

# This document is discoverable and free to researchers across the globe due to the work of AgEcon Search. 

## Help ensure our sustainability. Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

Papers downloaded from AgEcon Search may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.

December 2007

This report has been prepared for limited distribution to the research community outside the U.S. Department of Agriculture. The views expressed herein are not necessarily those of NASS or USDA.

## EXECUTIVE SUMMARY

In preparation for the census of agriculture, NASS conducts a census content test. The purpose of the content test is to test the forms and procedures proposed for the census and to provide a pool of test data for census systems testing. During the 2005 Census Content Test, 2 forms were tested. The first "long" form was modeled after previous census forms. In addition, a "short" form was designed by reordering and reformatting the form. Blank space in the form was minimized and tables with pre-listed items were replaced with open tables where respondents had to write in their information. The short form contained 12 pages and the long form contained 24 pages.

Contrary to expectations, the short form did not increase the response rate and actually prompted slightly fewer returns. In addition, there were several areas where data quality was worse on the short form. The 2005 Census Content Test provided valuable data and recommendations for planning the 2007 Census and is documented elsewhere in a comprehensive final report. Based on the results of the content test, changes have been made both to the short form and to the types of operations who will be eligible for the short form in the census. The purpose of this report is to document only the comparisons between the short and long forms tested in the content test. Therefore, no recommendations are included in this report.

## RECOMMENDATIONS

None

# A Comparison of the Long and Short Forms Used in the 2005 Census Content Test 

Jaki S. McCarthy ${ }^{1}$


#### Abstract

In advance of the census of agriculture, a content test is conducted to test procedures, systems and the report form(s) used to collect the data. During the 2005 Census Content Test two proposed versions of the 2007 report forms were tested. The two forms differed in format and number of pages. One version of the form similar to that used in the past was 24 pages long and had more extensive instructions and more information pre-printed on the form. A shorter twelve page form reordered and combined some questions, required respondents to write in more information and had less room for recording information. Both forms, however, collected the same information (with a few minor exceptions). The intent of the short form was to increase response and reduce the burden of reporting for operations which produce few commodities or have very simple operating arrangements. While intended for different types of operations in the 2007 Census, a split sample in the 2005 Content Test provided a rare opportunity to directly compare forms collecting the same data but with differences in page length and format. Contrary to expectations, the shorter form did not increase the response rate. In addition, the quality of the data provided on the short form was lower in several key areas. Additional insights regarding differences between the forms were also gained from follow up interviews with a subset of respondents. Based on these results, recommendations for changes and use of the forms were made for the 2007 Census of Agriculture.


## 1. Introduction

Many types of operations with very different types and amounts of agricultural production are contacted in the census of agriculture. However, only a handful of report form versions are used to collect their widely varying information. The traditional "long" form pre-lists most of the major commodities on the pages where their production should be reported, leaves substantial space for writing in additional commodities, and separates major sections of the report form onto separate pages. Operations with few commodities may skip substantial amounts of the form when they do not have the items of interest. The primary mode of data collection for the census of agriculture is by mail out/mail back using paper forms. Forms may be mailed to 3 million or more potential agricultural operations, and initial non-response is followed by a postcard reminder and a second mailing of the form. Additional pages in the form increase the weight and subsequent cost of the mail out package.

[^0]It was suggested that an additional version of the form could be designed which could contain fewer pages and enable some respondents to complete it more quickly, particularly if they had small amounts or little variety in their agricultural production. The hope is that this will increase response rates for those sent this form. However, the available evidence for form length increasing non-response rates is inconclusive at best. See for example, the review of the literature on this subject by Bogen (1996). Some studies have found that questionnaires with more pages have a negative but modest impact on response rates. For example, Heberlein and Baumgartner (1978), Adams and Gale (1982) and Kalantar and Talley (1999) all compared questionnaires differing in the number of pages. Importantly, in each case, the questionnaires compared differed in page length, but also differed in the amount of data collected. This is not the case for the content test forms, which differ in length, but collect the same amount of data.

