

SURVIVAL OF FREEZE-DRIED PROBIOTICS IN SOY PROTEIN POWDER

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ABSTRACT

A series of well diffusion assays determined that *Bifidobacterium longum* B6 (B6) and *Lactobacillus paracasei* ATCC 25598 (LP) best inhibited pathogenic bacteria. These bacteria were freeze-dried in the presence of sucrose, trehalose and soymilk to determine the best conditions for survival. Cultures were anaerobically grown overnight and centrifuged. Cell pellets were resuspended in 10 mL of 4% sucrose + 18% soymilk (SS), 4% trehalose + 18% soymilk (TS) or 4% sucrose + 4% trehalose + 18% soymilk (STS). Suspensions were freeze dried and stored at room temperature in the dark. Statistical analysis found that at 24 days, treatments SS and STS were shown to be significantly better than TS ($P \leq 0.05$).

Bacteria were then freeze-dried with 4% sucrose + 4% trehalose + 18% soymilk (STS). Freeze dried bacteria were added to isolated soy protein powder. Samples were vacuum packaged and stored in the dark at room temperature or 4°C. The product was prepared for sampling on days 0, 15, 30, 45, 60, 75, and 90.

Statistical analysis of percent reduction of bacterial counts ($P \leq 0.05$) showed significant differences for bacteria, bacteria and treatment, and time. Actual counts and log reduction suggest that bacteria freeze-dried with the cryoprotectant solution STS and stored at 4°C best support bacterial growth in soy protein isolate powder.