

Soil drainage in

**ARTESIAN WATER**

pressure areas

A recent study developed methods to determine the proper depth and spacing of soil drainage tile systems in artesian areas when the depth to the underground water and the pressure of the water are known.

In some locations in California—mainly in areas adjacent to the principal rivers and in the Sacramento-San Joaquin Delta—upward seepage of water caused by artesian pressure creates difficult soil drainage problems.

Where drainage water originates below an impermeable layer of soil a well that pierces the soil to the water stratum relieves the drainage problem. However, where the soil above the water stratum is fairly permeable, tile drainage lines set at proper depth and spacing may be needed to relieve the artesian pressure and hence the drainage problem.—*James N. Luthin, Dept. of Irrigation, Davis.*

Stressing factor of

**HISTAMINE**

in poultry

Findings in recent studies at Davis support in part current ideas that histamine may be a stressing factor in poultry. Fed diets containing histamine, the birds soon developed gizzard erosions, flabby stomachs, and excessive body fluid; weight and general condition were low. Preliminary experiments indicate that histamine at low levels in the feed may cause egg production to stop and the birds affected do not lay again for at least one month.

When histamine was used as a stressing factor, it lowered the resistance of chicks to chronic respiratory disease. The mechanism by which poultry can neutralize the toxicity of histamine and the effect of antihistaminics on birds orally fed histamine are currently under investigation.—*H. E. Adler and M. Shifrine, School of Veterinary Medicine, Department of Avian Medicine, Davis.*

Survey on

**CONSUMER PREFERENCE**

in fruits and vegetables

A three-year consumer preference study, started in Butte County in 1959, is designed to determine factors affecting purchase and use of selected fruits and vegetables.

The study—to be extended in California and by the United States Department of Agriculture to other western states—is collecting information from the food buyer in households on household food management: use and availability of fresh and processed fruits and vegetables; buying practices for selected food products of strawberries, peaches, green beans, and broccoli; and opinions on quality characteristics and purchase factors of fresh and frozen fruits and vegetables. Information concerning home production and processing, home storage facilities, and amount of food customarily stored also is being collected.

The study—part of a Western Regional Research Project made cooperatively with the United States Department of Agriculture—is intended to increase the available factual information on consumer preference, purchase, and use of fruits and vegetables.—*Marilyn Dunsing, Dept. of Home Economics, Davis.*

Function of

**MANGANESE**

in nutrition

Investigations with poultry, rats, and guinea pigs have shown that manganese-deficient females produce abnormal young.

In poultry, a manganese deficiency in the hen results in low fertility, poor hatchability, and high mortality of the chick. The surviving chicks often exhibit a lack of muscular coordination. Female rats and guinea pigs deprived of manganese during pregnancy produced young with faulty movements, imbalance, aimless head motions, and some underdevelopment of the bones.

In the rat—with a gestation period of 22 days—addition of manganese to the ration of the mother on the 14th day of pregnancy was followed by the normal development of the young. When the addition of manganese was delayed until the 18th day, the offspring were always

abnormal. Manganese-low young rats failed to develop the reflexes responsible for body righting reactions as early as the offspring of animals receiving manganese. A normal rat 12 days of age can right itself in 2½ seconds or less when placed on its back. The manganese-deficient rat at 12 days often requires more than 60 seconds to right itself.—*Lucille S. Hurley and Gladys J. Everson, Dept. of Home Economics, Davis.*

Radio frequency energy for

**FREEZE-DRYING**

of foods

Dehydration time required for freeze-drying food products was cut 90%–95% by the use of radio frequency energy in preliminary trials at Davis.

Freeze-drying—lyophilization—yields a dried food product with external dimensions that are not altered, and that will rehydrate rapidly without major changes in flavor.

Animal products dried by freeze-drying will keep at room temperatures for 6–12 months. When rehydrated they are almost indistinguishable from the fresh product.

Freeze-drying requires expensive equipment with an output limited by the relatively slow rate of drying. The product to be dried by this method is first frozen and then placed in a chamber under high vacuum. The moisture is removed, at temperatures below the melting point of the water in the product, as a vapor directly from an ice surface without a change to liquid water. Because food products are extremely porous and contain numerous interconnecting channels, they rehydrate quickly. Also, because the food is not subjected to high temperatures for extended periods, there is little loss in flavor by heating.

One of the more promising methods of increasing the rate of transfer of heat in a vacuum between the source and the ice crystals within the food product is the use of a high frequency electrical field in the drying chamber. Heat is generated within the ice phase and the rate of evaporation of the ice is increased. In preliminary experiments, with radio frequency energy supplying the heat for vaporization, the dehydration time was decreased by 90%–95%. —*C. O. Chichester, Dept. of Food Science and Technology, Davis.*