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RESEARCH ARTICLE

Variation in Growth of Candidate Lactic Acid Bacteria Isolated from Dadih under Varying Total Solids Concentration and Incubation Times

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ABSTRACT

Dadih is a traditional fermented milk from West Sumatra, Indonesia, which is made by naturally fermenting fresh milk inside bamboo tubes. While this traditional method gives dadih its unique flavor and texture, producing it on a larger scale consistently requires the use of controlled starter cultures. This study, therefore, aimed to have the optimal combination of total solids concentration and incubation time for milk fermented by lactic acid bacteria (LAB) starters isolated by dadih. Five individual LAB starters STARTER 11, STARTER 21, STARTER 25, STARTER 29, and STARTER 41 were tested in four different milk-based media: plain cow's milk (as a control), evaporated cow's milk, cow's milk added with 5.0% cream milk powder, and cow's milk added with 10% skim milk powder and 8.0% cream milk powder. Each medium was homogenized, pasteurized at 85 ℃ for 30 m, inoculated with a 3.0% LAB starter, and incubated for 24, 30, 36, 42, and 48 h. The outcome showed that the total solids concentration had a substantial effect on pH ($p = 0.032$) and curd formation ($p = 0.041$), but not on titratable acidity ($p = 0.117$). In the study, the control treatment using plain cow's milk had the lowest pH (4.66 ± 0.02) and the highest titratable acidity (0.45 ± 0.00), suggesting that LAB thrived best under these conditions and produced a stable, well-formed curd. By contrast, milk has a higher total solids content. Specifically, cow's milk with 10% skim milk powder and 8.0% cream milk powder has fermented more slowly, having weaker acidification and softer curd, likely due to reduced bacterial activity. Extending the incubation period to 48 h substantially increases acid production and curd firmness, resulting in the best coagulation consistency. Overall, plain cow's milk devoid of solids has a longer incubation time, creating the most favorable environment for LAB, which results in optimal acidification and a stable, firm curd.

1. INTRODUCTION

Lactic acid bacteria (LAB) comprise a heterogeneous group of Gram-positive, non-spore-forming microbes that are primarily used as starter cultures in the fermentation of various foods, including milk, vegetables, cereals, meat, and fish. These bacteria convert carbohydrates into lactic acid and produce a variety of compounds, including volatile molecules, alcohols, and organic acids, which contribute to the distinctive flavors, aromas, and textures of fermented foods (Akpoghelie *et al*., 2025). Beyond their framework in food processing, LAB also have health benefits. They possess natural antimicrobial compounds, including bacteriocins and organic acids, that inhibit harmful pathogens and prevent food spoilage. Additionally, certain LAB strains have been recognized for their probiotic potential, which contributes to gut health and overall well-being (Loo *et al*., 2025; Mgomi *et al*., 2023).

In dairy fermentation, the acids produced by LAB cause milk proteins to coagulate, resulting in the formation of curds. This acid-driven factor not only shapes the texture of the final product but also has its flavor, aroma, and overall sensory qualities (Cardenete-Fernández *et al*., 2025). However, the operation of LAB is highly influenced by its environment. The factors comprising the composition of the substrate, fermentation conditions, and the bacteria's ability to cope with stress all play a crucial role in determining how effectively they carry out their metabolic processes (Khushboo *et al*., 2023). The composition of the substrate, particularly its total solids content, is a key factor in fermentation. It has factors such as osmotic pressure, viscosity, and the movement of nutrients, all of which can affect how quickly and efficiently the microbes function (Abesinghe *et al.*, 2025; Yang *et al.*, 2024).

While greater total solids have often been pursued to enhance texture and have syneresis, excessive concentration may impose osmotic stress and slow the lag phase of societies (Mahdian and Tehrani, 2007). At the same time, the length of incubation has a crucial role in determining how quickly LAB produce acid and other metabolic byproducts. While many studies have focused on optimizing mixed-culture fermentations, relatively few have examined how total solids content and incubation time together affect the performance of single-strain LAB in controlled milk-based media. For instance, a recent study optimizing starter societies using 37 LAB strains found that different strain combinations have benefits. However, it did not systematically investigate how variations in media solids or fermentation duration might influence the outcome (Yang *et al.*, 2024). Despite their potential, there is still a limited understanding of how indigenous LAB isolates, especially those from traditional fermented milk like dadih, respond to variations in total solids and incubation conditions within standardized milk-based systems. By systematically studying the effects of total solids concentration and incubation time on dadih-derived LAB, this study has clearer insights into optimizing fermentation efficiency and maintaining stability in controlled dairy processes.

