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# Effect of heat, pH, ultrasonication and ethanol on the denaturation of whey protein isolate using a newly developed approach in the analysis of difference-UV spectra

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### ABSTRACT

A newly developed method of analysis of difference-UV spectra was successfully implemented in the study of the effect of heat, pH, ultrasonication and ethanol on the denaturation of whey protein isolate. It was found that whey proteins exhibit their highest stability against heat denaturation at pH 3.75. At very low pH values, i.e. 2.5, they exhibited considerable cold denaturation, while after heating at this pH value, the supplementary heat denaturation rate was lower compared to that at neutral pH. The highest heat denaturation rates were observed at pH values higher than neutral. High power sonication on whey proteins, previously heated at 90 °C for 30 min, resulted in a rather small reduction of the fraction of the heat denatured protein aggregates. Finally, when ethanol was used as a cosolvent in the concentration range 20–50%, a sharp increase in the degree of denaturation, compared to the native protein solution, was observed.

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