

User Experience Research Findings Presentation

ASA24 RNR

UX Testing

OCPL Analytics and Audience Research Branch (AARB)

Agenda

- *Overview*
- *Findings*
 - *Round 1*
 - *Round 2*
 - *Eye-Tracking Findings*
- *Recommendations*
- *Conclusion*

Overview

Method

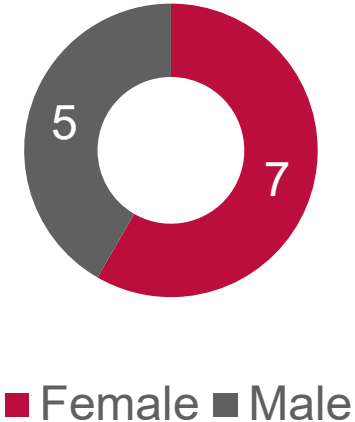
- Twelve people (Six in each round) participated in the research study.
 - Each testing session lasted about 60 minutes.
 - Eye tracking was used in this research study to analyze participants' visual attention.
1. Participants were first asked to discuss the websites that they have used to look up health and nutrition information online.
 2. Participants were presented with a scenario and asked to navigate the report to review the information.
 3. After navigating the report, participants were probed on the content and layout on the various pages.
 4. To close the session, participants were asked open-ended questions about their experience interacting with the report.

Research Questions

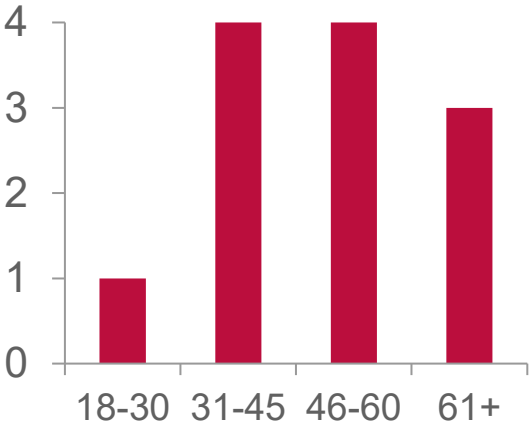
- How easy is it to understand the information the RNR contains?
- Is there a strong preference in how the content is organized?
- Is the terminology used throughout the RNR understandable?
- Are there any recommended changes that would make the RNR more understandable or useful?

Participant Demographics

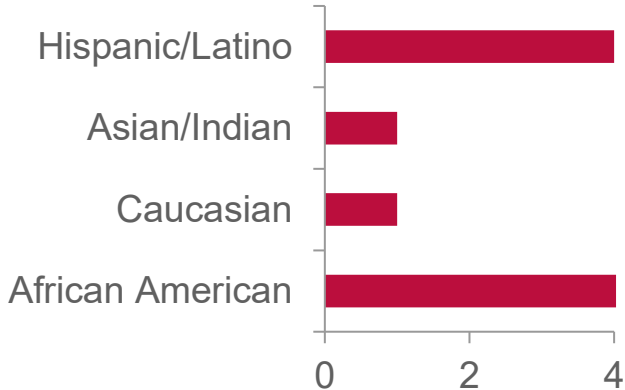
By Gender:



By Age:



By Ethnicity:



Findings

Overall Impressions (1/2)

Overall, participants commented that they liked the RNR and its sections. Participants said that they appreciated the color and visual representation of data.

The screenshot displays the ASA24 Nutrition Report cover page. At the top left is the ASA24 logo, which includes a circular icon with a fork and knife and the text 'ASA24 Automated Self-Administered 24-Hour Dietary Assessment Tool'. The main title is 'Nutrition Report'. Below the title is a text box explaining that the report compares intake to the Dietary Guidelines for Americans. The main section is titled 'Food, Drinks, and Supplements Consumed on May 22, 2019'. It is organized into columns for different meals: BREAKFAST (8 A.M.), SNACK (10 A.M.), LUNCH (12 P.M.), DINNER (7 P.M.), SNACK (9 P.M.), and SUPPLEMENTS. Each meal section lists the items consumed with their quantities.

Meal	Time	Items Consumed
BREAKFAST	8 A.M.	Egg, 1 Egg Cheerios, 1.5 cups with Skim milk, 1 cup Strawberries, 1.5 cups
SNACK	10 A.M.	Watermelon, 1/2 slice
LUNCH	12 P.M.	Mixed greens salad, 2.5 cups with Italian dressing, 2 tablespoons Apple, 1 fruit Peanut butter and jelly sandwich, 1 sandwich Skim milk, 8 fluid ounces
DINNER	7 P.M.	Salmon, 6 ounces Broccoli, 1 cup White rice, 1 cup Water, 16.9 fluid ounces
SNACK	9 P.M.	Carrots, 6 pieces Ranch dip, 3 tablespoons Water, 16.9 fluid ounces
SUPPLEMENTS		One A Day Multivitamin, 1 tablet

ASA24 RNR cover page and consumption details.

