ISSN: 2456-2912
NAAS Rating (2025): 4.61
VET 2025; SP-10(8): 183-187

www.veterinarypaper.com
Received: 25-07-2025
Accepted: 29-08-2025

Poorani A
Department of Livestock Products Technology Veterinary College and Research Institute, Udumalpet, Tamil Nadu, India

Elango A
Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Salem, Tamil Nadu, India

Pugazhenthi TR
Department of Livestock Products Technology Veterinary College and Research Institute, Theni, Tamil Nadu, India

Manivannan C
Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Udumalpet, Tamil nau, India

Corresponding Author:
Poorani A
Department of Livestock Products Technology Veterinary College and Research Institute, Udumalpet, Tamil Nadu, India

Exploring the best lactic starter culture suitable for the manufacture of cow milk curd incubated at lower temperature

Poorani A, Elango A, Pugazhenthi TR and Manivannan C

Abstract
Cow milk curd samples were made using standardized cow milk inoculated with different starter cultures and their combinations. The sensory scores of cow milk curd samples prepared with various combinations of starter cultures by incubating at 37 °C and stored at refrigeration temperature. Dairy starter cultures were obtained from the National Collection of Dairy Cultures (NCDC), Division of Dairy Microbiology, National Dairy Research Institute, Karnal (Haryana). A panel of six discriminative and communicative judges assessed the curd samples for sensory qualities like color and appearance, body and texture, flavor, and overall acceptability using a nine-point hedonic scale (9 for strongly like and 1 for disliking extremely). The sensory evaluations of curd samples made using cow's milk curd made with a mix of starter cultures In terms of flavor, body and texture, colour, and appearance, overall acceptability scores (8.79±0.01, 8.68±0.01, 8.81±0.01, 8.81±0.01) on day 0 for *Lactococcus lactis* subsp. lactis + *Lactococcus lactis* subsp. cremoris + *Lactococcus lactis* subsp. lactis biovar diacetylactis inoculation at 37°C incubation outperformed the control and other treatments. On day 0, the curd sample made with cow milk curd inoculated with *Lactococcus* lactis subsp. cremoris had the lowest overall acceptability scores (7.46±0.01, 7.05±0.01, 8.01±0.01, 7.48±0.01) for flavor, body and texture, color, and appearance.

Keywords: *Lactococcus lactis*, pH, refrigeration, cow milk curd, starter cultures, incubation temperatures

Introduction
Organoleptic analysis uses the panelists' senses (sight, smell, taste, touch) to assess food and its characteristics (texture, flavor, taste, appearance, fragrance, etc.). For many years, this kind of orgaoleptic analysis has been utilized to either accept or reject food goods. Due to their crucial role in the majority of fermented foods, including dairy products, lactic acid bacteria are currently the focus of a great deal of research. Curd is a fermented milk product popular in India. Curd is prepared on cottage scale as well as industrial scale. After pasteurizing milk, it is cooled to35-40 ºC, and then inoculated with commercial starter culture kept from the previous day, and transferred to earthenware pots; curdling takes place at room temperature overnight. It is immensely important to meet the current market trend of curd among consumers. Most of the curd manufacturers don't take any precautions to preserve the culture's dependability and purity. There are significant differences in the milk's fat, solids not fat, and total solids content when it comes to the milk needed to make curd.
There is an urgent need to modernize the technology for curd's commercial production given the rising demand for the product across the country and the organized dairy industry's growing interest in large-scale manufacturing of curd. Through organoleptic analysis, this research aims to investigate the suitable lactic starter culture for making cow milk curd that is incubated at a lower temperature and stored in a refrigerator.