It is widely believed that longer forms appear more intimidating and prompt higher levels of non-response. Questionnaires may have their content squeezed onto fewer pages in the belief that a smaller physical form will prompt higher response rates. There is little empirical evidence for or against this belief; the 2005 Content Test presented an opportunity to examine this.

This research report is intended to document and discuss only the findings of comparisons between the short and long forms used in the 2005 Census Content Test. The full details of the 2005 Census Content Test are documented elsewhere (USDA, 2006). The Content Test prompted recommendations for changes to the census forms and procedures so no specific recommendations will be contained in this report.

## 2. Methods

Two versions of the 2005 Census Content Test form were designed. The first version designed was the "long" form which was similar in format and layout to the previous census of agriculture form. The second version of the form, the "short" form, was significantly condensed by eliminating many of the blank lines in the tables, combining some sections, rearranging sections to fill more of the pages instead of beginning new sections on new pages and omitting the production contracts page. With the exception of irrigated land and the production contracts (any operation likely to have production contracts would not be in the short form census sample) the information that should have been reported was the same for each form. That is, the forms differed in format, layout and question order but otherwise had the same content and were intended to collect the same data. Key differences between the long and short form are summarized below in Table 1, examples of some of the relevant sections of the forms are also shown in Appendix A.

Table 1. Key Differences between Long and Short Content Test Forms

| Crop and Livestock <br> Production | All Crops and Livestock <br> collected in a single section <br> in small tables; no items pre- <br> listed, most common listed <br> as examples | Field Crops, Hay and Forage Crops, <br> Woodland Crops, Nursery, <br> Vegetables, Fruits and Nuts, Berries, <br> Cattle and Calves, Sheep, Poultry, <br> Hogs and Pigs, Aquaculture, Bees <br> and Other Livestock, each in <br> separate sections; most with <br> common items (with units) <br> preprinted, other items listed with <br> item codes, and each section on a <br> single page |
| :--- | :--- | :--- |
| Value of Sales | Value of sales collected in <br> same tables as production | Value of sales by commodity or <br> commodity grouping collected in <br> one section separate from production |
| Land | Acres operated by <br> ownership, followed by <br> combined crops and <br> livestock section, followed <br> by acres operated by use (or <br> land type) | Acres operated by ownership <br> collected immediately preceding <br> acres operated by use (or land type) |
| Irrigated Land | Not asked | Acres irrigated for Harvested Land; <br> Pastureland collected |
| Production Contracts | Section excluded (no <br> operations of this type <br> expected in short form <br> sample for the 2007 Census) | Additional page collected <br> information on production contracts |
| Government | Conservation and other <br> government program <br> information collected in <br> abbreviated table with short <br> list of examples | Conservation program acres and <br> payments collected in one section, <br> other government program payments <br> by type (with full list specified in the <br> question) collected in another <br> section |
| Number of Pages | 12 | 24 |

In the 2007 Census of Agriculture the short form will only be sent to a subset of operations. This subset will include operations expected to have few commodities and those not producing specialty commodities. However, to test how the form would be completed by all different types of operations (who may inadvertently get the short form in the census) a split sample, made up of subsamples of many specific types of farms was included in the Content Test. Definitions and subsample sizes are described in Appendix B. Operations in all states except Alaska and Hawaii were eligible for selection.

The National Processing Center (NPC) in Jeffersonville, IN mailed all the forms on 12/30/05. This was followed by a thank you/reminder postcard mailed to all operations on 1/17/06. Finally, a second form was mailed to all non-respondents on $2 / 9 / 06$. Forms were returned to NPC where they were checked in, scanned (for image only) and data were keyed from electronic images.

Response rates were tracked for all form types. In addition, a small sample of respondents was sent a form identical to that used in the 2002 Census of Agriculture, modified only by updating all reference dates. Therefore response rates for that form could be compared with the proposed 2007 forms.

