Table III. Composition of Fillets from Iced and Brine-Chilled Fish

Part	Moisture, %		Oil, %		Protein, %		Ash, %		Sodium, Mg./100 Grams		Potassium, Mg./100 Grams	
	Av.	Range	Av.	Range	Av.	Range	Av.	Range	Av.	Range	Av.	Range
8 days in ice												
Dorsal	57.5	49.9–65.0	31.7	23.8–39.6	11.5	11.1–11.8	0.6	0.6	62	44–79	110	108–112
Lateral	71.4	70.3–73.2	10.2	8.5–11.4	18.1	17.8–18.3	1.0	1.0–1.1	52	46–61	202	190–217
Belly flaps	75.8	74.1–77.6	6.8	4.4–9.1	17.7	16.9–18.4	0.7	0.6–0.7	53	45–60	104	82–125
Light meat	77.9	77.6–78.5	1.8	1.5–2.3	20.4	20.1–20.8	1.0	0.9–1.1	59	52–72	241	222–259
14 days in ice												
Dorsal	59.4	56.6–62.1	21.7	20.1–23.9	15.2[a]	...	1.1	0.6–1.5	44	33–55	134	111–157
Lateral	72.4	70.6–74.2	10.1	8.2–11.7	17.3	17.1–17.5	1.0	0.9–1.0	52	42–60	170	150–187
Belly flaps	78.8	77.8–79.9	4.3	3.5–5.3	17.1	16.8–17.3	0.5	0.4–0.5	43	27–57	82	62–93
Light meat	79.3	78.6–79.7	1.3	1.1–1.6	19.6	19.2–20.2	0.9	0.8–0.9	54	42–66	182	174–192
8 days in brine												
Dorsal[a]	70.2	...	18.0	...	9.8	...	1.8	...	608	...	65	...
Lateral	71.0	69.7–73.1	12.0	9.6–13.6	15.7	15.4–15.9	1.7	1.6–1.8	535	410–627	109	95–122
Belly flaps	80.7	77.8–83.2	4.9	3.2– 7.1	12.6	11.9–13.2	2.2	2.0–2.3	794	639–954	52	43–63
Light meat	78.4	78.0–78.9	1.5	1.3– 1.7	19.1	18.5–19.7	1.8	1.8–1.9	520	480–554	147	135–165
8 days in brine followed by 6 days in ice												
Dorsal	54.1	47.3–60.9	29.4	22.0–38.0	13.9	12.6–15.8	0.8	0.6–0.9	232	172–271	60	56–69
Lateral	71.7	69.6–73.6	11.3	8.7–13.9	16.0	15.1–16.8	1.2	1.1–1.2	313	307–323	98	82–112
Belly flaps	79.5	77.6–81.0	5.9	5.0– 6.6	13.9	13.0–14.4	1.1	1.0–1.2	342	297–396	43	39–47
Light meat	79.0	78.9–79.1	1.8	1.8	18.7	18.4–18.9	1.4	1.4	379	358–407	104	93–110

[a] Only one value due to lack of sample.

the other hand, when the potassium value was above 300, the protein content was usually above 20%.

Mineral Content of Iced Fish. The eviscerated fish stored in ice had about the same variations in moisture (50 to 80%), oil (1 to 40%), and protein (11 to 21%) (Table III) as samples prepared from the fresh fish. This was not the case, however, for ash, sodium, and potassium. The ash decreased by 0.25, the sodium by 0.10, and the potassium by 0.5 of their initial values.

Mineral Content of Brine-Chilled Fish. The eviscerated fish that were stored first in brine and then in ice had about the same ranges in composition as had the iced samples for moisture (47 to 83%), oil (1.3 to 38%), and protein (12 to 20%) (Table III), but the ash and metal ion contents showed much greater variations. After storage of the fish in brine for 8 days, the ash content increased by half and the sodium content ninefold, but the potassium content decreased by more than half. Because the brine contained only sodium chloride, there could be no uptake of potassium. Much of its apparent loss could be due to the large uptake of sodium when calculated on a proportional basis. In the samples that were iced after brine storage, there was extensive leaching of all three constituents. The ash dropped by one fourth but was still higher than normal. About one third of the sodium leached out, but the value was still about five times the normal value found in fresh flesh. Potassium continued to decrease, and the drop was about the same as for sodium (0.33).

Organoleptic Changes. Differences in quality between iced and brine-chilled fish were small. No objectionable flavors were detected in the fillets cut from the brine-chilled fish. These fillets, however, did have a salty taste. The sodium content of the brine-stored samples was approximately that found in the commercially canned product. Although storage of fish in ice subsequent to brine-chilling leached out a large part of the absorbed sodium, the level was still several times that found in fresh fish. It is not known if this level of salt would be objectionable to the consumer of the fresh product. The producer who specializes in dietetic packs should be aware of the increased sodium content of brine-chilled fish. The quality of the brine-chilled fish does not appear to be affected adversely, except for the sodium uptake. The storage life of iced fish after brine chilling does not appear to be shortened by this method of chilling.

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CORRESPONDENCE

Endrin Content of Milk and Body Tissues of Dairy Cows Receiving Endrin Daily in Their Diet

SIR: Table VI in our article [J. AGR. FOOD CHEM. **6,** 518 (1958)] has been criticized for including data appearing to show relative safety margin—with respect to milk contamination—of endrin, toxaphene, and DDT applied to alfalfa. We concede that a better basis for comparison would have been the chronic oral toxicity to rats and that if this had been done, the relative safety margin, as we call it, would have shown much less spread among the three materials. The only purpose of the table was to illustrate some of the factors which would be considered when evaluating the residue hazard of a pesticide.

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