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**ANALYSIS OF RESPONSE ERRORS IN  
THE DECEMBER 1988 AND DECEMBER  
1989 QUARTERLY AGRICULTURAL  
SURVEY DATA**

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**ANALYSIS OF RESPONSE ERRORS IN THE DECEMBER 1988 AND DECEMBER 1989 QUARTERLY AGRICULTURAL SURVEY DATA**, by Vic Tolomeo and Gretchen McClung. Research and Applications Division, National Agricultural Statistics Service, U.S. Department of Agriculture, Washington, D.C. 20250. February 1991. NASS Research Report No. SRB 91-03.

#### **ABSTRACT**

Four reinterview studies were conducted between December 1987 and December 1989 to measure response bias in Computer Assisted Telephone Interviewing (CATI) collected data. Experienced field enumerators conducted face to face reinterviews of a subsample of operations originally reporting on CATI, reconciled differences that occurred between the original and reinterview responses to determine a final value, and determined reasons for the differences. The assumption was that the final reconciled value represented a better measure of the true value for the subsampled operation. This paper presents results of the December 1988 and December 1989 reinterview studies. Results for December 1988 were comparable to those obtained from previous Agency reinterview studies indicating significant negative biases for on-farm grain stocks and hog inventory items. Significant negative biases were also estimated for hogs in December 1989, however, significant biases were not detected for grain stocks.

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## SUMMARY

Reinterview studies were conducted during the December 1988 and December 1989 Agricultural Surveys to estimate response bias for selected crop and hog inventory items. The states involved were Indiana, Iowa, Minnesota, Nebraska, Ohio, and Pennsylvania. A subsample of the Agricultural Survey operations originally contacted by Computer Assisted Telephone Interviewing (CATI) were recontacted for face to face reinterviews using supervisory and experienced field enumerators. This paper presents results of response bias estimates for grain stocks and hog inventory items.

In December 1988, multivariate tests were significant for grain stock items and the components of the total hog inventory, breeding and market classes. Univariate test results for corn stocks, soybean stocks, total hogs, breeding hogs, market hogs, and the over 180 lb. weight category were also significant, indicating negative biases or underreporting of these items. No significant biases were detected for wheat stocks or grain storage capacity. These results are comparable to those obtained in previous reinterview studies, where significant underreporting of corn stocks, soybean stocks, and hogs were also found [1,2,3].

Significant negative hog bias estimates in December 1989 were also similar to previous results. The multivariate test for grain stock items was significant, yet univariate test results were not significant.

Specific reasons for differences between the original and reinterview responses were analyzed and their contributions to the overall biases were computed. Reasons for differences were also classified into one of three categories: estimating, definitional, or other. The contribution of each category to the total bias was estimated. Definitional and other categories accounted for most of the estimated bias. Of the two, the definitional category seems to be the most manageable in terms of future efforts to eliminate response biases.

Analysis of the reasons for response errors should be used in enumerator training and to develop possible alternative questionnaire designs for testing. Feedback of reinterview results should be provided to the enumerators for the purpose of improving the interview process by reducing the incidence of response errors. Attention should focus on the causes of response errors as well as on the net bias estimates. Recommendations include additional research in developing more precise bias estimators and expanding the population coverage to include additional states and strata within states. The selection of additional CATI states should be based on their proportion of the national estimates for commodities of concern.

## INTRODUCTION

The National Agricultural Statistics Service (NASS) conducted reinterview projects during the December 1987, March 1988, December 1988, and December 1989 Agricultural Surveys (AS). Initially, three major agricultural states were selected in December 1987. Three different states were selected for the March 1988 project. The December 1988 and December 1989 studies combined both groups into six state studies. The strategy has been to repeat the project over time so that survey to survey comparisons of the biases can be made. This paper presents the results of the December 1988 and December 1989 studies related to on-farm grain stocks and hog bias estimates. The analysis consists of 1) bias estimates by commodity, 2) estimates by reason category, and 3) an evaluation of reasons associated with differences between the original and reinterview responses.

Earlier papers summarizing the December 1987 and March 1988 studies reported significant negative biases or underreporting of AS items. Negative biases on the order of 11 to 25 percent for on-farm grain stocks were reported as a result of the three-state December 1987 reinterview study [1]. Although smaller in magnitude, negative stocks biases were also detected in the three different states in the March 1988 study [2]. Analysis of the hog inventory numbers from December 1987 and March 1988 also indicated significant negative biases [3].

## REINTERVIEW PROCEDURES

A subsample of AS operations originally contacted by CATI were selected for face to face reinterviews. Supervisory or experienced field enumerators were used to 1) reinterview a subsample of the CATI AS sample within 10 days of the original interview, 2) reconcile differences between the original responses and the reinterview responses to determine a correct or 'true' value, and 3) determine, if possible, reasons for differences.

Bias estimates were computed under the assumption that the final reconciled value represented the true value or, at least, a better measure of the true value. This assumption is more likely to be valid if the reinterview respondents are not conditioned by the original responses and if the reinterview is an "improved" second trial [4]. We have attempted to validate this assumption by using 1) a separate corps of experienced and supervisory field enumerators and 2) different modes of data collection.

CATI was chosen for the studies because it accounts for a large percentage of the AS data collected and because CATI data are easily accessible for use in the computer generation of reconciliation forms containing the original responses. Reinterview assignments, containing a reinterview questionnaire and a corresponding reconciliation form, were mailed to the field enumerators each day after the CATI calls were completed. Copies of the reinterview questionnaire and reconciliation form for Nebraska can be found in Appendixes B and C.

After the reinterview questionnaire was completed, the enumerator opened an envelope containing the reconciliation form and compared the reinterview responses to the original CATI responses. When a difference occurred, a specific reconciliation procedure was used to resolve the difference and determine, if possible, a reason for the difference. Enumerators were instructed not to open the reconciliation form or review the original answers until after the reinterview questionnaire was completed.

Enumerators were also instructed to complete the reinterview and reconciliation within 10 days of the original CATI interview. The purpose of this was to minimize recall problems associated with the first of the month reference date for several questionnaire items. The time between the original CATI interview and the reinterview averaged about 6 days for both the December 1988 and December 1989 studies.

Questionnaires used in the reinterview were similar to the AS questionnaires with respect to question wording. However, not all questions asked in the original interview were re-asked in the reinterview. As in the operational survey, the enumerators were instructed to contact the most knowledgeable person regarding the subsampled operation. No attempt was made to recontact the same individual originally interviewed by CATI.

For December 1988 and December 1989, several changes were made to the methods used in the previous studies. These changes involved training, the generation of reconciliation forms, and coding of reasons for differences between the original and reinterview responses.

