

1 探討製程及不同加工方式對醃蜆品質與保存期限評估

2 陳威宇(5152)

3 05/10/2023

4 大綱

5 1. 簡介

6 2. 原物料及不同加工方式對醃蜆之品質與延長保存期限評估

7 2.1 原料品質與前處理對蜆之影響

8 2.2 天然抗菌成分對醃蜆之影響

9 2.3 後殺加工對醃蜆之影響

10 3. 結論

11 摘要

12 臺灣蜆由於高水分、高蛋白之特性，冷藏保存一個禮拜，便開始腐敗，無法
13 較長期保存將限制產品發展，與危害消費者之安全。醃蜆以簡易醃製加工，具有
14 延長保存期限之功能，但不足以完全抑制病原菌生長，仍需其他加工同步處理。
15 水產加工常見殺菌方式為高溫、巴斯德、臭氧及防腐劑等方式處理，然而上述處
16 理方式都可能對品質造成影響，故本研究將針對醃蜆加工之前處理、醃製及後殺
17 加工，以感官、微生物與質地等方式，探討上述處理對醃蜆品質與保存性之評估。
18 以總生菌數、K 值與 VBN 測定生鮮蜆之保存性，結果顯示於 7 天達到 $6.5 \pm$
19 $0.34 \log \text{CFU/g}$ ，VBN 於 14 天達到 $16.21 \pm 1.04 \text{ mg/100g}$ ，K 值由原先 $11.83 \pm$
20 1.34% 七天後達到 $26.93 \pm 0.09\%$ 並逐步上升，顯示七天後已不適用於食用。臭氧
21 處理組於總生菌數、VBN 與 TBARs 無顯著變化；冷凍處理以總生菌數與蜆肉
22 表面積評估，顯示 24 小時冷凍處理之總生菌數由原先 5.68 ± 0.02 下降為 4.22
23 $\pm 0.09 \log \text{CFU/g}$ 具顯著改變，表面積與其他組別無顯著差異；以不同濃度之茶
24 葉與金棗作為天然防腐劑，結果顯示 3% 金棗與茶葉具較佳之抗菌效果，由 4.73
25 降至 4.19 及 $4.04 \log \text{CFU/g}$ ，以總生菌數做為保存性之依據，醃蜆於 10-14 天
26 後超標，金棗與茶葉組別並未超標；巴斯德滅菌結果顯示 pH 值呈先上升後下降，
27 此原因可能為初期內部蛋白顯露，當持續加熱蛋白質變性降解導致下降，於質地
28 與色度分析結果顯示加熱 2.5 分鐘與原先品質較相近，且具有相當之殺菌效果，
29 由未處理 4.38 降至 $3.82 \log \text{CFU/g}$ 。綜上述結果顯示，以冷凍 24 小時添加茶葉、
30 金棗 3% 皆能增加保存期限；且以後殺加工 2.5 分鐘保有最佳之品質，之後會再
31 針對天然抗菌成份及巴斯德殺菌進行相關欄柵技術之探討。

參考文獻

- 于新華. (2001). 罐頭食品的歷史, 現狀及發展對策. *食品與發酵工業*, 27(2), 58.
- 崔瑞穎, 焦學芹, 崔波, 祖鐵紅, 鄭乾魏, & 張志勝. (2013). 凍藏對海灣扇貝閉殼肌蛋白質變性及組織結構的影響. *食品工業科技*, 34(22), 298-301
- Anema, S. G. (2020). The whey proteins in milk: Thermal denaturation, physical interactions, and effects on the functional properties of milk. *Milk proteins*, 325-384.
- Cho, T., Kim, N., Kim, S., Song, J., & Rhee, M.-S. (2016). Survival of foodborne pathogens (*Escherichia coli* O157: H7, *Salmonella* Typhimurium, *Staphylococcus aureus*, *Listeria monocytogenes*, and *Vibrio parahaemolyticus*) in raw ready-to-eat crab marinated in soy sauce. *International Journal of Food Microbiology*, 238, 50-55.
- Gao, X., Cui, C., Ren, J., Zhao, H., Zhao, Q., & Zhao, M. (2011). Changes in the chemical composition of traditional Chinese-type soy sauce at different stages of manufacture and its relation to taste. *International Journal of Food Science & Technology*, 46(2), 243-249.
- Glaze, W. (1986). Reaction products of ozone: a review. *Environmental Health Perspectives*, 69, 151-157.
- Guzel-Seydim, Z. B., Greene, A. K., & Seydim, A. (2004). Use of ozone in the food industry. *LWT-Food Science and Technology*, 37(4), 453-460.
- Hassoun, A., Siddiqui, S. A., Smaoui, S., Ucak, İ., Arshad, R. N., Garcia-Oliveira, P., et al. (2022). Seafood processing, preservation, and analytical techniques in the age of Industry 4.0. *Applied Sciences*, 12(3), 1703.
- Hernández, K. L., Sedas, V. P., Dehaibes, S. R., Valencia, V. S., Mozo, I. R., Herrera, D. M., et al. (2018). Improved microbial safety of direct ozone-depurated shellstock Eastern oysters (*Crassostrea virginica*) by superchilled storage. *Frontiers in Microbiology*, 9, 1-16.
- Ho, C.-H., Noryati, I., Sulaiman, S.-F., & Rosma, A. (2010). In vitro antibacterial and antioxidant activities of *Orthosiphon stamineus* Benth. extracts against food-borne bacteria. *Food Chemistry*, 122(4), 1168-1172.
- Jeon, J., Kim, J. H., Lee, C. K., Oh, C. H., & Song, H. J. (2014). The antimicrobial activity of (-)-epigallocatechin-3-gallate and green tea extracts against *Pseudomonas aeruginosa* and *Escherichia coli* isolated from skin wounds. *Annals of dermatology*, 26(5), 564-569.
- Lewis, M. J., & Heppell, N. J. (2000). *Continuous thermal processing of foods: pasteurization and UHT sterilization*: Springer.
- Li, D., Qin, N., Zhang, L., Li, Q., Prinyawiwatkul, W., & Luo, Y. (2019). Degradation

