

International Conference on **FOOD Safety and Regulatory Measures** August 17-19, 2015 Birmingham, UK

Development of whey protein based composite and blend edible films with pH controlled release

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properties intended for active packaging

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F ilms made of whey protein isolate (WPI), WPI-oleic acid blend films and WPI-bees wax composite films containing lysozyme were produced and the released enzyme activities were measured in buffered solutions at pH 3.0-6.0 and in smoked salmon discs. WPI films (pI \approx 5.2) bound considerable amount of lysozyme due to their inherent net negative charge at pH values close to neutrality. The release of bound lysozyme could be triggered as pH of release medium reduced from 6.0 to 3.0, down below the pI of WPI. The addition of oleic acid and bees wax into WPI film increased the film porosity and amounts of released lysozyme. The released enzyme activity had increased similarly when the blend and composite films were applied on smoked salmon discs. All of the films showed good antimicrobial activity against Listeria innocua. Results showed the possibility of activating antimicrobial WPI films by simply initiating lysozyme release with acidification of edible films and the potential of creating pH-controlled release systems which could be employed to improve safety of food stored in home type refrigerators.

Biography

Derya Boyaci is a PhD student and a Research Assistant in İzmir Institute of Technology. She wrote her MSc thesis at the same university on active packaging.

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