It should be of interest to you to know that due to the work of the League, the rates on citrus since 1928 have been approximately $1,000,000.00 less, annually, than they were prior to that date.

That a saving of approximately $500,000.00 annually, was made in the refrigeration rates since June, 1929.

That approximately $80,000.00 will be saved, annually, in preventing increase in charges for the use of refrigerator cars for pre-cooled citrus and for top icing of vegetables.

That a saving of approximately $80,000.00 annually, was affected by preventing an increase in the standard refrigeration charges to eastern territory.

That approximately $40,000.00, annually, was saved by securing a reduction in the citrus rates to territory intermediate between the Missouri River and the west.

That due to the efforts of the League, State Railroad Commission, and others, something over approximately $2,000,000.00 was saved the industry in transportation and refrigeration costs by preventing the imposition of the full fifteen per cent increase asked by the railroads this past summer. If the full penalty had been applied for the two-year period, it would have imposed an additional burden on the Florida citrus and vegetable industries in excess of $4,000,000.00.

In conclusion may I not appeal for an increasing interest in traffic matters affecting the citrus industry. After all, distribution, and the net rate of return to you on your investment in the citrus industry lies primarily in the rate you have to pay for freight and refrigeration and the service you get in return for the rate you pay. Consciously or unconsciously you are all vitally interested in traffic matters that affect the citrus industry.

I received a wire yesterday that reduced the rates for export on grapefruit that would go into effect April 27th.

There is one other matter. Yesterday I learned that there was a strike on the dock of the Clyde-Mallory Steamship Line at New York. There were 118 cars of citrus fruit tied up on the docks, and the strikers refused to permit the consignees to unload it, or take it away from the docks. I got in touch immediately with our counsel in Washington, and he is in New York today trying to adjust the matter, and take it up with the governor or mayor in an effort to get that fruit unloaded. I understand that yesterday some receiver in New York got a truck, loaded a few boxes on it which belonged to him and he had a right to take, and the strikers said, "Here, Buddy, that's enough." So that's a traffic matter of importance for the citrus industry that we are trying to handle today.

VITAMINS—WHAT THEY ARE AND WHAT THEY DO

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The term vitamin has been defined as a group name for substances other than fats, carbohydrates, proteins, and minerals, which are found in minute quantities in natural foods. They are essential for normal nutrition and for the prevention and cure of various pathological conditions known collectively as deficiency diseases. Up to the present time that is about all that could be said of vitamins with any degree of certainty. The chemical structure was unknown and no one had seen a vitamin. But to reject vitamins because their chemical structure was unknown would be illogical, for the chemical structures of toxins, antitoxins, enzymes, and insulin are still unknown, yet we know all of these substances as powerful realities. As with these other substances the therapeutic and practical importance of vitamins has outrun the investigation of their chemical nature. Almost no group of substances can out-rival vitamins in the extent of the information which has accumulated since their postulation about twenty
years ago. The realization that a diet may be adequate in energy and protein and still be inadequate in both organic and inorganic constituents opened up a new field of research. The idea of vitamins took hold of the imagination of the people and nearly every laboratory began the feeding of rats and guinea pigs. Unfortunately vitamins were discovered at a time when conservation and substitution of food was made imperative on account of the war. Hence vitamins became commercialized before the careful basic work had been completed. They became known as the mysterious vitamins, when in reality there is nothing any more mysterious about the action of vitamins than there is about iron or iodine or any one of the elements or compounds essential for life.

At the present time there are six independent vitamins, whose existence has been definitely proved, and the data are indicating the possibility and probability of at least three more. The known vitamins are vitamins A, B, C, D, E, F and G.

