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Use of Diet-Tracking Websites as a Resource for Hard-to-Find Food Label Information: An Example Using Specialty Grocery Store Items

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Abstract

Many specialty foods cannot be found in research-focused food databases. However, some nutrient data can be found for many of these foods through individual website searches using brand and store names. Some popular diet-tracking websites contain data for over 3 million foods, data often entered by consumers, based on non-systematic searches. The reliability of these data to guide dietary data entry decisions are unknown. Five popular diet tracking websites were used to compare availability and accuracy of data for food items from a specialty grocery store that are currently unavailable in research-focused food databases.

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Keywords: Specialty food items; food labels; dietary data; food composition database

1. Introduction

It is well known that there are many limitations when collecting dietary intake data including inaccurate portion estimation, under-reporting and under-eating[1-4]. Even if accurate data can be collected, there may be challenges in the coding and analyses of diet data due to the current limitations in available food composition databases. It is challenging to keep up with the constantly changing food market and even our most complete research food

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databases do not contain nutrient information for every food on the market. Currently, one of the most commonly used sources of food composition data in the United States is the US Department of Agriculture's (USDA) National Nutrient Database for Standard Reference (Release 27) which contains 8618 foods[5]. The USDA food composition database is incorporated in other databases commonly used in dietary data analysis, such as the Food and Nutrient Database for Dietary Studies (FNDDS) which contains about 7,600 main food descriptions with an additional 9,900 food descriptions[6], while the Food and Nutrient Database that is used in the Nutrition Data System for Research (NDSR) contains over 18,000 foods[7,8].

Traditional grocery stores on average carry over 43,000 food products[9] and with the introduction and reformulation of over 20,000 foods and beverages annually[10], there is not a current system in place to keep the databases completely up to date or inclusive of all the products available to the consumer. There are also natural food stores, limited assortment stores, and supercenters that bring even more variety to the food market[9]. Not every food can be found in research-focused food composition databases so there are standard protocols for coding foods that may appear on dietary assessments, such as 24-hour recalls or food records, for which an exact match cannot be found in the database. Often there is a similar food item that can be matched based on quality standards of how close certain nutrients can be per 100 grams of that food. In some cases, when a close match cannot be found, a recipe can be created for that food based on the ingredient list. Food packaging information that includes the nutrition facts panel and ingredient list or information from a manufacturer's website helps guide decisions when resolving the missing food item. When a food label is not available or when dietary information for these products is unavailable directly from the grocery store or the manufacturer's website, there is large potential for errors in estimating nutrient intakes. The growth of online diet-tracking companies provide a unique opportunity for dietary assessment research because many specialty products can be found in various online food databases that are part of diet-tracking and weight loss websites.

Popular diet-tracking websites and mobile applications post nutrition data for thousands, and for some even millions, of food items not currently found in research databases. These programs often allow for users to manually enter nutrient information from a food label or enter the food details by scanning the barcode. As a result, many of these web tools contain more restaurant items and more brand name and specialty grocery store items compared to the current research food databases. For example, one of the top diet-tracking websites, MyFitnessPal.com, states that it has over 3 million foods in its food database. It has been found that self-monitoring dietary intake is a key to success in weight loss and these websites and mobile apps help individuals track their caloric intake. However, it is unknown if the food composition data available on these sites are an accurate reference to guide data entry decisions when it comes to research-related dietary data entry.

The objective of this study was to gain insight into availability and accuracy of energy content for hard-to-find food labels such as foods from a specialty grocery store obtained from web-based diet-tracking sites.

2. Methods

For the purpose of this study, food items from a popular national specialty grocery store chain were selected because they commonly appear on our dietary assessments but are currently missing from research dietary analysis programs such as the FNDDS database or NDSR. Nutrition information can be obtained from the actual food package for these products, however, no information about the food labels is posted on the store's website and a list of the nutrient profiles could not be obtained by contacting the store directly.

A list of 110 quick meal food items provided on the store's website was used as a starting point since many of these prepared and frozen food items are reported on dietary assessments. Out of the 110 foods on this list, 87 of these food products were found in the local stores. Data from the food packages including the food item name, serving size, gram weight of the package and nutrient information from the nutrition facts label were collected at the specialty grocery store. Five popular diet-tracking website were chosen based on the websites that most often showed up when entering these grocery store items in a Google search. These 5 popular diet-tracking websites included http://www.myfitnesspal.com/, http://www.fatsecret.com/, http://www.livestrong.com/, http://caloriecount.about.com/ and http://www.calorieking.com/. All of these sites had free access to search their online food databases. We searched these five diet-tracking websites for the 87 food items for which food labels were available in order to compare the occurrence of these food items within each website as well as the accuracy of posted energy

data and number of duplicate entries for the same item. Serving sizes were matched based on the information from the food label and if a web entry did not have an exact serving size match, then adjustments were made so the energy content could be compared for the same serving size. When a food item had at least one inaccurate energy value posted for a food item within a website, the energy discrepancy was calculated using the energy value from the food label and the energy value of most discrepant entry for that same food item (matched for serving size).