Single-strain starters offer consistency and predictability, yet they can sometimes achieve sufficient acidification within practical fermentation times. In some cases, strains have adequate pH during a 24-hour fermentation, but composition and incubation time are critical limiting factors (Cho *et al.*, 2018). The metabolic responses of LAB to media composition are strain-specific: substrate quality, osmotic environment, and incubation interval can all affect growth yields, and acidification rates have been shown to vary (Khushboo *et al.*, 2023).

In agrocomplex systems, local LAB isolates from conventional fermented dairy products, such as dadih, have valuable bioresources for decentralized dairy innovation. However, fermentation outcomes can be inconsistent when starter performance is not standardized, highlighting the need to control the fermentation environment rather than relying solely on selecting strains that stabilize product quality and efficiency. This study, therefore, examines how varying total solids concentrations and incubation times affect the growth, acidification capacity, and curd formation of single LAB starters isolated by dadih. By systematically evaluating multiple combinations, the research has identified the optimal conditions for LAB performance. The findings suggest the development of more efficient, resource-conscious fermented milk processes utilizing indigenous LAB, thereby enhancing food security and sustainability within agrocomplex systems.

2. MATERIALS AND METHODS

2.1. Materials

Cow's milk used in this study was obtained from local dairy farms in Kediri Regency, East Java, Indonesia. Five single LAB starter strains (STARTER 11, STARTER 21, STARTER 25, STARTER 29, and STARTER 41) were isolated from dadih, a traditional fermented milk produced from goat milk in bamboo tubes. Although species-level identification was not performed, these isolates were confirmed as LAB based on their phenotypic and biochemical characteristics, including rod-shaped cell morphology, Gram-positive reaction, catalase-negative response, and non-motile behavior. These characteristics are consistent with standard criteria used to identify LAB suitable for milk fermentation studies.

2.2. Methods

The experiment was carried out utilizing four different milk-based media, each with a distinct total solids concentration-the first treatment used plain cow's milk as the control. The second treatment employed evaporated cow's milk. In the third treatment, cow's milk was added with 5.0% cream milk powder, while the fourth treatment consisted of cow's milk added with 10% skim milk powder and 8.0% cream milk powder.

2.3. Preparation of Evaporated Milk

Evaporated milk served as the model substrate for having the performance of a single-strain starter culture in this study. The preparation of the evaporated cow's milk was carried out utilizing a Buchi Rotavapor R-20 (BÜCHI Labortechnik AG, Flawil, Switzerland). Briefly, 400 g of freshly obtained cow's milk was transferred into a rotary evaporation flask. It was then subjected to heating at 45-50°C for a duration of 40 m, while maintaining a rotational speed of 4000 rpm. The concentration step was continued until the mass of the milk decreased to roughly 300 g, corresponding to an approximate 25% reduction in volume (Hariono *et al.*, 2024).

2.4. Analysis of titratable acidity

To determine the titratable acidity, approximately 9.0 g of each sample was accurately weighed and subsequently diluted with 9.0 mL of sterile distilled water. Having homogenized, phenolphthalein indicator (two drops) was introduced. The resulting mixture was then subjected to titration utilizing 0.1 N NaOH until the characteristic pink endpoint was achieved. As noted by Perveen and Mohiuddin (2018), organic acids are the predominant metabolites formed during fermentation processes (Matela *et al.*, 2019).

2.5. Analysis of pH

Monitoring pH levels is essential for having the acidogenic operation of LAB. In accordance with the method described by Ribeiro *et al.* (2021), the pH of the fermented milk samples was measured using a glass-electrode immersion technique. The measurements were conducted using a calibrated pH meter, which employed standard buffer mixtures at pH four and pH 7 (Mettler Toledo, Greifensee, Langacher) as reference points to ensure analytical accuracy (Aydogdu *et al.*, 2023).