Materials and Methods
Experiment trials using the starter culture combination *viz*. Dahi culture, *Lactococcus lactis* subsp. *lactis*, *Lactococcus lactis* subsp. *cremoris*, *Lactococcus lactis* subsp. *lactis biovar diacetylactis*, *Lactococcus lactis* subsp. *lactis* + *Lactococcus lactis* subsp. *lactis biovar*

diacetylactis, *Lactococcus lactis* subsp. *cremoris* + *Lactococcus lactis* subsp. *lactis biovar diacetylactis*, *Lactococcus lactis* subsp. *lactis* + *Lactococcus lactis* subsp. *cremoris* + *Lactococcus lactis subsp. lactis biovar diacetylactis*, *Leuconostoc lactis*, *Ln. mesenteroides* subsp. *cremoris*, *Leuconostoc lactis* + *Ln. mesenteroides* subsp. *cremoris*, *Lactobacillus plantarum*, *Brevibacillus brevis*, *Lactobacillus paraplantarum*, *Streptococcus salivarius* subsp. *thermophilus*. Dairy starter cultures were obtained from the National Collection of Dairy Cultures (NCDC), Division of Dairy Microbiology, National Dairy Research Institute, Karnal (Haryana) were used in this research. Cow milk curd were prepared and incubated at 37 °C using 5 per cent fat and 9 per cent SNF combination in cow milk.

The following starter cultures were used on the cow milk standardized to 5 per cent fat and 9 per cent SNF combination using Pearson square method (Pearson and Freeman, 1972).

Table 1: Experimental treatments and combinations of lactic acid bacterial strains with number of replications.

S. No.	Treatment	Combinations	Replication
1	T_1	*Lactococcus lactis* subsp. *lactis*	6
2	T_2	*Lactococcus lactis* subsp. *cremoris*	6
3	T_3	*Lactococcus lactis* subsp. *lactis biovar diacetylactis*	6
4	T_4	*Lactococcus lactis* subsp. *lactis* + *Lactococcus lactis* subsp. *lactis biovar diacetylactis*	6
5	T_5	*Lactococcus lactis* subsp. *cremoris* + *Lactococcus lactis* subsp. *lactis biovar diacetylactis*	6
6	T_6	*Lactococcus lactis* subsp. *lactis* + *Lactococcus lactis* subsp. *cremoris* + *Lactococcus lactis* subsp. *lactis biovar diacetylactis*	6
7	T_7	*Leuconostoc lactis*	6
8	T_8	*Leuconostoc mesenteroides* subsp.*cremoris*	6
9	T_9	*Leucuconostoc lactis* + *Leuconostoc mesenteroides* subsp. *cremoris*	6
10	T_{10}	*Lactobacillus plantarum*	6
11	T_{11}	*Lactobacillus paraplantarum*	6
12	T_{12}	*Streptococcus salivarius* subsp. *thermophilus*	6

Sensory analysis of curd

A panel of well-trained judges assessed the curd samples for sensory qualities like color and appearance, body and texture, flavor, and overall acceptability using a nine-point hedonic scale (9 for strongly like and 1 for disliking extremely). Just before serving, a single cup (100 ml) of each treatment w as randomly selected from the refrigerator and given to each p anelist for evaluation. (Divya *et al.*, 2024; Hussain *et al.*, 2016) [5, 9].

Results and Discussion

Cow milk curd samples were prepared using the different starter cultures as shown in Table 1 using cow milk that was standardized to contain 5% fat and 9% Solids Not Fat. Tables 2, 3, 4, and 5 present the sensory scores of cow milk curd samples that were made using different combinations of starter cultures, incubated at 37°C, and then stored at refrigerator temperature (Figure 1-5). The various starter cultures and their combinations as in table 1 were used to prepare cow milk curd samples with cow milk standardized to 5 per cent fat and 9 per cent Solids Not Fat combination

All curd samples were compared with the control curd sample by sensory evaluation to select the best starter culture combination with extended shelf life. The sensory scores for curd samples prepared using C1Ll+Lc+Ld combination of starter cultures incubated at 37 ºC were higher than the control and other treatments interms of flavour, body and texture, colour and appearance, overall acceptability (8.79±0.01, 8.68±0.01, 8.81±0.01, 8.81±0.01) on day 0 and lowest flavour, body and texture, colour and appearance, overall acceptability.

