

**Title** Improvement of the commercial quality of chilled Norway lobster (*Nephrops norvegicus*) stored in slurry ice: Effects of a preliminary treatment with an antimelanotic agent on enzymatic browning

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### Abstract

The use of slurry ice is gaining increasing importance as an advanced method for the hygienic and efficient chilling and sub-zero storage of aquatic food products. In this work, this technology was applied as a novel technique for the chilling and storage of Norway lobster (*Nephrops norvegicus*) – a crustacean species of high-commercial value – under refrigeration conditions at  $-1.5\text{ }^{\circ}\text{C}$ . In addition, the effects of a preliminary treatment with 0.5% Na HSO<sub>3</sub> on surface browning were evaluated and compared with the results obtained in control batches not subjected to such treatment. The processing of lobster in slurry ice significantly ( $p < 0.05$ ) slowed down microbial spoilage, as determined by the counts of aerobes, psychrotrophs, proteolytic bacteria, and lactose-fermenting *Enterobacteriaceae*, and by the formation of volatile amines. Likewise, the autolytic breakdown mechanisms – as determined by the *K* value – were also significantly ( $p < 0.05$ ) inhibited in the slurry ice batch. Remarkably, preliminary treatment with 0.5% sodium metabisulphite permitted better maintenance of the parameters involved in sensory quality – especially as regards the aspect of the carapace – as compared with non-treated batches, and allowed a shelf life of 9 days without surpassing the 150 mg/kg legal limit established for this food additive. On contrast, the non-treated batch stored in slurry ice exhibited a shelf life of 5 days. The combination of technological treatments proposed in this work – preliminary antimelanotic treatment and storage in slurry ice – may be successfully applied to other fresh and frozen shellfish species with a view to extending shelf life and to avoiding the legal and toxicological problems derived from current abuse of such antimelanotic agents to prevent shellfish browning.