

**DOTTORATO DI RICERCA IN BIOTECNOLOGIE
CICLO 32°**

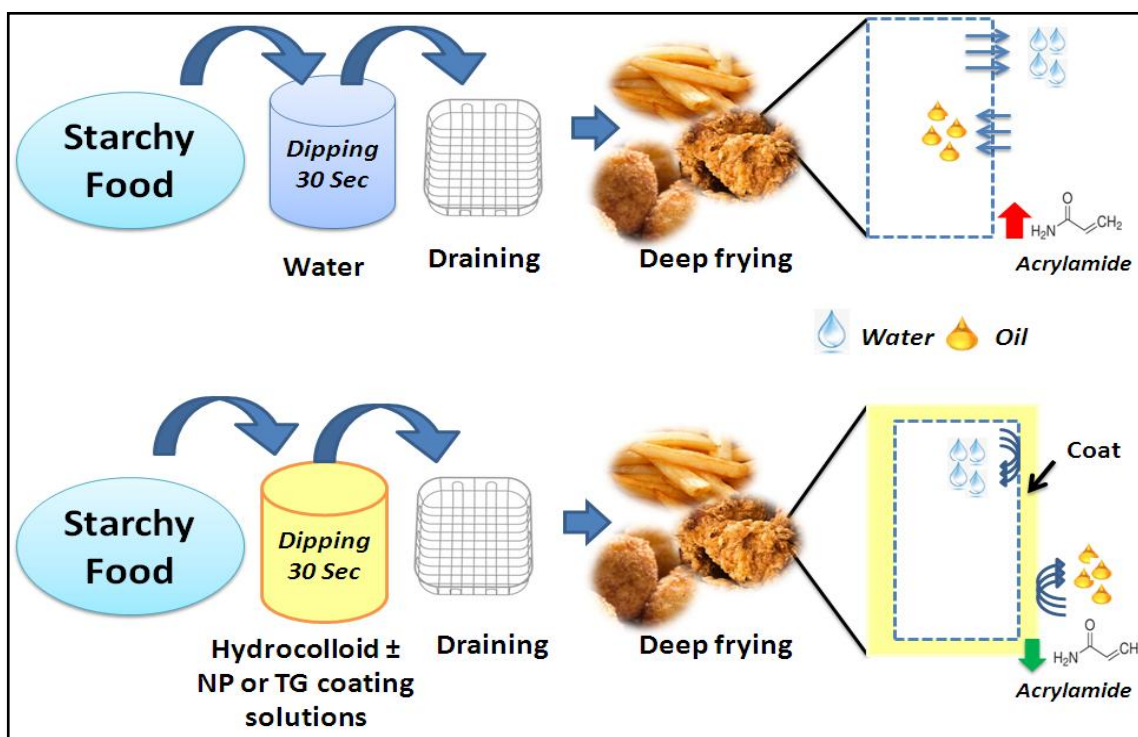
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TITLE:

Nano-reinforced hydrocolloid-based and crosslinked edible films to prevent the formation of toxic products during food cooking



During food cooking there is 4 main different toxic products produced as heterocyclic amines, furan, 5-hydroxymethylfurfural and acrylamide (ACR). Our attention in this project is devoted to ACR. In 2002 Swedish researchers have first reported the formation of ACR in starch-based foods as part of the Maillard reaction. In particular, ACR is formed during frying, baking and roasting at temperatures above 120°C and in the presence of low moisture because of a chemical reaction between free asparagine and reducing sugars (such as glucose and fructose). However, the International Agency for Research on Cancer (IARC, 1994) classified ACR as genotoxic and carcinogenic and recently European Food Safety Authority (EFSA) scientists in 2015 conclude that ACR is a health concern. The aim of the present project is to evaluate the effectiveness of hydrocolloid-based coatings reinforced or not with nanoparticles (NP) or transglutaminase (TG), in reducing ACR formation in different fried foods. Providing a coating, fried foods should retain more moisture, slowing the rate of Maillard reaction and, thus, ACR content.