Karakaya, 2009) [5]. Olive leaves contain secoiridoids (oleuropein, ligstroside, dimethyloluropein and oleoside) (Hayes *et al.* 2011) [4]. Pereira *et al.* (2007) [7] who reported that olive leaves can decrease blood pressure, increase blood flow in the coronary arteries, decrease arrhythmia and prevent intestinal muscle spasms.

Material and Methods

1. Selection of panel members

Threshold test was used for selection of the panel member (Potter, 1987) [8]. Convenience, experience, knowledge, willingness, interest and sincerity were the criteria for consideration of panel members. Ten members were

enlisted in the panel comprised of staff of the College of Home Science, SKRAU, Bikaner.

2. Preparation of score card

Score card was developed for assessing acceptability of powder on the basis of certain qualities looked for in food preparation such as colour, aroma, texture and overall acceptability. Nine-point hedonic ranking scale was provided to the judges for scoring as suggested by Ranganna (1986) [9].

3. Organoleptic evaluation of developed products

Standardization of the developed product was carried out through organoleptic evaluation. The developed product evaluated for their sensory characteristics like colour, appearance, aroma, texture, taste and overall acceptability by selected panel of ten semi trained panel members.

4. Proximate composition of developed product

The sample of product were also analyzed for nutrient content i.e. moisture, crude protein, crude fat, crude fiber, ash, total carbohydrate and energy (AOAC, 2012) [11].

5. Statistical Analysis

The data of the organoleptic acceptability, nutritional assessment and shelf life study was statistically analyzed to fine out significance of the results (Chandel.1997) [2]. The results are expressed as mean \pm SD. The obtained data statistically analyzes by using SPSS statistics (Ver.20) software using one way of analysis of variance (ANOVA) and significance of difference between means of tested parameters was carried out using Turkey Post hoc test. Differences were considered statistically significant at 1% and 5% level of significance.

Result and Discussion

Development and standardization of value added product

The shade dried powder of olive mature leaves was selected

for study. Value added product were developed and standardized using different proportions of shade dried powder of olive mature leaves (5%, 7%) and evaluated by the panel of semi trained judges for sensory characteristics like colour, appearance, aroma, texture, taste and overall acceptability on nine point hedonic scale. Results of sensory evaluation of developed product are depicted in Table I.

Khakhra

Mean acceptability score for organoleptic attributes of *khakhra* are portrayed in Table 1. Sample I and II of *khakhra* prepared using olive leaves powder along with control made by wheat flour sample found to be organoleptic acceptable by the panelists.

The highest score (8.4) recorded by the control and fell in the category “liked very much” by the panel member. The lowest scores (6.8) secured by sample II which had maximum amount of olive leaves powder i.e. 7%, and fell under category of “liked slightly”. While sample I (5% powder + 95% wheat flour) recorded 8.1 and found at par when compared with control one. Mean organoleptic scores for the sensory parameters i.e. colour, appearance, aroma, texture, taste and overall acceptability were found to be highly significant at 1% level. Similar study conducted by Sharma (2010) [11] showed that incorporation of AVL (aloe vera leaf powder) with wheat flour and Bengal gram in *khakhra* secured 7.7 and fell in the category of “liked moderately” on nine point hedonic scale.

Table 1: Organoleptic acceptability of *khakhra*

| Sr No | Khakhra | Mean score of sensory characteristics on nine point hedonic ranking scale | | | | | |
|-------|----------------|---|------------|------------|------------|------------|-----------------------|
| | | Colour | Appearance | Aroma | Texture | Taste | Overall Acceptability |
| 1. | Control | 8.8 ± 0.42 | 8.6 ± 0.69 | 8.2 ± 0.63 | 8.7 ± 0.48 | 8.7 ± 0.67 | 8.4 ± 0.69 |
| 2. | Sample I (5%) | 8.2 ± 0.78 | 8.0 ± 0.66 | 7.9 ± 0.31 | 8.4 ± 0.51 | 8.0 ± 0.66 | 8.1 ± 0.56 |
| 3. | Sample II (7%) | 7.1 ± 0.56 | 7.2 ± 0.78 | 7.0 ± 0.66 | 7.2 ± 0.66 | 6.4 ± 1.34 | 6.8 ± 0.42 |
| | “F” Value | 19.87** | 9.51** | 12.38** | 12.06** | 15.31** | 21.94** |

Values are mean ± SD of ten panelists **significance at 1% level

Proximate composition of *khakhra*

The sample of product was also analyzed for nutrient content i.e. moisture, crude protein, crude fat, crude fiber, ash, total carbohydrate and energy.

