



ASA24

Automated Self-Administered 24-Hour Dietary Assessment Tool

Overview of the ASA24® Respondent Website and Considerations Related to Data Security and Participant Confidentiality

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Extensive evidence has demonstrated that 24-hour dietary recalls provide the highest quality, least biased dietary data. Traditional 24-hour recalls, however, are expensive and impractical for large-scale research because they rely on trained interviewers and multiple administrations to estimate usual intakes. As a result, researchers often make use of food frequency questionnaires, which are less expensive but contain substantial error.

To address this challenge, investigators at the National Cancer Institute (NCI) created the Automated Self-Administered 24-hour Dietary Assessment tool (ASA24), a freely-available, web-based tool that enables multiple automated self-administered 24-hour recalls and food records. The ASA24 system was developed under contract with Westat®, a social science research firm located in Rockville, MD. ASA24 adapted the United States Department of Agriculture's (USDA) Automated Multiple-Pass Method (AMPM) and the Food Intake Recording Software System (FIRSSt) developed by Dr. Tom Baranowski of the Baylor College of Medicine.

The ASA24 system consists of a respondent website used to collect recall and food record data and a researcher website used to manage study logistics and obtain data analyses. Since 2016, the ASA24 respondent website is compatible with mobile devices and the U.S. version is available in English and Spanish, the Canadian version is available in English and French, and the Australian version is available in English. Also, since the 2016 version, ASA24 allows for the collection of both recalls and food records. This document provides an overview of the methodology and main features of the ASA24 respondent website, as well as information on security of the data collected and protections to the confidentiality of the participants of studies that make use of the ASA24 system. Images of the main respondent site screens are also included.

ASA24 Respondent Website Methodology

Respondents asked to complete a 24-hour recall or food record are guided through ASA24 using a modified version of USDA's AMPM, with two main differences, timing and order of the questions.

Timing

- The 24-hour recall asks respondents about everything they ate and drank the previous day or in the last 24 hours. Researchers have the option to set up a study to ask about food the previous day (midnight to midnight) or in the last 24 hours from the time they log in to the respondent website (e.g., 2 p.m. today to 2 p.m. yesterday). The respondent needs to complete the recall by midnight the day of the login or 8 a.m. the next day, depending on the settings the researcher selected.
- The food record, also known as a food diary, asks respondents about the foods they are eating in real time. A researcher can set up the food record to include a single-day or multiple consecutive days. Respondents can review their information, add information, and complete missed days for up to one day after completing the record. The timing of the single-day record and consecutive day record starts when the respondent logs in to

ASA24. For consecutive day records with multiple days, the first day is the day the respondent first logs in through the last day of data collection.

Order of Questions

- The 24-hour recall is based on the AMPM method where a respondent first reports all eating occasions, and then the foods, beverages, and supplements in those eating occasions. Once the respondent has reported all of the foods, beverages, and supplements they consumed, they are asked about the details of each item. After reporting the details, the respondent proceeds to the final review, forgotten foods, and usual amount questions.
- The food record is set up differently because it is considered to be “real time” reporting where respondents can log in and out throughout the day. The respondent reports their eating occasions, the foods, beverages, and supplements in that eating occasion, and then they answer the detail questions. After reporting the details, respondents are asked if this is their last eating occasion for the day. If not, then the respondent can continue to report in a similar fashion throughout the day. After the respondent’s last eating occasion, they go through the final review, forgotten foods, and usual amount questions to complete the day.
- The 2016 and later versions of ASA24, respondents report supplements similar to how they report foods as part of an eating occasion.

24-Hour Dietary Recall Methodology

There are up to nine steps or passes used by ASA24 to facilitate respondents’ reporting of 24-hour dietary recalls.

1. [Meal-based Quick List](#)
2. [Meal Gap Review](#)
3. [Detail Pass](#)
4. [Final Review](#)
5. [Forgotten Foods](#)
6. [Last Chance](#)
7. [Usual Intake Question](#)
8. [Sleep Module, if selected by the researcher](#) (Note: Only available for ASA24-2020 version)

Food Record Methodology

A food record can consist of one or more days as determined by the Researcher during study setup. The days can be consecutive or nonconsecutive. Respondents are instructed to complete a food record in real time. The methodology for food records was adapted from the ASA24 methodology for 24-hour recalls described above.