Overall Impressions (2/2)

“It gave me some more insight on what I need to maintain a healthy regiment. Monitor my intake of everything. It convinces me to have a journal to keep a record of what I am eating.” –Round 1, Participant 3 (R1P3)

“I was very impressed as I don’t usually read the nutrition facts when I shop. I liked how it highlighted a lot of the nutrients that you don’t usually hear about like copper or folate.” –R2P1

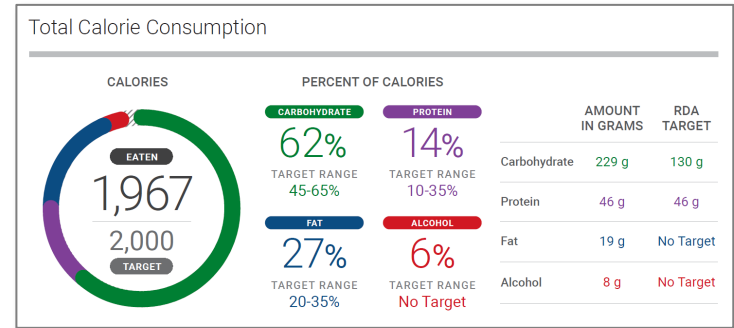
“It is very informative and the colors and graphs make it easy to identify the important information.” –R1P5

Round 1

Data collection: April 30, 2019

Section: Total Calorie Consumption (1/2)

Participants had most difficulty understanding the different portions of this section. In the calories ring, participants had difficulty understanding why there was a gap in the ring or what would happen if calorie consumption exceeded the target. Also, almost all participants were unclear on how to interpret the table and attempted to connect the values in the table with the percentages and ranges but were confused after noticing that fat does not have a target in the table but has a target range. There was also confusion around some terminology (e.g., “no target”) in this section.



ASA24 RNR Total Calorie Consumption section for Round 1 of testing.

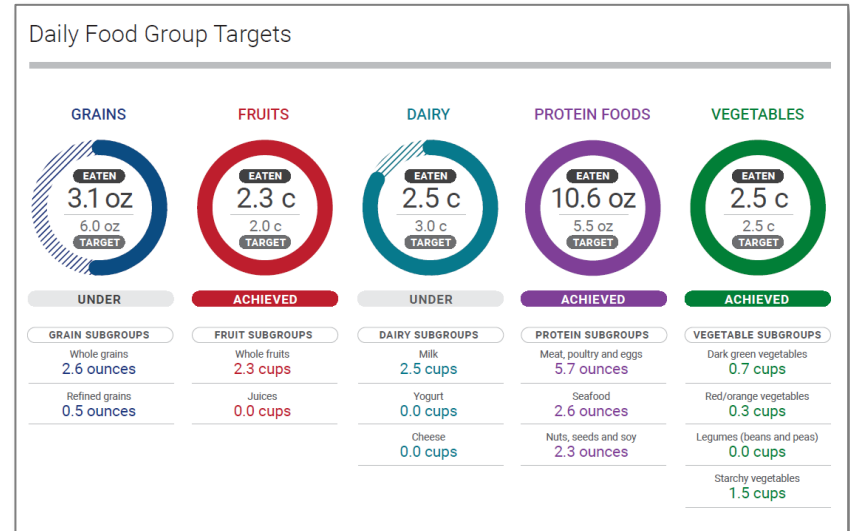
Section: Total Calorie Consumption (2/2)

“[The diagonal lines in the calorie circle] I am not sure what it means. Oh those are the left-over calories from the 2000.” –R1P4

“I don’t know what to make of that. The first column is amount in grams and the second is RDA target. But I don’t know what RDA stands for. I think the amount in grams is the amount you have consumed.” –R1P1

Section: Daily Food Group Targets (1/2)

Most participants received this section very positively. Participants were easily able to comprehend what the rings represented and appreciated the assistance of the status indicator (under or achieved) to understand the rings. Participants mainly had difficulty understanding some terms such as starchy vegetables, whole fruits, and whole grains vs. refined grains.



ASA24 RNR Daily Food Group Targets section for Round 1 of testing.

Section: Daily Food Group Targets (2/2)

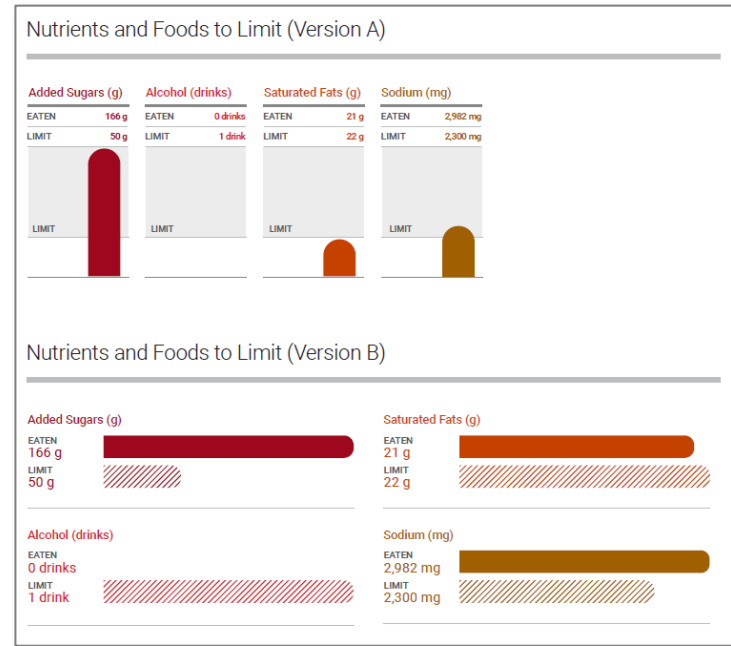
“This one is telling me a little bit more. I like it. It tells me the specific categories of food I should eat to get to my daily needs.” – R1P3

“I am trying to figure out what is refined grains.” – R1P4

“Starchy vegetables. Not everyone knows what that is” – R1P2

Section: Nutrients and Foods to Limit (1/2)

Participants strongly preferred version B over version A, even though they had difficulty understanding the word “limit” on the graph in version A. Participants were confused by the term “eaten” to indicate consumption of alcohol.