The curd samples made *Lactococcus lactis* subsp. *lactis*, *Lactococcus lactis* subsp. *cremoris* and *Lactococcus lactis* subsp. *lactis* biovar *diacetylactis* mixed cultures had the highest sensory score from the sensory panel on days 0 and 6 of storage.

In addition to having a lengthy setting time and a poor coagulation tendency, the cow milk curd made with C1Lnl, C1Lnm, C1Lnl + C1Lnm, C1Lp, C1Bb, and C1Lpp starter cultures was not assessed for potential contamination from non-starter organisms and was not the subject of additional organoleptic investigations. (Holland and Liu, 2011) [8].

In terms of flavor, body and texture, color and appearance, and overall acceptability, the sensory scores for curd samples made with a C1Ll+Lc+Ld combination of starter cultures incubated at 37 ºC were higher than those for the control and other treatments (8.79±0.01, 8.68±0.01, 8.81±0.01, 8.81±0.01) on day 0. The curd sample made with C1Lc starting culture on day 0 had the lowest overall acceptance scores (7.46±0.01, 7.05±0.01, 8.01±0.01, 7.48±0.01) in terms of flavor, body and texture, color, and appearance.

Compared to the control and other treatments, the curd samples made with C1Ll+Lc+Ld (Table 13-16) starter culture combinations and incubated at 37 ºC on day 6 of storage at 5.00± 0.5 ºC had higher flavor, body, and texture scores (7.00±0.01, 6.59±0.01, 7.02±0.01, 7.02±0.01). The findings of this research align with the conclusions drawn by Farsi *et al*. (2017), who discovered that citrate-positive strains of *Lactobacillus lactis* subsp. *lactis* biovar. *Diacetylactis* or *Leuconostoc* strains that generate low levels of CO2 are sometimes incorporated into cheese to create diacetyl, an essential flavoring component. The scores for flavour, body, texture, and overall acceptability were found to be lower than those of the control and other treatments for the curd sample made with the C1St starter culture (3.98±0.01, 3.57±0.01, 4.01±0.01) on the sixth day of storage at 5.00± 0.5 ºC.

These findings are consistent with the observations made by Marshall *et al*. (1985), which indicate that *Streptococcus salivarius* subspecies *thermophilus* is not suitable for milk fermentations, as the fermentation process using this organism leads to products characterized by poor flavour, aroma, and texture.

Significant (p<0.01) difference between treatment and control cow milk curd samples was observed. The *Lactococcus lactis* subsp. *lactis*, *Lactococcus lactis* subsp. *cremoris and Lactococcus lactis* subsp. *lactis* biovar *diacetylactis* sample received a higher flavour, body texture and overall acceptability scores than the other curd samples incubated at

37 °C on 0 day. The same sample was acceptable up to 6 days under refrigerated storage. This is in agreement with Rasane *et al.* (2025) who documented in dairy food fermentation industry, lactic acid bacteria mainly *Lactococcus lactis* acts as a functional starter culture and also as a vital microorganism due to its peculiar characteristics such as food flavoring, acidification, organoleptic and in the production of various fermented dairy products.

Body and texture of curd containing *Lactococcus lactis* subsp. *lactis, Lactococcus lactis* subsp. *cremoris and Lactococcus lactis* subsp. *lactis* biovar *diacetylactis* starter culture was characterized by firm homogenous gel and it was free from syneresis and possess typical white, smooth and shiny surface. These results are in agreements with the findings of Joon *et al.* (2017) [10].

