探討非離心蔗糖製程中丙烯醯胺形成之影響

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大綱

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摘要

非離心蔗糖(non-centrifugal cane sugar, NCS)在生產過程中長時間的熱處理會發生梅納反應(Maillard reaction)，提供了風味、芳香族化合物和類黑素，使其呈深棕色外觀，但它仍然伴隨著不良產物的形成，例如 2A 類致癌物丙烯醯胺。爲了減少 NCS 中丙烯醯胺的形成，本研究主要探討了由不同原料、濃縮技術以及添加焦糖或糖蜜製成的 NCS 對丙烯醯胺形成之影響。由甘蔗汁、椰子與糖棕樹液製成的 NCS 中丙烯醯胺含量範圍落在< 15 至 4011 μg/kg，這些原汁液中蔗糖、果糖和葡萄糖的含量相似，而胺基酸方面則有所不同。鳥胺酸(ornithine, Orn)含量的變化是顯著的，說明對從這些材料製備的糖漿中丙烯醯胺形成程度(867 - 1564 μg/kg)的影響顯著。製造 NCS 過程中添加焦糖(caramel, C)和糖蜜(molasses, M)並未積累大量丙烯醯胺，但 NCS_C 的色值發生了顯著變化。大多數參變化與溫度降解過程有關，但是與酚類含量呈負相關，和丙烯醯胺含量呈正相關，而糖類含量與熱處理過程中發生的梅納反應有關。Marmite (MAR)是獲得 NCS 產品之最佳數據結果的濃縮技術，這項技術或許能成爲傳統工藝的替代方案，生產出更優質、功能性(抗氧化活性高達 135.8 mg/g)和安全的(丙烯醯胺含量<1 μg/kg)食品。若要配合消費者感官喜好度，亦能結合添加物(如焦糖)，在不影響丙烯醯胺生成的條件下調整其外觀色澤。

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