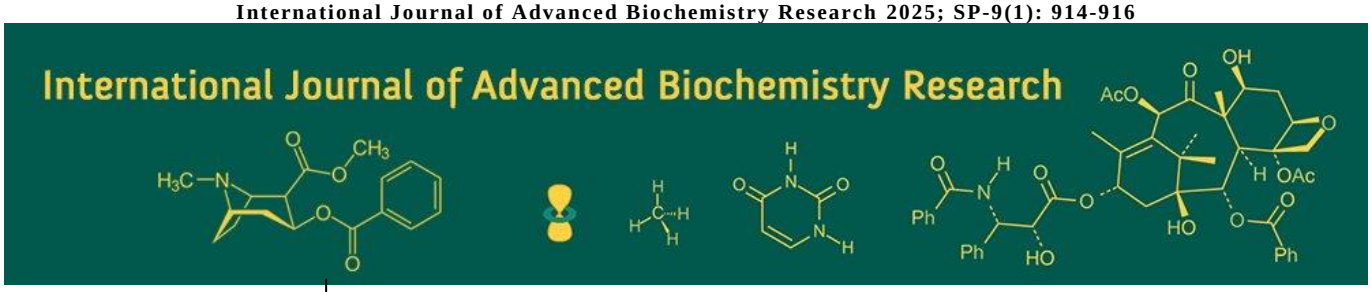

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Effect of selected herbal preservatives on keeping quality of paneer

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Abstract
The present investigation entitled **"**Effect of selected herbal preservatives on keeping quality of paneer**"** was carried out in the laboratories of Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola.
In final experimental trials different herbal preservatives at their selected levels (@ 1%, 0.6% and 0.4%) were studied in detail for their efficacy on shelf life of paneer. the fresh and refrigerated samples of paneer were analysed for chemical, microbiological and sensory quality.
The present study it is concluded that the, control sample was acceptable up to 10th days of refrigerated storage while in case of paneer samples contain 0.4% turmeric powder + 0.6% cardamom powder was acceptable up to 15th days of refrigerated storage.

Keywords: Herbal paneer, storage period, SPC, yeast and moulds, coliform

Introduction
Paneer is of great value in diet, especially in the Indian vegetarian context, because it contains a fairly high level of fat and proteins as well as some minerals, especially calcium and phosphorous. It is also good source of fat soluble vitamins A and D. Paneer is a rich source of animal protein available at a comparatively lower cost and forms an important source of animal protein for vegetarians. Over and above its high protein content and digestibility, the biological value of protein in paneer is in the range of 80 to 86 (Shrivastava and Goyal, 2007) [4]. So, its food and nutritive value is fairly high. Superior nutritive value of paneer is attributed to the presence of whey proteins that are rich source of essential amino acids. Due to its high nutritive value, paneer is an ideal food for the expectant mothers, infants, growing children, adolescents, and adults. Paneer is a highly perishable product and suffer from limited shelf life, largely because of its high moisture content. Over the years various attempts have been made to increase the shelf life of paneer. Food additives such as sorbic acid, potassium sorbets, and solutions of H_2O_2 and brine solution. Delvocid and Nisin have been tried to increase shelf life of paneer though they are not permitted additives to paneer under PFA rules 1955.
Now a day there has been increasing trend of the consumer about foods free from chemical preservatives because of their possible toxic effect in human beings. The consumers are also demanding foods with long shelf life and absence of risk of causing foot born disease. There is an increasing demand for foods containing natural ingredients. The spices offer a promising alternative in food safety. The spices have been well known for their medicinal, preservative and antioxidant properties (Soura *et al*. 2005) [7]. In addition to imparting flavour, certain spices prolong the shelf life of foods due to their bacteriostatic or bactericidal activity and some prevent rancidity in food by their antioxidant activity (Shelf *et al*. 1984) [3].

Materials and Methods
The following ingredient was used for the research work

Cow milk
Fresh, clean whole Cow milk was procured from Livestock Instructional Farm of Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola.

Citric acid
Citric acid was procured from local market of Akola city, used as per requirement.

