



**Development and Nutritional analysis of Homemade snacks incorporated with
garlic (*Allium sativum*)**

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ABSTRACT

Garlic possesses antiviral, antibacterial, anti-fungal properties allowing it to stand against all infections. It contains high levels of vitamin C and being identified as a serious anti-cancer food. It was earlier used in ancient cultures to physical performance of labourers. Because of its high potassium content, it can aid in absorption of essential nutrients, and help avoid digestive problems and fatigue as well. The present research was conducted with the objective to develop garlic incorporated product and to assess the nutritive value of the best acceptable product. Organoleptic evaluation was carried out using nine point hedonic scales. Nutritive values were calculated by using titration method and By Laury et al., 1951 for ascorbic acid analysis and for protein estimation respectively. The best acceptable food sample was of code B which contains 7.81g protein per 100 mg sample and 0.52mg per 100g ascorbic acid.

KEY WORDS: *antibacterial, Organoleptic, acceptable, ascorbic acid.*

I. INTRODUCTION

The potency of garlic has been acknowledged for more than 500 years. In the ancient times, garlic was used for treating intestinal disorders, flatulence, worms, respiratory infections, skin diseases, wounds, symptoms of aging, and many other ailments. (Heli Roy et.al 2009)

Cultures that never came in contact with one another came to many of the same conclusions about the role of garlic in the treatment of diseases. Garlic was also recommended for pulmonary and respiratory complaints. Its efficacy in treating dropsy is compatible with known cardiovascular treatments. Modern science is tending to confirm many of the beliefs of ancient cultures regarding garlic, defining mechanisms of action and exploring garlic's potential for disease prevention and treatment (Allicin facts).

Health Benefits Of Garlic:

- 1. It is helpful in boosting immune system:** Garlic possess antiviral, antibacterial, anti-fungal properties allowing it to stand against all infections. Skin conditions caused by bacteria, virus, fungi or yeast can be treated by rubbing raw chopped garlic on the affected area. It contains high levels of vitamin C and being identified as a serious anti-cancer food. Because of its high potassium content, it can aid in absorption of essential nutrients, and help avoid digestive problems and fatigue as well (Mike Barrett 2012).
- 2. It lowers the blood pressure:** a study published in the *Pakistan Journal of Pharmaceutical Sciences 2013* shows that Aged garlic extract between 600 to 1,500 milligrams (mg) was found to be just as effective as the drug Atenolol prescribed for hypertension in a 24-week period .(Lizette Borreli, 2015)
- 3. Role in reducing heart disease:** According to one of the study it is found that people who took 900 mg daily of standardized garlic powder slowed the development of atherosclerosis. (Steven D. Ehrlich, 2015).

4. **Performance enhancing food:** It was traditionally used in ancient cultures to reduce fatigue and enhance the work capacity of labourers. (Joe Leech).
5. **Detoxify heavy metals from the body:** The sulfur compounds in garlic have been shown to protect against organ damage from heavy metal toxicity. A study conducted on employees of a car battery plant (excessive exposure to lead) found that garlic reduced lead levels in the blood by 19%. It also reduced many clinical signs of toxicity, including headaches and blood pressure.(Kianoush S, et al.,2012)
6. **In treating bone health:** Garlic has antioxidant and anti-inflammatory properties that may help with arthritis and other pain. A study published in the "Soviet Archives of Internal Medicine" 1999 found that a garlic preparation taken twice a day for four to six weeks can work as therapy for rheumatoid arthritis. However, not all studies on using garlic to improve symptoms of pain show positive results. For example, taking garlic is likely ineffective for treating leg pain during walking due to poor circulation caused by peripheral arterial disease, or PAD, according to MedlinePlus, a publication of the National Institutes of Health. (Linda Tarr Kent, 2015)
7. **In treating cancer:** The National Cancer Institute, part of the National Institutes of Health, does not recommend any dietary supplement for the prevention of cancer, but recognizes garlic as one of several vegetables with potential anticancer properties. (national cancer institute, 2008)
8. **Prevents diabetes :**A number of animal studies support the effectiveness of garlic in reducing blood glucose in streptozotocin-induced as well as alloxan-induced diabetes mellitus in mice. Most of the studies showed that garlic can reduce blood glucose level in diabetic mice and rabbits (Ohaeri, 2001). A study was conducted to evaluate oral administration of garlic extract for 14 days on the level of serum glucose, total cholesterol, triglycerides, urea and uric acid, in normal and streptozotocin-induced diabetic mice. The result of the study showed significant decrease ($p < 0.05$) in serum glucose, total cholesterol, triglycerides, urea, uric acid, aspartate amino transferase and alanine amino transferase levels, while increased serum insulin in diabetic mice, but not in normal mice. From a comparison study made between the action of garlic extract and glibenclamide, it was shown that the antidiabetic effect of the garlic was more effective than the glibenclamide.(Eidi et al., 2006).
9. **Antioxidant :** Garlic extract exhibit direct antioxidant effects and enhance the serum levels of two antioxidant enzymes, catalase and glutathione peroxidase (Prasad et al., 1995). Garlic extract, allicin is efficiently scavenged exogenously generated hydroxyl radicals in a dose dependent fashion, but their effective-ness was reduced about 10% by heating to 100°C for 20 min. Other garlic constituents, such as S-allyl cysteine, also confirmed significant antioxidant effects. The sulfur compounds found in fresh garlic appear to be more potent as antioxidants than crude garlic extract. (Torok et al., 1994)
10. **As natural blood thinner:** Platelets and fibrin play great role in blood clotting and higher amount of fibrin in blood can cause heart attack. Garlic constituents can reduce fibrin formation and also help reduce the fibrin existing in the blood even better than aspirin (Fukao et al., 2007). Ajoene, a sulfur compound found in garlic seems to be responsible for its anti-clotting effect; but ajoene is only viable at room temperature or above, it is not present in raw or freeze-dried garlic. (Ernst, 1994)

