

NUTRITION

Diet Standards For Americans Of All Ages Announced

What Old, Young and Middle-Aged Need to Eat for Building Health for Defense Now Worked Out

AMERICA is about to learn exactly which foods and how much of each should be eaten each day for the health and vitality needed to make us strong individually and for defense as a nation.

Standards for planning an adequate diet for Americans of all ages, Mother and Dad, the children, the old folks, the young matron who is expecting or nursing a baby, have been worked out and finally approved by the nation's authorities on nutrition.

The new diet standards are contained in a report by Dr. Russell M. Wilder, of the Mayo Clinic, chairman of the Food and Nutrition Committee of the National Research Council, to Surgeon General Thomas Parran, U. S. Public Health Service.

Diet and food standards have been announced before, but these new ones are planned according to the latest scientific knowledge about foods and their contribution to health, strength and morale. The food standards worked out only a few years ago by a committee of the League of Nations, Dr. Wilder explained, would not serve for our nationwide program of defense on the nutrition front because they are out of date.

When those standards were compiled, the discovery of nicotinic acid as a cure and preventive of pellagra had not been made. Riboflavin, another important member of the vitamin B group, was unknown. The standard set for thiamin, which is morale vitamin B₁, was based on animal diet studies. Studies on humans have recently shown that we need more of this morale vitamin than the animal studies showed.

Actually we need more of the B vitamins than can be readily obtained from modern diets, Dr. Wilder said, because modern refined foods contain relatively little of these vitamins. The use of enriched bread will help in planning diets that will meet the higher requirements now known about, and there are plans for enriching other staple foods to make sure that an adequate diet can be made from foods that are available to everyone.

The new defense diet standards, which are suitable for any time but especially important to follow right now, took a long time to develop. Over a month ago a committee of nutrition authorities were ready to announce them. At that time the standards were stated in terms nutritionists use in their laboratories: grams of protein, fat, carbohydrate, milligrams of vitamins, and the like.

Then, when someone started translating them into bread (*Turn to page 347*)

NUTRITION

Without Thiamin in Diet Pigs Cease to Be Hoggish

See Front Cover

LACK of thiamin (vitamin B₁) changes personality of pigs. Without thiamin they are no longer piggish. The United States Department of Agriculture says more and better pigs, capable of producing good meat, are needed to fill vacancies soon to exist in the defense market.

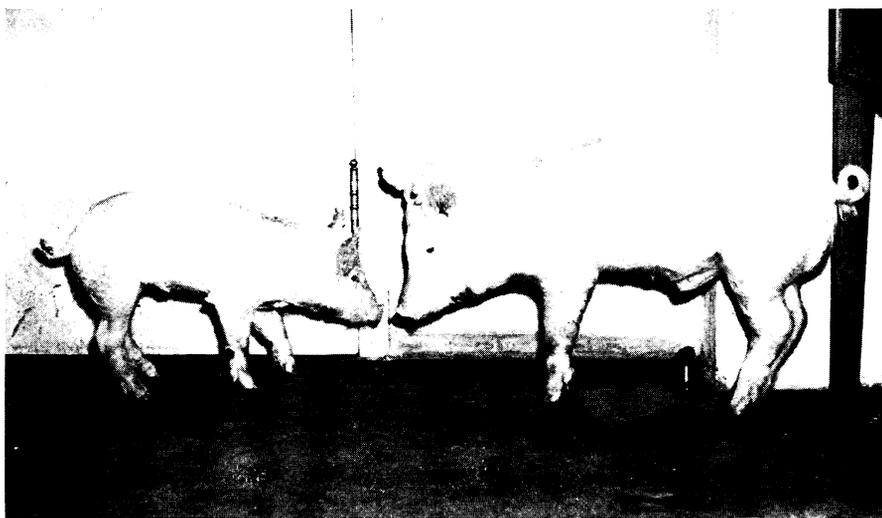
With this in mind, the Beltsville Experimental Farm, near Washington, D. C., is working to reduce the infant mortality rate of pigs. One reason for this large mortality rate may be that little pigs do not get enough thiamin in their diet. N. R. Ellis, Nutrition expert of the U. S. Department of Agriculture, fed part of a litter of pigs a synthetic diet without thiamin, and the rest a diet with thiamin. It was found that pigs lacking thiamin gained weight for a time but then began to lose weight. They developed bad hearts, ran subnormal body temperatures, got weak and died. One suffered from convulsions. There was a noticeable lack of appetite as these pigs became sick.

