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Methods of Measuring Fish

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Accounts of methods used to measure fish have been received from Canada, Iceland, Portugal, Spain, United Kingdom (England and Wales, Scotland) and United States.

They are as follows:

- Canada: (a) All groundfish species are measured to the mid-point of the fork of the caudal fin; i. e., fork length (if the tail is rounded, measurement is made to the end of the caudal fin). Measurements are made from the most anterior part of the head region. For some species, this is the tip of the snout, for others, the tip of the lower jaw with the mouth closed.
- (b) The whole fish, including the tail, is placed parallel to the measuring stick; i. e., the tail is straightened out in all cases.
- (c) Measurements are recorded to the nearest centimetre. Thus a length of 40 centimetres includes, as nearly as can be judged visually, all fish between 39.5 and 40.5 centimetres.
- (d) The measuring stick is offset 0.5 centimetres from the head board and the length recorded for each fish is the first whole centimetre beyond the mid-point of the fork of the tail.
- (e) Fish lengths are recorded in centimetre units. In compilation, measurements may be grouped. For cod, 3 centimetre groups are commonly used; for haddock, 2 centimetre groups. For most other species, lengths are not grouped.

Measuring Devices

- (a) Basically all the measuring devices have a measuring stick set into a long wooden board with a headboard at one end. The anterior tip of the fish is butted against the head board.
- (b) The measuring stick may be of wood, graduated in millimetres, *or of stainless steel*, graduated in centimetres. In all cases, it is offset 0.5 centimetres from the headboard.

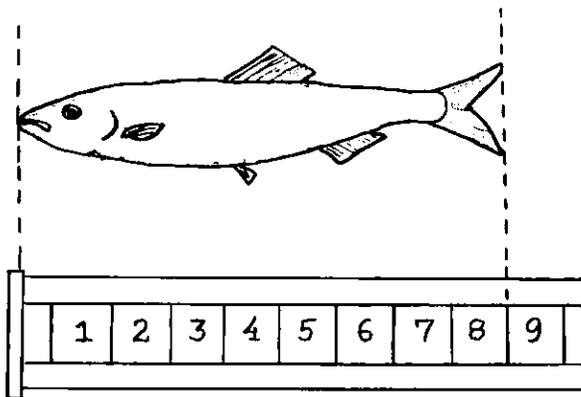
- (c) The measuring board is *usually* 100 centimetres long with provision for extension.
- (d) For some projects, such as mesh selection, punch strips are used for measuring fish. Aluminium strips of 0.016 gauge by 4 inches wide are very satisfactory. Slotted brass guide bars are used to hold the strips in place. Lengths are recorded by punching a small hole at the mid-point of the fork of the fish's tail. The length frequency is compiled by placing a celluloid grid, graduated into centimetres, over the aluminum strip and counting the number of punches in each centimetre space.

Denmark: (by Dr. E.M. Poulsen)

Fish are measured from the most anterior point to the line joining the lobes of the caudal fin (except where these lobes are relatively long and flexible e. g. herring, when the measurement is made to the end of the lobe laid out along the main axis of the fish i. e. as in U.K.). Measurements is made to the centimetre below and 0.5 cms. are added to the mean value calculated to get the true mean length.

Iceland:

All species are measured from the snout to the line joining the lobes of the tail, (see diagram). The measurement board is offset 0.5 cms. to permit readings *to the nearest centimetre* to be made easily, (Idea originally due to Einar Lea). All measurements are made to the nearest cms. except for small fish which may be measured to the nearest m/m.



For instance, all fish which fall inside the area marked 9 are recorded as 9 cm. long.

Portugal:

Cod are measured from the anterior tip of snout to mid-fork of tail. Measurements are recorded to the nearest centimetre.

