Optimisation of the Thermal Processing of Mussels

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ABSTRACT

Perna canaliculus, more commonly known as the green-lipped mussel, is unique to New Zealand and is the foundation of the mussel farming industry in this country. This project aimed to identify practical ways to improve the thermal processing of mussels to maximise yield.

Initial work was carried out to characterise the composition of the mussel tissue. Following this, a method to quantify the cooking losses was developed. This methodology was used to examine the rate and extent of cooking losses in mussel tissue at various temperatures. Further to this it was possible, using differential scanning calorimetry, to examine the kinetics of protein denaturation associated with cooking losses.

The cook loss trials over various temperatures showed a definite increase in water loss once a temperature of approximately 65°C was reached. A relationship was developed between the water loss exhibited over a range of temperatures and the rate of protein denaturation. It was found that low temperature, long time cooking results in increased yields. These conditions will reduce the impact of temperature gradients through the mussel. The exact time temperature regime used commercially will be a compromise between moisture losses, microbial destruction, inactivation of rancidity causing enzymes and production restraints.

This regime was tested for whole and half shell mussels resulting in up to 4.5% increases in yield.

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