

INDIGENOUS VERSUS INTRODUCED VEGETABLES IN THE VILLAGE DIETARY

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MANY seeds of European vegetables are being distributed amongst the Native people of Papua and New Guinea to plant in their gardens. This is done in order to introduce more variety into their meals. Whilst some of these vegetables are good nutritionally and could considerably improve the diet of the people, it must be borne in mind that in many areas indigenous plants already growing and being eaten are superior in food value to the introduced kinds. The following table will indicate this.

Food 100 gm. Edible portion	Calories	Protein gm.	Calcium mgm.	Iron mgm.	Vitamin A I.U.	Thiamin mgm.	Ascorbic Acid mgm.	Botanical Name
Pit Pit *	38	4.1	10	....	....	....	21	<i>Saccharum edule</i> .
Shoots of Palm *	19	1.9	550	....	....	....	14	<i>Archontophoenix</i> sp.
Shoots of Grass *	25	1.6	7	....	....	....	8	<i>Panicum palmarum</i> .
Aibika *	45	5.7	580	3.0 approximately	13,000	0.15	118	<i>Hibiscus abelmoschus</i> .
Pumpkin tips *	26	3.8	80			0.15	18	<i>Cucurbita maxima</i> .
Taro Leaf *	43	4.1	310			0.15	16	<i>Colocasia antiquorum</i> .
Amaranthus *	6	3.5	267	3.9	6,090	0.08	80	<i>Amaranthus</i> spp.
Purslane (Pig Weed) *	21	1.7	103	3.6	2,550	0.03	25	<i>Portulaca oleracea</i> .
Lettuce †	15	1.2	22	0.5	440	0.04	8	<i>Lactuca sativa</i> .
Cabbage †	24	1.4	40	1.0	240	0.06	50	<i>Brassica oleracea</i> .
Chinese Cabbage †	14	1.5	186	1.0	2,800	0.08	45	<i>Brassica chinensis</i> .
Tomato †	22	0.9	130	0.2	400	0.06	22	<i>Lycopersicum esculen- tum</i> .
Cucumber †	2	1.0	5	0.1	0	0.01	2	<i>Cucumis sativus</i> .
Carrots †	9	0.2	12	0.2	6,237	0.02	1	<i>Daucus carota</i> .
Choko †	8	0.2	3	0.1	5	0.05	4	<i>Sechium edule</i> .
Radish †	4	0.2	6	0.3	0	0.03	5	<i>Raphanus sativus</i> .
Turnip †	5	0.1	11	0.1	0	0.07	5	<i>Brassica rapa</i> .
Spring Onion †	37	1.0	30	0.4	250	0.03	15	<i>Allium cepa</i> .
Treefern *	43	5.5	....	....	....	0.15	26	<i>Alsophila</i> sp.
Wild Mulberry leaves (Burua) *	57	2.9	300	....	....	0.15	49	<i>Morus</i> sp.

* Indigenous. † Introduced.

Greens.—

The importance of green leaves in the diet of the Native people is frequently overlooked. In most areas it is the custom for green leaves to be eaten daily in considerable amounts. They form an important

part of the diet for the following reasons.

1. Most of the Native people are infested with parasites which deplete the body of iron, therefore foods rich in iron are important for the health of these people. Most of the indigenous green leaves are rich in iron.

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2. In areas where the staple foods are taro, yam, tapioca or banana, green leaves play an important part in the diet by supplying Vitamin A and ascorbic acid as well as calcium and iron.

3. In areas where sago is the staple diet green leaves can supply all the nutriments which are commonly found in the other staple vegetables but are deficient in sago. Adequate green leaves of a high nutritive value are essential to the health of the people in sago eating areas.

4. In Highland areas the people obtain adequate Vitamin A, thiamin and ascorbic acid from the staple sweet potato. Signs of calcium deficiency have been noted in these areas away from the coast where betelnut and lime are not eaten. The main source of calcium for these people comes from green leaves, which also supply extra iron and protein.

5. It is well known that the main deficiency in the diet of the people of this country is a deficiency of protein. In many areas the greater part of the protein intake of the people comes from vegetable sources. The indigenous green leaves have a higher protein content than most other vegetables excepting legumes and cereals. Considering the quantity of green leaves that are eaten they do add something to the small protein intake of the people. Proteins are comprised of varying numbers of amino acids. Only proteins from animal sources contain all the amino acids essential for growth of body maintenance. Vegetable proteins contain some but not all of the essential amino acids. If a diet containing a number of different vegetables is eaten all the essential amino acids can be obtained. Most of the indigenous greens have not been analysed for amino acid content but it is believed that they do contain essential amino acids which are lacking in the staple vegetables and so when these greens are eaten with the staple vegetable, the proteins of both can be utilized to better advantage. In this way greens play an important part in the protein intake of the people.