Vitamin A.—Vitamin A was one of the first vitamins discovered. It is essential for growth and well being of all ages. While it is not the anti-sterility vitamin, it is necessary for reproduction. The absence of this vitamin from the diet produces in experimental animals very definite changes, the most conspicuous of which is the condition of the eye known as xerophthalmia, but the most frequent is the abscess at the base of the tongue, and the pus in the sinuses and ears. When vitamin A is low in the diet over a long period there is an increased susceptibility to bacterial infection, which is supposed to be due to the weakened condition of the tissues. It has been found that the body has the power to store this vitamin and is able to draw on this supply for future needs. An abundant supply of vitamin A in early life seems to safeguard the body against later infections as well as providing protection for the present. As growth proceeds the amount of this vitamin must be increased. During pregnancy and lactation there must be a still further increase in the vitamin content of the diet if it is to meet the added demands of these functions.

The chief sources of vitamin A are eggs, liver, milk and butter, thin leafed green vegetables and the pigmented ones. It has been very definitely proved that carotin is the organic compound present in plants which forms vitamin A in the body. Carotin is a constituent of chlorophyll, and this is the green pigment in plants. In finding that carotin is the constituent in plants that is essential for life, again there is emphasized the wisdom and providence of nature in distributing this compound so widely and abundantly. Chlorophyll is made up of four pigments, two green pigments and two yellow ones. The green pigments are called chlorophyll alpha and beta, and the two yellows are called carotin and xanthophyll. We have been able to show that of these four pigments carotin is the only one that can supply the material from which the animal body can make vitamin A. Tomatoes are an excellent source of vitamin A, but again the precursor is carotin and not the red pigment lycopersicin which covers the carotin. It is evident then that all yellow and green vegetables are richer in the precursor of vitamin A than the white ones, hence yellow sweet potatoes and yellow corn would have more value in the diet than white sweet potatoes and white corn. If all the yellow color in satsumas and tangerines is due to carotin then they should be more potent as a source of vitamin A than oranges. It also explains why grapefruit juice and lemon juice are lacking in this factor and why the oils of citrus fruits contain the precursor of vitamin A.

While it is generally accepted that carotin is the parent substance from which vitamin A is synthesized by the animal body, the exact chemical nature of vitamin A is still in the experimental stage. Some investigators are of the opinion that there is an enzyme in the liver that splits carotin into vitamin A and that a new substance is formed that is much more potent than carotin. By some it is claimed that vitamin A is one of the higher alcohols, and still others believe that vitamin A is closely kin to synthetic violet perfume, the basic material of which is ionome. This substance is closely related to the terpenes, which occur in resins and turpentines. It is evident that the exact nature of vitamin A
is still unknown, but as long as we know that carotin is the substance from which it is made it is unnecessary that any one should have a diet low in this substance.

**Vitamin B.**—This vitamin was also one of the first vitamins postulated, and is now known as the vitamin B complex since it contains at least two separate and distinct vitamins which are now known as vitamin F and G.

**Vitamin F.**—Vitamin F is known as the anti-neuritic vitamin. It is soluble in water and is relatively heat stable. This vitamin has been found to prevent polynieuritis in pigeons and chickens, a similar disease in rats, and probably beri beri in man. The symptoms of this deficiency are loss of appetite, a rapid loss of weight, a nervous condition which is characterized by spasms and paralytic seizures. When vitamin F is added in even minute quantities the recovery is almost miraculous, and this may account for calling the vitamins mysterious.

Vitamin F is stored in the body to a very limited extent. As with vitamin A, this vitamin must be increased during lactation for it seems to be of special importance to lactating animals. The most abundant source of this vitamin at the present time is a water extract prepared from corn and wheat germ. However, except in times of limited food or where the diet is made up of highly purified food materials there is little danger of a deficiency in this factor. Nearly all the grains have it in large amounts, most vegetables are excellent sources, while fruits are upon the whole rather a poor source of the vitamin. It has been found, however, that grapefruit, oranges, and lemons are well supplied with this vitamin.

The other member of the vitamin B complex, vitamin G, is often called the anti-pellagra vitamin. When this vitamin is absent from the diet of experimental animals there is a retardation of growth, soreness of the eyes, nose, and mouth, and a loss of hair. In the absence of vitamin F the animals become nervous and irritable, but in the absence of vitamin G they become weak and lethargic. While there are some very striking resemblances to pellagra there are not enough to make the acceptance of vitamin F deficiency as a cause of all types of pellagra.

