

The Effect of Inulin on Aflatoxin M1 Binding Ability of Probiotic Bacteria in Yoghurt

Authors : Sumeyra Sevim, Gulsum Gizem Topal, Mercan Merve Tengilimoglu-Metin, Banu Sancak, Mevlude Kizil

Abstract : Aflatoxin M1 (AFM1) represents mutagenic, carcinogenic, hepatotoxic and immunosuppressive properties, and shows adverse effect on human health. Recently the use of probiotics are focused on AFM1 detoxification because of the fact that probiotic strains have a binding ability to AFM1. Moreover, inulin is a prebiotic to improve the ability of probiotic bacteria. Therefore, the aim of the study is to investigate the effect of inulin on AFM1 binding ability of some probiotic bacteria. Yoghurt samples were manufactured by using skim milk powder artificially contaminated with AFM1 at concentration 100 pg/ml. Different samples were prepared for the study as: first sample consists of yoghurt starter bacteria (*L. bulgaricus* and *S. thermophilus*), the second sample consists of starter and *L. plantarum*, starter and *B. bifidum* ATCC were added to the third sample, starter and *B. animalis* ATCC 27672 were added to the fourth sample, and the fifth sample is a binary culture consisted of starter and *B. bifidum* and *B. animalis*. Moreover, the same work groups were prepared with inulin (4%). The samples were incubated at 42°C for 4 hours, then stored for three different time interval (1,5 and 10 days). The toxin was measured by the ELISA. When inulin was added to work groups, there was significant change on AFM1 binding ability at least one sample in all groups except the one with *L. plantarum* ($p < 0.05$). The highest levels of AFM1 binding ability (68.7%) in samples with inulin were found in the group which *B. bifidum* was added, whereas the lowest levels of AFM1 binding ability (44.4%) in samples with inulin was found in the fifth sample. The most impressive effect of inulin was found on *B. bifidum*. In this study, it was obtained that there was a significant effect of storage on AFM1 binding ability in the all groups with inulin except the one with *L. plantarum* ($p < 0.05$). Consequently, results show that AFM1 detoxification by probiotics have a potential application to reduce toxin concentrations in yoghurt. Besides, inulin has different effects on AFM1 binding ability of each probiotic bacteria strain.

Keywords : aflatoxin M1, inulin, probiotics, storage

Conference Title : ICFPFI 2017 : International Conference on Food Processing and Functional Ingredients

Conference Location : Venice, Italy

Conference Dates : February 16-17, 2017