Tropical Fruits and Nectars Typically Consumed in Latino Communities Are Excellent Sources of Vitamins A, C, and Other Nutrients

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ABSTRACT

Latinos are the largest minority group in the U.S. The Nutrient Data Laboratory (NDL) is sampling and analyzing foods commonly consumed by Latin Americans in order to improve the quality and quantity of data on ethnic foods in the USDA National Nutrient Database for Standard Reference (SR). Guanabana, guava, mango, and tamarind nectars were sampled from retail stores using NDL's National Food and Nutrient Analysis Program's (NFNAP) nationwide, probability-based method. Nectars were sent to qualified labs for analysis of proximates, sugar, fiber, vitamins, minerals, and carotenoids. Findings include the following per 1 cup (251 ml): guava nectar, 10% DV for fiber; and mango nectar, 35% DV for vitamin A. All nectars are excellent sources of vitamin C (30-82% DV). NDL and Minnesota's Nutrition Coordinating Center created a list of tropical fruits typically consumed in Latino communities. The NFNAP sampling method was not feasible due to the low probability of finding these fruits in retail stores. Cherimoya, jackfruit, mango, papaya, and mamey sapote were purchased from U.S. wholesalers, then composited and analyzed. All five fruits are excellent sources (32-138% DV) of vitamin C per 140 g (FDA serving, approximately 1 cup). Other standouts are mango for vitamin A and folate (45% and 21% DV, respectively); mamey sapote for potassium (21% DV); and cherimoya and mamey sapote for fiber (20% and 26% DV, respectively). Papaya has 2173 µg lycopene per 140 g. These new analytical values will enable researchers, clinicians, and consumers to more accurately assess the nutrient intakes of Latin Americans.

INTRODUCTION

The USDA National Nutrient Database for Standard Reference (SR) is an important source of nutrient composition data for foods consumed in the U.S. As the Latino population in the U.S. increases, there is a greater need to serve this population by adding nutrient data to SR for foods they commonly consume.

Many people seek the fruits they consumed in their native countries, resulting in increased tropical fruit imports such as mangos and papayas (Pollack, 2001). The general population is able to enjoy more tropical fruits with the greater availability resulting from the increased demand.

Four tropical nectars and 5 tropical fruits were analyzed in order to update SR with quality nutrient data for foods commonly consumed by Latinos.

METHODS

Tropical nectars and whole fruits were sampled and nutrient components analyzed using the following procedures:

Nectar

- National Food and Nutrient Analysis Program (NFNAP) – probability-based, nationwide retail sampling.
- Obtained two brands of each of following types of nectar: guanabana (soursop), guava, mango, and tamarind.
- Food Analysis Laboratory Control Center (FALCC) at Virginia Polytechnic Institute and State University prepared samples according to standard protocols and shipped composited samples to pre-qualified analytical laboratories along with quality control materials.

Fruit

- Types of fruit were selected based on recommendations by the Nutrition Coordinating Center, at University of Minnesota from results of the multi-center epidemiologic Hispanic Community Health Study.
- NFNAP probability-based sampling method not feasible due to limited availability.
- Ordered from U.S. wholesalers via Internet; arrived at various stages of ripeness and allowed to fully ripen before composited at FALCC.
- Fruits studied and their scientific names and countries of origin (according to the wholesaler) were cherimoya, *Annona cherimola*, Chile and U.S. (CA); jackfruit, *Artocarpus heterophyllus*, U.S. (FL); mamey sapote, *Pouteria sapota*, U.S. (FL); mango, *Mangifera indica*, Mexico and U.S. (FL); and papaya, *Carica papaya*, Brazil, Mexico and U.S. (FL).

Laboratories conducted analyses of proximate components, sugars, dietary fiber, vitamins, minerals and carotenoids in all of the nectars and fruit using AOAC or other published methods.

