

A/OP/08

Effects of Dietary Supplementation with Effective Microorganisms on Milk Production and Composition in Lactating Dairy Cows

Shaill Rathnayake RMH¹, Nayananjali AWD¹, Adikari AMJB¹, Mangalika ULP²

¹Department of Animal and Food Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka

²Department of Animal Production and Health, Getambe, Peradeniya, Sri Lanka

Background: Effective microorganisms (EM) are beneficial microbes that improve livestock performance by enhancing digestive efficiency through various mechanisms.

Objective: To evaluate the effect of dietary supplementation of effective microorganisms on milk production and composition in lactating dairy cows.

Methods: Thirty Jersey-crossbred lactating dairy cows were randomly assigned into two treatment groups using a randomised complete block design. The groups received either total mixed ration (TMR) (control/C-TMR) or EM-supplemented TMR (EM-TMR) with EM added at 10 mL kg⁻¹ of TMR. Animals were fed twice daily for 12 weeks, with water provided *ad libitum*. Milk production data and samples were collected starting from the eighth week. Weekly milk composition was analyzed using the Ultrasonic Lactoscan® milk analyser. Statistical analysis was performed using a mixed-effect model in SAS software.

Results: Although dietary EM supplementation did not result in a statistically significant increase in milk yield ($P > 0.05$), cows fed EM-TMR produced numerically higher daily milk yield (8.28 ± 0.81 L) compared to the control group (7.24 ± 0.81 L). While the difference appears modest, the resulting increase of approximately 1 litre per cow per day can have a meaningful economic impact when scaled to total herd production. EM-TMR treated group showed significantly higher ($P < 0.05$) milk fat ($4.36 \pm 1.11\%$) and milk protein ($3.27 \pm 0.02\%$) compared to the control group. Lactose and solid non-fat percentages were not significantly different ($P > 0.05$) between groups. A significantly higher ($P < 0.05$) milk price per litre (163.21 ± 1.22 LKR) was recorded in the EM-TMR fed group compared to the control (159.56 ± 1.22 LKR). This price difference of 3.65 LKR L⁻¹ reflects improvements in milk composition, particularly in quality-determining components such as fat and solids.

Conclusion: While EM supplementation does not increase milk yield, it improves milk composition, particularly milk fat and protein. Improved milk composition results in a higher milk price per litre, demonstrating economic benefit.

Keywords: Animal Nutrition, Dietary Manipulation, Probiotics, Rumen Modification.