

The Interactions of Phenolic Compounds with Proteolytic Enzymes Important for Dairy Industry

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Potential use of polyphenols in dairy formulations has gained much attention due to their beneficial health effects. The goal of this study is to assess the binding characteristics of several phenolic acids and flavonoids upon interaction with plasmin and chymosin in milk and evaluate the potential changes in enzyme activity.

Epicatechin gallate, epigallocatechin gallate, quercetin and myricetin caused a significant reduction in plasmin activity due to the interactions mainly dominated by H-bonds resulting in an altered secondary structure.

On the other hand, none of the phenolics changed the activity of chymosin in model systems with conserved conformation. The elongated primary phase of rennet induced coagulation of milk in the presence of green tea extract was found revealing the possible interactions between phenolics and caseins leading to a non-direct inhibition of chymosin activity in cheesemaking” enzyme inhibition, polyphenols, plasmin, chymosin.

Seda Yildirim-Elikoglu is a PhD candidate in Food Engineering at Hacettepe University. She is experienced in food chemistry, focused on milk proteins, enzymes and dairy chemistry.

Her current research includes phenolic-protein interactions and consequences in dairy product manufacturing.

Speaker Publications:

- A tool for explaining the differences on renneting characteristics of milks from different origins: the surface hydrophobicity approach
- Interactions between milk proteins and polyphenols: Binding mechanisms, related changes and the future trends in dairy industry
- Binding characteristics of polyphenols as milk plasmin inhibitors
- Textural evaluation of milk gels by polyphenols
- Interactions Between Milk Proteins and Polyphenols in Model Systems or Complex Dairy Matrices

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