

# Develop different nutritive recipes using chikoo and kiwi peel powder and performe sensory evaluation

Isha Sachdeva and Swati Sharma

Chikoo and kiwi peel powder contain high amount of magnesium, potassium, vitamin A, vitamin C, calcium and has numerous therapeutic benefits. Due to its healthy beneficial properties it was incorporated with other ingredients and turned into chikoo and kiwi peel powder and new recipes - Chikoo and kiwi peel powder “Samosa”, Chikoo and kiwi peel powder “Burfi”, Chikoo and kiwi peel powder “fruit cream”, Chikoo and kiwi peel powder “burger”, Chikoo and kiwi peel powder “ice cream pudding”, Chikoo and kiwi peel powder “Aloo cutlet” was subjected to sensory analysis. Both chikoo and kiwi peel powder recipes was liked by the 15 experts. Its appearance, colour, taste, texture, odour and overall acceptability were liked moderated (scores 10) by panel member. Both type of recipes – were highly nutritive. They were excellent source of potassium, vitamin A, vitamin C, contained sufficient amount of calcium and protein. It can be concluded that the product were tasty, healthy, safe to use and low in cost thus, can be a part of daily diet of individual, without changing there regular dietary consumption.

**Key Words :** Preparation chikoo, Kiwi peel powder, Fortified chikoo, Kiwi peel powder, Chikoo, Kiwi peel powder recipes, Sensory, Nutritional evaluation

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## INTRODUCTION

### Sapota (Chikoo):

The sapota fruit has brown skin with the oval shape and has the yellowish brown flesh. The skin and the seeds of chikoo are inedible the flesh has the soft and juicy texture with a sweet and musky flavour. They can grow to more than 30 m (98 ft) tall with an average trunk diameter of 1.5 m (4.9 ft). The fruit is a large berry, 4–

8 cm (1.6–3.1 in) in diameter. Inside, its flesh ranges from a pale yellow to an earthy brown colour with a grainy texture a skin to that of a well-ripened pear. The sapodilla trees yield fruit twice a year, though flowering may continue year round. Chikoo has black bean-shaped seeds. It has a texture similar to that of a kiwi fruit. Chikoo grows in a hot climate and takes about 5-8 years to mature. Each fruit contains one to six seeds. The fruit has an exceptionally sweet, malty flavour. The unripe fruit is hard to the touch and contains high amounts of saponin, which has astringent properties similar to tannin, drying out the mouth.

Chikoo peel has a lot of health benefits eaten with skin. The vitamin content in chikoo skin also maintain the health of mucus lining. Chikoo peel regulates the functioning of the digestive system as it is enriched with potassium, iron. It is well established that chikoo peel

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and chikoo peel product are rich source of vitamin, mineral, and dietary fibre. The consequence, chikoo can be eaten fresh with the seeds removed or it can be used to make many kinds of desserts as well. The trees can only survive in warm, typically tropical environments, dying easily if the temperature drops below freezing. From germination, the sapodilla tree will usually take anywhere from five to eight years to bear fruit. The sapodilla trees yield fruit twice a year, though flowering may continue year round. Chikoo has black bean-shaped seeds. It has a texture similar to that of a kiwi fruit. Chikoo grows in a hot climate and takes about 5-8 years to mature.

### **Kiwi:**

Kiwifruit or chinese gooseberry is the edible berry of several species of woody vines in the genus *Actinidia*. The most common cultivar group of kiwifruit ('Hayward') is oval, about the size of a large hen's egg [5–8 cm (2.0–3.1 inch) in length and 4.5–5.5 cm (1.8–2.2 inch) in diameter]. It has a fibrous, dull greenish-brown skin and bright green or golden flesh with rows of tiny, black, edible seeds. The fruit has a soft texture, with a sweet and unique flavour (Bernadine Stirk, 2005).