Prior to December 1988, reinterview training workshops were conducted in each state by headquarters staff. In December 1988 and December 1989, each reinterview state sent one survey statistician and two supervisory enumerators to a one and one-half day regional workshop. These regional workshop participants returned to the states to supervise their state workshops.

Beginning in December 1988, reconciliation forms were generated in the state offices rather than in headquarters as was previously done. Also, the manual and machine editing of the forms and coding of the written explanations for differences were done in the state offices by the survey statisticians rather than in headquarters.

#### **MEASURE OF BIAS**

Response bias and variance estimates were based on a stratified sample design. Estimates and tests of significance were computed for the Survey Processing System (SPS) edited CATI data.

For the  $i^{\text{th}}$  observation in stratum  $h$ , response bias was measured as

$$B_{hi} = O_{hi} - F_{hi} \quad \text{stratum } h = 1, \dots, L \text{ and unit } i = 1, \dots, n_h$$

where  $O_{hi}$  = SPS edited CATI response  
 $F_{hi}$  = final or reconciled value

A negative bias indicates underreporting of the survey item. Both univariate and multivariate test procedures ( $H_0$ : bias = 0) were used in the analysis.

### THE SAMPLE

The reinterview subsample was drawn from the list portion of each state's AS sample completed on CATI. Completed samples units eligible for reinterview included completed interviews, out-of-business reports, and interviews with specific item refusals or item don't knows. CATI interview refusals were not eligible for reinterview. Reinterview sample sizes and response rates by state and survey period are shown in Table 1. Also shown are the AS list sample sizes and the number of sample units completed by CATI.

Table 1. Sample sizes and response rates for December 1988 and 1989 reinterview surveys.

	December 1988				CATI Completes	Total AS list sample
	Completed	Refusal	Inacc.	n		
Indiana	82%	4%	14%	162	676	2,737
Iowa	94%	3%	3%	256	793	3,025
Minnesota	95%	2%	3%	180	1,235	2,971
Nebraska	86%	6%	8%	200	1,165	2,910
Ohio	93%	3%	4%	188	1,456	2,354
Penn.	87%	7%	6%	71	571	1,453
Total	90%	4%	6%	1,057	5,896	15,450

	December 1989				CATI Completes	Total AS list sample
	Completed	Refusal	Inacc.	n		
Indiana	87%	4%	9%	160	462	2,721
Iowa	89%	4%	7%	244	1,048	3,050
Minnesota	95%	2%	3%	197	1,058	2,949
Nebraska	86%	6%	8%	204	1,261	2,917
Ohio	83%	7%	10%	187	1,483	2,362
Penn.	88%	1%	11%	83	739	1,365
Total	88%	4%	8%	1,075	6,051	15,364

As shown in Table 2a, the six study states accounted for approximately 55 percent of the national total hog estimate and 60 percent of the national on-farm corn stocks estimate in December 1988 and December 1989. However, list strata not placed on CATI and area nonoverlap tracts were not eligible for reinterview. Therefore, the CATI reinterview subsample represents a restricted portion of each state's population of farm operations.

The proportion of each state's operational list expansion for total hogs and corn stocks represented by the CATI list strata and eligible for reinterview is shown in Table 2b. These proportions provide a more accurate description of the reinterview population coverage. Although a year to year comparison at the six-state level shows that the percentage attributed to CATI is approximately the same, state variations are evident in Indiana for both total hogs and corn stocks and in Iowa for total hogs. Several strata were excluded from the Indiana CATI sample in December 1989 whereas additional strata were included in Iowa.

Table 2a. State percent of the Board U.S. estimates for total hogs and on-farm corn stocks.

	% Total Hogs		% Corn Stocks	
	Dec. 1988	Dec. 1989	Dec. 1988	Dec. 1989
Indiana	7.8	8.1	7.2	8.5
Iowa	25.2	25.1	20.8	20.6
Minnesota	8.5	8.3	14.3	12.8
Nebraska	7.5	7.8	16.1	12.3
Ohio	4.0	3.9	4.4	4.3
Pennsylvania	1.8	1.8	1.2	1.8
Total	54.7	54.9	64.1	60.3

Table 2b. Proportion of operational AS list expansion represented in the reinterview project by state for total hogs and corn stocks. <sup>1/</sup>

	% AS List Represented in Reinterview			
	Total Hogs		Corn Stocks	
	Dec. 1988	Dec. 1989	Dec. 1988	Dec. 1989
Indiana	77.8	37.2	95.6	81.3
Iowa	29.1	44.2	51.2	49.3
Minnesota	38.9	32.6	76.1	77.6
Nebraska	50.8	47.7	93.6	87.5
Ohio	97.7	94.9	98.1	97.8
Pennsylvania	90.2	87.7	96.6	97.0
Total	48.1	45.9	76.3	72.0

<sup>1/</sup> (Reinterview strata Direct Exp. ÷ Total List Direct Exp.) x 100

## RESULTS

### Response Bias

Tables 3a-3c present the reinterview bias estimates for selected items for all states combined. Multivariate and univariate test ( $H_0$ : Bias=0) results are shown for the two studies. Levels of significance (p-values) are indicated in parentheses.

In December 1988, multivariate tests for grain stock items and the components of the total hog inventory, breeding and market classes, were significant (p-values < .05). Univariate test results for corn stocks, soybean stocks, total hogs, breeding hogs, market hogs, and the over 180 lb. weight category were also significant, indicating negative biases or underreporting of these items. No significant biases were detected for wheat stocks or storage capacity. These results are comparable to those obtained in the December 1987 and March 1988 reinterview studies, where significant underreporting of corn stocks, soybean stocks, and hogs were also found.

Significant negative hog bias estimates in December 1989 were similar to previous results. The results for the grain stock items, however, were very different at the six state level. The multivariate test for the four grain stock items was significant, indicating that some variable or combination of variables was different from zero, yet univariate test results were not significant at  $\alpha = .05$ . However, a breakdown of the six states into the original December 1987 and March 1988 three state groups resulted in a significant corn stocks bias estimate (-11%) for the March 1988 group composed of Iowa, Nebraska, and Pennsylvania.

Table 3a. Bias estimates for on-farm stocks and grain storage capacity for the December 1988 and December 1989 reinterview studies.

	December 1988		December 1989	
	Bias 1000 bu.	% of SPS Edited CATI	Bias 1000 bu.	% of SPS Edited CATI
Corn Stocks	-245,369	-13.6 (<.01)	-89,572	-5.3 (.08)
Soybean Stocks	-36,890	-20.1 (<.01)	8,752	3.3 (.36)
Wheat Stocks	-3,869	-6.3 (.23)	-5,917	-6.8 (.25)
Capacity	-158,437	-3.8 (.09)	343,297	7.8 (.12)
Multivariate		(<.01)		(.04)

Table 3b. Bias estimates for breeding, market, and total hogs by survey.