After responses were received from the mailout, a subset of respondents was recontacted and interviewed in person. These interviews verified some of the reported data and collected more detailed information for problem or suspicious data. There were also more general questions about completing the form. Three hundred re-interviews were targeted for operations in six target areas where it was felt that more information about reporting was needed. The six areas were: operations with production contracts, organic agriculture, berries, farms with land used on an Animal Unit Month (AUM) basis, farms on Indian reservations, and farms with government payments. Operations were selected from mail returns and contacted in re-interviews. (A small sample of respondents reporting via the Internet were also contacted in re-interviews, but will not be discussed here.) Re-interview samples were randomly selected from those with the target items and from the remaining returns received during December and January. (Early returns were used in order to complete the re-interviews in time for analysis before the deadline for finalization of the report forms.)

## 3. Results

Contrary to expectations, the short form did not have a higher response rate than either the long form or the 2002 version of the form. Overall response rates for the the three forms are shown below in Table 2. Response rates by form type and subsample are shown in Appendix C.

Table 2. Response Rate by Form Type

| Form | Total <br> Mailed | Receipts | Response Rate ${ }^{2}$ Unweighted <br> (Weighted) (\%) |
| :--- | :--- | :--- | :--- |
| Short | 12808 | 6870 | $53.24(52.73)$ |
| Long | 14860 | 8200 | 54.68 |
| 2002 Form Version | 1978 | 1036 | 53.38 |

No additional analysis was done for the 2002 Form Version; all following comparisons are between the newly designed long and short forms.

[^1]
### 3.1 Comparisons between reported data on the long and short form mail returns

While the two forms ask for the same data, reporting errors differed depending on the form completed. For the following analysis, data from 5773 short forms and 6960 long forms were included. (Data from responses received via the Internet are excluded from this analysis, due to problems processing that data. )

All results that follow are based on unweighted and unedited data so results should be viewed with caution. ${ }^{3}$ Differences in sample sizes and response rates across the two forms are listed in Appendix C. Chi-square tests of independence were performed to examine the relationship between potential problems on the form and form type. Results and significance levels are shown below each table.

## Total Acres Operated

For both forms, both the Total Acres Operated based on ownership (K46) and Total Acres Operated based on land use (K798) must be reported. These two numbers should be equal (and this is explicitly stated on both forms). On the long form these two items appear on facing pages. On the short form, these two items appear 3 pages apart and are separated by the crop and livestock tables.

There were significantly more missing data for both K46 and K798 on the short form. In addition, there were significantly more instances on the short form where K46 did not equal K798 when at least one of them was reported.

Table 3. Problems with Total Acres Operated by Form Type

|  | K46 missing* | K798 missing** |  | K46 or K798 <br> greater than 0 | K46 <> K798*** |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Short | $364(6.3 \%)$ | $841(14.6 \%)$ | Short | 5503 | $2180(39.61 \%)$ |
| Long | $358(5.1 \%)$ | $790(11.4 \%)$ | Long | 6702 | $1779(26.54 \%)$ |

$* \chi^{2}(1, \mathrm{~N}=12796)=33.17, * * \chi^{2}(1, \mathrm{~N}=12690)=324.0,{ }^{* * *} \chi^{2}(1, \mathrm{~N}=12205)=15733.4 ; \mathrm{p}<.0001$

## Crop Yield Reporting

For crops, respondents were to report acres harvested and the quantity harvested (bushels, tons, pounds, etc.). From this, yield per acre can be calculated. On the long form, the quantity harvested column includes the unit (bushel, tons) for the pre-listed crops. On the short form, there is a separate column where the respondent is to write in this unit. Some respondents mistakenly believed that the column for quantity harvested was acres, not the volume unit (i.e. bushels, tons, pounds, etc.) and reported the same number in both columns. For the crops prelisted on the long form crop table, a significantly higher percentage of short form respondents reported the same number in the acres and quantity harvested columns producing an unrealistic

[^2]yield per acre of 1 . Shown are figures for corn and soybeans, similar results were found for oats ( $9 \%$ vs. $3 \%$ ) and winter wheat ( $8 \%$ vs. $2 \%$ ).