Spain: The method of measuring fish is the one used in Canadian laboratories. Measurement is made from the most anterior tip of the snout to the fork of the caudal fin. Measurements are read to the nearest centimetre. (The measuring board is offset 0.5 cm.). As in many investigations the measurement was made to the vertical line uniting the two lobes of the caudal fin, the relationship between the two methods of measurement is of interest. Rojo in Document No.13 presents data (Fig.2) which gives the following conversion factors:

To convert from measurements made to mid-fork to measurements to lobe x by 1.036
 To convert from measurements made to lobes to measurements to midfork x by 0.965

United Kingdom: In England and Wales with the exception of rays, fish are measured by being stretched along a board containing a centimetre scale and furnished with a head-stop at one end. The nose of the fish is brought up to the head-stop and the body laid flat along the scale, so that the extreme length may be read off on the scale. The extreme length is considered to be that of the end of the longest caudal fluke when smoothed by hand to lie lengthways. The length is taken to the nearest whole unit below, e.g. when measuring in centimetres, a fish of 35.9 cm. would be set down as 35 cm. When the results are processed for tabulation 0.5 cm. is added to order to allow for the size distribution within the centimetre above that measured. For small fish the unit of measurement is 1 mm. and for large species the measurements are sometimes grouped at 5 cm. intervals. In the case of skates and rays the dimension used for measurement is the extreme width across the "wings", i.e. from wing-tip to wing-tip.

Scotland - Methods of fish measurement used in Scotland: A measuring board with a scale divided into cm. and mm. is used except in special cases. The fish is laid evenly on the board, the snout being brought against a stop at the zero end of the scale. Measurement is made to the end of the longest lobe of the tail fin brought into line with the midline of the body. The only exception is halibut, which are measured to the fork of the tail. In large fishes such as sharks or large halibut, a tape measure is used. The dimension used for skates and rays is the greatest width across the disc, i.e. from wing-tip to wing-tip. Length measurements are given to the nearest cm. (36.5 to 37.4 cm. = 37 cm.) in all species except herring which are measured to the nearest mm.

United States: The instrument and method of measuring fish used by United States investigators are as follows: The device commonly employed for measuring individuals is a wooden meter stick, graduated in millimeters. The meter stick is counter-sunk flush in a broader supporting board with a headboard at the left-hand or zero end carefully fitted to correspond with the index mark on the meter stick.

United States: (cont'd)

When large number are to be measured, a similar board is used but a thin metal strip about 8 x 50 cm. is substituted for the meter stick. A small dent is made in the metal at the distal end of the caudal fin as de-scribed below. When the metal strip is later measured it yields the lengths of all the fish thus recorded on it. This system is rarely if ever used where precision of more than whole centimetres is required.

The actual method of measurement for all ICNAF species (as listed in the Statistical Bulletin, Vol.3, p.18) is as follows:

With mouth closed and fish pressed flat on measuring board, the most anterior point of protrusion of snout or jaw is pressed lightly against the headboard. The distal end of the median caudal filaments is flattened on the scale and the length is here taken, usually to the nearest whole millimeter. When lengths are recorded to whole centimeters only the measurements are not rounded off in the usual manner, rather the third digit of the millimeter measurement is dropped, i.e. the same specimen would be recorded as 537 mm. or 53 cm. Thus the mean length of the fish recorded as 53 cm. would be 53.5 cm. rather than 53.0 cm.

Summary	Measured From		- Measured To -			- Measured To -	
	Snout ¹⁾ or Jaw	Snout	Mid-Point of Fork	Lines Joining Lobes of Caudal Fin	End of Longest Caudal Lobe brought into line of Main Axis	nearest centimetre	centimetre below
Canada	✓		✓			✓	
Denmark cod & herring &c	✓			✓			✓
Iceland	✓			✓	✓	✓	
Portugal	✓		✓			✓	
Spain	✓		✓			✓	
England		✓			✓	✓	✓
Scotland		✓	*		✓	✓	
United States	✓		✓				✓

¹⁾ whichever protrudes

* halibut are measured to midpoint of fork

- The End -