The steps for any given day of a food record process include:

1. [Meal-based Quick List](#)
2. [Detail Pass](#)
3. [Meal Gap Review](#)

After each meal reported, respondents are asked if they are finished reporting for the day. If not, on their next login, they return to step 1 to report another meal. If they are finished for the day, they go to step 4.

4. [Final Review](#)
5. [Forgotten Foods](#)
6. [Last Chance](#)
7. [Usual Intake Question](#)
8. [Sleep Module, if selected by the researcher \(only available for ASA24-2020 version\)](#)

Meal-based Quick List

During the first step of a 24-hour recall, respondents are asked to provide a list of the foods and drinks consumed at each meal occasion during the reporting period. For a 24-hour recall, the researcher can define the reporting period as either the previous 24 hours from midnight-to-midnight or for the past 24-hours starting at the time of the first login.

For food records, respondents first provide a list of foods and drinks for the meal they are reporting. After reporting all foods and drinks for that meal, they immediately proceed to the Detail Pass.

Respondents are required to search to find foods, drinks, or supplements. Search results correspond to items associated with the Food and Nutrient Database for Dietary Studies (FNDDS) and dietary supplement food codes. Search results can then be filtered by food groups, if desired. Since ASA24-2018, respondents can also add recipes during this step.

Meal Gap Review

For 24-hour recalls, once Respondents finish creating their My Foods and Drinks list at the end of the Quick List step, they are asked if they consumed anything during any 3-hour gaps between eating occasions. During a Gap Review, respondents have the opportunity to return to the Quick List to add a meal(s) and the foods, drinks, and supplements they consumed.

For a food record, the Meal Gap Review follows the Detail Pass. For the midnight-to-midnight version of a 24-hour recall and for food records, Respondents are also asked if they consumed anything between midnight and the first eating occasion, and between the last eating occasion and midnight regardless of the length of time gaps.

Detail Pass

Respondents are asked for details about the foods and drinks they recorded during the Quick List, including form (e.g., raw or cooked), preparation methods (e.g., grilled or roasted), recipe ingredients, the amount consumed, and any additions (e.g., sugar, coffee cream, salad dressing). During study setup, researchers can select an option to ask respondents about the source (e.g. grocery store, farmer's market) of all or most of the ingredients in their reported foods and drinks.

Final Review

Respondents are asked to review all of the foods, drinks, and supplements they reported for the intake day. Respondents can return to the My Foods and Drinks page to edit existing items or to add meals, foods, drinks, and supplements.

Forgotten Foods

Following the Final Review, respondents are asked if they consumed any commonly forgotten foods and drinks (e.g., snack foods, fruits, vegetables, cheese, water, coffee, tea) and supplements. Respondents must select either "Yes" or "No" for each food or drink probed. For any "Yes" response, the respondent will be returned to the Quick List to add the forgotten item(s).

Last Chance

After Forgotten Foods, respondents are asked if they reported all that they consumed. If respondents want to add more foods, drinks, or supplements, they will be returned to the Quick List to add more items; otherwise, they will move to the Usual Intake Question.

Usual Intake Question

For recalls, the final question asks: Was the amount of food that you ate yesterday more than usual, usual, or less than usual?

For records, the final question asks: Was the amount of food and drink that you had on [record day] more than usual, usual, or less than usual?

Sleep Module

This optional module allows researchers to examine the associations between sleep and dietary intake, timing of eating, and other variables in the context of the 24-hour day. When researchers turn on the sleep module during the creation of new ASA24 studies, respondents will be prompted to answer questions about sleep timing, quantity, and quality after they complete their diet assessment. The questions are available on the researcher website in the document that describes the modules.

