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Complementary Feeding in Jamaica: The Hidden Cost of Commercial Baby Foods

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Abstract

The convenience and attraction of commercial baby foods have dominated the recent purchasing patterns of mothers in Jamaica. A supermarket survey of complementary foods found forty-four different preparations. We compared the commercial meals and homemade preparations to determine differences in price, nutritional profiles and value index using nutrient analysis software. We found the homemade meals to be more than 50% cheaper-some meals were even 87% cheaper. Apart from price, the vitamin A and protein content was higher in the homemade preparations. Homemade preparations were superior in providing the growing infant with the nutrients necessary to support growth and development. Even with assumptions for the cost of fuel and time these results show that much financial savings can be gained with homemade preparations. Without these savings, low income families are less able to cater for the other priority needs of the growing child-a hidden cost.

Keywords: Commercial foods; Home-made preparations; Cost; Nutrient profile; Health; Jamaica.

Introduction

Despite the international guidelines on young child feeding, the practice of feeding infants varies considerably across countries and is influenced by nutrition knowledge, commercial interests, family purchasing power, and tradition, among others. Modern societies have experienced dramatic replacements of freshly prepared meals with ultra-processed products particularly in childhood. [1] This study therefore analyzed a critical aspect of infant feeding-complementary feeding-to determine the relative benefits from commercial and homemade preparations.

Breast milk alone after 6 months can no longer support a child's rapid growth and development patterns and nutritional requirements of energy, protein, iron, zinc, vitamin A and vitamin D [2,3]. Complementary foods are clearly an important part of the child's development in ensuring that their needs are being met [4]. As the infant ages 6 months and onwards, an inherent health risk develops when the recommendations for complementary feeding are not followed. [5,6].

The amount of complementary food administered also depends on whether the child is breast or non-breast fed. In developing countries infants 6-8 months old being breast fed receive 200 kcal/meal from complementary foods versus that of the non-breast feed infant who should receive an additional 400 kcal/meal to compensate for cessation of breastfeeding [7]. Similar guidelines are given for children 9-11 months and 12- 23 months [7]. The volume of complementary meals however must be in line with the capacity of the infant's gastrointestinal tract to avoid over feeding or gastric discomfort. On average infants 6-11 months should receive 249 ml/meal; at 9-11 months - 285 ml/meal and for infants 12-23 months - 385 ml/meal [7]. If complementary feeding is not done or is inadequately administered, this can lead to diarrhea and months of growth retardation leading to nutritional deficiency and immunodeficiency signified by recurrent and persistent infections which may prove to be fatal [6]. Poor nutrition practices; breast and complementary feeding also lead to underweight and stunting but once infant feeding is done properly, it can decrease the risk of under-five mortality by 19% [6].

Methods

A supermarket survey of complementary foods for infant feeding was done to determine the types of preparations available in four parishes-Kingston and St. Andrew, Portland, St. Elizabeth and St. James. A total of 44 different preparations of complementary foods were found across the four parishes. Only one type was common to all four parishes and this was Gerber mixed fruit juice. Five preparations were common to three parishes. These were: Gerber Oatmeal cereal (powder); Gerber Turkey, rice and vegetable (textured puree); Heinz Tropical fruits (puree); Gerber Banana Orange medley desert (puree); Gerber Vegetable turkey dinner (puree). The cost for all ingredients for the recipes for the home-made versions was not available. The average cost for both the commercial and the home-made equivalent was ascertained and shown in the

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tables.

The most commonly consumed complementary foods across most parishes formed the short-list. Seven popular preparations were analyzed and they included foods suitable for breakfast, dinner and snacks for an infant. An ingredient list was then generated from the short-list and the nutrient composition of the commercially prepared complementary foods was calculated. The ingredients list and nutrient composition were then utilized to prepare home-made versions of the commercially prepared foods with similar texture and acceptable taste. The cost of the ingredients for the recipes was then calculated.

The cost of each complementary food was obtained directly from the shelves of various retailers in the four parishes surveyed. The average cost per commodity/commercially prepared complementary food was used for the cost estimates. The cost of home-made versions was obtained using the ingredients list and recipe quantities formulated, as well as the costs of the commodities at the retailers in the four parishes. Again, the average cost per ingredient was used for the cost estimates. Where all ingredients were not available, the cost was not listed. The costs were adjusted according to the output quantity so that the cost listed would reflect the cost for the same amount of food when commercial and home-made foods were compared. The nutrient content of the home-made complementary foods was also ascertained using the I Profile 2010 nutrient analysis software.