Table 4. Percent of respondents with commodity reporting a calculated yield of 1

|  | Corn* | Soybeans** |
| :--- | :---: | :---: |
| Short Form |  | $11 \%$ |
|  | Long Form | $2 \%$ |

Reported hay yields also differed quite substantially between the forms. Current edit procedures will allow a calculated yield for tame hay (K110) between between 0.1 tons/ac and 13 tons/ac. Any yield falling outside the range will have that production removed and a new production (with an acceptable yield) will be imputed. The short form respondents had a much lower percentage of records falling into an acceptable range than the long form, $79 \%$ versus $93 \%$, respectively.

Table 5. Percent of respondents with Low/High Tame Hay Yields

|  | Yield less than 0.1 tons/ac | Yield greater than 10 <br> tons/ac |
| :--- | :--- | :--- |
| Short Form | $83(8.5 \%)$ | $206(21 \%)$ |
| Long Form | $12(1 \%)$ | $52(4 \%)$ |

## Crop Sales Reporting

One advantage that the short form might have over the long form is that crop sales are reported in the same table as the acreage and production. This might prompt greater reporting of sales than the long form, which has all the sales items in a separate section many pages later than crop acreage and production. However, the short form prompted slightly fewer corn producers to report corn sales, (short form, $61.9 \%$; long form $63.9 \%$ ). In addition, no short form respondents reported corn sales without any production, as would be the case if producers were selling previous year's production. In comparison, $1.6 \%$ of long form respondents reported corn sales and zero acres of corn production.

## Milk Cows and Milk Sales

On the long form, milk cow inventory (K805) is collected in the Cattle and Calves section. Milk sales (K1340) are collected separately in the Value of Sales section, item 10 (Milk and other dairy products). In the short form, milk cow inventory should be reported in the cattle table and milk sales should be reported in the Livestock and Their Products table. "Milk from cows" is listed in the examples for this table.

While the number of milk cows reported is comparable across the 2 forms, it appears that milk sales are significantly underreported on the short form. A significantly lower percentage of operations reported milk sales on the short form than the long form (short form, $47.7 \%$, long form $64.2 \%$ ). The total value of sales and average sales of milk are also much higher for the long form respondents than the short form respondents. Full details are shown in Table 6.

Table 6. Milk cow operations and milk sales by size of operation and form type

## Short Form

| \# Milk <br> Cows | $\begin{gathered} \# \\ \text { Ops } \\ \hline \end{gathered}$ | \# Ops w/ Sales | $\begin{gathered} \% \text { Ops } \\ \text { reporting } \\ \text { sales } \end{gathered}$ | List Frame Control Data Milk Cows | Reported Milk Cows (K805) | Reported Total Milk Sales (K2146) | Avg Sales <br> Reported <br> (Per <br> Operation reporting sales) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 101+ | 38 | 22 | 57.9 | 6,821 | 8,016 | \$11,710,496 | \$532,295 |
| 51-100 | 80 | 47 | 58.8 | 5,532 | 5,904 | \$9,349,871 | \$198,933 |
| 21-50 | 94 | 56 | 59.6 | 3,690 | 3,518 | \$4,543,562 | \$81,135 |
| 1-20 | 75 | 12 | 16.0 | 351 | 408 | \$180,449 | \$15,037 |
| Overall | 287 | 137 | 47.7\% | 16,394 | 17,846 | \$25,784,378 | \$188,207 |

## Long Form

| \# Milk Cows | $\begin{gathered} \# \\ \text { Ops } \\ \hline \end{gathered}$ | $\begin{gathered} \text { \# Ops } \\ \text { w/ } \\ \text { Sales } \end{gathered}$ | $\begin{gathered} \text { \% Ops } \\ \text { reporting } \\ \text { sales } \\ \hline \end{gathered}$ | List Frame <br> Control <br> Data Milk <br> Cows | Reported Milk Cows (K805) | Reported Total Milk Sales (K1340) | Avg Sales Reported (Per Operation reporting sales) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 101+ | 38 | 32 | 84.2 | 7,874 | 8,457 | \$25,063,458 | \$783,233 |
| 51-100 | 78 | 68 | 87.2 | 5,217 | 5,519 | \$12,160,393 | \$178,829 |
| 21-50 | 87 | 66 | 75.9 | 3,332 | 3,392 | \$5,960,691 | \$90,314 |
| 1-20 | 96 | 26 | 27.1 | 416 | 538 | \$306,314 | \$11,781 |
| Overall | 299 | 192 | 64.2\% | 16,839 | 17,906 | \$43,490,856 | \$226,515 |

