

DEVELOPMENT OF SOY WHEY-BASED BEVERAGES

M.M.R.N. Mudunna¹, S.P.A.S. Senadheera², H.T.W. Weerakoon²,
C.A.K. Dissanayake¹ and D.W.M.M.M. Kumari³

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

²Department of Biochemistry, Faculty of Medicine and Allied Sciences,
Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

³Department of Biosystems Technology, Faculty of Technology, University
of Sri Jayewardenepura, Homagama, Sri Lanka.

Soy whey, a nutritious by-product is discarded during the manufacturing of tofu. Thus, the study aimed to develop beverages using soy whey. Non-fermented beverages (NFB) from concentrated and non-concentrated soy whey (NCSW) with four flavours were tested. Three beverages fermented (FB) with microbial cultures (*Lactobacillus plantarum*, *Bifidobacterium bifidum*, and a combination of both at a 1:1 ratio) with two flavours were tested. The best NFB and FB were selected through sensory evaluations. They were analysed for proximate composition, total alcoholic content, pH, total soluble solids (TSS), colour (L*, a* and b* values), titratable acidity (TA), and yeast and mold counts (YMC) at weekly intervals for 21 days. The strawberry flavoured NFB and FB from NCSW were the best beverages with a high significant ($p < 0.05$) preference in sensory properties. All the FBs developed with different culture combinations were accepted at the sensory evaluation with 30 panellists. Therefore, *L. plantarum* was selected considering its health benefits. The protein, fat, fibre, ash, and carbohydrate content of NFB were $0.048 \pm 0.007\%$, $0.018 \pm 0.0004\%$, $0.035 \pm 0.012\%$, $0.34 \pm 0.009\%$, and $8.2 \pm 1.182\%$, respectively while in FB were $0.68 \pm 0.006\%$, $0.16 \pm 0.044\%$, $0.026 \pm 0.004\%$, $0.1 \pm 0.0004\%$, and $9.75 \pm 0.939\%$, respectively. The total alcoholic content of the FB was 2%. During storage, no significant difference ($p > 0.05$) was observed in pH (ranged in NFB: from 4.67 ± 0.03 to 4.73 ± 0.03 ; FB: from 4.93 ± 0.03 to 4.8 ± 0.03) and in TSS (NFB: from 11.06 ± 0.06 to 11.1 ± 0.05 ; FB: from 9.9 ± 0.3 to 10.67 ± 0.18) while a significant difference was observed ($p < 0.05$) in TA of NFB from 0.02 ± 0.007 to 0.65 ± 0.05 , no significant difference ($p > 0.05$) in TA of FB from 0.75 ± 0.003 to 0.79 ± 0.03 . L*, a* and b* values of NFB and FB had no significant change throughout the storage period ($p > 0.05$). The YMC ($8.7 \log \text{CFU mL}^{-1}$) were within the safe levels in both beverages during storage. In conclusion, fermented and non-fermented beverages with acceptable organoleptic properties with 21 days of storage life can successfully develop from soy whey.

Keywords: By-product, Fermented beverage, Non-fermented beverage, Organoleptic properties