3. Results

The percentage of food items that had corresponding data on the five diet-tracking websites varied from 23-99% (Table 1), with MyFitnessPal, FatSecret and Livestrong all having data for more than 90% of the food items. The percentage of food items that had duplicate entries varied among the sites, with 76% of items having a duplicate entry in MyFitnessPal compared to only 12% on FatSecret. While some food items may have had only two entries for the same food, some food items had up to 11 entries for the same food item. The duplicate entries usually resulted because of consumer-entered differences in the naming of the product or differences in nutrient information or serving sizes.

Table 1 – Availability and duplicate entries of specialty grocery store food items in online diet-tracking food databases.

Variable	Diet-Tracking Website[1]				
	MFP	FS	LS	CC	CK
% food labels found on website (n)	99% (86)	95% (83)	91% (79)	44% (38)	23% (20)
% foods with duplicate entries	76%	12%	47%	8%	5%
Duplicate entries/food[2] (mean±SD)	3.8 ± 1.9	2.1 ± 0.3	2.7 ± 0.9	2.3 ± 0.6	2.0 ± 0.0
Duplicate entries/food (range)	2-11	2-3	2-7	2-3	0

[1]MFP: http://www.myfitnesspal.com/; FS : http://www.fatsecret.com/; LS: http://www.livestrong.com/; CC: http://caloriecount.about.com/; CK: http://www.calorieking.com/
[2] = includes foods with >1 entry

Table 2 – Accuracy of energy reported for specialty grocery store food items in online diet-tracking food databases.

Variable	Diet-Tracking Website[1]				
	MFP	FS	LS	CC	CK
% food items with no accurate entry	6%	13%	22%	32%	35%
% food items with inaccurate alternate entry	23%	6%	15%	0%	0%
Total % food items with ≥1 inaccurate entry (n)	29% (25)	19% (16)	37% (29)	32% (12)	35% (7)
Mean energy (kcal) discrepancy[2] (mean±SD)	90 ± 67	73 ± 99	74 ± 93	48 ± 67	38 ± 28
Range of energy discrepancy[2] per item (kcal)	10-290	10-400	10-400	10-248	9-90

[1]MFP: http://www.myfitnesspal.com/; FS : http://www.fatsecret.com/; LS: http://www.livestrong.com/; CC: http://caloriecount.about.com/; CK: http://www.calorieking.com/
[2] Energy (kcal) from food label compared to most discrepant energy value for inaccurate entry of same food item (matched for serving size)

Some food items had no accurate energy entry (ranging from 6-35%) (Table 2). The mean number of entries per food ranged from 1.1-3.2 entries and when these alternate entries were included, the percentage of foods items that had at least one inaccurate entry across sites increased by as much as 23% and ranged from 17-37%. Food items that had at least one inaccurate energy entry resulted in energy discrepancies ranging from 9 to 400 kcal per item across the 5 sites.

4. Conclusions

We found that many of the specialty grocery store food items that cannot be currently found in research-based dietary analysis databases were easy to find on multiple diet-tracking websites. Up to 99% of the 87 food labels we selected could be found on at least one website and there were accurate energy entries for many of these products across the sites. However, because users can often enter data into many of these databases, there were often duplicate entries for one food item with some foods having up to 11 entries for the same item. The duplicates often have slightly different naming, different serving sizes or different energy information. When these duplicates were included, over 30% of some foods had at least one inaccurate entry making it challenging to know which food entry was correct. These duplicates could result in an energy discrepancy of up to 400 calories per item in some cases.

With the large quantity of food items on the market and thousands of products being introduced each year, there are current challenges keeping food databases up to date. A great amount of effort goes into maintaining research food databases to assure high-quality data that includes current and complete nutrient profiles for foods[11]. It has been suggested that more dietary assessment resources such as more complete and accurate food composition databases are needed to progress in many areas of nutrition and genomic research[12] but currently there is not a system in place to get frequently-updated food items available in the rapidly changing market and keep the high standard of data quality that is seen in research-based food databases. Diet-tracking websites have food databases that include thousands of foods that are currently not found in research databases often with data entered by consumers using food labels from purchased food items. Self-monitoring dietary intake has been shown to be one of the most helpful tools when people are trying to manage their weight[13] so these programs try to have user-friendly, flexible programs that offer many food choices in their databases. Although the food databases available on diet-tracking websites may not need to maintain the same level of quality control that research databases strive for, there is still a common goal to provide accurate, complete food composition data to its users.

Even though many foods from a specialty grocery store were found on these diet-tracking websites, the presence of duplicate and inaccurate entries that currently exist introduces a need for caution if using these sites to guide dietary research data entry decisions. Some sites seem to be more effective in limiting the duplicate entries, but there is limited information on how the quality control of their databases is maintained. Currently, there are still challenges in maintaining an accurate, quality-controlled and complete food database regardless of the main purpose of the database. Further research is needed to examine the accuracy and completeness of additional hard-to-find food items as well as how accurate and complete other information from a food label, including macro- and micronutrients, appears in these diet-tracking website databases. More quality control checks, especially with user-entry systems, may be helpful to decrease errors and duplicate entries. Over time, the merging of the techniques and technologies used for the development and maintenance of online food databases and research-focused food databases could hopefully lead to more complete, accurate and up-to-date food composition resources.

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