

NUTRITION

A Bread Revolution

America's "Staff of Life" Will Provide New Strength When It Is Made To Contain the Morale Vitamin

By JANE STAFFORD

WE ARE on the eve of a food revolution. It will strike the average American home at the breakfast table some morning soon.

Our staff of life, bread, will be restored to an ancient estate, making it more worthy of bearing this proud title. Vitamins are coming to its rescue. For the better—breakfast toast, muffins, wheatcakes, the sandwich lunch, the dinner roll, will all be changed. They will be made of a new kind of flour. This flour is as rich in vitamins as that which gave primitive man strength for defense against his multitudinous enemies.

The new vitaminized flour will give modern Americans strength for defense in war. It will add strength to cope with the problems of modern civilized life which threaten as ominously as war itself.

Preparations for national defense have quickened the arrival of this food revolution, but it has been on its way for two or three years. The last steps are being taken now in the nation's capital in the Department of Agriculture offices of the U. S. Food and Drug Administration where a new definition of flour is being made.

Flour, wheat flour or white flour, legally in the United States today is "the fine ground product obtained in the commercial milling of wheat consisting essentially of the starch and gluten of the endosperm. It contains not more than 15% of moisture, not less than 1% of nitrogen, nor more than 1% of ash, and not less than 0.5% of fiber."

Tomorrow, this may still be the legal definition for white flour in the United States. It will not, however, be the legal definition for all wheat flour. Legally, there will be a new wheat flour, with a new name.

The new flour will not be a compulsory diet item for American citizens. Millers will still be able to make the old white flour. Bakers and housewives will still be able to make bread, rolls, cakes and pastry from the old white flour. All of us can go on eating the old white flour bread if we wish.

Any flour sold under the name chosen for the new flour, however, must meet the standards now being written into the definition. When the Food and Drug Administration announces the standards and definition and name for the new flour and sets the date for adoption of the definition, the new flour will become legal. The definition becomes part of the law of the land to which any flour sold under that new name, not yet selected, must conform.

When the new flour becomes legal, we shall all be urged, though not compelled, to eat it, at least for the main part of the breadstuffs in our diet. And as more and more of us learn how much better the new flour is, the revolution will really get under way.

This revolution is something new in history, perhaps in the entire experience of mankind. Communities have put iodine into their table salt or into their drinking water; they have completely changed their water supplies for health. Probably never before, however, has an entire nation revolutionized a staple food for health reasons. England has just done it as a war measure. The threat of war, defense preparations, have hastened the flour revolution in the United States. But this is still no compulsory war measure, it is primarily a health measure.

The bread revolution we are about to experience will rescue 45,000,000 Americans from a state of chronic famine.

These people are not starving for lack of bread. Marie Antoinette's famous remark on the eve of another revolution, "Let them eat cake," does not apply in the present situation.

The kind of famine that is abroad in the land of plenty today was never dreamed of in the time of Marie Antoinette and the French Revolution nor until much, much more recently. The present famine is due to lack of vitamins and minerals, not to lack of food.

Victims of this vitamin famine are not hungry. On the contrary, they have no appetite and do not want food. They are tired, weak, nervous, easily frightened, worried. Many of them do not feel like working and they appear to be lazy and "ornery."

Vitamin starvation makes people sick, not hungry. People starved for vitamin C, the vitamin found in citrus fruits, tomatoes and cabbages, for example, get the sickness known as scurvy. Oriental people living on a diet consisting almost entirely of polished rice got a strange disease called beriberi. They were starved for a vitamin found in the outer, branny coat of the rice kernel. This vitamin was originally labeled vitamin B, the anti-beriberi vitamin.

Calling it the anti-beriberi vitamin was misleading. Doctors rarely see a patient sick with beriberi in the United States, although millions of Americans are starved for this anti-beriberi vitamin. The sickness they have takes a different form. First comes loss of appetite, then indigestion and constipation, weakness, fatigue,



HOME FLOUR MILL

The electrically driven home flour mill, in which the housewife can grind her own vitamin-rich whole wheat flour as she needs it, attracted the attention of M. L. Wilson, Department of Agriculture Director of Extension Work, as one solution to the bread problem. The mill shown was made by the C. S. Bell Co., and placed in a cabinet made at the School of Living, Suffern, N. Y.



VITAMIN FOR BREAD

The white, powdery-looking substance in the glass dish is riboflavin, one of the B vitamins slated probably to go into the new flour along with thiamin, nicotinic acid and certain minerals.

skin troubles, nervous and mental upsets. It is only recently that doctors have recognized these ailments and symptoms as being signs of vitamin B starvation.