Two versions of the ASA24 RNR Nutrients and Foods to Limit section for Round 1 of testing.

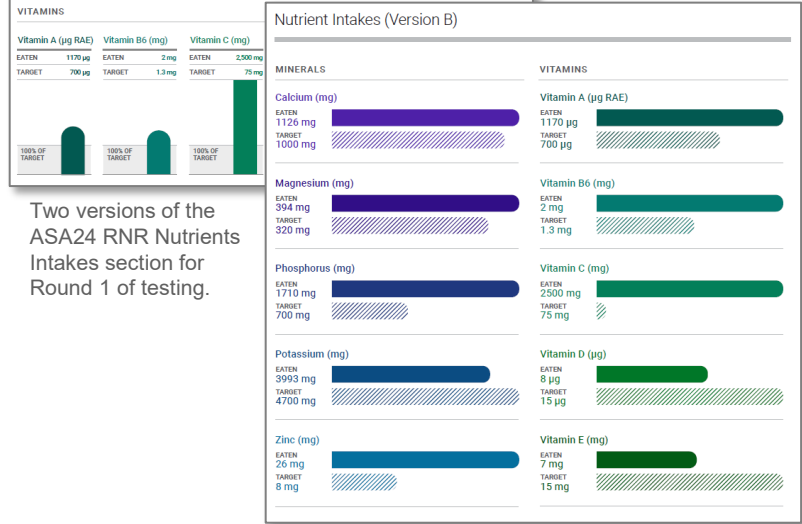
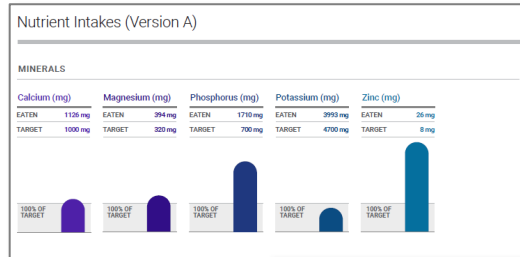
Section: Nutrients and Foods to Limit (2/2)

“I think the word ‘limit’ in two spots is confusing. The word ‘eaten’ is not usually with alcohol.” –R1P2

“I like version B better. It would be easier to explain to anyone else.”
–R1P4

Section: Nutrient Intakes (1/2)

When asked to choose, most participants preferred version B over version A. However, participants did not have difficulty comprehending version A and the term “100% of target”. Participants were unclear of the measurement units (e.g., μg) for a few minerals and vitamins. Many participants noted that they can understand this information as data but are unsure of what to do with this information. Participants recommended integrating examples of sources for the said minerals and vitamins or helper text to help convert the data to actionable information.



Two versions of the ASA24 RNR Nutrients Intakes section for Round 1 of testing.

Section: Nutrient Intakes (2/2)

I like this vertical graph because the target vs limit is clear. The grey shaded area for limit was above the line and for target it is below. I think for the limit, I prefer the horizontal version but for target, the vertical version is better.” – R1P2

“[μg or RAE] I am not sure what that means” –R1P3

Key Changes from Round 1 (1/3)

Section	Change
Total Calorie Consumption	<p>Version 1:</p> <ul style="list-style-type: none">- If a person's caloric intake exceeds their target, the circle is closed indicating that the calories were met and the "Eaten" value showing the total calories consumed.- Percentages and target ranges arranged in compact format.- Alcohol's target range changed to "limit intake."
Total Calorie Consumption	<p>Version 2:</p> <ul style="list-style-type: none">- If a person's caloric intake exceeds their target, have the additional calories appear as a pop-out from the circle and label that pop-out as "Calories over target."- Percentages and target ranges arranged in spread format.- Alcohol's target range changed to "limit intake."

Key Changes from Round 1 (2/3)

Section	Change
Daily Food Group Targets	Give examples for the terms starchy vegetables, whole grains, and refined grains to help provide more clarity to the information.
Daily Food Group Targets	Rename whole fruits to fruits.
Nutrient and Foods to Limit	Format graphs horizontally.
Nutrient and Foods to Limit	Change “eaten” to “consumed” for Alcohol (drinks).
Nutrient Intakes	Split information into two sections – 1) Nutrient Intake from Food and Drinks, and 2) Combined Nutrient Intake from Food, Drinks, and Supplements.

