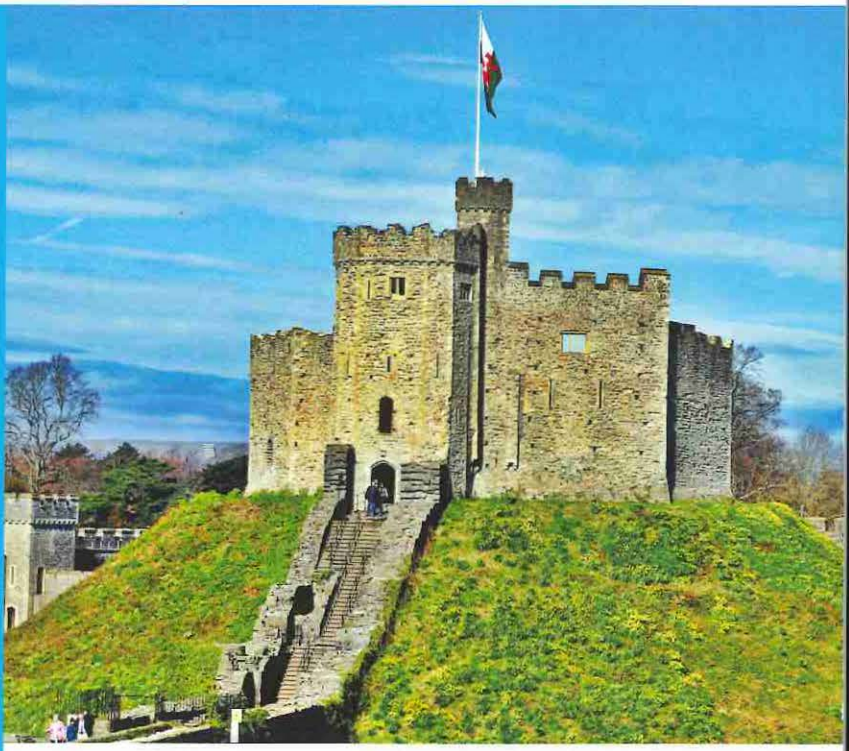
European Symposium on Food Safety

20-22 April 2015

Cardiff City Hall, Cardiff, Wales

Programme



In Collaboration with ILSI Europe and with the Technical Cooperation of the Food and Agriculture Organization of the United Nations.

Hosted by the United Kingdom Association for Food Protection

International Association for Food Protection®

www.foodprotection.org

Results: Results showed that survival and heat resistance of *Salmonella* in both products was greater when stored at low a_w and at 15°C compared to 25°C. Survival patterns of *Enterococcus faecium* are very similar to *Salmonella* but heat resistance was significantly different. Z-values for *Salmonella* (12–20°C) were higher than z-values for *Enterococcus faecium* (11–13°C), showing that *Salmonella* is more heat resistant at higher temperatures than *Enterococcus faecium*.
Significance: Results have shown that use of *Enterococcus faecium* ATCC 8459 as a *Salmonella* surrogate has some limitations especially when used at higher temperatures (> 75°C).

P3-22 Survival of Pathogenic Microorganisms in Spices and Herbs

IOANNA STRATAKOU[1], Heidy Den Besten[1] and Marcel Zwietering[1,2]; (1) Wageningen University, Wageningen, Netherlands, (2) Microbiology and Risk Assessment, Wageningen University, Wageningen, Netherlands

Introduction: Spices and dried aromatic herbs can be cultured where hygiene conditions might be poorly controlled and products can have high levels of spoilage and pathogenic microorganisms. Since spices and dried herbs are commodities with low water activity, they are usually stored at room temperature under dry conditions. Hence they have a shelf life of 2–3 years.
Purpose: Although drying can inhibit microorganism growth, it may not completely inactivate pathogens. Thus the purpose of this study was to investigate survival of pathogens during storage of spices and dried herbs.
Methods: We investigated the survival capacity of different pathogenic microorganisms in powdered paprika and also performed a meta-analysis to identify the most critical factors that influence survival. We performed a meta-analysis on the available published data to identify the most critical factors that influence survival in spices and dried herbs. Additionally, survival of different pathogenic microorganisms was monitored experimentally in powdered paprika under controlled storage conditions.
Results: From the meta-analysis we concluded that storage temperature and water activity both play significant roles in survival. Experimental studies which simulated storage conditions showed that different pathogens do not survive to the same extent under the same storage conditions as *Salmonella* spp. had a fifteen times lower inactivation rate than *Listeria monocytogenes*.
Significance: Reduction of pathogens during storage of spices and herbs might be limited depending on the type of organism present. Control of the initial levels of microbial contaminants is therefore of importance.

