

ABSTRACT

In this report, methods to determine the fruit content of processed fruit products, such as jams and cordials are discussed. The work done here is characterized, by the application of a large number of chemical analytical techniques.

The results obtained on analysing the pulp samples, and the corresponding processed products made in the laboratory, were treated statistically. Depending on the coefficient of variability ' ∞ ', some parameters were selected for further discussion, and they are called the Index Constituents. The selected index constituents were, the total Nitrogen, total Phosphorous, total ash and water insoluble solids. For convenience this chapter is divided into sections.

When pineapple, passion fruit, mango, and silver melon jams, along with their pulp samples were analysed, it was observed, that the figures obtained for the index constituents calculated, based on pulp results, agreed well, with the experimental values obtained, when the actual jam was analysed.

However, there was no agreement, between the experimental, and the calculated results, (Nehring and Klinger model) when ingredient contributions were considered. (Only the sugar contribution was considered, as pectin was added in very small quantities.)

When samples of individual areas were considered, it was noted, that most of the parameters were reduced in the product, in proportion to the amount of pulp used, in making them.

Pineapple jam was selected as the first product, and the reasons as to why, only some parameters were selected as index constituents, are given here in detail.

Market samples were collected for each product made, and they too were analysed, for these index constituents. It was found that they, too gave a high ' α ', suggesting how difficult it is, to get a single parameter, to determine the fruit content. In the case of silver melon jam, the ' α ' of the market samples analysed, showed very low ' α ' even though the individual results were far out, from the maximum and the minimum values obtained, for the laboratory made samples of 45 % fruit content.

Next, the inferences made, on analysing the pulp and the corresponding cordial samples made, are discussed.

The results obtained for sauce show, how difficult it is, to fix a single parameter, to define its fruit content. By definition, various other ingredients are added, during sauce manufacture. Hence, it is not possible, to fix one single parameter, to define its fruit content.

Some selected methods for the determination of fruit content are considered next, and they are:

(a) Utilization of the fatty acid content.

(b) Utilization of the polyphenolic content.

(c) Utilization of the lead number.

In the above methods fruit content was defined as

$$\frac{\text{Percentage of constituent A in sample}}{\text{Percentage of constituent A in pulp}} \times 100.$$

Fatty acids and the polyphenolic method were tried out with the laboratory samples, and the results were found to be agreeable. But, to apply these methods to determine the fruit content of market samples, the corresponding pulp from which they were made, too, had to be analysed, for the particular parameter in question.

The "Lead Number" method gave good results for the laboratory samples, but not for the market samples. The reason being that acids are added to processed fruit products during their manufacture in industry.

The last section describes, methods tried out by other researchers, who worked in this field.

It was found that the formula suggested by Bonney worked well for both laboratory made jam and cordial samples.

$$\text{fruit content (X)} = \frac{5790 B}{AD - BC} \quad 23$$

The other formula where

$$\text{fruit content (X)} = \frac{100 - M}{100 - F} \times 100 \quad 24$$

worked only for fruit - sugar mixtures and not for jams and cordials.

At present regression equations and Multivariate

statistical analysis is being tried out on the experimental results obtained for different batches of fruits and products made in the laboratory, and it is intended to compare these results, with those obtained for market samples. A report on these results will be submitted to NARESA, as soon as it is made available.