

Analysis of the September 2020 Current Population Survey Food Security Supplement Split Panel Test

Alisha Coleman-Jensen and Matthew P. Rabbitt
USDA Economic Research Service

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Food Security Definitions

- **Food Security:** Access at all times to enough food for an active, healthy life for all household members.
- **Food Insecurity:** Unable, at some time during the year, to provide adequate food for one or more household members because of a lack of resources.
 - **Very Low Food Security:** Normal eating patterns of some household members were disrupted at times during the year and their food intake reduced because they could not afford enough food.



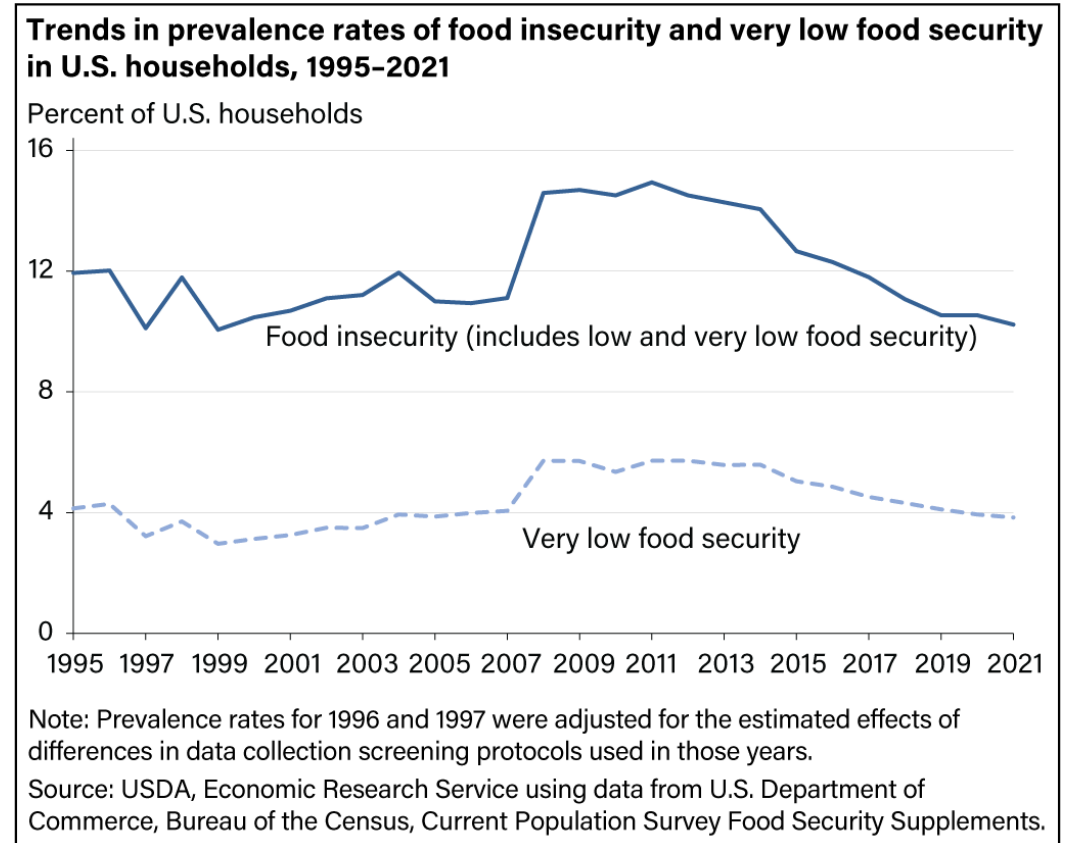
The importance of measuring and monitoring household food security

- USDA has been collecting data on household food security for more than 25 years
- Food security data used for multiple purposes:
 - Assess well-being including as objective in Healthy People
 - Research to assess effectiveness of policies and programs
 - Research to understand determinants and outcomes of food security
- Food security measurement modules used in many data collections