The methodology used to create the sleep module is described in the following abstract:

Shams-White M, O'Connor L, O'Connor S, Miller A, Mittl B, Nicholson T, Kaefer C, Herrick K. [Development of a Sleep Assessment Module in the Automated Self-Administered 24-Hour \(ASA24\) Dietary Assessment Tool: New Research Opportunities](#). *Curr Dev Nutr*. 2021 Jun; 5(Suppl 2): 474.

Depending on whether a researcher uses a dietary recall or record, they can capture different sleep periods and thus investigate different research questions.

For researchers using the recall, the sleep module includes two questions on wake time and sleep quality for the sleep period immediately preceding the first reported meal, then primarily focuses on the sleep period after the last meal. This allows researchers to assess morning fasting or how dietary intake may influence the following night of sleep.

For researchers using food records, the sleep module focuses on the sleep period prior to the first meal. A single-day food record with the sleep module allows researchers to assess how the previous night of sleep may influence subsequent dietary intake. The use of consecutive-day food records with the sleep module allows researchers to also assess how dietary intake may influence the following night of sleep.

Respondent Nutrition Report

For 24-hour recalls or food records collected using the US and Canadian versions of ASA24 from respondents 2 years and older, researchers can select an optional module to allow respondents to receive a Respondent Nutrition Report (RNR). The RNR provides information to respondents regarding how their intake on a single reporting day compares to country-specific dietary guidance and nutrient requirements.

When this optional module is selected by researchers, after they have completed their 24-hour recall, respondents will be asked if they would like to obtain a Nutrition Report about that day. Respondents who answer affirmatively are asked their age and sex, and if female, if they are pregnant or lactating. The ASA24 system then presents respondents with an RNR. The RNR provided to respondents is also available to researchers on the Researcher website. Note that the RNR will only be generated if the respondent provides their age, sex, and pregnancy/lactation status.

ASA24 Respondent Website Features

The ASA24 respondent website guides participants through the completion of either a 24-hour recalls or food records. The ASA24 website uses an extensive branching database of questions with more than 13 million pathways that allow respondents to specify portion size and preparation, and includes reminders to add frequently forgotten foods. ASA24 gives researchers control over many options.

For both types of dietary tools, researchers can select any of the following study configurations:

- Location where respondents ate
- With whom (if anyone) respondents ate
- Television and computer use during eating occasions
- Source of respondents' food
- Dietary supplement intake
- Respondents' sleep quantity and quality in relation to dietary intake (available in ASA24-2020 version only)

ASA24 allows respondents to:

- Report type and time of eating occasion
- Search for a wide variety of foods, drinks, and supplements
- Report, save, and modify recipes for use in subsequent recalls or records (only available in 2018 and later versions)
- Search results for misspelled and related food items
- Use images to report portion size
- Add or modify food, drink, and supplement choices at multiple points during the recall or record
- Report sleep timing, duration, and quality (ASA24-2020 version only)

Data Security and Protections to Confidentiality of Participants Using the ASA24 System

Respondent confidentiality is of the utmost important within the ASA24 system. Researchers using the ASA24 system do not provide NCI, Westat, or the ASA24 system with any personally identifiable data for associated with study respondents. Rather, researchers specify a user ID for each respondent and download system-generated usernames and passwords that they provide to respondents so that they may access the application.

The ASA24 system also does not collect any identifying data directly from respondents. However, IP address information is accessed for the purpose of routing information between the server and the respondent's computer—often the IP address is that of the user's Internet Service Provider (ISP).

IP addresses are not stored or tracked by the ASA24 system. However, logs of connections are kept for audit trail purposes. This information is not mined in any way but would be available if there were a legal obligation to release it.

Respondent data are protected using industry standard security controls. All data entered into the ASA24 system at the respondent's computer are encrypted by the internet browser (e.g., Chrome, Firefox, etc) while transmitted to ASA24 servers using Secure Socket Layer (SSL) Technology. SSL allows for the authentication of the sending and receiving computers.

Only a particular study's investigator(s) and the ASA24 operations team can access response data. Access is gained through usernames and strong passwords.

ASA24 Respondent Website Screen Shots

Screen layouts will vary depending upon the screen size of the device.

