

6th Global Summit and Expo on FOOD & BEVERAGES August 03-05, 2015 Orlando-FL, USA

Optimization of fermentation conditions for Teff (*Eragrostis tef*) Malt Wort using response surface methodology

Mekonnen M Gebremariam, Ahmed Hassani, Martin Zarnkow and Thomas Becker Center of Life and Food Sciences, Germany

The first nutritious and gluten-free low risk cereal with the potential as an alternative raw material for gluten-free foods and beverages. The aim of the research was to investigate optimal fermentation conditions for teff malt-wort to be fermented by *lactobacillus amylolyticus*. The experimental design and statistical analysis were performed using "design expert statistical software". High lactic acid formation was observed between 42 and 48 °C. An increase and decrease in temperature beyond the stated range caused a decrease in the formation of lactic acid. Temperature was the dominant factor influencing the three response variables viz. lactic acid to sugar ratio, lactic acid, and pH. However, the main factor influencing extract was time followed by cell concentration. The optimum conditions of the parameters such as temperature, initial pH, initial cell concentration, and fermentation 15 g/L, and lactic acid to sugar ratio 0.26 was predicted to be produced. The validation experimental runs demonstrated a good agreement between the experimental and predicted values. The sensory evaluation of the product also shows that it was accepted by the assessors.

mekmela@yahoo.com

Effects of active zein films having different release profiles on Listeria monocytogenes growth and lipid oxidation in fresh kashar cheese

Figen Korel Izmir Institute of Technology, Turkey

There has been a growing interest to develop packaging materials incorporating functional agents and enhance quality and shelflife of packed foods. Active packaging containing antimicrobial and antioxidant agents is one of the most promising areas since application of this method can improve safety of foods by inhibiting pathogenic/spoilage bacteria and prevent quality losses due to lipid oxidation by using minimum amounts of active agents. Nowadays, health concerns of consumers and environmental problems related to plastics increased. In this study, zein and zein-wax composite films incorporating lysozyme and mixture of lysozyme, catechin and gallic acid with different controlled release properties were developed and their antimicrobial and antioxidant activities were investigated on fresh Kashar cheese inoculated with *Listeria monocytogenes*. All lysozyme containing films inhibited the growth of *L. monocytogenes* in Kashar cheese for 8 weeks at 4 °C, but it is only the zein-wax composite films with sustained lysozyme-release rates caused a significant reduction (-0.4 decimals) in initial microbial load of inoculated samples. The films having mixtures of catechin and gallic acid had an antimicrobial activity against *L. monocytogenes* in vitro, but they showed no considerable antimicrobial activity in cheese. However, the films having catechin and gallic acid inhibited the oxidative changes in cheese. This study showed the possibility of increasing safety and quality of fresh cheeses by use of active packaging employing natural antimicrobial compounds and controlled release technology. It is concluded that there is a potential of using flexible antimicrobial and antioxidant films with controlled release properties in diary industry.

figenkorel@iyte.edu.tr

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