Conclusion

Dahi produced on domestic levels has undefined cultures, thus, difference in texture and taste is often observed. With standardization of culture and production conditions a defined product of consistent quality (sensory and textural) can be achieved. Thus exploring the best lactic starter culture suitable for the preparation of cow milk curd incubated at lower temperature and stored under refrigerated conditions through organoleptic analysis revealed that the flavour, body and texture, overall acceptability scores were higher for the curd samples prepared using *Lactococcus lactis* subsp. *lactis*, *Lactococcus lactis* subsp. *cremoris* and *Lactococcus lactis* subsp. *lactis* biovar *diacetylactis* combined cultures starter culure combinations and incubated at 37 ºC on day 6 of storage at refrigeration temperature.

Table 2: Flavour scores of cow milk curd samples with various starter cultures incubated at 37°C during refrigerated storage

Storage period in Days	Starter cultures							
	C1C	C1Ll	C1Lc	C1Ld	C1Ll+Ld	C1Lc+Ld	C1Ll+Lc+Ld	C1St
0	8.64^{bA}±0.10	8.68^{bA}±0.10	7.46^{cA}±0.10	8.68^{bA}±0.10	8.79^{aA}±0.10	7.48^{dA}±0.10	8.79^{aA}±0.10	7.48^{cA}±0.10
2	7.96^{dB} ±0.10	7.96^{dB}±0.10	6.98^{eB}±0.10	8.29^{bA}±0.10	8.19^{cA}±0.10	6.98^{eB}±0.10	8.38^{aA}±0.10	6.98^{eB}±0.10
4	6.46^{cC}±0.10	5.97^{dC}±0.10	5.98^{dC}±0.10	6.99^{bB}±0.10	7.00^{bB}±0.10	5.99^{dC}±0.10	7.49^{aB}±0.10	6.48^{cB}±0.10
6	4.97^{bD}±0.10	4.96^{cD}±0.10	4.98^{cD}±0.10	4.99^{cC}±0.10	4.98^{cC}±0.10	4.99^{cD}±0.10	7.00^{aB}±0.10	3.98^{dC}±0.10
8	3.96^{bE}±0.10	3.96^{bE}±0.10	3.98^{bE}±0.13	3.99^{bD}±0.10	4.00^{bD}±0.13	4.00^{bE}±0.13	5.20^{aC}±0.13	3.70^{cC}±0.10
10	2.98^{bF}±0.10	3.02^{aF}±0.10	2.98^{bF}±0.10	2.99^{bE}±0.10	3.01^{aE}±0.10	2.99^{cF}±0.10	3.02^{aD}±0.10	3.00^{aD}±0.10

Mean ± Standard error values from six trials.
Mean values bearing different superscripts in a column differed significantly (p<0.01)

Table 3: Body and texture scores of cow milk curd samples with various starter cultures incubated at 37°C during refrigerated storage

Storage period in Days	Starter cultures							
	C1C	C1Ll	C1Lc	C1Ld	C1Ll+Ld	C1Lc+Ld	C1Ll+Lc+Ld	C1St
0	8.68^{aA}±0.22	8.21^{bA}±0.10	7.05^{cA}±0.10	8.27^{bA}±0.10	8.38^{aA}±0.10	7.07^{cA}±0.10	8.68^{aA}±0.10	7.07^{cA}±0.10
2	7.55^{dB} ±0.10	7.55^{dB}±0.10	6.57^{eb}±0.10	7.88^{bB}±0.10	7.78^{cB}±0.10	6.57^{eB}±0.10	7.97^{aB}±0.10	6.57^{eB}±0.10
4	6.05^{cC}±0.10	5.46^{dC}±0.10	5.47^{dC}±0.10	6.58^{bC}±0.10	6.59^{bC}±0.10	5.59^{dC}±0.10	7.08^{aC}±0.10	6.07^{cC}±0.10
6	4.46^{dD}±0.10	4.55^{cD}±0.10	4.57^{bD}±0.10	4.58^{bD}±0.10	4.57^{bD}±0.10	4.58^{bD}±0.10	6.59^{aD}±0.10	3.57^{eD}±0.10
8	3.55^{bE}±0.10	3.55^{bE}±0.10	3.57^{bE}±0.13	3.58^{bE}±0.10	3.59^{bE}±0.13	3.59^{bE}±0.13	4.79^{aE}±0.13	2.58^{cE}±0.10
10	2.57^{bF}±0.10	2.61^{aF}±0.10	2.57^{bF}±0.10	2.58^{bF}±0.10	2.60^{aF}±0.10	2.58^{bF}±0.10	2.61^{aF}±0.10	2.61^{aF}±0.10