Figure 1: The respondent can choose to complete the ASA24 records or recalls in English or Spanish for the US version.



Figure 2: An introductory screen prompts the participant to report everything that they had to eat or drink for the desired period.



Figure 3: The meal details screen collects information on the eating occasion and time, and displays optional modules that can be selected by the researcher to query where meals were eaten, whether meals were eaten alone or with others, and television and computer use during meals. This is the first step in the meal-based Quick List.

ASA24[®] Show Tips A A Finish Later

Report Meals and Snacks **Find Food and Drinks** **Add Details** **Review**

Report a Meal or Snack

All fields are required

Select a meal or snack:
Brunch

Day of the Brunch:
Monday, September 24th

Time of the Brunch:
(Select a time between Monday, September 24th - 12:00am and Monday, September 24th - 11:59pm)

12 : 00 AM

Location:
Please select one

TV and computer use while eating and drinking (Select all that apply):

- Watching TV
- Using a computer or laptop
- Using a mobile phone or tablets
- None of these

Did you eat with anyone?

Yes
 No

[Help](#) [Cancel](#) [Find Foods and Drinks](#)

Figure 4: The Find Foods & Drinks screen is used to select foods, drinks, and supplements to be added to a meal during the Quick List Pass during the reporting period assigned by the researcher.

ASA24 Show Tips A A Finish Later

Report Meals and Snacks **Find Food and Drinks** **Add Details** **Review**

Find Foods & Drinks

Brunch, Monday, September 24th

Search: **Search**

Filter your results: **33 Results:**

Breads, Cereals, Bakery products & Salty snacks:

- Bread, Muffin, Roll, Tortilla (6)
- Pancake, Waffle, Crepe (1)

Dairy Products:

- Cheese (2)
- Eggs (3)

Fast Food:

- Dunkin' Donuts (5)
- McDonald's (4)
- Other (1)

Food Groups:

- Soups, Stews, Chili (1)

Fruit:

- Dried fruit (1)

Main dishes & Entrees:

- Main dish, Entrée, Frozen meal (2)
- Sandwich (13)

Meat, Poultry, Fish, Eggs & Nuts:

- Bacon, Sausage, Frankfurter (3)
- Chicken, Turkey, Poultry (1)

Snack foods:

- Cracker, Chip, Popcorn (2)
- Nut, seed (1)

Vegetables, Beans & Salad:

- Bean, Pea, Legume (1)
- Vegetable (1)
- Vegetable/Bean salad (1)

What I ate and drank for Brunch, Monday 12:00am

Help **★** **Finish with This Meal**

Figure 5: Respondents complete the Quick List pass by adding meals and selecting foods, drinks, and supplements.

ASA24 Show Tips A A Finish Later

Report Meals and Snacks **Find Food and Drinks** **Add Details** **Review**

My Foods & Drinks

starting Wednesday, November 4th - 12:00am

BREAKFAST

Wednesday 8:05am

+ Add Foods

| | |
|--------------|--|
| Bagel | |
| Orange juice | |
| Coffee | |

JUST A DRINK

Wednesday 10:15am

+ Add Foods

| | |
|------------------|--|
| Tea, hot or iced | |
|------------------|--|

LUNCH

Wednesday 12:30pm

+ Add Foods

| | |
|-----------------|--|
| Turkey sandwich | |
| Water | |
| Apple | |

ending Wednesday, November 4th - 11:59pm

[Help](#) **Report a Meal** **Next**

Figure 6: In a recall, after the Respondent reports the foods, drinks and supplements consumed and selects the Next button in Figure 5, gaps between meals are identified (Meal Gap Review pass) After reviewing the gaps, the Respondent selects the 'Add Details' button.