2.6. Analysis of curd formation

Curd formation was evaluated visually using a curd scale to assess the extent of coagulation, based on the methods reported by Loddo *et al.* (2025) and Wardhani *et al.* (2018) with modifications applied in the present study:

-: no coagulation (liquid State)
+: slight curd formation
++: moderate curd development
+++: firm curd formation
++++: substantial curd structure
+++++: fully solidified curd

2.7. Statistical methods

All experimental outcomes are conveyed as the arithmetic mean accompanied by their corresponding standard deviation (SD). Although formal tests for normality and homogeneity of variance were not conducted, visual inspection of the data and residual plots revealed consistent patterns across treatments. To evaluate the individual and interactive influences of total solids concentration and incubation duration, a two-way analysis of variance (ANOVA) was employed. In instances where the ANOVA indicated statistically significant effects ($p < 0.05$), post hoc pairwise contrasts were subsequently conducted utilizing Duncan's Multiple Range Test (DMRT). All statistical procedures were executed utilizing IBM SPSS Statistics software, version 26.0.

3. RESULT AND DISCUSSION

3.1 pH

Statistically significant variations in pH values ($p < 0.05$) were detected throughout the incubation intervals of 24, 30, 36, 42, and 48 h among the fermented milk samples, which had varying total solids concentrations (Figures 1-4). As fermentation has progressed, the pH has gradually declined, accompanied by a rise in titratable acidity and the visible formation of curd. This drop in pH reflects the active metabolism of LAB, which break down lactose into lactic acid through glycolysis, resulting in both acidification and milk coagulation. Extending incubation to 48 h further enhanced LAB operation, allowing for continued acid production and more stable curd development. According to Ghimire *et al.* (2020), longer fermentation enables sustained metabolic activity and the accumulation of lactic acid until nutrient limitation or pH inhibition occurs. LAB typically grow inside a wide pH range (3.5-10.0), yet optimum metabolic rates are achieved in mildly acidic environments (pH 5-6), depending on strain and substrate composition (Ko *et al.*, 2024; Saifur *et al.*, 2025).

Different total solids levels have an apparent effect on pH, titratable acidity, and curd formation. The lowest pH values have been consistently observed in the control plain cow's milk devoid of added solids, while the highest pH has occurred in samples with the highest solids content (10% skim milk + 8.0% cream). This has indicated that excessive solids can hinder LAB operation by increasing osmotic pressure, viscosity, and buffering capacity, all of which limit nutrient uptake and slow acid diffusion (Kuang *et al.*, 2024). High levels of solids have been shown to slow microbial growth by creating osmotic stress and limiting the operation of metabolic enzymes. Additionally, the accumulation of fermentation products can further reduce acidification in high-solids media. As lactic acid accumulates, undissociated molecules enter bacterial cells, lowering their internal pH and inhibiting key enzymes. To cope, LAB activate proton-pumping ATPases to maintain a cytoplasmic pH, but this energy-intensive process diverts resources away from growth and biosynthesis (Guan and Liu, 2020). Over time, this energy has a detrimental outcome, resulting in reduced cell concentration and metabolic slowdown.

Milk's buffering capacity increases as its protein and mineral content rise, which can delay noticeable drops in pH even while acids are being produced. As a result, high-solids milk often appears to acidify more slowly, despite ongoing organic acid formation. This relationship between concentration and acidification kinetics was similarly demonstrated by Atasoy *et al.* (2024), who noted that microbial acid-stress adaptation involves multiple regulatory systems controlling intracellular pH, membrane integrity, and enzyme conformation. In contrast, milk, with lower total solids, provides a more favorable environment for LAB, offering greater water availability, easier nutrient diffusion, and lower osmotic stress. Our results suggest that the presence of total solids promotes efficient acid production and stable curd formation. These studies on fermented dairy gels have demonstrated that nutrient concentrations can be enhanced through longer incubation times, leading to improvements in both texture and flavor (Ko *et al.*, 2024). Overall, these findings suggest that striking a balance between total solids concentration and incubation time is crucial for efficient LAB fermentation. While greater solids can have texture, they may also harbor bacterial growth and produce acid. On the other hand, overly long incubation can lead to over-acidification, negatively affecting the flavor. Optimizing both factors is therefore essential for producing stable, high-quality fermented milk products in a resource-efficient manner, and for achieving sustainable innovation in the dairy industry.

