

ABSTRACTS

The Effect of Processing on Vitamins in Fruits and Vegetables—A Review. C. R. Fellers. (*Massachusetts Agricultural Experiment Station, Bul. No. 338*, December 1936). The effects of storage, freezing, drying, and thermal treatments on the several vitamins are discussed at the end of the respective chapters. A bibliography of 235 references to the literature is appended.

Generally speaking, ordinary storage and to a lesser extent cold storage in air have no serious effect on vitamins D, E and G; have a slight to moderate destructive action on vitamins A and B; and cause serious loss of vitamin C, particularly when storage is long continued. Losses are reduced when storage is near the freezing point. Shipped-in vegetables may lose substantial quantities of vitamin C during shipment and incidental marketing operations. This is not true in the case of most fruits and such acid vegetables as tomatoes and rhubarb. Properly packaged frozen fruits and vegetables show practically no losses in any of the vitamins even after long storage at 0°F or below.

Destruction of vitamin C is very rapid when frozen fruits and vegetables are defrosted in air. Little loss in vitamin C occurs if solidly frozen vegetables are cooked in boiling water without previous defrosting. Sun-drying is more destructive to vitamins A and C than artificial dehydration. Fermentation of fruits and vegetables is injurious to vitamin C.

In general, heat treatments such as cooking and canning are not injurious to any of the vitamins, but the accompanying oxidations and other destructive reactions, unless carefully controlled, are decidedly injurious to vitamins B and C. Fruits or vegetables containing added acid may be heated with less destruction to vitamins B, C and G than non-acid foods. Thus, canned fruits retain vitamin C very well, while canned vegetables lose much of their original C. Modern methods of vacuumization and air removal and sealed packaging now used in the food preservation industries are practical aids in preventing vitamin losses through oxidation. It is not believed that cooking and canning are harmful to the vitamins A, G, D and E of fruits, vegetables and cereals.

Heat in the presence of alkalies is very destructive to all the vitamins. Rapid cooking, with minimum exposure to air, serves to minimize losses of vitamins C, A, and B.

Food manufacturing operations such as blanching, openkettle cooking, pulping, and filling containers are ordinarily destructive to vitamins C and probably to a lesser degree to B and A as well.

There is no satisfactory evidence that foods once canned lose appreciable quantities of any vitamins on storage. Losses of vitamins C and A in reheating canned foods for table use are small. Large quantities of the water-soluble vitamins B, C, and G are dissolved in the cooking water of fruits and vegetables and are lost unless this cooking water is utilized. In conclusion, it should be borne in mind that this field of research is in an active state of change. The literature is being multiplied very rapidly. There is still need for much more research before all the effects of environmental factors on vitamin stability can be stated with finality.

Studies of the Physiology of *Coffea arabica*. I. Photosynthesis of Coffee leaves under natural conditions. Nutman F. J. *Ann. Bot. (N. S.)* 1: (3) 353—367 (1937).

The disease of *Coffea arabica* known as 'overbearing and die-back' prevalent in the coffee growing areas of E. Africa is explained as due to the heavy demands for carbohydrate by the developing crop which exceed the total daily photosynthetic activity. The branches then die-back, roots degenerate and the tree is

injured and remains unproductive. Since shortage of carbohydrate is associated with this disease, the author has presented the results of his investigations into the rate of carbon assimilation under field conditions by leaves of *Coffea arabica* growing in the Northern Province of Tanganyika Territory.

The apparent rate of assimilation for whole trees as well as the diurnal march of assimilatory rate for single attached leaf are determined under different degrees of sun and shade and full data are presented which show that the rate varies directly when the intensity of light is low but is inversely proportional in high light intensity. The total daily assimilation is greater under a moderately shaded condition than in full sunshine, and that during cloudy weather, the assimilation rate remains at a fairly constant though low value, while in the sun the rates show a large depression during the midday hours. These studies show why the coffee plant assimilates better under shade and why the plant can stand heavy bearing better under shady conditions than under exposure to intense sun-light.

V. T. B.

The control of the leaf spot disease in young Coconuts. Tammes, P. M. L. *Landbouwe*, 13: 69—73 (1937). The writer's observations in Java indicate that freedom from grey spot or leaf blight of coconuts (*Pestalotzia palmarum*): R. A. M., xv, p. 15) may be ensured by the provision of light shade, e. g., *Sesqania grandiflora* cuttings, during the first two years after planting. Such conditions frequently obtain in native plantings, where the seed nuts are kept under shade in the gardens or planted out in maize fields. In a test in 1936 the incidence of infection in shaded plots was only 2 per cent. compared with 46 per cent. in exposed sites. Excessive shade, however, should be avoided as tending to weaken the development of the plants. (*Rev. Appl. Mycol.* 16: 529).

Gleanings.

Controlling Growth of Weeds. Sulphuric acid spray as a method of controlling the growth of weeds in fields of grain is gaining ground in the United States. Tests covering several years and several thousand acres of grain fields in California have demonstrated the effectiveness of this method. During the present season more than 6000 acres are being kept free from weeds by spraying with solutions of sulphuric acid which kill weeds but do not injure the growing grain. This is a meagre beginning when in California alone there are more than half a million acres that could be benefited and when the vast grain fields of the mid-west and the Pacific Northwest have not yet been touched. In France the treatment is already applied to more than 500,000 acres and its use is growing in England and on the Continent. The California development includes testing new, more efficient types of sprayers to cover larger areas more effectively. (*Scientific American*, September 1937).

Treat ulcers by continuous drip of milk into stomach. A continuous feeding of milk, drop by drop, into the patient's stomach is the new method of treating stomach ulcers reported by Dr. Asher Winkelstein of New York.

Frequent feeding of small amounts of milk and cream has for years been part of the standard medical treatment of stomach ulcer. The milk, together with alternating doses of alkaline powders such as bicarbonate of soda, is given to neutralize the acid normally secreted by the stomach but which irritates the ulcer and prevents its healing.

Dr. Winkelstein's modification of this method into a constant feeding of milk, a drop at a time through a tube, is based on studies of stomach secretion, especially at night.