

Genesis of Lipid Oxidation and other Neo-formed Reaction Products during Frying of Plantain by Small-scale Producers in Africa

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The part taken by plantain chips in the diet of the urban Cameroonians is continuously growing. The chips are produced and sold by small-sized enterprises with highly diversified frying methods. These methods need to be evaluated to control and preserve the sensory and nutritional/toxicological quality of the fried products.

Neo-formed products :acrylamide, hydroxymethyl furfural (HMF), conjugated dienoic hydroperoxy fatty acids, volatile compounds, *trans* fatty acids- and other current markers of lipid alteration were measured either in fried chips or in frying oils sampled in local workshops during daily continuous frying. The results reveal that the palm olein which is often used by producers is relatively stable towards oxidation in the conditions used by the local producers, within 9 h of continuous frying. Accordingly, in addition, to the absence of formation of *trans* fatty acids, changes in conjugated dienes, para-anisidine value and viscosity of the palm olein were low and significantly lower than in soybean oil, the other frying oil utilized by some producers. Among the identified volatile compounds, 12.5% came from Maillard reaction and 87.5% from lipid oxidation. HMF concentration ranged from 4 to over 500 mg/kg with no clear trend showing that HMF and browning is be higher in the samples obtained after 9h of continuous frying. Acrylamide was not detected in the chips, which can be related to undetectable amounts of asparagine in the raw plantains.

The study evidences that the frying practices of Cameroonian plantain chips producers that use palm olein allow to obtain good quality products.