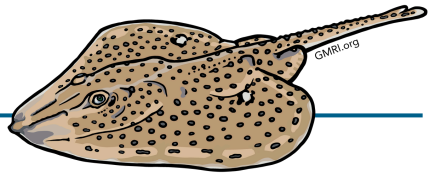
Measuring Quality: Skate



Handling Strategies

Gear: Gillnet **Trip Length:** 1-2 days

Skate quality was measured during offload and again after truck transport to a processing facility.

Vessel 1:

- Flowing seawater to cool catch on deck in the checker pen
- Compare quality of top, middle and bottom of the pile

Vessel 2:

- Compare cutting wings vs. whole
- Compare using ice vs. not using ice

Total fish measured: 505 whole skate across the 2 vessels (representing an estimated ~4,000-5,000 lbs)

Methods of Measuring Quality

Certified Quality Reader (CQR): Hand held device that runs a small electrical current through fish tissue to measure resistance and signs of good/bad quality; higher numbers indicate higher quality.

Quality Index Method (QIM): Visual/physical assessment of fish characteristic categories (e.g. color, firmness, smell, etc), based on a demerit point system. A lower total number indicates higher quality. Characteristics and possible points vary for different species and need to be developed for skate.

Temperature data: Tracked fish temperature with digital loggers on the vessels through offload and during trucking to a processing facility.

Skate quality was challenging to measure due to slime, anatomy, and lack of existing assessment materials.

Key Results

- QIM assessments of skates at the various levels of the pile on deck indicated that the bottom layer had the lowest quality. There was an increasing presence of slight bruising with 20% on the top, 47% in the middle and 73% in the bottom layer.
- The temperature profile experienced by the bottom layer stayed the most consistent, being the most insulated, while the top and middle layers showed more variation in temperatures.
- The CQR and QIM could not detect significant differences in quality for different chilling methods. Neither vessel achieved a temperature of below 40 F (skates were above 45 F on vessel 1 and above 50 F on vessel 2). This suggests not enough ice was used or the flowing seawater was not cold enough to have a significant impact.
- There was no measurable quality difference in CQR scores between cut skate wings or whole skate. However, degradation of cut wings due to any bacteria exposure or improper cutting technique might not show up until later in the form of reduced yield or shelf life.

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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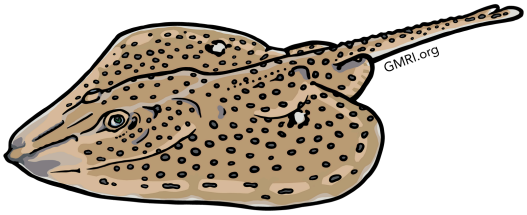

Key Results (continued)

Trucking to the processing facility:

- Vessel 1: the QIM showed that the skates from the top and middle of the pile declined in quality between the dock and being measured at the processing facility. (The bottom of the pile was lower quality overall, but consistent at both dock and processor.) Temperature on the truck never got below 40 F, which may have contributed to the top/middle decline.

- Vessel 2: quality increased slightly when measured after trucking. However, the temperature of skates on deck never went below 50 F (with the exception of 1 tote that was iced) and the air temperature was in the 80s. While the truck still did not dip below 40 F, the temperature steadily decreased from start to finish of each truck trip. This suggests there is opportunity to preserve quality by bringing the temperature down even after landing.

Takeaways

- **Layer ice** in the bottom, middle, and top of the catch to prevent hot spots or variation in temperature.

- **Use temperature loggers** at the bottom, middle and top of the pen to monitor temperature and determine appropriate amount of ice. **Goal is to maintain temperature below 40 F.**

- Skate would benefit from **more research** to determine if QIM and CQR measurement techniques are appropriate given the lack of correlation seen in the two data collection methods. A shelf-life study would help clarify expected ranges of skate quality scores.

- To achieve higher quality, **consistent application of ice** is needed to further chill the catch on deck, even when fishing in cooler seawater temperature or in cooler shoulder seasons.

- Transport skate with a **refrigerated truck** to maintain quality. Ensure the truck is adequately chilled before loading.

- Consider using **false bottoms** in the middle of the on-deck pen to reduce bruising on skates crushed in the bottom of the pile.

- Quality impacts such as shelf-life, yield and ability to adequately cool the product should also be considered when assessing the value between whole skate to cut wings.

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