

Economics of quality at sea for nephrops

Key Features

Quality practices on board Scottish nephrops vessels improve packout rate and profitability

A recent Seafish study, in association with Seafood Scotland, shows that increased revenues for whole nephrops can be achieved by adopting better on-board handling practices, leading to higher profits for quality vessels. The study focussed on landings of whole nephrops in the north east and the south west of Scotland, sold to two particular processors. Data relating to price and quality were collected and analysed to examine links between practices on board, quality score for the catch, and total value of whole nephrops landed.

Why care for catch quality?

Recent Seafish research illustrated the profit advantages for vessels which landed higher quality whitefish at Peterhead market. Better quality fish on the quayside attracted higher prices on the whole and the cost of delivering quality could be paid for from higher earnings.

But is there a similar story for nephrops? A study was designed to look into rewards for higher quality whole nephrops.

Does quality pay for nephrops vessels?

Research has shown that practices on board nephrops vessels impact on the quality of the nephrops landed – but do the vessels which land better quality nephrops have higher earnings than other vessels?

This study shows that vessels which land higher quality whole nephrops and sell to a processor on a packout rate, can get significantly higher annual revenues if they deliver good quality nephrops and achieve a consistently high packout rate. This means that over a year, vessels will have higher earnings and only marginally higher costs, since quality handling is mainly down to temperature control, hygiene and not overfilling boxes. Higher earnings without significant increase in costs means higher profits than vessels which deliver lower quality whole nephrops to the processor and get a lower packout rate.

The study

Around 15 vessels landing into two specific processors were selected for the study. Catches of whole nephrops from these vessels were given quality scores by the processors and by Seafish staff. The vessels themselves were assessed by Seafish quality advisors and were awarded scores for aspects relating to the quality handling of nephrops.

Data were collected from September to December 2003 on packout rates, prices achieved, costs, on-board practices and fish quality score, with permission from the vessels.

The processor in south west Scotland bought mostly from day boats. The average length of boats in this study was around 14m. The north east processor bought from boats which took 6 to 8 day trips with an average vessel length of around 20m.

Higher packout rate for quality nephrops

When landing whole nephrops to a processor / exporter in Scotland, vessels are often paid according to the volume of their whole nephrops that were actually packed for sale as whole nephrops – this figure is known as the packout rate. Some skippers and processors talk about a discard rate, which is converse – the proportion of whole nephrops that could not be packed for sale as whole, but instead had to be tailed (for a much lower price) or discarded.

Quality scores of vessels were combined with the quality scores from their individual landings to give a combined quality score for each landing. These were compared with the packout rates for each landing to see whether higher quality scores did on average achieve higher packout rates.

The vessels taking part in this study were mostly good quality vessels which were achieving quite high average packout rates in general. Although the actual difference in packout rate between different quality scores is not large, (because the vessels were generally good quality) the results are statistically significant, meaning that the difference in packout rate can be attributed to the difference in quality (see Figure 1). The importance of this is that vessels with poorer quality handling can make a significant improvement to their packout rate by improving their on-board handling methods for whole nephrops.

Fig. 1. Catch quality score and packout rate at south west Scotland processor for landings

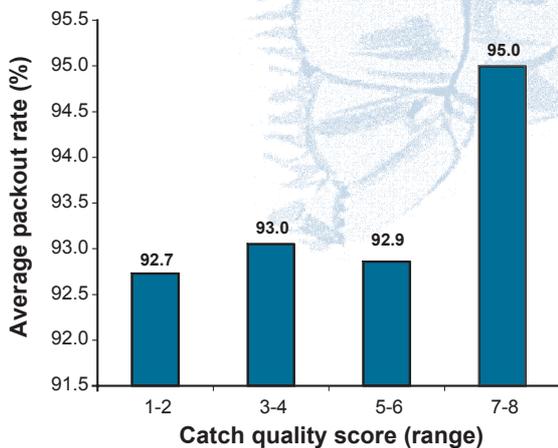
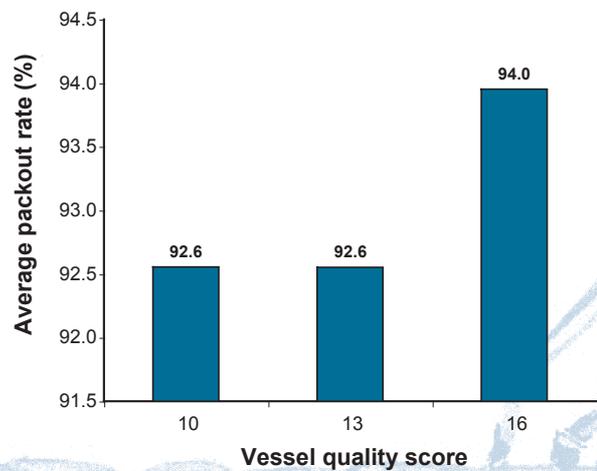


