

# 乳化劑對食品穩定性與其成分的影響

曾資凌(5112)

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## 大綱

一、前言

二、乳化劑在加工食品上的應用與穩定性

三、乳化劑作用於食品成分的反應與差異

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## 摘要

乳化劑的兩性結構能改變澱粉、蛋白質與水分的相互作用，影響食品的質構與化學反應，如抑制有害物質生成或提升儲存穩定性。本研究旨在探討乳化劑在加工食品中的應用及穩定性，評估其對食品成分的影響，並改善產品的質構、穩定性與安全性。研究中使用兩種乳化劑製備多組鱈魚骨奈米乳液( Pollock bones nano-emulsions, PBNs )，結果顯示乳化劑種類與濃度會影響粒徑、黏度與 Zeta-potential，其中以 0.9% 酪蛋白酸鈉蔗糖脂肪酸酯 ( Sodium caseinate and sucrose fatty acid ester, CS-SE ) 製備的 PBNs 最為穩定，加熱時粒徑降低、乳化指數 ( Creaming index, CI% ) 達 90.83%，證明 CS-SE 可提高 PBNs 的乳液穩定性。此外，添加焦磷酸鈉 ( Sodium pyrophosphate, SPP ) 和蒸餾單甘油酯 ( Distilled monoglycerides, DMG ) 等乳化劑可與澱粉形成澱粉-脂質複合物，改善蒸米蛋糕 ( Steamed rice cakes, SRCs ) 的凝膠結構，增加比容、降低孔隙率與硬度，提升口感；同時改變水分分布，增加附著力，改善烤雞肉餅 ( Roasted chicken patties ) 質地並延緩異環胺 ( Heterocyclic amines, HAs ) 的生成。綜上所述，乳化劑不僅能使油水均勻分散，透過調整種類與濃度，還能有效改善食品的質地、穩定性並減少有害物質的產生。

# Effects of Emulsifiers on Food Stability and Its Components

Tzu-Ling TSENG (5112)

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## Outline

1. Introduction
2. Applications and Stability of Emulsifiers in Processed Foods
3. Reactions and Differences of Emulsifiers on Food Components
4. Conclusion

## Abstract

The amphiphilic structure of emulsifiers can alter the interactions among starch, protein, and water, affecting food texture, stability, and the formation of harmful compounds. This study investigated the use of emulsifiers in processed foods and their effects on food components. Two types of emulsifiers were used to prepare Pollock bones nano-emulsions ( PBNs ), and results showed that types and concentrations influenced particle size, viscosity, and zeta potential, with 0.9% CS-SE producing the most stable emulsions; upon heating, their particle size decreased and the creaming index ( CI% ) reached 90.83%, demonstrating improved PBN stability. In addition, emulsifiers such as sodium pyrophosphate ( SPP ) and distilled monoglycerides ( DMG ) can form starch–lipid complexes, improving the gel structure, specific volume, and texture of steamed rice cakes ( SRCs ), while also enhancing water distribution and adhesiveness in roasted chicken patties and reducing heterocyclic amine ( HAs ) formation. Overall, emulsifiers improve oil–water dispersion and, when properly used, enhance food texture, stability, and safety.

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