

Did You Use Our App Diary? The Experience of FoodAPS Field Test

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Agenda

FoodAPS

FoodLogger

Compliance with request

- Taking pictures of food/drink items

- Taking pictures of receipts

Lessons learnt and future research

Disclaimer

- › The findings and conclusions in this presentation are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy.

Food Acquisition and Purchase Survey (FoodAPS)

- › Conducted for USDA's Economic Research Service
- › Collects food data important for policymakers and researchers
 - Food acquisition (both paid and free), expenditure, nutrition, food environments, food assistance
- › Collection of FoodAPS data is challenging
 - People may not remember what they got and for how much
 - People do not know the size/amount/quantity of food items
- › Food diary provided to people so that they can record foods obtained as they get them

Three Type of Diaries



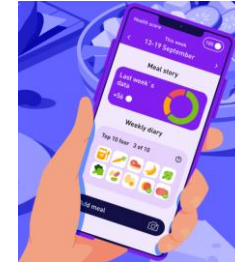
Paper Diary

(FoodAPS-1)



Web-based Diary

(FoodAPS-ADCM)



App Diary

**(FoodAPS
Field Test)**

	Paper Diary	Web Diary	App Diary
Coverage	Almost perfect coverage of general population	Incomplete coverage due to digital divide	Incomplete coverage due to digital divide and device ownership
Nonresponse	Burden of filling out paper diary	Additional nonresponse due to unfamiliarity with technology and equipment	Additional nonresponse due to unfamiliarity with technology/equipment, unwillingness to download and install app, and unwillingness to share/upload data
Measurement	Measurement error from free entry; minimal paradata available	Reduced error due to computerization; paradata available	Reduced error due to computerization and use of device features; rich paradata available
Post-survey Processing	Huge effort to scan and/or manually enter data, correct and clean data	No survey data entry is needed; minimal effort to correct and clean survey data	No survey data entry is needed; minimal effort to correct and clean survey data; additional data collected by app requires processing
Cost of creating diary	Inexpensive to develop and print paper diary	Expensive to develop and maintain web diary	More expensive to develop and maintain app diary
Cost of data extraction	Costly to extract data due to data scanning and manual data entry	Low cost to extract survey data from web diary	Low cost to extract survey data from app diary; extraction of additional data can increase cost



- Built-in functionality to reduce burden
 - Phone camera to take picture of food drink items
 - Phone camera to take picture of receipts
 - Phone camera to scan barcodes
 - File downloading and uploading
 - GPS to collection location data
 - Leveraging databases

