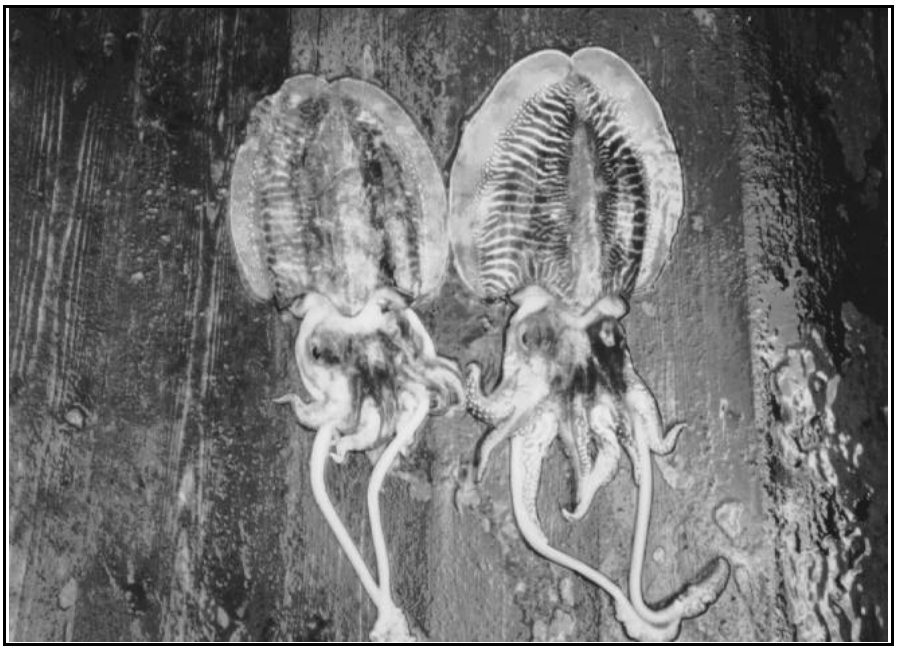
Cuttlefish Quality

Technical Information Sheet No: 1996/04/FT



Handling Trials

Introduction

In May and June 1995, in conjunction with the Marine Technology department's cuttlefish capture trials, the Fish Technology department conducted a small series of trials to investigate factors affecting cuttlefish quality. The aim of these trials was to determine the effects of both icing delay and gutting delay upon cuttlefish quality.

Prior to the trials a preliminary study was carried out to determine if the Torry fish quality scoring scheme for cooked squid was applicable to cuttlefish (see Table 1).

It was found that the flavour changes in cuttlefish matched those of squid and so the scheme was used.

Table 1 - Cooked squid Torry fish quality score scheme

Score	Cooked flavour of squid	Days in ice (ungutted)
10	fresh, characteristic of shellfish, sweet, meaty	
9	slight loss of freshness, creamy, sweet, meaty, metallic	
8	slightly sweet, slightly meaty, creamy, milky	6–8
7	no sweetness, caramel	
6	neutral	8–10
5	slightly sour	
4	sour, musty, cabbage	
3	slightly bitter, overripe cheese, oily, slight sulphide	13–14
2	bitter, sulphide	
1	strongly bitter, putrid	

A number of sea trips were made from Hastings to observe capture and handling and to identify if changes in handling practices at sea are necessary and would be practical.

Cuttlefish were being caught by tangle nets and pots, as part of the Marine Technology

department's cuttlefish capture trials (see Figures 1 and 2).

The normal practice was to store the cuttlefish, ungutted, in plastic fish boxes on the deck of the vessel with no icing or further protection applied (see Figure 3).

The cuttlefish were iced when the vessels came ashore, usually after 6-8 hours (see Figure 4).

Ice was taken to sea for the trials. Cuttlefish samples were taken and some were immediately iced, others were stored at ambient temperatures, 12–18 °C, for various time periods of 6–36 hours.

