

# The Effect of Icing on the Quality of Trawled Whole *Nephrops*

Ref No:1994/29/FT

## The Need for Ice

*Nephrops* are a highly rated seafood because of their succulence and flavour - when in good condition. Ice has been little used on short trips as it was considered that *Nephrops* need to be kept alive to maintain quality whereas icing killed them. The practice of weighing when landed also required the removal of ice which resulted in delay and physical damage to the *Nephrops*. However, trials have shown that trawled *Nephrops* deteriorated rapidly at high ambient temperatures with resulting loss of freshness and reduced yield of premium product. Correct icing minimises this deterioration in *Nephrops* which are due for some form of fresh or processed product. *Nephrops* destined for the live trade should not be iced.

## Seafish Trials with Icing at Sea

- Comparative commercial trials were carried out from Mallaig on the West Coast of Scotland during the summer. Correct icing to the top and bottom of the boxes was compared with the usual practice of not icing at sea on day boats and top only icing on two day trips.
- To remove the need for weighing ashore, *Nephrops* were weighed at sea using a mechanical check weigh scale (developed by Seafish). All the boxes were further top iced as necessary at landing, as is usual commercial practice.
- The *Nephrops* were then consigned in the usual refrigerated transport to arrive at an East Coast processor within 12 hours of landing.
- The processing of the catches was monitored to compare product quality and commercial yields when sorted by the processor. *Nephrops* not suitable for the premium whole *Nephrops* product were diverted to lower value tail meat products.
- Further trials were carried out to establish the effect on the eating quality of whole *Nephrops* when subjected to delays of 12 and 24 hours at ambient temperatures before icing. These particular samples were dipped in 3% sodium metabisulphite 24 hours after capture.



## Findings

### Temperature

- Direct top and bottom icing chilled *Nephrops* to less than 2°C within 10 hours.
- Top only icing was only partially effective as *Nephrops* in the middle and the bottom of the boxes remained poorly chilled through the processing.
- *Nephrops* left uniced aboard and beyond landing remained above 14°C.

### Quality

- On arrival at the factory the observed standard of freshness of the correctly top and bottom iced *Nephrops* was markedly better than those handled without adequate icing.
- A delay of 12hrs before icing resulted in some loss of freshness and a 24hr delay can result in the loss of all the desirable sweet eating qualities of the *Nephrops*.
- Sodium metabisulphite dipping of whole *Nephrops* reduced blackening but did not prevent spoilage of the flesh.

### Yields

- Delays before icing and inadequate icing increased the commercial rate of rejection from the premium whole *Nephrops* product.
- Weighing at sea returned weights at factory consistently within 4% of the 19kg (3 stone) unit with no boxes under weight.
- Following the trials the processor involved arranged with their trawled *Nephrops* suppliers for the catches to be properly iced at sea and not tipped until weighing at factory.



## Recommendations

- Trawled *Nephrops* are highly perishable and need to be promptly iced at sea and landed soon after catching to ensure high yields of best quality product.
- *Nephrops* (both whole and tailed) should be top and bottom iced with sufficient ice to maintain chill temperatures. For a standard 70 litre box this corresponds to a box loading of about 19kg (3 stone) of whole *Nephrops* and 22kg (3.5 stone) of tails.
- The use of papers between the ice and *Nephrops* is generally not recommended as it will reduce the effectiveness of chilling.
- The practice of tipping and de-icing of *Nephrops* at the quayside is not recommended as it causes damage to the *Nephrops* and reduces chilling. It can be avoided by weighing at sea

and/or at factory.

For further information and reports on this work please contact the Fish Technology Group at the address below. Guidelines on good live handling practice can also be obtained from the Marine Technology Group at the same address.

The Sea Fish Industry Authority  
Seafish House  
St Andrew's Dock  
HULL HU3 4QE  
Telephone: (01482) 327837  
Fax: (01482) 223310