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DETERMINATION OF THE RELATIVE EFFECTS OF

TEMPERATURE, pH AND WATER ACTIVITY IN

FOOD SYSTEMS: A META-ANALYSIS STUDY

WAN ZAWIAH W. ABDULLAH^{1,2*}, BERNARD M. MACKEY¹ and

KIMON- ANDREAS G. KARATZAS¹

¹Department of Food and Nutrition Sciences, University of Reading,

P.O. Box 226, Whiteknights, Reading RG6 6AP, UK

²School of Food Science and Technology, Universiti Malaysia Terengganu,

21030, Kuala Nerus, Terengganu, Malaysia

**Email: wzawiah@umt.edu.my*

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ABSTRACT

The aim of this study is to use ComBase to determine the relative effects of temperature, pH, and water activity in the inactivation rates of *Salmonella enterica* in a range of foods. This is performed to determine whether any of the above factors have a dominant effect on survival. The inactivation rates of *Salmonella* were obtained from original raw data in the ComBase browser and from complete ComBase data for *Salmonella*. A total of 972 data of different types of food systems and data of individual types of food from ComBase were analysed. Over the range of 0–90 °C, the z values calculated for the food data is 14 °C. At 0–46 °C relevant to intermediate moisture foods (IMF), the z values for the food data was 22 °C, indicating a moderate effect of temperature. The z value for inactivation at 47–90 °C was 11 °C, indicating that temperature has an important effect on survival. This study shows that the effect of temperature is clearer at high temperatures than in the low temperature region. It suggests that the inactivation of *Salmonella* in food systems is slightly dominated by temperature and that the pH and a_w levels appear to be less influential.

Key words: *Meta-analysis, food system, temperature, pH, a_w*