Results

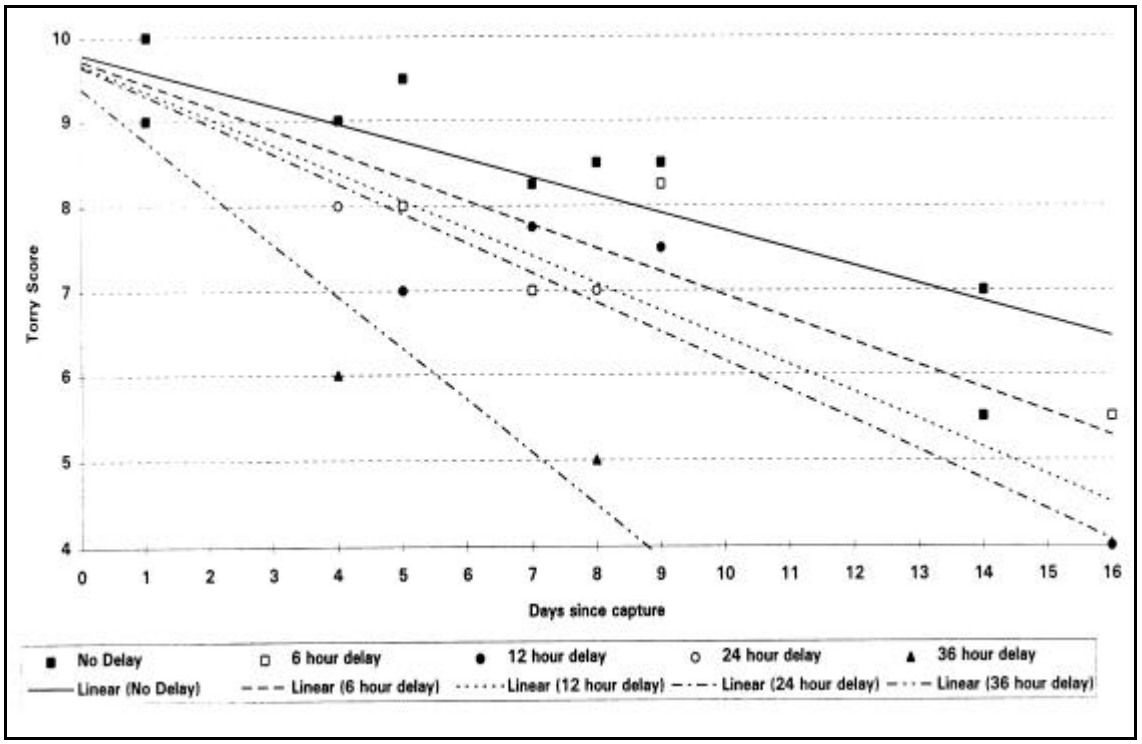
Icing Delay Trials

The Torry cooked fish flavour scoring system is a commonly used indicator of fish quality and useful storage life. The end of the useful storage life of a product is usually defined commercially as when the flavour falls below neutral and off flavours start to develop. This is generally when the Torry score falls below a score of 6, as is the case with

cuttle-fish. The results are detailed in Figure 5 overleaf. These show a deterioration in fish quality, as measured by the Torry score, as the time delay before icing increases. Most striking is the difference between the directly iced, 0 hour, and the 6 hour delay samples. Here a 1 Torry point difference is evident a day after capture and this difference is maintained right through to 16 days after capture. The useful storage life of the directly iced samples is 16 days compared to only 12 days from the 6 hour delay samples. This equates to a 3–4 day shelf-life difference caused by only a 6 hour delay in icing.

Gutting Delay Trials

The gutting delay trials were carried out by comparing cooked flavour scores, from different gutting delays, at various time intervals after capture. The results showed that there was no difference in quality up to 9 days storage ungutted or gutted but by 12 days there was a 2 point quality difference.



Fishing Vessel Observations

Some physical damage was caused to the cuttlefish by both fishing methods used, tangle netting and potting. Cuttlefish taken from tangle nets had surface abrasion to the skin from the netting, though this was not severe and should not affect the end product. Potting resulted in some badly damaged cuttlefish (see Figure 6). Underwater video film showed some of the cuttlefish colliding the posterior end of their body against the side of the pots.

Cuttlefish handling on the vessels was limited to placing the cuttlefish into fish boxes for storage. Washing of the cuttlefish causes problems of the water becoming contaminated with the black cuttlefish ink and staining the vessel deck or fishold. Due to the complicated anatomy of cuttlefish, gutting at sea is not a viable option.

Discussion

Cuttlefish are prone to rapid spoilage if not chilled immediately after capture. However a problem may occur if ice is used as the melt water becomes contaminated by the black cuttlefish ink and causes staining of the vessel's fish room or deck. Contaminated bilge water pumped overboard in port may also cause a problem. On large vessels with refrigerated fishholds, storage of cuttlefish without ice in the fishhold may be acceptable, but cannot be considered as a direct substitute for ice which results in more rapid and effective chilling. To maintain cuttlefish quality on smaller vessels there is no alternative but to use ice.

Apart from icing the cuttlefish, it was evident from the sea trips and these trials that any other handling operation onboard vessel is not feasible or necessary. The gutting delay trials have shown that the gut membrane of the cuttlefish is very strong and for cuttlefish stored from capture at chilled temperatures it takes approximately 9–10 days before this membrane weakens, ruptures and effects the cuttlefish's quality. Gutting cuttlefish is not a simple operation. The process is essentially filleting with the gut removed at the same time. The cuttlefish is separated into a number of components: the mantle, tentacles, head, guts, skin and cuttlebone (see Figure 7). This processing is not suited to a fishing vessel environment. In addition, the washing of the ungutted cuttlefish at sea is not recommended as this exacerbates the ink problem.

It was evident from the sea trips that some damage to cuttlefish is being caused by the capture methods used, especially the pots. Further assessment of the effects of fishing gear upon cuttlefish quality is necessary to fully assess the extent of the problem.

More detailed information is contained within:

465 Jan 96. Cuttlefish Quality and Handling Trials

467 May 96. The Cuttlefish (Sepia Officinalis): A Guide to Its Exploitation in UK Waters

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