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Comparison of online food composition databases including those in nutritional assessment tools

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Measuring dietary intake accurately is essential in establishing relationships between food consumption patterns and non-communicable diseases. Researchers are now using online tools to replace traditional methods[1]. New technologies provide a more flexible approach and are generally preferred by study participants. However, it is not known whether the underlying databases are reliable. Weight loss app energy calculations vary considerably compared to weighed food records[2]. The aim of this work was to review the quality and compare the content of online food composition tables including those linked to assessment tools.

We undertook a Google search supplemented by expert knowledge to identify online food composition tables in the English language. Databases were either stand-alone online food and drink databases or associated with dietary assessment tools. Databases found were accessed; and we conducted a review of their features. Information on numbers and types of foods, their origin, nutrients and completeness of datasets were extracted using a standardised approach.

Twenty-two online food composition databases were reviewed from around the world. 12 (55%) of the databases were associated with dietary assessment software and 9 (41%) solely used an API to link with other systems. Numbers of food items included in the databases ranged from 18 million ('myfitnesspal') to 600 ('FoodDB'). The largest databases generally used crowd sourced data.

'myfood24' had the largest total number of variables (n = 326) and 'Carbs and Cals' and 'Nutracheck' only had 8 nutrient variables. The source of food composition data is not clear for all of the datasets. 7 of the databases explicitly include the UK and 3 the US generic food tables, often in addition to branded data. Most databases do not state how they are checked for accuracy or completeness. Where databases state how missing data is infilled only 'myfood24' considers both macro and micronutrients. Eight of the databases were only relevant for one country, and 13 tools reported having food data for a range of countries. In addition to nutrients some databases also include non-nutrient phytochemicals, allergens or sustainability metrics. Food images were often used to assist with portion size estimation, although some tools only used general pictures or pictures that did not reflect the food. Searching for food items varied in accuracy and some systems allowed barcode scanning.

Online food composition databases allow for much greater differentiation of foods, including branded items compared to traditional tables. They range considerably in size and quality. Care should be taken to ensure databases underlying online assessment tools are reliable with limited missing data to ensure the application of such databases to research does not produce misleading results.

References

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