

3.12 Survival of pathogenic microorganisms in spices and herbs

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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 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.

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