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the Compassionate, the Merciful

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Study on interaction of commercial starter culture and *Lactobacillus casei* in Iranian white cheese produced using ultrafiltration technique

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Objectives: The interaction of starter culture and probiotic strains *Lactobacillus casei* (ATCC 39392 Collection, Australia) in Iranian white cheese produced by ultrafiltration technique was investigated.

Materials & Methods: Three batches of Iranian white cheese were produced using UF technique in triplicates as follow: C (control containing only commercial starter), P (containing only *Lactobacillus casei*) and CP (containing *Lactobacillus casei* and commercial starter). The cheese samples were ripened at 8-12 °C for 60 days and the viability of cultures, moisture, salt, protein, fat in dry matter and pH were determined in fortnight basis. Cheese samples were analyzed for sensory evaluation at the end of 60 days of ripening.

Results & Conclusion: The analysis of the results showed that the numbers of probiotics were decreased during ripening. This decrease in P samples was higher than that CP samples ($P < 0.01$). The final numbers of *L. casei*, in all of the cheese samples were greater than the minimum number of the recommended therapeutic products (106-107 cfu /g). The amount of salt and FDM contents did not show significant differences among cheeses but moisture and protein contents showed significant differences among samples. The maximum range of moisture and protein content were found in C and P groups respectively. At day 1, the pH did not show significant differences among cheeses, but the reduction of pH in C sample was found as the lowest one. The sensory evaluation showed that there was no significant difference among the experimental samples in terms of texture and flavor ($P < 0.05$). P acquired the high score of texture and flavor which was not significant. Therefore probiotic *L. casei* can be used successfully in Iranian white cheese produced via ultrafiltration technique without adversely affecting the cheese quality during ripening. Also *L. casei* can be use as starter culture in the Iranian white cheese.

Keywords: Probiotic, Iranian white cheese produced by ultrafiltration technique, Survival, *Lactobacillus casei* (ATCC 39392).

Microbial evaluation of washing and packing steps of fresh-cut and minimally processed vegetables in a vegetable processing plant

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Objectives: The number of vegetable processing plants has increased during recent years in Iran and many other countries. Fresh vegetable products are susceptible to microbial contamination after harvesting, processing, distributing, packing and handling. The aim of this study was to determine and evaluate the level of microbial contamination during cleaning in a fresh-cut vegetable processing plant and to identify the critical points in the processes and operation areas.

Materials & Methods: The samples were taken from the plant before processing and after washing and disinfecting, cutter, drying and packing in ice pack. The samples, according to the standard method, were analyzed for mesophilic aerobic bacteria, yeast and moulds, lactic acid bacteria, total coliforms, Enterobacteriaceae, *E. coli*, and *Staphylococcus aureus* and for the presence of Salmonella. The amounts of total aerobic bacteria, Enterobacteriaceae, *E. coli*, yeast and moulds on surfaces and air were measured too.

Results & Conclusion: Results showed decreasing number of bacteria, yeast and moulds after washing up to 1 and 1.5 log10, respectively. The samples, in other steps, were contaminated and the microbial load was increased. During the steps, salmonella was not detected, but *E. coli* was detected in some steps. *S. aerous* was detected in all steps. The highest levels of total aerobic bacteria, Enterobacteriaceae, *E. coli*, yeast and moulds were detected on machines (cutters, peeling and centrifuge machines, etc.). Different Hygienic areas should be separate to allow maintenance of good hygiene in cleaner areas during primary washing steps. The results revealed that improve cleaning and hygiene practices in vegetable production are required. Several practical recommendations were given for cleaning, designing of production areas, training of employees and providing hygienic surfaces.

Keywords: Vegetable processing, microbial evaluation, raw vegetable, hygiene practices.