This vitamin starvation comes not from living on polished rice because Americans do not eat so much rice, but from living on very refined flour. Wheat, from which most of our flour and bread is made, contains the anti-beriberi vitamin, known chemically as thiamin. It also contains other vitamins, known collectively as the vitamin B complex, and certain minerals. When wheat is ground in modern mills to make fine, long-keeping, pure white flour, 80% to 90% of the thiamin, and in addition a good portion of the other B vitamins and of the minerals, are removed with the bran, as they are when rice is polished to shiny whiteness.

Bread and white flour, because they are low-priced and bulky, filling foods, form a large part of our national diet. One authority says we eat 11 billion loaves of bread a year. The U. S. Bureau of Home Economics states that each American consumes flour and other cereals at the rate of 200 pounds per person per year. This single food item supplies us with one-fourth or more of our total food calories. In the case of 45,000,000 Americans who must count pennies even for food, bread or flour foods supply much more than one-fourth of the total food calories.

For years, nutritionists have been urg-

ing Americans to eat whole wheat bread, so they would be sure to get the B vitamins and the minerals of wheat. In spite of these educational efforts, however, we do not eat whole wheat bread to any extent. Only about 2% of all bread sold in the United States is the whole wheat variety.

So the 45,000,000 who depend heavily on bread for filling their stomachs and giving them energy and strength are starved for the B vitamins and certain minerals.

That is why bread, the staff of life, is going to have vitamins and minerals added to it. This is the bread revolution which will save millions from vitamin famine and bring extra strength and health to many millions more.

Revolutionizing bread has an ominous sound. Many people, remembering the dark, soggy breads of World War days in 1917-1918, may fear that the new bread, made from flour restored to its primitive nutritional state, will be unpalatable. Others, aware of the benefits to be had from the new bread, may be fearing that such benefits cannot be added without a considerable increase in the price of bread.

Such fears can safely be banished.

The label on the package of bread or flour you bring home from the grocery store may be the only thing that tells you the bread or flour you are about to eat has been revolutionized. Bread and flour are going back to their ancient estate but they will not be the coarse, dark, heavy stuff our ancestors ate.

Instead of being white as the virgin snow, the new bread and flour may be slightly creamy in color. This does not mean any loss in purity or in quality. It means, actually an improvement in quality, due to the presence in the flour or bread of vitamins and minerals which our present snowy white bread and flour lack—to the detriment of our health. If the vitamins are added in the form of synthetic chemicals, they may not cause any change in color of the bread at all. If they are added by using a part of the wheat kernel, as some millers are already doing, they will tinge the white flour with a faint cream color.

Flavor, if it is changed at all, will probably be improved. Reports on the new enriched flours already being produced by some mills state that the flour and bread from it acquires a pleasant, slightly nutty flavor. This will be good news to the epicures who for years have been complaining about the tastelessness of ordinary white bread and yearning for the kind that grandmother used to bake.

The most important quality of the new bread, of course, is something you cannot taste or see, but which in time you will feel. This is the improvement in health and strength which will come from the vitamins and minerals the new bread and flour will contain. People who eat this bread will feel stronger and more like working. They will feel brighter and more alert. Their appetites will improve. Their digestion will be better. They won't be so nervous and timid and apprehensive.

These benefits will, of course, take a little time to be felt. The first slice of the new bread is not going to make a new man or woman of you. People who will feel the benefits most will be those who need them most. These are the people whose food budget is so small that they must eat lots of bread, which is one of the cheap foods, in order to get filled up.

The bread revolution, finally, will be easy on the pocketbook. It would do no good to put vitamins and minerals in flour if they made the flour taste or look disagreeable, because people would not use it. It would not help the ones who most need these vitamins and minerals in bread if it made bread expensive. The cost of the new bread will depend somewhat on the method used to put vitamins and minerals into it. Present estimates are that the job can be satisfactorily done at an additional cost of about 75 cents a barrel of flour, although some authorities claim this would only cover the cost of the extra ingredients, not the cost of putting them into flour. Another estimate is that the new bread can be made to sell for about one cent more per loaf of bread. This will be in the beginning. Later, as the price of vitamin chemicals continues to drop and methods for adding them to flour improve, the cost may decrease.

