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BOOK OF ABSTRACT

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P 164 Proteomic analysis of probiotic *Lactobacillus acidophilus* NCFM response to oxidative stress

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Lactic acid bacteria are extensively used in food fermentation technologies and some of the strains are recognized as probiotics since they can give significant benefits to the human body. *Lactobacillus acidophilus* NCFM (NCFM) is one of the well-defined probiotic strains, which is available commercially as food supplement[1]. Oxidative stress is a dangerous stress condition during the industrial process or throughout the body that can cause loss of viability of the strains. Therefore, in this study, we aimed to investigate the effects of different concentrations of hydrogen peroxide on the growth and protein expression of NCFM. The growth studies showed that NCFM adapted to the given hydrogen peroxide concentrations (0.8-1.2 mM). 2-D gel electrophoresis and mass spectrometry were used to identify the differentially expressed proteins during the hydrogen peroxide stress. Thiols are most sensitive group to oxidative stress[2] and the results show that the proteins that contain cysteine residues at the active site are main targets of oxidative stress. Key glycolytic enzymes were induced because of their sensitive cysteine that can affect enzyme activity along with energy production and finally the microorganism's viability. Some proteins related with protein folding and degradation was identified, which indicates that protein degradation is a preferred way rather than chaperone-activity in an oxidative stress environment. Moreover, cysteine synthase was induced during the stress probably as a consequence of the higher demand of cysteine. Thus, NCFM can adapt to hydrogen peroxide concentrations by altering the expressions of different proteins.

P 165 Stability of fructooligosaccharides added to orange and tomato juices during storage at ambient conditions

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The health benefits associated with consumption of short chain fructooligosaccharides (scFOS) have been documented for more than two decades, but chemical hydrolysis of them during the storage, can occur, this being more feasible than other oligosaccharides hydrolysis, which may reduce the food functionality. The authors have developed an enzymatic technology to produce scFOS from sucrose. In the current study, the stability of the scFOS added to orange and tomato juices was measured during storage at ambient conditions. The scFOS were obtained by enzymatic transfructosilation. Sixty glass containers with 4 mL of orange and tomato juices (pH 3.5) enriched with scFOS (10 g/L) were pasteurized at 90 °C according to the process design. Two formulations were made for each food matrix using two syrups of different average degree of polymerization (DP). After 7 weeks, the orange juice retained 66 and 73% in total content of FOS using the syrup I and II, respectively. Likewise, tomato juice retained 36 and 51% using the same syrups. The FOS hydrolysis occurs during storage, but it is influenced by the food matrix and the DP of the oligosaccharides.