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## Studies on shelf life of black pepper powder incorporation paneer

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#### Abstract

The Study was conducted on the topic “Studies on Effect of Black Pepper on Quality of *Paneer*.” The different levels of black pepper 0.25, 0.50 and 0.75 per cent were tried in *paneer*. The product obtained for organoleptic evaluation by panel of judges. It was observed that colour and appearance scores for the treatments T<sup>1</sup>, T<sup>2</sup>, T<sup>3</sup> and T<sup>4</sup> were 7.13, 7.75, 8.63 and 7.06, respectively. Flavour score was T<sup>1</sup>, T<sup>2</sup>, T<sup>3</sup> and T<sup>4</sup> treatments were 6.69, 7.56, 8.56 and 7.75, respectively. Taste was T<sup>1</sup>, T<sup>2</sup>, T<sup>3</sup> and T<sup>4</sup> treatments were 6.69, 7.56, 8.56 and 7.75, respectively. It was observed that the overall overall acceptability score for sensory was 6.90, 7.53, 8.31 and 7.28, respectively. It was clear that the level of 0.50 black pepper have highest overall acceptability.

**Keywords:** Shelf life, black pepper powder, incorporation paneer

#### Introduction

*Paneer* is an indigenous coagulated milk product prepared by the addition of permitted organic acids to hot milk and subsequent drainage of whey. *Paneer* consists of entire milk casein part of denatured whey proteins, almost all fat, colloidal salts and soluble milk solids in proportion to the moisture content retained.

The characteristics features of *paneer* is a typical mild acidic flavour with slightly sweet taste and has a firm, cohesive and spongy body and a close knit smooth texture. *Paneer* like other indigenous dairy products, is a highly perishable product and suffers from limited shelf-life, largely because of its high moisture content (approx. 55 per cent) (Khatkar *et. al.*, 2017).

Black pepper is used as medicinal agent, a preservative, and in perfumery. Whole Peppercorn of *Piper nigrum* or its active components are being used in different types of foods and as medicine. Pepper is used worldwide in different types of sauces and dishes like meat dishes. It contains major pungent alkaloid Piperine (1-peperoyl piperidine) which is known to possess many interesting pharmacological actions. It is widely used in different traditional systems of medicine like

Ayurvedic and Unani System of medicines. Piperine exhibits diverse pharmacological activities like antihypertensive and antiplatelets, antioxidant, antitumor, antiasthmatics, antipyretic, analgesic, anti-inflammatory, anti-diarrheal, antispasmodic, anxiolytic, antidepressants, hepato-protective, immuno-modulatory, antibacterial, antifungal, 3 anti-thyroids, antiapoptotic, anti-metastatic, antimutagenic, anti-spermatogenic, anti- Colon toxin, insecticidal and larvicidal activities etc. Piperine has been found to enhance the therapeutic efficacy of many drugs, vaccines and nutrients by increasing oral bioavailability by inhibiting various metabolising enzymes. It is also known to enhance cognitive action and Fertility. Piperine also found to stimulate the pancreatic and intestinal enzymes which aid to digestion. Many therapeutic activities of this spice are attributed to the presence of piperine apart from other chemical constituents. The uses of black pepper in various fields such as food processing, pharmaceutical industry etc., is increasing steadily due to its recognition as an important source of natural antioxidant having anti-carcinogenic activity. It also have bioavailability enhancement nature, carminative property, anti-inflammatory action, cholesterol lowering capacity, immune enhancer ability, anti-pyretic, anti-periodic, antimicrobial and rubefacient activity. On searching out in past two decades research work it was found that there is scarcity of information on assessment of nutritional, medicinal and functional properties of black pepper and on the other hand, to perform the comparative study of ambient and cryogenic ground black pepper to asses in change in its all above mentioned properties such comprehensive study is required.

The present review highlights the nutritional composition, medicinal properties, functional properties, product development and its utilization along with potential application.

**Material and Methodology**

**Treatment combinations**

Following treatment combinations were considered for preparation of *paneer* with black pepper.