FoodLogger Compliance

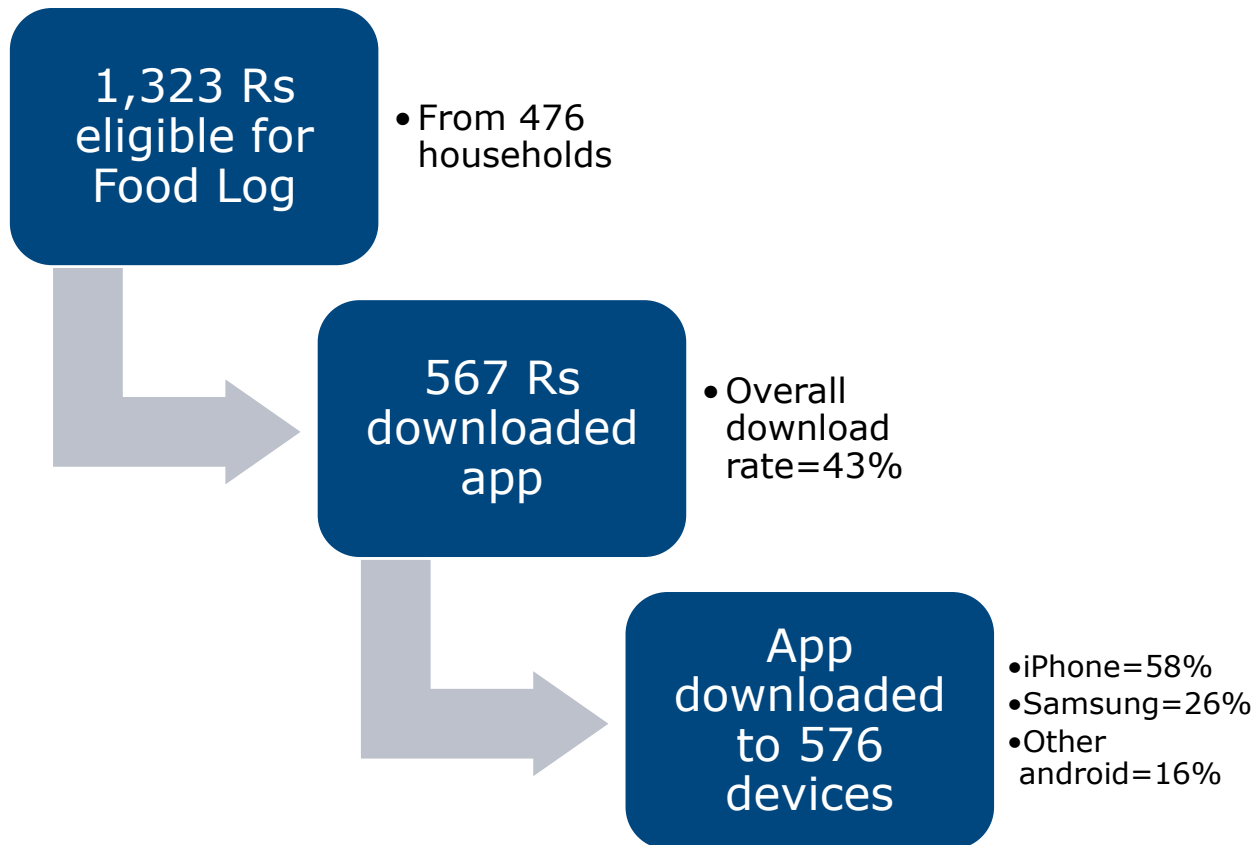


- Compliance is the key for the built-in functionality to reduce burden
 - Phone camera to take picture of food drink items
 - Phone camera to take picture of receipts

FoodAPS Field Test

- › Conducted from July to November 2022
- › Address-based sample from 12 PSUs
 - In-person recruitment
 - Once eligible, participants asked to enter foods and drink obtained for 7 days via
 - A native smartphone app diary (FoodLogger), or
 - A web diary
 - Interviewers trained household members on how to download and use app/web diary
 - At the end of food diary week, interviewers visited household, collected hard copy receipts, and uploaded them

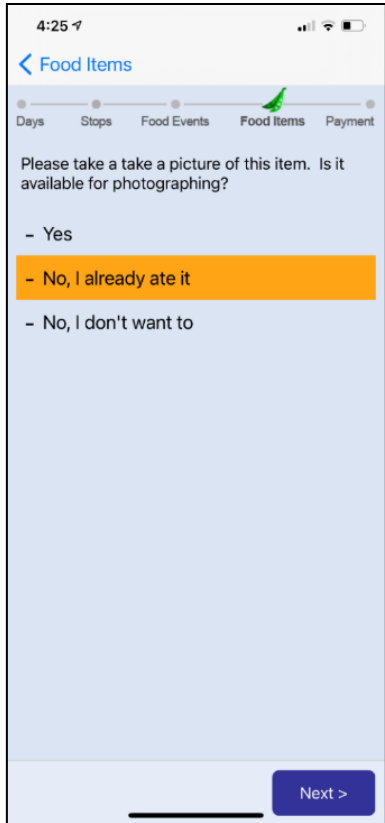
FoodAPS Field Test Recruitment



Taking picture of food/drink items

- › Information about food needs to contain details with enough granularity to calculate nutrition content. Can pictures of food be good enough for nutrition coding?
- › 1/3 of Food Away From Home (FAFH) items (n=1,167 items) randomly selected for picture taking

Taking picture of food/drink items: Compliance



› For 1,167 FAFH items selected for picture taking

- Picture taken: 129 (11%)
- Food eaten: 957 (82%)
- Don't want to: 81 (7%)

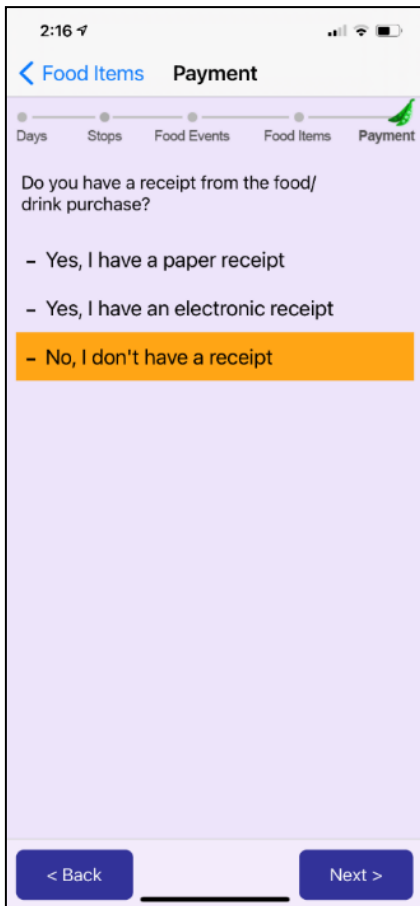
› Compliance rate

- 61% assuming food actually eaten
- 11% assuming 'food eaten' soft refusal

Taking picture of receipts for uploading

- › Participants were asked to save all receipts (both paper and electronic receipts) from purchases and to upload receipts during the 7-day food reporting
 - Paper receipts: take a photo and upload the photo
 - Electronic receipts: copy-and-paste, take a screen capture and upload the screen capture