The other little pigs born at the same time of the same mother, but fed thiamin in their diet, grew well and are healthy.

The pig shown on the cover of this week's SCIENCE NEWS LETTER had a medium thiamin and medium fat diet.

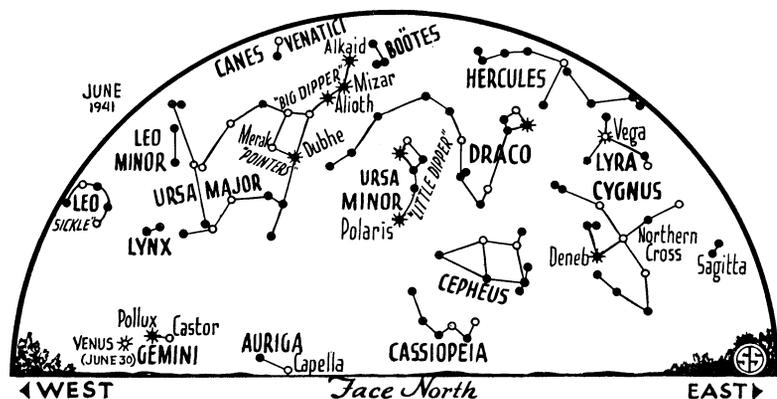
What these pigs demonstrate may possibly have human implications. It has been found, Mr. Ellis said, that contrary to what some biologists believe, thiamin is involved in the use of fat by the body. It is possible to get along with smaller amounts of fat if the amount of thiamin eaten is high. A high fat diet (28%) with 25 mcg. thiamin per kilogram of body weight, seems to be equal to a medium fat diet (12%) with 35 mcg. of thiamin, or a diet containing a minimum of fat (2%) if 40 mcg. of thiamin is taken.

Science News Letter, May 31, 1941



CONTRAST

The big pig had thiamin, the other pig had none. But both were born of the same mother at the same time. The small pig is fed a high fat diet, but deprived of thiamin. The other, three times as heavy, has a low-fat diet but with a high thiamin content in its ration.



Celestial Time Table for June

Monday, June 2, 4:56 p.m., Moon at first quarter. **Thursday, June 5**, 11:00 p.m., Mercury farthest east of sun. **Saturday, June 7**, 9:00 p.m., Moon nearest; distance 223,800 miles. **Monday, June 9**, 7:34 a.m., Full moon. **Monday, June 16**, 4:24 a.m., Moon passes Mars; 10:45 a.m., Moon in last quar-

ter. **Friday, June 20**, 2:00 a.m. Moon farthest; distance 251,900 miles; 7:00 a.m., Venus passes Mercury. **Saturday, June 21**, 2:34 p.m., Sun farthest north, summer commences. **Tuesday, June 24**, 2:22 p.m., New moon. **Wednesday, June 25**, 12:54 p.m., Moon passes Mercury. **Thursday, June 26**, 5:50 a.m., Moon passes Venus.

Eastern standard time throughout.

GEOLOGY

"Reverse Matter" Theory of Meteorites Called Unnecessary

THE theory of meteorites made of "reverse matter," which explode and vanish when striking ordinary matter, is not necessary to explain the failure to locate meteoritic fragments around certain craters which seem to have been produced by the impact of giant masses of stone or rock from the sky, says Dr. H. H. Nininger, director of the American Meteorite Laboratory in a report to the Society for Research on Meteorites.

