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Mercury Content in Danish Marine Fishes

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Danish data on Hg in fishes are few and scattered. References (1) and (2) - both in Danish - give the full information so far published. For the present purpose the Danish Isotope Centre has kindly placed some additional data at my disposal.

All determinations of Hg given in this paper were made by D.I.C. Method: activation analysis according to reference (3). Mercuric content is expressed in ng Hg per g wet weight (1 ng (nannogram) = 10^{-9} g. Thus 1 ppm (mg/kg) equals 1000 ng/g).

Published data, references (1) and (2).

The papers cited give an account of an investigation sponsored by the National Health Service of Denmark ("Sundhedsstyrelsen"). From this I have collected all Hg-data (132 samples) on fishes caught in marine environment. They are arranged in table 1 next page.

The Karrebæk Fjord area was chosen while local industrial activities made you expect to find high mercury levels here. With reference to Swedish results also The Sound was presumed to be a contaminated area. "Other coastal areas" (not specified here) were intended to form a natural background.

A reasonable conclusion from the sparse data in table 1 must be, that you actually found what could be expected. Note that some of the Hg-figures in the suspected areas surpass the limit (1000 ng Hg/g) fixed by Sweden for prohibiting local fisheries.

Table 1.

<u>Area</u>	<u>Species</u>	<u>Nb.of Spl.s</u>	<u>Hg content, ng Hg/g</u>	
			<u>mean</u>	<u>range</u>
Karrebæk Fj. complex	Eel,yellow	20	<u>667</u>	61 - 2692
	Eel,silver	15	<u>389</u>	61 - 1405
	Flounder	17	<u>784</u>	80 - 1697
The Sound	Cod	15	<u>604</u>	141 - 1290
	Flounder	5	<u>425</u>	98 - 893
	Plaice	15	<u>239</u>	47 - 496
Other coastal waters	Eel,yellow	20	<u>204</u>	31 - 520
	Eel,silver	9	<u>111</u>	41 - 369
	Flounder	10	<u>158</u>	32 - 488
North Sea	Cod	3	<u>172</u>	158 - 186
	Sole	3	<u>72</u>	67 - 77
Greenland	Cod,filets	5	<u>19</u>	13 - 26

Table 2. 36 samples from Danish waters, all from 1970

<u>Area</u>	<u>Species</u>	<u>ng Hg/g (indiv. det.s)</u>
Isefjord	Eel	21,41,54,135.
	Cod	88,97.
	Flounder	27,59.
Kattegat	Cod	112,114,153,202.
	Plaice	22,38.
Limfjord	Eel	148,148,197,303,306.
	Cod	139,144.
	Flounder	58,115,170,217.
	Plaice	54,57.
	Herring	51,61,66.
	Gar-pike	112,113.
	Sea scorpion	71,164,422.
Viviparous blenny	432.	

Additional data

Mercury content of 36 fish from different coastal areas are given in table 2. The general picture is very much the same as stated for 39 fish from "other coastal areas" in table 1.

Adding the two data groups (75 fish) we may very roughly characterize the mercury levels in coastal areas (where no special contamination is known of) as follows: abt. 75% of the fish have mercury levels below 200 ng Hg/g while abt. 25% show values between 200 and 500 ng Hg/g.

16 samples from Greenland (incl. 5 spl.s from table 1) show definite lower levels than those found in coastal areas of Southern Denmark.

<u>Greenland.</u>	<u>ng Hg/g (indiv.det.s)</u>
Catfish	68,82,83,140,240.
Cod	31,35,53,58.
Blue Halibut	33.
Capelin	14.

It is concluded, that much more research in the field of mercury contamination in fish should be carried out in Danish waters. The almost entire lack of data from fish caught in the open sea is evident.

References.

- (1) Kviksølvundersøgelser af danske æg, svineleverer og fisk. "Fra Sundhedsstyrelsen". Følgeblad til Ugeskrift for Læger. 5(8):81-89. October 1969.
- (2) Sundhedsstyrelsens fortsatte undersøgelser vedrørende kviksølvforureningen i visse danske farvande. Ibid. 5(17):213-215. August 1970.
- (3) Sjöstrand, B.;1964: Anal.Chem. 36:814.