

4 Outline

- 5 1. Introduction
- 6 2. Effect of ultrasound-assisted immersion thawing on emulsifying and gelling properties of
- 7 chicken myofibrillar protein
- 8 3. Use of high-intensity ultrasound to improve emulsifying properties of chicken
- 9 myofibrillar protein and enhance the rheological properties and stability of the emulsion
- 10 4. Conclusion

11 Abstract

12 Myofibrillar protein (MP) is the major protein providing excellent water-binding ability,

13 gel-forming ability and emulsifying properties. Improving emulsifying properties of MP

14 contributes to the manufacture of high-quality products. This study aims to explore the effect

15 of ultrasonic application on thawing and fresh chicken on the emulsification properties of MP.

16 Ultrasound-assisted immersion thawing (UT) at 300 W significantly improved the solubility

17 and the absolute ζ -potential value of MP, reduced its turbidity and particle size. It also achieved

18 the highest gel strength and gel water holding capacity, forming a homogeneous and compact

19 gel network that minimized the loss of both immobilized and free water. High-intensity

20 ultrasound treatment for 6 min decreased both MP and MP-based emulsion particle size,

21 resulting in smaller and uniformly distributed droplets. This treatment increased protein

22 adsorption concentration and facilitated MP adsorption onto oil droplet surfaces. Moreover, it

23 induced changes on the secondary and tertiary structures. These changes contribute to

24 improving the emulsifying properties of MP and enhancing the rheological properties and

25 stability of the O/W emulsion. The ultrasonic treatments significantly improved the

26 emulsifying activity index and emulsifying stability index of MP. These results demonstrate

27 that ultrasound can reduce the loss of MP emulsification and gelling properties, enhance

28 emulsion stability, and improve the quality of thawed meat, thereby providing a reference for

29 meat processing.

- 1 Li, K., Fu, L., Zhao, Y. Y., Xue, S. W., Wang, P., Xu, X. L., & Bai, Y. H. (2020). Use of high-
2 intensity ultrasound to improve emulsifying properties of chicken myofibrillar protein and
3 enhance the rheological properties and stability of the emulsion. *Food Hydrocolloids*, 98,
4 105275.
- 5 Zhang, C., Liu, H., Xia, X., Sun, F., & Kong, B. (2021). Effect of ultrasound-assisted
6 immersion thawing on emulsifying and gelling properties of chicken myofibrillar protein.
7 *LWT-Food Science and Technology*, 142, 111016.