more than 50% of ash was potassium. The high amount of potassium suggest the use of banana powder in condition of hypertension and liver disease[10]. Sodium content varied from 208–334·70 mg per cent in the samples.

The vitamin contents of banana powders are reported in Table III. Different varieties of banana powders differed in their contents of B-group vitamins and ascorbic acid. Thiamine content of Safed Velchi was found to be highest (94 μg %). Riboflavin content in the samples varied from 29–79 μg per cent. Niacin was found within a range of 610–920 μg per cent. Ascorbic acid ranged in amounts from 15·12–21·40 mg per cent. Safed Velchi and Lalkel banana powders were rich in ascorbic acid.

TABLE III

Thiamine, riboflavin, niacin and ascorbic acid content of banana powders

Variety	Thiamine B^1 μg%	Riboflavin μg%	Niacin μg%	Total apparent Ascorbic acid mg%
Basrai	83	34	730	16·94
Harichal	80	29	610	15·12
Lalkel	88	52	860	19·73
Rajeli	72	36	790	18·46
Safed Velchi	94	79	920	21·40

On the whole, the banana powders were found to contain many of the nutrients that were normally required for the general well being of the body. Of the five varieties examined, Safed Velchi, Basrai and Lalkel banana powders showed fairly good percentage of minerals and vitamins.

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MINERAL NUTRIENT VALUE OF CITRUS FRUITS

FRUITS are one of the main sources of vitamins and minerals[1-3]. These two nutrients, in minute quantities, are essential for growth and disease resistance. Many suffer from deficiencies of vitamins and minerals, and liberal inclusion of fruits will be helpful. Even cheap fruits like the Citrus fruits are in fact more nutritious than the expensive apple. Hence it will be interesting to study the mineral contents of various Citrus fruits and compare them so that it will be easier for an individual to understand the nutritive merit of the different Citrus fruits.

Five varieties of Citrus fruits from Kollimalai region of Trichy District are chosen for this investigation. They are analysed quantitatively for their moisture content, ash content, and mineral content[4].

Procedure.—A sample of edible portion (juice sac with juice), of Citrus fruits for each variety is obtained and its moisture content is determined by oven drying to constant weight at 70° C. The dried sample is ground and ignited at low red heat to produce the ash quantitatively. About 0·4 gram of the ash is digested with 10 ml of 1 : 1 HCl to a paste twice and then extracted with water containing a little of 1 : 1 HCl. The solution is then made up to 250 ml with distilled water. This solu-

TABLE I

Name of the Citrus Fruit	Botanical Name	Moisture content	Ash content	Minerals Present
1. Lime	*Citrus aurantifolia*	84·23	0·6404	Na, K, Mg, Ca, P, Zn, Fe, Al, S, Cl
2. Kamala Orange	*Citrus reticulata*	85·92	0·4139	,, ,,
3. Orange	*Citrus sinensis*	89·2	0·4860	,, ,,
4. Kolunji	*Citrus limettioides*	85·39	0·5919	,, ,,
5. Kadarangai	*Citrus medica*	85·43	0·6193	,, ,,

TABLE II

Name of the fruits	Weights in mgms per 100 grams of the edible portion of the fruits					
	Ca	Fe	P	Na	K	Mg
1. Lime	95·54	0·4812	19·86	1·88	58·35	14·92
2. Kamala Orange	55·33	0·1937	18·41	1·614	58·76	10·15
3. Orange	46·70	0·2390	17·62	1·866	56·14	13·48
4. Kolunji	64·91	0·3398	26·34	1·912	78·16	16·00
5. Kadarangai	86·08	0·3438	26·40	1·719	77·34	20·06

tion is used for qualitative analysis and the minerals present in each variety are noted (*see* Table I).

All the elements present, except Al, S, Cl and Zn are then estimated quantitatively. The weight of Ca present in the ash is determined volumetrically by precipitating calcium as oxalate and titrating it with standard solution of potassium permanganate in presence of 1 : 1 sulphuric acid. Iron is estimated colorimetrically as $[Fe(CNS)_6]^{3-}$, using Systronics Double cell colorimeter[5]. With the same instrument, the weight of phosphorus is determined by the "Molybdenum blue method".

The elements sodium and potassium are estimated flame photometrically with Bruno-Lange (filter type) Flame photometer. For these estimations, petrol gas is used as the fuel with a pressure of 0·65 kg per cm^2. Magnesium is estimated by titrating it with 0·01 mole EDTA at pH 10 using Erio-T indicator. The interference of other elements is suppressed by adding a little of potassium cyanide and hydroxyl amine hydrochloride. From the total volume of EDTA consumed the volume equivalent of calcium present is subtracted and the resultant volume of EDTA gives the weight of magnesium present.

The weights of minerals thus calculated are then expressed in milligrams per 100 grams of the edible portion of the fruits (*see* Table II).

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