Strategies for the Reduction of Ester Bound 2- and 3-MCPD and Esterified Glycidol in Pre-fried Fishery Products

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The pre-frying process is the critical process step with respect to the formation of ester bound 2- and 3-Monochloropropane (2- and 3-MCPD-E) and esterified glycidol (G-E) in frozen fishery products. The presence of a chloride source in combination with glycerol or glycerol derivates like tri-/diacylglycerides together with high temperatures induce the formation of 2- and 3-MCPD-E and G-E [1,2]. The IARC has classified 3-MCPD as a “possible human carcinogen (group 2B)” and glycidol as “probably carcinogenic to humans (group 2A)”.

The aim of this research project was the development and assessment of practical strategies aiming for the reduction of these processing contaminants in pre-fried, frozen fishery products. Different approaches have been conducted and evaluated by analyzing the contents of 2- and 3-MCPD-E and G-E by the modified AOCS method Cd 29b-13 in pre-fried products and frying oils [3]. Influences of the frying temperature, type of the frying oil, salt content and frying time on the formation of 2- and 3-MCPD-E and G-E in pre-fried, frozen fishery products and frying oils have been proven. Further applied strategies included the use of adsorbent materials as well as the supplementation of the batter with L-Cystein. Additionally, the effect of physical filtration methods on the 2- and 3-MCPD-E und G-E content of the frying oil have been investigated. The impact of the minimizing strategies on the content of pre-fried, frozen fishery products will be presented.

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