The value index was determined by first determining the cost per milliliter per Jamaican dollar. The quantities for each for item recorded in milliliters were divided by the total cost in the determination of the cost per ml per dollar. The milliliters of protein per preparation was ascertained by diving the total grams for the meal item by a density of 1.35g/cm^3, which is the density of protein [8]. The product of the cost per Jamaican dollar and protein per milliliter preparation was used as the value index. A point scale was used ranging from 1-5, with 1 being the highest value and 5 denoting the lowest value.

Results

The costs of the complementary foods and homemade comparisons are shown in (Table 1). In all cases it was found that preparation of home-made meals costs significantly less than purchasing the prepared and packaged foods. The cost difference ranges from over twice the value as in the case of oatmeal and banana porridge up to nearly eight times as much in the case of macaroni & cheese. The costs per nutrient are correspondingly higher for the commercial foods. (Table 2). The nutritional values of the complementary foods are shown in (Table 3). Home-

Complementary Food	Quantity	Average Cost (J$)	
		Commercial	Home-Made
Macaroni & Cheese	7 oz	350.14	44.37
Chicken & vegetables	6 oz	248.80	88.30
Chicken stew with noodles	6 oz	258.57	91.13
Banana puree	4 oz	148.16	35.67
Oatmeal and Banana Porridge	4 oz	200.1	83.39
Mango puree	4 oz	115.27	22.19
Guava puree	4 oz	115.27	49.82

Table 1: Average cost of commercial complementary foods compared with home-made equivalents across four parishes in Jamaica.

Complementary Foods	Quantity (ml)	Energy (kcal)	Total Cost (J$)	Cost Per Nutrient (J$)			
				Protein (cost per g)	Iron (cost per mg)	Zinc (cost per mg)	Vitamin A (cost per ug)
Home-Made Meals							
Macaroni & Cheese	177.4	145	44.37	6.33	44.37	44.37	1.2
Chicken & vegetables	177.4	127	88.3	8.83	88.3	88.3	0.38
Chicken stew with noodles	177.4	117	91.13	5.36	91.13	91.13	0.76
Banana puree	118.3	98.7	35.67	32.1	9.63	0	1.28
Oatmeal and Banana Porridge	118.3	118.7	83.39	43.89	0	0	1.86
Mango puree	118.3	74	22.19	22.19	0	0	0.51
Guava puree	118.3	77	49.82	16.61	0	0	1.42
Commercially Prepared Foods							
Gerber Vegetable turkey dinner	177.4	60	350.14	116.71	0	350.14	6.61
Gerber Chicken & vegetables	177.4	106	248.8	52.76	248.8	248.8	0.87
Gerber Oatmeal Cereal	118.3	120	258.57	64.64	30.42	80.8	0
Oatmeal and Banana Porridge	118.3	118.7	148.16	77.98	0	0	3.31
Gerber Banana Orange medley desert (puree)	118.3	95.6	200.1	166.75	0	0	28.83
Heinz Tropical fruits (puree)	118.3	60	115.27	0	0	0	10.16
Mango puree (commercial)	118.3	74	115.27	115.27	0	0	2.68
Guava puree (commercial)	118.3	77	350.14	116.71	0	0	10

Table 2: The cost per nutrient for home-made and commercial meals.

made preparations of chicken based foods had the higher protein content (about 67%) compared to its commercial equivalent the commercially prepared oatmeal cereal had higher values for iron and zinc - 8.5mg and 3.2 mg respectively. All preparations contained vitamin A at varying levels with exception of the commercial oatmeal cereal which had none. (Table 4) shows the order value of home-made and commercially prepared meals using protein as the defining variable. It is noted that the commercially prepared meals consisted of the higher orders compared to the commercially prepared meals.

Discussion

The alarming trend of replacing freshly prepared dishes with ultra-processed meals has negative nutritional consequences [9]. The changes in consumption pattern are significantly related to simultaneous increases in body mass index in the population but the pattern starts in infancy [1]. Homemade complementary foods carry risks associated with inadequate composition and unsafe preparation. This study shows, however, that homemade foods were two to eight times cheaper than the commercial preparations. The largest differential in cost was observed with macaroni and cheese-a favorite dish in Jamaica. The 87% difference in pricing is a significant cost for low income families. Although the costs of fuel and time were not factored into the homemade cost it is noted that the commercial preparations are substantially higher.

