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# Influence of Milk Fat Content on Yield and Quality of Paneer

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**Abstract**

*In an attempt to study the quality of paneer, there were four fat levels i.e. 1.5 %, 3.0%, 4.5% and 6.0% maintained in the buffalo milk to manufacture paneer. The paneer samples thus prepared were analyzed for sensory evaluation and chemical analysis in terms of moisture, fat, protein, lactose, ash and titratable acidity. Investigation was replicated thrice. The data thus obtained were statistically analyzed using CRD and tested at 5% level of significance. The fat content of milk had a significant effect on all above chacteristics of study. This study was concluded as milk must contain at least 6.0% fat for getting well accepted quality paneer and to meet the legal standards.*

Key Words: SNF, legal standards, sensory evaluation, fat on dry matter, ash

## Introduction

Paneer is an Indian soft cheese manufactured by the combined action of heat and acid in coagulation of milk. This is used as a base material for the preparation of a large number of culinary dishes and is highly nutritious and wholesome (Sachdeva and Singh 1990). It contained almost all the fat, casein complexed with denatured and a potion of salts and lactose as reviewed by Kumar et. al. 2014. Paneer is an ideal food for expectants mother, infants, growing children, adolescents and adults. Being rich source of animal protein, it is good source of all essential amino acids to the vegetarians. Its fat content renders the fat-soluble vitamins A and D, all essential fatty acids and energy. With its high protein and low sugar content, it is recommended to the diabetic patients. It has also particular value for those who possess the problem of lactose intolerance. With out standardization of milk, uniformity in the composition of the finished product cannot be obtained. Simultaneously, It is also necessary to get the product conforming the legal standard

## Materials and Methods

Buffalo milk was received from the source aseptically, tested and standardized to 1.5, 3.0, 4.5 and 6.0 percent milk fat with a SNF level of 9.0 percent by adding water / fresh buffalo skim milk. The additional requirement of SNF content was made up through spray dried skim milk powder. The paneer was prepared by the method suggested by Sachdeva and Singh (1987) and Aneja (1997). The yield (%) of paneer was reported on the weight basis of same milk used for the purpose. Paneer samples were taken as per procedure described in SP18 Part XI (1981). Sensory evaluation was done by 100-point scale as given by Patil and Gupta (1986). The moisture content determined by Gravimetric method as described in IS: 1479, Part II 1961. Fat content was determined by the Gerber's method. The protein content of Paneer was determined by the Kjeldahl's method. The lactose content of paneer was estimated by Fehling's solution method as described in Lab. Mann. in Agriculture Chemistry (1960). Ash Content determined by the procedure given in S.P. 18 Part XI (1981), BIS New Delhi. Titratable acidity

in paneer was determined as per the procedure adopted by Rajorhia et al., (1984). This study was replicated thrice and data thus obtained were analyzed by CRD and tested at 5% level of significance.

## Results and Discussion

It is evident from the data depicted in the table that fat levels of milk had a significant effect on every parameter of quality of paneer in the study (Table 1).

The yield of paneer was increased with the increase in fat level of milk. The increase in yield of paneer at higher fat level of milk might be attributed to increase in the recovery of total solids and higher fat content in milk. Similarly, the recovery of total solids in paneer also increased at higher fat levels of milk. The hike in recovery of total solids with increasing fat levels in milk might be attributed to the increase in fat- protein complexes during heating of milk (Chauhan et al.1917). The overall sensory score of paneer samples increased with the increase in fat levels of milk. It is particularly due to improvement in flavour. and body and texture of paneer with increase in fat content of paneer samples. It is well established that milk fat contributes most pleasing taste and odour to the milk products (Kumar 2021). Moisture content in paneer samples was significantly reduced with the increase in each level of fat in milk. The reason could be hydrophobic nature of fat which reduces the moisture content of paneer at higher fat levels. Similar trend was also reported by Roy (1994). All fat levels of milk conformed the legal requirement of moisture in paneer samples which is maximum 70%. The fat content of paneer samples increased significantly with increase in each level of fat. Pal and Yadav (1992) also reported the milk with greater fat content produced paneer with more fat. The analysis of data shows that there must be at least 6.0% fat in milk to get paneer of corresponding legal standard which is 50 % fat on dry matter basis.

The protein content of paneer samples decreased significantly with increase in each level of fat. Chawla et al. (1987) also reported as inverse relationship between protein content of paneer and fat level of milk. The lactose content of paneer was significantly reduced with increase in each level of fat. It is well established that lactose, being water soluble and have no association with any other constituents, remains in the whey (Kumar 2021). So, paneer samples which retains higher amount of whey, contained higher lactose. This view get support from the results of Pal et al. (1991). The ash content of paneer was significantly decreased with increase in each level of fat. There is intimate association between protein and ash content in milk

Table 1: Effect of fat content of milk on the yield, recovery of total solids and quality of paneer

| Characteristics | Fat Levels | | | | Effect | SE (Diff) | CD at 5% |
|---|---|---|---|---|---|---|---|
| | 1.5% | 3.0% | 4.5% | 6.0% | | | |
| Yield (%) | 18.40 | 19.19 | 20.80 | 22.91 | Significant | 0.11 | 0.22 |
| Recovery of total solids (%) | 58.09 | 59.72 | 63.29 | 66.35 | Significant | 0.25 | 0.50 |
| Overall sensory score out of 100 | 74.68 | 80.42 | 85.47 | 88.52 | Significant | 1.13 | 2.24 |
| Moisture (%) | 66.84 | 62.65 | 58.92 | 56.55 | Significant | 0.25 | 0.50 |
| *Fat (%) | 7.83 | 14.80 | 20.43 | 24.36 | Significant | 0.09 | 0.19 |
| | (23.61) | (39.63) | (49.73) | (56.06) | | | |
| Protein (%) | 17.18 | 16.52 | 15.34 | 14.01 | Significant | 0.09 | 0.17 |
| Lactose (%) | 3.12 | 2.94 | 2.84 | 2.73 | Significant | 0.02 | 0.03 |
| Ash (%) | 2.23 | 2.14 | 1.97 | 1.79 | Significant | 0.01 | 0.02 |
| Titratable acidity (lactic acid %) | 0.350 | 0.338 | 0.329 | 0.320 | Significant | 0.003 | 0.005 |

*Values in the parentheses are fat on dry matter basis

system. So, paneer samples higher in protein would also be higher in ash content and vice a versa. Pal and Yadav (1992) also reported similar results in this regard. The titratable acidity of paneer samples progressively decreased with the increase in fat levels of milk. The relatively higher acidity in low fat paneer might be due to its higher level of protein and greater retention of colloidal phosphate. Protein and phosphate contribute maximum acidity of milk products Chawla et.al. (1987).

## Conclusion

It is finally, concluded that 6.0 % fat in milk can produce paneer of well accepted quality conforming legal standards, and is being recommended for the commercial production of paneer.

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