DETOXIFICATION OF LACTOBACILLUS RHAMNOSUS AS PROBIOTIC IN YOGHURT

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Introduction: Mycotoxin is fungal secondary metabolite that can contaminate food and feed and also cause toxic effects on a higher organism in both human and animals. Aflatoxin, the natural occurring mycotoxins are produced by various species of Aspergillus, a fungus specially, Aspergillus flavus and Aspergillus parasitocous. They have mutagenic carcinogenic and also teratogenic effects, reported to be involved in various health complications include liver cancer. Aflatoxin B1 (AFB1) has been known as the most potent toxic among various aflatoxins. When aflatoxin B1 and B2 contaminated food or feed is consumed, the toxins are metabolized to aflatoxins M1 and M2 and excreted into the tissues, biological fluids, and milk of lactating animals, including breast milk. Many methods suggested for control of aflatoxins such as chemical, physical and biological, but a great chance for reducing the presence of aflatoxins in food products is implemented through the utilization of certain types of non-pathogenic bacteria, such as the group of lactic acid bacteria (LAB). Lactobacillus rhamnosus is a Gram-positive bacterial strain of the probiotic bacteria which really is one of the most effective micro-organisms to binding aflatoxin. This study presents the effect of lactobacillus rhamnosus in reduction rate of aflatoxin in yogurt so that their lethal effects could be minimized.

Materials and Methods: Milk contaminated artificially with aflatoxin M1 (AFM1) at a level of 0.1(ppb). Then after pasteurization starter YC-280 (2%) and Lactobacillus rhamnosus (1,3,5 gr/50 ml) were added and incubated at 42 ºC. The sample's AFM1 concentration was determined by a competitive Enzyme-Linked Immune Sorbant Assay (ELISA) method at the day of 2, 7, 14, 21 of refrigeration. The analysis of variance was done by SPSS 16 for determining the difference as the binding amount of aflatoxin M1 by different treatment of dose of bacteria. In addition, ANOVA variance analysis was also done for comparison of binding AFM1 in yoghurt. DUNCAN test was used for determining the different groups after the variance analysis.

Result and discussion: The analysis of yoghurt during the 21th day of refrigeration with various treatment of Lactobacillus rhamnosus showed that the maximum level of binding about 71.7% was for the treatment of 1gr/50 ml at second day. and minimum level of binding about 83.8% was for the 5gr/50 ml at the 21th day of refrigeration. This study showed that many of tested yogurt had significant differences (p<0.05) in reduction the level of AFM1 the probiotic effect of Lb. rhamnosus is a safe method that it can be used for detoxification without losing nutritional value.