

Organoleptic evaluation of vitamin C rich commonly consumed food preparations using under exploited greens

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Abstract

The Study was conducted comparing four vitamin C rich under exploited greens (cauliflower, drumstick, radish, broccoli) for developing commonly consumed food products: Pakora, Poori and Parantha. These products were organoleptically evaluated on 9 point Hedonic scale. Analysis of variance (ANOVA) showed that 30 to 40 per cent incorporation of under exploited greens were more acceptable. The highest score of overall acceptability was found in cauliflower greens Pakora i.e. 8.40, Cauliflower greens poori i.e. 8.60 and broccoli greens parantha i.e. 8.73 respectively.

Keywords: Under exploited greens, organoleptic, 9 point Hedonic scale

Introduction

Vitamin C is available only in fresh fruits and vegetables and is essential for the synthesis of collagen and metabolism of tyrosin. In addition to this, it also play a vital role in bone formation, wound healing, electron transport, cholesterol metabolism and also act as an antioxidant. Suzane, *et al.* (1991). In poor Indian diet, where fruit is expensive, green leaves of vegetables can make up the requirement of vitamin C and other nutritional disorders, if consumed in plenty. These green leaves of vegetables are also rich in other important constituents, which are required by the human body such as dietary fibre, beta carotene, iron, phosphorus and calcium.

Nutritious greens of cauliflower, drumstick, radish and broccoli though available at no cost are always discarded. Various reports Splenger (1971) have shown that the vitamin C is heat labile and easily destroyed in the process of cooking. Therefore, present investigation has been planned to develop commonly consumed food preparations by incorporating vitamin C rich, cheaply available under exploited greens of cauliflower, drumstick, radish and broccoli, using different methods of cooking and to know the acceptability of the prepared product by organoleptic evaluation.

Materials and Methods

The experiment was conducted in the Deptt. of Food Science and Nutrition, M.A.B. College of Home Science, C.S.A. University of Agric. & Tech. Kanpur during the year 2008-2009. A total number of four vegetable greens (cauliflower, drumstick, radish and broccoli) were included for the three replications. Greens were collected from reputed sources. These food preparations were prepared by different cooking method viz. deep fat frying and shallow fat frying. These methods of cooking were specially selected because of being commonly applied in homes. Each recipe was prepared by incorporating the greens at different variations 20, 30, 40, 50 and 60 per cent. Organoleptic evaluation of all these preparations were conducted by a panel of judges using 9 point Hedonic scale. Ranganna (1991). The interpretation of the data so obtained was done by analysis of variance (ANOVA) test (Chandel 1998).

Results and Discussion

The Organoleptic evaluation of the food preparations made by the incorporation of greens revealed that all the food products developed were organoleptically acceptable. It has also been noticed that when the level of incorporation of greens increased or decreased beyond the acceptance level in any

Table 1: Organoleptic evaluation of Pakoras with incorporation of under exploited greens of cauliflower, drumstick, radish and broccoli leaves

| Percent level of incorporation | Appearance | Taste | Flavour | Texture | Colour | Overall acceptance |
|--------------------------------|------------|--------|---------|---------|--------|--------------------|
| Cauliflower Poori | | | | | | |
| 20 | 6.00 | 8.00 | 7.66 | 7.00 | 7.6 | 7.26 |
| 30 | 7.66 | 8.33 | 8.00 | 7.66 | 7.66 | 7.86 |
| 40 | 8.66 | 9.00 | 8.33 | 8.33 | 7.66 | 8.40 |
| 50 | 7.66 | 7.66 | 7.33 | 9.00 | 7.30 | 7.80 |
| 60 | 7.00 | 7.33 | 7.66 | 8.66 | 7.00 | 7.53 |
| Mean Square | 2.90** | 1.22 | 0.43 | 1.93 | 0.27 | 2.00* |
| Drumstick Poori | | | | | | |
| 20 | 6.66 | 7.66 | 7.33 | 7.00 | 9.00 | 7.53 |
| 30 | 7.66 | 8.00 | 8.33 | 7.66 | 8.00 | 7.93 |
| 40 | 8.66 | 7.66 | 7.33 | 8.00 | 7.66 | 8.00 |
| 50 | 7.33 | 6.66 | 7.00 | 7.66 | 6.33 | 7.00 |
| 60 | 7.00 | 4.33 | 5.00 | 8.00 | 5.33 | 5.93 |
| Mean Square | 1.77** | 6.92** | 4.50** | 0.50 | 6.23** | 1.76* |
| Radish Poori | | | | | | |
| 20 | 6.33 | 8.00 | 7.66 | 8.00 | 8.00 | 7.60 |
| 30 | 7.33 | 8.66 | 8.33 | 8.00 | 7.66 | 8.00 |
| 40 | 9.00 | 8.66 | 8.33 | 8.66 | 8.66 | 8.33 |
| 50 | 7.66 | 7.66 | 7.33 | 7.33 | 7.00 | 7.40 |
| 60 | 7.00 | 7.00 | 7.00 | 7.00 | 8.00 | 7.20 |
| Mean Square | 2.93** | 1.50 | 1.06 | 1.27 | 1.10 | 2.23* |
| Broccoli Poori | | | | | | |
| 20 | 7.33 | 7.66 | 7.33 | 7.33 | 8.33 | 7.40 |
| 30 | 8.33 | 8.33 | 8.33 | 7.66 | 7.66 | 8.06 |
| 40 | 7.66 | 8.00 | 7.66 | 8.66 | 8.00 | 8.00 |
| 50 | 8.00 | 8.00 | 6.66 | 8.33 | 8.00 | 7.80 |
| 60 | 7.33 | 7.33 | 7.00 | 8.00 | 7.33 | 7.40 |
| Mean Square | 0.57 | 0.43 | 1.23 | 0.83 | 0.43 | 4.10** |