	December 1988		December 1989	
	Bias Number	% of SPS Edited CATI	Bias Number	% of SPS Edited CATI
Breeding	-144,118	-7.8 (<.01)	-98,968	-6.4 (.02)
Market	-1,139,423	-9.1 (.05)	-733,315	-6.8 (.04)
Total <sup>1/</sup>	-1,281,950	-8.9 (.03)	-854,415	-6.9 (.02)
Multivariate		(<.01)		(.05)

<sup>1/</sup> Not the sum of breeding and market due to item refusals or item missings.

Table 3c. December 1988 and December 1989 bias estimates for market weight categories for hogs.

Weight	December 1988		December 1989	
	Bias Number	% of SPS Edited CATI	Bias Number	% of SPS Edited CATI
0 - 60 lbs.	-237,538	-5.6 (.20)	-198,220	-5.6 (.21)
61 - 119 lbs.	-99,439	-3.0 (.59)	30,185	.9 (.87)
120 - 179 lbs.	-198,132	-7.4 (.72)	-240,002	-11.0 (.09)
over 180 lbs.	-559,737	-25.3 (.01)	-241,983	-13.2 (.02)
Multivariate		(.10)		(.06)

The coefficients of variation (CV) of the percent bias estimates and the associated confidence interval estimates are shown in Tables 4a-4c. The large CV's and estimated confidence intervals indicate that although we are able to conclude that biases exist, the precision of the bias estimates are very low.

Table 4a. Precision of total hog bias estimates by survey.

Survey	Estimated Percent bias	Std. error	CV (%)	95% CI
December 1988	-8.9	4.24	47.4	(-17.3, -.6)
December 1989	-6.9	3.03	43.8	(-12.8, -1.0)

Table 4b. Precision of corn stocks bias estimates by survey.

Survey	Estimated Percent bias	Std. error	CV (%)	95% CI
December 1988	-13.6	3.11	22.8	(-19.7, -7.5)
December 1989	-5.3	3.06	58.2	(-11.3, .7)

Table 4c. Precision of soybean stocks bias estimates by survey.

Survey	Estimated Percent bias	Std. error	CV (%)	95% CI
December 1988	-20.1	7.22	35.9	(-34.3, -6.0)
December 1989	3.3	3.59	107.8	(-3.7, 10.4)

### Reason Categories

Reasons for differences between the original CATI and reinterview responses were provided by the reinterview respondents and recorded on the reconciliation forms by the enumerators. These written explanations were later coded by the state survey statisticians for summarization.

Specific reasons have been grouped into 3 categories. The first category, 'Estimating' or rounding reasons, included cases where the respondent said they were just estimating the answer or they used their records for one of the two interviews. The second category is 'Definitional' reasons. Definitional reasons are associated with problems of interpreting exactly what should or should not be included for the particular sampled unit. Some examples are failing to report for rented land, not reporting as of the first of the month, and confusion about whether or not the operation is actually in business by our (NASS) definition. The final category, 'Other' reasons, includes reasons that could not be attributed to either the definitional or estimating categories. This category dealt with problems or difficulties related to telephone interviewing in general or instances where the respondent was unable to provide an explanation.

The percent bias by reason category and the frequency of response errors are shown in Tables 5a and 5b, for on-farm corn stocks and total hogs. In general, the data suggest that estimating reasons occur most frequently yet contribute the smallest proportion of the bias. Positive and negative errors seem to offset each other in this category. The definitional and "other" categories of bias are the major contributors to the total bias, but definitional errors seem to occur more often.

Table 5a. Percent of total bias by reason categories and frequency (in parentheses) of response errors for on-farm corn stocks.

Survey	Reason Category			Total
	Estimating	Definitional	Other	
December 1988	4% (141)	43% (113)	53% (70)	100% (324)
December 1989	8% (120)	6% (94)	86% (77)	100% (291)

Table 5b. Percent of total bias by reason categories and frequency (in parentheses) of response errors for total hogs.

Survey	Reason Category			Total
	Estimating	Definitional	Other	
December 1988	2% (74)	55% (70)	43% (56)	100% (200)
December 1989	20% (65)	29% (70)	51% (57)	100% (192)

Unlike previous reinterview results, the estimated biases for corn and soybean stocks were not statistically significant in December 1989. Table 6 shows the average negative, positive, and overall soybean stocks bias for each reason category for December 1988 and December 1989. It can be seen that the total number of errors in 1989 was less than in 1988 (150 versus 167), yet the number of positive errors increased from 59 in 1988 to 77 in 1989. The largest increase in the frequency of positive errors is found in the definitional category.

As shown in Table 6, both the number and magnitude of definitional positive errors increased in December 1989 compared to the previous year. In 1988 the number of negative definitional errors was about twice the positive number, whereas in 1989 this relationship was reversed. Also, in 1989 the average positive definitional bias was more than twice as large as the average negative definitional bias. In 1988 the two were approximately equal. This indicates that there was more overreporting of stocks particularly in the definitional category in December 1989 as positive errors tended to offset the negative errors. The number of response errors was relatively unchanged, but the mix and magnitude of the errors, positive or negative, changed from 1988 to 1989. Similar results were found for corn stocks.

Table 6. Unexpanded average bias by reason category and direction of bias for soybean stocks for the December 1988 and 1989 reinterview studies.

Reason category	December 1988			December 1989		
	Average Neg bias	Average Pos bias	Average Net bias	Average Neg bias	Average Pos bias	Average Net bias
Estimating	-705 n=32	1,146 n=22	49 n=54	-889 n=27	558 n=25	-193 n=52
Definitional	-2,391 n=44	2,039 n=20	-1,007 n=64	-2,449 n=20	5,010 n=37	2,393 n=57
Other	-4,339 n=32	3,855 n=17	-1,496 n=49	-3,111 n=26	2,352 n=15	-1,113 n=41
Total	-2,469 n=108	2,229 n=59	-809 n=167	-2,108 n=73	3,047 n=77	538 n=150

### Reasons for the Differences

Appendix A, Tables 1a and 1b, shows specific reasons by category, their frequency of occurrence, and the average absolute difference for corn and soybean stocks for December 1988 and 1989 combined. A similar analysis is presented for total hogs in Table 1c summarizing the combined results for December 1987, March 1988, December 1988 and December 1989. As mentioned earlier, enumerators were instructed to reconcile and determine reasons for any differences between the original CATI and the reinterview responses. These tables summarize the differences and the reasons or explanations for the differences.