Key Changes from Round 1 (3/3)

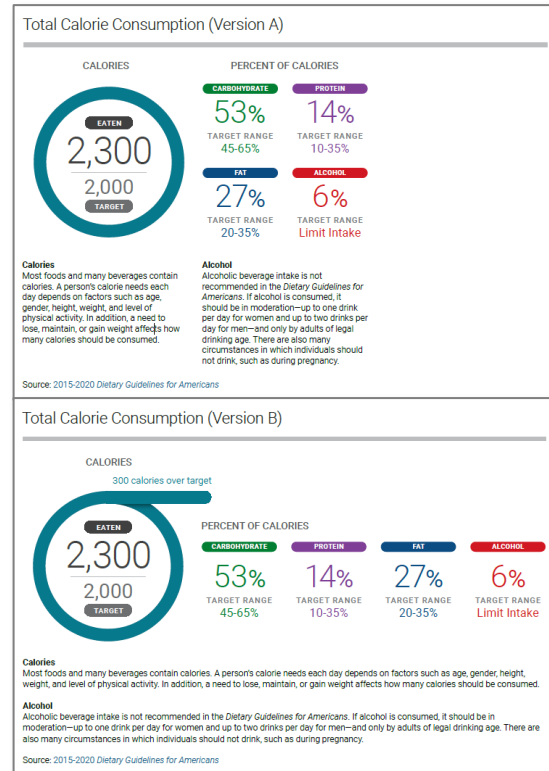
Section	Change
Nutrient Intake from Food and Drinks	Format graphs vertically.
Combined Nutrient Intake from Food, Drinks, and Supplements.	Format as table.
All	Add legend for units where necessary.
All	Add explanatory text and source/reference link to each page.

Round 2

Data collection: June 4, 2019

Section: Total Calorie Consumption (1/2)

Participants liked the calories ring in version B. Participants stated that the extension of excess calories consumed was easy to understand. However, most participants preferred the percent of calories and text layout in version A. A few stated that the compact layout reminded them of their interaction with content on a mobile screen.



Two versions of the ASA24 RNR Total Calorie Consumption section for Round 2 of testing.

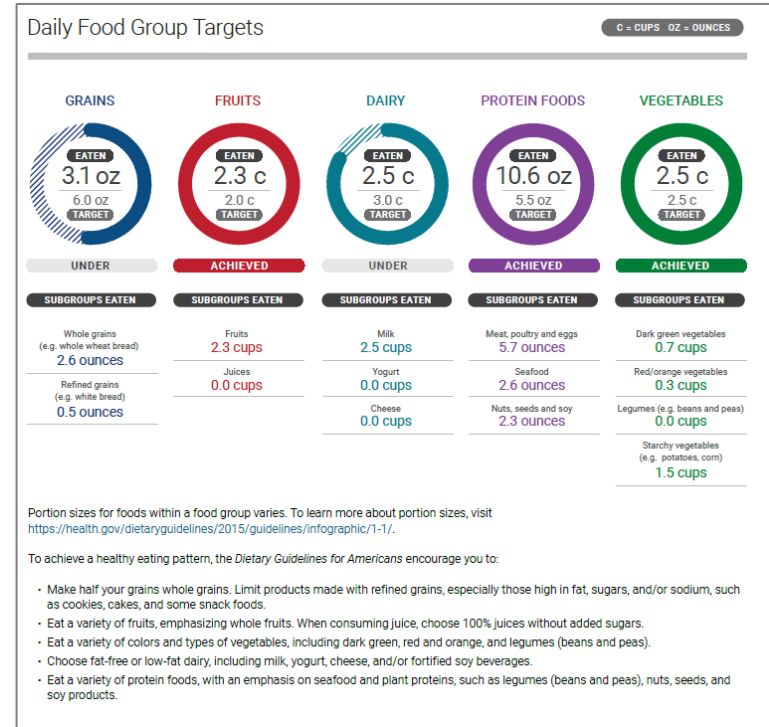
Section: Total Calorie Consumption (2/2)

“Version B. I liked that it had the little extension that tells me that I am over.” – R2P2

“I like the (layout of version A) as I mostly ready these type of things on a mobile device so this layout makes it easy for me.” – R2P5

Section: Daily Food Group Targets (1/2)

Conforming with feedback from round 1, participants did not have difficulty understanding the content in this section. Difficulties observed in round 1 were overcome as participants were able to understand the different terms. Participants also appreciated the informative text below the graphics as they found the content educational.



ASA24 RNR Daily Food Group Targets section for Round 2 of testing.

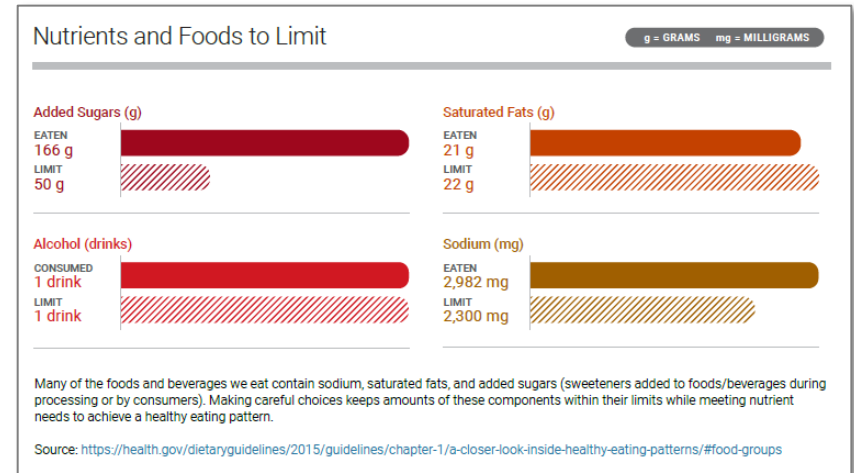
Section: Daily Food Group Targets (2/2)

