

國立臺灣海洋大學食品科學系碩士在職專
班

專題討論書面報告

探討不同添加物對麵包澱粉老化特性的影響

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大綱

一、前言

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三、茶萃取物與小麥澱粉在回凝過程中的相互作用

四、澱粉酶的添加對麵包品質和麵包老化的影響

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摘要

麵包在儲存過程中會逐漸變硬、品質下降，這是澱粉老化現象所致，本研究將探討不同添加物對提高烘焙性能以及在儲存過程中延緩澱粉老化的影響。添加磷酸二澱粉 (Distarch phosphate, DP)、乙醯化己二酸二澱粉 (Acetylated distarch adipate, ADA)、預糊化乙醯化磷酸二澱粉 (pregelatinized acetylated distarch phosphate, PADP) 產生交聯化、穩定化和預糊化的反應，並製作成無麩質麵包來分析麵糰的結構、在儲存過程中的質地和反應熱變化。實驗發現，添加 20% PADP 可提高麵糰的吸水能力，卻影響了氣體產生使麵包體積縮小，反而加快老化，使用 20% ADA 則顯著減少麵包的硬度，延緩澱粉的老化。研究綠茶中的茶多酚和兒茶素分子與小麥澱粉在回凝過程中的相互作用，多酚和兒茶素可以和澱粉形成氫鍵，阻止澱粉再結晶，研究使用了 X 光繞射分析澱粉的相對結晶度、紅外光譜分析澱粉的氫鍵數量，實驗發現，添加兒茶素和茶多酚，澱粉分子形成氫鍵，尤其茶多酚抑制澱粉再結晶的效果最為顯著。在麵包中添加澱粉酶可以使澱粉分解成老化速度較慢的短鏈分子。研究添加麥芽糖澱粉酶和產麥芽四糖澱粉酶分解澱粉分子形成短鏈，並產生高保濕力的麥芽四糖，並將麵包儲存後測定比容積、質地分析、反應熱變化了解澱粉回凝程度、和測定麥芽糖組成，實驗發現，添加產麥芽四糖澱粉酶的麵包，其抗老化能力非常顯著，可使麵包品質提升。

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