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## BRIEF RECORDING

# Bread — a Dietary Source of Large Quantities of Iodine*

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DURING an outpatient study of iodine intake and excretion, we encountered cases of very high iodine intakes (1100 to 1300 microgm. per day),[1] and we were not able to identify the sources of iodine in those diets. Subsequently, we learned that some bakeries add iodate to commercial bread mix as a "dough conditioner."[2] According to Food and Drug Administration regulations the maximum permissible quantity of any conditioner in dough is 0.0075 per cent by weight, or a possible 75 microgm. of iodine per gram of bread.[3]

To determine if bread was an actual or merely a potential source of iodine, 32 bakery products manufactured by 12 different commercial bakeries were analyzed. The weight per slice (or per roll) and weight per loaf were determined. Slices of bread were soaked in iodine-free distilled water, homogenized, treated with ultrasound and lyophilized to a fine powder.[4] The final product was analyzed for total iodine content by the method of Zak as modified by Benotti and Benotti.†[5]

The iodine content of the breads ranged from nondetectable to 150 microgm. per slice, and dinner rolls contained from nondetectable to 63 microgm. per roll. Nine of the 32 bakery products contained more than 50 microgm. per slice or per roll. In general, the lowest-priced, very fluffy, spongy white breads had the highest iodine content whereas the more expensive, higher-weight-per-volume breads had the lowest iodine content. The iodine content of other kinds of breads (rye, whole wheat, potato and cheese) was not predictable on the basis of physical characteristics. All the bakery products purchased from 1 national chain of grocery stores were found to have elevated iodine levels.

Ingestion of bread containing high iodine levels may be of considerable clinical importance. We analyzed a day's diet composed of 4 slices of bread, 2 rolls, 1 glass of orange juice, 2 eggs, 2 cups of coffee, 1 glass of milk, tuna-fish salad (for 2 sandwiches), 2 cookies, 1 glass of vegetable juice, 1 serving of pot roast with gravy, 1 potato, 1 portion of carrots and 1 scoop of ice cream, and found that it contained 1072 microgm. of iodine. The tuna fish contributed only 10 microgm. of this total, but the bread and rolls were responsible for 726 microgm. One milligram of iodine will suppress the uptake of radioactive iodine by the normal thyroid gland, probably by simple dilution of the dose,[6] and may considerably reduce organic binding of iodine in the thyroid glands of thyrotoxic persons.[7]

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