* Significant at 5% level of significance

**Significant at 1% level of significance.

preparations, the mean score for organoleptic evaluation for appearance, taste, flavour, texture, colour and overall acceptability affected.

Table 1 revealed that Pakoras were prepared by incorporating all the four greens i.e., cauliflower, drumstick, radish and broccoli leaves. The most acceptable level for cauliflower greens, drumstick greens and radish greens Pakora was 40 per cent. For broccoli greens it was 30 per cent. The respective scores for overall acceptability ranged from 8.00 (drumstick greens) to 8.40 (cauliflower greens Pakora).

Table 2 showed that Poori were prepared by incorporating the greens of cauliflower, drumstick, radish and broccoli. The most acceptable level of incorporation was 30 per cent for cauliflower greens, drumstick greens and radish greens. For broccoli greens it was 40 per cent. The respective scores for overall acceptability ranged from 7.93 to 8.60.

Table 3 showed that parantha were prepared by incorporating all the four greens i.e. cauliflower, drumstick, radish and broccoli leaves. The most acceptable level for cauliflower greens, drumstick

Table 2: Organoleptic evaluation of Poori with incorporation of under exploited greens of cauliflower, drumstick and radish broccoli

| Percent level of incorporation | Appearance | Taste | Flavour | Texture | Colour | Overall acceptance |
|--------------------------------|------------|--------|---------|---------|--------|--------------------|
| Cauliflower Pakora | | | | | | |
| 20 | 7.33 | 8.00 | 8.00 | 7.66 | 8.00 | 7.73 |
| 30 | 8.66 | 8.66 | 9.00 | 8.33 | 8.33 | 8.60 |
| 40 | 8.33 | 8.33 | 7.66 | 8.33 | 7.66 | 8.06 |
| 50 | 7.33 | 7.66 | 7.66 | 8.00 | 8.66 | 7.86 |
| 60 | 6.66 | 6.33 | 6.66 | 7.66 | 7.33 | 6.93 |
| Mean Square | 2.00* | 2.43* | 2.10 | 0.35 | 0.83 | 1.09* |
| Drumstick Pakora | | | | | | |
| 20 | 7.00 | 8.33 | 9.00 | 8.33 | 8.33 | 8.20 |
| 30 | 8.00 | 8.00 | 8.66 | 8.33 | 8.00 | 8.20 |
| 40 | 9.00 | 7.33 | 8.00 | 7.66 | 7.33 | 7.86 |
| 50 | 7.66 | 6.33 | 6.66 | 7.66 | 6.00 | 6.80 |
| 60 | 7.33 | 5.00 | 5.00 | 7.66 | 5.66 | 6.13 |
| Mean Square | 1.77* | 5.50** | 8.10** | 0.40 | 4.23** | 2.59** |
| Radish Pakora | | | | | | |
| 20 | 7.00 | 7.33 | 8.00 | 7.00 | 8.33 | 7.40 |
| 30 | 8.33 | 7.33 | 7.66 | 8.00 | 8.33 | 7.93 |
| 40 | 8.66 | 7.00 | 7.33 | 8.66 | 8.00 | 7.73 |
| 50 | 7.33 | 6.33 | 6.33 | 7.00 | 7.33 | 7.13 |
| 60 | 6.66 | 6.00 | 5.66 | 7.00 | 7.33 | 6.73 |
| Mean Square | 2.23* | 0.56 | 2.83* | 0.93 | 0.77 | 0.68* |
| Broccoli Pakora | | | | | | |
| 20 | 6.00 | 8.00 | 7.66 | 8.00 | 8.66 | 7.66 |
| 30 | 7.00 | 9.00 | 8.66 | 8.00 | 8.66 | 8.26 |
| 40 | 8.33 | 8.00 | 8.00 | 8.33 | 8.66 | 8.40 |
| 50 | 8.33 | 8.33 | 7.66 | 7.33 | 8.33 | 7.80 |
| 60 | 6.00 | 6.00 | 8.66 | 8.00 | 7.00 | 7.53 |
| Mean Square | 4.10** | 3.77* | 0.77 | 0.40 | 0.57 | 0.43 |