Mean ± Standard error values from six trials.
Mean values bearing different superscripts in a column differed significantly (p<0.01)
* indicates curd sample with long setting time/poor coagulation effect

Table 4: Colour and appearance scores of cow milk curd with various starter cultures incubated at 37°C during refrigerated storage

Storage period in Days	Starter cultures							
	C1C	C1Ll	C1Lc	C1Ld	C1Ll+Ld	C1Lc+Ld	C1Ll+Lc+Ld	C1St
0	8.78^{abA}±0.10	8.70^{bA}±0.10	8.01^{dA}±0.10	8.70^{bA}±0.10	8.81^{aA}±0.10	8.12^{cA}±0.10	8.81^{aA}±0.10	8.05^{dA}±0.10
2	8.45^{cA} ±0.10	8.66^{bA}±0.10	7.97^{eA}±0.10	8.64^{bA}±0.10	8.75^{aA}±0.10	8.06^{dA}±0.10	8.75^{aA}±0.10	8.00^{deA}±0.10
4	7.50^{aB}±0.10	7.01^{cB}±0.10	7.03^{cB}±0.10	7.01^{cB}±0.10	7.02^{cB}±0.10	7.01^{cB}±0.10	7.51^{aB}±0.10	7.20^{bB}±0.10
6	6.85^{bC}±0.10	5.72^{eC}±0.10	5.79^{eC}±0.10	5.78^{eC}±0.10	5.77^{eC}±0.10	5.83^{dC}±0.10	7.02^{aC}±0.10	6.14^{cC}±0.10
8	5.26^{cD}±0.10	5.23^{cC}±0.10	5.29^{cC}±0.13	5.22^{cD}±0.10	5.24^{cD}±0.13	5.23^{cD}±0.13	6.82^{aC}±0.13	5.81^{bD}±0.10
10	5.12^{cD}±0.10	5.15^{cC}±0.10	5.19^{cC}±0.10	5.13^{cD}±0.10	5.06^{dD}±0.10	5.09^{dD}±0.10	6.04^{aD}±0.10	5.52^{bD}±0.10

Mean ± Standard error values from six trials.
Mean values bearing different superscripts in a column differed significantly (p<0.01)
* indicates curd sample with long setting time/poor coagulation effect

Table 5: Overall acceptability scores of cow milk curd with various starter cultures incubated at 37°C during refrigerated storage

Storage period in Days	Starter cultures							
	C1C	C1Ll	C1Lc	C1Ld	C1Ll+Ld	C1Lc+Ld	C1Ll+Lc+Ld	C1St
0	8.76^{abA}±0.15	8.70^{bA}±0.10	7.48^{cA}±0.10	8.70^{bA}±0.10	8.81^{aA}±0.10	7.50^{dA}±0.10	8.81^{aA}±0.10	7.50^{cA}±0.10
2	8.00^{dB} ±0.10	8.00^{dB}±0.10	7.02^{eA}±0.10	8.31^{bA}±0.10	8.21^{cB}±0.10	7.01^{eA}±0.10	8.41^{aA}±0.10	7.04^{eA}±0.10
4	6.50^{cC}±0.10	6.01^{dC}±0.10	6.03^{dB}±0.10	7.01^{bB}±0.10	7.02^{bC}±0.10	6.01^{dB}±0.10	7.51^{aB}±0.10	6.50^{cB}±0.10
6	6.01^{bC}±0.10	5.01^{cD}±0.10	5.02^{cC}±0.10	5.01^{cC}±0.10	5.01^{cD}±0.10	5.01^{cC}±0.10	7.02^{aC}±0.10	4.01^{dC}±0.10
8	4.00^{bD}±0.10	4.01^{bE}±0.10	4.02^{bD}±0.13	4.01^{bD}±0.10	4.02^{bE}±0.13	4.02^{bD}±0.13	5.22^{aD}±0.13	3.23^{cD}±0.10
10	3.05^{aE}±0.10	3.04^{aF}±0.10	3.06^{aE}±0.10	3.05^{aE}±0.10	3.07^{aF}±0.10	3.06^{aE}±0.10	3.07^{aE}±0.10	3.06^{aD}±0.10

