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The Nutritional Quality of Gluten-Free Products for Children

Charlene Elliott

Abstract

OBJECTIVES: To examine the nutritional quality of gluten-free (GF) products specifically marketed for children.

METHODS: All child-targeted food products were purchased from 2 major supermarket chains in Calgary, Alberta, Canada. Using the Pan American Health Organization Nutrient Profile Model, the nutritional quality of products with a GF claim was compared with those without such a claim. A secondary analysis further compared the nutrient profile of child-targeted GF products to their product “equivalents.”

RESULTS: Overall, child-targeted GF products had lower levels of sodium, total fat, and saturated fat but also had less protein and a similar percentage of calories from sugar compared with child-targeted products without a GF claim. According to the Pan American Health Organization criteria, both GF products and "regular" products designed for children can be classified as having

poor nutritional quality (88% vs 97%; $P < .001$). When analyzed in light of their product equivalents without a GF claim, both had similarly high levels of sugar (79% vs 81%; $P < .001$).

CONCLUSIONS: GF supermarket foods that are targeted at children are not nutritionally superior to regular child-targeted foods and may be of greater potential concern because of their sugar content. The health halo often attributed to the GF label is not warranted, and parents who substitute GF products for their product equivalents (assuming GF products to be healthier) are mistaken. Parents of children with gluten intolerance and/or sensitivity, along with parents who purchase GF products for other health reasons, need to carefully assess product labels when making purchases.

- Abbreviations:

CD — celiac disease

GF — gluten-free

PAHO — Pan American Health Organization

What's Known on This Subject:

Gluten-free (GF) products tend to have a health halo for consumers, although they are not nutritionally superior to regular foods. Children on GF diets may struggle to get adequate nutrition; they also consume more sugars (related to processed food intake).

What This Study Adds:

In this first study of child-targeted GF foods, the findings reveal that GF-labeled products are not nutritionally superior to other children's foods nor to their gluten-containing equivalents. Approximately 80% of child-targeted GF products have high sugar levels.

Celiac disease (CD) is an inherited immune reaction that is triggered by gluten, a protein found in wheat, rye, barley, and other grains. Among the most prevalent chronic diseases, CD is estimated to affect 1% of the world's population.[1–4] Given CD's genetic basis, children are equally affected. Approximately 1% of children have CD,[5] making it "one of the most common chronic disorders" in young people.[6]

Treating CD requires a strict dietary regimen that is free of gluten. However, interest in gluten-free (GF) products from consumers without CD has burgeoned over the past decade. GF has been labeled "the fastest growing food intolerance category"[2] and has been lauded for its "market potential."[2] Sales of GF foods globally are projected to reach $4.89 billion (US dollars) by 2021, expanding from $2.84 billion in 2014.[7] In the United States, the world's largest GF market, sales are projected to exceed $2 billion in 2020, an increase of almost $400 million since 2015.[8] Reasons for this growth are not only due to purchases by those with CD or those with a gluten sensitivity but are also propelled by changes in consumer attitudes toward health. Mainstream consumers are experimenting with their diets for health-related reasons, and "free-from" foods (such as GF foods) are part of that trend.[9] The Washington state–based Hartman Group's Health and Wellness 2017 report reveals that consumer motivations for purchasing GF products include, among other things, the desire to "try something new" (35%), the belief that GF foods are "healthier" (30%), the

desire to lose weight (23%), experimenting with a new eating plan (19%), and the belief that GF foods taste better (14%). Only 6% of the consumers surveyed said that they purchased GF products because they are allergic to gluten.[9]

The dynamic growth of the GF market has been accompanied by an increased scrutiny of the nutritional quality and composition of GF products.[10–12] However, the nutritional quality of GF products specifically marketed for children has not been examined in a published study. Given that some parents opt for GF products because they believe that they will be healthier for their children[13] and that the trade press has identified GF children's food as a "big area for growth,"[13] an analysis of these products is warranted. In this study, a novel contribution in 2 additional respects is provided: (1) the nutritional quality of GF children's food products is compared with "regular" child-targeted foods found in the supermarket, and (2) the nutritional quality of a selection of GF children's food products is compared with that of their product "equivalents" without a GF claim (eg, GF macaroni and cheese versus regular macaroni and cheese).

