



A “Toolbox” for the Reduction of Acrylamide in Fried Potato Products/French Fries

Acrylamide

Acrylamide is a substance that is produced naturally in foods as a result of high-temperature cooking, e.g., baking, grilling, or frying. Acrylamide can cause cancer in animals and experts believe it can probably cause cancer in humans. Although acrylamide has probably been part of our diet since man first started cooking, because of concerns over safety, world experts have recommended that we reduce the levels of acrylamide in foods.

Acrylamide has been found in a wide variety of foods, including those prepared industrially, in catering and at home. It is found in staple foods such as bread, potatoes as well as in some specialty products such as crisps, biscuits and coffee.

The FoodDrinkEurope Acrylamide Toolbox

Following the discovery of acrylamide in food, the food industry and other stakeholders, including regulators, took action to investigate how acrylamide is formed in foods and possible methods that can be employed to reduce levels of acrylamide in foods. FoodDrinkEurope coordinated the efforts and pooled the results together to produce the Acrylamide Toolbox.

ALARA

ALARA is an acronym for the concept “As Low As Reasonably Achievable”. This simply means that a Food Business Operator (FBO) should take appropriate measures to reduce the presence of a given contaminant in a final product to a minimum: taking account of the risk presented, but also taking account of other legitimate considerations, such as potential risks from other contaminants, organoleptic properties and quality of the final product, and the feasibility and effectiveness of controls.

To ensure continuing compliance with the ALARA concept the FBO should monitor the effectiveness of the implemented measures and should review them as necessary.

Acrylamide in Fried Potato Products

This brochure is designed to help manufacturers of French fries and fried potato products.

For advice, contact the European Potato Processors Association (EUPPA) at euppa@fvphouse.be

Read the full toolbox at:

<http://www.fooddrinkeurope.eu/publication/fooddrinkeurope-updates-industry-wide-toolbox-to-help-manufacturers-further/>

Methods of formation

- Acrylamide is formed via the reaction of asparagine and reducing sugars (both naturally occurring in potatoes)
- Acrylamide is formed at temperatures higher than 120 °C
- The amount of acrylamide formed depends on
 - Temperature of final cooking
 - Cooking time
 - Amounts of asparagine and reducing sugars in the potato

Methods of Reduction for finished French Fries

The following “Tools” have been used successfully to reduce levels of acrylamide in French fries. Manufacturers are advised to select those “Tools” that are most suitable to their type of product, process methods and product quality specification. euppa@fvphouse.be



Raw Materials Selection	Recipe Design	Process Design	Finished Product Attributes*
<ul style="list-style-type: none"> • Only use (low sugar) potato varieties suitable for fried potato products • Store potatoes climate controlled > 6° C: check temperature and humidity • Suppress sprouting in stored potatoes using CIPC or equivalent • Check in-coming potato lots at plant through fry colour testing or other tools to measure reducing sugars • Remove immature tubers 	<ul style="list-style-type: none"> • Cut thicker French fries; thicker French fries contain less acrylamide than thinly cut French fries through the surface area/volume effect 	<ul style="list-style-type: none"> • Blanching potato strips in water is the most important tool to control reducing sugar levels before frying • Addition of disodium diphosphate directly after blanching can reduce acrylamide levels in the final product through pH effect 	<ul style="list-style-type: none"> • Give clear cooking instructions on pack: fry at max 175 °C; do not overcook; aim for light golden colour; when cooking smaller amounts reduce cooking time • Check final colour against product specification after frying according to cooking instruction

* This is intended for the final preparation before consumption