My Foods & Drinks

starting Wednesday, November 4th - 12:00am

GAP + Report a Meal
Wednesday 12:00 am to Wednesday 8:05am Dismiss This Gap x

BREAKFAST + Add Foods ✎ 🗑️
Wednesday 8:05am

| | |
|--------------|----------------------|
| Bagel | 🔧 Tools |
| Orange juice | 🔧 Tools |
| Coffee | 🔧 Tools |

JUST A DRINK + Add Foods ✎ 🗑️
Wednesday 10:15am

| | |
|------------------|----------------------|
| Tea, hot or iced | 🔧 Tools |
|------------------|----------------------|

LUNCH + Add Foods ✎ 🗑️
Wednesday 12:30pm

| | |
|-----------------|----------------------|
| Turkey sandwich | 🔧 Tools |
| Water | 🔧 Tools |
| Apple | 🔧 Tools |

GAP + Report a Meal
Wednesday 12:30 pm to Wednesday 11:59pm Dismiss This Gap x

ending Wednesday, November 4th - 11:59pm

[Help](#) + Report a Meal + Add Details

Figures 7a-c: The detail pass prompts the respondent to report the details of each food, drink, and supplement including the specific type or how it was prepared, anything added to it, and the amount that was consumed.

Figure 7a.

Add details to your Bagel
🕒 Lunch Wednesday, November 4th - 8:05am

Bagel: Did it have any fruit or vegetable?

Select an option

- Plain
- Apple
- Blueberry
- Cranberry
- Garlic
- Onion
- Raisins
- Other
- Don't know

Help Back Next

Figure 7b.

Add details to your Bagel
🕒 Lunch Wednesday, November 4th - 8:05am

Bagel: How much did you actually eat? 🗳️



| | | | | | | |
|------------|---------------------|-----------|------------------|-----------|---------|-------------------|
| Don't know | Less than 1/4 bagel | 1/4 bagel | 1/2 bagel | 3/4 bagel | 1 bagel | More than 1 bagel |
|------------|---------------------|-----------|------------------|-----------|---------|-------------------|

AMOUNT: 1/2 bagel

Help Back Next

Figure 7c.

Add details to your Bagel

🕒 Lunch Wednesday, November 4th - 8:05am

Bagel: Did you add anything to your Bagel that you haven't already reported?

Yes
 Nothing Added
 Don't know

Search for additions:

Type a food or drink

Figure 8: Once the Detail Pass is complete, the Final Review begins. The Respondent can make changes to the details for a given food or drink and add more foods and drinks if necessary.

Review

starting Wednesday, November 4th - 12:00am

Show food details »

LUNCH

Wednesday 8:05am

Bagel » (show details)

Orange juice » (show details)

Coffee » (show details)

JUST A DRINK

Wednesday 10:15am

Tea, hot or iced » (show details)

LUNCH

Wednesday 12:30pm

Turkey sandwich » (show details)

Water » (show details)

Apple » (show details)

ending Wednesday, November 4th - 11:59pm

Help

Make Changes

Next

Figure 9: The forgotten foods pass queries the respondent about frequently forgotten foods. Responding yes to one or more categories will result in a prompt to add the forgotten foods or drinks.

Frequently Forgotten Foods

Certain foods and drinks are frequently forgotten. In addition to the foods and drinks you already reported, did you have any:

All fields are required

Water, including tap, faucet, bottled, water fountain?
 Yes No

Coffee, tea, soft drinks, milk or juice?
 Yes No

Beer, wine, cocktails or other drinks?
 Yes No

Cookies, candy, ice cream or other sweets?
 Yes No

Chips, crackers, popcorn, pretzels, nuts or other snack foods?
 Yes No

Fruits, vegetables or cheeses?
 Yes No

Breads, rolls or tortillas?
 Yes No

Supplements
 Yes No

Anything else?
 Yes No

[Help](#) [Next](#)

Figure 10: The Last Chance Pass provides respondents one more opportunity to edit their intake.

drinks are frequently forgotten. In addition to the foods

Last chance

Did you have anything else to eat or drink between Wednesday, November 4th - 12:00am to Wednesday, November 4th - 11:59pm?

Figure 11: The final question in the food and drink module asks the respondent whether the amount of foods and drinks consumed yesterday was usual.

Amount of Reported Food

How usual was the amount you reported?

