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

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Objectives: Abstract The number of vegetable processing plants has been 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 load of vegetables during different cleaning steps in a fresh-cut vegetable processing plant and to identify the critical points in the processes and operating areas.

Materials & Methods: Samples were taken from the plant before processing and after washing and disinfection, cutting, drying and packing in ice pack. The samples were analyzed for mesophilic aerobic bacteria, yeast and moulds, lactic acid bacteria, total coliforms, Enterobacteriaceae, E. coli, Staphylococcus aureus and for the presence of Salmonella, according to the standard guidelines. The amounts of total aerobic bacteria, Enterobacteriaceae, E. coli, yeasts and moulds on surfaces and air were also determined.

Results & Conclusion: Results showed decreasing bacteria, yeasts and moulds after washing and disinfectant up to 1 and 1.5 log10, respectively. The samples, in other steps, were contaminated and the microbial load increased due to secondary contamination. During all steps, salmonella was not detected, but E. coli detected in some of the steps. S. aureus was detected at all steps. The highest levels of total aerobic bacteria, Enterobacteriaceae, E. coli, yeasts and moulds were detected on machines (cutters, peeling, centrifuge machines, etc.). Different Hygienic areas should be separated enough to allow maintenance of good hygiene in cleaner areas in primary washing steps. Despite this, the results revealed a vital need to improve cleaning and hygiene practices in vegetable processing plants. Several practical recommendations were given for cleaning, designing of production areas, training of employees and providing surface hygiene.

Keywords: Keywords: vegetable processing, microbial evaluation, bacteria

Determination of oxytetracycline in fish meat using high-performance liquid chromatography with PDA detection

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Objectives: Oxytetracycline is widely used in treatment of various bacterial infections in several animal species including aquatic animals. The US Food and Drug Administration (FDA) and the US Environmental Protection Agency (EPA) approved three antibiotics, including OTC for use in aquatic animals. With the increased use of veterinary drugs in food production, there is global concern about the consumption of low levels of antimicrobial residues in aquatic foods and the effects of these residues on human health. In this study a high-performance liquid chromatographic analytical method was developed for the determination of oxytetracycline residue in rainbow trout.

Materials & Methods: A rapid and sensitive HPLC method was developed for the determination of oxytetracycline in fish tissues (muscle and liver) based on a clean-up and concentration procedure on Sep-Pak C18. Oxytetracycline was analyzed using a 250 * 4.6 mm I.D. Symmetry column, a mobile phase of acetonitrile, methanol and 2 M oxalic acid buffer (pH2.0) (15:5:80, v/v/v), and an UV detection wavelength of 365 nm. Flow rate was 1.2ml/min at 40 °C. In this study, 20 samples of fish muscle were collected and analyzed.

Results & Conclusion: The calibration curve of oxytetracycline was linear (r2 = 0.9997). Using a signal-to-noise ratio of 4:1 the oxytetracycline detection limit was 40 ng/g of tissue. Mean recovery of oxytetracycline amounted to 91%, while intra-assay variability was 1.5%. This study was used an analytical method to evaluate the dispositions of OTC in meat of rain boat and other species of fish. This method was reliable, sensitive, economical and appropriate for routine monitoring of OTC residues in fish meat. This method can be successfully applied for residual study in fish.

Keywords: Oxytetracycline, rainbow trout, HPLC -UV, residue.