

**Isolation and identification of *Lactobacillus* spp. and  
*Streptococcus thermophilus* towards developing  
probiotic Dahi**



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**A thesis submitted in partial fulfillment of the requirements for the degree of  
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**Department of Dairy and Poultry Science  
Faculty of Veterinary Medicine  
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**DECEMBER 2019**



**Dedicated**  
**To My**  
**Beloved Family**



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**Umme Salma Amin**

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**This is to certify that we have examined the above Master's thesis and have found  
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**The Author**

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## List of Abbreviations and symbols

Abbreviations	Elaborations
<	Less than
>	Greater than
%	Percentage
µg	Microgram
µl	Microliter
µmol	Micromole
A.	<i>Akkermansia</i>
ACE	Angiotensin converting enzyme
Amp	Ampere
ANOVA	Analysis of variance
B.	<i>Bifidobacterium</i>
BHI	Brain heart infusion
bp	Base pair
°C	Degree centigrade
Ca	Calcium
cDNA	Complementary DNA
cfu	Colony forming unit
CVASU	Chattogram Veterinary and Animal Sciences University
DDPS	Department of Dairy and Poultry Science
DM	Dry matter
DNA	Deoxyribonucleic acid
dNTP	Deoxyribonucleotide triphosphate
e.g	Example
EPS	Exopolysaccharides
et al.	And his associates
etc.	Et cetera
GDP	Gross domestic product
GIT	Gastrointestinal tract
gm	Gram

<b>Abbreviations</b>	<b>Elaborations</b>
h	Hour
HDL	High-density lipoproteins
i.e.	That is
IgE	Immunoglobulin E
IU	International unit
Kb	Kilobase pair
Kg	Kilogram
L	Litre
L.	<i>Lactococcus</i>
LAB	Lactic acid bacteria
Lb.	<i>Lactobacillus</i>
LDL	Low-density lipoproteins
Ln.	<i>Leuconostoc</i>
mg	Milligram
Mg	Magnesium
min	Minute
ml	Milliliter
MRS	De Mann Rogosa Sharpe
MS	Master of Science
P.	<i>Propionibacterium</i>
PBS	Phosphate buffer saline
PCR	Polymerase chain reaction
PRTC	Poultry Research and Training Centre
rpm	Rotation per minute
S.	<i>Streptococcus</i>
SEM	Standard errors of mean
Spp.	Species
Subsp.	Subspecies
TG	Triglyceride
UV	Ultraviolet
VRB	Violet Red Bile

## Abstract

Dahi claims as popular fermented dairy food product available in the consumer world. An attempt was made herein this study to develop Dahi with the specific lactic acid bacteria (LAB) isolated from locally available Dahi. For this view, local Dahi samples were collected and specific bacteria (*Lactobacillus* spp. and *Streptococcus thermophilus*) were isolated and identified by the lab analytical process. The analyses included morphological characteristics, microscopic observation and catalase reaction etc., to select the isolated bacteria, which were confirmed by Polymerase Chain Reaction-Gel Electrophoresis method. Five Dahi samples (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>) were prepared using the PCR identified culture. Dahi samples (T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>) were prepared using *Lactobacillus* spp., whereas T<sub>4</sub> sample from *Streptococcus thermophilus* and T<sub>5</sub> sample was prepared by a combination of *Lactobacillus* spp. (T<sub>3</sub>) and *Streptococcus thermophilus* (T<sub>4</sub>) bacteria together. Physicochemical, microbiological and sensory properties were measured out to assess the quality of the developed Dahi. The shelf life of the product was assessed by determining pH and titrable acidity of the samples measured on day 1 and 7, respectively. Numerically variable pH and acidity were observed in the different samples of Dahi. There was an increase in acidity with the progress of the storage time, but the values were in acceptable range on day 7. Data on proximate analysis revealed that the ash and protein percentage of T<sub>3</sub> sample were significantly (P<0.05) better than those of other samples. The viable count of Dahi cultures was well above the minimum recommended amount (10<sup>6</sup> CFU/ml) in all the Dahi samples. The sensory properties namely taste, aroma and overall acceptability of Dahi prepared from *Streptococcus thermophilus* (T<sub>4</sub>) and *Lactobacillus* spp. (T<sub>3</sub>) were significantly (P<0.05) improved compared to other samples. The results suggest that the starter culture identified and utilized in this study to develop Dahi have a potential to contribute to Dahi production technology. It can be concluded that the developed Dahi in this study might be a potential dairy food item to draw the attention of the consumer demand, acceptability and consumer world for introducing a novel dairy market outlet across the globe.

**Key words:** Lactic acid bacteria, PCR, Probiotic, shelf life, acidity, pH, sensory characters, Dahi.