“I did not eat my grains and dairy. [How?] By looking at the solid line vs the dashed. Can also tell by looking at the numbers. The text (subgroups) reinforces what you see in the graph. It tells you how to achieve it and work better for your meals. It is not overbearing. Just enough.” –R2P2

“I think it is good. It is not overwhelming. The text at the bottom is really good. It advises me on what are some good eating habits.” –R2P4

Section: Nutrients and Foods to Limit

There were no difficulties observed as participants interacted with this section. A few participants noted that alcohol was labeled as consumed whereas others were labeled as eaten but did not have negative feedback about this difference.



ASA24 RNR Nutrients and Foods to Limit section for Round 2 of testing.

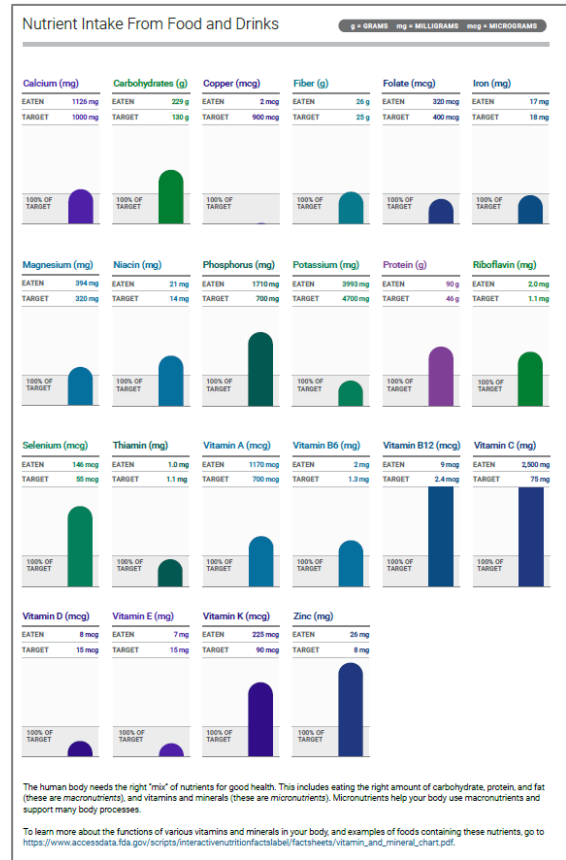
Section: Nutrients and Foods to Limit (2/2)

“It is organized the way it is supposed to be. I like it. It is very clear what it is trying to tell me.” –R2P1

“This seems easy. Oh I see that only for alcohol it says consumed and everywhere else it says eaten. But makes sense.”
–R2P5

Section: Nutrient Intake from Food and Drinks (1/2)

A few participants noted being overwhelmed seeing this section and were not sure where to focus. Some participants also stated that they did not know about some nutrients (e.g., copper) and sought more information to gain some background information about the nutrients. Participants noted that the link at the bottom of the page would be able to provide that information. Additionally, the lack of pattern among the colors was also remarked by a few participants.



ASA24 RNR Nutrients Intake from Food and Drinks section for Round 2 of testing.

Section: Nutrient Intake from Food and Drinks (2/2)

“I don’t know what micronutrients are. It says that my body needs them but I don’t know what they are. To me, all these look like things for my body.” –R2P1

“I like the colors. At first I was not sure what they indicate. Were they trying to tell me something. But I like the idea that it is different colors.” –R2P6

Section: Nutrient Intake from Food, Drinks, and Supplements (1/2)

Participants were late to recognize the difference in information in this section from the previous section. Participants also had difficulty identifying key information within the table. Most participants did not notice the shaded row quickly and often had to scroll up and down multiple times to understand the column headers.

Combined Nutrient Intake
From Food, Drinks, and Supplements

g = GRAMS mg = MILLIGRAMS mcg = MICROGRAMS

Individuals should aim to meet their nutrient needs through foods. In some cases, fortified foods and dietary supplements may be useful in providing one or more nutrients that otherwise may be consumed in less than recommended amounts. If you reported taking any dietary supplements, vitamins, and/or minerals, the table below shows the sum of nutrients from both sources.