3.2 Titratable Acidity

The five LAB starters did have distinct fermentation behaviors. Over the course of incubation (24, 30, 36, 42, and 48 h) (Table 1-4), pH steadily declined as fermentation progressed, reflecting increased acid production. This was accompanied by an inverse relationship between pH and titratable acidity: as the pH dropped, the titratable acidity values increased. Although Tomovska *et al.* (2016) reported that more prolonged incubation reduces pH and increases titratable acidity across various societies, in our experiment, the effect of incubation on titratable acidity was not statistically significant, despite the observed trend aligning with expectations.

During fermentation, LAB break down lactose into organic acids, primarily lactic acid, along with other compounds such as acetic acid, which collectively increase the total acidity of the product (Fan *et al.*, 2024). Incubation time also affects the amount of lactic acid produced, the rate of carbohydrate consumption, and the extent of protein breakdown and fat metabolism in fermented dairy products (Wati *et al.*, 2018). Moreover, LAB are capable of producing inhibitory compounds comprising bacteriocins, hydrogen peroxide, diacetyl, and other antimicrobial metabolites (Ismael *et al.*, 2024). Bacteriocins, in particular, are ribosomally synthesized peptides with potent antimicrobial actions, often produced during the stationary phase of growth (Ismael *et al.*, 2024; Todorov *et al.*, 2020).

As incubation progresses, the populations of LAB grow until they reach their optimal phase. Beyond this point, after 48 h in our study cells, they may enter the stationary or death phase, characterized by net acid production. This helps explain why titratable acidity does not continue rising indefinitely. When cell lysis or decreased viability happens, the ability to convert substrates into acid diminishes. The more pronounced curd formation observed by greater reflects greater protein coagulation under more acidic conditions. During LAB fermentation, proteins are broken down by proteases, while β-galactosidase hydrolyzes lactose into glucose and galactose, which are then altered into lactic acid. According to standards, the Codex Alimentarius (2011) recommends a titratable acidity of around 0.3% for fermented milk, whereas the Indonesian SNI (2009) has a minimum of 0.5-2.0%. In our study, starters fermented in fresh milk, evaporated milk, and milk with 5% cream all met the Codex threshold, but only fermentation in fresh milk reached the stricter SNI range.

These observations are consistent with models and empirical data in recent studies. For example, in a study on LAB fermentation in plant medium, Fan *et al.* (2024) observed that titratable acidity accumulation has an inverse correlation with pH, characterized by rapid acidification in the early phases and a subsequent plateau. The study found that total titratable acidity rises rapidly during the first 40 h of fermentation, while the rate of pH decline slows afterward. Both the concentration of the starter culture and the incubation time influence pH and lactic acid production, with more extended fermentation periods typically resulting in higher total lactic acid levels (Wati *et al.*, 2018). The production and operation of bacteriocins by LAB have also been extensively discussed in open-access reviews. Ismael *et al.* (2024) provide an overview of LAB-bacteriocins' structure, classification, and application in gastrointestinal health and biopreservation. The review highlights that these compounds are mainly produced during the stationary phase of microbial growth and play important roles in competition among microorganisms. Todorov *et al.* (2020) also review bacteriocins produced by LAB as antimicrobial metabolites with potential applications in food safety and therapeutics.

3.3 Curd Formation

Statistically significant variations in pH values ($p < 0.05$) were detected throughout the incubation intervals of 24, 30, 36, 42, and 48 h among the fermented milk samples, which differed in their total solids concentrations (Tables 5-8). Starters grown in evaporated milk did have better growth than those cultured in milk supplemented by skim or cream powder. This is because the evaporation process increases the total solids content, utilizing only the milk's natural components, without adding external ingredients like skim or cream powder. During evaporation, water is removed to achieve the desired concentration, creating a standardized milk base with an optimal composition for fermentation. This concentrated milk can then be used directly to produce fermented dairy products. In commercial production, additional solids can also be added, comprising 11-13% solids-not-fat (SNF) by skim milk powder or evaporated/condensed milk to achieve the desired product quality (Rasane *et al.*, 2017).

