

pounds in 1974. A breakdown of the Mexican states producing mangos compared to production in Florida and Hawaii is shown in Table 2.

The principal reason mangos have not expanded into a commercial enterprise in Hawaii is a quarantine against exports to mainland United States. The quarantine has been imposed because of the mango seed weevil which may be found in the seed of the fruit. The seed weevil is not known to cause damage to other fruit crops. The removal of the quarantine could stimulate the development of a new export industry in Hawaii.

Cultivars

Presently, the most popular mango cultivars being cultivated in Hawaii are the 'Haden', 'Pirie' and 'White Pirie'. The 'Haden' is sold in the markets as well as exported to Canada. On the other hand the 'Pirie' and 'White Pirie' primarily are home garden cultivars and the fruits are rarely marketed because most of it is consumed in the islands and yields are relatively modest. Other cultivars of merit include 'Pope', 'Gouveia' and 'Momi K'. Still others of some interest because of outstanding characteristics such as color, firmness, or flavor include 'Ah Ping', 'Waianae

Table 2. Mexico and U. S. Mango Acreage and Production for 1973.

MEXICO		
Largest producing States		
State	Acreage	Production in Tons
Veracruz	31,295	103,210
Oaxaca	12,558	38,031
Guerrero	4,470	39,250
Michoacan	2,515	15,223
Sinaloa	6,410	19,972
Chiapas	1,853	16,000
Total (all 24 states)	71,519	300,871
UNITED STATES		
Florida	1,450	6,875
Hawaii	125	625

Beauty', and 'Harders'. (15 slides of mango varieties in Hawaii, Costa Rica, Jamaica, Florida and Fiji were shown.)

References

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The Breadfruit

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"Ulu" is the Hawaiian name for breadfruit. The variety commonly found in Hawaii is *Artocarpus incisus*, known as the Hawaiian breadfruit. The fruit is large, round or oblong, and about four to eight inches in diameter, Fig. 1.

The breadfruit is part of the mulberry family. It has a male flower, a large yellow catkin, and a female

flower attached to the branch by a large stem. The fruit develops from the female flower.

The rind of the breadfruit is green in the upripe stage and as the fruit matures greenish-brown or yellow spots become visible.

Breadfruit is essentially a carbohydrate food; it is low in protein and fat. Table 2. 100 grams of cooked, green

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Table 1. Composition of the Breadfruit.

	%
Water	67.8
CHO	27.82
Protein	1.34
Fat (ether extract)	0.31
Fiber	1.5
Ash	1.23
Calcium	0.022
Phosphorus	0.062

mature breadfruit has 21 milligrams of calcium. Table 2. Compared with some of the other fruits of Hawaii, breadfruit is not considered to be an important source of calcium. However, eaten in large quantities it can provide a substantial amount of the day's need of calcium.

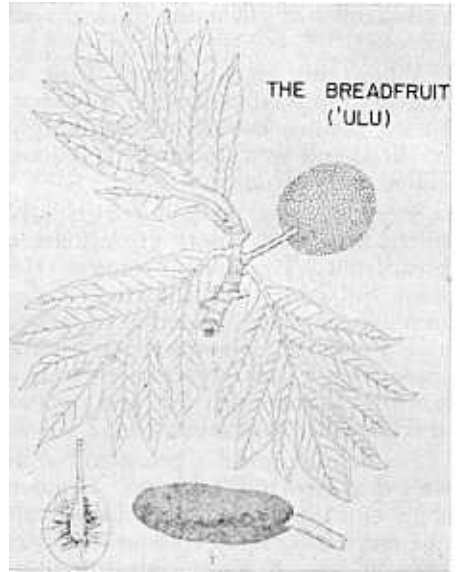
One hundred grams of cooked breadfruit furnishes about one-tenth of the recommended daily allowance of thiamine and ascorbic acid and approximately one-fourteenth of the recommended daily allowance of niacin.

When cooked, 100 grams of mature breadfruit has 119 calories as compared to the cooked ripe breadfruit which has about 134 calories.

As with bananas, all the starch of the green, mature breadfruit changes to sugar when the fruit is fully ripe.

To use the breadfruit as a starchy fruit, pick the breadfruit in the "tapau" stage when the milky sap has surfaced and the fruit is still green and firm.

To prepare green breadfruit as a starchy vegetable, place four cups

**Fig. 1. The breadfruit**

of diced green breadfruit in a pan; add three cups of boiling water; cover and cook about one hour, or until tender. Remove cover and evaporate excess water, season with salt and pepper, add margarine and a little sugar.

If a riper and sweeter fruit is desired, pick the fruit when the rind is tinged with yellow or is just beginning to turn brown. It is not advisable to wait until the fruit softens on the tree and falls.

Polynesians always cooked breadfruit before eating it. Hawaiians placed the whole breadfruit in an underground oven or "imu". Today,

Table 2. Nutritive value of Breadfruit 100 grams, cooked.

	Calcium (mg)	Thiamin (mcg)	Ascorbic acid (mg)	Niacin (mg)	Calories
Green, mature					
Ripe					
Recommended daily dietary allowance—males, 23-50 yrs. of age	800	1400	45	18.0	

breadfruit is usually baked or steamed.

When the green mature fruit is boiled, it resembles potato in flavor. Green mature breadfruit can simply be diced and, as is done with potatoes, added to chowder.

Steaming is a method particularly suited to preparation of green mature breadfruit. To steam, remove the stem and core (and the rind, if desired); cut into halves or quarters and steam in a covered pan until thoroughly cooked (one to two hours). Season with salt and pepper and dot with margarine.

For baking, select a breadfruit with rind that is partially brown. Remove stem and core, and place breadfruit in a pan with a small amount of water. Bake at 350° F. for an hour, or until tender.

Very ripe uncooked breadfruit was used by the old Hawaiians for a pudding. The breadfruit was mashed, mixed with coconut milk, wrapped in ti leaves and baked. This

pudding was eaten as such, or sliced and dried in the sun for later use. To preserve it until the next crop, it was occasionally placed in the sun to prevent mildew.

Today in Hawaii, baked or steamed breadfruit is often served as a vegetable in a gourmet dinner.

The Polynesian Voyaging Society, as part of the Bicentennial celebration, is going on a month-and-a-half voyage from Oahu to Tahiti in March or April 1976. One of the food items they will carry is breadfruit. They are now experimenting on how best to preserve breadfruit by drying, baking, and wrapping — all methods of preservation now being used in Micronesia and Malaysia.

References

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Macadamia Nut Production in Hawaii

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Macadamia nut production in Hawaii will be reviewed with operations and problems encountered at Brewer Orchards on the island of Hawaii where about 4,030 acres are under cultivation at two separate locations.

Macadamia Statistics

According to the 1974 statistics of Hawaiian Agriculture, there were 350 farms growing macadamia nuts each with an annual sales of \$600 or more. The total state acreage in crop was 9,890 of which 5,760 acres were bearing. 18,750,000 lbs. of in-shell nuts

were sold at 29 cents per lb. for a total of \$3,986,000. It is interesting to note that 9,840 acres were planted on the island of Hawaii or 99.5% of the total. Brewer Orchards grows over 4,000 acres or 41% of the acreage on the island of Hawaii.

The macadamia nut was introduced into Hawaii from Australia in the 1800's. Interest in its culture had its ups and downs since 1920 when the first commercial venture was started. When the virtues of the processed macadamia nuts became better known by 1947, Castle and Cooke, Inc. be-

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