Techniques for extraction of otoliths

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Sampling of otoliths

for

Age determination
Stable isotope analyses
etc…

Otoliths (3 pairs)

- Sagitta (largest)
- Lapillus
- Asteriscus

[Longline fishery]

Japan has collected from...

28 individuals in 2008-09.

(Atlantic bluefin tuna)

349 individuals in 2009.

(Southern bluefin tuna)

Why use drill?

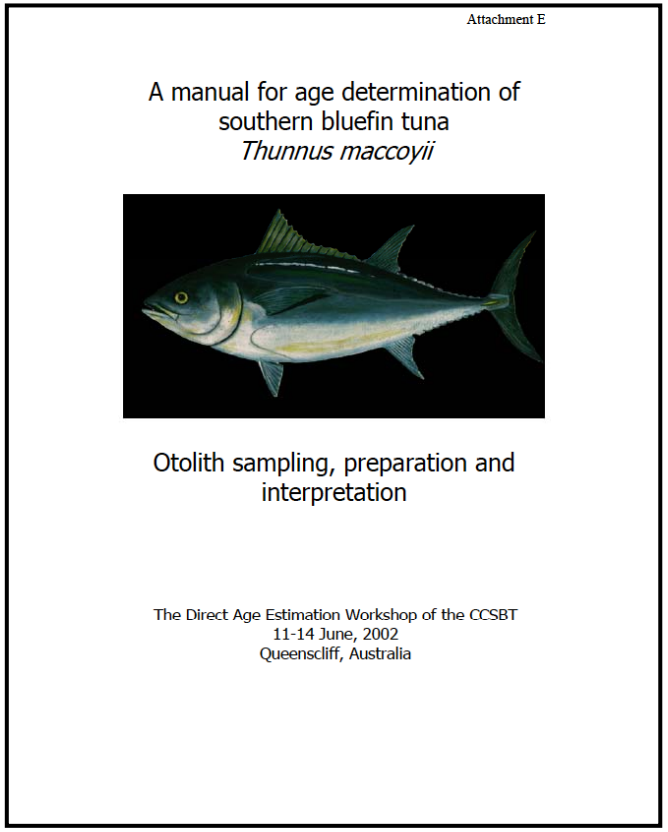
Japanese product type is mostly “Gilled and Gutted” (Head is not removed).

To achieve the maximum market price,
sashimi tuna must appear intact and undamaged.

In Japanese culture,
the entire head of tuna is often cooked / consumed.

Why use drill?

The otoliths are taken from the posterior region of the skull.


Attachment E

A manual for age determination of southern bluefin tuna
Thunnus maccoyii

Otolith sampling, preparation and interpretation

The Direct Age Estimation Workshop of the CCSBT
11-14 June, 2002
Queenscliff, Australia

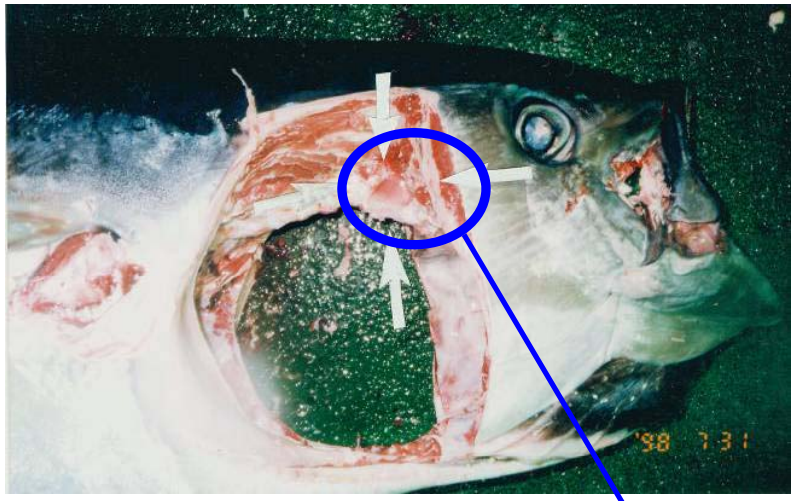
This technique was developed by Thorogood (1986)*1), and adapted by CCSBT.