Kiwifruit may be eaten raw, made into juices, used in baked goods, prepared with meat or used as a garnish. The whole fruit, including the skin, is suitable for human consumption; however, the skin is often discarded due to its texture. Sliced kiwifruit has long been used as a garnish a top whipped cream on pavlova, a meringue-based dessert. Traditionally in China, kiwifruit was not eaten for pleasure, but was given as medicine to children to help them grow and to women who have given birth to help them recover. This exotic fruit is known for its attractive bright green colour and its wonderful and distinct flavour. It is basically an oval shaped fruit with a fibrous dull greenish brown skin and bright green or golden flesh containing several rows of tiny black edible seeds. It is approximately the size of a hen's egg and weighs about 125 grams. Its flesh has a soft and fuzzy texture and a unique soft flavour which is a blend of strawberry, apple, pineapple and banana fruits.

Raw kiwifruit contains actinidain which is commercially useful as a meat tenderizer and possibly as a digestive aid. Actinidain also makes raw kiwifruit unsuitable for use in desserts containing milk or any other dairy products because the enzyme digests milk proteins. This applies to gelatin-based desserts, due to the fact that

the actinidain will dissolve the proteins in gelatin, causing the dessert to either liquefy or prevent it from solidifying. Kiwi is associated with a variety of health benefits. It has been considered a health tonic and was given to women after childbirth and children to improve immunity. It is a power food which provides the following health benefits (Beutel, 1997).

The kiwi skin is completely edible and makes this nutrient-dense fruit even more nutritious. Kiwi skin eating triples the fibre intake compared to merely eating the flesh. Kiwi skin contains a high concentration of nutrients, especially fibre and vitamin A. The skin of kiwi contains many antioxidants. In fact, there is a higher concentration of antioxidants in the skin than in the flesh of kiwi. The skin is a particularly good source of two major antioxidants, vitamin C, and vitamin E. In a 100-gram amount, green kiwifruit peel provides calories, water and carbohydrates, with negligible protein and fat. It is particularly rich in vitamin C and vitamin K, has a moderate content of vitamin E, with no other micronutrients in significant content (Ferguson, 1999).

### **Objectives of study:**

- To explore the knowledge and fact about chikoo and kiwi peel powder.
- Preparation and standardization of different products using chikoo and kiwi peel powder.
- To analyse the nutritive value of prepared products.
- To conduct sensory evaluation of the prepared products.
- Compute the costing of the prepared products of chikoo and kiwi peel powder.
- To study the beneficial effect of prepared product.
- To prepare a recipe book of the chikoo and kiwi peel powder recipes.

## **METHODOLOGY**

It was a laboratory based trial which was conducted in 2018. In this study instead of chikoo and kiwi peel powder recipes. The present study aims at "develop different nutritive recipes using chikoo and kiwi peel powder perform and sensory evaluation", which contains various vitamins like vitamins A, C, E, potassium, magnesium, iron, calcium, enzymes, amino acid.

The present study was focused on developing different recipes using kiwi and chikoo peel and performing nutritional and sensory evaluation. The study has two parts:

- Develop different products using kiwi and chikoo peel.
- Organoleptic evaluation of the prepared recipes.

**Sensory evaluation:**

A trained panel of 15 judges was selected from of G.D.M (P.G) college, modinagar, dist- Ghaziabad and Chaudhary Charan Singh University, Meerut. Nine point Hedionic test was like extremely, like very much, like moderately, like slightly, Neither like nor dislike, Dislike extremely, Dislike very much, Dislike moderately, Dislike slightly was used to study the overall acceptabiliy and organoleptic qualities, *i.e.*, appearance, texture, colour, flavour of chikoo and kiwi peel powder recipes.

**Nutrient analysis:**

Magnesium, potassium, vitamin A, vitamin C, calcium of both chikoo and kiwi peel powder recipes were analysed in nutrient content of kiwi and chikoo peel powder was calculation (1900) Institute of nutrition, Mahidol University (INMU).

**OBSERVATIONS AND ASSESSMENT**

Since chikoo and kiwi peel powder contain very good quality vitamins, calcium in considerable quantity, it can very well replace the pulse component and can provide a better nutrition.

