

Foods that have been cooked or processed at high temperatures and at levels that can rise over time have been found to contain acrylamide. The Maillard reaction appears to produce acrylamide as an unwanted byproduct. When foods are properly balanced in terms of their proportions of proteins, lipids, and carbs, the Maillard reaction can happen during baking or frying (Tareke et al. 2000). When foods are baked or fried, heat-induced interactions between the carbonyl group of reducing sugars like glucose and the amino group of the free amino acid asparagine result in the majority of the acrylamide that ends up in food (Margaretha and Kerstin 2005).

After condensation with reducing sugars or a carbonyl source in cooked foods, the asparagine is mostly to blame for the creation of acrylamide (Gokmen and Palakzagli 2008). The early Maillard reaction may be a significant source of acrylamide because it produces large amounts of the sugar asparaginase adduct N-glycosylasparagine (Stadler et al. 2005). According to Becalski et al. (2003), acrylamide can be created from meals that include oils and nitrogen-containing chemicals, such as acrolein, which is created when glycerol is thermally degraded (Umamo and Shibamoto 1987). Acrylamide is then produced as a result of the oxidation of acrolein to acrylic acid and the subsequent reaction of acrylic acid with ammonia, which may be produced by the pyrolysis of molecules containing nitrogen. Even within one food category, such as potatoes, the amount of asparagine varies widely, and the amount of acrylamide also varies greatly. When foods heavy in carbohydrates are fried, baked, or roasted at temperatures exceeding 120 C, acrylamide is created (INFOSAN 2005).

Processed foods with high acrylamide content include bread crust, crisp bread, tortilla chips, potato chips, French fries, various baked products, coffee, and cereal formulas. Wide changes in acrylamide levels in the foods, however, are caused by processing variations in factors including temperature, duration, frying oil type, and food matrix type. (Kerstin and Margaretha 2005).

Toxicity of Acrylamide

According to FAO/WHO estimates from 2002, an adult's daily intake of acrylamide ranges from 0.3 to 0.8 g/kg bodyweight, or 21 to 56 g/day for a person weighing 70 kg. Rice (2005) examined acrylamide's carcinogenicity. Acrylamide's mutagenic and carcinogenic traits are thought to be dependent on the metabolite of the epoxy compound known as glycidamide. Glycidamide causes

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