Issues Related to the Use of Nutrient Data for Hispanic Foods

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There is much dietary diversity among Hispanic subgroups even though Hispanics have at least one heritage in common. The US Department of Agriculture (USDA) nutrient databases contain codes for foods consumed by Hispanics but coverage is better for some subgroups than others. The small number of Hispanic foods in USDA databases probably reflects the relative proportion of this group in the US population; Hispanics comprise about 9% of the total population (1). Unless Hispanic subgroups are oversampled in national surveys, few Hispanics will be included and few foods consumed by each Hispanic subgroup will be reported frequently enough for these foods to be added to the USDA databases.

In 1977-78 the Nationwide Food Consumption Survey (NFCS) included a special sample in Puerto Rico (2) and since then USDA nutrient databases have contained many Puerto Rican foods. Mexican Americans have not been oversampled in USDA surveys but the databases do contain some Mexican foods that were probably reported by non-Hispanics. The National Center for Health Statistics (NCHS) carried out a special survey of three Hispanics groups from 1982-84 (3) and a survey nutrient database has been created for foods reported by Mexican Americans, Puerto Ricans, and Cuban Americans. The NCHS is also oversampling Mexican Americans in the Third National Health and Nutrition Examination Survey (NHANES) and because of this, the Human Nutrition Information Service (HNIS) of the USDA is continually adding new foods reported by Mexican Americans to their nutrient databases. The USDA databases contain very few foods typical of other Hispanic subgroups such as Dominicans and Central and South Americans.

When nutrient data are unavailable or inappropriate for members of a Hispanic group, alternative strategies must be considered for finding food composition data (4). Commonly used strategies include substituting nutrient data for similar foods for which food composition data are available including foods from another Hispanic group, asking respondents to list ingredients in foods consumed, supplementing data with those from other sources, and modifying existing recipes. These strategies will be examined using, as examples, foods consumed by Mexican Americans although these issues can be generalized to traditional foods consumed by members of any ethnic group living in the United States. The inappropriateness of many of these strategies for use in studies where the diet of Mexican Americans is of primary interest has prompted many additions and modifications to the USDA databases. Differences among current versions will be summarized as well as changes that can be expected in future versions of the USDA databases.

Previously available USDA food composition data

Mexican foods in previous versions of the USDA databases were limited to relatively few foods consumed by Mexican Americans--usually those Mexican foods that are commonly consumed by the non-Hispanic population too. Examples of such foods include tacos, tamales, and enchiladas. Mexican Americans are probably unique among Hispanic subgroups because many of their traditional foods are widely consumed among non-Hispanics; Packaged Facts, Inc., a market-research company just reported that more money was spent last year on salsa than on catsup (5). However, many foods eaten by Mexican Americans that are not usually consumed by non-Hispanics have not been in previous versions of the USDA databases, for instance, stews such as carne guisada or pollo guisado and sopa seca.

Nutrient data for Mexican foods in previous USDA databases were based on commercially-prepared, Americanized versions of these foods that are often not representative of recipes, ingredients and preparations used by Mexican Americans in the home. For example, Americanized tacos are usually made with a fried tortilla, a filling and shredded lettuce whereas Mexican tacos often consist of a tortilla cooked without fat that is wrapped around a filling and eaten without lettuce.

If Mexican Americans are not eating commercially-prepared Mexican foods but instead are eating more traditional versions of these foods, then the nutrient data that are in previously available USDA databases are generally inappropriate for assessing Mexican American dietary intakes. This raises an important issue that is common to all mixed dishes in nutrient databases, not just Mexican ones: how much variability should a typical recipe incorporate before more than one recipe is needed? This issue deserves more attention but is beyond the scope of this paper. However, it is clear that for many Mexican mixed dishes there is too much variation between Americanized and traditional versions for a single recipe and its associated nutrients to be appropriate for both versions.

Finding nutrient data for traditional Mexican foods

As I mentioned before, there are several commonly used strategies when nutrient data are unavailable or inappropriate. Although the examples use Mexican foods, the strengths and weaknesses of these strategies can be generalized to foods consumed by other Hispanic subgroups or members of any ethnic group within the US.

Substituting nutrient data for 'similar' American foods

The simplest approach is to substitute nutrient data for American foods that might be nutritionally similar to Mexican foods. While this may work well for some

foods, others are more problematic and the substitutions become inappropriate for calculating dietary intakes of Mexican Americans.

