

Residues of DDT and Its Degradation Products in Cod Liver from Two Norwegian Fjords

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In the orchards in the hills along some of the fjords of the Norwegian West coast, a considerable amount of DDT has been sprayed.

This preliminary study was performed in order to see if this use of DDT leads to residues in the aquatic biota. The cod (*Gadus morrhua* L.) was chosen as the test organism because it is relatively high up in the food web and residues are therefore likely to be accumulated in their livers which are rich in fat. These cod are relatively stationary and any local contamination should be accumulated in these fish.

Cod from Sognefjorden, where there is intensive fruit production, and cod from Dalsfjorden, with no fruit growing, were caught in the fall of 1969 and immediately frozen until analysis could be carried out by gas chromatography (1) after cleanup on a celite-sulfuric acid column (2). Quantitative separation of DDD and DDT was obtained on a 11% (QF-1+OV-17) GLC-column and results were confirmed by dehydrochlorination.

TABLE 1

Average residues (ppm) in cod liver (wet weight) from two Norwegian fjords. Standard deviations and ranges are given in brackets.

Sample Size	Dalsfjorden 19	Sognefjorden 5
DDT	0.6 (0.22) (0.26-1.12)	5.05 (6.32) (0.98-17.41)
DDE	0.27 (0.11) (0.09-0.56)	2.67 (2.73) (0.69-7.29)
DDD	0.42 (0.19) (0.15-0.98)	1.85 (2.95) (0.18-7.72)
Total	1.28 (0.47) (0.57-2.15)	9.57 (11.96) (1.98-33.07)

The table shows that the residues on the average, are 7.5 times higher in Sognefjorden than in Dalsfjorden, and the relative standard deviation is as much as 3.4 times higher. Although the samples taken from Sognefjorden were few, the figures indicate that local DDT spraying in the orchards has led to some contamination of the aquatic biota.

A correlation between cod weight and liver residue level seems to exist for the Dalsfjord cod samples (fig. 1). A lower limit of residue level, dependent of the size of the fish (indicated in the diagram by a broken line) seems apparent.

The use of DDT was banned from Oct. 1. 1970 (3). The influence of the ban on the residues in cod liver will be investigated in later studies.

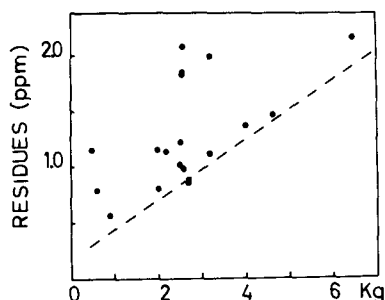


Fig. 1. Residues in ppm of DDT plus metabolites in cod liver (wet weight). An apparent lower limit of residue, dependent of the cod weight are indicated by a broken line.

REFERENCES

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