The trend towards commercial meals is also worrisome because the homemade versions with minimally processed foods often have lower content of sodium and unhealthy fats and free sugars but a higher content of fiber, and micro-nutrients [9]. In general there was no significant and consistent advantage in the macro or micronutrient composition for either commercial or homemade preparations. However, the protein and vitamin A content on average was higher in the homemade meals. Only two of the commercial preparations surpassed the caloric value of the homemade preparations.

All the preparations were of a smooth consistency in line with the guidelines for complementary feeding [10] an infant. The volumes were also appropriate and were less than that of the gastric capacity for the average child. With the differences in prices we note the corresponding cost per nutrient varied greatly between the commercially prepared and home-made meals. It addition, the cost per gram for protein on average was 50% more than with the home-made preparations. This was further deduced by the order value of protein based on both preparations. The comparison of protein sources showed home-made preparations with a higher rank (1-3) while commercially prepared meals had lower ranks (4-5). The cost for zinc vitamin A and iron per gram was more than a 100% for commercial preparation compared with home-made preparations. This shows the superior nutrient benefits of home made preparations.

It is recognized that commercially prepared foods are popular

Foods	Quantity (ml)	Energy (kcal)	Protein (g)	Iron (mg)	Zinc (mg)	Vitamin A (ug)
Vegetable turkey dinner*	177.4	60	3	0	1	53
Chicken and Vegetables*	177.4	109	4.7	0.19	1	285
Chicken & vegetables	177.4	127	10	1	1	236
Chicken stew with noodles	177.4	117	17	1	1	120
Oatmeal Cereal*	118.3	120	4	8.5	3.2	0
Oatmeal and Banana Porridge	118.3	118.7	1.9	0	0	44.78
Banana Orange medley desert (puree)*	118.3	95.6	1.2	0	0	7.1
Tropical fruits (puree)*	118.3	60	0	0	0	11.35
Mango puree*	118.3	74	1	0	0	43
Guava puree*	118.3	77	3	0	0	35
Mango puree	118.3	74	1	0	0	43
Guava puree	118.3	77	3	0	0	35

* = Commercial, others = homemade

Table 3: Comparison of nutrient composition of commercial and home-made meals.

Complementary Foods	Quantity (ml)	Total Cost (J$)	ml/1J$	Protein (ml per preparation)	Value Index	Order of Value
Home-Made Preparations						
Macaroni and cheese	177.4	44.37	4	13.02	22.4	3
Chicken & vegetables	177.4	88.3	2	18.6	37.2	2
Chicken stew with noodles	177.4	91.13	1.95	31.62	61.66	1
Commercially Prepared Meals						
Gerber Vegetable turkey dinner	177.4	350.14	0.51	5.6	2.86	5
Gerber Chicken & vegetables	177.4	248.8	0.71	8.74	6.21	4

Table 4: Order of value using protein for home-made and commercially prepared meals.

for several reasons including:

- Refrigeration not needed - These foods usually do not require refrigerated storage in their prepared state, contrary to freshly prepared meals which must be refrigerated if not used immediately after preparation
- Long shelf life-Foods can be stored for longer periods before spoilage compared to freshly produced meals
- Packaging-Commercially prepared foods are already packaged and are therefore ready for packing into lunch bags for care givers
- Time-Preparation time eliminated. This, however, can be factored into preparation of meals for the rest of the family, as ingredients can be taken from the family pot.

However, there are hidden costs of commercially prepared foods which include:

- Price: commercially available complementary foods can cost up to eight times as much as foods prepared at home. Over time, this extra spending can significantly impact low-income households negatively.
- Food additives: Stabilisers, thickeners and other additives are used in commercially prepared foods. These are not nutritionally necessary and are not used in home prepared foods
- Lack of control: prepared foods do not allow the consumer to decide what goes into the food preparation. Home prepared meals allow consumers to select the best ingredients accessible to them, and eliminate unnecessary additives.

Nevertheless, the overall convenience of commercially prepared foods makes them an attractive option for many parents. But the convenience of home prepared meals can be improved through proper organization, preparation and planning. Preparing foods at home will not only reduce household expenditure, it will also establish the practice of consuming mostly home prepared meals. In adolescence and adulthood, a major driver of obesity is the consumption of foods from quick serve outlets, lack of portion control and generally eating away from the home. Establishing the practice of control over dietary intake in early life is therefore a major step in decreasing the risk of becoming overweight which will in turn reduce the risk of developing chronic non-communicable diseases. The hidden cost of commercial infant foods therefor goes beyond prices and has implications for nutrient intake in childhood and health outcomes later in life. The savings forfeited by purchasing commercial preparations are crucial to a low-income family faced with major financial challenges for early child development. That loss of saving represents a substantial hidden cost.

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