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Investigation of the effects of rennet proteins and peptides on the astringency of red wine

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Wine is one of the most important sources of dietary polyphenols with antioxidant properties. These polyphenols are also responsible for astringency and bitterness which are organoleptic characteristics of many foods and beverages. Astringency is perceived as dryness and/or a tactile sensation caused by the precipitated complex formed between polyphenols and saliva proteins. The purpose of this study was to investigate the effect of rennet whey proteins and peptides on astringency resulting from the interaction between model saliva proteins and polyphenols. A protein precipitation method was employed to determine astringency since the perception of oral astringency is the result of a similar precipitation of the saliva protein by tannin. Astringency was estimated chemically by employing the ovalbumin precipitation method which evaluates astringency as a measure of equivalent tannic acid concentration. We hypothesized that the addition of certain whey proteins/peptides will compete with proteins in saliva in their interaction with tannins and in this way reduce astringency. Several whey proteins and hydrolysates containing β-lactoglobulin and caseinomacropeptides were tested. Interactions between proteins and polyphenols were investigated by fluorescence quenching and the size of particles by dynamic light scattering. In addition, the phenolic composition of the treated wine was analyzed by HPLC. The effect of whey proteins and peptides on the astringency was dependent on the protein type and concentration. A greater reduction of astringency was obtained with the proteins consisting mainly of β-lactoglobulin at the concentrations tested compared to the peptides. Precipitation of polyphenol was seen with both low and high molecular weight whey proteins. The findings illustrated that high molecular weight polypeptides may be able to play an important role in reducing astringency and that in this role they are superior than the low molecular weight polypeptides. The outcomes of this study could be of particular interest to improving wine quality during wine making processes.

Biography

Jumoke B Olatujoye graduated with a B Tech in Food Science and Technology and had her Master's degree in Food Technology-Quality Assurance at the University of Reading, UK in 2010. A food science and technology Lecturer for some years and currently on a study leave for her PhD program at the University of Reading on a scholarship called Tertiary Education Trust Fund (TEFT). Her area of interest is in food biotechnology, dairy technology, bioactive and functional food ingredients and plant-derived polyphenols in beverages.

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