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Evaluation of Neogen® PetrifilmTM Lactic Acid Bacteria performance compared to cultural methods on Brazilian Fermented Lactic Acid Products

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Lactic Acid Products can be defined as the dairy product obtained from milk, that can be added of allowed non-dairy products, with at least 51% of dairy base at final product ingredients and that contains live lactic acid bacteria, at least at 6 $\log_{10}$ CFU/g. In Brazil, dairy products are the second largest food business market, and it is formed by a young population that demands healthier nutritional products. The enumeration of lactic acid bacteria (LAB) in fermented dairy products is crucial to ensure the quality of these products. The analysis performed with cultural method takes 3 days and requires the use of supplemented media. Given the short shelf life of lactic acid drinks, a ready-to-use method could provide faster and reliable results. Furthermore, conventional methods have certain limitations, like ISO 15214:1998 standard, which aims to enumerate all mesophilic LAB in food and animal feed, serving as a horizontal method for various products in the food chain. However, it cautions that not all LAB will form colonies on the specified culture medium. This method uses a single culture medium (acidified MRS) and an anaerobic incubation condition that supports the growth of many LAB, although some may not grow or may form only pinpoint colonies. Additionally, the presence of competitive microflora can affect the results. Neogen® Petrifilm™ LAB is a sample-ready-culture-medium, contains oxygen scavenging compounds which create an anaerobic environment for the recovery of homofermentative and heterofermentative lactic acid bacteria, with international validation for the enumeration of lactic acid bacteria in fermented dairy products currently available on the market. The purpose of this study was to evaluate the performance of a ready to use lyophilized plate (AOAC PTM 041701) compared to agar Man, Rogosa & Sharp (MRS) according to ISO 15214:1998 at 30°C and 37°C in fermented dairy products. Five different brands of pasteurized fermented acid lactic products (fermented acid lactic drink, curd, yogurt, kefir, fermented milk) were acquired in the market and evaluated (n=20). Samples were paired analyzed in the rapid plate and in cultural method (30°C and 37°C, both methods, anaerobic jar applied to cultural method). Results were compared by t-paired testing and Bias. At both incubation temperatures, the alternative and cultural methods are correlated (30°C, Pvalue=0.884, Bias=0.03; 37°C, Pvalue=0.654, Bias=-0.02) at 95% of significance, however, for one of the fermented lactic acid products (lactic acid drink), natural population recovery was 3$\log_{10}$ CFU/g higher at 37°C than at 30°C in both methods. For the fermented products tested in this study, the Neogen® Petrifilm BAL allowed reliable and rapid enumeration of lactic acid bacteria compared to ISO 15214:1998.

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