Current Population Survey-Food Security Supplement (CPS-FSS) Overview

- The CPS-FSS is sponsored by ERS and conducted by the Census Bureau
- The CPS-FSS is the source for annual Federal statistics on food insecurity in U.S. Households
 - The data are the basis for the annual USDA report Household Food Security in the United States
 - For all reports in the series, see: <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/history-background/#annual>



The importance of looking forward

- ERS has been making investments to ensure the high quality of the food security measure and data
 - Approaching 25 years of food security data collection was a time to take stock, look ahead and plan
- What instrument/survey issues need to be addressed and updated?
 - Worked with the U.S. Census Bureau to:
 - review the entire CPS-FSS instrument
 - consider revisions for all sections
 - conduct cognitive testing of revisions
 - implement split-panel test to assess impact of modifications to instrument



Cognitive testing

- Review of questionnaire and cognitive interviewing of modified survey items completed by Census Bureau in 2019
 - Kephart, Kathleen, Jonathan Katz, Matthew Virgile, Rodney Terry, and Jessica Holzberg, 2021, “Cognitive Testing Results for the Current Population Survey Food Security Supplement,” Working Paper Number Rsm2021-06, November 12, <https://www.census.gov/library/working-papers/2021/adrm/rsm2021-06.html>.
- Split-panel test of modified survey items in September 2020 CPS to assess performance of revised questionnaire.



CPS-FSS instrument updates: Food spending and food security

- Modifications to the CPS-FSS Test Instrument:
- **Food Spending: Updated to reflect changes in terminology, the retail environment, and technology.** For example, the new wording asks about online food purchases and purchases at farmers markets.
- **Food Security: The section was moved** earlier in the survey instrument. A few child items were modified to standardize the resource constraint to “there wasn’t enough money for food.” Also, the **lead-in to one of the screening variables (HES9) was changed** due to moving sections in the questionnaire.



CPS-FSS instrument updates:

Federal and community nutrition assistance

- Modifications to the CPS-FSS Test Instrument:
- Federal Nutrition Assistance: The section was moved after the food security section. The lead-in to the first question (HESP1) in the section changed due to moving the section. Questions on school meals were modified slightly to refer to “reduced-price” meals instead of “reduced-cost.” A new question was added on receipt of free or reduced-price afterschool meals and snacks.
- **Community Food and Nutrition Assistance: New questions ask about receipt of free groceries and free meals recommended by Feeding America**, based on their expertise in the charitable feeding sector and their own testing of the questions. The section no longer asks separate questions about free meals received by the elderly but includes those programs in the more general questions about receipt of free meals.



Data

- In a split panel test, a portion of the survey sample receives one questionnaire, and the other portion of the sample receives an alternate questionnaire.
- CPS months-in-sample groups 2, 3, 4, 6, 7, and 8 were eligible to be interviewed in the September 2020 split panel. Did not include CPS months-in-sample groups 1 and 5 (one-quarter of the total sample) because they would be eligible for interview in the regular December 2020 CPS-FSS data collection.
- In the September 2020 CPS 35,084 households were eligible for the split panel.
 - 17,588 households were assigned to the original (standard) instrument and 17,496 households were assigned to the test instrument
 - 13,160 completed interviews (74.8% response) for the standard instrument and 13,132 completed interviews (75.1% response) for the test instrument
- Each split panel is weighted separately to be representative of the U.S. population.



Results: Food Spending

- Most differences in usual food spending between the split panels are not statistically significant.
- The results suggest that the modified questions functioned at least as well as the standard instrument and show possible improvement, with slightly lower nonresponse.
- For both the Standard and Test Instruments total reported median weekly food spending was \$130
- For both the Standard and Test Instruments median usual food spending per person was about \$60
- For the Standard Instrument 6.8 percent of unweighted respondents did not answer the questions about food spending or reported zero usual spending. For the Test Instrument 6.3 percent of unweighted respondents had missing or zero food spending.



