International Conference on

Food Safety and Regulatory Measures

August 17-19, 2015 Birmingham, UK

Predictive modeling tools and strategies for establishing risk-based microbiological criteria in foods

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The application of the generated knowledge in predictive microbiology has been mainly focused on the quantification of the bacterial behavior in culture media or foods under certain environmental conditions. The kinetic parameters estimated from mathematical equations (i.e. maximum growth rate, lag time, inactivation rate etc.) have accurately described growth, inactivation, survival or probability of growth of several pathogens and/or spoilers in a wide range of foods. Nonetheless, the dissemination of this knowledge to food industries in order to optimize food processes and to provide assistance in decision-making in a short time frame is still being developed. To this sense, the routine and successful use of mathematical models by the food industry, governmental or educational agencies, will depend on the development of appropriate and useful applications (software packages and on-line platforms) of easy management. The increased use of models in the food industry might depend on the availability of user-friendly software, which encompass predictive models and allow different users to retrieve information from them in a rapid and convenient way. A flexible and upgraded tool assessing the behavior of potential microbial hazards along the food chain and their impact on public health could be highly valuable for food safety decision makers. The performance of risk-based metrics and the establishment of microbiological criteria could help to identify critical steps along the food chain that influence on the final risk associated to a specific pathogen. Some examples of how to establish microbiological criteria basing on risk-based metrics and predictive models will be provided.

Biography

Antonio Valero is a Postdoctoral Researcher holding a Degree and PhD in Food Science and Technology, obtained at the University of Cordoba (Spain). He has published nearly 40 articles in high-standard international journals and books being specially focused on the development of predictive models and risk assessment for growth, probability and inactivation of pathogens. He belongs to the Editorial Board of International *Journal of Food Microbiology*. He worked in a close relationship with the Spanish Food Safety Agency and the European Food Safety Authority (EFSA).

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J Food Process Technol

ISSN: 2157-7110 JFP, an open access journal

Food Safety-2015
August 17-19, 2015

Volume 6, Issue 9

Page 115