RESULTS

Nectar (Table 1)

The percent of fruit juice varied for each type of nectar and brand: guanabana – 13% and 20% juice; guava – 16%, 32%, 13% and 25% juice; mango – 23%, 30% and 20% juice; and tamarind – 14% and 25% juice.

- Dietary fiber – Guava nectar had the most fiber at 2.5 g/251 g (1 cup) which was 10% of the Daily Value (DV).
- Total sugar – All four nectars had similar sugar levels at 31-33 g/251 g.
- Minerals – Tamarind nectar is a good source of iron at 1.9 mg/251 g.
- Vitamin C – All nectars are excellent sources of vitamin C (Figure 1). All brands and nectars had ascorbic acid listed in the ingredients; thus the vitamin C levels were due in part to fortification.
- Folate – The nectars ranged from 3 to 18 µg/251 g.
- Vitamin A and carotenoids – %DV for Vitamin A is compared in Figure 1. One cup mango nectar has 1737 IU vitamin A (35% DV), derived mostly from ß-carotene (1009 µg) with some ß-cryptoxanthin (65 µg). Both yellow and pink varieties of guava nectar were sampled, resulting in an average lycopene value of 45 µg.

Table 1. Results of nutrient analyses of tropical nectars*

	Nectar, amount per 1 cup (251 g) and %DV**							
	Guanabanana		Guava		Mango		Tamarind	
	Amount	%DV	Amount	%DV	Amount	%DV	Amount	%DV
Energy, kcal	148		143		128		143	
Protein, g	0.3	1	0.2	<1	0.3	1	0.2	<1
Fat, g	0.4	1	0.2	<1	0.2	<1	0.3	<1
Carbohydrate, g	37.5	13	37.3	12	32.9	11	37	12
Dietary fiber, g	0.3	1	2.5	10	0.8	3	1.3	5
Total sugar, g	32.8		31.1		31.3		31.9	
Calcium, mg	18	2	28	3	43	4	25	3
Iron, mg	0.9	5	NA		0.9	5	1.9	10
Potassium, mg	63	2	95	3	60	2	68	2
Sodium, mg	20	1	18	1	13	1	18	1
Vitamin C, mg	28	47	49	82	38	64	18	30
Vitamin A, IU	0	0	88	2	1737	35	0	0
Folate, µg	15	4	8	2	18	5	3	1
Beta-carotene, µg	0		43		1009		0	
Alpha-carotene, µg	0		0		0		0	
Beta-cryptoxanthin, µg	0		20		65		0	
Lycopene, µg	0		45		0		0	
Lutein/zeaxanthin, µg	0		0		0		0	

* Yellow highlights indicate good source (≥ 10%DV) and green highlights indicate excellent source (≥ 20%DV).
** Percent Daily Values are based on a 2000 calorie diet.

Guanabana

Guava

Tamarind

Fruit (Table 2)

FDA's Reference Amounts Customarily Consumed Per Eating Occasion (RACC) indicates the reference amount for "other" fruit is 140 g (CFR, 2002). The equivalent of 140 g of the fruits in the current study was 0.8 – 1.0 cup of pieces (Table 2).

- Dietary fiber – Mamey sapote had the most fiber at 6.4 g/140 g. Both mamey sapote and cherimoya are excellent sources of fiber at 26% and 20% DV, respectively.
- Total sugar – Sugars ranged from 11 g/140 g in papaya to 28 g/140 g in mamey sapote.
- Minerals – Jackfruit is a good source of magnesium at 41 mg/140 g. For potassium, mamey sapote (738 mg) is an excellent source and cherimoya (453 mg) and jackfruit (627 mg) are good sources (Figure 2).
- Vitamin C – All five tropical fruits are excellent sources of vitamin C (Figure 2).
- Vitamin A and carotenoids – The variability of carotenoids and vitamin A within each fruit was high, most likely due to varying cultivars. For example, ß-carotene results for 3 composites of papaya were 31, 97, and 129 µg/100 g. Mango is an excellent source of vitamin A, with 2226 IU/140 g (45% DV). Papaya was quite high in lycopene, with 2173 µg/140 g, comparable to pink grapefruit's 2185 µg/154 g (USDA, 2009). Mamey sapote had 278 µg lycopene and 286 µg lutein/zeaxanthin per 140 g.