Source: 2015-2020 Dietary Guidelines for Americans

NUTRIENT	INTAKE FROM FOOD	INTAKE FROM SUPPLEMENTS	TOTAL INTAKE	RECOMMENDED DIETARY ALLOWANCE*	UPPER INTAKE LEVEL**
Calcium (mg)	1,126 mg	380 mg	1,506 mg	1,000 mg	2,500 mg
Copper (mcg)	2 mcg	0.9 mcg	2.9 mcg	900 mcg	10,000 mcg
Folate (mcg)	320 mcg	400 mcg	720 mcg	400 mcg	1,000 mcg
Iron (mg)	17 mg	18 mg	35 mg	18 mg	45 mg
Magnesium (mg)	394 mg	0 mg	394 mg	320 mg	None
Niacin (mg)	21 mg	16 mg	37 mg	14 mg	None
Phosphorus (mg)	1,710 mg	0 mg	1,710 mg	700 mg	4,000 mg
Potassium (mg)	3,993 mg	0 mg	3,993 mg	4,700 mg	None
Riboflavin (mg)	2 mg	1.3 mg	3.3 mg	1.1 mg	None
Selenium (mcg)	146 mcg	27.5 mcg	173.5 mcg	55 mcg	400 mcg
Thiamin (mg)	1.0 mg	1.2 mg	2.2 mg	1.1 mg	None
Vitamin A (mcg)	1,170 mcg	210 mcg	1,380 mcg	700 mcg	3,000 mcg
Vitamin B6 (mg)	2.0 mg	1.7 mg	3.7 mg	1.3 mg	100 mg
Vitamin B12 (mcg)	9 mcg	6 mcg	15 mcg	2.4 mcg	None
Vitamin C (mg)	2,500 mg	75 mg	2,575 mg***	75 mg	2,000 mg
Vitamin D (mcg)	8 mcg	25 mcg	33 mcg	15 mcg	100 mcg
Vitamin E (mg)	7 mg	7.5 mg	14.5 mg	15 mg	1,000 mg
Vitamin K (mcg)	225 mcg	25 mcg	250 mcg	90 mcg	None
Zinc (mg)	26 mg	8 mg	34 mg	8 mg	40 mg

*The Recommended Dietary Allowances (RDAs) are recommended daily intakes of a nutrient for healthy people.

**The Tolerable Upper Intake Level (UL) is the highest level of nutrient intake that is likely to pose no harmful health effects for most people. If someone routinely consumes intakes above the UL, their risk of harmful effects increases.

***Routine consumption at this level could pose harmful health effects.

For more information about dietary supplements, visit <https://ods.od.nih.gov/HealthInformation/makingdecisions.sec.aspx>.

ASA24 RNR Nutrients Intake from Food, Drinks, and Supplements section for Round 2 of testing.

Section: Nutrient Intake from Food, Drinks, and Supplements (2/2)

“It is similar to what I just saw. Is it the same information?” – R2P1

“It tells you how much I got from my food and intake from supplemental vitamins. It adds those numbers. I was a little confused until I got to the bottom because I did not know what upper intake level meant. But it explains that at the bottom.”
–R2P2

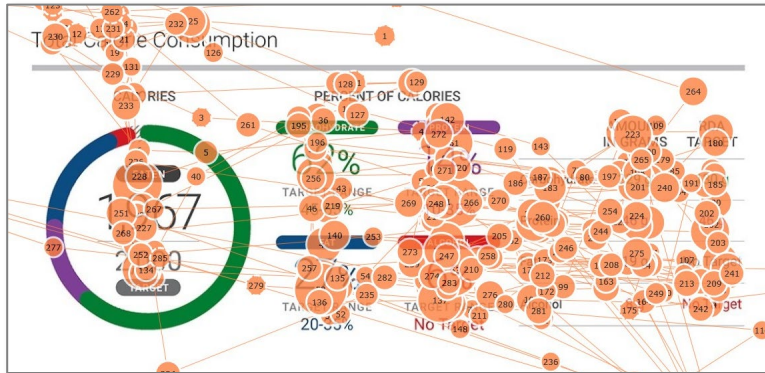
Eye-Tracking Findings

Heat maps aggregated for all participants in each round of data collection

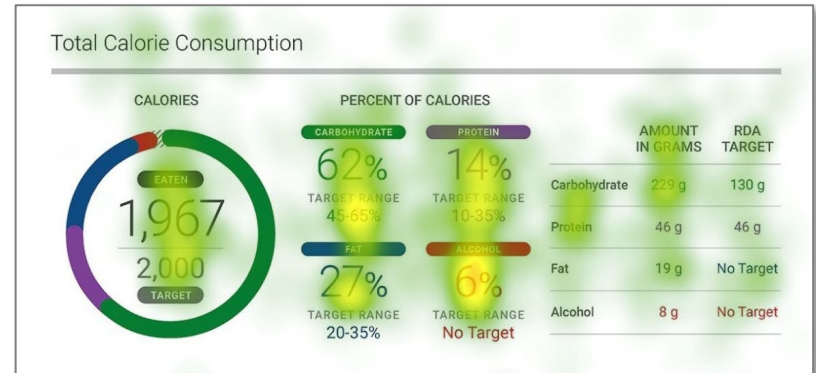
Eye Tracking Glossary (1/2)

- **Fixation:** When the eyes are relatively motionless and are focusing on an area of the page.
- **Fixation count:** The number of times the eyes paused in a defined area of interest.
- **Fixation duration:** Length of time the eyes paused.
- **Saccade:** The rapid movement of the eyes from one fixation to another.
- **Gaze plot:** Visual representation of fixations and saccades. Each circle represents a fixation and each line represents a saccade from one fixation to the next. Circles are numbered to represent the order of the fixations. The larger the circle, the longer the fixation duration. Gaze plots typically visualize one participant's eye movements.
- **Heat map:** Visual representation that compares the relative count of fixations on areas of the page. The red color represents areas of the page that were fixated on the most. The light green color represents areas of the page that were fixated on with lower frequency. Heat maps typically use aggregated data to visualize multiple participants' eye movements.

Eye Tracking Glossary (2/2)



Gaze plot visualization of one participant.



