



## **MEHSANA BUFFALO MILK AS PREBIOTICS FOR GROWTH OF LACTOBACILLUS**

**Abhinandan Patil<sup>1,2\*</sup>, Srinath Balkundhi<sup>1</sup>, Harshada Joshi<sup>1</sup>, Gaurav Ghewade<sup>2</sup>,  
Kumar Gurakesh<sup>2</sup>**

*1. School of Pharmaceutical Sciences, Sanjay Ghodawat University, Kolhapur, India.*

*2. Pollen Healthcure Pvt. Ltd. Pune, India.*

### **ABSTRACT**

Milk is the basic source of food in the country like India and many Asian countries. There are two types of milks – A1 and A2 Milk. Nearly 50 samples of Mehsana buffalo milk samples were collected in local areas of Maharashtra. The parameters screened were protein, fat, lactose, total solid content and percentage of casein in the raw milk of Mehsana reported as  $5.4 \pm 0.62$ ;  $6.1 \pm 0.66$ ;  $6.2 \pm 0.65$ ;  $18.8 \pm 1.54$ ;  $11.4 \pm 1.02$  respectively. Similarly, the parameters screened for pasteurized milk sample were protein, fat, lactose, total solid content and percentage of casein as  $5.2 \pm 0.21$ ;  $6.2 \pm 0.22$ ;  $6.1 \pm 0.71$ ;  $18.1 \pm 0.54$ ;  $10.4 \pm 2.02$  respectively.

**Keywords:** - Probiotics, prebiotics, milk, Lactobacillus

### Short communication

Milk is the basic source of food in the country like India and many Asian countries. There are two types of milks – A1 and A2 Milk. A1 Milk is most commonly used milk. It is obtained from cow or some hybrid milking animals. A1 type of milk raises the issues of digestion. Stomach pain and respiratory problems can occur due to consumption of A1 milk. In type 1 diabetes, the production of insulin is in fewer amounts because of intake of A1 milk thus type 1 diabetes is triggered at the end<sup>1-3</sup>. Milk also negatively effects on the blood vessel's function and blood pressure rate by controlling the cholesterol content. A1 milk is not good for infants' health. It also contains more amount of fat which is not healthy for human beings<sup>4-7</sup>.

Similarly, there is another type of milk that is called A2 milk. This milk is obtained from desi cows in countryside. A2 milk is a great source of vitamin A, Vitamin D, Vitamin B12, Calcium and Potassium. As compared to A1 milk the A2 milk is more beneficial for health concerns. Due to Consumption of A2 milks bones and teeth get stronger. It maintains tissue growth and cell growth in human body. It maintains good nourishment and the well-being in the human body<sup>8-11</sup>.

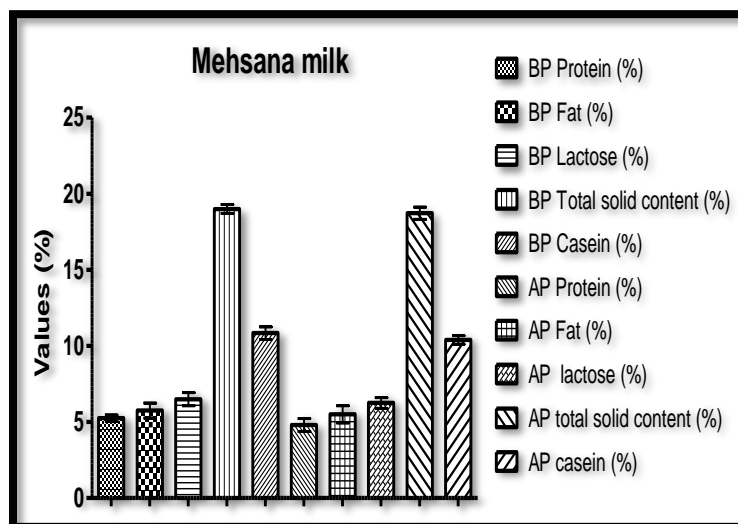
Camel's milk also contain A2 caseins. It is used as nutrition support for the human who are living in desert area. Buffalo milk is used in the dairy products like Mozzarella cheese.

It is most common animal milk used in dairy products. It contains more amounts of fats proteins and minerals. The Cow's milk also known as A2 milk. As we know in the cow's milk is having higher amount of casein which help into whitening of the color of milk. The cows' milks are thick than the other animal's milk.

Nearly 50 samples of Mehsana buffalo milk samples were collected in local areas of Maharashtra. To conduct the experiment approximately 40 ml quantity of milk was used. Before the study to initiate the milk was processed with ultra-high-temperature (UHT) pasteurized in cyclic process of 8 s for a period of 1 hour<sup>12-18</sup>. To analyse the nutrient content FOSS milk scan<sup>TM</sup>120 (calibrated with buffalo standards, Swabhimani dairy, India) milk analyzer was used. The parameters which were screened included the total solid content (%), protein (%), casein (%), density (%), freezing point (%), fat (%) and lactose (%) in the milk sample in both raw and pasteurised conditions<sup>17-18</sup>.

