

PUBLIC HEALTH

Fruits Shed Strontium-90

► **FRUITS CARRY** a lower level of strontium-90, a harmful element of fallout from nuclear weapons, than vegetables, *SCIENCE SERVICE* was told by Dr. Edwin P. Laug, chief of the physiochemistry branch of the division of pharmacology of the Food and Drug Administration.

Dr. Laug has been evaluating radioactive strontium-90 levels in foods and exploring various ways to lower human exposure to this dangerous, long-lived element. The results of his findings may revolutionize current concepts of good diet.

He attributes the low level of strontium-90 in fruits to their relatively smooth skins from which particles of fallout tend to fall off. Also significant: most fruits grow on stems, branches or vines and are removed from direct contact with contaminated soil.

Strontium-90 often is referred to as "the bone-seeker" because, like calcium, it tends to settle in the bones of man and animals. Infants and children, whose calcium bone formations are not complete, are more susceptible to this known cause of bone cancer and leukemia.

Dr. Laug's studies have shown that whole grains, though higher in nutritional values and vitamin content than refined grains, also have a higher level of strontium-90. Deliberately contaminated whole wheat was as much as 75% higher in levels of fallout than the white wheat flour processed from it.

The vitamin-rich leaves of spinach are about four times as high in strontium-90 as the considerably less nutritional cabbage. The rough surface of spinach retains soil and atomic particles more easily than smoother cabbage or lettuce leaves. Generally, the outer leaves of the leafy vegetables, the skins of tubers such as potatoes and carrots, and the pods of peas and beans, all known to be richer in vitamins than their inner segments, have a higher fallout content.

The best way to reduce fallout in the

diet is to peel the skins of tubers, remove the outer leaves of vegetables or shell the legume variety, and thoroughly wash all fruits and vegetables before preparing them for the table. Just washing spinach, for example, reduces the strontium-90 content by 60%.

At current levels of fallout, there is no danger in maintaining present recommended eating habits. However, if nuclear testing should be resumed, the resulting increase of contaminating fallout might warrant abandoning the more nutritional and preferred whole grains for refined and processed grains. In any event, it may be wise to plan the diets of children so that foods with lower levels of strontium-90 predominate.

Dr. Laug pointed out that in the coming years, as nuclear reactors become more widely used as sources of energy, fallout from these sources will add to the contamination.

"I personally believe that fallout from nuclear reactors is potentially more dangerous than fallout from weapons testing," he said.

For this reason as well as consideration of the hazards from nuclear weapons testing, the Food and Drug Administration is experimenting with ways to reduce the dangers.

Progress already has been made in filtering strontium-90 from milk. Health authorities also are testing the possibility of adapting this process for home use. However, Dr. Laug believes that this never will be as efficient as industrial processing, which ultimately may prove the most practical and economical way of reducing radiation fallout in all foods.

Another way to effectively reduce radiation uptake of vegetables and fruits from contaminated soil is to lime the soil or add to its calcium content. Plowing also reduces fallout concentration at ground levels.

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Sclerosis and Cosmic Rays

► **RADIATION** bombarding the earth from space may be a factor in the occurrence of multiple sclerosis, the Harvard University neurologist Dr. John S. Barlow believes. He told scientists of a world study linking the chronic disease with the amount of cosmic rays reaching areas of the earth.

Dr. Barlow spoke at Northwestern University's medical school in Chicago during the first International Symposium on the Response of the Nervous System to Radiation.

Multiple sclerosis, a disease known for more than a century, results from degeneration of the sheath-like covering that surrounds nerve fibers in the brain and spinal cord. It often causes severe crippling. Cause of degeneration is not known, and there is no specific treatment.

Dr. Barlow's statistical study of the distribution of multiple sclerosis shows that the frequencies of occurrence of the disease vary systematically with geomagnetic latitude. The intensity of cosmic radiation is the only phenomenon known to be related to geomagnetic latitude. Therefore, Dr. Barlow said, the possibility arises that cosmic rays might, in some way, be a factor in occurrence of the disease.

It is much more common in the northern parts of Europe and North America than in the southern areas; and it is extremely rare in the Orient, South America, Africa, the tropics or subtropics.

Other scientists have suggested that the mystery of the distribution of multiple sclerosis might depend on the amount of

radiation from the sun or trace elements in the soil.

If, after further research, positive links are found between cosmic radiation and incidence of the disease, Dr. Barlow said, protection may be effected by chemical agents "known to lessen biological effects of ionizing radiation."

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Radiation Affects Vision

► **HIGH ENERGY** radiation, even in very small doses, can damage vision, Dr. Leo E. Lipetz of the Institute for Research in Vision at Ohio State University, reported to the first International Symposium on the Effects of Radiation on the nervous system at Northwestern University's medical school in Chicago.

Dr. Lipetz said the response of the optic nerve in frogs was reduced after exposure to as little as one-half roentgen. This is the amount of radiation allowed per year for total body exposure of the general population under the Radiation Protection Guides established by the Federal Radiation Council.

Dr. Lipetz explained that the tiny amount of energy could have a large effect by triggering a series of reactions, "each one stepping up the effects, like an amplifier, of the previous one."

Other stimulating and damaging effects of high energy radiation on visual function have been shown, he said, in water fleas, crabs and rabbits, as well as people. Cancer patients, after a series of X-ray treatments, are more visually responsive to light.

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Radiation Hurts Unborn

► **DEVELOPING EMBRYOS** are especially sensitive to radiation, Dr. Roberts Rugh, associate professor at the Radiological Research Laboratory of Columbia University, has found. He told scientists meeting at Northwestern University's medical school in Chicago that the radiation effects may not be evident for generations.

Abnormalities of the central nervous system may be produced by irradiation of sperm cells or of egg cells before or after fertilization, or by irradiation at any stage in the development of the nervous system, the radiologist said.

"We cannot now state the extent—duration—of irradiation damage to the developing central nervous system," Dr. Rugh said. He spoke at the first International Symposium on the Response of the Nervous System to Radiation.

In studies on mice, Dr. Rugh said he found a severe abnormality was produced in successive generations after a single radiation of sex organs.

The abnormality, a protrusion of the brain through the skull, also was produced by exposing the mouse embryo at any time up to eight days after fertilization in relatively low doses. The most common effect in progeny of survivors of the Hiroshima and Nagasaki atomic bombings is microcephaly (abnormally small brain).

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