The conventional method of estimating fish age is by counting rings (annuli) found in fish otoliths. Otoliths are calcium carbonate bone-like structures found in the inner ear. Otoliths contain patterns of concentric rings, similar to those seen in tree trunks, but often not as explicit. Biologists also can use radionuclides to estimate fish age.

A sablefish otolith showing three clear annuli.

A sablefish otolith with approximately 20 annuli. Note that the last 15 annuli are difficult to distinguish.

Normal Ageing Procedure
Otoliths are examined using a microscope to count the number of annuli.

Equipment used for separating radionuclides from otoliths.

Radiometric Ageing Procedure
Radionuclides can be used as an alternative method to estimate fish age. Therefore, ages from radionuclides are a method to validate that the counted number of annuli is close to the true age.

These two nuclides are incorporated from sea water into the otoliths during fish growth.

Nuclear instruments are used to measure the radionuclides.

The relative concentration of the two radionuclides is used to estimate fish age.