

Using of polysaccharide preparations for manufacture of lactic acid fermented cabbage juices

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Abstract: The purpose of this work was to study the fermentation of cabbage juices with addition of various commercial polysaccharide preparations isolated from chicory root. The cabbage juices were inoculated by *Lactobacillus plantarum* CCM 7039 and fermented during 168 h at 21 °C. On the basis of analytical and sensory results we suggested addition of polysaccharide preparations containing more than 99.5% (high performance inulin) of inulin into the cabbage juices. We recommend to stop the fermentation process of this juice in the 72nd h of fermentation because in this hour the juice had the highest intensity of selected sensory parameters and it proved adequately low pH value (3.65) in order to warrant the preservative effects.

Key words: fermentation, cabbage juice, inulin, principal component analysis.

Introduction

Fermented foods can generally be described as palatable and wholesome foods, prepared from raw or heated raw materials by microbial fermentation (HOLZAPFEL, 1997). While there are 21 different commercial vegetable fermentations in Europe along with a large number of fermented vegetable juices and blends, the most economically relevant of these are the fermentations of olives, cucumbers (pickles), and cabbage (sauerkraut, Korean kimchi) (CAPLICE & FITZGERALD, 1999). The lactic acid fermentation of vegetable products, applied as a preservation method for the production of finished and half-finished products, is again being ranked as an important technology and it is being further investigated because of the growing amount of raw materials processed in this way in the food industry.

The main reasons for this interest are the nutritional, physiological and hygienic aspects of the process and their corresponding implementation and production costs (KAROVIČOVÁ et al., 1999). The chinese cabbage, cabbage, pH adjusted tomato (to pH 7.2), carrot and spinach media gave relatively higher fermentability than other vegetables due to their higher content of fermentable saccharides in comparison with others vegetables (KIM et al., 2000).

Jerusalem artichoke and chicory intybus contain a large amount of carbohydrate stored as inulin (MULLIN et al., 1994; ROBERFROID et al., 1998). Chemically,

inulin is a polydisperse β -(2,1)-fructan. The fructose units in this mixture of linear fructose polymers and oligomers are each linked by β -(2,1)-bonds (FLICKINGER et al., 2003). Inulin is used world-wide for many different food applications (COUSSEMENT, 1996). It is legally classified as food or food ingredient (not additive) in all EU countries. Australia, Canada and Japan came to the same conclusions. In the USA a panel of recognised experts has confirmed the GRAS (Generally Recognized As Safe) status of chicory inulin. In all these countries inulin can be used without specific limitations as ingredient in foods and drinks. Most countries have also agreed that inulin may be labeled as dietary fibers (COUSSEMENT, 1996). This substance has excellent technological and taste-texture properties that allow its incorporation in many foods. Inulin can simply be added (amounts of 2 to 5 % are most common) or used to substitute other carbohydrates or fat. Inulin can be used for its either nutritional advantages or technological properties, or even for both to offer a dual benefit: an improved organoleptic quality and better-balanced nutritional composition (FRANCK, 2002).

The purpose of this work was to prepare lactic acid fermented cabbage juices with addition of commercially available inulin preparations for food industry. The selection of preparation suitable for fermentation from the analytical and sensory viewpoints as well as definition of the optimal time of fermentation was also done.

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