is set too tight but give no indication of wasteful operation. By combining this information with checks on the juice content of the pulp, control in both directions can be obtained. Yield information can be obtained in a few minutes which is a great aid in finisher studies involving a number of variables. Normal yield studies, which involve running large weighed lots of fruit and measuring the yield of product, are quite time-consuming.

Summary:
The amount of juice in finisher pulp can be quickly determined by calculations involving data derived from two simple titrations for acid concentration. The results are easily reproducible and reasonably accurate.

A STATISTICAL REVIEW OF FLORIDA'S CANNED CITRUS

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The statistical data of the Florida canning industry reads like a fairy tale. The industry mushroomed in a few short years until the figures became astronomical.

The first Florida canned citrus product was grapefruit sections, which started commercially in 1921-22 and has increased 400 times in 16 years until now this product seems to have reached a rather constant annual pack level of slightly less than 5 million cases.

Florida canned grapefruit juice started in 1928-29 with a pack of 202,000 cases until the production reached an all time peak of 16,778,124 cases in 1943-44 or an increase of 83 times greater than the 1928-29 pack. Since 1943-44 the production of canned grapefruit juice has dropped down to an annual production of between 8 and 9 million cases annually except for last year when the production rose to 12,741,552 cases.

1929-30 saw the first appreciable commercial pack of canned orange juice in Florida. The pack was 37,552 cases; 19 years later (1947-48) the pack reached 25,593,134 cases or an increase 682 times the first recorded commercial pack. Last year's pack of single strength orange juice was slightly higher than the average for the past 6 years or 20,021,348 cases.

Florida canned blended orange and grapefruit juice came into the picture during a period of Government surplus buying in 1935-36 and rapidly increased in popularity until it reached a high of 12,267,484 cases in 1945-46. Last year's pack of blended juice was 8,711,255 which was about 1,000,000 under the last 6 years' average.

All of the above figures were record production figures for the canning industry as a whole who are accustomed to large volumes and increases, then came the most spectacular product of all canned products—frozen orange concentrate. From a meager start in 1945-46 of 226,000 gallons its production shot up like a rocket to 30,757,656 gallons for last season or an increase in 6 short years of 135 times the original pack. Nothing has ever approached this record in the canning industry.

These figures are indeed astronomical and tax one's imagination to conceive them. Recently published figures by the Florida Canners Association show that the number of boxes of grapefruit used by the Canners for the past ten years had been over 50% of the total State's grapefruit production. Also during the last 10 years period the use of oranges by Canners and Concentrators had increased from 16% to 61% of the total orange production. This amount represents more oranges than were produced in Florida prior to 1943-44 season.

In giving this review, the writer has picked the period between 1941 and 1950 for particular emphasis although longer periods of time are used when trends are to be shown more graphically. It was during this period that two major factors affected the citrus industry. The first was World War II with food rationing, the Tin order, and other related economic controls, together with large volume buying of citrus products by the Armed Forces. Although every processed citrus item except grapefruit sections and salad were unlimited as far as production or sale were concerned, many competitive food products were drastically curtailed, causing a great increase in
consumer demand for citrus products. The second factor in this base period was the conception of frozen orange concentrate. In order to properly understand the factors we must know the position citrus products holds in relationship to the principle canned fruits and canned fruit juices produced in the United States and its territories. For this information the writer has taken the statistics from the National Canners Association on vegetables and fruits. Chart No. 1 shows the total U. S. principle canned fruits and juices. On canned fruits, the U. S. pack of citrus canned fruits (grapefruit sections and salad) represents 4.3% average for the base period.

On juices against the U. S. total fruit juices the U. S. citrus industry does a great deal better—74% average. Now if we include the principle vegetable juice—tomato juice—we come up with 51% average of the total canned juices.

Chart No. 2 shows the position of Florida orange production in relationship to the total U. S. production. Note that the relative position of the two major producing areas are reversing themselves, the turning point being 1946-47.

Chart No. 3 shows the position held by Florida oranges used in processing against the total U. S. oranges used in processing. The same reversing procedure is taking place. Florida is definitely taking the lead.