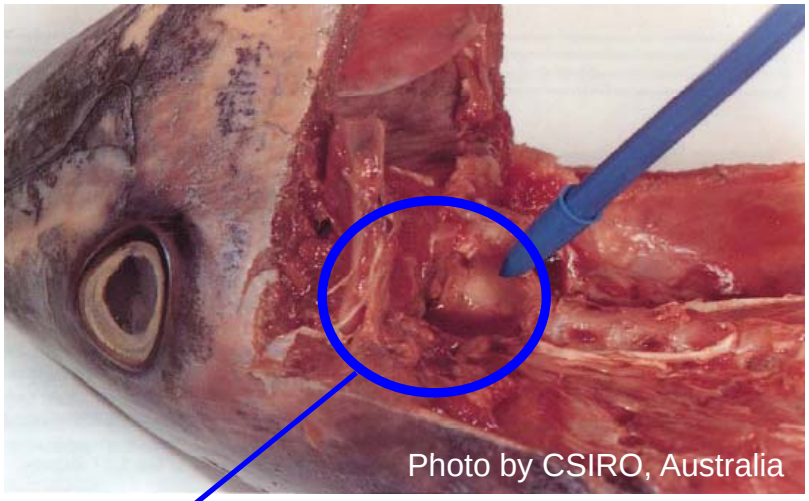
http://www.ccsbt.org/docs/pdf/meeting_reports/ccsbt_9/report_of_daews.pdf

1) Thorogood J. (1986) New technique for sampling otoliths of sashimi-grade scombrid fishes. Transactions of the American Fisheries Society 1986; 115: 913-914

Procedures

(1) Prepare the Gilled and Gutted products of tuna.





The points of entry for the drill

This area will be exposed when the tuna are dressed with operculae removed.

Procedures

(2) Prepare a battery-powered drill with a hole-saw.

Drill

Hole-saw
(core bit)

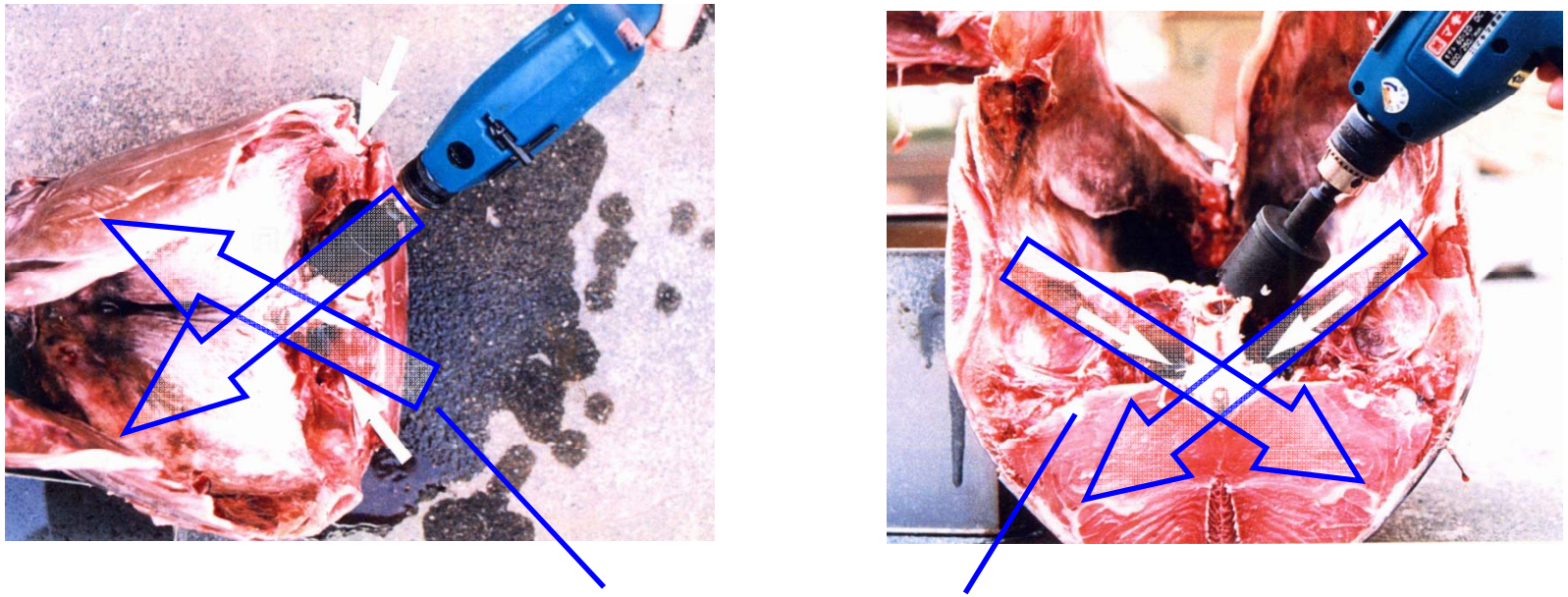
For the frozen fish,
a more powerful drill is
needed.