Ginger, Cardamom and Turmeric
Good quality Ginger, Cardamom and Turmeric was purchased from local market of Akola city.

Methodology
Treatment details
T_1= Control (without spices)
T_2= Acceptable level of ginger powder
T_3= Acceptable level of cardamom powder
T_4= Acceptable level of Turmeric powder
T_5= Acceptable level of Ginger + cardamom
T_6= Acceptable level of Turmeric + Cardamom
T_7= Acceptable level of Turmeric + Ginger
T_8= Acceptable level of Ginger+ cardamom + Turmeric
No. of treatment = 08 No. of Replication = 03

Statistical Design - Data generated from the final experiment was analysed by Analysis of Variance Technique.

Technique for Preparation of Paneer
Paneer was prepared from cow milk with slight modifications using the method given by Singh and Kanawjia (1992) [6] with slight modification for addition of different herbs.
Formation of herbal paneer was done by using cow milk with incorporation of different herbal preservatives. The milk was standardized 4.5% fat. The milk used for preparation of paneer was subjected to heating 85 °C for 5 minutes. The milk was subsequent cooled to 70 °C. Addition of coagulant-citric acid @1% at 70 °C. The solution was added with continuous agitation until the coagulation was complete. The curd or milk coagulum was allowed to settle for 10 minutes. Whey was drained through muslin cloth by gentle squeezing with hand and spices were added as per the treatment. Proper mixing of preservatives in to coagulum. Lining of muslin cloth in to block and filling of paneer into block. Pressing (pilling and repelling). Removal of herbal paneer from block. Cutting of herbal paneer into required size and chilling is done (4 °C). Removal of herbal paneer cubes from chilling water and allow to drain water and packaging of paneer is done and stored at refrigerated condition (5-7 °C).

Results and Discussion
Standard plate count (x10^4 cfu/ml)
The data pertaining to the bacterial counts in paneer i.e. standard plate counts of paneer made from cow milk blended with (0.4% TP+ 0.6% CP) turmeric and cardamom powder at different storage intervals are presented in Table 1.

Table 1: Effect of selected herbal preservatives on standard plate count (x10^4cfu/gm) of paneer

Treatments	Storage Period (days) mean of six replication				
	0	5	10	15	20
T_1 (Control)	3.21	4.13	4.51	6.01	S
T_6 (Preservatives)	3.10	3.98	3.41	4.51	6.21
F test				Sig.	
SE(M)±				0.078	
CD at 5%				0.248	

S- Indicates the prepared product was spoiled

It is evident from the Table 1 that there was a sharp increase in the Standard Plate Count (SPC) on the 5th day of the storage, both in control as well as samples containing turmeric and cardamom powder. On further storage the count continued to increase on 15th day and visible mould growth was found on 20th day of storage in control sample, but the count decrease considerably in case of turmeric and cardamom powder containing samples. In the turmeric and cardamom powder containing samples again count increase up to 20th day of storage. Incorporation of turmeric and cardamom powder resulted in significant (p<0.05) decrease in SPC of paneer. compared to control. The samples containing turmeric and cardamom powder had significantly (p<0.05) lower SPC count during storage.
In paneer containing turmeric and cardamom powder SPC remained within BIS requirement up to 15th days of storage.
The above results were in agreement with Vaishnavi *et al.* (2001) [8] reported total plate count of 3×10^2 to 9.7×10^{10} in the samples of paneer collected from Chandigarh market.

Yeast and Mould count (x10^2cfu/ml)
The data pertaining to the yeast and mould counts of paneer made from cow milk blended with (0.4% TP+ 0.6% CP) turmeric and cardamom powder at different storage intervals are presented in Table 2.