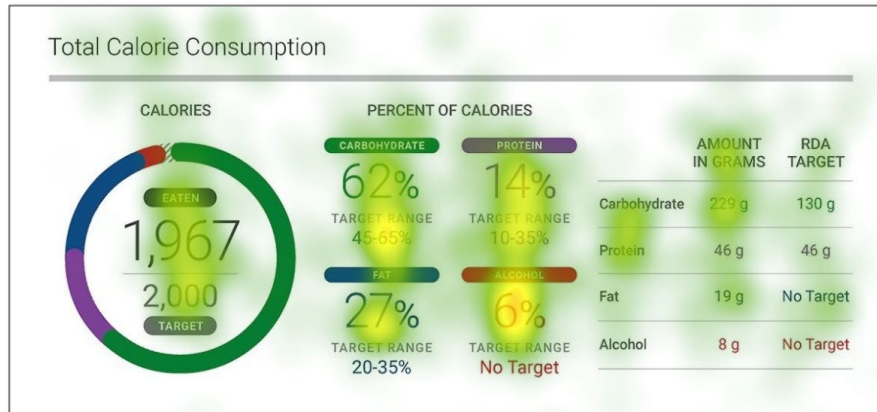
Heat map visualization aggregated from multiple participants.

Section: Total Calorie Consumption

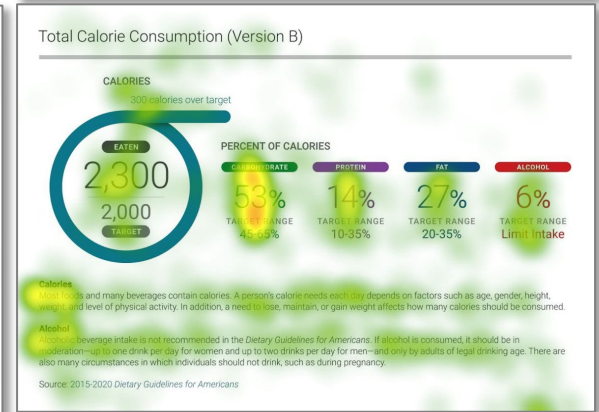
Key Findings

- Participants did not focus on the table in Round 1.
- In Round 2, participants read the explanatory text.
- In Round 2, version A garnered the most attention.

ROUND 1



ROUND 2



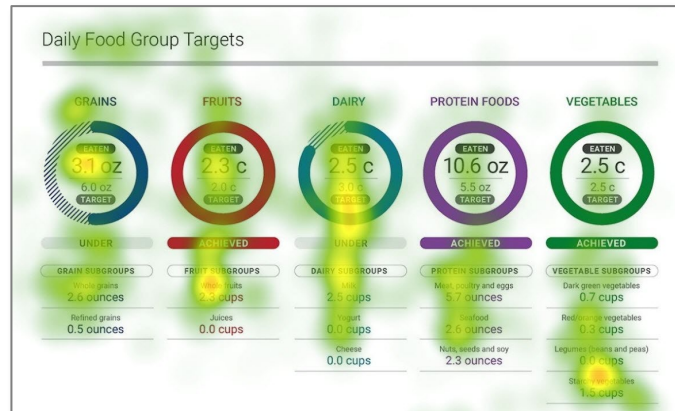
Section: Total Daily Food Group Targets

Key Findings

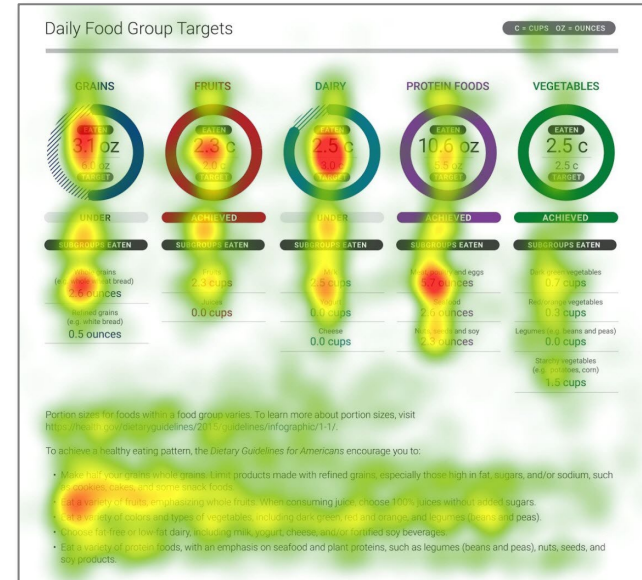
- Participants focused on the word 'whole' to describe fruits and 'starchy vegetables' in Round 1.

ROUND 1

- In Round 2, participants attended to the page evenly.