Diameter of the core bit

- ø 35 mm (<135 cm FL)
- ø 45 mm (135-170 cm FL)
- ø 55 mm (>170 cm FL)

Procedures

(3) Drill through the basi-occipital plates towards the back of the opposite eye.



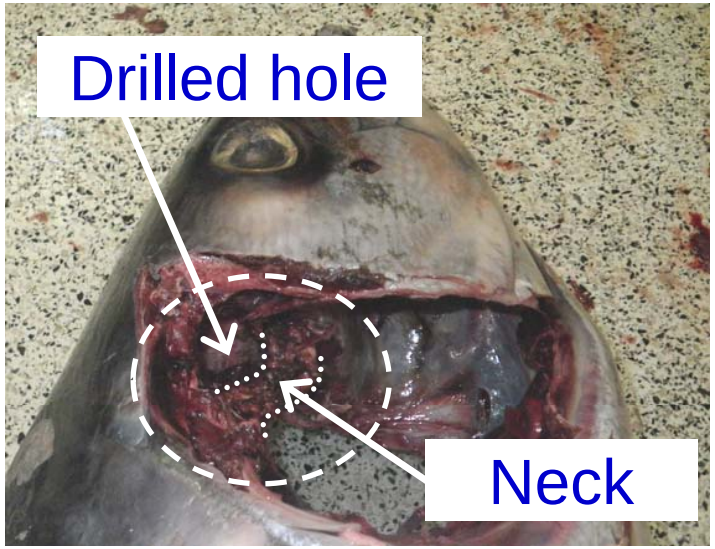
The directions to drill

To extract the otoliths, the fish is turned onto its back and the core obtained by drilling from either side of the cranium.

Procedures

(4) !!ATTENTION!! When drilling from either side, take care not to damage the fish's neck.