Some Mexican foods are so unique that no similar food for which nutrient data already exist can be identified. Mole poblano, a spicy sauce consists of a paste made from rehydrated dried chile peppers that is thinned with chicken or turkey stock and mixed with tomatoes, ground nuts, sesame seeds, raisins, chocolate, oil, lard, various spices and a tortilla for thickening. This is such an unusual combination of ingredients that no suitable substitute exists in the USDA databases.

Some Mexican foods resemble 'American' foods but have distinct enough recipes that their nutrient contents differ. The meatless version of sopa seca de fideo looks very much like meatless spaghetti. But unlike spaghetti, sopa is prepared by browning uncooked noodles before adding tomatoes and broth and cooking them until the liquid is absorbed. As shown in Table 1, the nutrients for a typical sopa recipe prepared with half lard and half vegetable oil are very different from those for meatless spaghetti with tomato sauce; sopa contains more calories, fat, and sodium than meatless spaghetti.

Some Mexican foods that are widely consumed by non-Hispanic Americans have much more variability in ingredients and preparations among Mexican Americans and require more than one substitution. In the USDA databases, salsa has been assigned the nutrients for tomato-chili sauce which is commercially-prepared, thicker than salsa and similar to catsup. Among Mexican Americans, salsa can refer to a variety of spicy sauces, their common ingredient being chilies. Salsa can be made with red tomatoes or with tomatillos, a green, tomato-like vegetable. A further distinction among salsas is that they can either be cooked or uncooked; the cooked version is usually prepared with fat and dried red chilies while the uncooked version is usually made with fresh green chilies and without fat.

Table 2 contains selected nutrient values for tomato-chili sauce and two different red salsa recipes--one is uncooked while the other is cooked. Uncooked red salsa has a much lower caloric content than the cooked salsa or tomato-chili sauce. Cooked salsa contains more fat than uncooked salsa and tomato-chili sauce. Tomato-chili sauce has a much higher sodium content than either red salsa. The two red salsas differ in their vitamin A and C content. Thus, important nutrient differences would be overlooked by coding these two salsas as tomato-chili sauce.

Substituting data for foods from another Hispanic group

An alternative option is to substitute nutrient data from another Hispanic group if such data are available. The USDA databases contain many Puerto Rican foods. Many fruits, vegetables and other single-item foods are consumed by both Puerto Ricans and Mexican Americans; guava, tamarind and fresh coriander are examples of

such foods. The nutritive values for these foods can be used to assess Mexican American dietary intakes too.

Food composition data for recipe-type dishes, though, should be used cautiously since many Puerto Rican foods have the same name as Mexican ones but contain different ingredients or have different preparations. For example, many Puerto Rican recipes for mixed dishes contain ham and salt pork whereas Mexican versions of these same dishes do not include them. Picadillo, a dish of ground meat sauteed with tomatoes and spices, is often made by Mexican Americans with all ground beef whereas the Puerto Rican version contains beef, pork, ham and salt pork. The Puerto Rican version of picadillo contains 926 mg of sodium per 100 gm (6) compared to only 233 mg per 100 gm (7) in the all beef Mexican version of picadillo. The frequent substitution of Puerto Rican recipes that include ham and salt pork may artificially inflate sodium intakes for Mexican Americans. Another difference between the two Hispanic groups is that Puerto Rican recipes generally call for vegetable oil whereas Mexican recipes are more varied and can include lard, shortening or vegetable oil. Saturated fat intakes for Mexican Americans may be underestimated if Puerto Rican recipes with vegetable oil are frequently substituted for Mexican dishes. In general, recipe-type dishes with the same names among different Hispanic subgroups cannot be assumed to have the same nutritional content.

Listing ingredients in reported foods

Another method of obtaining data on mixed dishes is to ask respondents during the interview to itemize the ingredients in the foods that they consumed and then use nutrient data for the individual items. This method is useful for multiple-item foods that have variable types and amounts of ingredients. For example, a taco usually consists of a tortilla, a filling and possibly a sauce but a corn or flour tortilla may be used, the tortilla may or may not be fried and the taco can contain many different types of fillings and sauces.