As stated above it has been found that cereals appear to be an excellent source of vitamin F, but are relatively poor in G. Skimmed milk is high in this factor so cereals and milk make a combination which gives both F and G in liberal amounts. Bananas have been found to be high in G but deficient in F. Tomatoes, fish, lean beef, have all been found to contain vitamin F so that they may be classed as protective foods. Turnip greens have been found to be an excellent source of vitamin G, so that the South has a very cheap source for this vitamin.

The chemical nature of the vitamin B complex is not known. This is probably due to the fact that during the greater part of the experimental work the complex nature of vitamin B was not recognized, so that the isolation and identification of vitamin F and G was necessarily delayed.

**Vitamin C.**—Long before there was a vitamin theory the value of citrus fruits as a cure and preventive of scurvy was well recognized. When fresh fruits and vegetables are absent from the diet of man or guinea pigs, scurvy develops. This disease is characterized by soreness of the joints, with a tendency to hemorrhage, soreness of the gums, with a loosening of the teeth and a fragility of the bones. Formerly this disease was somewhat prevalent among babies and among adults in times of long sea voyages and of famines. On diets low in this vitamin children become irritable and show less resistance to infectious diseases. A shortage of vitamin C is thought to be an important factor in the prevalence of tooth decay and much of the so-called rheumatism of children. Vitamin C, like all other vitamins, is widely distributed in natural food materials. It is present in varying amounts in most fruits and vegetables. Citrus fruits apparently lead the list in the abundance of vitamin C, which they contain. Raw cabbage, turnips, rutabagas, and tomatoes are excellent sources of this factor. Cereals and legumes contain no appreciable amount of vitamin C but if they are allowed to sprout they become a fairly rich source of the vitamin.
When foods containing vitamin C are cooked or the juice of fruits extracted the retention of vitamin C becomes a problem. It is easily destroyed by heat and by oxidation. In the open kettle method of canning vitamin C is easily destroyed in most foods, while in the commercial or cold pack method of canning there is a retention of the greater part of the vitamin. It has been found that when orange juice was neutralized and allowed to stand for twenty-four hours the antiscorbutic properties were lost. Hess has shown that orange juice has lost some of its potency after storage in a refrigerator for three months. There is a difference of opinion as to the value of dried orange juice as an antiscorbutic, some investigators found that there was a gradual destruction of the vitamin of dried orange juice stored at room temperature which amounted to about fifty per cent in fifteen months, while others report that dried orange juice retained the antiscorbutic properties after three months' storage. Experiments on the preservation of oranges and lemons in cold storage were not particularly satisfactory on account of the fact that the fruit did not keep well for any length of time, but the results indicate that whenever the fruit was edible the antiscorbutic property was not seriously damaged. Oranges and lemons stored in a frozen condition for five years retained about half of their antiscorbutic value. Orange and lemon juices preserved in the rind oil retained their activity after storage from one to three years. Work done at the California Agricultural Experiment Station on orange juice concentrates shows that the concentrated whole juice retained practically all the antiscorbutic value of the original juice. The desiccated juice, at the end of two years still retained a good proportion of its antiscorbutic properties, and the dried whole juice proved to be a highly concentrated source of vitamin C.

The vitamin content of frozen citrus juices is still uncertain. In Miss Smith's new bulletin from the U. S. Department of Agriculture, she shows that the vitamin A and B content of orange juice frozen and stored is uncertain and that the vitamin C content has been reduced about one-third. Since the methods used in freezing and storing are not given, before a definite statement could be made it would be necessary to test samples from known methods for it is possible and probable that the amount of vitamin C might be greatly influenced by the method used.

Orange peel has been found to contain vitamin C but the peels of grapefruit and lemon do not possess this factor in appreciable amounts.

Taking orange juice as a standard, peaches and apples are about one-half and pears about one-fourth as potent as oranges. Papayas, pineapples and mangoes are good sources of vitamin C. Some investigators report that mangoes have been known to cure advanced cases of scurvy where all other means failed.