Taking picture of receipts for uploading (2): Availability



The screenshot shows a mobile application interface. At the top, the time is 2:16. Below the time, there is a navigation bar with a back arrow and the text "Food Items Payment". A progress indicator below the navigation bar shows five steps: "Days", "Stops", "Food Events", "Food Items", and "Payment", with "Payment" being the current step. The main content area contains the question "Do you have a receipt from the food/drink purchase?" followed by three radio button options: "Yes, I have a paper receipt", "Yes, I have an electronic receipt", and "No, I don't have a receipt". The "No, I don't have a receipt" option is selected and highlighted with an orange background. At the bottom of the screen, there are two buttons: "< Back" and "Next >".

› For 2,048 food purchases

- Yes, a paper receipt: 1,359 (56%)
- Yes, an electronic receipt: 130 (5%)
- No, don't have a receipt: 913 (38%)

Taking picture of receipts for uploading (3): Compliance with picture taking



- Among 1,359 purchases with a paper receipt available
 - Picture of receipts taken and uploaded: 1,358 (100%)
- Among 130 purchases with an electronic receipt available
 - Screen captures of electronic receipts uploaded: 130 (100%)
- Compliance rate = 62% if “don’t have a receipt” soft refusal

Taking picture of receipts for uploading (4): Legibility

- › 781 receipts were selected for further inspection by two research assistants
 - **753 (96%) are legible**
 - 7 (1%) failed to download
 - 20 (3%) are not legible
 - 12 completely illegible
 - 4: one piece of information illegible
 - 6: two or more pieces of information illegible

Taking picture of receipts for uploading (5): Information Completeness

› 781 receipts were selected for further inspection by two research assistants

- **753 (96%) are legible**
- 7 (1%) failed to download
- 20 (3%) are not legible
 - 12 completely illegible
 - 4: one piece of information illegible
 - 6: two or more pieces of information illegible



› Among 753 legible receipts,

- **593 (79%) have complete information**
- 160 (21%) with incomplete information
 - 14 missing name of food place
 - 92 missing address, 28 partial address
 - 42 missing date
 - 57 missing food item information
 - 24 missing payment information

Taking picture of receipts for uploading (6): In-scope

› Among 753 legible receipts,

- **593 (79%) have complete information**



- 160 (21%) with incomplete information

- 14 missing name of food place

- 92 missing address, 28 partial address

- 42 missing date

- 57 missing food item information

- 24 missing payment information

› Among 593 receipts that are legible and have complete information,

- **553 (93%) occurred during Food Log week**

› Compliance with taking legible, in-scope receipts with complete information=71%

Taking picture of receipts for uploading (7): Underreporting

- › Among 593 receipts that are legible and have complete information,
 - 553 (93%) occurred during Food Log week
 - 390 (71%) were reported in Food Log
 - **163 (29%) were *not* reported** → Underreported events
 - FAFH:
 - 62 receipts; 211 food items; expenditure of \$1,030
 - FAH:
 - 101 receipts; 1,136 food items; expenditure of \$4,353

Summary on compliance

- › App download and installation rate: 43%
- Higher than studies (e.g., 16.5% reported in Jackle et al., 2019; 14.5% reported in Keusch et al., 2023)
- Presence of interviewers was instrumental

Summary on compliance (2)

- › Taking pictures
 - Of food items
 - 11% - 61% depending on whether 'food eaten' soft refusal or not
 - Of receipts
 - 62% to 100% depending on whether 'do not have a receipt' soft refusal
 - 72% for legible, in-scope receipts with complete information
- › Bosch et al. (2018) reported compliance rate of 41% for taking a picture at the moment and 49% for uploading a funny photo from camera gallery
- › Bosch et al. (2022) reported compliance rate of 75% for uploading image of vacation, 61% for image of favorite food, 64% for location, and 48% for image of self's emotions

Lessons Learnt and future research

- › Presence of interviewers helped compliance with app downloading
 - Motivation or technical difficulty
- › Timing and instructions were critical for compliance with taking pictures of food items
 - Prompting Rs for picture-taking when detected being at restaurants, cafeteria, etc
 - Privacy concerns
 - Google place type is not error free
- › Instructions and encouragement were critical for compliance with taking pictures and upload receipts
 - Instructions on saving the correct types of receipts
 - Incentivizing on saving receipts

Future research (2)

- › Targeted protocol for tech-savvy vs. not savvy, willing vs. unwilling respondents
 - E.g. interviewer addresses motivation for tech-savvy respondents, but helps with technical issues for non-savvy ones
- › Implementing adaptive design for data quality
 - E.g., detecting illegible receipts and asking retake

Thank You

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