Table 1 revealed the sensory properties of the fresh products – chikoo and peel powder were assessed using Nine point Hedionic scale.both chikoo and kiwi peel powder recipes got more than (92% score) for their sensory properties indicating that experts liked these products. Overall acceptabilty of chikoo and kiwi peel powder recipes was liked moderately. Scores of colour and taste, apparanace, odour. Generally chikoo and kiwi peel powder recipes has beany flavour but it was not detected in sweet recipes. Fig. 1 show the sensory qualities of the chikoo and kiwi peel powder recipes by ranking method.

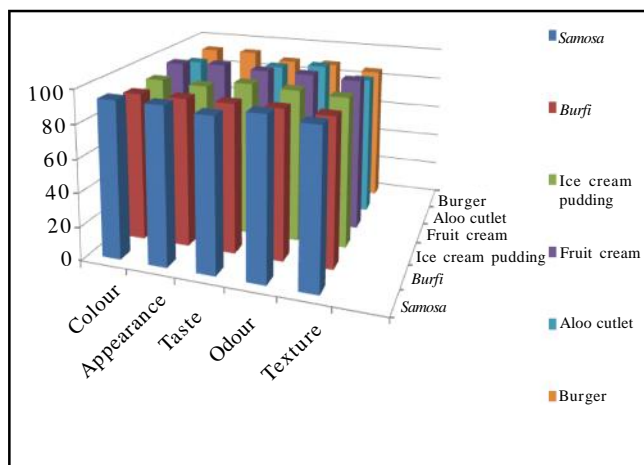


Fig. 1: Sensory qualities of kiwi and chikoo peel powder recipes by ranking method

Table 1 concluded that 93.4 per cent of the panel members likes the colour kiwi and chikoo peel powder “Samosa”, 93.4 per cent likes the appearance, 90.66 per cent likes the taste, 94.5 per cent odour and 92 per cent like the texture. 89.33 per cent of the panel members likes the colour kiwi and chikoo peel powder”Burfi”, 89.33 per cent likes the appearance, 89.33 per cent likes the taste, 89.33 per cent odour and 88 per cent like the texture. 90.67 per cent of the panel members likes the colour kiwi and chikoo peel powder “ice cream pudding”, 89.33 per cent likes the appearance, 93.33 per cent likes the taste, 92 per cent odour and 90.67 per cent like the texture. 94.67 per cent of the panel members likes the colour kiwi and chikoo peel powder “fruit cream”, 96 per cent likes the appearance, 94.67 per cent likes the taste, 94.67 per cent odour and 93.33 per cent like the texture. 89.33 per cent of the panel members likes the colour kiwi and chikoo peel powder “aloo cutlet”, 89.33 per cent likes the appearance, 90.66 per cent likes the taste, 93.33 per cent odour and 86.66 per cent like the texture. 92 per cent of the panel members likes the colour kiwi and chikoo peel powder “burger”, 92 per cent likes the appearance, 88 per cent likes the taste, 88 per cent odour

| Parameter  | Samosa | Burfi | Ice cream pudding | Fruit cream | Aloo cutlet | Burger |
|------------|--------|-------|-------------------|-------------|-------------|--------|
| Colour     | 93.4   | 89.3  | 90.67             | 94.6        | 89.33       | 92     |
| Appearance | 93.4   | 89.3  | 89.3              | 96          | 89.33       | 92     |
| Taste      | 90.6   | 89.3  | 93.3              | 94.6        | 90.66       | 88     |
| Odour      | 94.5   | 89.3  | 92                | 94.6        | 93.33       | 88     |
| Texture    | 92     | 88    | 90.6              | 93.3        | 86.66       | 85.33  |

and 85.33 per cent like the texture.

Table 1a revealed the like and dislike properties of the fresh products – chikoo and peel powder were assessed using Nine point Hedonic scale. both chikoo and kiwi peel powder recipes got more than 10 score for their like and dislike properties indicating that experts liked these products. Overall acceptability of chikoo and kiwi peel powder recipes was liked extremely.

