

**STUDIES ON VARIOUS SUGAR DERIVATES FORMED
BY THERMAL DEGRADATION OF DIFFERENT
PREBIOTIC CARBOHYDRATES**

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Natural carbohydrates play important role in the growth of beneficial colonic microflora and provide the health of the host. Several functional food products have been developed using prebiotics as bioactive components. Food processing (especially baking) may lead to significant conversion of the parent compounds. The main aim of this work was to investigate the plausible decomposition carbohydrate derivatives formed by thermal degradation. Several different well-accepted prebiotic carbohydrates have been exposed to elevated temperatures (between 150°C to 220°C) for 10 minutes. The effect on the thermal degradation of prebiotic structure with the most frequently occurring metal ions (Fe(II), Cu(II), Zn(II), Mn(II), Ca(II), Mg(II)) in the food matrices has been also examined. Various chromatography methods were used to analyze the decomposition products of heat treated prebiotics. HPLC equipped with evaporative light scattering detection (ELSD) was applied to identify the carbohydrate oligomers. ELSD proved to be suitable for the reliable detection of the UV/VIS inactive carbohydrate degradation products. During the heat treatment producing hydroxy-methyl-furfural (HMF) components were analyzed by HPLC coupled diode array detector (DAD). Gas-chromatography coupled with mass spectrometer detection system (GC-MS) was used to identify difructose-anhydride (DFA) sugar moieties. According to the HPLC-ELSD results thermal processing and mineral fortification influence the carbohydrate chain structure with polymer and oligomers degradation. Various DFAs were identified in minerals fortified and thermally treated prebiotic samples using GC-MS method. The forming lower molecular weight components and DFAs have enhanced prebiotic activity. The concentration of HMF was determined in the treated samples by HPLC-DAD methods.

Keywords: Functional food, prebiotic carbohydrate, HPLC, GC

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