Figure 1 shows the relationship between catch quality score and packout rate at the processor in the south west of Scotland. The quality score took account of temperature, use of ice and whether the boxes were correctly filled or over filled. The highest score possible was 8. This processor commented that other vessels selling to his factory, which were not included in this study, sometimes achieved much lower packout rates, which he believed could be substantially improved if skippers and crew would adopt the quality practices advised by Seafish and Seafood Scotland, especially the use of ice during summer months.

What makes a quality vessel?

Figure 2 shows that vessels with better quality scores achieved higher average packout rates than vessels with lower scores. In this study however, the vessels with lower scores were still fairly good overall vessels. Poorer quality conditions exist on vessels not included in this study and these are the vessels on which the biggest improvements could be made.

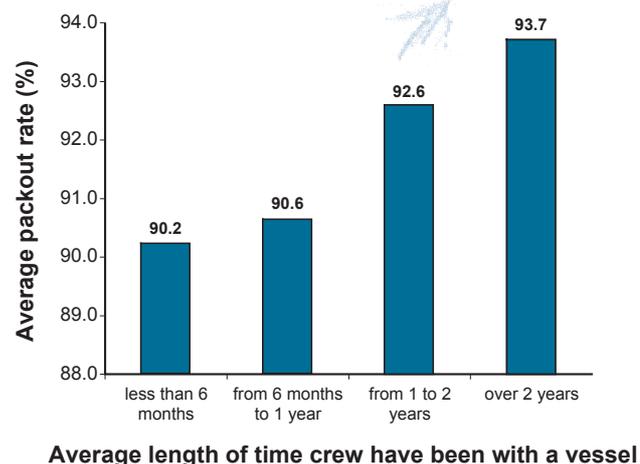
Fig 2. Impact of vessel quality score on packout rate for vessels in south west Scotland



The elements that were assessed to give a quality score to vessels included the hygiene and general cleanliness of the deck area, storage areas, boxes, hoppers, baskets, tables and other handling equipment. Skippers were also asked about weighing at sea, on board cleaning practices, crew experience and temperature of storage areas.

Figure 3 shows what many skippers mentioned in interviews – an experienced crew, with people who are used to working together and know the vessel well, can deliver better quality than a crew which frequently changes. This graph gives an idea of the scale of benefit from keeping regular crew members together on the vessel.

Fig 3. Impact of crew service length on packout rate, south west Scotland



What practices impact on packout rate?

Among the vessels studied in the north east of Scotland, some weighed at sea to ensure boxes were not over filled and these vessels achieved higher packout rates, and therefore higher overall revenues, than those that did not weigh at sea. Ensuring that boxes are not over 20kg leads to less damage of whole nephrops.