The theory of reverse, or "contraterrene," matter was proposed about a year ago by Dr. Vladimir Rojansky, of Union College. Ordinary matter is made of atoms having nuclei of positively charged protons, and negatively charged electrons revolving around them. Contraterrene atoms, on the other hand, if they exist, have negative nuclei and positrons, electrons with positive charges, revolving around. If ordinary and contraterrene matter were to come into contact, the charges would cancel, and both would disappear in a violent outburst of energy.

Following this proposal, it was suggested by Dr. Lincoln La Paz, of Ohio State University, and also by Dr. Samuel Herrick, Jr., of the University of California, Los Angeles, that contraterrene meteorites sometimes land on the earth. Dr. La Paz's idea was that they

might have caused craters like those at Tunguska, Siberia, which seem to have been the result of meteoritic impact in 1908, even though expeditions have found no meteorites in the vicinity.

Dr. Herrick made the proposal that a contraterrene meteorite was responsible for the "phantom Bertha," last summer, when a boating party in Long Island Sound were startled by what seemed to be a shell fired across their bow, hitting the water and exploding nearby. It was shown, however, that it could not have been a shell.

Without commenting on whether or not contraterrene matter may exist, Dr. Nininger declares that either the meteorless craters or the mysterious "shell" can be explained "without assuming the existence of any such purely hypothetical material." He says that if even the famous Arizona meteorite crater, near which many tons of meteorites have been found, had been formed in a partly swampy and wooded area, like that of central Siberia, probably not a single meteorite would have been found.

The story of the "phantom Bertha," he declares, "is entirely consistent with an ordinary daylight meteorite fall, such as hundreds that have been related either in the literature on meteorites or to the

writer in conversation with witnesses of such events."

"We should never be afraid to look for new facts or new explanations," Dr. Nininger concludes, "but, so long as well-established facts are sufficient to explain a given set of phenomena, we are surely courting a return to the days of 'spirits and mystery' when we shrink from painstaking or even back-breaking investigation and seek refuge in untried hypotheses, especially when these hypotheses rest entirely on assumptions."

In a later report to the Society for Research on Meteorites, Dr. La Paz answers Dr. Nininger, and defends his hypothesis. The Russian Academy of Sciences, he says, "sent well-organized expeditions, elaborately equipped with excavating tools, drills and modern geophysical equipment," to the Siberian site to search for meteorites. Their methods, he states, were essentially similar to those used successfully to hunt for meteorites in Arizona.

"On the basis of discoveries actually made at the Arizona crater," he declares, "there can be no reasonable doubt that intensive searches made by Russian scientists would have resulted in the recovery of meteoritic material if, as Nininger asks us to imagine, the Canyon Diablo rather than the Podkamennaya Tunguska fall had occurred on the Stony Tunguska River in 1908."

Science News Letter, May 31, 1941

From Page 339

and butter, meat, and potatoes, and so on, it was discovered that some of the standards set could not be supplied from any combination of foods that the majority of people were able to get. So the scheduled announcement was cancelled and the whole problem restudied. Now the National Research Council's committee on food and nutrition, representing doctors, nutritionists and public health authorities among others, is satisfied that it has standards which will guide us to fitness for defense along the diet route.

The yardstick, translated from laboratory terms, was announced by Dr. Lydia J. Roberts, head of the department of home economics of the University of Chicago, at the National Nutrition Conference for Defense called by President Roosevelt. Here it is:

One pint of milk daily for an adult, more for children.

One serving of meat.

One egg daily, or some suitable substitute such as beans.

● RADIO

Dr. W. W. Bauer, director of the American Medical Association, will discuss with Miss Jane Stafford, Science Service medical writer, research being reported at the meeting of the Association, as guest scientist on "Adventures in Science," with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, June 5, 3:45 p.m. EDT, 2:45 EST, 1:45 CST, 12:45 MST and 11:45 a.m. PST. Listen in on your local station. Listen in each Thursday.

Two servings of vegetables daily, one of which should be green or yellow.

Two servings of fruit daily, one of which should be a good source of vitamin C, such as the citrus fruits or tomatoes.

Bread, flour and cereal, most and preferably all of it whole grain or the new, enriched bread, flour and cereals.

