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THE BOOK OF ABSTRACTS

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EFFECT OF FREEZE-DRYING ON LONG-TERM STORAGE AND NUTRITIONAL CHARACTERISTICS OF SUGAR BEET MOLASSES

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ABSTRACT

Sugar beet molasses (SBM) as nutritionally valuable product can easily be transformed from byproduct to bioproduct. SBM represents rich source of minerals (Na, K, Ca, Mg) and bioactive compounds (betaine). Although, molasses consists of high amount of sugar (≤ 50.0 °S), a_w value is still high (≤ 0.600). Freeze-drying technique represents one step where biological material was treated before finalization of the product. SBM was lyophilized at 1 Pa, corresponding temperature -60°C until dry. Mineral composition of SBM molasses before and after applied freeze-drying process were determined according to ISO 6869:2008. Quantitative HPLC method revealed presence of betaine. Influence of freeze-drying on molasses was expressed in relation to changes of the dry matter, a_w value, mineral composition (Na, K, Ca, Mg, Fe, Zn) and betaine content. Lyophilized SBM with very high content of dry matter (97.5%) and reduced a_w value (from 0.587 to 0.287) implicated material long-term storage, reduced packaging cost, easier handling and transport instead of high viscous molasses. All analysed minerals were more concentrated in the lyophilized molasses expressed on dry matter content, from 4.4% for K to 23.1% for Mg. Dehydrated molasses concentrated in minerals and betaine represents nutritive favourable compound for further manipulation and enriching of food products.

Keywords: sugar beet molasses, freeze-drying, long-term storage, mineral composition.