The acidity of the medium closely associates with the development of curd; as the pH decreases beyond a critical threshold, coagulation processes are triggered, resulting in curd formation. According to Putranto *et al.* (2020), a disruption in casein stability occurs as the pH approaches 4.6, at which point denaturation processes are initiated. By continued fermentation, the solubility of milk proteins progressively diminishes. This phenomenon is associated with the outward exposure of previously internal hydrophobic domains and the inward folding of hydrophilic surface regions. Inside the context of this experiment, the most substantial curd development occurred in Treatment 1 (the control), where plain cow's milk inoculated by a single starter culture exhibited the highest degree of coagulation. This finding aligns with Krisnaningsih *et al*. (2019), who stated that the decrease in pH was slower in samples with higher dry matter and a more extended incubation period.

Curd development is intrinsically linked to the acidity of the system; when the pH declines to a sufficiently low level, the conditions favor the initiation of coagulation, thereby leading to curd formation. According to Putranto *et al*. (2020), a casein imbalance occurs when the pH drops to 4.6, at which point denaturation takes place. Additionally, as fermentation progresses, protein solubility decreases. The hydrophobic regions inside the protein molecules become exposed, while the hydrophilic regions on the outside fold inward. Within the scope of this investigation, the most uniform and pronounced manifestation of curd formation occurred in Treatment 1, the control group, where plain cow's milk was inoculated with a single-strain starter culture. This is in line with Krisnaningsih *et al*. (2019), who state that samples with higher dry matter content and prolonged incubation exhibited a more gradual decline in pH. Throughout the fermentation process, notable alterations in product characteristics become evident, including a progressive increase in viscosity and the development of curd-like aggregates. These changes arise from the metabolic operation of LAB, which convert lactose into lactic acid. As the accumulation of lactic acid intensifies, indicated by decreasing pH values and increasing titratable acidity, both of which signify enhanced sugar utilization, curd formation becomes more prominent, ultimately shaping the textural properties of the fermented beverage.

Tamime (2007) reported that bio-yoghurt can be formulated with a solids-not-fat (SNF) level of 18 g/100 g and a fat content of 4.5 g/100 g, both of which influence curd characteristics. Yogurt can be fortified by adding various types of milk powders to adjust its texture and composition. This idea is inspired by the traditional Indonesian fermented milk, dadih, which uses evaporated milk added with 8.0% cream powder. However, utilizing a single starter culture in milk with excessively high total solids is not recommended, as it can hinder bacterial activity and curd formation. High total solids can limit the growth and development of LAB. Conversely, extending the duration of fermentation provides LAB with additional time to synthesize lactic acid, thereby further lowering the pH and intensifying the acidification process that underpins the formation of yogurt (Nurhartadi *et al*., 2017).

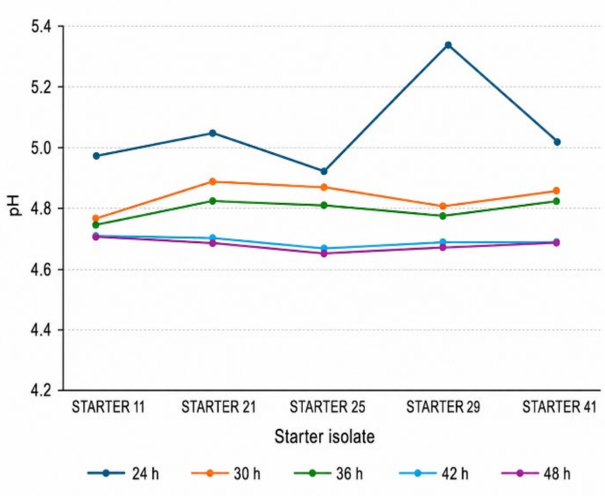

Figure 1. The pH profile of plain milk
[1]The outcomes are reported as mean values accompanied by their respective standard deviations, based on three replicates (n = 3).