Listing ingredients for mixed dishes is equivalent to obtaining recipes and may be critical in studies where much precision is needed on an individual level, although it is probably less important in studies of population groups in which average intakes are of interest. Also, gathering recipe-level information may be easier when diet records are collected but less feasible when 24-hour recalls are conducted.

Asking the respondent to break the food down into component parts may result in more detailed information but has several disadvantages: (a) respondent burden is increased, (c) basic ingredients may be forgotten or omitted, (d) the nutrient composition of foods combined in this way may not take into account the effects due to preparation, (e) portion sizes may be difficult to estimate, and (f) the identity of the complete food is difficult to code, thereby limiting the use of such data. In addition, this method requires that nutrient data be available for ingredients commonly used in

Mexican dishes. Substituting nutrient data for missing ingredients may lead to the same problems encountered with substituting similar foods.

Using other sources of nutrient data

Nutrient data can also be supplemented with data from another source; in this case, data are available from Mexico, the country of origin (8). However, Mexican foods consumed in the U.S., especially recipe-type dishes, may have been modified due to the unavailability of certain ingredients or by exposure to another culture's eating habits. The use of multiple sources may introduce biases due to inconsistencies in analytic methods, sampling procedures and methods of estimating nutrient changes due to food preparation techniques (9).

Modifying existing recipes

Modifying existing recipes may be the best strategy to adopt although several issues should be considered. Codes are usually used to identify foods but once a recipe has been modified, how will the original food be distinguished from the new recipe? Changing a recipe may change the yields, weights, and retention factors; this requires an understanding of how they work. Nutrient data for unusual ingredients may be unavailable and substituting similar ingredients may be fraught with many of the same problems for substituting entire foods.

Analytic Issues

Systematic biases may be introduced into intake data as a result of using multiple sources of food composition data or by substituting nutrient values for foods from other Hispanic groups or similar American foods. If a nutrient is overestimated in some commonly consumed foods and underestimated in others, it becomes difficult to predict the overall effect on total nutrient intakes and the contributions of these foods to those intakes.

The variability in dietary intakes may be artificially reduced if one food's nutrient data are used for many nutritionally different foods. As a result, it may be difficult to detect differences among subgroups of Mexican Americans, among Hispanic groups or between Hispanic and non-Hispanic populations, depending upon the kind of substitutions that are made. Additionally, dietary intakes with artificially reduced variability or those containing substitution biases may contribute to the misclassification of individuals which will affect the power of detecting important relationships between diet and diseases.

Listing ingredients in reported foods can contribute to measurement error by complicating portion size estimation or if important nutrient sources are omitted.

Substituting food composition data for similar foods or modifying existing recipes may lead to the loss of the reported food's identity, unless another coding system is devised for recording this information. Loss of food identity has an impact on studies concerned with eating behavior. The ability to evaluate dietary habits and detect changes in eating patterns will be limited since not all foods can be accurately identified. Also, it becomes impossible to draw conclusions about which foods are major contributors to the intake of specific nutrients which in turn limits the ability to recommend dietary changes.

Implications

If currently available nutrient data or one of these approaches are used for a few foods reported by members of a specific Hispanic subgroup in studying a general population, only a small amount of error may be introduced into nutrient intake estimates and the impact will be minimal. In contrast, the amount of error may be larger and less tolerable if a study focuses on the diet of Mexican Americans or another Hispanic subgroup and inappropriate nutrient data must be used for many, frequently reported foods. Given that dietary data are subject to many sources of error, the error contributed by lack of specificity of nutrient databases should be reduced or eliminated whenever possible.

Ideally, a single source of nutrient data for Hispanic and American foods should be used in the assessment of the diets of a Hispanic subgroup. In practice, most researchers are forced to use multiple sources of food composition data. Reliance on one source as much as possible and the use of few substitutions is recommended. The careful modification of existing recipes is probably one of the best strategies.

Hispanic Foods in Current and Future Versions of USDA Databases

The list in Table 3 contains three currently available and two new survey databases that will be released in the future that contain codes for Puerto Rican foods. As mentioned previously, the 1977-8 NFCS contained a special sample carried out in Puerto Rico and as a result many new codes were added. All of these foodcodes were carried forward in the 1985 CSFII. The soon-to-be-released Hispanic HANES (HHANES) dataset contains only those codes for Puerto Rican foods reported during that survey. Two survey databases, the recently available 1987-8 NFCS and the combined 1989 CSFII/NHANES III cycle I dataset currently being developed, will contain all Puerto Rican food codes reported in 1977-8.