Mean ± Standard error values from six trials.
Mean values bearing different superscripts in a column differed significantly (p<0.01)

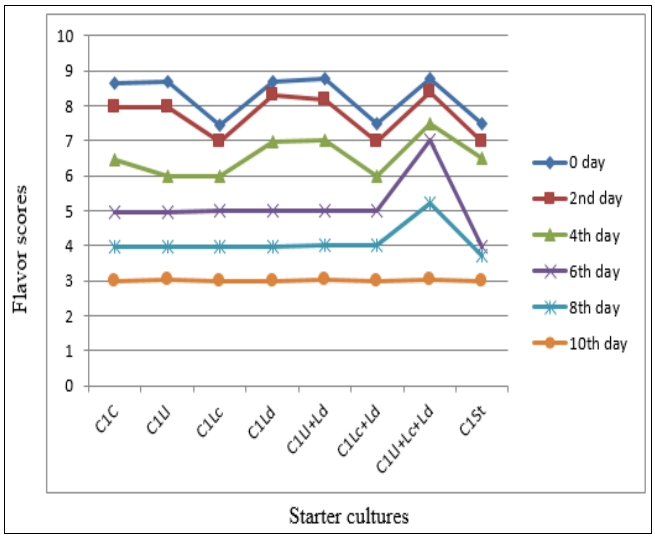

Fig 1: Flavour scores of cow milk curd samples with various starter cultures incubated at 37°C during refrigerated storage

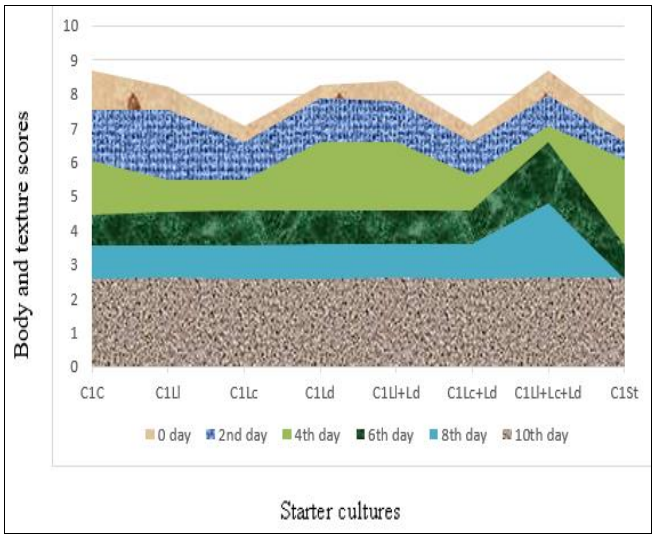

Fig 2: Body and texture scores of cow milk curd samples with various starter cultures incubated at 37°C during refrigerated storage