Fig 4. Impact of weighing at sea on packout rate, north east Scotland vessels

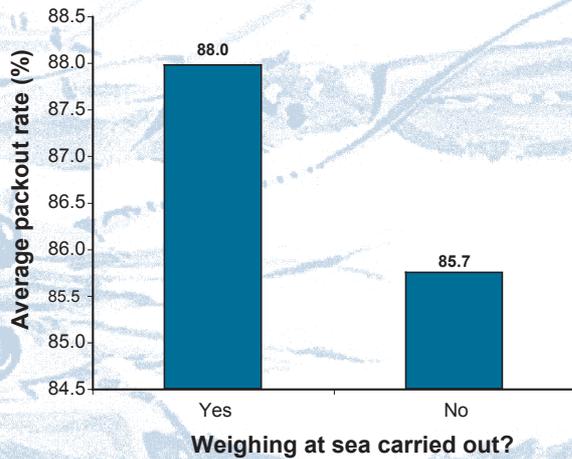


Fig 5. Impact of box weight on packout rate, north east Scotland vessels

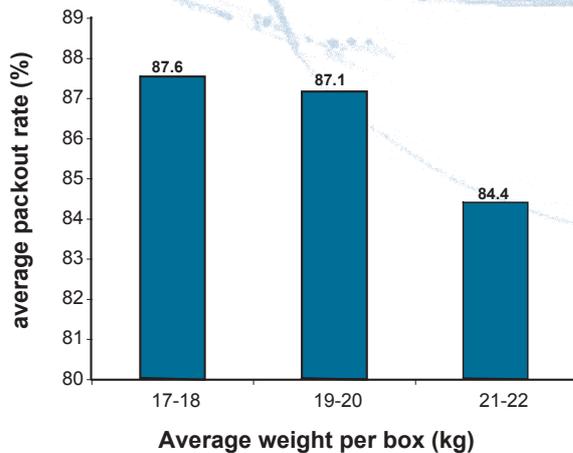


Figure 5 shows that there can be a significant improvement on packout rate, and therefore on earnings for the catch, if the box weight is kept down to 20kg or just below. Even with boxes slightly over 20kg, there is significantly more damage to the whole nephrops and loss of income to the vessel. Although there are other advantages of using scales, the correct weight can be achieved by using a basket with a line drawn to show the fill level that will equal 20kg so that crew can ensure there is no over filling.

Fig 6. Impact of trip length on packout rate, north east Scotland vessels

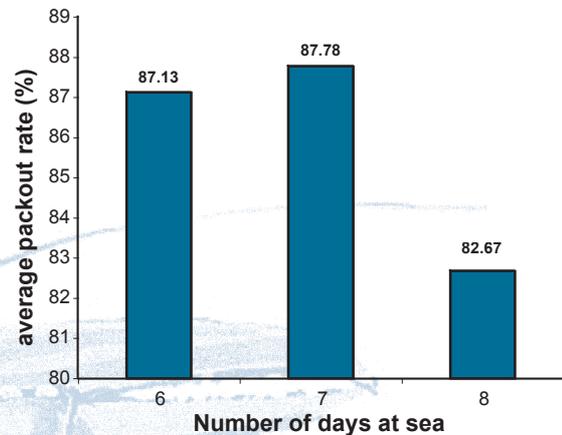


Figure 6 shows that for vessels landing in north east Scotland, there is typically a trade-off between fuel efficiency, volume caught and the packout rate achieved for whole nephrops. These important findings give vessel owners information which they can use to determine how best to manage their vessels.

What does packout rate mean in terms of earnings per year?

For smaller vessels in the south west of Scotland, the difference in revenues for whole nephrops between an 80% packout rate and a 95% packout rate, over one year with 201 landings, could be around £14,000, based on typical prices, as illustrated in table 1.

Packout rate	Trip revenue	Annual revenue
95%	£416.58	£88,730.48
90%	£394.65	£84,060.45
80%	£350.80	£74,720.40
Difference between annual earnings for 95% packout rate and 80% rate:		£14,010.08