Table 2: Effect of selected herbal preservatives on yeast and mould counts (x10^2 cfu/gm) of paneer

Treatments	Storage Period (days) mean of six replication				
	0	5	10	15	20
T_1 (Control)	NA	NA	2.07	3.15	S
T_6 (Preservatives)	NA	NA	NA	1.72	3.01
F test				Sig.	
SE(M)±				0.087	
CD at 5%				0.279	

S- Indicates the prepared product was spoiled & NA Indicates not observed

The yeast and mould count gradually increase in control sample after 10 day of the storage and sharply increase in the 15th day of storage and then VMG seen on 20th day of storage. In case of the samples of paneer containing turmeric and cardamom powder the count was nil. which gradually increase up to 15th day of storage but sharp increase was observed 20th day of storage. Incorporation of turmeric and cardamom powder resulted in significant (p<0.05) decrease in yeast and mould of paneer.
Fresh samples of both control and turmeric and cardamom powder containing paneer met the standards prescribed by BIS for yeast and mould counts. Up on storage only in

turmeric and cardamom powder containing samples yeast and mould count remained within BIS requirement up to 15th day of storage.

The above results were in agreement with Monika Rani *et al*. (2014) [2] reported that yeast and mould was not detectable till 15 days of storage. It could be because of the action of essential oils from various spices, which cause their inhibition. While yeast and mould in paneer kept at 10 °C was 219 log cfu/g on 5th day. Both become detectable in both the products after 15th days of storage and subsequently rose steeply. However, their count remained below the permissible limits prescribed by FSSAI for paneer ie. not more than 250/g there for pickling process reduced yeast and mould growth in paneer.

Dhole *et al*. (2009) [1] evaluated the 70 samples of fresh paneer from seven vendors of Ahmednagar city (M.S.) for microbiological quality. The yeast and mould counts in market samples of paneer were ranged between 1×10^2 and 99×10^2 cfu per g.

Coliform count ($x10^2$cfu/ml)

It is evident from the data presented that no coliform counts was found in control and (0.4% TP+ 0.6% CP) turmeric and cardamom powder containing paneer samples during fresh and storage period.

The effect of 0.4% turmeric powder and 0.6% cardamom powder on coliform count was nil during fresh and storage period. It means that the product was prepared very hygienically indicating that product was safe for due to the anti -fungal and anti-bacterial properties.

The above results were in agreement with Shweta Buch *et al*. (2014) [5] studied that the addition of turmeric at the rate of 0.6% by weight of excepted yield of paneer. It is evident to no coliform count was found in control and turmeric containing samples when fresh and even during storage.

Conclusion

During storage and microbial studies it was recorded as control paneer and paneer prepared with 0.4% turmeric powder and 0.6% cardamom powder was has safe keeping storage capacity at refrigeration condition (4 ± 1^oc) temperature up to 10 and 15 days respectively, then after product was spoiled due to growth of yeast and moulds.

References

1. Dhole PT, Deokar DK, Pawar RD, Patil SJ. Chemical quality of paneer sold in Ahmednagar city (Maharashtra). XXXVII Dairy Industry Conference, Goa, Feb. 7-9, 2009.
2. Monika Rani, Sharma RS, Khanna S, Chaudhari M, Potliya S. Storage stability and quality characteristics of ready-to-serve spice paneer products. Asian Journal of Dairying and Food Research. 2014;33(3):171-174.
3. Shelef LA. Antimicrobial effects of spices. Journal of Food Safety. 1984;6:29-44.
4. Shrivastava S, Goyal GK. Preparation of paneer—A review. Indian Journal of Dairy Science. 2007;60(6):377-388.
5. Shweta, Buch, Pinto S, Aparnathi KD. Evaluation of efficacy of turmeric as a preservative in paneer. Journal of Food Science and Technology. 2014;51(11):3226-3234.
6. Singh S, Kanawjia SK. Effect of coagulation temperature and total solid levels on quality of paneer made from whole milk powder. Journal of Food Science and Technology. 1992;29(1):57-59.
7. Soura EL, Stamford TLM, Lima EO, Trajano VN, Filho MB. Antimicrobial effectiveness of spices. International Journal of Biology. 2005;41:549-558.
8. Vaishnavi C, Singh S, Grover R, Singh K. Bacteriological study of Indian cheese (paneer) sold in Chandigarh district. Indian Journal of Medical Microbiology. 2001;19(4):224-226.