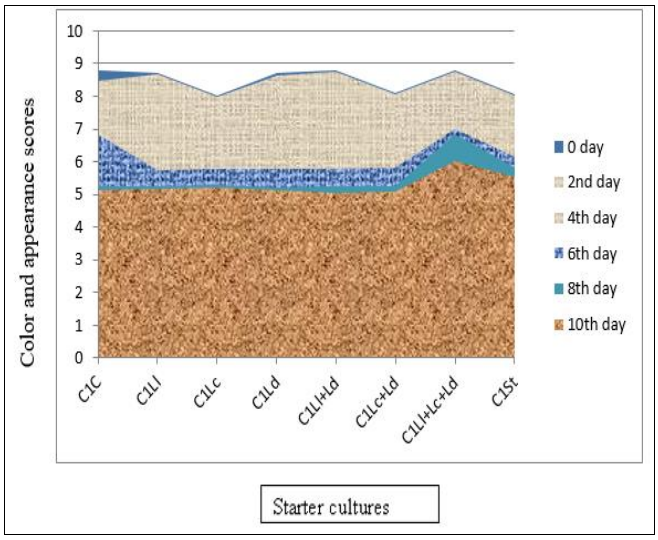

Fig 3: Colour and appearance scores of cow milk curd with various starter cultures incubated at 37°C during refrigerated storage

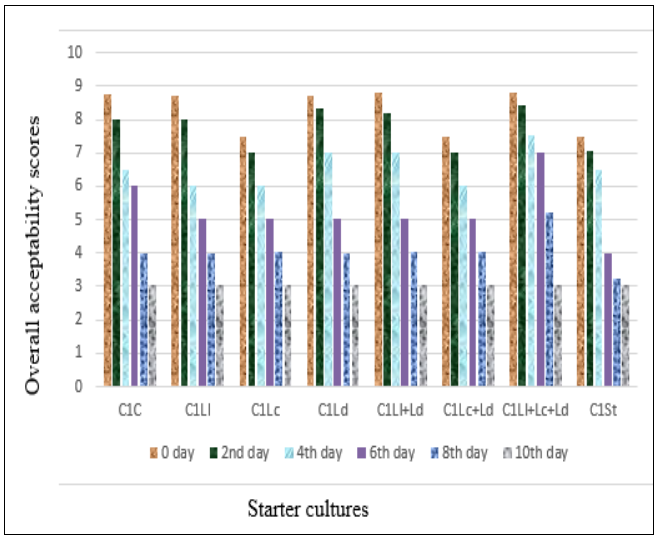

Fig 4: Overall acceptability scores of cow milk curd with various starter cultures incubated at 37°C during refrigerated storage

The flavour, body and texture, overall acceptability scores were lower for the curd sample prepared using starter culture *Lactococcus lactis* subsp. *cremoris* inoculation and incubated at 37 °C on day 0. Cow milk curd prepared by *Streptococcus salivarius* subsp. *thermophilus* inoculation and incubated at 37 °C starter culture on day 6 of storage at 5.00±0.5 ºC showed lowest flavor, body and texture, colour and appearance, overall acceptability scores.

Thus, these experimental findings will ensure the selection of suitable starter cultures for the preparation of cow milk curd incubated at lower temperature.

Conflict of Interest: Not available

Financial support

Authors sincerely thank Tamil Nadu Veterinary and Animal Sciences University for providing necessary facilities to carry out this research work.

