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## Promoting Caribbean Agriculture to Promote Health: Beyond Dietary Guidelines

Fitzroy Henry\*, Deonne Caines and Sheerin Eyre

*College of Health Sciences, University of Technology, Jamaica*

**Corresponding author:** Fitzroy J. Henry, College of Health Sciences, University of Technology, 235-237 Old Hope Road Kingston, Jamaica, **E-mail:** [Fitzroy.Henry@utech.edu.jm](mailto:Fitzroy.Henry@utech.edu.jm)

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### Abstract

**Objective:** This study was conducted to determine which food items have the best nutrition value for money in securing a healthy diet to combat non-communicable diseases. Several studies have evaluated whether healthier foods or diets cost more but a full range of health criteria has rarely been explored. Rather than merely comparing high and low energy dense foods, this study also included type of fat, vitamin, mineral and fibre content of foods in classifying them as healthy and less healthy.

**Method:** Commonly consumed foods were ranked according to their nutritional value and potential positive or negative contribution to the development of major health problems in Jamaica such as obesity and chronic diseases. The costs of 158 food items were averaged from supermarkets, municipal markets and wholesale outlets in six parishes across Jamaica. The cost of foods was then compared according to their nutritional value.

**Results:** The study found that some of the commonly consumed foods were cheap with low nutritional value. Other items were low ranked but costly. The results highlighted those traditional Caribbean food crops which were highly ranked yet less costly.

**Conclusion:** Caribbean agriculture policy should reposition their strategy to ensure that many of the traditional nutritious foods can be easily accessible. In so doing the burden of the main health problem-non-communicable diseases, can be substantially reduced via an agriculture policy.

**Keywords:** Healthy foods; Cost; Dietary guidelines; Food policy; Caribbean

### Introduction

The obesity tsunami and the resultant burden of chronic diseases in the Caribbean have heightened the urgency to ensure the availability and accessibility of foods that satisfy the nutrition and health goals of the region [1]. More critical to the cause is preventing the consumption of less expensive, easily accessible, energy-dense, micronutrient-deficient foods that adversely affect good health. Current trends in food availability and consumption reflect a dietary transition that is not in keeping with the current recommendation of a balanced diet consisting of foods from the Six Caribbean Food Groups [2]. The challenge is to find ways for consumers to select more healthy food options within their often limited financial resources.

The development of food-based dietary guidelines in several Caribbean countries is a major advance in reducing both under-nutrition and obesity [2,3]. It must be recognized, however, that the health benefits of foods within food groups vary and some selections can lead to negative outcomes [4]. This study was conducted to examine those differences within food groups.

To help formulate an effective Caribbean food policy the recommended strategy therefore is to prioritize Caribbean foods which satisfy the most fundamental and explicit nutritional requirements of the population, in tandem with health, social and economic goals [5]. So which food items in the Caribbean confer the desired health benefits and how costly are they? Answers to these questions can lay the foundation for a new approach to food availability and accessibility in the Caribbean. Moreover, such an approach can demonstrate how agriculture policy can have a tremendous impact on public health.

### Methods

#### Data collection

A pilot survey was carried out during May 2014 using prices collected from the Jamaica Consumer Affairs Commission. This pilot survey indicated that prices varied across parishes and there were no parishes with consistently highest or lowest prices for foods. Data were therefore collected randomly from six parishes across Jamaica -Portland; St. Elizabeth; St. James; St. Ann; Manchester and Kingston & St. Andrew (KSA). In order to increase the applicability of the results, prices were obtained from densely populated areas and from vendors which were most popular among consumers in each parish. The prices of one hundred and fifty eight commodities were sought during the month of June 2014. These prices were collected from popular supermarkets, wholesale and open markets in each of the six selected parishes. Trained data collectors were used for price collection and data entry.