Some butter or margarine with vitamin A added.

Other foods to satisfy the appetite.

Total number of calories are set at 3,000 for a moderately active man and 2,500 for a moderately active woman.

Cheaper cuts of meat, Dr. Roberts reminded, are just as nourishing as the more expensive ones.

Many people, in fact the majority of Americans follow this pattern now in planning their daily diets. They do not always quite come up to the yardstick, however. The green vegetable, Dr. Roberts pointed out, may only be a scrap of lettuce under a salad, and even if a more generous serving is given, it may not all be eaten.

Defense on the nutrition front calls for actually eating daily the food allowances set by the new yardstick.

The minority who do not now get meals up to the yardstick make up about one-third of the population. Plans are being considered at the Conference to help them bring their daily meals up to defense diet standards.

Science News Letter, May 31, 1941

BOOKS

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ENGINEERING

Electrical Currents Prevent Corrosion of Submerged Pipes

All Corrosion of Pipe in Contact With Water or Moist Earth Is Caused by Electrolytic Action

HOW electric currents can counteract the process by which submerged pipes act as parts of an electric battery and are corroded was described to the meeting of the American Petroleum Institute by N. A. Miller, of Universal Oil Products, Inc.

Mr. Miller declared that all corrosion of metal in contact with water or moist earth takes place by just one means, that of electrolytic action. In this process, the metal pipe or other structure forms one pole of a battery. The other pole may be formed by another metal, or spots of impurity or mill scale on the first. Current flows from the anode to the cathode, and the former is gradually consumed.

To counteract this process, the current must be made to flow the other way. Sometimes pieces of other metal are placed nearby, which will become anodes more easily than the metal to be protected. Then, the latter becomes the cathode, and is not corroded. But still better is the application of a direct electric current to flow in the proper direction.

Mr. Miller described installations of such a system by oil refineries, especially in pipes of open tank condensers. Though the operating records are meager, he stated, "what information we do have indicates positive beneficial results." He urged further investigation of the subject, and pointed out that records available concern locations where corrosion was initially very bad.

"Additional data are necessary to establish the economics involved in the border-line cases," he concluded.

Science News Letter, May 31, 1941

Living Organisms Blamed

BACTERIA and other living organisms are responsible for some kinds of corrosion, which may affect non-metallic as well as metallic objects. W. J. O'Connell, Jr., of the technical division of Wallace & Tiernan Products, Inc., told the meeting about these pests, and methods of combating them.

One kind, for example, affects con-

crete. The bacteria produce hydrogen sulfide gas, which reacts to produce sulfurous or sulfuric acid, either of which will attack the concrete.

He pointed out that methods for controlling these organisms are well known, but that attention must be paid to physical, chemical, electrochemical, biochemical and biophysical aspects of the problem in applying them.

Science News Letter, May 31, 1941

NUTRITION

Feather-Weight Rations For Parachute Troops

FEATHER-WEIGHT rations for ski and parachute troops are being studied by the U. S. Army. Also in the experimental stage are thirst-quenching tablets for soldiers on the march.

Describing these newest tight-packed foods, Miss Mary Barber, food consultant to the Quartermaster General's office, emphasized that research to perfect them is still going on, and the foods are not yet accepted for Army use.

A sample of the emergency ration for ski and parachute troops resembles a slab of brown toast. It will probably contain pemmican, which is jerked meat, and also whole wheat flour, soy flour, and molasses. It will provide about 450 calories for energy, which, as army rations go, is a "light lunch."

Anti-fatigue tablets with which the Army is experimenting contain dextrose, which is fruit sugar and a good source of energy. They also contain citric acid and vitamin B₁. They stimulate the flow of saliva, Miss Barber pointed out, and serve to relieve thirst on the march. Evolving its anti-fatigue tablets, the U. S. Army has studied foreign special rations, including some furnished German troops.

Science News Letter, May 31, 1941

Selected *Indians* at several CCC training centers are being taught modern signaling methods, important in defense.