Methods

Following previous studies in which "fun foods" aimed at children were analyzed,[14,15] all child-targeted food products were purchased from 2 major supermarket chains in Calgary, Alberta, from February 2017 to March 2017. Canada has 2 major national retail grocery and food distributors (Loblaw Companies Ltd and Sobeys Inc), and a large supermarket that represents each of these national grocery distributors was visited for data collection. Stores were visited multiple times during the data collection phase to ensure that no products were missed.

In the study, children's food was examined, not candy or junk food, so confectionary products (such as candies and chocolate bars), potato chips, cheese-flavored snacks, sugary sodas, etc were excluded from the sample. Instead, the intent was to examine the regular foods that have been repackaged to attract children. Products were identified as child targeted if they met 1 of the following criteria[14,15]:

- the product or brand name contains the word "kids" or "child" or is marketed as specifically designed for children (eg, EnviroKidz, Chapman's Kids, CLIF Kid);
- links with children's television programs, merchandise, or movies (ie, character licensing);
- promoted for lunchboxes (including Lunchables);
- contains child-friendly graphics (ie, cartoons or bubble font) or activities (games, puzzles, or crafts);
- contains the word "fun," "play," or "kid(s)" on the package;
- contains premium offers for children (ie, a free gift inside the package, a free download, merchandise with a code, etc); and

- presents unusual or child-oriented shapes, unusual colors, or playful product names or tastes (eg, Flavor Blasted Xplosive Pizza–flavored crackers and Princess Potion–flavored ice cream).

Duplicate products were excluded from the analysis. Products were photographed, and a research assistant coded them for variables, including the brand, product name, food category, food type, and presence of a specific GF claim. Nutrition information was recorded for all products.

By using the Pan American Health Organization (PAHO) Nutrient Profile Model,[16] nutritional content was compared between child-targeted products that contained a specific GF claim and those without a such claim. Products had different portion sizes; therefore, all portions and nutritional values per serving were adjusted to represent a 100 g serving. Overall poor nutrition was calculated by using the following PAHO criteria[16]: excessive sodium (ratio between sodium and energy ≥1), excessive free sugars (amount of energy from free sugar [g × 4 kcal] ≥10% of total energy), containing other sweeteners, excessive total fat (amount of energy from total fat [g × 9 kcal] ≥30% of total energy), and/or excessive total saturated fat (amount of energy from total saturated fat [g × 9 kcal] ≥10% of total energy). In keeping with PAHO recommendations, the PAHO criteria was only applied to processed and ultraprocessed foods within the sample. Note that the definition of "free sugars" comes from the World Health Organization and refers to monosaccharides (such as glucose and fructose) and disaccharides (such as table sugar) added to foods and drinks by the manufacturer, cook, or consumer and sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrates. Free sugars were estimated as the total sugar content of products in which added sugars were listed in the first 3 ingredients (free sugars were calculated as 0 g for products with no added sugars).

A secondary analysis was undertaken in which the nutrient profiles of the products with a GF claim were compared with those of their product equivalents. For example, EnviroKidz Apple Cinnamon–flavored oatmeal (with a GF claim) has a product equivalent (without a GF claim) in Quaker Apples and Cinnamon–flavored oatmeal. This also holds true for EnviroKidz Brown Sugar Maple Oatmeal (GF claim) and Quaker Maple and Brown Sugar Oatmeal (no GF claim). Similarly, the Nudge GF macaroni and cheese (white cheddar) has a product equivalent without a GF claim in the Kraft macaroni and cheese dinner (white cheddar). Along these lines, product equivalents to the products with a GF claim were purchased on a separate grocery trip (October 2017) so that nutritional comparisons between GF products and their counterparts without a specific GF claim could be made. A comparison by food category was also performed.

Statistical analyses were performed in SAS 9.4 (SAS Institute, Inc, Cary, NC). *t* tests and χ^2 tests were used to compare average nutrition content with and without gluten for the overall data set (variables were tested for skewness before reporting means). For the secondary analysis of matched products, paired *t* tests were used to compare nutrition content. In all analyses, a 5% significance level ($P < .05$) was considered.

Results

A total of 374 child-targeted products were purchased, and ∼18% of the sample (66 products) had a specific GF claim. Overall, products with a GF claim had lower levels of protein, sodium, total fat, and saturated fat compared with products without a GF