National defense is the spark that has set off the bread revolution. In the midst of plans to build more airplanes and ships and guns, Americans have realized that the man-power of the nation must also be built up to top fighting strength. Scientists who for years have warned of the chronic famine, the vitamin starvation that afflicts millions of Americans, have stated that the kinds of food which will remedy the famine will also build strength and morale for defense.

One of the newest pieces of knowledge about vitamins is the evidence that thiamin, the old vitamin B₁, should change its alias from "anti-beriberi vitamin" to "morale vitamin." This is one of the

vitamins that will be put into the new bread and flour.

The evidence that gives thiamin a right to the new name of morale vitamin came from diet experiments at the Mayo Clinic. A group of healthy young people there were put on a diet otherwise adequate, but lacking in thiamin. These healthy persons developed, among other symptoms, moodiness, sluggishness, fear, and mental and physical fatigue.

"The states of mind and body observed in these subjects," comments the editor of the *Journal of the American Medical Association*, "were such as would be least desirable in a population facing invasion, when maintenance of stamina, determination and hope may mean defeat or successful resistance."

Equally striking were the results of another experiment in which increasing the daily ration of thiamin above the accepted adequate amount increased mental alertness and almost doubled the capacity for physical work. This shows that putting the vitamin into flour for toast, sandwiches and dinner rolls will not only protect millions from vitamin famine but give extra strength to those already getting adequate amounts of the vitamin from other foods.

Thiamin, the morale vitamin, and others of the vitamin B group are found in such foods as liver, lean meat, certain vegetables and yeast. Yeast has been suggested as one way of adding the vitamin to bread. The plan is to increase the

amount of the vitamin in yeast by growing it on a special medium and using this yeast to make a vitamin-rich bread.

Many other plans for adding the B vitamins to flour or bread have been suggested and some already are being used. One flour milling company claims it is doing this by a method which retains the germ of the wheat kernel in the flour, thus retaining a good portion of the vitamin which is discarded by ordinary milling processes.

Thiamin is obtained from a selected portion of the wheat germ obtained in the milling process and put back into the flour by another milling concern. This company also adds another of the B vitamins and the minerals, iron and calcium, to its flour. This flour has won the approval of the American Medical Association's council on foods.

These flours and breads and others that have appeared within the last year, are the millers' and bakers' answer to the scientific and lay public demand for flour that is as nourishing as that which our ancestors found a veritable staff of life.

The number of these breads and flours, however, gives the housewife a confusing problem. Which is best? In her dilemma, she is turning to scientists and government bureaus for advice. Food

and Drug administrators are also faced with a problem. Their job is to protect the public from adulterated foods.

The new flours and breads may be more nourishing than the old ones, but the flours, though not exactly adulterated, are not legally wheat or white flour. The Food and Drug Administration believes it can best serve and protect the public by creating a new definition for white flour-with-vitamins-and-minerals to which all millers can adhere.

The National Defense Advisory Commission, eager to build up the nation's man-power as well as its munitions, wants the people to have the benefit of flour restored to its ancient estate of vitamin and mineral richness. It cannot urge the use of enriched or fortified flours unless these contain enough of the right vitamins and minerals to bring real benefit. The National Defense Advisory Commission has turned to the scientists, requesting through Miss Harriet Elliot, Consumer Commissioner, formation of a committee of specialists to help determine how flour shall be modified to be a source of mental and physical stamina.

Such a committee has been organized. This committee, the Food and Drug Administration and the millers are now drawing the blueprints for the new flour.

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ESSAYS ON THE NEW VORTEX ATOM

by Carl F. Krafft

A new system of atomic structure in which the atom has a structural center, but no nucleus. The structural unit which is common to all atoms is the circular vortex ring in a quasifrictional dynamic ether of the kind used by Clerk Maxwell in his electromagnetic theory. By virtue of the electromagnetic properties of this ether, these vortex rings arrange themselves in such positions that adjacent portions do not rub across each other as in the Kelvin vortex atom, but have *only rolling contact*. The interiors of the atoms consist entirely of helium groups (alpha particles), but the external portions may consist partly or wholly of hydrogen groups (valence bonds). The new vortex atoms look somewhat like organic molecules, except that they are composed of helium groups instead of carbon atoms, and are radial structures with a high degree of symmetry. Every physics and chemistry teacher should have a copy.

Free upon request

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BASEMENT COMPLEX

Dr. Harlan T. Stetson, of the American Geophysical Union, exhibited this model prepared by Dr. W. P. Thom of the basement complex of underlying continental United States made from the latest geophysical surveys. The exhibit was displayed at the meeting of American Association for the Advancement of Science in Philadelphia.