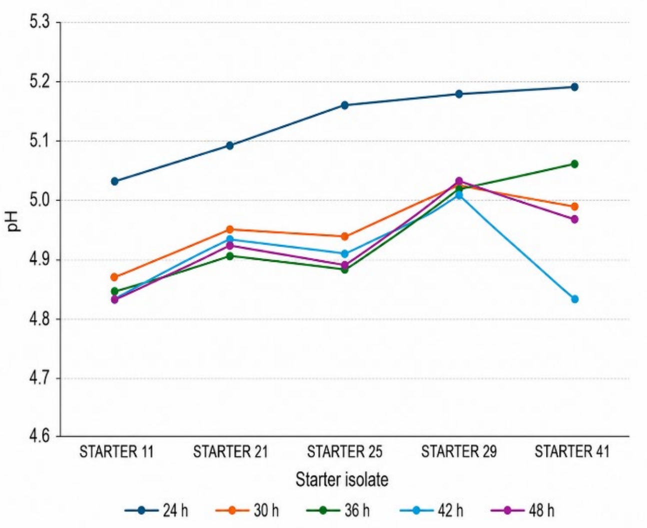

Figure 2. pH value of the evaporated milk
[1]The outcomes are reported as mean values accompanied by their respective standard deviations, based on three replicates (n = 3).

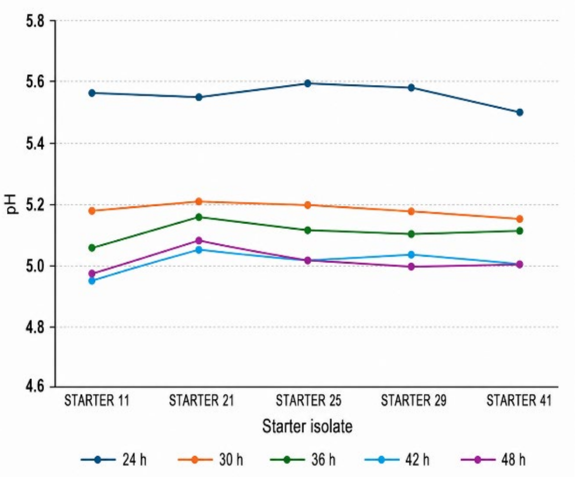

Figure 3. The pH profile of the fermented milk added with 5.0% cream
[1]The data are presented as mean values accompanied by their corresponding standard deviations, derived from three independent measurements (n = 3).

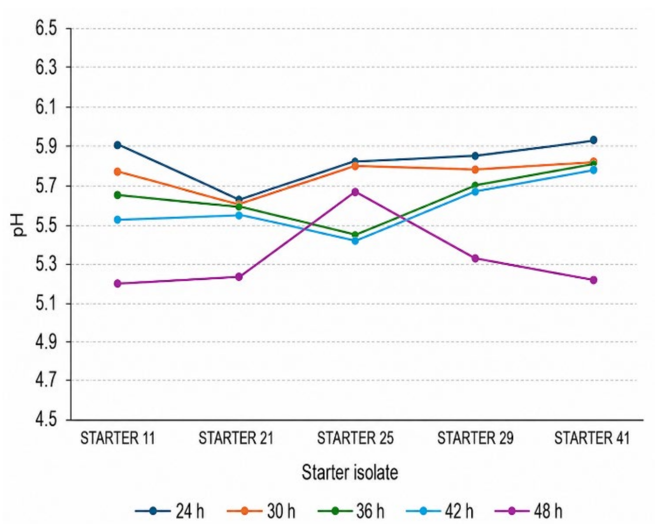

Figure 4. pH value of Milk fermented added with 10% skim and 8.0% cream
[1] All numerical outcomes are reported as the arithmetic mean together with their associated standard deviations, calculated from three experimental replicates (n = 3).

Table 1. The Titratable Acidity profile of plain milk

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	0.42 ± 0.01[1]	0.51 ± 0.00	0.51 ± 0.00	0.61 ± 0.00	0.62 ± 0.01
STARTER 21	0.40 ± 0.00	0.43 ± 0.00	0.46 ± 0.00	0.61 ± 0.00	0.61 ± 0.00
STARTER 25	0.42 ± 0.01	0.43 ± 0.00	0.47 ± 0.00	0.62 ± 0.00	0.62 ± 0.00
STARTER 29	0.24 ± 0.00	0.47 ± 0.00	0.50 ± 0.00	0.62 ± 0.00	0.61 ± 0.00
STARTER 41	0.40 ± 0.00	0.44 ± 0.00	0.46 ± 0.00	0.61 ± 0.00	0.61 ± 0.00

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 2. The Titratable Acidity profile of the evaporated milk