Table 4 is a list of databases containing Mexican foods. Mexican foods were reported in and added to the databases for the 1977-8 NFCS and the 1985 CSFII but the recipes used are Americanized versions of these foods. The foodcodes in the 1985 CSFII are contained in the HHANES database if they were reported and some

of these recipes were modified to more traditional recipes. Listed in Table 5 are 24 foods frequently consumed by Mexican Americans that were added to the HHANES database. All 1985 CSFII and HHANES codes are included in the 1987-8 NFCS as well as a few new codes for foods reported in that survey. The combined 1989 CSFII/NHANES III cycle I dataset contains all of the NFCS 1987-8 Mexican foodcodes and many new codes reported in both surveys but primarily in NHANES III. There are too many new foods to list but examples include papas guisadas, atole de avena, horchata, mole verde, mole rojo, pollo guisado, sopes, and gorditas.

Summary

In conclusion, there have been and continue to be good nutrient data for Puerto Rican foods and HNIS intends to maintain these codes in the future. Because of the oversampling in the HANES surveys, many codes have been added for Mexican foods that are appropriate for Mexican Americans. Users of the nutrient databases should be aware that some of the recipes for Mexican mixed dishes are more Americanized versions since these foods are also frequently reported by the non-Hispanic population too. The need for recipes appropriate for two distinct populations raises some important questions currently being discussed by HNIS and NCHS. How do we add foodcodes and more importantly their descriptors to the databases so that users can distinguish between different recipes for the same food? What questions do you ask of the respondent in order to select between the foodcodes? These questions can probably also be raised for many Asian foods too. Any thoughts or suggestions on how to resolve these issues would be welcome.

Table 1: Selected nutrients for sopa seca de fideo and spaghetti with meatless tomato sauce (per 100 gm)

food	energy (kcal)	fat (gm)	sodium (mg)
sopa seca[a]	150	7.4	508
spaghetti[b]	63	0.3	171

[a] USDA nutrient data base for individual food intake surveys, Release 4.0, working version, 1991.

[b] USDA nutrient data base for individual food intake surveys, Release 2.1, 1986.

Table 2: Selected nutrient values for three red sauces (per 100 gm)

food	energy (kcal)	fat (gm)	cho (gm)	NA (mg)	vit. A (IU)	vit. C (mg)
tomato-chili[a]	104	0.3	25	1338	1400	16
salsa, uncooked[b]	18	0.2	4	389	1691	36
salsa, cooked[b]	127	9.8	10	211	7969	10

[a] USDA nutrient data base for individual food intake surveys, Release 2.1, 1986.
[b] USDA nutrient data base for individual food intake surveys, Release 4.0, working version, 1991.

Table 3: Source of Puerto Rican food codes in USDA Nutrient Databases

SURVEY DATABASE	SOURCE OF CODES	NOTES
NFCS, 1977-8	new	Puerto Rico sample
CSFII, 1985	NFCS, 1977-8	all codes
HHANES, 1982-4	NFCS, 1977-8	reported codes
NFCS, 1987-8	NFCS, 1977-8	all codes
CSFII, 1989 and NHANES III, 1988-92	NFCS, 1977-8	all codes

Table 4: Source of Mexican food codes in USDA Nutrient Databases

SURVEY DATABASE	SOURCE OF CODES	NOTES
NFCS, 1977-8	new	Americanized
CSFII, 1985	new	Americanized
HHANES, 1982-4	CSFII, 1985	reported codes*
	new	
NFCS, 1987-8	CSFII, 1985	all codes*
	HHANES, 1982-4	
CSFII, 1989 and NHANES III, 1988-92	NFCS, 1987-8 new	all codes

* some recipes were modified to more traditional recipes

Table 5: Mexican foods added to USDA database for HHANES

queso fresco	carne guisado
queso anejo	picadillo
queso asadero	chilaquiles
queso chihuahua	sopa seca de arroz
atole de arroz	sopa seca de fideo
atole de masa	salsa cruda roja
pan dulce	salsa cruda verde
sopaipillas	salsa de chile rojo
empanadas dulces	salsa verde
dulce de tamarindo	mole poblano
chocolate	guacamole
rompope	cafe cubano

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