RETROGRADATION IN RICE INCORPORATED SYNBIOTIC YOGHURTS: INVESTIGATING NOVEL APPROACHES TO OVERCOME THE PROBLEM

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Retrogradation process of rice starch causes to develop hard texture of rice incorporated yoghurt under refrigerated conditions. Therefore, present study was conducted to investigate ways to overcome the retrogradation process of rice incorporated synbiotic yoghurt. Yoghurts were prepared using *Bifidobacterium lactis* (BB-12) as probiotic bacterium. Rice was incorporated into yoghurts just after completing the incubation period. Addition of carboxymethyl cellulose (CMC), carrageenan, soya lecithin and incorporation of low amylose rice varieties into yoghurt were evaluated as retrogradation reduction methods. Based on the results of the preliminary trials, incorporation of low amylose rice varieties was selected as the best method. Three local rice varieties namely, AT-309, AT-405 and MA-2 were selected based on their low amylose content, whereas Thailand jasmine (KDML 105) rice variety was used as the control. Treatments were arranged in completely randomized design with three replicates. Two sensory evaluations were conducted on 7th and 14th days of storage at 4 °C. Physicochemical properties of all treatments and microbial properties of the highest sensory scored sample and control were measured on 21 days at 4 °C and compared with plain yoghurt. AT-309 rice incorporated yoghurt scored the highest ($p<0.05$) for flavour and overall acceptance among treatments, after 14 days of storage at 4 °C. After 4th day of storage, all the rice incorporated yoghurt samples showed significantly higher ($p<0.05$) water holding capacity, compared to that of plain yoghurt. Maximum shear force values of AT-309 rice incorporated yoghurts were significantly ($p<0.05$) lower than that of other local rice incorporated yoghurt samples. *Bifidobacterium lactis* counts of both AT-309 rice incorporated and KDML 105 rice incorporated yoghurts were higher than that of plain yoghurts throughout the storage period, probably due to prebiotic effect of rice. According to the results, AT-309 rice variety could be effectively used for the production of rice incorporated yoghurt without quality deterioration during storage (21 day at 4 °C).

Keywords: Retrogradation, Rice, Yoghurt