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# The development of hotcake products with reduced staling and reduction of microbiological growth

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A thesis presented in partial fulfilment of the requirements for the degree of

**Master of Technology**

**In**

**Food Technology**

**At**

**Institute of Food, Nutrition and Human Health**

**Massey University, Palmerston North, New Zealand**



**MASSEY UNIVERSITY**  
**TE KUNENGA KI PŪREHUROA**

**Enchong Zhang**

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## **Abstract**

Staling and microbiological spoilage are major issues in the market development of hotcake products. This project is aiming at reduce the staling rate of hotcake product during storage and review the methods that could be effective in reducing microbiological spoilage of hotcakes at ambient temperature.

The staling rate was reduced by incorporation of anti-staling ingredients into the formulation. A combination of anti-staling ingredients including Dimodan PH 320/B-M, a distilled monoglyceride; DATEM Palsgaard 3502, a Diacetyl Tartaric Acid Ester of Mono- and Diglycerides; and also Novamyl 10000 BG, a bake stable alpha amylase was effective to reduce the staling rate of hotcake when incorporate them into the hotcake formulation. The staling rate of hotcake products was reduced from 0.14N/day to 0.085N/day in commercial trial. In addition, the sensory results indicated the customers can not perceive a stale hotcake for the new formulation developed in this research and they also can not perceive the changes between original formulation and the new formulation.

Two applicable antimicrobial spoilage approaches were used; these were to increase the level of calcium propionate preservative and to reduce the oxygen content level to below 1% using O<sub>2</sub> absorber or 100% CO<sub>2</sub> in the packaging. The commercial trial showed decreasing the oxygen content level to less than 1% in the packaging and increasing the level of preservatives increased the shelf life by 1 or 2 days under the ambient storage condition used.

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## List of Abbreviations

AF: Amylofresh

BG: Novamyl 10000BG

BHA: Butylated hydroxyl anisole

BHT: Butylated hydroxyl toluene

BP: Barrier pouch packaging

CA: Controlled atmosphere

Cont: Control

CFU: Colony forming unit

DATEM (DT): Diacetyl tartaric acid esters of mono and diglycerides

Dim: Dimodan PH 320/B-M, distilled monoglyceride

DP: Degree of polymerization

FB: Flour base

LDPE: Low density polyethylene

LSD: Least significant difference

MAP: Modified atmosphere packaging

NA: No Available data

Pro: Novamyl Pro BG

SAS: Sodium aluminium sulphate

SALP: Sodium aluminium phosphate

SSL: Grindsted ® SSL P 86 K, Sodium stearyl lactylate

Std: Standard

TPA: Texture profile analysis

TPC: Total plate count

VDFV: Van Dyck Fine Foods Ltd.