Results preview: Food security measurement

- Psychometric analyses using Conditional Maximum Likelihood (CML) Rasch measurement model:
 - All the food security items that comprise the adult and child food security scales captured similar levels of the severity of food hardship in the standard and test instruments, suggesting they would produce comparable measures of adult food security.
 - Given the current findings and past findings regarding the stability of the food security scale to similar minor modifications, we expect that the proposed updates to the CPS-FSS instrument will continue to produce comparable estimates to previous years.
- Modest differences in prevalence are not due to differences in how respondents interpreted the food security module.
 - Differences in the prevalence of food insecurity between the test instrument and standard instrument may be due, in part, to sampling error that has a greater impact on the smaller samples in the split panel and was potentially more problematic during the COVID-19 pandemic when response rates were lower. There may have been more sampling error during the pandemic that resulted in nonresponse bias. Evidence from Census Bureau analysis suggests that nonresponse during the pandemic was more strongly associated with income than in prior years of the CPS data collections (Rothbaum and Bee 2021).



Households by food security status and instrument version, September and December 2020

Panel A: All Households

	Food Secure	All food insecure	Low food security	Very low food security
Category	Percent			
September Standard Instrument	90.3	9.7*+	6.2	3.5*+
September Test Instrument	89.3	10.7	6.7	4.0
December 2020 (standard instrument)	89.5	10.5	6.6	3.9

Panel B: Households with Children

	Food secure	Food insecure	HH with food-insecure children	HH with very low food security among children
Category	Percent			
September Standard Instrument	87.2	12.8*+	6.2+	0.5
September Test Instrument	85.4	14.6	7.1	0.8
December 2020 (standard instrument)	85.2	14.8	7.6	0.8

* Difference between the September standard instrument and September test instrument is statistically significant with 90-percent confidence ($t > 1.645$).

+ Difference between the September standard instrument and December standard instrument is statistically significant with 90-percent confidence ($t > 1.645$).

¹ Totals exclude households for which food security status is unknown because household respondents did not give a valid response to any of the questions in the food security scale. For Panel A these exclusions representations 0.2 percent of all households for each sample.

² For households with children shown in Panel B these exclusions represent: September 2020 Standard Instrument 0.1 percent, September 2020 Test Instrument 0.3 percent, and December 2020 CPS-FSS 0.3 percent of all households with children.

Source: USDA, Economic Research Service using data from U.S. Census Bureau September 2020 and December 2020 Current Population Survey, Food Security Supplement.



Percent of households affirming items in the food security scale, Standard and Test Instrument, Sept. 2020

Scale item	Standard	Test	
Household items:			
Worried food would run out before (I/we) got money to buy more	14.0	14.7	
Food bought didn't last and (I/we) didn't have money to get more	10.9	11.6	
Couldn't afford to eat balanced meals	10.4	11.8	*
Adult items:			
Adult(s) cut size of meals or skipped meals	5.7	6.3	*
Respondent ate less than felt he/she should	5.7	6.5	*
Adult(s) cut size or skipped meals in 3 or more months	4.1	4.7	*
Respondent hungry but didn't eat because couldn't afford	3.0	3.2	
Respondent lost weight	2.0	2.2	
Adult(s) did not eat for whole day	1.1	1.1	
Adult(s) did not eat for whole day in 3 or more months	0.8	0.8	
Child items:			
Relied on few kinds of low-cost food to feed child(ren)	11.6	11.8	
Couldn't feed child(ren) balanced meals	6.6	7.4	
Child(ren) were not eating enough (Standard: ...we just couldn't afford enough food vs. Test: ...there wasn't enough money for food)	3.0	2.9	
Cut size of child(ren)'s meals	1.5	1.6	
Child(ren) were hungry (Standard: ...but you just couldn't afford more food vs. Test: ...there wasn't enough money for food)	0.6	1.0	
Child(ren) skipped meals	0.4	0.6	
Child(ren) skipped meals in 3 or more months	0.2	0.4	
Child(ren) did not eat for whole day	0.1	0.1	

* Difference between the September standard instrument and September test instrument is statistically significant with 90-percent confidence ($t > 1.645$).

