

MEDICINE

Vitamin D May Save Lives Of Trichinosis Patients

Disease Caused by Parasites in Under-Cooked Pork Responds to Vitamin Which Hastens Calcification

DOSES of vitamin D may be a means of preventing death and providing relief in trichinosis, if further experiments by Drs. Franklin D. Barker and Wayne W. Wantland, Northwestern University zoologists, prove successful.

Trichinosis is a painful and sometimes fatal disease caused by eating raw or under-cooked pork that contains trichina worms. The larvae of the worms make their way from the digestive tract to the muscles.

As it does with all foreign substances that enter the muscles, the body encloses these parasitic worm larvae with a coating of calcium as a protective measure. It takes from 10 to 15 months to do this. In the meantime, according to Dr. Wantland, "it seems quite probable that the more general symptoms of trichinosis, muscular pains, fever, etc., are, in part at least, due to toxic products formed by the breaking down of large amounts of muscle tissue together with waste products of the larvae. Thus a continuous inoculation of the infected host with toxins occurs."

Vitamin D, in the form of irradiated ergosterol, definitely hastens the calcification of the trichina cysts in the muscle fibers during the critical stage of trichinosis in rabbits, Dr. Wantland found. He is now trying to accomplish the same results with the use of the vitamin in higher animals and eventually in man.

Speed Calcification

Making use of the property of vitamin D to stimulate calcium absorption from the intestines and calcium deposition in the body, as is done in rickets, the zoologists have brought about calcification of cysts containing the parasitic larvae in from 5 to 6 weeks.

They are now trying to determine whether the calcified cysts in the muscle fibers have any deleterious effect on higher animals. There is a possibility, it was pointed out, that the particles in the tissues may decrease efficiency.

"It is significant that the majority of deaths from trichinosis occur from four to six weeks after infection, during that period immediately preceding, or during the earlier stages of cyst formation,"

Dr. Wantland said. "It would seem then that if cyst formation and subsequent calcification could be hastened this would shorten the critical period in trichinosis and more quickly terminate the disease.

"The treatment of trichinized rabbits with irradiated ergosterol apparently has a definite therapeutic value. It still remains to be tested in human cases of trichinosis."

Science News Letter, May 2, 1936

ENTOMOLOGY

Change From Grub to Moth Given Scientific Study

BUTTERFLIES coming out of the cocoon have long been favorite springtime nature-study objects to show to wandering children.

Until now, scientists have paid relatively little attention to the physiological processes that accompany the change from dormant pupa to the winged, active butterfly or moth that emerges. They knew, of course, that the seeming death was not real; the pupa or chrysalis was not dead but only asleep. But the details of the waking, in the greatly changed form, have until now not been adequately investigated.

However, researches at present in progress at Brown University have begun to clear away some of the mystery and bid fair to bring more facts into the daylight. Prof. Ivon R. Taylor, of the department of biology, is applying the methods of chemistry and physics to large numbers of moth pupae, and is learning some of the secrets of the really active life that goes on beneath the surface of the rigid, sarcophagus-like chrysalis-case while the animals are so still that they appear dead.

Prof. Taylor uses bee-moths as his "insect guinea pigs," because they are very easy to raise in large quantities and easy to handle under laboratory conditions. Results obtained with them, however, can be assumed to apply reasonably closely to the larger, showier species of moths and butterflies. Bee-moths are small insects, only about half an inch in



MOTH CALORIMETER

Prof. Ivon P. Taylor of Brown University with the sensitive apparatus that measures the amount of heat given off by the body of a single moth chrysalis.

length. They are best known as parasites on bee colonies, where their strange appetite—they feed only on beeswax—makes them a destructive and dreaded pest. But that very adaptation to crowded living, and the ease of feeding them, makes them also quite valuable in the role of experimental animals.

Life-processes go on more rapidly at the beginning of pupation in males, but in females more energy is released toward the end of the period, Prof. Taylor found from very delicate tests of heat given off by the pupae. To measure this heat evolution, a special micro-calorimeter was devised. It is so sensitive that it can measure accurately the heat given off by a single pupa. One of these "moths-in-the-making" gives off enough heat during a week to raise a quarter of a thimbleful of water from freezing to boiling temperature.

The chemical changes that go on during the change from larva to full-grown moth, with wholly new sets of body parts, are necessarily very great. The pupating insect practically "digests itself," as Prof. Taylor puts it. The rate of carbon dioxide indicates that there is a high utilization of fat, of which the larvae store a good deal in their bodies, in the release of energy. Other chemical tests show that during the entire process the body fluids remain acid.

Science News Letter, May 2, 1936