Table 1a show (%) that 53.33 per cent of the panel members like chikoo and kiwi peel powder “*Samosa*” like extremely, 33.33 per cent like very much, 13.33 per cent like moderately. 40 per cent of the panel members like chikoo and kiwi peel powder “*Burfi*” like extremely, 26.66 per cent like very much, 26.66 per cent like moderately. 60 per cent of the panel members like chikoo and kiwi peel powder “ice cream pudding” like extremely, 40 per cent like very much. 66.66 per cent of the panel members like chikoo and kiwi peel powder “fruit cream” like extremely, 33.33 per cent like very much. 40 per cent of the panel members like chikoo and kiwi peel powder “bruger” like extremely, 33.33 per cent like very much, like moderately 13.33 per cent, like slightly 13.33. 53.33 per cent of the panel members like chikoo and kiwi peel powder “aloo cutlet” like extremely, 20 per cent like very much, 26.66 per cent like moderately.

Table 2 indicates nutrients composition analysis (1900) Institute of nutrition, Mahidol University (INMU). Both type of chikoo and kiwi peel powder recipes were nutritional adequate and rich source of potassium, magnesium, vitamin A, vitamin C, calcium, hence, regular intake of these recipes can enhance the nutritional status of the individuals.

Table 2 reveals that after the preparation of chikoo and kiwi peel powder “*Samosa*” 30.73 mg magnesium, 3.39 mg potassium, 45.75 mg calcium, 22.81 IU vitamin A, 6.37 g vitamin C. Thus, all the macro and micronutrients has increased after the addition of chikoo and kiwi peel powder. chikoo and kiwi peel powder “*Burfi*” in 23.49 mg magnesium, 18.05 mg potassium content, 152.5 mg calcium, 31.85 IU vitamin A, 4.87 g vitamin C. Thus, all the macro and micronutrients has increased after the addition of chikoo and kiwi peel powder. Chikoo and kiwi peel powder “ice cream pudding” 19.77 mg magnesium, 17.03 mg potassium, 25.05 mg calcium, 25.05 IU vitamin A, 4.42 mg vitamin C. thus, all the macro and micronutrients has increased after the addition of chikoo and kiwi peel powder. chikoo and kiwi peel powder “fruit cream” 15.32 mg magnesium, 25.55 mg potassium, 219 mg calcium, 113.7 IU vitamin A, 4.1 mg vitamin C. Thus, all the macro and micronutrients has increased after the addition of chikoo and kiwi peel powder. chikoo and kiwi peel powder “Aloo cutlet” 13.25 mg Magnesium, 68.72 mg potassium, 4.72 mg calcium, 12.81 IU vitamin A, 6.37 g vitamin C. Thus, all the macro and micronutrients has increased after the addition of chikoo and kiwi peel powder. chikoo and kiwi peel powder “burger” 6.27 mg magnesium, 60.23 mg potassium, 11.76 mg calcium, 26.63 g vitamin A, 7.6 g vitamin C. Thus, all the macro and micronutrients has increased after the addition of chikoo and kiwi peel powder.

### Conclusion:

From the study it can be concluded that the attitudes of the consumer’s today is changing and they are no longer

| Parameters      | Samosa | Burfi | Ice cream pudding | Fruit cream | Aloo cutlet | Burger |
|-----------------|--------|-------|-------------------|-------------|-------------|--------|
| Like extremely  | 8      | 6     | 9                 | 10          | 8           | 6      |
| Like very much  | 5      | 4     | 6                 | 5           | 3           | 5      |
| Like moderately | 2      | 4     | –                 | –           | 4           | 4      |