Reference

1. Behare PV, Singh R, Nagpal R, Kumar M, Tomar SK, Prajapati JB. Comparative effect of Exopolysaccharide produced in situ or added as bio ingredients on dahi properties. Milchwissenschaft. 2009;64(4):396.
2. Behare P, Singh R, Singh RP. Exopolysaccharide-producing mesophilic lactic cultures for preparation of fat-free Dahi-an Indian fermented milk. J Dairy Res. 2009;76(1):90-97.
3. Bourdichon F. Safety demonstration of microbial species. Risk assessment of specific microbial strains for use in the food chain; 2022.
4. Chaudhary GV, Prajapati JB. Evaluation of Exopolysaccharide (EPS) and non-Exopolysaccharide (NON EPS) producing strains of lactic acid bacteria to select the best combinations of cultures for Dahi preparation. Int J Environ Sci Technol. 2016;5:3486-93.
5. Divya KB, Rajakumar SN, Beena AK, Divya MP, Sudheerbabu P, Ramnath V, *et al*. Physico-chemical characterization and fuzzy logic sensory evaluation of Kaalan: A dairy product of Kerala. J Food Sci Technol. 2024, p. 1-12.
6. Farsi DN, Mathur H, Beresford T, Cotter PD. Cottage cheese, a relatively underexplored cultured dairy product with potential health benefits. Crit Rev Food Sci Nutr; 2025, p. 1-11.
7. Fguiri I, Ziadi M, Rekaya K, Samira A, Khorchani T. Isolation and characterization of lactic acid bacteria strains from raw camel milk for potential use in the

production of yogurt. J Food Sci Nutr. 2017;3:1-8.
8. Holland R, Liu SQ. Lactic acid bacteria: *Leuconostoc* spp. In: Fuquay JW, Fox PE, McSweeney PLH, editors. Encyclopedia of dairy sciences. 2nd Ed. Cambridge (MA): Elsevier; 2011, p. 138-142.
9. Hussain SA, Patil GR, Yadav V, Singh RRB, Singh AK. Ingredient formulation effects on physico-chemical, sensory, textural properties and probiotic count of Aloe vera probiotic Dahi. LWT Food Sci Technol. 2016;65:371-380.
10. Joon R, Mishra SK, Brar GS, Singh PK, Panwar H. Instrumental texture and syneresis analysis of yoghurt prepared from goat and cow milk. 2017;6:7.
11. Khan B, Riaz S, Aslam I, Ghous HMA, Khaliq H, Ali MA, *et al*. Exploring *Lactococcus* spp. in dairy fermentation as a lactic acid bacteria from raw cow milk. J Med Health Sci Rev. 2025;2(2).
12. Majumder R, Salini SV, Basavaprabhu HN, *et al*. Development and evaluation of thermophilic Direct-Vat-Set liquid starter culture blends for dahi production. J Food Sci Technol. 2025. DOI: 10.1007/s13197-025-06304-0.
13. Marshall VM, Cole WM, Phillips BA. Fermentation of milk by Streptococcus salivarius subsp. salivarius and Streptococcus salivarius subsp. thermophilus and their use to the yoghurt manufacturer. J Appl Bacteriol. 1985;59(2):147-51.
14. AOAC. Official methods of analysis. 21st Ed. Rockville (MD): AOAC International; 2019.
15. Rasane P, Kailey R, Singh SK. Fermented Indigenous Indian dairy products: standards, nutrition, technological significance and opportunities for its processing. J Pure Appl Microbiol. 2017;11(2).
16. Ray RC, Paramithiotis S, Thekkangil A, Nethravathy V, Rai AK, Martin JGP. Trending topics on fermented foods in the human history; 2025, p. 237-346.
17. Shanuke DS, Edirisinghe EMRKB, Marapana RAUJ, Hettiarachi S. Development of omega-3 fortified stirred yoghurt with enhanced sensory and oxidative qualities through the addition of fish oil nanoemulsion and fruits. Int. J Food Sci. Technol. 2025;60(1):34.
18. Teixeira CC. *Lactiplantibacillus plantarum* as a model species for VOCs studies in the food sector: VOCs monitoring in a microbiological medium using PTR-TOF-MS [Dissertation]. PQDT-Global; 2023.

How to Cite This Article
Poorani A, Elango A, Pugazhenthi TR, Manivannan C. Exploring the best lactic starter culture suitable for the manufacture of cow milk curd incubated at lower temperature. International Journal of Veterinary Sciences and Animal Husbandry. 2025;SP-10(8):183-187.