

**TITLE:** INFLUENCE OF COOLING TEMPERATURE ON VIABILITY AND POST-ACIDIFICATION OF YOGHURT CULTURES AND *Lactobacillus paracasei* Lpc-37 IN FERMENTED SOY POWDER.

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**ABSTRACT:**

Soy is considered a functional food and its extract is a product with potential for the development of new beverages. Fermentation is one of the most employed techniques used in the preparation of soy products. In this context, the present work deals with the fermentation of soybean powder by yoghurt and probiotic bacteria to evaluate their kinetics of growth, viability and post-acidification. The soybean powder was used as the matrix to be fermented by *Lactobacillus paracasei* Lpc-37 (Lp) and a combination of microorganisms such as *Streptococcus thermophilus* TA040, *Lactobacillus bulgaricus* Lb340 and *Lactobacillus paracasei* Lpc-37 (St, Lb, Lp). The fermentation processes were carried out at 37°C and were monitored by the Cinac system until it reaches pH 4.5. The cooling stage was performed in two different ways: (a) direct way, in which the fermentation was stopped and the flasks were placed into ice bath and (b) two-phase cooling way, in which after the fermentation the flasks were first conditioned into water bath at 25°C for 8 hours and then transferred to the ice bath. Microbiological (counting of viable bacteria) and post-acidification analyses were determined on days 1, 14 and 28 of refrigerated storage. Ternary cultures (St, Lb, Lp) had lower fermentation time than monoculture (Lp) (9 and 15 hours, respectively), a significant difference of 6 hours. At the beginning of the fermentation, the counting of viable bacteria in mono and ternary cultures was around 10<sup>6</sup> CFU/mL however, regarding the cooling stage of the monoculture (Lp) at the first day (d1), there was a difference from 1 log between the direct and two-phase cooling (10<sup>8</sup> and 10<sup>9</sup> CFU/mL, respectively). During the others days, the counts remained stable. The post-acidification profile of monoculture (Lp) showed the highest decrease, to a fall of 0.9 units compared to a fall of 0.5 units for the ternary cultures (St, Lb, Lp). Although the two-phase cooling had increased the final time of the production, it enhanced the viability of the bacteria and the combination of St and Lb decreased significantly the fermentation time due to the synergism promoted by the presence of both microorganisms. These data allows us to conclude that even at 25°C the probiotic bacteria was able to continue the fermentation.

**Keywords:** probiotics, fermentation, soybean powder, cooling

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