As to the chemical nature of vitamin C investigators are still uncertain. Phosphorus, iron and sulphur have been found in the active concentrates. It has been very definitely proved that vitamin C is not citric acid, nor the ash. One very potent extract has been prepared which has yielded on evaporation, needle-like crystals which were very hygroscopic and easily oxidized. Upon oxidation a yellowish brown quinone was formed. The minimum protective dose for guinea pigs was less than two milligrams daily. Some Norwegian investigators claim to have isolated a substance from narcotine which is an opium derivative that relieved scurvy and they were of the opinion that this was vitamin C.

Vitamin D.—Because Vitamin D is fat soluble and present in cod-liver oil, very early in its history it was confused with vitamin A. Later work showed that there were two fat soluble vitamins which were quite distinct in their action. Vitamin D is called the antirachitic vitamin because it has the property of promoting the assimilation of Ca and P and thus controlling bone formation. Further investigations showed that exposure to ultra violet light had the same beneficial effects as cod-liver oil and that exposure of other food materials to this light conferred on them antirachitic properties. This is due to the presence of ergosterol, which become a powerful antirachitic agent upon irradiation. Ergosterol is present in minute traces on the skin and it is believed that the favorable effect of ultra violet light is due to the formation of vitamin D from
the ergosterol in the skin. Irradiated ergosterol is now on the market, under the trade name of viosterol. Its use is recommended for the prevention and cure of rickets. However, codliver oil is better in most cases of rickets, as ergosterol, while a most potent calcifying agent, does not stimulate growth as codliver oil.

In addition to the curative and preventative effects of vitamin D in rickets it has been found to have other very effective uses in medicine. It has been found to hasten blood clotting by increasing the number of thrombocytes. Its use will be indicated in cases of bleeders and in jaundice. Irradiated ergosterol has been found beneficial in the treatment of radium poisoning.

The exact chemical structure of vitamin D is not known. British investigators have prepared the most active antirachitic substance known, it consists of colorless crystals formed by the irradiation of ergosterol. The elements are in the same proportions as in ergosterol although the structure may be different. American investigators treated ergosterol with nitrogen monoxide and obtained crystals which are very potent. This is the first time an antirachitic substance has been formed without the use of ultra violet light. Whether these two compounds are identical is not yet known.

Among natural food sources liver and egg yolk are probably the richest sources of this vitamin. Milk and dairy products contain it in small but appreciable quantities. Almost any food can be irradiated and made antirachitic, but codliver oil is one of the best natural sources of this factor.

Vitamin E.—This is the reproductive vitamin or antisterility vitamin. In its physical properties it resembles vitamins A and D but differs from them in its distribution. It is practically absent from codliver oil but is present in vegetable oils. The oil of wheat embryo is one of the richest sources while the best natural food is lettuce. It is present but never highly concentrated in a great variety of animal tissues and fat. Milk and butter fat contain it in small amounts.

In conclusion it should be emphasized that there is no need to worry about vitamins. A well balanced diet of natural foods contains enough of the known and also the unknown vitamins to furnish all the factors needed. When concentrated vitamin preparations are needed they are too potent to be prescribed and administered by the laity, but must be given by a physician.

A RESUME OF THE HORTICULTURAL CROPS OF NORTHWEST FLORIDA AND THEIR CULTURE

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For the purpose of this discussion, northwest Florida is assumed to consist of that part of Florida lying west of the Aucilla River. The larger part of this area of Florida has a rolling contour and many high hills, which make it an ideal horticultural section. The land is largely Orangeburg and Norfolk soils, with the exception of that lying near the Gulf. This means a clay subsoil, and it follows that the land can be built up with legumes, and also that moisture will be retained, both of which are quite essential to economical horticultural practices. West Florida is well supplied with rivers, branches, springs and lakes. There are several leading horticultural crops which will be discussed individually.

PECANS

In northwest Florida there are more acres devoted to growing of pecans than to any other horticultural project. The oldest pecan trees are at Newport and are seedlings. The improved varieties were not planted commercially before about 1907. From this time on, large and small plantings were made at an increasing rate until about 1917. A planting of 1,000 to 3,000 acres was not uncommon.