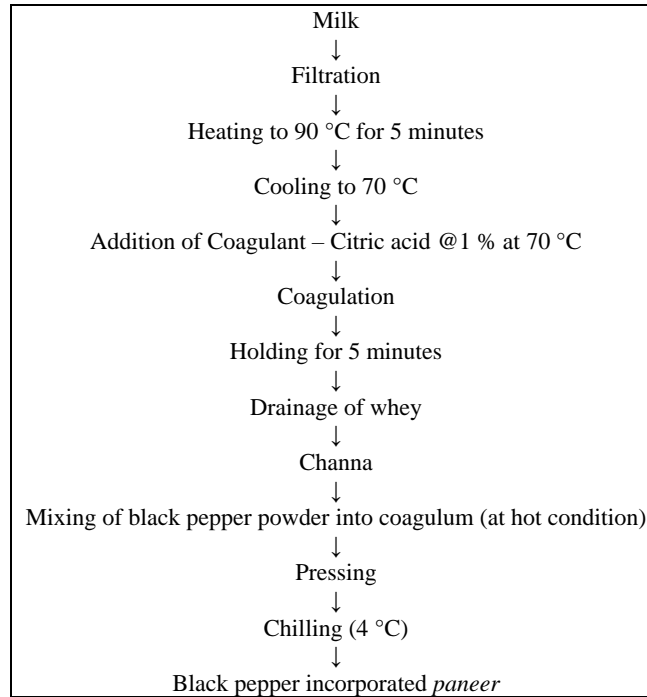
T1= Paneer from Buffalo milk (control)

T2= Paneer with 0.25 per cent of black pepper by weight of buffalo milk

T3= Paneer with 0.50 per cent of black pepper by weight of buffalo milk

T4= Paneer with 0.75 per cent of black pepper by weight of buffalo milk

**Experimental Methodology**



Flow chart for preparation of *paneer* (Ref: Badola *et al.* 2018)<sup>[1]</sup>

To assess its shelf life, blended with black pepper powder with *paneer* was kept in refrigerated condition at (4±10C) for 9 days. The sensory scores were registered on the 3rd, 6th and

9th days after the day of preparation, i.e. 0th day, for all sensory parameters such as color and appearance, flavour, mouth feeling, body and texture and overall acceptability.

**Table 1:** Sensory score of stored *paneer* samples at refrigerated temperature (4±10C) in days

Days Treatment	0 Day	3rd Day	6th Day	9th Day
<b>Colour and Appearance</b>				
T <sub>1</sub>	7.00	7.00	6.70	6.50
T <sub>2</sub>	7.70	7.70	7.50	7.00
T <sub>3</sub>	8.60	8.60	8.20	8.00
T <sub>4</sub>	7.03	7.03	7.00	6.70
<b>Flavour</b>				
T <sub>1</sub>	6.65	6.65	6.50	6.30
T <sub>2</sub>	7.50	7.50	7.20	7.00
T <sub>3</sub>	8.30	8.30	8.00	7.80
T <sub>4</sub>	7.60	7.60	7.20	7.00
<b>Mouthfeel</b>				
T <sub>1</sub>	6.90	6.90	6.70	6.50
T <sub>2</sub>	7.20	7.20	7.00	6.90
T <sub>3</sub>	8.00	8.00	7.80	7.50
T <sub>4</sub>	7.00	7.00	6.80	6.60
<b>Body and Texture</b>				
T <sub>1</sub>	6.81	6.70	6.50	6.30
T <sub>2</sub>	7.31	7.10	7.00	6.80
T <sub>3</sub>	8.00	7.80	7.50	7.10
T <sub>4</sub>	7.00	6.90	6.60	6.30
<b>Overall Acceptability</b>				
T <sub>1</sub>	6.90	6.70	6.50	6.20
T <sub>2</sub>	7.53	7.45	7.30	7.00
T <sub>3</sub>	8.31	8.10	7.80	7.50
T <sub>4</sub>	7.28	7.10	6.70	6.50

### Colour Appearance of Black pepper treated sample

*paneer* scores for colour and appearance continued to increase, but the highest score, i.e. 8.63, was found in treatment T3. The developed *paneer* varied from 7.75 to 8.63 for colour and appearance.

### Control treated sample

The colour appearance of control sample decreased highly significantly ( $P < 0.01$ ) from an initial 7.00 to 6.50 in 9 days and in 8 days and 5 days packed.

### Changes in flavor

There was gradual decrease in flavour score of *paneer* samples during storage.

### Control treated sample

Individually the flavour sample of control sample decreased highly significantly ( $p < 0.01$ ) from an initial 6.69 to 6.30 in 9 days and in 8 days and 5 days packed.

### Changes in body and texture

The body and texture of all the samples was within desirable range of black pepper except control samples packaged in different packaging material.

### Control treated sample

There was highly significantly ( $P < 0.01$ ) decreased in body and texture score of control samples from an initial 6.81 to 6.30 in 9 days, and in 8 days and 5 days packed

### Changes in Overall acceptability

There was highly significantly ( $P < 0.01$ ) decreased in overall acceptability of all the samples with increase in storage period. The overall acceptability of all the samples was within desirable range, except slightly poorer for control samples as compared to others and exhibited natural look when packed in different packaging material.

### Control treated sample

Individually, the overall acceptability score of control sample decreased highly significantly ( $P < 0.01$ ) from an initial 6.90 to 6.20 in 9 days, to 6.20 in 8 days and to 6.50 in 6<sup>th</sup> day packed.

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