These studies have shown that the definitional and other categories account for most of the estimated bias. Although occurring frequently, the net effect of estimating type differences appears to be small. Of the two major bias categories, the definitional type problems seem to be the more manageable in terms of future efforts to reduce the bias.

Appendix A, Table 1a, highlights two reasons which occurred frequently and resulted in relatively large average differences between the original and reinterview responses for corn stocks. "Didn't report someone else's grain on acres operated" accounted for 31 percent of the total negative definitional bias in December 1988 and 48 percent in December 1989. "Included grain or capacity on another operation or off-farm" accounted for 53 percent of the total positive definitional bias in December 1988 and 49 percent in December 1989.

A similar problem in the definitional category is evident in Table 1c for total hogs. One particular reason, "Didn't include another's hogs on the operation" accounted for 38 percent of the total negative

definitional bias in December 1988 and 44 percent in December 1989.

Conceptually, these reasons are similar since both relate to the difficulty of associating physical objects (corn stocks or hogs) with a uniquely defined land operating arrangement or farm.

In the "other" category, isolating one or two particular reasons as major bias contributors is more difficult. Many of the problems associated with this category are inherent to telephone interviewing or surveys in general. But one reason, "respondent just didn't know", occurred frequently and was often related to instances where a person, other than the operator, was contacted on either the original interview or the reinterview.

### **Bias and the Effect of the Respondent**

A respondent combination was generated for each reinterview sample unit based on the original CATI and reinterview respondents. Respondent combinations were grouped into three categories. The first category, 'operator-operator', included all the interview-reinterview combinations in which an operator responded both times. An operator is defined as any partner, hired manager, or individual operator of the sampled operating unit. This category can be used to measure the response bias resulting from interviewing the operator. The second category, 'other-operator', includes all cases where an operator was the reinterview respondent but not the original respondent. This category measures the bias associated with reporting by individuals other than the operator. The last category is 'other combinations', which contains all remaining respondent combinations. This category is difficult to interpret since it contains several effects which are not easily separated.

In the operational survey, interviewers are instructed to contact the operator whenever possible because the operator is assumed to be the most knowledgeable person about the operation. Similarly, the reinterview interviewers were also instructed to interview the operator, if possible, regardless of who the original respondent was. A large proportion of the original CATI interviews and the reinterviews involved the operator. For the two project periods, approximately 90 percent of the original CATI respondents were the operator. A similar proportion of the reinterview respondents were also the operator.

Table 7 shows the relationship between respondent combination and the magnitude of the bias. Biases of greater magnitude were associated with the other-operator and other combinations of respondents compared to the operator-operator combination. However, few biases were observed in the other-operator and other categories. Although a high proportion of the original CATI respondents are the operator, the data indicate that a change in the mix of respondents could have a strong influence on the level of the biases.

Table 7. Frequency table of relative bias by respondent combination for corn stocks.<sup>1/</sup>

**December 1988:**

Relative bias <sup>2/</sup> absolute value	Respondent Combination		
	Operator-operator	Other-operator	Other comb.
Less than 10%	91 (33%)	9 (28%)	0 (0%)
>10%, <=20%	38 (14%)	4 (13%)	1 (6%)
Greater than 20%	147 (53%)	19 (59%)	15 (94%)
Total	276 (100%)	32 (100%)	16 (100%)

**December 1989:**

Relative bias <sup>2/</sup> absolute value	Respondent Combination		
	Operator-operator	Other-operator	Other comb.
Less than 10%	89 (35%)	1 (7%)	0 (0%)
>10%, <=20%	47 (18%)	0 (0%)	4 (19%)
Greater than 20%	119 (47%)	14 (93%)	17 (81%)
Total	255 (100%)	15 (100%)	21 (100%)

1/ Includes only observations with a bias.

2/ Relative bias =  $100 * \frac{(\text{SPS edited CATI} - \text{reconciled value})}{\text{reconciled value}}$ .

**Bias by Size of Operation**

The bias in corn stocks was calculated based on size of operation. Table 8 shows the results using total cropland acres for the size classification variable. Total expanded corn bias and the average reported bias for each size category are presented. As shown, the average amount of corn stocks underreported increases as the size of the operation increases. This is particularly evident in the December 1988 project.

Table 8. Corn stocks bias estimates by size of operation based on cropland acres for December 1988 and December 1989.

**December 1988:**

Cropland acres classification	Frequency (n)	Corn stocks bias (expanded) (1000 bu)	Average bias (unexpanded)
0-99	40	-26,851	-1,819
100-249	86	-27,814	-2,108
250-499	90	-68,503	-3,801
500-999	76	-71,487	-5,085
1000+	29	-45,825	-5,125
missing	3	-4,886	1/
Total	324	-245,369	-3,598

**December 1989**

Cropland acres classification	Frequency (n)	Corn stocks bias (expanded) (1000 bu)	Average bias (unexpanded)
0-99	38	-4,523	-653
100-249	63	-716	439
250-499	89	-36,995	-1,942
500-999	68	-4,382	-1,052
1000+	32	-43,344	-2,448
missing	1	388	1/
Total	291	-89,572	-1,091

1/ Average bias was not computed for operations where the final or "true" value for cropland acres was missing.

**Proportion of Original and Reinterview Correct Responses**

Table 9 shows the proportions of the original and reinterview responses which were correct when differences were detected for corn stocks. The reinterview response was determined to be the correct or final response in 69 and 63 percent of the reinterviews, compared to 20 and 19 percent for the CATI response for the two survey periods. The proportion of differences resulting in a third or compromise value was about 3 percent for both periods. The remaining categories included instances where the respondent indicated that both responses were estimates and equally likely to be correct or where a final value was not reconciled.

Table 9. Frequency table of reinterview differences by correct response for corn stocks.

December 1988:

Difference	CATI	Correct response			
		reinterview	third ans.	either	missing
CATI < Reinterview	30	184	7	11	3
CATI > Reinterview	49	89	5	16	1
Total	79 (20.0%)	273 (69.1%)	12 (3.1%)	27 (6.8%)	4 (1.0%)

December 1989:

Difference	CATI	Correct response			
		reinterview	third ans.	either	missing
CATI < Reinterview	28	147	7	22	4
CATI > Reinterview	43	88	5	25	2
Total	71 (19.1%)	235 (63.4%)	12 (3.2%)	47 (12.7%)	6 (1.6%)

#### DISCUSSION AND RECOMMENDATIONS

The purpose of the reinterview studies was to estimate biases due to response error and to identify reasons for their occurrence. The goal was to measure the impact of response errors and determine possible alternative procedures or questionnaire designs to reduce them. It was proposed that information derived from these studies could be used to adjust the operational survey indications, suggest improvements in the operational survey methods, and monitor survey quality over time. The projects were motivated by 1) a desire to measure or evaluate the quality of data collected and 2) the knowledge that underreporting exists for some of our agricultural commodities where check data are available. A specific example is on-farm grain stocks where a significant underreporting has been observed for a number of years.