*Significant at 5% level of significance

**Significant at 1% level of significance.

greens and radish greens was 30 per cent. For broccoli greens it was 40 per cent. The respective score for overall acceptability ranged from 8.06 to 8.73.

Statistical analysis for overall acceptability of Table I, II, III showed that judges were highly consistent in awarding the score for cauliflower Pakora (8.40), cauliflower poori (8.60) and broccoli parantha (8.73).

Summary and Conclusion

It may be concluded that all the developed food products were organoleptically acceptable with the incorporation of under exploited greens from

different sources and at different levels. The most acceptable level of incorporation of greens in pakora was between 20 to 30 per cent. In poori it was 30 to 40 per cent whereas in parantha it was 30 to 40 per cent. The highest score for overall acceptability after analysis of variance were 8.40, 8.60 and 8.73 for Pakora, Poori and Parantha respectively.

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Table 3: Organoleptic evaluation of Parantha with incorporation of under exploited greens of cauliflower, drumstick, radish and broccoli

| Percent level of incorporation | Appearance | Taste | Flavour | Texture | Colour | Overall acceptance |
|--------------------------------|------------|--------|---------|---------|--------|--------------------|
| Cauliflower Pakora | | | | | | |
| 20 | 7.00 | 7.66 | 8.00 | 7.33 | 7.66 | 7.53 |
| 30 | 8.66 | 7.66 | 8.00 | 7.33 | 8.33 | 8.06 |
| 40 | 7.66 | 7.00 | 7.00 | 7.00 | 6.66 | 6.40 |
| 50 | 7.00 | 6.66 | 6.33 | 8.00 | 5.66 | 6.80 |
| 60 | 5.66 | 5.66 | 5.66 | 8.66 | 4.33 | 6.00 |
| Mean Square | 3.60** | 2.06 | 3.17* | 1.33 | 7.60** | 2.11* |
| Drumstick Pakora | | | | | | |
| 20 | 7.00 | 8.00 | 7.00 | 7.00 | 7.66 | 7.46 |
| 30 | 8.33 | 7.66 | 7.33 | 7.66 | 8.00 | 8.00 |
| 40 | 8.00 | 6.00 | 6.33 | 7.33 | 6.00 | 6.00 |
| 50 | 6.66 | 5.66 | 5.33 | 7.33 | 6.00 | 6.00 |
| 60 | 6.39 | 4.33 | 4.33 | 6.33 | 4.33 | 4.33 |
| Mean Square | 2.23* | 6.83** | 5.77** | 0.77 | 6.57** | 6.2** |
| Radish Pakora | | | | | | |
| 20 | 7.33 | 8.33 | 7.66 | 8.66 | 7.00 | 7.00 |
| 30 | 8.00 | 8.33 | 9.00 | 8.33 | 8.33 | 8.46 |
| 40 | 9.00 | 8.66 | 8.33 | 8.33 | 7.66 | 8.40 |
| 50 | 6.33 | 7.33 | 7.33 | 7.33 | 7.00 | 7.00 |
| 60 | 6.00 | 6.00 | 7.33 | 8.00 | 5.33 | 5.86 |
| Mean Square | 4.90** | 3.57* | 1.57 | 0.77 | 3.73** | 3.56** |
| Broccoli Pakora | | | | | | |
| 20 | 6.00 | 7.00 | 6.66 | 6.00 | 7.00 | 6.66 |
| 30 | 6.66 | 7.66 | 6.66 | 7.66 | 7.00 | 7.13 |
| 40 | 8.66 | 8.66 | 8.66 | 9.00 | 8.66 | 8.73 |
| 50 | 7.66 | 8.00 | 7.33 | 7.33 | 7.33 | 7.53 |
| 60 | 6.66 | 6.66 | 6.66 | 5.33 | 6.00 | 6.26 |
| Mean Square | 3.27** | 1.90 | 2.27* | 6.23** | 2.77* | 2.70 |

*Significant at 5% level of significance

**Significant at 1% level of significance

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