| Nutrient composition | <i>Samosa</i> | <i>Burfi</i> | Ice cream pudding | Fruit cream | Aloo cutlet | Burger |
|----------------------|---------------|--------------|-------------------|-------------|-------------|--------|
| magnesium            | 15.32         | 23.49        | 19.77             | 30.73       | 13.25       | 6.27   |
| potassium            | 25.55         | 18.05        | 17.03             | 3.391       | 68.72       | 60.23  |
| calcium              | 219           | 152.5        | 25.055            | 45.75       | 4.72        | 11.76  |
| vitamin A            | 113.7         | 31.85        | 25.05             | 22.81       | 12.81       | 26.40  |
| vitamin C            | 4.1           | 4.87         | 4.42              | 6.37        | 6.37        | 7.6    |

reluctant to try new food but on the contrary they are curious to try products which promise greater convenience superior flavour and nutritional properties. chikoo and kiwi peel powder. Overall acceptabilty of chikoo and kiwi peel powder fruit cream recipes was liked extremely.

People are aware about the medicinal properties and health benefits of chikoo and kiwi peel powder and thus, development of new products interesting and were providing all the essential nutrient necessary for their good health. The new products was appreciated and accepted by panel members being highly nutritional.

### LITERATURE CITED

- Bekhit, A. A., Hopkins, D. L., Geesink, G., Bekhit, A. A. and Franks, P. (2014).** Exogenous proteases for meat tenderization. *Critical Reviews in Food Sci. & Nutr.*, **54** (8): 1012–31. doi:10.1080/10408398.2011.623247.
- Beutel, James A. (1990).** Kiwifruit. In : Janick, J., Simon, J.E., *Advances in new crops*. Timber Press. pp. 309–316.
- Bowling, Barbara L. (2000).** *The berry Grower's companion*. Timber Press. ISBN 978-0-88192-489-3- via Google Books.
- Butler, Margi I., Stockwell, Peter A., Black, Michael A., Day, Robert C., Lamont, Iain L. and Poulter, Russel T. M. (2013).** Pseudomonas syringae pv. actinidiae from recent outbreaks of kiwifruit bacterial canker belong to different clones that originated in china. *PLoS ONE.*, **8** (2): e57464. doi:10.1371/journal.pone.0057464.
- Deverson, Tony and Kennedy, Graeme (2005).** *The New Zealand oxford dictionary*. Oxford University Press. 27
- May 2015.
- Hembry, Owen (2011).** *Relief for kiwifruit industry*. The New Zealand, Herald. Retrieved 2011-09-04.
- Huang, H. and Ferguson, A. R. (2001).** Review: Kiwifruit in China. *New Zealand J. Crop & Hort. Sci.*, **29** (1): 1–14. doi:10.1080/01140671.2001.9514154.
- Huang, H. and Ferguson, A. R. (2003).** Kiwifruit (*Actinidia chinensis* and *A. deliciosa*) plantings and production in China, 2002. *New Zealand J. Crop and Hort. Sci.*, **31** (3): 197–202. doi:10.1080/01140671.2003.9514253.
- Kiwifruit's name (2013). Zespri Kiwifruit. *Archived from the original on* May 13, 2013. Retrieved February 19, 2013.
- Mark McGinley, Michael Hogan C. and Cleveland, C. (2010).** *Encyclopedia of earth*. National Council for Science and the Environment. Washington. D.C., U.S.A.
- Morton, J. (1987).** Sapodilla. In : Julia F. Morton. *Fruits of warm climates*. Florida Flair Books, Miami, FL. pp. 393–398.
- Skallerud, Kare and Olsen, Svein (2011).** Export market arrangements in four New Zealand Agriculture Industrues: An Institutional Perspective. *J. Internat. Food & Agribusiness Mktg.*, **23** (4): 310–329. doi:10.1080/08974438.2011.621841.
- Watson, Peter (2011).** *More virulent PSA strain a new worry for kiwifruit growers*. The Dominion Post. Retrieved 2011-09-04.
- Wilson, E.H., Yichang, A.R., Ferguson, Green and Emily (2002).** "Kiwi" *Los Angeles Times*. Retrieved January 4, 2013.

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