Summarization of reasons for differences identified specific reasons which occurred frequently and accounted for relatively large average differences between the original and reinterview responses for both corn stocks and total hogs. Analysis of the reasons for differences has shown that definitional problems account for a major portion of the response bias and may result in both positive and negative biases.

"Didn't report someone else's grain on acres operated" accounted for 31 percent of the total negative corn stocks definitional bias in December 1988 and 48 percent in December 1989. "Included grain or capacity on another operation or off-farm" accounted for 53 percent of the total positive definitional bias in December 1988 and 49 percent in December 1989. A similar type of reason, "Didn't include another's hogs on the

operation", accounted for 38 and 44 percent of the total negative definitional hog bias in December 1988 and December 1989, respectively. For both hogs and stocks the difficulty is to correctly associate the survey items with a uniquely defined land operating arrangement.

A comparison of the 1989 and 1988 estimated stocks biases by reason category shows that, although significant biases at the six state level were not detected, the frequency of errors was about the same. In December 1989 more overreporting of stocks was observed which tended to offset the underreporting. One possible explanation is that the published results of previous reinterview studies may have resulted in a learning or conditioning effect on the telephone enumerators. Knowledge of past underreporting of stocks may be conditioning enumerators to "find" stocks which by our definition should not have been associated with the sampled operation.

The reinterview samples were initially designed to test whether or not response biases exist. The large estimated confidence intervals and CV's indicate that the precision of the percent bias estimates may be too low for direct adjustment of the operational survey indications. The large CV's are in part the result of the small sample sizes but they are also due to the highly skewed nature of the bias data. On average, response errors for corn stocks were observed in about 32 percent of the reinterview subsamples for the two survey periods, December 1988 and December 1989. The corresponding percentages for soybean stocks and total hogs were 17 and 21 percent, respectively. As a result, the bias data consist mostly of zeros with relatively few large values.

The restricted reinterview coverage of the population of farm operations and the focus on CATI collected data also limits direct application of these results to the operational survey. Future studies that include subsamples from both the area NOL and entire list frames will provide more complete information with respect to the overall bias levels.

Based on these results and the results of previous reinterview studies the following are recommended:

- 1) Analysis of the reasons for response errors should be used by the Agency to develop alternative questionnaire designs or question wording for testing.
- 2) The reinterview sample should be augmented to include more states and strata to improve population coverage and precision of the estimates. The projected increase in the number of CATI states would provide the additional states for study. New states should be selected based on their proportion of the national estimate for large bias items.
- 3) Include in the reinterview study the nonoverlap area tract samples placed on CATI. This would increase the coverage of the bias estimates, providing information about a portion of the population not currently under study.

- 4) A data series of bias estimates should be developed and charted to identify major changes in bias levels over time. The application of statistical process control procedures can help identify an actual shift in the bias based on previous reinterview estimates.
- 5) Enumerator training should emphasize the frequency and effect, positive or negative, of specific types of response errors rather than the net bias estimates. Feedback of results should be provided to the enumerators for the purpose of improving the interview process by reducing the frequency of response errors.
- 6) Efforts to improve the precision of the bias estimators should continue. Research to develop statistical bias models and more stable estimators is currently being conducted through a cooperative agreement with New Mexico State University.

## REFERENCES

1. Pafford, Bradley V. (1989) "Use of Reinterview Techniques for Quality Assurance: The Measurement of Response Bias in the Collection of December 1987 Quarterly Grain Stocks Data Using CATI," SRB Research Report Number SRB-89-08, National Agricultural Statistics Service, U.S. Department of Agriculture.
2. McClung, G., Tolomeo, V., Pafford, B. (1990). "The Measurement of Response Bias in March 1988 Quarterly On-Farm Grain Stocks Data", SRB Research Report Number SRB-90-09, National Agricultural Statistics Service, U.S. Department of Agriculture.
3. Tolomeo, V., McClung, G. (1990). "Response Bias in the Quarterly Agricultural Survey Hog Data: December 1987 and March 1988", SRB Research Report Number SRB-90-12, National Agricultural Statistics Service, U.S. Department of Agriculture.
4. U.S. Bureau of the Census (1985) "Evaluating Censuses of Population and Housing, Statistical Training Document, ISP-TR-5, Washington, D.C.

APPENDIX A: REASONS FOR DIFFERENCES

Table 1a. Reasons for differences in corn stocks and the average absolute differences. Data are from December 1988 and December 1989 combined.

Reason	Frequency	Average absolute difference  Bushels
<b>ESTIMATING REASONS</b>		
Used records (or actually counted)	42	4,014
Figure was estimated	190	3,026
Rounding	14	2,031
Both estimated, either could be right	75	1,443
<b>DEFINITIONAL REASONS</b>		
Didn't report for operation on label	8	36,550
Included acres in another operation	2	23,000
Didn't report someone elses' grain on acres operated	30	17,648
Didn't include govt. program grain	13	12,477
Included grain or capacity on another operation or off-farm	36	10,762
Did not include corn that had been bought	1	10,000
Did not include this year's grain	1	10,000
Didn't include wet (high moisture) storage	6	9,667
Enumerator - insufficient probing for name & address	1	8,820
Grain on farm but not in storage facility	1	8,000
Enumerator asked question wrong	6	7,761
Didn't include bins on rented land	11	7,455
Definitional confusion on type of operation (individual, partner, or hired manager)	1	7,000
Only reported govt. stored grain	4	6,750
Reported for the wrong year	2	6,550
Gave capacity, not grain stored	7	5,843
Definitional problem of whether in business or not	16	5,779
Didn't include last year's grain	21	5,324
Forgot to include a bin, silo, or other structure	38	4,855
Did not report as of December 1 reference date	36	2,516
Included mixed grains or not whole grains	6	2,173
Didn't report grain for feed and/or seed	12	2,108
Didn't report ear corn amount	9	1,611
Respondent didn't think it was enough to report	2	100

Table 1a. continued.