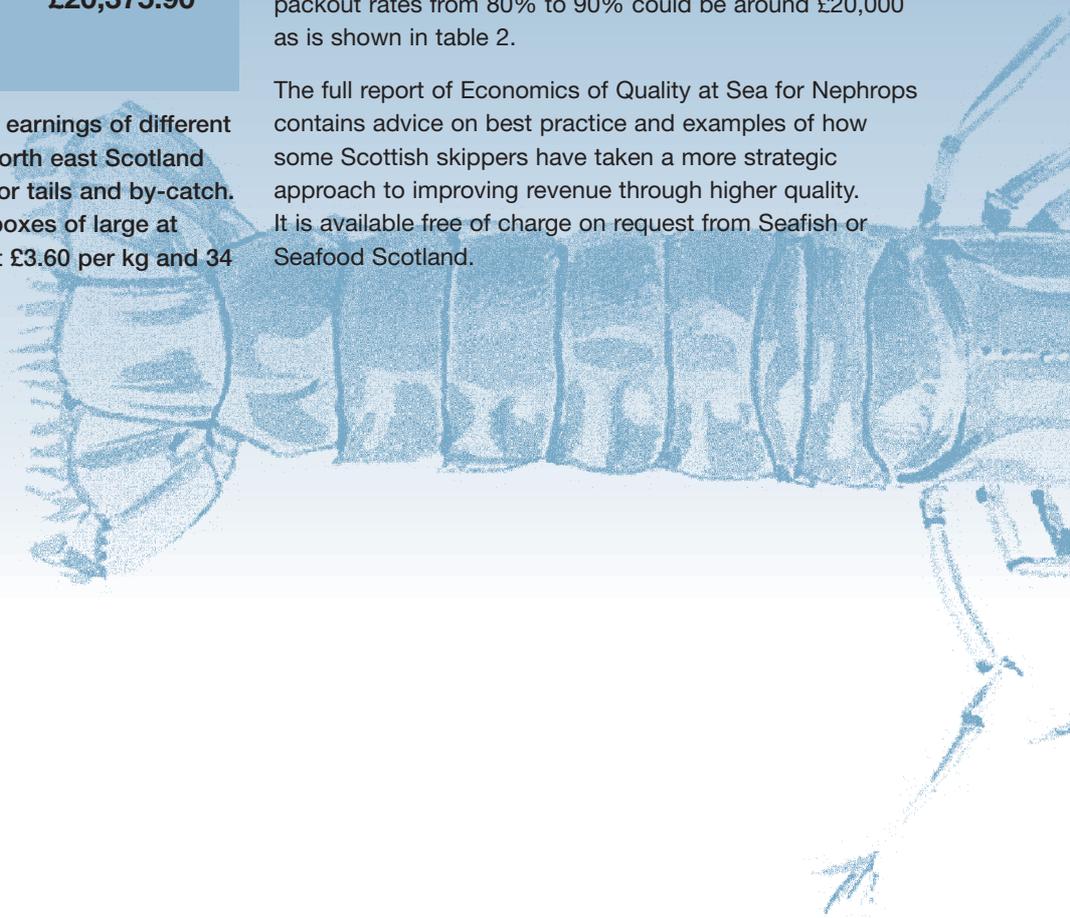
Table 1. Potential impact on annual earnings of different packout rates for whole nephrops, Clyde vessels. Does not include revenue for tails and by-catch. Based on 213 trips, each landing 10kg of large at £9.65 per kg, 60 kg of medium at £3.60 per kg and 70 kg of small at £1.80 per kg.

Packout rate	Trip revenue	Annual revenue
90%	£4,956.30	£183,383.10
85%	£4,680.95	£173,195.15
80%	£4,405.60	£163,007.20
Difference between annual earnings for 90% packout rate and 80% rate:		£20,375.90

Table 2. Potential impact on annual earnings of different packout rates for whole nephrops, north east Scotland vessels. Does not include revenue for tails and by-catch. Based on 37 trips, each landing 11 boxes of large at £9.65 per kg, 30 boxes of medium at £3.60 per kg and 34 boxes of small at £1.80 per kg.

Larger vessels making longer trips in north east Scotland tend to find that their whole nephrops are frozen before export and there are stricter standards in terms of what level of damage to nephrops is acceptable, therefore they tend to have lower average packout rates. The potential difference in revenues for whole nephrops over a year for packout rates from 80% to 90% could be around £20,000 as is shown in table 2.

The full report of Economics of Quality at Sea for Nephrops contains advice on best practice and examples of how some Scottish skippers have taken a more strategic approach to improving revenue through higher quality. It is available free of charge on request from Seafish or Seafood Scotland.



Copies of the full report “*Economics of Quality at Sea for Nephrops*”, HC Curtis, ML Alva and AA Martin, published by Sea Fish Industry Authority, Edinburgh, Jan 2005, may be obtained from:

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This study received FIG grant funding from the EU.

