

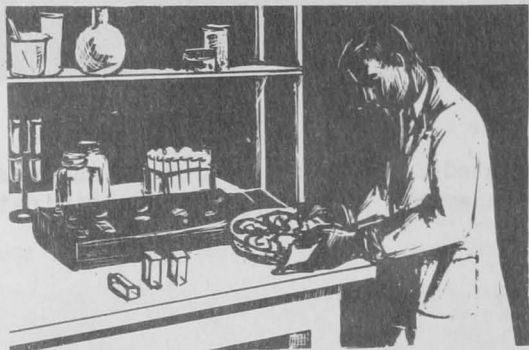
# THIAMINE AND RIBOFLAVIN IN BAKED AND SIMMERED OYSTERS

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## ABSTRACT

When baked, oysters lost about 40 percent of their thiamine (vitamin B<sub>1</sub>) content, but the riboflavin (vitamin B<sub>2</sub>) was hardly affected, although a little passed into the liquor. When the oysters were simmered, there was hardly any destruction of either vitamin, although a portion of each was found dissolved in the liquid.

In furtherance of the comparative study to determine the effect of cooking methods on the nutritive value of fishery products, baked and simmered oysters were assayed to determine whether the cooking had caused a loss of thiamine or riboflavin.



Mickelsen, Waisman, and Elvehjem (1939, 1) reported a 50 to 60 percent loss of thiamine when meat was cooked by moist-heat methods. Lelong (1940) reported a 25 percent loss of thiamine when beef was boiled for 10 minutes. None of these investigators reported data for the thiamine content of the cooking liquid. It seems probable that part of the losses

could be accounted for by leaching of the vitamin into the cooking liquid. However, in the case of riboflavin, the experimental data presented by Mickelsen, Waisman, and Elvehjem (1939, 2), Hodson (1941), and Christensen, Latzhe, and Hopper (1936) indicate that this vitamin is not greatly affected by cooking.

Oysters were chosen for the herein-reported study because they contain quantitatively more of these two vitamins than most other fishery products. It must be emphasized, however, that the results of these tests cannot be applied to other fishery products, or to other methods of cooking, since vitamin loss is affected by many variables such as quantity of vitamin present, the liquid content of the dish being prepared, degree of heating used, and the degree of aeration during cooking.

The fresh shucked oysters were bought in 1-quart lots, once a week, from local dealers. The packages were immediately quick-frozen and kept below freezing until thawed for cooking tests. Baking and simmering were used in cooking the oysters, since these are popular dry- and moist-heat cooking methods.

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Several preliminary trials showed that oysters were cooked sufficiently, as indicated by the curling of the edge of the mantle, after being baked for 5 minutes at 450° F., or held in simmering water for 3 minutes. After these respective cooking periods, the meats of the test oysters were wrapped in cellophane and quick-frozen. The liquid remaining in the cooking utensil was placed in a flask and kept in cold storage. The thiamine was determined by the thiochrome method, and the riboflavin was determined fluorophotometrically on solutions purified by adsorption on florisisil.

The following average results were obtained:

| Sample         | Micrograms per 100 Grams of Oysters |        |       |            |        |       |
|----------------|-------------------------------------|--------|-------|------------|--------|-------|
|                | Thiamine                            |        |       | Riboflavin |        |       |
|                | Meats                               | Liquid | Total | Meats      | Liquid | Total |
| Raw .....      | 154                                 | 39     | 193   | 220        | 18     | 238   |
| Baked .....    | 95                                  | 39     | 134   | 200        | 42     | 242   |
| Simmered ..... | 94                                  | 101    | 195   | 180        | 30     | 210   |

The data show that there is an apparent reduction of 40 percent in the thiamine content of the meats during cooking. This amount of thiamine is destroyed in baking and is transferred to the cooking liquid in simmering. In both baking and simmering of oysters there is a small transference of riboflavin from the meats to the cooking liquid. Apparently, very little, if any, riboflavin is destroyed in cooking.

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