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	0.40 ± 0.00	0.44 ± 0.01	0.45 ± 0.01	0.45 ± 0.00	0.45 ± 0.00
STARTER 21	0.36 ± 0.00	0.41 ± 0.00	0.43 ± 0.00	0.42 ± 0.00	0.43 ± 0.00
STARTER 25	0.33 ± 0.00	0.42 ± 0.00	0.44 ± 0.00	0.43 ± 0.00	0.43 ± 0.00
STARTER 29	0.32 ± 0.01	0.40 ± 0.00	0.40 ± 0.00	0.41 ± 0.00	0.40 ± 0.00
STARTER 41	0.31 ± 0.00	0.37 ± 0.01	0.39 ± 0.00	0.44 ± 0.01	0.42 ± 0.01

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 3. The Titratable Acidity profile of the fermented milk added with 5.0% cream

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	0.12 ± 0.00	0.32 ± 0.00	0.39 ± 0.00	0.41 ± 0.00	0.42 ± 0.00
STARTER 21	0.12 ± 0.00	0.30 ± 0.00	0.33 ± 0.00	0.40 ± 0.00	0.36 ± 0.00
STARTER 25	0.11 ± 0.00	0.31 ± 0.00	0.32 ± 0.00	0.41 ± 0.01	0.40 ± 0.00
STARTER 29	0.11 ± 0.00	0.32 ± 0.01	0.32 ± 0.01	0.40 ± 0.00	0.40 ± 0.00
STARTER 41	0.11 ± 0.00	0.32 ± 0.00	0.33 ± 0.00	0.40 ± 0.00	0.40 ± 0.00

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 4. The Titratable Acidity profile of fermented milk added with 10% skim and 8.0% cream

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	0.08 ± 0.00	0.09 ± 0.00	0.10 ± 0.00	0.11 ± 0.00	0.25 ± 0.00
STARTER 21	0.11 ± 0.00	0.11 ± 0.00	0.11 ± 0.00	0.12 ± 0.00	0.27 ± 0.00
STARTER 25	0.08 ± 0.00	0.08 ± 0.01	0.18 ± 0.00	0.19 ± 0.00	0.12 ± 0.00
STARTER 29	0.07 ± 0.00	0.08 ± 0.00	0.18 ± 0.00	0.18 ± 0.00	0.22 ± 0.00
STARTER 41	0.06 ± 0.00	0.07 ± 0.00	0.07 ± 0.00	0.08 ± 0.00	0.27 ± 0.00

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 5. Curd Formation of the plain milk

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	+	+++	+++	++++	++++
STARTER 21	+	++	++	++++	++++
STARTER 25	++	++	++	+++++	+++++
STARTER 29	-	++	+++	+++++	+++++
STARTER 41	+	++	++	+++++	++++

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 6. Curd formation of the evaporated milk

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	+	++	++	++	++
STARTER 21	+	++	++	++	++
STARTER 25	-	++	++	++	++
STARTER 29	-	+	+	+	+
STARTER 41	-	+	+	++	+

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 7. Curd formation of the fermented milk added with 5.0% cream

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	-	-	+	++	++
STARTER 21	-	-	-	+	+
STARTER 25	-	-	-	+	+
STARTER 29	-	-	-	+	+
STARTER 41	-	-	-	+	+

[1] Data are conveyed as means values ± standard deviation (n = 3).

Table 8. Curd formation of milk fermented added with 10% skim and 8.0% cream

Starters	incubation time (h)				
	24	30	36	42	48
STARTER 11	-	-	-	-	-
STARTER 21	-	-	-	-	-
STARTER 25	-	-	-	-	-
STARTER 29	-	-	-	-	-
STARTER 41	-	-	-	-	-

[1] Data are conveyed as means values ± standard deviation (n = 3).

4. CONCLUSION

The study found that both the total solids content and the incubation time had a substantial effect on the fermentation performance of LAB derived from dadih. Plain cow's milk, devoid of added solids, had a longer fermentation time of 48 h, produced the best acidification, and the most stable curd. These outcomes provide insight into how indigenous LAB adapt to controlled milk fermentation and highlight the need for further research into their molecular traits and pilot-scale production, paving the way for their potential commercial application.

5. ACKNOWLEDGEMENTS

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