Table 2. Results of nutrient analyses of tropical fruits*

	Amount in 140 g fruit and %DV**									
	Cherimoya		Jackfruit		Mamey Sapote		Mango		Papaya	
	Amount (.8 cup)	%DV	Amount (.9 cup)	%DV	Amount (.8 cup)	%DV	Amount (.8 cup)	%DV	Amount (1 cup)	%DV
Energy, kcal	105		133		172		90		48	
Protein, g	1.5	3	2.4	5	1.9	4	0.9	2	0.8	2
Fat, g	1.1	2	0.9	1	0.9	1	0.6	1	0.6	1
Carbohydrate, g	25.3	8	32.5	11	43.9	15	22.7	8	11.3	4
Dietary fiber, g	5.1	20	2	8	6.4	26	1.8	7	1.9	8
Total sugar, g	18		27		28		20		11	
Calcium, mg	21	2	33	3	36	4	13	1	30	3
Iron, mg	0.3	2	0.3	2	0.3	2	0.2	1	0.3	1
Magnesium, mg	26	6	41	10	16	4	12	3	23	6
Potassium, mg	453	13	627	18	738	21	236	7	268	8
Sodium, mg	16	1	4	<1	13	1	3	<1	19	1
Vitamin C, mg	19	32	20	33	29	48	35	59	83	138
Vitamin A, IU	7	0	154	3	202	4	2226	45	429	9
Folate, µg	39	10	33	8	8	2	85	21	49	12
Beta-carotene, µg	3		85		111		1318		120	
Alpha-carotene, µg	0		9		0		2		13	
Beta-cryptoxanthin, µg	2		6		21		33		263	
Lycopene, µg	0		0		278		4		2173	
Lutein/zeaxanthin, µg	8		220		286		57		76	

* Yellow highlights indicate good source (≥ 10%DV) and green highlights indicate excellent source (> 20%DV).
** Percent Daily Values are based on a 2000 calorie diet.

Figure 1. Comparison of % Daily Values in vitamins C and A in nectars

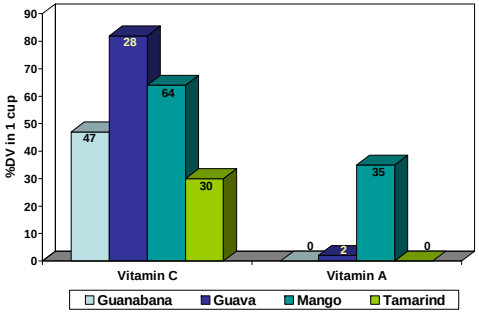
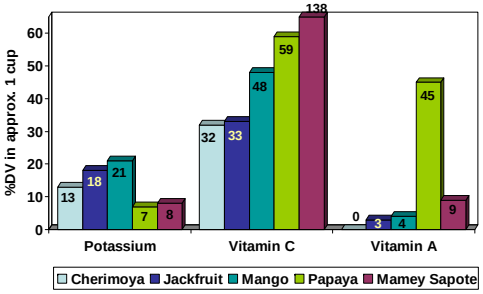


Figure 2. Comparison of % Daily Values in select nutrients in tropical fruits



CONCLUSION

Nutrient composition information assists consumers in making more informed food choices to positively impact their health.

All four nectars were added to USDA's SR in earlier releases. The cherimoya was updated with the new data in the recently released SR22 (USDA, 2009). The remaining four tropical fruits will be updated in SR23. A few more types of tropical fruits commonly consumed by Latinos will be sampled and analyzed in the future.

New data will aid in the assessment of nutrient intakes of Latin Americans and help health professionals provide dietary guidance to this population .

REFERENCES

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