P3-23 Impact of Drying Kinetics on Foodborne Pathogen *Salmonella enterica* Survival

EMILIE LANG, Fiona Zoz, Stéphane Guyot, Jean-Marie Perrier-Cornet and Patrick Gervais; Unité Mixte de Recherche - Procédés Alimentaires et Microbiologiques (UMR-PAM), Université de Bourgogne/AgroSup Dijon 1, Esplanade Erasme, 21000 Dijon, France, Dijon, France

Introduction: *Salmonella enterica* is a foodborne pathogen, salmonellosis agent. It is highly represented in outbreak across the world, with nearly 100,000 cases every year in the European Union. Its ability to survive in several environments and its low infective dose made *Salmonella enterica* a key bacterium in food protection.
Purpose: This study aims to evaluate and understand the impact of drying process conditions (such as relative humidity, duration, kinetics or the food product nature) on *S. enterica* survival.
Methods: To study the survival of *S. enterica* as a function of drying different levels of relative humidity, we selected two *S. enterica* serovars: *Salmonella* Typhimurium, for its implication in outbreak and its thermal resistance in dried state, and *Salmonella* Senftenberg, for its thermal stress resistance in aqueous state. These strains were suspended in phosphate buffered saline solution or milk and then dried in thin covering layers on glass in controlled-relative humidity containers maintained to 11%, 25%, 44% and 58% thanks to saturated salt solution.
Results: The higher and lower drying rate, 11% and 58% of relative humidity, respectively, correspond to the lower destructions (1.5 log and 3 log for *Salmonella* Typhimurium, respectively, for 15 min in phosphate buffer saline) and the intermediate drying speed, 25% and 44% of relative humidity respectively, correspond to the higher destruction (3.5 log and 4 log for *Salmonella* Typhimurium, respectively, for 15 min phosphate buffer saline). Furthermore, drying in milk brings about less cell mortality than drying in phosphate buffer saline (2.5 log and 4 log for *Salmonella* Typhimurium, for 180 min at 58 % of relative humidity).
Significance: These results indicate that the drying parameters have a high impact on *Salmonella* survival and drying processes could be a tool for food decontamination and food safety.

P3-24 Monitoring Spoilage of Sterile Pork Meat Fillets Inoculated with Specific Spoilage Microorganisms (*Lactobacillus sakei, Leuconostoc mesenteroides*) Packaged under Modified Atmospheres in Tandem with GC/MS Analysis and Chemometrics

Olga Papadopoulou[1], Athina Ropodi[2], Efstathios Panagou[2,3] and **GEORGE-JOHN NYCHAS**[2,4]
(1) Hellenic Agricultural Organisation DEMETER, Lycovrissi Attica, Greece
(2) Agricultural University of Athens, Department of Food Science and Human Nutrition, Athens, Greece
(3) AUA, Athens, Greece
(4) Agricultural University of Athens, Athens, Greece

Introduction: *Lactobacillus*, *Leuconostoc* and *Carnobacterium* are most frequently found on vacuum or modified atmosphere packaged meat playing an important role in the spoilage of refrigerated meat.
Purpose: The purpose of this work was to determine the type of end-products produced during the growth of two main specific spoilage microorganisms in contrast to sterile meat and to determine the metabolomic profile of the samples during storage.
Methods: Sterile pork meat was inoculated with 2 log CFU/cm^2 of *Lb. sakei*, *Ln. mesenteroides* and mix cultures and stored under MAP at 4 and 10°C until spoilage was pronounced. Microbiological analysis (TVC, LAB) was performed in parallel with HP/SMPE-GC/MS analysis. The spectral data collected from GC/MS were subjected to factorial discriminant analysis (FDA), One-way ANOVA and PLS-DA to distinguish the metabolic compounds produced by the different microorganism used.
Results: Results showed qualitative and quantitative differences on the volatile compounds (alcohols, carbonylic compounds, esters) detected by GC/MS, between microbial species in mono and mix cultures as well as on sterile meat. Analysis with ANOVA and PLS-DA showed that 1-butanol, 2-butanol and 2-hexanol was related more with sterile samples, while 1-octen-3-ol, 2-heptenal, 2-octanone were related mostly with samples inoculated with *Lb. sakeii.* Finally, FDA