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Okara as a novel prebiotic ingredient in the manufacture of a probiotic yogurt

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Okara is a by-product of tofu and soymilk manufactures. High in protein, vitamin B group and antioxidants, okara is very nutritious. Preliminary studies demonstrated okara to be a promising prebiotic, compounds that can benefit the host by selectively stimulating the growth of probiotics, which are health-beneficial bacteria. Despite its nutritional benefits, okara use in industry is very limited and mainly restricted to Asian countries due to a significant difficulty in processing because of its high fiber content. This project was conducted in order to determine if okara could be used as an ingredient in an acceptable fermented product that would promote the growth of probiotics. In order to successfully incorporate the insoluble okara into food products, homogenization is necessary to make it more soluble and dispersible in the food matrix. Three different homogenization methods were utilized: (1) milling using a lab-grade grinder, (2) blending using a lab-grade blender and (3) processing using a home-style KitchenAid® food processor. The growth of the probiotic bacterium, *Bifidobacterium longum* B6, was initially determined in MRS broth supplemented with 0.3% okara homogenized by the above techniques. Based on the results of that experiment, it was determined that processing was not suitable for homogenizing the okara enough to make it available to the probiotic. Therefore, subsequently the growth of *B. longum* B6 was analyzed in blended and milled okara in concentrations of 1%, 3%, 5% and 10%. After finding that the optimum okara concentration for the growth of *B. longum* B6 was 3%, the growth of other probiotics, including *acidophilus* ADH, *L. acidophilus* A, *L. acidophilus* E, *L. acidophilus* NCFM, *L. acidophilus* FARR, and *L. acidophilus* N1 were analyzed in MRS broth containing 3% milled or blended okara. Based on the data from that experiment, strawberry yogurt supplemented with 3% milled or blended okara was manufactured under optimal conditions and followed by a sensory test. The yogurt, containing 3% blended okara fermented by the two yogurt commercial starter cultures, *bulgaricus* and *S. thermophilus*, and the probiotic strain, *L. acidophilus* NCFM had the best texture and flavor. Further studies need to be carried out to determine the feasibility of using other probiotic cultures and more comprehensive chemical and sensory analyses to improve the taste and acceptability of probiotic yogurt supplemented with okara.