#### Ranking of commodities

Unlike other studies that merely compared high and low energy dense foods [6], this study included type of fat, vitamin, mineral and fibre content in classifying foods as healthy and less healthy [7]. This approach also avoided the methodological weakness of comparing energy density with energy cost [6]. The method also avoided the limitations of the single nutrient approach which may not capture the health-promoting phytochemicals found in plant-based foods. The criteria utilised were associated with major chronic diseases prevalent in the Caribbean [2].

Food composition data were used to determine the quantities of the relevant nutrients contained therein. Scores were allocated for each

nutrient and then totalled to develop a Cumulative Rank Score (CRS) for the food commodity. This score was translated into the rank of the food within the food groups. Select food composition information was recorded per 100 gm of each food item.

### Data analysis

The cost was calculated and recorded for each food with known food composition data. The average cost per 100g was calculated. This average was calculated using the costs of the commodity in each parish. Averages reflected only the parishes in which the commodity was found, and was therefore not an average of six parishes in all cases. The value was then converted to US\$ per Kg.

To estimate the cost of healthy and less healthy food consumed in Jamaica the food commodities were arranged according to their food groups and then according to their CRS, with the highest score being first and the lowest score last.

### Results

Of the one hundred and fifty-eight foods surveyed, one hundred and twenty five foods were found in all six parishes. Results are presented for two of the six Caribbean food groups- 'staples' and 'food from animals'. These two food groups are among the largest and also make the major contributions to the Caribbean diet.

Table 1 indicates that among the staples, most of the traditional Caribbean crops are ranked in the top half of the staples list, particularly green plantain, green banana, yam, potato (sweet and irish) and breadfruit. Further down was dasheen, cassava and coco. The staples food group was most consistently consumed across parishes. Also within the group, starchy foods/tubers such as yam and green banana featured in all parishes with plantain being the next most frequently appearing item, followed by dasheen and breadfruit. The cheapest staple was green banana and it was among the highest ranked. The next cheapest was coco but at a much lower rank. Sweet potato and breadfruit were also low cost with good nutritional benefits. It is important to observe that the cheapest staples were the fresh traditional Caribbean grown crops while some of the processed and imported items were among the most expensive and also of low nutritional value.

| Food Commodity        | Health Rank | Cost US\$/Kg |
|-----------------------|-------------|--------------|
| Macaroni (enriched)   | 1           | 2.76         |
| Green plantain        | 6           | 1.37         |
| Green banana          | 7           | 0.45         |
| Noodles, dry-packaged | 9           | 3.86         |
| Yam                   | 10          | 1.33         |
| Brown rice            | 11          | 2.49         |
| Sweet potato-purple   | 14          | 0.99         |
| Breadfruit            | 15          | 1.09         |
| Irish potato          | 16          | 1.52         |
| Dasheen               | 21          | 1.23         |
| Cassava               | 22          | 1.28         |
| Coco (yautia)         | 26          | 0.84         |
| Potato chips          | 29          | 14.99        |
| Corn, canned          | 30          | 4.35         |
| Sweet biscuit         | 35          | 4.67         |

**Table 1:** Ranking and cost of commonly consumed staples

Table 2 shows that among food from animals many of the fresh unprocessed foods such as liver, whole chicken and fish were among the highest ranked whereas processed foods such as bacon, corned beef sausage and ham were among the lowest ranked. Striking also was the difference in rank between whole chicken at 12 and chicken back at 57; also between the different types of fish. The observation that chicken back is almost one-third the cost of whole chicken has implications for consumers with low purchasing power. While chicken back is the cheapest food from animals and ranked low we note that liver is the next cheapest but ranked the highest. Overall there are several items with good nutritional value which are among the cheapest. Some processed items such as ham and bacon are extremely expensive and lowest ranked.

### Discussion

Globally, it is believed that energy dense foods made of refined grains, added sugars and added fats are often chosen above the more nutritionally dense lean meats, fish and fresh foods because they are inexpensive, tasty and convenient. High energy diets are therefore associated with lower expense than less energy dense but more nutrient rich diets [8]. This study ranked commonly consumed food items in Jamaica [9] according to a wide range of nutrition and health criteria and also compared the cost of the different ranked foods.