Reason	Frequency	Average absolute difference Bushels
OTHER REASONS		
Respondent doesn't remember any phone interview	4	71,250
Operation in transition, enumerator 1 collected information for one, enumerator 2 for the other	1	40,000
Off a decimal or digit	5	32,689
Respondent doesn't give accurate information on phone	6	16,862
Respondent said was not asked on phone interview	11	15,992
Enumerator 1 seemed to have problems with computer	1	15,000
Typing error on CATI (?)	1	14,980
Respondent thought they had reported this the 1st time	16	11,724
Enumerator did not attempt to reconcile	8	9,897
Enumerator forgot to ask	1	9,000
Enumerator recorded wrong	13	8,477
Respondent just didn't know	22	6,880
No explanation	35	6,314
Fatigued/tired/hurried on phone	14	5,409
Gave wrong answer or added wrong	30	3,917
Forgot to report	2	1,275
Included unharvested one time but not the other	3	1,133
Respondent had difficulty hearing on phone	2	1,075

Table 1b. Reasons for differences in soybean stocks and the average absolute differences. Data are from December 1988 and December 1989 combined.

Reason	Frequency	Average absolute difference
		Bushels
<b>ESTIMATING REASONS</b>		
Used records (or actually counted)	22	1443
Figure was estimated	75	828
Both estimated, either could be right	29	747
Rounding	13	357
<b>DEFINITIONAL REASONS</b>		
Didn't report for operation on label	4	10794
Included acres in another operation	3	4300
Didn't report someone else's grain on acres operated	18	3890
Didn't include govt. program grain	4	3570
Definitional problem of whether in business or not	9	3417
Included grain or capacity on another operation or off-farm	50	3208
Didn't include last year's grain	8	2373
Did not report as of December 1 reference date	12	1929
Didn't include bins on rented land	6	1859
Gave capacity, not grain stored	1	1400
Asked question wrong	3	1350
Forgot to include a bin, silo, or other	15	1267
Definitional confusion on type of operation (individual, partner, or hired manager)	1	1000
Only reported govt. stored grain	1	700
Didn't report grain for feed and/or seed	10	332
Respondent didn't think it was enough to report	1	75
<b>OTHER REASONS</b>		
Respondent doesn't remember any phone interview	2	38500
Typing error on CATI (?)	1	23550
Respondent doesn't give accurate information on phone	6	4629
No explanation	25	4208
Respondent said was not asked on phone interview	7	3950
Enumerator recorded wrong	6	3713
Enumerator did not attempt to reconcile	7	3604
Enumerator forgot to ask	1	3500
Off a decimal or digit	1	2700
Respondent thought they had reported this the first time	8	2279
Respondent had difficulty hearing on phone	3	1567
Gave wrong answer or added wrong	16	1412
Respondent just didn't know	10	1179
Forgot to report	1	750
Fatigued/tired/hurried on phone	9	507

Table 1c. Reasons for differences in total hogs and the average absolute differences. Data are from December 1987, March 1988, December 1988, and December 1989 combined.

Reasons	Frequency	Average Absolute Difference
		Number
<b>ESTIMATING REASONS</b>		
Figure was estimated	211	71.9
Used records (or actually counted)	41	49.0
Rounding	12	21.5
Both estimated, either could be right	24	15.9
<b>DEFINITIONAL REASONS</b>		
Didn't include acres rented from someone	2	759.5
Didn't report for operation on label	9	516.4
Confusion over father/son partnership	6	316.3
Didn't include another's hogs on the operation	15	234.3
Definitional problem of whether in business or not	6	229.0
Included hogs owned but on another operation	4	226.3
Excluded hogs/stocks on acres operated but not owned	22	131.4
Included acres in another operation	1	77.0
Forgot to report one or more hog categories	15	72.5
Did not report as of Dec/Mar 1 reference date	100	72.3
Difficulty with putting hogs in weight groups	59	48.9
Respondent didn't think it was enough to report	7	37.7
Counted some hogs twice	3	28.3
Didn't include hogs for home use	3	18.0
Didn't include gilts to be bred	6	10.7
Problem classifying hogs as market vs breeding	6	10.3
Enumerator - insufficient probing for name & address	1	10.0
Included boars with sows	3	2.0
<b>OTHER REASONS</b>		
Respondent doesn't remember any phone interview	2	455.0
Enumerator did not attempt to reconcile	5	382.8
Respondent had difficulty hearing on phone	3	236.0
Enumerator 1 seemed to have problems with computer	1	205.0
Respondent just didn't know	37	200.1
Enumerator asked question wrong	6	140.2
Respondent thought they had reported this the first time	11	107.5
Respondent said was not asked on phone interview	4	100.3
Enumerator forgot to ask	2	95.5
Forgot to report	9	95.1
Respondent doesn't give accurate information on phone	8	73.3
No explanation	47	64.3
Enumerator recorded wrong	8	49.6
Fatigued/tired/hurried on phone	41	47.7
Gave wrong answer or added wrong	26	28.0
Didn't feel survey was important	1	4.0



Agricultural  
Statistics  
Board

National Agricultural  
Statistics Service

U.S. Department  
of Agriculture

# REINTERVIEW SURVEY DECEMBER 1989

Form Approved  
O.M.B. Number 0535-0213  
Approval Expires 12/31/92

Nebraska

999	1
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Dear Reporter:

Information requested in this survey will be used to improve the quality of our agricultural statistics. It is strictly confidential, and your response is voluntary.

Respectfully,

Richard D. Allen, Chairperson  
Agricultural Statistics Board

Strata	ID	Tract	Subtr.

## SECTION 1 - IDENTIFICATION

1. Please verify name and address of this operation.

Is it correct?  YES  NO (Make corrections on label)

001
-----

2. On land operated by the farm, ranch or individual(s) listed on the label:

- a. Have or will crops be grown or hay cut at any time during 1989, or is any of the land in this operation in government programs? .....  YES  NO
- b. Have or will grains or oilseeds be stored at any time during 1989, or do you have storage facilities used for storing grain? .....  YES  NO
- c. Have or will there be any hogs on this operation at any time during 1989? .....  YES  NO
- d. Have or will there be any cattle, sheep, other livestock, or poultry on this operation at any time during 1989? .....  YES  NO

→ If NO to all questions,  
GO TO SECTION 7.

002
-----

3. Does this operation do business under any name, other than as shown on label?

- YES - Enter name: \_\_\_\_\_  
(Do you want this name to appear on the label?)  YES  NO
- NO

003
-----

4. Are the day-to-day decisions for this farming (or ranching) operation made by:

- An Individual Operator?
- Partners? Enter number of partners, including self .....   
(Partners jointly operate land and share in decision making.  
DO NOT include landlord as partner.)
- A Hired Manager?

004
-----

005
-----

4a. Are the decisions still made by the same person(s) making them on June 1, 1989?

- YES  NO - Would you please explain what changed?

