

From: <hans.blom@matforsk.no>
To: <coshita@oehha.ca.gov>
Date: 6/3/2005 12:37:56 AM
Subject: Comment from Norwegian Food Research Institute on reduction of acrylamide formation, regarding "exposures to listed chemicals from natural constituents during heat processing"

Dear Cynthia Oshita

Please find enclosed our contribution to methods to reduce the amount of acrylamide formed in heat treated products.

The purpose of this contribuion is to show that there are available means for reducing acrylamide formation in foods.

I sincerely hope you will find our comment interesting and useful.

(See attached file: 506california.doc)

Kind regards

for Matforsk

Norwegian Food Research Institute

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Means for reducing acrylamide formation in foods

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Food processing approaches to reduce level of acrylamide formed during heat treatment like deep frying, roasting and baking could be directed towards reducing the amount of reactants, i.e. asparagine and reducing sugars, and/or by making the conditions for the reaction unfavorable.

Research performed at Matforsk AS and The University of Life Sciences in Norway has shown that the level of acrylamide formed during processing of potato chips depends on the potato cultivars used. Increased levels of reducing sugars resulted in increased formation of acrylamide. Shorter exposure to high temperature during processing has also been shown to reduce the levels of acrylamide formed. Further, soaking of the potato slices in a 0.15M acetic acid solution at 20 °C for 60 minutes prior to deep fat frying lowered levels of acrylamide formed during processing of potato crisps by up to 90%. Adding glycine or glutamine during blanching of potato slices intended for chips processing resulted in approx. 30% reduction in acrylamide level, compared to no addition. Addition of glycine or glutamine to dough for flat bread resulted in 50 – 90% reductions in acrylamide levels, and in yeast-leavened bread a 60 – 95% reduction was obtained.

In studies performed as a cooperation between Forinnova AS and Matforsk AS, we have used lactic acid fermentation as a means to reduce acrylamide levels in deep-fried potato products. Lactic acid fermentation converts reducing sugars to lactic acid. Consequently, the pH is lowered and the substrate levels for acrylamide formation reduced. We have shown that fermentation of blanched potato rods with lactic acid bacteria for 45 minutes at 37 °C resulted in 79% reduction of formed acrylamide in French fries, and in 94% reduction after 2 hours fermentation. Thus, a fermentation process has the potential for substantially reducing acrylamide formed during processing of deep fried potato products and should be included in industrial process around the world. Fermentation could also be the solution to reduce the amounts of acrylamide formed during roasting of coffee and during baking of crisp bread and other cereal products.