ROUND 2



Section: Nutrients and Foods to Limit

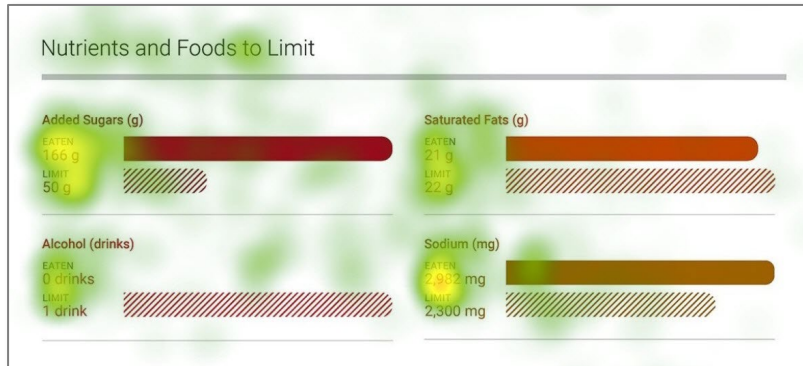
ROUND 2

Key Findings

- In Round 1, participants attended comparably between version A and B.
- In Round 2, participants focused most on the numbers in the visualizations.



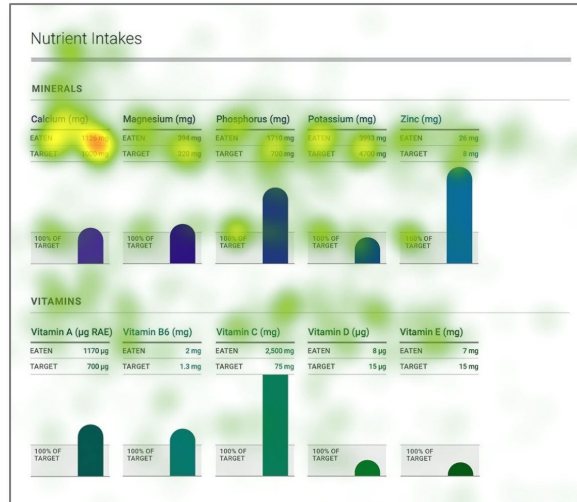
ROUND 1



Section: Nutrient Intakes (Round 1)

Key Findings

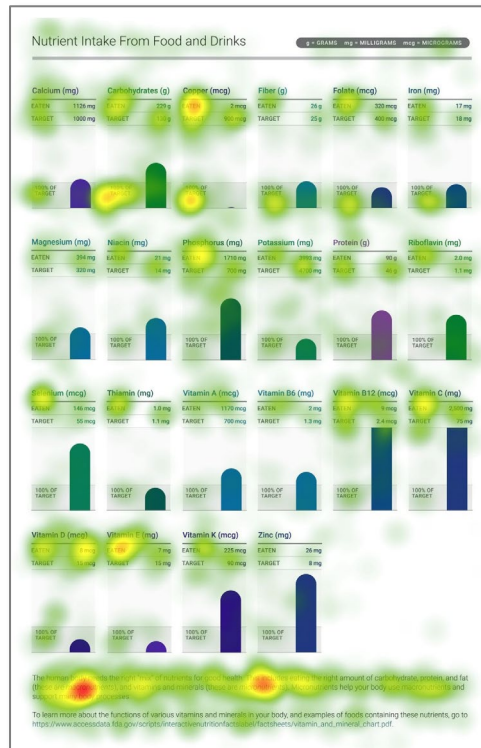
- Participants did not fixate on the extreme value in version A whereas in version B, the consumption of vitamin C was attended to.
- In version A, attention was mostly distributed to the first few nutrients.



Section: Nutrient Intakes (Round 2)

Key Findings

- In the visualization for Nutrient Intake from Food and Drinks, participants scanned all nutrients and attended to the accompanying text as well.
- In the visualization for Nutrient Intake from Food, Drinks, and Supplements, only focused on values at the top of the table.
- Participants did not focus on the highlighted row.





Recommendations

Recommendations after Round 2 (1/2)

Section	Change
Total Calorie Consumption	Design it as version A but add excess calorie extension to the ring from version B.
Daily Food Group Targets	Change units to lower case in legend.
Daily Food Group Targets	Change units in subgroup sections to abbreviations.
Nutrient Intake from Food and Drinks	Move information text above the table.
Nutrient Intake from Food and Drinks	Consider implementing a consistent color scheme for the graphs.

Recommendations after Round 2 (2/2)

Section	Change
Nutrient Intake from Food, Drinks, and Supplements	Consider emphasizing the highlighted row more prominently to draw attention.

Conclusions

Conclusions

- Overall, participants found the RNR to be a useful resource.
 - The changes made to the RNR following Round 1 were well received.
 - Addition of explanatory text in several locations within the RNR positively impacted the content comprehension and usability of the report.
 - The RNR works well for audiences that prefer to see information graphically *and* for audiences that prefer to reference numbers and text.

Appendix

Background Information

- The NCI's Analytics and Audience Research Branch in the Office of Communications and Public Liaison regularly conducts usability testing sessions. These sessions typically combine two to three projects into a single collective project to provide an opportunity for any NCI web portal manager, designer, or content manager to test existing or new work. Project team members observe these testing sessions.

Usability Testing Methodology

- These sessions consist of qualitative research. They aim to produce immediate, actionable insights that can be put to use when creating or updating a project by using a small number of participants.
- For the content usability portion of the interview, specific activities focus on observing the participants' behavior as they interact with the material being tested. Participants may complete specific or self-defined tasks, compare different versions, answer questions about the material, or answer questions about their preferences and context of use.

Contact

- For more information, contact Silvia Inéz Salazar (salazarsi@mail.nih.gov), Analytics and Audience Research Branch in the Office of Communications and Public Liaison.