Households not responding to an item are omitted from the calculations of percentages for that item. Household without children are omitted from the calculation of child-referenced items.

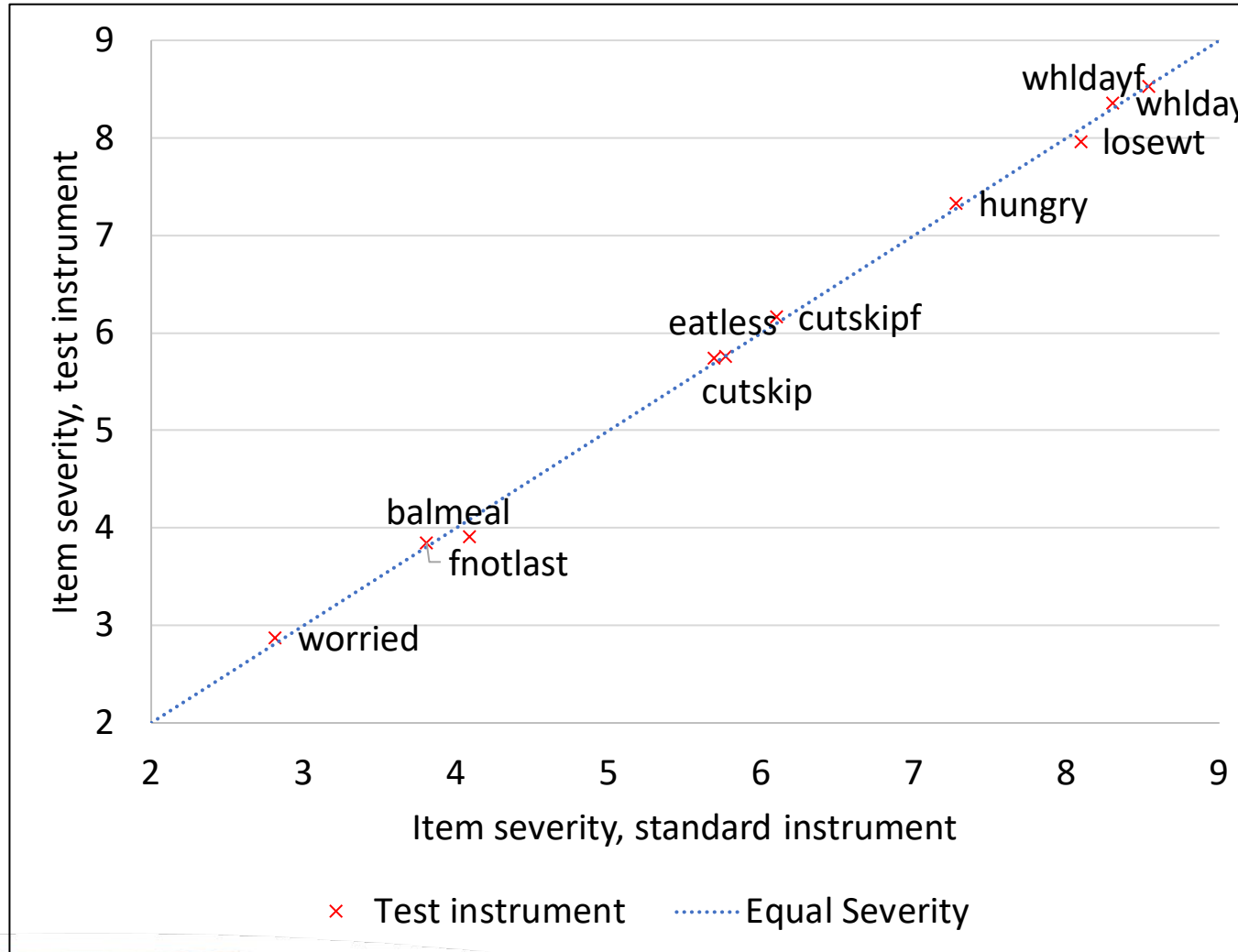
Source: USDA, Economic Research Service using data from U.S. Census Bureau September 2020 Current Population Survey Food Security Supplement.

