Acrylamide Mitigation Procedures in Fried Potatoes

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Acrylamide diminishing in potato slices and strips was studied in relation to frying temperature and some pre-treatments. Potato slices (Tivoli variety, diameter 37 mm, width: 2.2 mm) were fried at 150, 170 and 190 degrees C until reaching moisture contents of similar to 1.8 percent. Prior to frying, potato slices were treated in one of the following ways: (i) blanched in hot water at six different time-temperature combinations (50 degrees C for 30 and 70 min; 70 degrees C for 8 and 40 min; 90 degrees C for 2 and 9 min); (ii) immersed in a citric acid solutions of 10 g/L for half an hour. Potato strips (0.8 x 0.8 x 5 cm) of Bintje variety were fried at 150, 170 and 190 degrees C until reaching moisture contents of similar to 40 percent. Prior to frying, potato strips were treated in similar ways to potato slices. Glucose and asparagine contents were determined in potato slices and strips before frying, whereas acrylamide content was determined in the fried potato chips and French fries. Blanching reduced in potato chips on average 76 percent and 68 percent of the glucose and asparagine content compared to the control. Potato slices blanched at 50 degrees C for 70 minutes surprisingly had a very low acrylamide content (28 µm/kg) even when they were fried at 190 degrees C. Potato immersion in citric acid solution of 10 g/L reduced acrylamide formation by almost 70% for slices fried at 150 degrees C. Color represented by the parameters L* and a* showed high correlations (r(2) of 0.79 and 0.83, respectively) with French fry acrylamide content.

General information
State: Published
Organisations: National Food Institute, Division of Food Chemistry
Contributors: Pedreschi, F., Kaack, K., Granby, K.
Pages: 32-36
Publication date: 2008
Peer-reviewed: No

Publication information
Journal: Agro Food Industry Hi-Tech
Volume: 19
Issue number: 2
ISSN (Print): 1722-6996
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 0.29 SJR 0.159 SNIP 0.174
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.33 SJR 0.203 SNIP 0.151
Web of Science (2016): Impact factor 0.299
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 0.24 SJR 0.167 SNIP 0.208
Web of Science (2015): Impact factor 0.202
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 0.22 SJR 0.157 SNIP 0.162
Web of Science (2014): Impact factor 0.205
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 0.28 SJR 0.177 SNIP 0.103
Web of Science (2013): Impact factor 0.294
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.19 SJR 0.158 SNIP 0.094
Web of Science (2012): Impact factor 0.234
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.21 SJR 0.167 SNIP 0.138