The amount of food and drinks I had from Wednesday, November 4th - 12:00am to Wednesday, November 4th - 11:59pm was:

- Much more than usual
- Usual
- Much less than usual

[Help](#) [Next](#)

Figure 12: Once the respondent completes their reporting, their responses are saved in the secure database and he or she can exit the ASA24 system* Only the researcher(s) who are registered to that study and the ASA24 operations team can access the response data.

ASA24[®] Show Tips A A Finish Later

Report Meals and Snacks Find Food and Drinks Add Details Review

Amount of Reported Food

How usual was the amount you reported?

The amount of food and drinks I had from Wednesday, November 4th - 12:00am to Wednesday, November 4th - 11:59pm was:

- Much more than usual
- Usual
- Much less than usual

[Help](#) [Next](#)

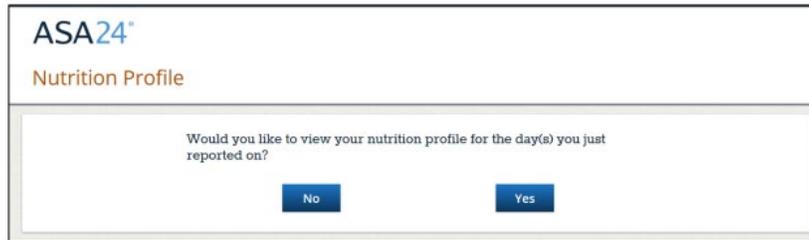
Save and submit x

Congratulations! You are done. Thank you for your participation.

[Finish](#)

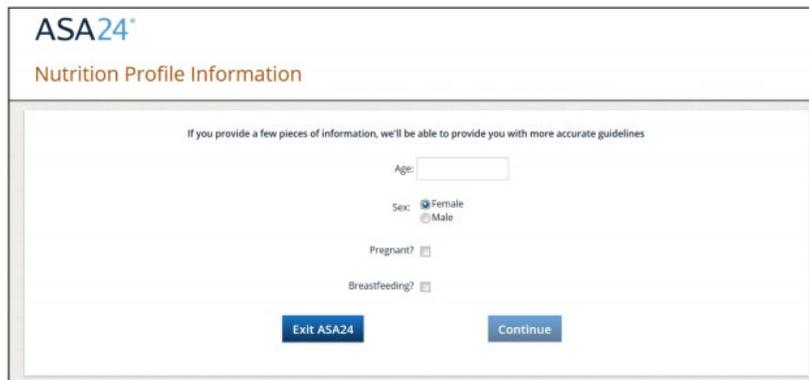
***12b. If the researcher chose to include the option of providing a Respondent Nutrition Report (RNR) at the end of diet recall or food record entries, participants are given the option of answering a few basic questions in order to receive a copy of their nutrition report. To view a sample of an RNR, visit <https://epi.grants.cancer.gov/asa24/respondent/nutrition-report.html>.**

Questions presented to the participant in advance of creation of the RNR include whether the participant would like to view the report, and if yes, they are asked to provide their age, gender, and whether participant is pregnant or lactating, as depicted in the figures below.



ASA24[®]
Nutrition Profile

Would you like to view your nutrition profile for the day(s) you just reported on?



ASA24[®]
Nutrition Profile Information

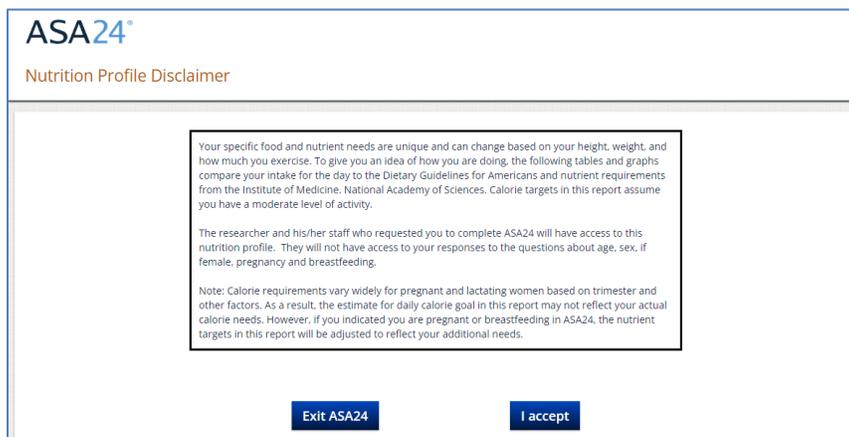
If you provide a few pieces of information, we'll be able to provide you with more accurate guidelines

Age:

Sex: Female
 Male

Pregnant?