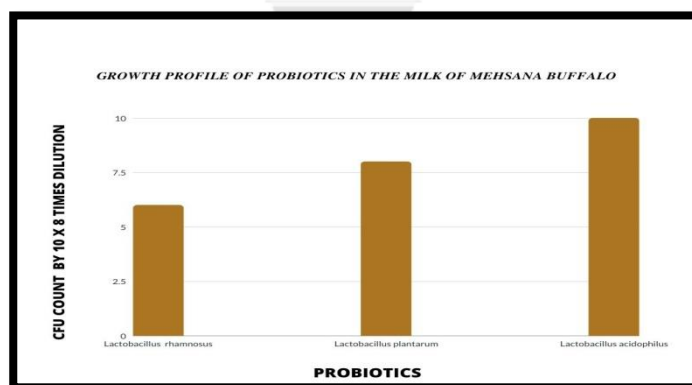
The parameters screened were protein, fat, lactose, total solid content and percentage of casein in the raw milk of Mehsana reported as  $5.4 \pm 0.62$ ;  $6.1 \pm 0.66$ ;  $6.2 \pm 0.65$ ;  $18.8 \pm 1.54$ ;

11.4 ± 1.02 respectively. Similarly, the parameters screened for pasteurized milk sample were protein, fat, lactose, total solid content and percentage of casein as 5.2 ± 0.21; 6.2 ± 0.22; 6.1 ± 0.71; 18.1 ± 0.54; 10.4 ± 2.02 respectively. No any significant ( $p < 0.05$ ) changes are observed in the nutrient contents of raw and pasteurized milk of all breeds as observed in fig 1.



**Fig 1. The physiochemical composition of Mehsana milk**

± indicate standard error of means; n=3



**Fig 2. Screening of growth parameters of probiotics in Mehsana milk in form of CFU count**

± indicate standard error of means; n=3

To determine the prebiotic nature the probiotics like *Lactobacillus plantarum*, *Lactobacillus acidophilus* and *Lactobacillus rhamnosus* were inoculated in milk of Mehsana buffalo. The CFU count observed at 37°C after 24 hours was determined. It was observed that CFU count of *Lactobacillus acidophilus* was higher in 10 x 10<sup>8</sup> CFU/ ml as compared to *Lactobacillus rhamnosus* showing less growth of around 6 x 10<sup>8</sup> CFU/ ml ( $p < 0.05$ , n=3) as per figure. 2.

## REFERENCES

1. Abhinandan, Pawar S. "Health benefits of Probiotics by Antioxidant Activity: A review" *Pharma Times* 50. 9 (2018):1-3.
2. Abhinandan Patil., et al. "Granules of unistain *Lactobacillus* as nutraceutical antioxidant agent" 9. 4(2017): 1594-1599.
3. DisouzaJ, Patil A. "Antioxidant study and phenolic content of *Caralluma fimbriata* herb". *World Journal of Pharmaceutical Research* 3.7 (2014): 565-575.
4. Hamada S., et al. "Evaluation of the rodent micronucleus as-saybya28-daytreatmentprotocol:Summaryofthe13thCollaborative Study by the Collaborative Study Group for the Micronucleus Test (CSGMT)/Environmental Mutagen Society ofJapan (JEMS)-Mammalian Mutagenicity Study Group (MMS)". *Environmental and Molecular Mutagenesis* 37.2 (2001): 93-110.
5. Patil A, Disouza J."Genomic-Based Restriction Enzyme Selection for Specific Detection of *Lactobacillus rhamnosus* and *Lactobacillus plantarum* strain by 16SrDNAPCR-RFLP". *Inter-national Journal of Innovative Science, Engineering and Technology*1.1 (2020): 91-99.
6. Patil A., et al. "Shelf-life stability of encapsulated lactic acid bacteria isolated from Sheep milk thrived in different milk as natural media". *Small Ruminant Research* 170 (2019): 19-25.
7. Patil A., et al. "Evaluation of *Lactobacillus plantarum* growth in milk of Indian buffalo breeds based on its physico-chemical content". *Buffalo Bulletin* 38. 2 (2019): 345-352.
8. Patil A., et al. "Probiotic potential of *Lactobacillus plantarum* with the cell adhesion properties". *Journal of Global Pharma Technology* 10.12 (2018): 1-6.
9. Patil A., et al. "Complete Genome Sequence of *Lactobacillus plantarum* Strain JDARSH, Isolated from Sheep Milk". *Microbiology Resource Announcements* 9.2 (2020).
10. Patil A., et al. "Banana fibers camouflaginga sagutwormina 6-month-old infant". *Iberoamerican Journal of Medicine* 3(2020): 245-247.
11. Patil AR. "*Lactobacillus rhamnosus* ARJD as a Functional Food with Potential Antioxidant and Antibacterial Abilities". *Acta Scientific Pharmaceutical Sciences* 3(2019): 63-70.
12. Patil AR. "Use of Probiotics as a Functional Food against Cancer". *Acta Scientific Pharmaceutical Sciences* 3.8 (2019): 103-105.
13. Patil AR. "The role of the food and fertilizers in antimicrobial resistance in human and its preventive measures". *International Journal of Innovative Science, Engineering and Technology*1.1 (2020): 31-37.
14. Patil AR. "The origin of novel coronavirus: COVID-19" *International Journal of Innovative Science, Engineering and Technology* 1.1 (2020): 18-23.
15. Patil AR., et al. "Nanotechnology based upgradation in tuberculosis diagnosis and treatment" (2020):395-414.
16. Patil AR and Disouza J. "Isolation and characterization of *Lactobacillus* species from sheep milk". *International Journal of Innovative Science Engineering and Technology* 1. 1(2020): 9-17.
17. Patil AR, Patil P. "The Insight of Body's Immune System, Inflammation and Damages in Wound Healing- The review". *International Journal for Research in Applied Science and Engineering Technology* 9.8 (2021): 2777-2780.
18. Patil AR., et al. "*Lactobacillus* Model Moiety a New Era Dosage Formas Nutraceuticals and Therapeutic Mediator". *In Biotechnology and Bioforensics Springer, Singapore* (2015):11-21.