



A study on degradation kinetics of riboflavin in spinach (*Spinacia oleracea*)

ABSTRACT

The kinetics of riboflavin degradation in spinach as well as in pure ascorbic acid solutions at initial concentration (0.43 mg/100 g) present in spinach over a temperature range of 50-120°C (steady state temperature process) was studied. The degradation kinetics of riboflavin in normal open pan cooking, pressure-cooking and a newly developed and patented fuel-efficient 'eco - cooker' was also studied (unsteady state heating process). The degradation of riboflavin followed a first order reaction kinetics where the rate constant increased with an increase in temperature. The temperature dependence of degradation was adequately modeled by Arrhenius equation. The activation energy for riboflavin in the present study was found to be 7.13 Kcal/mole for spinach and 5.74 Kcal/mole for pure vitamin solution. A mathematical model was developed using the steady state kinetic parameters obtained to predict the losses of ascorbic acid from the time-temperature data of the unsteady state heating processing method. The results obtained indicate similar retention of riboflavin in all the three modes of cooking, a result not unexpected since riboflavin is known to be a heat stable vitamin.