This study is unique in 4 distinct ways.

1. It used a method of ranking that went beyond the mere high versus low energy-dense foods and hence eliminated the methodological weakness of that approach [6].
2. It used a wide range of health criteria, related to the major health problems in the Caribbean.
3. It used a numerical health score for the food items ranked within food groups.
4. It showed the nutritional rank of each food as well as its cost-which can be used as a health promotion tool.

This study provided a strong justification to aggressively promote the consumption of the traditional Caribbean crops simply because they

| Food Commodity   | Health Rank | Cost US\$/Kg |
|------------------|-------------|--------------|
| Beef, liver      | 1           | 1.66         |
| Codfish          | 7           | 7.46         |
| Chicken, whole   | 12          | 3.52         |
| Fish, tilapia    | 15          | 5.65         |
| Turkey neck      | 17          | 2.5          |
| Pork             | 19          | 3.86         |
| Milk, evaporated | 24          | 3.61         |
| Egg, hen         | 25          | 3.64         |
| Fish, snapper    | 27          | 6.04         |
| Goat             | 33          | 5.75         |
| Oxtail           | 37          | 9.04         |
| Ham              | 43          | 18.88        |
| Chicken, sausage | 47          | 4.43         |
| Pig, trotters    | 48          | 2.52         |
| Beef, corned     | 52          | 6.25         |
| Bacon, Turkey    | 55          | 17.1         |
| Chicken, back    | 57          | 1.23         |

**Table 2:** Ranking and cost of commonly consumed foods from animals

confer health benefits which can reduce the risk of obesity and non-communicable diseases in the region. Some of these traditional food items are already among the cheapest on the market. The expansion of production of these foods will ultimately further reduce their cost and make them even more price competitive.

In Jamaica, yam and sweet potato are kings, while breadfruit and banana are commonly eaten in most households. In other Caribbean countries the pattern is the reverse. Given that these commonly grown staples are much more nutritious and cheaper than the other staples and cereals available the food security strategy in the Caribbean should therefore be predicated on these compelling facts.

The reality is that not enough roots, tubers, peas and beans, fruits and vegetables are being included in the daily Caribbean diet. Cereals and sugars contribute the greatest proportions of energy to the daily total calorie intake [2]: a likely result of the superfluous intakes of imported packaged cereals, high-sugar foods and carbonated beverages. Starchy roots and tubers make the least contribution to total energy intake despite their abundance and accessibility within the Caribbean, and also their health benefits.

One major challenge to the consumption of healthy meals is cost. Table 2 shows that popular foods in the Caribbean such as chicken back and pig trotters are among the cheapest items available but their nutritional value is low. On the other hand favourites such as codfish and other fish items are highly ranked, but costly.

Another major challenge to the consumption of healthy meals is culture. In Jamaica oxtail, goat, salted and fresh fish are ingredients of some of the traditional and most frequently consumed dishes. But they are relatively costly items. Providing information about alternative cheaper and nutritious options will have to contend with the traditional tastes and preferences.

Empirical data across the globe show an epidemiological transition whereby non-communicable nutrition-related chronic diseases as the major causes of death have replaced infectious and communicable diseases [10]. These diseases cut across socio-economic, spatial and demographic lines, and are associated with a sedentary life style, and changes in diets which can be linked to domestic and import food policies [11,12]. This study points to an urgent need to establish food and nutritional goals so that the region's agriculture and food systems can deliver adequate and nutritionally appropriate quantities of food, especially to low income and vulnerable groups. This study also complements the Caribbean-based dietary guidelines, but it goes further in identifying the more healthy options within food groups. Efforts to reposition agriculture in the region must therefore consider the health benefits that can be derived by making available more of the health-promoting foods which are culturally acceptable and ultimately more accessible.

The enormous cost of chronic disease is overwhelming the health budgets of all Caribbean countries. A repositioned food policy can therefore reap substantial financial benefits beyond the agriculture sector.

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