Nutritional content of garlic:

Serving size :One ounce of garlic = 28 gms

Calories- 42 ,Carbohydrates- 9 gm,Sodium- 5mg,Fiber- 1 gm,Protein- 2gm

(Source: <http://foodfacts.mercola.com/garlic.html>)

II. MATERIALS AND METHODS

The study conducted was to assess the nutritional value of the garlic incorporated homemade snack.

Homemade snack made for the study was garlic incorporated Mathri. Three types of Mathri were prepared which were named as code A, code B, code C with same ingredients but the amount of garlic was varying in all the three codes

Ingredients of garlic incorporated Mathri

Code A - Garlic paste-35g, wheat flour-1kg, red chilli, refined oil, ajwain, butter
Chat masala.

Code B - Garlic paste-30g, wheat flour-1kg, red chilli, refined oil, ajwain, butter
Chat masala.

Code c - Garlic paste-25g, wheat flour-1kg, red chilli, refined oil, ajwain, butter
Chat masala.

Study Sample- The sample size was 60 subjects. This was done to get an impartial and a large opinion about the development of mathri. It consists of two panels and the member of panel were Trained Panel and Semi Trained Panel

Method of Data Collection- For this purpose a "Sensory Evaluation Sheet" was prepared and there was distributed to the subjects with the sample of Mathri. Then they filled the sensory evaluation sheet on the basis of taste flavor and acceptance of the developed Mathri using hedonic rating scale.

Preparation of the test

Sample -

The three types of garlic incorporated mathri with different quantity of garlic, but method of preparation was same. In product of code A, Garlic is in more amount , In product of code B garlic was in less amount than code A and in product of code C garlic was in less amount than code B but in all these three products all ingredients were same .

Test Schedule

The sample was kept without telling the Subjects/Panellist about all three coded sample. They just have to taste it and gave score according to the scale.

Sample Coding-

The sample was coded in the numbers- code A, code B, and code C.

Sample Amount-

One piece of Mathri from each sample was given to the Subject/Panel members for tasting.

Nutritional evaluation of most acceptable product

After conducting the sensory evaluation it was identified which sample code was best acceptable. The best acceptable code was taken for nutrition analysis. The best acceptable product was code B in which the garlic amount was in moderation. Test conducted were Protein and Ascorbic acid.

Test results

Parameter	Results	Test Method
Ascorbic acid	0.52 mg per100g	Titrimetric method
Protein	7.81 g per100g	(By Laury et ,al 1951)

III. RESULT

The food sample of code B contains 7.81g protein per 100 mg sample and 0.52mg per 100g ascorbic acid.

IV. CONCLUSION:

As an antiseptic, use of garlic has long been recognized. Garlic contains many sulfur compounds which detoxify the body, boost the immune system, lower blood pressure and improve circulation. An effort was made to develop Garlic incorporated Mathri which is good in boosting immune system. The product gained instant acceptance among the people involved in the sensory evaluation.

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