RHEOLOGY OF BATTER TYPE DOUGHS

SUBMITTED BY : Lazaros . D. Sasloglou

A thesis submitted in partial fulfilment of the requirements for the degree of

Master of Science in Food Technology

SUPERVISED BY: Dr . Evangelos . S . Lazos

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Dedication

To my parents who brought me in life.

ABSTRACT

Batter-type doughs are viscoelastic with explicit, nonlinear shear thinning behaviour. The commonly used empirical and descriptive rheological methods determined the consistency and extensibility of doughs by applying large deformation forces in a single-point measurement. They were therefore not suitable to describe dough flow properties. Flow properties determined by basic rheological methods using a rotational viscometer. Flow behaviour and consistency indices can be described by the power law model. Both the flow and consistency indices were affected by the flour:water ratio of doughs and the addition of egg and milk in the pancakes.The range of consistency index vaues for the three types of flours for the different flour:water ratios at 10°C was from 47,798 to 1,577 mPas. At 20°C 37,573-1,438; at 30°C 24,120-1,341; at 40°C 20,596-1,161; at 50°C 15,156-769.2 and at 55°C from 68,446 to 5,031 mPas. The viscosity was increased by the addition of egg and decreased when milk was incorporated.

The effect of temperature was the same for all the mixtures. Any increase from 10°C to 50°C resulted in a decrease in viscosity while at 55°C-60°C the viscosity was increased.

The pancake mixture showed a shear-thickening dilatant behaviour with an average flow index of 1.623 compared with that of a commercial recipe of 0.779.

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