Chart No. 4 shows the acreage and production of Florida and California oranges. The tendency of California is to level off if
not actually to decrease, while Florida is still rising at a very rapid rate.

A similar situation is shown in Chart No. 5 which compares the computed yield per acre of oranges in Florida and California.

Another very important factor in the production of Florida canned orange juice is the tremendous increase in yield per box in Florida over a comparatively short period of time from roughly 25 No. 2 cans per box to 35 No. 2 cans per box. Last year this average going even higher. This is due both to growing bet-
ter fruit and better methods of extraction. This increase of 10 cans per box of fruit is a tremendous factor in all products containing orange juice.

Now, let us examine in the same way, the grapefruit picture (Chart No. 6).

You will note from this graph with the same base period, Florida has been ahead of Texas every year except 1944-45, when the Texas production equaled that of Florida, but from then on Texas rapidly fell off and Florida increased greatly. Of course, this was due to an extreme freeze in Texas which not only took the fruit but seriously injured a great many of the trees.

Let us now examine the total U. S. Grapefruit used in processing (Chart No. 7). During this same period Florida was always ahead of its nearest competitor, although during the first % of the period Texas seemed to pretty well hold its own, then lost it to the freezes. There is one interesting thing to be noted here and that is at the end of the period under discussion (1949-50) Arizona had surpassed Texas in the use of grapefruit for processing.

In examining the acreage and production chart (Chart No. 8) of Florida and Texas on grapefruit, we see Texas coming forward at the beginning of the period very rapidly then dropping down, while Florida production and acreage is ever upward.

Chart No. 9 on the computed yields per acre show a similar chart. In plotting Florida yields on grapefruit juice, we find that during the same period of time that orange juice had increased 10 No. 2 cans per box, grapefruit only increased 3 No. 2 cans per box. The graph for annual yield on grapefruit sections is not shown. The curve is quite erratic, varying from 27 cans to as high as 37 cans per box. As this operation is chiefly manual, slight variances in interior quality of fruit makes a big difference in yield.

Chart 10 shows the tremendous growth of frozen orange concentrate. Included on this chart is processed or pasturized concentrate. Tabulated below the chart are the other concentrates which to date have only played a minor role.

The final chart (chart No. 11) was kindly furnished by Mr. C. C. Rathburn of the Florida Canners' Association, which the writer thinks deserves a lot of thought by the industry. On this chart is plotted the total U. S. orange production. You will note that this line is ever upward. The other line is the average price paid by Florida Canners over a period of time. Your attention is called to the extreme rise in war years and then the sharp collapse after
the war. The next rise coincides with the introduction of frozen orange concentrate. Note the falling off last season due to high prices and heavy losses by the Concentrators the year before. This same thing might be expected this season, due to high inventory and low prices this summer to move the accumulated inventories. These peaks and valleys are dangerous to every segment of the industry and should be avoided if possible.

It has been pointed out by the Industrial Survey Co., that the per capita consumption of citrus is 103 pieces of fruit per year or 2 fruit per week per person. It would seem easy to increase this 50% or 3 fruit per week. It is not an impossible task but it has taken us a long time to come this far. We should not miss an opportunity to increase the sale of our fruit whether it be by advertising, promotion, beverages, dispensing machines or some new miracle product such as frozen orange concentrate. We can not sit complacently by with our large new acreages coming along. As the charts all show, we are the leaders of the citrus industry now, and as such we have a very definite responsibility of leadership.

SOURCES OF INFORMATION
1. Florida Canner’s Association
   (a) Directory
   (b) Year Book, Season of 1949-50
   (c) Year Book, Season of 1950-51
2. National Canner’s Association
   Canned Food Pack Statistics 1960
   Part I—Vegetables
   Part II—Fruits
3. Florida Citrus Fruit Annual Summary 1960

VARIETIES OF VEGETABLES SUITABLE FOR FREEZING

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When the freezing of vegetables was started some years ago very little was known about the freezing characteristics of the different varieties. The enormous consumer acceptance of frozen vegetables encouraged a large number of concerns to get into production and many of these new processors had little or no technical information about food freezing and did not realize their need for adequate laboratory facilities.

Production in this new industry was more