\_\_\_\_\_

\_\_\_\_\_

R. Unit
921
Change
923

Continue On Next Page

**SECTION 2 - ACRES OPERATED**

Acres

1. How many total acres of land were in this operation on December 1? .....

**Include:** Farmstead, all cropland, woodland, pastureland, wasteland, government program land, all land owned, rented or managed.

**Exclude:** Land rented to others and all grazing land used on an AUM (fee per head) basis

2. Of the total acres in this operation, how many acres would be considered cropland, including land in hay and cropland in government programs? .....

**SECTION 3 - CROPS**

31

How to complete this section.

- Report for all the land you operate, including land rented from others
- If harvest is not complete, make your best estimate of acres and total production.
- Production is equal to acres harvested and to be harvested times average yield per acre.
- LAND IRRIGATED should include all land watered one or more times for the 1989 crop.
- Report acreage and production for both irrigated and non-irrigated crops when listed separately.
- Total production should include the landlord's share.

1. The following information is needed for **CROPS HARVESTED DURING 1989.**

**CORN** (exclude popcorn and sweet corn):

	Non-Irrigated	Irrigated
a. Acres planted for all purposes .....	532 ac	621 ac
b. Acres harvested and to be harvested for grain and seed .....	538 ac	544 ac
c. Total grain and seed production .....	372 bu	371 bu

**SOYBEANS:**

	Non-Irrigated	Irrigated
d. Acres planted for all purposes .....	761 ac	622 ac
e. Acres harvested and to be harvested for beans .....	226 ac	225 ac
f. Total production .....	229 bu	228 bu

2. Please report **WINTER WHEAT** seedings for the 1990 CROP YEAR.

**WINTER WHEAT** acres seeded and to be seeded for all purposes .....  ac

Continue On Next Page

**SECTION 4 - GRAINS AND SOYBEANS IN STORAGE**

Please account for whole grains and soybeans on hand or stored December 1 on the total acres operated, whether for feed, seed or sale. They may have belonged to you or someone else, or been stored under a government program (loan, farmer owned reserved, or CCC.)

	<b>NO</b>	<b>YES</b>	
1a. On December 1, was any whole grain corn on hand or stored on the total acres operated? ...	<input type="checkbox"/>	<input type="checkbox"/>	How many bu? ..... <input style="width: 100px;" type="text" value="121"/>
1b. Were any soybeans on hand or stored on these acres? .....	<input type="checkbox"/>	<input type="checkbox"/>	How many bu? ..... <input style="width: 100px;" type="text" value="125"/>
1c. What about wheat, including all types? (winter, durum, and spring) .....	<input type="checkbox"/>	<input type="checkbox"/>	How many bu? ..... <input style="width: 100px;" type="text" value="126"/>

**UNHARVESTED CORN AND SOYBEANS**

2. On December 1, did you have any corn or soybeans still in the field that you intend to harvest for grain or beans?

YES  NO - Go to Item 4 below.

↓

3a. Was this unharvested production included with corn and soybeans in storage?

<input type="checkbox"/> YES = 1 - Enter code in Code Box 460, then go to Item 4 below.  <input type="checkbox"/> NO = 3 - Enter code in Code Box 460, then continue.	enter code →	<input style="width: 100px;" type="text" value="460"/>
---	--------------	--

3b. Corn .....	Acres remaining to be harvested .....	ac	559
	AND		573
	Expected yield per acre .....	bu/ac	

3c. Soybeans .....	Acres remaining to be harvested .....	ac	575
	AND		594
	Expected yield per acre .....	bu/ac	

**GRAIN STORAGE CAPACITY**

4. On December 1, what was the TOTAL STORAGE CAPACITY of all bins, cribs, sheds, and other structures normally used to store whole grains or oilseeds on the total acres operated? ..... bushels

Continue On Next Page

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**SECTION 5 - HOGS AND PIGS**

006

1. On December 1, were any HOGS or PIGS, regardless of ownership, on the total acres operated?

YES

NO

1a. Were any HOGS or PIGS on the total acres operated, at any time, during the period of September 1, 1989 through November 30, 1989?

YES - GO TO Section 6.

NO - GO TO Section 6.

2. Of the HOGS and PIGS for BREEDING on hand December 1, how many were:

a. SOWS, GILTS and YOUNG GILTS bred and to be bred?.....

301

★

b. How many were BOARS and YOUNG MALES for breeding?.....

302

★

c. How many were SOWS and BOARS no longer used for breeding?.....

303

★

3. Of the HOGS and PIGS FOR MARKET and HOME USE, how many were in each of the following four weight groups? (Exclude breeding hogs reported in Item 2.)

a. Under 60 lbs. (Include pigs not yet weaned) .....

311

★

b. 60 - 119 lbs. ....

312

★

c. 120 - 179 lbs. ....

313

★

d. 180 lbs. and over (Exclude hogs no longer used for breeding.) .....

314

★

4. Then the TOTAL number of HOGS and PIGS on hand December 1 was: .....

300

(Add ★ Items 2a through 3d)

Continue On Next Page

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**SECTION 6 - PARTNER NAMES**

1. Did you check partners in Section 1, Item 4, on Face Page?

NO - GO TO Section 8.

YES - Continue.

924

2. Please identify the other person(s) in this partnership in boxes below, then go to Section 8 on next page.  
(make necessary corrections if names have already been entered)

Name \_\_\_\_\_ Phone \_\_\_\_\_  
(First) (Middle) (Last)

Address \_\_\_\_\_  
(Rt. or St.) (City) (State) (Zip)

Did this person operate land individually in this State on June 1, 1989?

YES  NO

925

Name \_\_\_\_\_ Phone \_\_\_\_\_  
(First) (Middle) (Last)

Address \_\_\_\_\_  
(Rt. or St.) (City) (State) (Zip)

Did this person operate land individually in this State on June 1, 1989?

YES  NO

926

Name \_\_\_\_\_ Phone \_\_\_\_\_  
(First) (Middle) (Last)

Address \_\_\_\_\_  
(Rt. or St.) (City) (State) (Zip)

Did this person operate land individually in this State on June 1, 1989?

YES  NO

927

Name \_\_\_\_\_ Phone \_\_\_\_\_  
(First) (Middle) (Last)

Address \_\_\_\_\_  
(Rt. or St.) (City) (State) (Zip)

Did this person operate land individually in this State on June 1, 1989?

YES  NO

928

Go to Section 8 on Next Page

### SECTION 7 - CHANGE IN OPERATOR

Has this operation (name on label) been sold, or turned over to someone else?

007

NO - GO TO Section 8.       YES - Please identify the new operator(s).