Results: Food security items

- Examine items in food security module:
- Lower percentage of households in the September standard instrument affirmed the food security items when compared to households in the September test instrument, with statistically significant differences marked with an asterisk.
- Child items with changes in wording between the test and standard instrument were not statistically significantly different.
- Psychometric analyses using Conditional Maximum Likelihood (CML) Rasch measurement model:
- Rasch model severity parameters capture the relative severity (in terms of food hardship) for each food security question.
- Any differences in the estimates of these severity parameters for households administered the standard and test instruments may be indications of respondents perceiving the food security questions differently or reflect differences in the way they experience food hardships.



Figure 1. Comparisons of the adult food security scale question severity parameters, 2020 Sept. CPS-FSS test versus standard instrument

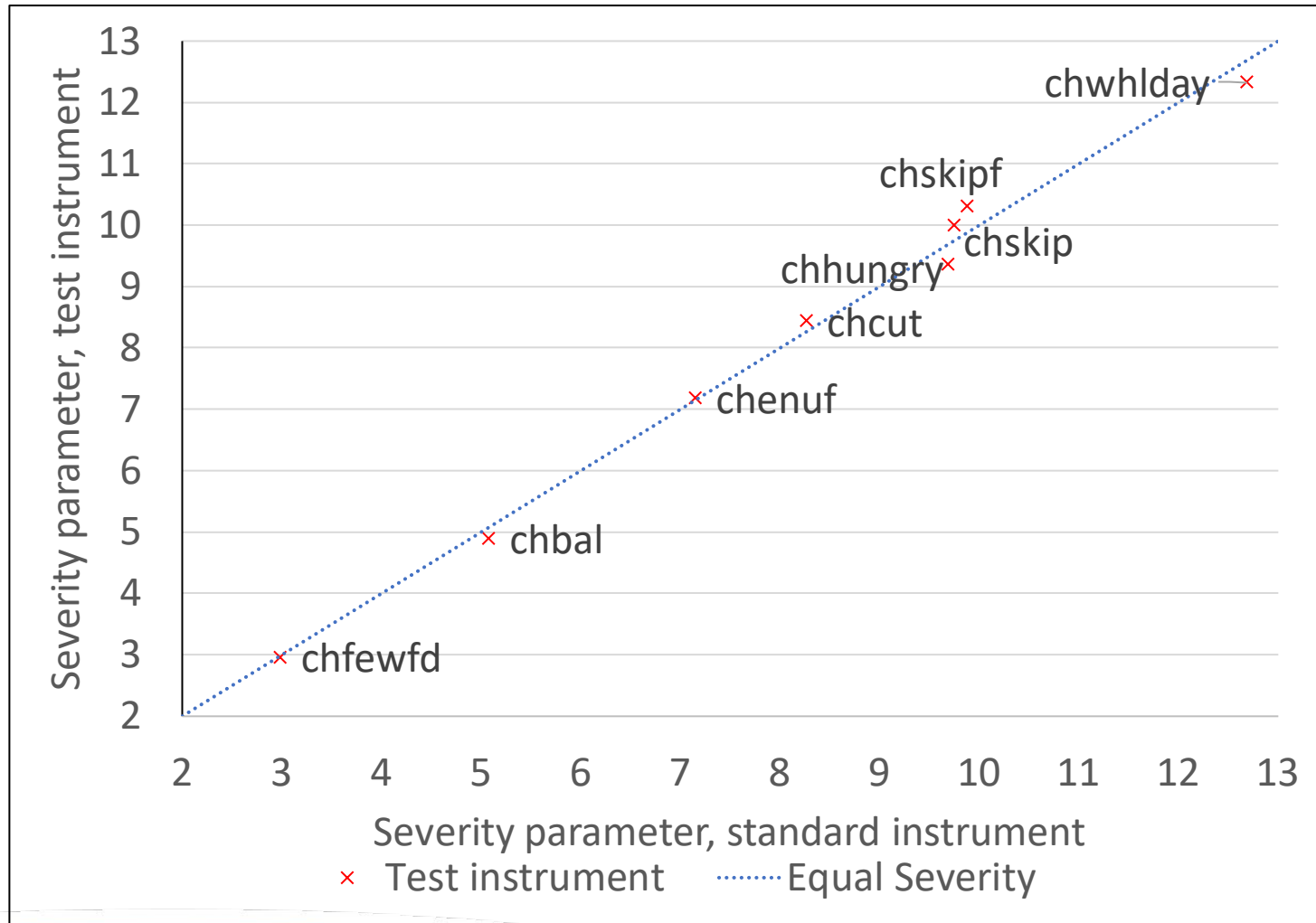


Note. Question severity parameters estimated from separate CML Rasch measurement models for households administered the standard and test instruments in the 2020 September CPS-FSS.

Source: USDA, Economic Research Service using data from U.S. Census Bureau September 2020 Current Population Survey Food Security Supplement.



Figure 1. Comparisons of the child food security scale question severity parameters, 2020 Sept. CPS-FSS test versus standard instrument



Note. Question severity parameters estimated from separate CML Rasch measurement models for households administered the standard and test instruments in the 2020 September CPS-FSS.

Source: USDA, Economic Research Service using data from U.S. Census Bureau September 2020 Current Population Survey Food Security Supplement.



Results: Community nutrition assistance

- There is no expectation that these items are comparable given the changes in wording.
- For both the question about free groceries and free meals in the test supplement, the reported receipt is higher than for the questions about food pantries and soup kitchens in the standard instrument.
 - This is consistent with our expectation for the test items.