Breastfeeding?



ASA24[®]
Nutrition Profile Disclaimer

Your specific food and nutrient needs are unique and can change based on your height, weight, and how much you exercise. To give you an idea of how you are doing, the following tables and graphs compare your intake for the day to the Dietary Guidelines for Americans and nutrient requirements from the Institute of Medicine, National Academy of Sciences. Calorie targets in this report assume you have a moderate level of activity.

The researcher and his/her staff who requested you to complete ASA24 will have access to this nutrition profile. They will not have access to your responses to the questions about age, sex, if female, pregnancy and breastfeeding.

Note: Calorie requirements vary widely for pregnant and lactating women based on trimester and other factors. As a result, the estimate for daily calorie goal in this report may not reflect your actual calorie needs. However, if you indicated you are pregnant or breastfeeding in ASA24, the nutrient targets in this report will be adjusted to reflect your additional needs.

Figure 13a-m: Sleep Module Questions: If the researcher chooses to include the option of the sleep module, 10-12 questions ask the respondent about about his/her sleep timing, quantity, and quality after they complete their diet assessment.

Figure 13a. recall question

Thank you for telling us about the food, beverages, and supplements that you had yesterday. Now we want to ask you a few questions about your sleep.

What time did you wake up yesterday? (Tuesday, June 7)

Enter time

:

I prefer not to answer
 I don't know

Next

Figure 13b. recall question

How did you feel when you woke up yesterday?

Refreshed
 Somewhat refreshed
 Tired
 I prefer not to answer
 I don't know

Back Next

Figure 13c. recall and record question

You reported eating your last meal yesterday at 7:00 PM. After this...

What time did you get into bed? *This may not be the time that you began trying to fall asleep.*

Enter time

:

I prefer not to answer
 I don't know

Figure 13d. recall and record question

What time did you begin trying to fall asleep?

Enter time

:

I prefer not to answer
 I don't know

Figure 13e. recall and record question

About how long did it take you to fall asleep, from when you first began trying?

Hours: Minutes:

I prefer not to answer
 I don't know

Figure 13f. recall and record question

How many times did you wake up, not counting the final time you woke up?
Please enter 0 if none.

I prefer not to answer

I don't know

Figure 13g. recall and record question

In total, about how long were you awake? *What was the total time you were awake between the time you first fell asleep and the final time you woke up?*

Hours: Minutes:

I prefer not to answer

I don't know

Figure 13h. recall and record question

What was the final time you woke up today? (Wednesday, June 8)

Enter time

:

I prefer not to answer

I don't know

Figure i. recall and record question

What time did you get out of bed today? *This may be different from the final time you woke up. For example, you may have woken up at 6:35 AM but did not get out of bed to start your day until 7:20 AM.*

Enter time

:

I prefer not to answer
 I don't know

Figure j. recall and record question

How well did you sleep last night?

Very good
 Good
 Fair
 Poorly
 Very poorly
 I prefer not to answer
 I don't know

Figure k. recall and record question

How did you feel when you woke up today (Wednesday, June 8)?

Refreshed
 Somewhat refreshed
 Tired
 I prefer not to answer
 I don't know

Figure l. recall and record question

How does the amount of sleep you reported between Tuesday, June 7 and Wednesday, June 8 compare to your usual sleep?

- Much more than usual
- Usual
- Much less than usual
- I prefer not to answer
- I don't know

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Figure m. recall and record question

Thank you for telling us about your sleep. Please click "next" to complete this questionnaire.

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