



Variations In The Nutrient Profile Of Rice Across Three Pacific Islands

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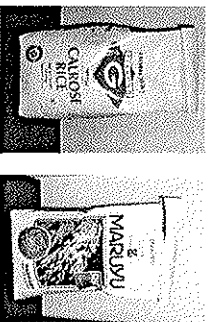


Introduction

Rice is a primary staple food for many Pacific cultures including Hawaii, Guam, and the Common Wealth of the Northern Marianas (CNMI). Although rice is the predominant staple food, nutrient content is uncertain. Other factors may contribute to the uncertainty of the nutrient content of rice, including the pre-cooking washing method and nutrient content of local tap water used to cook the rice. These factors make it necessary to analyze samples of enriched rice to check for nutrient content.

Objective

To determine the actual nutrient profile of white rice from three Pacific Islands and compare results to 'Nutrition Facts' label. In particular, nutrient content of thiamin, niacin, iron, and folic acid were of interest.



Popular brands of enriched rice available on Guam, Oahu, and Saipan

Methods

- Information on the enrichment levels of thiamin, niacin, iron, and folate was collected from the Nutrition Facts panel on food labels for samples of white rice in Oahu, Hawaii; Guam; and Saipan in the CNMI.
- Initially, samples from one package of enriched rice from Guam were analyzed after being prepared in three ways: (1) according to the label directions (unwashed); (2) washed twice in local tap water; (3) superwashed by scrubbing the rice in local tap water, as is the local custom. These initial samples were sent to Covance Lab in Madison Wisconsin.

- After the initial sampling from the one package of enriched rice from Guam, a more comprehensive sampling of rice brands was then collected and analyzed.
- 12 rice samples from various stores and brands was collected:
 - From Guam — 7 samples
 - From Oahu, Hawaii — 3 samples
 - From Saipan, CNMI — 2 samples

Dry rice samples were sent to USDA Lab for nutrient analysis

Results

- Results of the initial single sample of enriched rice from Guam showed that there was little variation in the nutrient values of the unwashed and washed samples. In fact, nutrient levels in the rice were similar to those found in unenriched rice. For example, iron levels were 0.30, 0.80, and 0.15 mg/100g in the three samples, compared to the 1.49 mg/100g that would be expected in enriched rice.
- Table 1 shows the results from the analyses of the 12 rice samples collected from various stores and brands in Oahu and Guam.
- None of the rice samples that were labeled enriched met the enrichment standard minimum, and almost all were well below the label claim as well.

Significance

This information will be used to determine nutrient values used for the Pacific Tracker, a food composition database being developed by the Cancer Research Center of Hawaii. Based on these analyses, we will assume that all rice consumed by our Pacific Island Populations is unenriched.

Table 1. Nutrient Content of Rice Samples Labeled "Enriched"

Rice Brands	Location	Thiamin		Niacin		Iron		Folic Acid	
		Label Claim	Actual mg/100g	Label Claim	Actual mg/100g	Label Claim	Actual mg/100g	Label Claim	Actual mg/100g
Enrichment Standard Minimum									
		0.44 mg/100g		3.59 mg/100g		2.7 mg/100g		154 µg/100g	
Hakuba Sweet Rice	Hawaii	0.43	0.28	3.81	1.77	2.57	0.89	147	12.1
Safeway Medium Grain	Hawaii	0.61	0.06	4.08	1.49	3.67	0.54	149	-
Safeway Glutinous	Hawaii	0.43	0.11	2.88	0.16	2.97	1.1	89	-
Diamond G Carrots	Guam	0.47	0.15	3.16	2.76	2.84	1.44	152	15.1
Diamond G Carrots (enrich)	Guam	0.43	0.06	3.61	1.57	2.57	0.55	163	-
Pacific Pride Carrots	Guam	0.33	0.16	3.56	2.03	2.40	1.34	245	22.8
Guam Royal Carrots	Guam	0.33	0.14	3.56	2.33	2.4	1.89	65	25.1
Royal Prodoms Asarimo	Guam	0.34	0.07	4.08	0.90	4.41	0.21	89	-
Ko Ice Jasmine Fragrant	Guam	0.37	0.03	4.08	1.26	3.67	0.2	152	-
Vicavay	Guam	N/A	0.23	N/A	3.12	0.80	1.57	N/A	-



Nutrient Content of Rice Samples Labeled "Enriched"**

Rice Brands	Location	Thiamin		Niacin		Iron		Folic Acid	
		Label Claim	Actual mg/100g	Label Claim	Actual mg/100g	Label Claim	Actual mg/100g	Label Claim	Actual µg/100g
<i>Enrichment Standard Minimum</i>									
Hakubai Sweet Rice	Hawaii	0.43	0.26	3.81	1.77	2.57	0.89	147	12.1
Safeway Medium Grain	Hawaii	0.61	0.06	4.08	1.49	3.67	0.54	143	-
Safeway Calrose	Hawaii	0.43	0.11	2.86	0.16	2.57	1.1	89	-
Diamond G Calrose	Guam	0.47	0.15	3.16	2.76	2.84	1.44	152	15.1
Diamond G Calrose (short)	Guam	0.43	0.06	3.81	1.57	2.57	0.53	163	-
Pacific Pride Calrose	Guam	0.33	0.16	3.56	2.03	2.40	1.34	245	22.8
Guam Rose Calrose	Guam	0.33	0.14	3.56	2.33	2.4	1.39	65	25.1
Royal Phoenix Jasmine	Guam	0.34	0.05	4.08	0.90	4.41	0.21	89	-
Ko Ko Jasmine Fragrant	Guam	0.37	0.03	4.08	1.26	3.67	0.2	152	-
Maruyu	Guam	N/A	0.23	N/A	3.12	0.80	1.67	N/A	-

**Dry rice samples were sent to USDA Agriculture Research Service Lab for HPLC Analysis.