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The effects of different thermal treatments on amino acid contents and chemometric-based identification of overheated honey

Haoan Zhao, Ni Cheng, Ying Zhang, Zheng Sun, Wenqi Zhou, Yin Wang, Wei Cao



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1 **The effects of different thermal treatments on amino acid**
2 **contents and chemometric-based identification of**
3 **overheated honey**

4 Haoan Zhao^b, Ni Cheng^{ac}, Ying Zhang^a, Zheng Sun^b, Wenqi Zhou^b, Yin Wang^a, Wei
5 Cao^{*ac}

6 **Abstract**

7 This study was dedicated to distinguish overheated honey under simulated
8 industrial thermal treatment by analyzing the amino acid contents. In this research,
9 jujube honey and chaste honey samples were characterized by amino acids contents,
10 color values and 5-hydroxymethylfurfural (5-HMF) contents after different thermal
11 treatments. According to the results and multivariate statistical analysis, the contents
12 of most amino acids in honey decreased after heat treatment, and there were
13 significant differences between moderate and over processed honey samples. It also
14 turns out that the sensitive markers of thermal treating are 5-HMF, b*, L*, a* and
15 proline in jujube honey, 5-HMF, L*, b*, a* and phenylalanine in chaste honey. The
16 above researches indicate that all honey samples in present study should be subject to
17 category division of whether overheating.

18 **Keywords:** Honey, thermal treatment, chemometric, overheating

19 **1. Introduction**

20 Thermal treatment is a common practice in food manufacturing. Traditionally,
21 most foods are processed at high temperatures (60-100 °C) for a few hours, in order to
22 sterilize food, improve sensory properties, and extend shelf life (Oms-Oliu,

^aSchool of Food Science and Engineering, Northwest University, 229 North TaiBai Road, Xi'an, 710069, China. E-mail: caowei@nwu.edu.cn; Fax: +86 29 88302213; Tel.: +86 29 88302213.

^bSchool of Chemical Engineering, Northwest University, 229 North TaiBai Road, Xi'an, 710069, China.

^cBee Product Research Center of Shaanxi Province, Xi'an, 710065, China.

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