- of adenosine triphosphate, water loss and textural changes in frozen common carp (*Cyprinus carpio*) fillets during storage at different temperatures. *International Journal of Refrigeration*, 98, 294-301.
- Lin, C.-S., Lee, Y.-C., Kung, H.-F., Cheng, Q.-L., Ou, T.-Y., Chang, S. K., et al. (2022). Inactivation of microbial loads and retardation of quality loss in Asian hard clam (*Meretrix lusoria*) using high-hydrostatic-pressure processing during refrigerated storage. *Food Control*, 133, 108583.
- Lou, S.-N., Lai, Y.-C., Huang, J.-D., Ho, C.-T., Ferng, L.-H. A., & Chang, Y.-C. (2015). Drying effect on flavonoid composition and antioxidant activity of immature kumquat. *Food Chemistry*, 171, 356-363.
- Matoba, T., Kuchiba, M., Kimura, M., & Hasegawa, K. (1988). Thermal degradation of flavor enhancers, inosine 5'-monophosphate, and guanosine 5'-monophosphate in aqueous solution. *Journal of Food Science*, 53(4), 1156-1159.
- Mootian, G. K., Flimlin, G. E., Karwe, M. V., & Schaffner, D. W. (2013). Inactivation of *Vibrio parahaemolyticus* in hard clams (*Mercanaria mercanaria*) by high hydrostatic pressure (HHP) and the effect of HHP on the physical characteristics of hard clam meat. *Journal of Food Science*, 78(2), 251-257.
- Nayan, H. H., Hazra, P., Parvez, M. S., & Khatun, M. M. (2020). Development of pickle from marine mollusks and shelf-life assessment during storages. *Khulna University Studies*, 19-30.
- Olafsdottir, G., Martinsdóttir, E., Oehlenschläger, J., Dalgaard, P., Jensen, B., Undeland, I., et al. (1997). Methods to evaluate fish freshness in research and industry. *Trends in food Science & Technology*, 8(8), 258-265.
- Pan, C., Chen, S., Hao, S., & Yang, X. (2019). Effect of low-temperature preservation on quality changes in Pacific white shrimp, *Litopenaeus vannamei*: a review. *Journal of the Science of Food and Agriculture*, 99(14), 6121-6128.
- Papoutsis, K., Pristijono, P., Golding, J. B., Stathopoulos, C. E., Bowyer, M. C., Scarlett, C. J., et al. (2018). Optimizing a sustainable ultrasound-assisted extraction method for the recovery of polyphenols from lemon by-products: Comparison with hot water and organic solvent extractions. *European Food Research and Technology*, 244, 1353-1365.
- Rhee, M.-S., Lee, S.-Y., Dougherty, R. H., & Kang, D.-H. (2003). Antimicrobial effects of mustard flour and acetic acid against *Escherichia coli* O157: H7, *Listeria monocytogenes*, and *Salmonella enterica* serovar *Typhimurium*. *Applied and environmental microbiology*, 69(5), 2959-2963.
- Son, K. T., Shim, K. B., Lim, C. W., Yoon, N. Y., Seo, J. H., Jeong, S. G., et al. (2014). Relationship of pH, glycogen, soluble protein, and turbidity between freshness of raw oyster *Crassostrea gigas*. *Korean Journal of Fisheries and Aquatic*

Sciences, 47(5), 495-500.

- Sultana, B., Anwar, F., Mushtaq, M., & Alim, M. (2015). Citrus residues: A potential source of phenolics with high antioxidant values. *International Food Research Journal*, 22(3).
- Tian, S., Yang, Y., Wu, T., Luo, C., Li, X., Zhao, X., et al. (2022). Functional characterization of a flavone synthase that participates in a kumquat flavone metabolon. *Frontiers in Plant Science*, 13, 1-13.
- Wenjiao, F., Yunchuan, C., Junxiu, S., & Yongkui, Z. (2014). Effects of tea polyphenol on quality and shelf life of pork sausages. *Journal of Food Science and Technology*, 51, 191-195.
- Wright, A. C., Fan, Y., & Baker, G. L. (2018). Nutritional value and food safety of bivalve molluscan shellfish. *Journal of Shellfish Research*, 37(4), 695-708.
- Yang, Y., & Zhang, T. (2019). Antimicrobial activities of tea polyphenol on phytopathogens: A review. *Molecules*, 24(4), 816.
- Zhang, T., Xue, Y., Li, Z., Wang, Y., Yang, W., & Xue, C. (2016). Effects of ozone on the removal of geosmin and the physicochemical properties of fish meat from bighead carp (*Hypophthalmichthys nobilis*). *Innovative Food Science & Emerging Technologies*, 34, 16-23.
- Zhou, Y., Yao, Q., Zhang, T., Chen, X., Wu, Z., Zhang, N., et al. (2020). Antibacterial activity and mechanism of green tea polysaccharide conjugates against *Escherichia coli*. *Industrial Crops and Products*, 152, 112464.