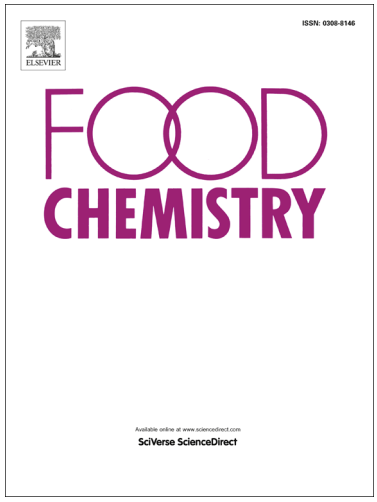

Effect of amino acids and frequency of reuse frying oils at different temperature on acrylamide formation in palm olein and soy bean oils via modeling system

G. Daniali, S. Jinap, M. Sanny, C.P. Tan

PII: S0308-8146(17)31708-9
DOI: https://doi.org/10.1016/j.foodchem.2017.10.070
Reference: FOCH 21893

To appear in: *Food Chemistry*

Received Date: 13 June 2017
Revised Date: 2 October 2017
Accepted Date: 11 October 2017

Please cite this article as: Daniali, G., Jinap, S., Sanny, M., Tan, C.P., Effect of amino acids and frequency of reuse frying oils at different temperature on acrylamide formation in palm olein and soy bean oils via modeling system, *Food Chemistry* (2017), doi: https://doi.org/10.1016/j.foodchem.2017.10.070

Effect of amino acids and frequency of reuse frying oils at different temperature on acrylamide formation in palm olein and soy bean oils via modeling system

Daniali, G.[a], Jinap S.[a,b*], Sanny, M,[a], Tan C.P.[c]

[a]Department of Food Science, Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia, [b] Food Safety and Food Integrity, Institute of Tropical Agriculture, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia,[c] Department of Food Technology, Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia

Corresponding author: *Email: jinap@upm.edu.my; sjinap@gmail.com

Abstract

This work investigated the underlying formation of acrylamide from amino acids in frying oils during high temperatures and at different times via modeling systems. Eighteen amino acids were used in order to determine which one was more effective on acrylamide production. Significantly the highest amount of acrylamide was produced from asparagine (5987.5 µg/kg) and the lowest from phenylalanine (9.25 µg/kg). A constant amount of asparagine and glutamine in palm olein and soy bean oils was heated up in modelling system at different temperatures (160,180 and 200 ºC) and times (1.5, 3, 4.5, 6, 7.5 min). The highest amount of acrylamide was found at 200 ºC for 7.5 min (9317 and 8511µg/kg) and lowest at 160 ºC for 1.5 min (156 and 254 µg/kg) in both frying oils and both amino acids. Direct correlations have been found between time (R2=0.884), temperature (R2=0.951) and amount of acrylamide formation, both at $p<0.05$.