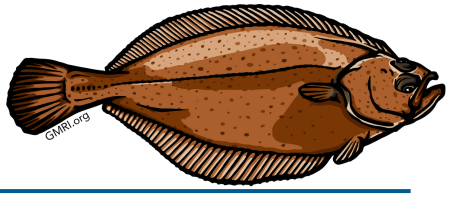
Measuring Quality: American Plaice and Grey Sole



Handling Strategies

Vessel 1: Trawl gear
- Fish stored in slurry ice in vat

Vessel 2: Trawl gear
- Fish stored on ice in the hold

Total fish measured: 1001 American plaice, 577 grey sole (representing an estimated ~2,500 lbs)

Experimental Design

Data on flounders (American plaice and grey sole) were taken opportunistically during experiments focused on haddock and hake trips, as large flounder landing volumes allowed for a significant sample size. Quality was measured several times on the same fish, including on-deck immediately after capture, during offload, and after the catch was stored for several days at the offload facility.

Methods of Measuring Quality

Certified Quality Reader (CQR) – handheld device that runs a small electrical current through fish tissue to measure resistance; higher numbers indicate higher quality.

Key Results

Across all sampling, the average CQR score was 12 for American plaice and 17 for grey sole, indicating average to good quality.

- **On trip 1** (Vessel 1), project staff were onboard and recorded quality measurements directly after capture, resulting in average CQR scores of 18 (plaice) and 20 (sole), representing the higher end of quality values. Quality measurements were repeated on samples of these fish after 1 day and then after 3 days of storage:
  - Average CQR scores of plaice from trip 1 decreased from an initial score of 18 to 11 after 1 day (39% decrease) and decreased further after 3 days to a score of 5 (72% decrease).
  - Average CQR scores of grey sole from trip 1 decreased from an initial score of 20 to 15 after 1-3 days (25% decrease).
  - It was determined that the notable drop in scores was because the slurry was not maintained properly. Too much ice had melted and fish were immersed in too much freshwater and had an off odor.

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For more details on this experiment with this species and results on quality experiments with a range of other species, visit gmri.org/quality.

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Key Results cont.

- **On trip 2** (Vessel 1) the slurry technique was adjusted by cooling fish on ice before adding to slurry, and adding salt to reduce temp further. Fish measured after 1 day of storage averaged CQR scores of 12 (plaice) and 15 (sole). This was comparable to the average scores (12 and 17) for fish measured across all trips and indicated the improved slurry did not damage fish quality as it had in trip 1.
- A sample size of 250+ fish from Vessel 2 measured during offload did not show a pattern in quality from top to bottom of the hold.

Takeaways

- Slurry ice is effective for rapid chilling, but requires monitoring of temperature and texture when used for longer storage.
- Heat from fish will melt ice in a slurry and can cause the mixture to be too watery and decrease the salinity.
- Additional ice and salt may need to be added until the temperature stabilizes (i.e., no more heat from fish causing melting).
- The texture of a slurry should be thick like oatmeal and be capable of suspending a fish.
- American plaice appear more susceptible to damage from improper slurry than grey sole.
- Based on other experiments and CQR results, round fish quality appears more sensitive to potential damage (crushing) during storage in the fish hold than flounders.

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