

virtually all cole crops; arsenic in shell fish; selenium in many cereals, fruits and vegetables (which incidentally is quite possibly an essential nutrient element for all warm-blooded animals, including man); cobalt in all meats (also a major component of vitamin B<sub>12</sub> essential for blood formation); iron found in virtually all foods (and a component of human blood); estrogens found in all meats and also in humans.

Whether such substances induce carcinomas or not depends, of course, upon a number of other factors, the principal one of which is dosage intake versus metabolism and elimination rate. Similar consideration applies to all agricultural chemicals.

It is frequently argued that pesticide and feed supplement residues are objectionable even in minute amounts as they may induce allergies, yet innumerable natural foods induce allergy in man. Such common food-stuffs as cow's milk, eggs, fish, particularly shell fish, pork, chicken, cheeses, wheat, corn and a wide variety of fruits and vegetables are authentically recorded as allergenic in man under certain conditions, regardless of whether they have been treated with agricultural chemicals or not.

There is also a wide variety of cyanogenetic (cyanide producing) compounds found in the seeds of almond, peach, plum, apricot, cherry, apple and pear; also in lima beans and java beans and, of course, in the Christmas treat marzipan; and in many animal fodders such as sorghum and grasses (Johnson, Sudan, Bermuda and arrow), in white clover and linseed cake.

Again there are natural foods which contain anti-enzymes that can readily induce vitamin deficiencies when consumed in excess. Examples include avidin from raw egg white, which produces biotin deficiency, thiaminase in certain fish produces vitamin B<sub>1</sub> deficiency (beriberi); pellagrogen in corn meal induced a widespread condition of pellagra among the poorer peoples of the Southern states until it was recognized as a niacin deficiency.

Among animals dicumarol in certain clover hays induces vitamin K deficiency and hemorrhage, while unsaturated fats in the diet of poultry may induce encephalomalacia which is controllable with dietary vitamin E. Linseed oil meal fed in excess can induce a vitamin B<sub>6</sub> (pyridoxine) deficiency.

#### THE "CRANBERRY BOGGLE"

During the "cranberry boggle" of 1959, the industry was virtually ruined because it was alleged that part of the crop had been "sprayed with a violent carcinogen." Actually the experimental evidence accumulated both before and since the incident indicates that the accused compound is not a carcinogen but a goitrogen, a chemical which will cause the thyroid gland to enlarge, presumably by preventing the gland from absorbing