Name \_\_\_\_\_

Address \_\_\_\_\_ Phone \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Did this person operate land individually in this State on June 1, 1989?

YES       NO

008

### SECTION 8 - CONCLUSION

009

1. Do you make any day-to-day decisions for another farm or ranch?

NO       YES - List other operation(s) \_\_\_\_\_  
 \_\_\_\_\_

2. Thank you for your help in completing this questionnaire. Now I would like to compare these responses with those from the original telephone interview.

### GO TO THE RECONCILIATION FORM

Reported by \_\_\_\_\_ Date \_\_\_\_\_

Telephone(Area Code) \_\_\_\_\_ (Number) \_\_\_\_\_

Respondent		Response Code		Sup /Enum	Eval	Date
1-Op	101	3-int	910	098	100	095
2-Sp		8-IR				
3-Oth		9-Inac				

RECONCILIATION FORM

REINTERVIEW SURVEY - DECEMBER 1989

THIS FORM IS NOT TO BE OPENED UNTIL AFTER THE REINTERVIEW RESPONSES HAVE BEEN OBTAINED. In order to obtain measures of quality of our data we must maintain independence between the initial and reinterview surveys. Viewing the initial response before the reinterview may hurt this relationship.

Strata	ID	Tract	Subtr	County

LABEL

( ) -
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515	090	950



Initial Respondent:

Initial Int:

QUESTION	ORIGINAL (1)	REINTERVIEW (2)	What is correct? (3) 1=orig 2=reint 3=either	Source of difference? 1=orig.resp. 2=reint.resp 3=orig.enum. 4=reint.enum (4)	for office use REASON (5)
<b>SECTION 2 -- ACRES OPERATED</b>					
1. Total Acres of Land	239	405	636	816	136
2. CROPLAND ACRES	240	406	637	817	137
<b>SECTION 3 -- CROPS</b>					
1a. CORN plt ac - NON-IRR	246	412	643	823	143
- IRR	247	413	644	824	144
b. CORN hv ac - NON-IRR	248	414	645	825	145
- IRR	249	415	646	826	146
c. CORN prod - NON-IRR bu/ac	250	416	647	827	147
- IRR bu/ac	251	417	648	828	148

**EXPLANATION**

(Explain as fully as possible why the original and reinterview differ)

Section number	Item	Reason for difference

Initial Respondent:

Initial Int:

QUESTION	ORIGINAL (1)	REINTERVIEW (2)	What is correct? (3)	Source of difference? (4)	for office use REASON (5)
			1=orig 2=reint 3=either	1=orig.resp. 2=reint.resp. 3=orig.enum. 4=reint.enum	
<b>SECTION 3 -- CROPS - cont.</b>					
1d. SOYBEANS plt - NON-IRR	261	427	658	847	158
- IRR	262	428	659	848	159
e. SOYBEANS hv ac - NON-IRR	263	429	660	849	160
- IRR	264	430	661	850	161
f. SOYBEANS prod - NON-IRR bu/ac	265	431	662	851	162
- IRR bu/ac	266	432	663	852	163
2. WINTER WHEAT SEEDINGS	267	433	664	853	164

**EXPLANATION**

(Explain as fully as possible why the original and reinterview differ)

Section number	Item	Reason for difference

Initial Respondent:

Initial Int:

QUESTION	ORIGINAL (1)	REINTERVIEW (2)	What is correct? (3) 1=orig 2=reint 3=either	Source of difference? 1=orig.resp. 2=reint.resp. 3=orig.enum. 4=reint.enum (4)	for office use  REASON (5)
<b>SECTION 4 -- GRAINS AND SOYBEANS IN STORAGE</b>					
1a. CORN in STORAGE	268	434	665	854	165
b. SOYBEANS in STORAGE	269	435	666	855	166
c. ALL WHEAT in STORAGE	270	436	667	856	167
2. ACREAGE left to harvest? (yes/no)	271	437	668	857	168
3a. INCLUDED in above storage? (yes/no)	272	438	669	858	169
b. CORN ACRES REMAINING	273	439	670	859	170
c. SOYBEAN ACRES REMAINING	274	440	671	860	171
4. GRAIN STORAGE CAPACITY	275	441	672	861	172

**EXPLANATION**

(Explain as fully as possible why the original and reinterview differ)

Section number	Item	Reason for difference

Initial Respondent:

Initial Int:

QUESTION	ORIGINAL (1)	REINTERVIEW (2)	What is correct? (3) 1=orig 2=reint 3=either	Source of difference? 1=orig.resp 2=reint.resp 3=orig.enum 4=reint.enum (4)	for office use REASON (5)
<b>SECTION 5 -- HOG AND PIG INVENTORY</b>					
1. HOGS or PIGS? (yes/no)	276	442	673	862	173
1a. HOGS or PIGS between Sept1 and Nov30? (yes/no)	277	443	674	863	174
2a. SOWS, GILTS BRED AND TO BE BRED	278	444	675	864	175
b. BOARS and YOUNG MALES FOR BREEDING	279	445	676	865	176
c. SOWS and BOARS NO LONGER USED FOR BREEDING	280	446	677	866	177
3. HOGS and PIGS FOR MARKET AND HOME USE	281	447	678	867	178
a. under 60 lbs.					
b. 60 - 119 lbs.	282	448	679	868	179
c. 120 - 179 lbs.	283	449	680	869	180
d. 180 lbs. and over	284	450	681	870	181
4. TOTAL HOGS & PIGS	285	451	682	871	182

**EXPLANATION**

(Explain as fully as possible why the original and reinterview differ)

Section number	Item	Reason for difference

Initial Respondent:

Initial Int:

QUESTION	ORIGINAL (1)	REINTERVIEW (2)	What is correct? (3) 1=orig 2=reint 3=either	Source of difference? 1=orig.resp. 2=reint.resp. 3=orig.enum. 4=reint.enum (4)	for office use  REASON  (5)
<b>SECTION 6 -- PARTNERS' NAMES</b>					
NAME 1:			683	872	183
NAME 2:			684	873	184
NAME 3:			685	874	185
NAME 4:			686	875	186
<b>SECTION 7 -- CHANGE IN OPERATOR</b>					
OPERATION name on label sold or turned over? (yes/no)	286	452	687	876	187
NAME: ^F69^^F86^			688	877	188
Operate Indiv. on June 1? (yes/no)	287	453	689	878	189
<b>SECTION 8 -- CONCLUSION</b>					
1. Day-to-day decisions for another farm or ranch? (y/n)	288	454	690	879	190
NAME:			691	880	191

**EXPLANATION**

(Explain as fully as possible why the original and reinterview differ)

Section number	Item	Reason for difference

