Low A, B – Unsaturated Carbonyl Compounds as a Food Risk Factor in Thermal Processing of Grapeseed Oil

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Abstract. Low α,β – unsaturated carbonyl compounds (LUCC) (2-propenal, crotonaldehyde) and other similar structures highly reactive organic chemicals is ubiquitously present in (cooked) foods and in the environment. Chemical reactions responsible for release of acrolein (ACR) include heat-induced dehydration of glycerol, retro-aldol cleavage of dehydrated carbohydrates, lipid peroxidation of polyunsaturated fatty acids, and Strecker degradation of methionine and threonine. Thermal processing (managing or aggressive non-monitored) of grapeseeds oil can become a food-risk factor.

Keywords: α, β-unsaturated carbonyl compounds, acrolein, crotonaldehyde, combustion of biodiesel, Maillard reactions, grapeseed oil.

INTRODUCTION: Maximum permissible concentration (MPC), is determined according to European norms of labor protection, at 0.5mg ACR/m$^3$ air, and the average concentration at 0.3mg ACR/m$^3$. In Rusia, MPC is set at 0.7mg ACR/m$^3$ air, in Germany and SUA at 0.25mg ACR/m$^3$ air.

RESULTS AND DISCUSSION: In paper we monitor the qualitative and quantitative colorimetric evolution of this risk factor in the gaseous phase [samples continuously harvested 0.5 mL/minute from evacuation devices in chips, fast-food produces, etc. manufacturing technologies) through absorption in benzidine solutions 1% in glacial acetic acid medium.

CONCLUSIONS: The proposed method for identifying trace amounts of LUCC as acrolein as a food chemical risk factor in thermal processing of grapeseed oil (conventional range) is reproductible (±1%), rapid and can be adapted a continuous control by flow various capacity (high average).

REFERENCES