 - The language for the test items is more inclusive in several ways, including asking if “anyone in your household” received assistance rather than just “adults,” referring to “free groceries” rather than only “emergency food,” asking about “home-delivered meals”, and by asking about any “other place that helps with free food/meals.”
- Based on expert review, cognitive testing, and the results of the test instrument the revised questions on community nutrition assistance appear to be an improvement and function well.



Use of community nutrition assistance¹, by standard and test instrument, September 2020

	Standard Instrument				Test Instrument			
	Food Pantries		Soup Kitchens		Free groceries		Free meals	
	1,000	Percent	1,000	Percent	1,000	Percent	1,000	Percent
All households²	7,584	5.9	597	0.5	8,888	6.9	2,705	2.1
Households by food security status³:								
Food secure	3,618	3.1	224	0.2	4,355	3.8	1,448	1.3
Food insecure	3,966	31.8	374	3.0	4,533	33.4	1,257	9.3
Low food security	2,174	27.3	206	2.6	2,598	30.5	579	6.8
Very low food security	1,793	39.9	167	3.7	1,934	38.4	678	13.5

¹ Questions about receipt of community nutrition assistance are not comparable between the standard and test instrument. Percentages between the two instruments are not tested for statistical significance, because the wording of the items changed enough that there is no expectation of comparability.

² Households with missing data are excluded. September 2020 Standard Instrument: 0.6 percent of all households had missing data on food pantries, and 0.6 percent of all households had missing data on soup kitchens. September 2020 Test Instrument: 0.8 percent of all households had missing data on free groceries, and 0.9 percent of all households had missing data on free meals.

³ Totals also exclude households for which food security status is unknown because household respondents did not give a valid response to any of the questions in the food security scale.

Source: USDA, Economic Research Service using data from U.S. Census Bureau September 2020 Current Population Survey, Food Security Supplement.



Conclusions

- The revised items functioned as well as the original items, and in some cases better.
- Received OMB approval for full implementation in the CPS-FSS in December 2022:
https://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=202201-0536-005
- We expect food security estimates to be comparable to be past years.
- Questions:
 - Alisha Coleman-Jensen alisha.coleman-jensen@usda.gov
 - Matthew Rabbitt matthew.rabbitt@usda.gov



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