It will be noted that all leaves of a dark green colour are superior in iron calcium and Vitamin A to those of a light green colour and most of the indigenous greens are higher in protein content than imported varieties,

consequently plants such as aibika, pumpkin tips, taro leaves and amaranthus which are grown and eaten in most areas should not be supplanted by the inferior imported plants such as English cabbage and lettuce. This could happen as the people become more sophisticated if they are encouraged to grow the new vegetables and the old ones are given no recognition. They will then tend to think that the indigenous plants are of no importance. I have seen this happening about Lae and Port Moresby. In other areas I have seen the European vegetables grown and wasted because the people do not care to eat them and they have no sale for them. Where garden space is short and the nutrition is poor, as in some areas of Chimbu, the vegetables that will give the highest yield and the best nutritive value should be encouraged. There is not much point in the people growing English cabbage, lettuce, cucumber and radish, etc., where there is no sale for them to Europeans.

In some areas many of these European vegetables are grown for sale to Native hospitals and labour lines. It would be better to encourage the production of more indigenous vegetables for this purpose.

There are many other varieties of indigenous greens such as ferns and fig leaves and sweet potato leaves eaten by the Native people which are equally as nutritious as the varieties mentioned.

Legumes.—

The following list shows the protein content per 100 gm. of the mature seed of some varieties of legumes :—

Winged beans	....	....	35 gm.
Soya bean	....	....	35 gm.
Cow bean	....	....	24 gm.
Lima bean	....	....	20 gm.
French bean	....	....	24 gm.
Green gram	....	....	22 gm.
Peanut	....	....	23 gm.

To overcome the deficiency of protein in the diet of the people throughout Papua and New Guinea certain types of beans have been introduced in some areas with limited success. It will be noted from the above figures that apart from soya beans, winged beans (*Psophocarpus tetragonolobus*) have a higher protein content than any of the other legumes. Winged beans are indigenous to the country, and are grown both in high-

land and lowland areas. They are popular, the leaves and the tuberous root as well as the green beans in the pod, and the mature beans are eaten. In areas where these beans flourish would it not be better to encourage larger crops of wing beans, perhaps by distributing more seeds, rather than try to introduce new varieties of beans which are not so nutritious and a taste for which has to be acquired.

In most areas it is the custom of the people to eat mature beans but not dried beans. The mature beans would have somewhere about the same nutritive value as the soaked dried beans and a great deal more nutriment than the immature green beans in the pod, such as french beans as eaten by Europeans.

It would perhaps be an advantage to encourage the people to dry and store some of their beans, then they could be eaten on days when fresh beans are not available, thus a continuity of the protein intake could be assured. However, this cannot be done unless the people have containers in which to soak and cook the beans and even then they must be taught how to soak and cook them before they will be bothered using them in this way.

Peanuts are always popular. They can be an important source of protein in the diet of the people. They are usually eaten raw. They are better assimilated, however, if they are cooked before eating them. It has been found that peanuts with a low oil content, such as Virginia Bunch, are better tolerated by young children than those varieties with a higher oil content.

Fruit.—

In many areas where sweet potato is not the staple food there is a deficiency of ascorbic acid especially amongst the infants and small children. Fruits such as papaw, ripe mango, fivecorner, citrus fruits and pineapple are the richest source of ascorbic acid. Insufficient of these fruits are cultivated. Occasionally mango trees are planted around a village, mainly for shade; and, sometimes, there are a few citrus trees. The fruits of these trees are seasonal, therefore other fruits should also be planted about the village or in the gardens so that a continuous supply of fruit can be maintained. Papaws, which bear throughout the year, should be grown more frequently. Too often they are

not planted. The papaws obtained are gathered from trees which have seeded themselves, consequently there is insufficient fruit for the needs of the people. Pineapples are also a good source of Vitamin C and more should be grown for home consumption.

Conclusion.—

Greens are very important in the diet of the Native people. Indigenous greens have a higher nutritive value than imported ones. More native greens should be encouraged to be grown rather than introduce new varieties of inferior nutritive quality.

Indigenous winged beans have a very high protein content. The variety which gives the best yield should be determined and seeds of this variety of winged bean distributed widely throughout the Territory.

Soya beans will sometimes flourish in areas which are unsuitable for winged beans, such as in some highland areas over 6,500 feet. Soya bean seeds should be distributed in these areas with instructions for them to be used when mature. Only in areas where cooking containers are available can the use of dried beans be encouraged with success.

Only peanuts with low oil content such as Virginia Bunch should be distributed in areas where they are to be used for local consumption. In areas where peanuts of a high oil content are grown for sale outside the Territory, or for local oil extraction, some Virginia Bunch or other low oil content peanut should be distributed with instructions for them to be used for the feeding of infants and small children.

Papaws are a rich source of Vitamin C. The trees are hardy. The fruit is not seasonal, it is obtainable at all times of the year. The people should be encouraged to plant more papaw trees and be instructed to feed papaw to their babies and small children daily.

The majority of imported vegetables should be distributed only in areas where they can be sold for European consumption.

More native vegetables and less European vegetables should be grown for sale to Native hospitals and labour lines.

The following vegetables and fruits are suitable for general distribution:—

Winged beans.

Soya beans and other varieties, and peas,
according to the suitability of the area
for the crop.

Peanuts (preferably Virginia Bunch).

Tomatoes.

Pineapple.

Citrus fruits.

Papaw.

Pumpkin.

Corn.

Improved varieties of indigenous greens.

Peppers and spring onions for flavouring.