Table II and fig.I exhibited the proximate composition of control, sample I and sample II of *khakhra*. Moisture content of control, developed sample I and sample II of *khakhra* was analyzed as 12.56 percent, 12.66 percent and 12.70 percent respectively. Crude protein content as observed lower (12.54) in control sample whereas higher

values (13.01) was observed in sample II. Data from Table II and fig. I depicted that fat content analyzed to be 12.59, 12.89 and 13.01 percent in control and developed sample I and II, whereas ash content was 2.87 percent 2.44 and 2.55 percent respectively. Crude fiber content of control, sample I and sample II of *khakhra* was 2.20 percent, 2.44 percent and 2.55 percent respectively, indicating higher crude fiber in the developed sample II than its counterpart and difference observed to be significant at 1 % level for energy, ash & carbohydrate.

Table 2: Proximate composition of *Khakhra* (on dry weight basis)

| Sr. No. | Khakhra | Moisture (%) | Crude Protein (%) | Crude Fat (%) | Crude fiber (%) | Ash (%) | Carbohydrate (%) | Energy (%) |
|---------|----------------|--------------|-------------------|---------------|-----------------|-----------|------------------|------------|
| 1 | Control | 12.56±0.40 | 12.54±0.19 | 12.59±0.51 | 2.20±0.76 | 2.87±0.09 | 70.16±0.41 | 438.1±1.1 |
| 2 | Sample I (5%) | 12.66±0.41 | 12.87±0.17 | 12.89±0.51 | 2.44±0.77 | 3.19±0.77 | 71.35±0.06 | 446.9±1.43 |
| 3 | Sample II (7%) | 12.70±0.41 | 13.01±0.17 | 13.01±0.51 | 2.55±0.75 | 3.32±0.12 | 71.82±0.03 | 450.5±1.53 |
| | “F” Value | 5.353 | 0.087 | 0.540 | 0.162 | 14.84** | 1021.09** | 63.43** |

Values are mean ± SD of three replicates **significance at 1% level.

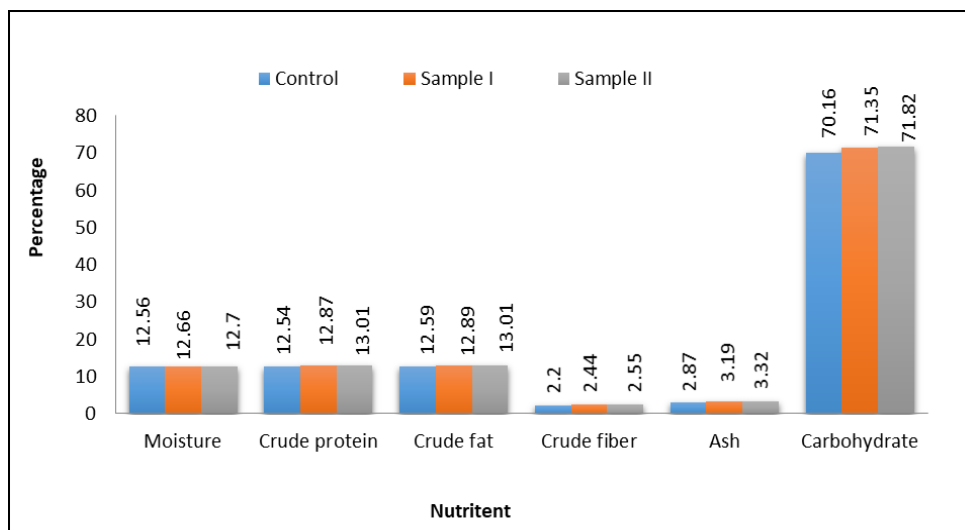


Fig 1: Proximate composition of *Khakhra*

In control *khakhra* total carbohydrate calculated to be 70.16 percent whereas in developed sample I and sample II it was 71.35 percent and 71.82 percent respectively. Energy content of control sample was 438.1Kcal/100g whereas in developed sample I and sample II *khakhra*, it was noted to be 446.9 Kcal/100g and 450.5 Kcal/100g.

Conclusion

The product *khakhra* was developed by supplementation of olive leaves powder. The developed product was “liked very much” on the organoleptic parameter. Result of sensory evaluation of products indicates that sample I found to be most acceptable and scored 8.1 on 9 point scale as compared to other sample II (6.8). Developed products contained 12.70, 13.01, 13.01, 2.55, 3.32, 71.82 percent moisture, crude protein, crude fat, crude fiber, ash, total carbohydrate and 450.5 kcal/100g energy respectively.

Acknowledgement

I would like to express my deep sense of gratitude, respect and special thanks to my research advisor Dr. (Mrs.), Vimla Dunkwal, Professor, Department of Food and Nutrition, College of Home Science, S.K. Rajasthan Agricultural University, Bikaner for her learned counsel, sagacious guidance, keen interest, kind encouragement and efficient supervision during entire course of study. I also pay my due respect to her accommodating and continuous support to my work in spite of her pre occupations and tedious busy schedule. I m beholden to her in a special manner and no words can fully convey my feelings of respect and regards for her.

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