Drilling

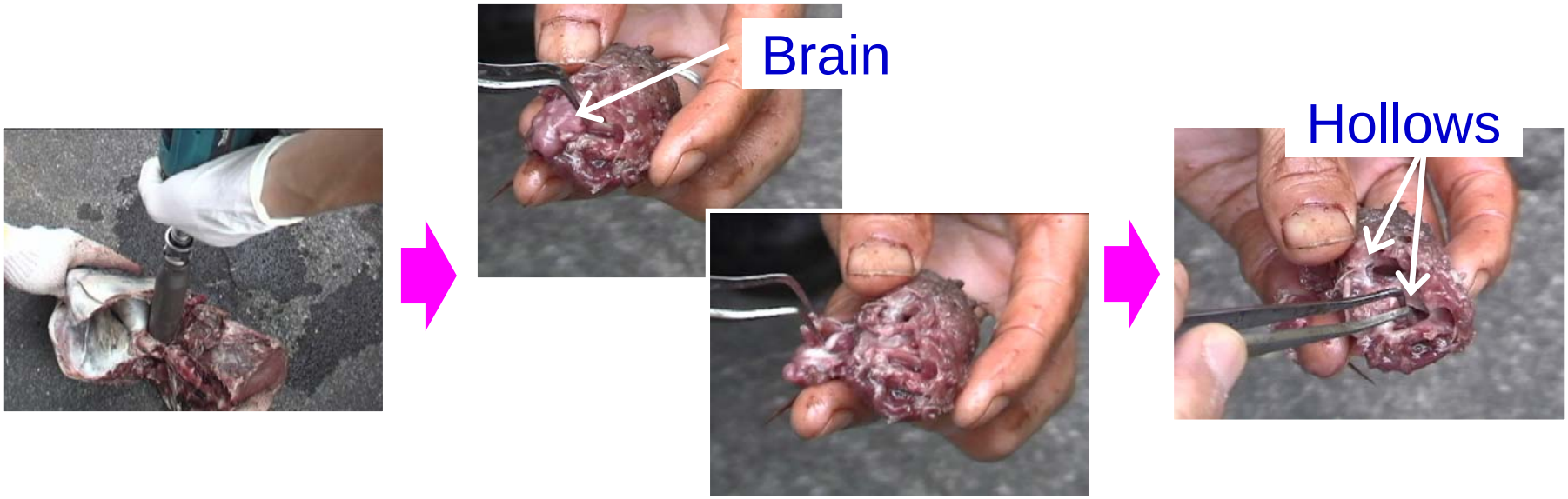


Damaging neck becomes the cause of head removing.

Commercial value ➡ Decrease

Procedures

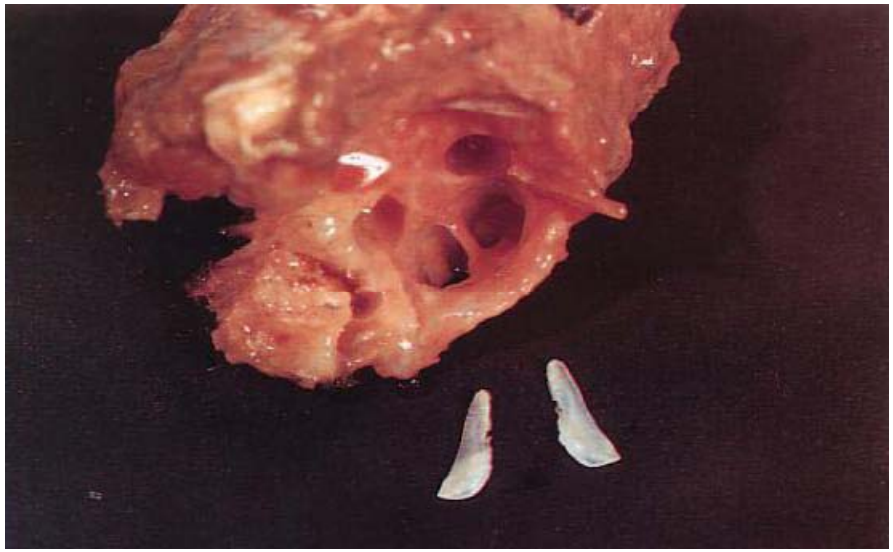
(5) After the drilling from either side, the cores can be disconnected easily from the skull.



The large hollows should be visible underneath the brain.
Otoliths may be resting inside the hollows.

Procedures

(6) A correctly-drilled core should contain the otoliths.



An experienced sampler will understand where the otoliths are situated, which will ensure the positioning and the angle of the hole-saw are correct.

Video

Equipment (Hole-saw)

Poly-clic Percussion core bit (MIYANAGA CO. LTD.)

http://www.miyanaga.co.jp/engl/products/polyclic/s_core.html