## Horses

Since horses are often not thought of as livestock, there was some concern that these might be omitted on the short form. For this reason, "horses" was the first example listed in the other livestock table in the short form. Even so, it appears horses were erroneously omitted, with a much higher percentage of respondents who reported horses in 2002 not reporting any horses on the short form than on the long form. Correspondingly, far more respondents who had not reported horses in the 2002 Census, reported horses on the long form than the short form. Since we would also not expect any difference in the number of horses added to these respondent's operations, the assumption is that short form respondents are uniformly underreporting horses.

Table 7. Horses reported in 2002 Census and Content Test by form type

|  | 1 or more Horses <br> reported in both 2002 <br> and Content Test* | No Horses reported <br> in 2002 and 1 or <br> more horses reported <br> in Content Test ** | Total number <br> reporting horses in <br> either 2002 Census <br> or Content Test |
| :--- | :---: | :---: | :---: |
| Short Form | $356(30.9 \%)$ | $43(3.7 \%)$ | 1151 |
| Long Form | $1056(62.3 \%)$ | $287(16.9 \%)$ | 1696 |

$* \chi^{2}(1, \mathrm{~N}=2517)=54859.4, * * \chi^{2}(1, \mathrm{~N}=2860)=5715.7 ; \mathrm{p}<.0001$

## Landlord (LL) Shares and Rent

Respondents with landlords may pay cash rent and/or provide landlords with shares of the production. We would expect that the proportion doing either would be the same regardless of the form used to collect the data. On the long form the question asking for landlord's share of the total sales (K1349) was the final question on the Value of Sales page. On the short form, it followed the series of crop and livestock tables which collected production and sales. Slightly fewer respondents who reported having rented land reported a positive value for K1349 on the short form. In addition, slightly more short form respondents reported having paid cash rent (K1513). However, overall the percent of respondents reporting rented land who reported either landlord share of sales, cash rent or both was comparable across the forms. In addition, on $41 \%$ of the short forms and $33 \%$ of the long forms the landlord shares equaled the total sales. This is inferred as an error and would be changed by the edit.

Table 8. Rented land and rent paid to landlords (LL) by form type

|  | Total Reporting <br> Rented Land |  <br> LL Share <br> Reported (\%) | Rented Acres <br> \& Cash Rent <br> Reported (\%) |  <br> LL Share or <br> Cash Rent Paid <br> Reported (\%)* |
| :--- | :--- | :--- | :--- | :--- |
| Short form | 2012 | $387(19 \%)$ | $1287(64.0 \%)$ | $1421(70.6 \%)$ |
| Long Form | 2527 | $589(23 \%)$ | $1526(60.4 \%)$ | $1767(69.9 \%)$ |

## Government Payments

The short form collected government payments in a table with two empty lines and only a single line pre-printed with "Conservation Reserve Program (CRP,WRP, FWP, and CREP)". Other programs were listed as examples preceding the table. The long form collected Conservation Program acreage and dollars received in a separate section, Commodity Credit Corporation Loan (CCC) dollars in a separate section, and other Federal, State and local agricultural program payments in a third section containing 4 distinct types of payments. Payments reported on the short form were assigned to one of the six items shown below. Overall, more long form than short form respondents reported any government payment (long form- $35.1 \%$, short form$31.5 \%$ ). In addition, long form respondents reported more government payments of all types except Conservation Programs (which were the sole type of payment preprinted on the short form in the table). Number of government payments reported by type are shown below.

Table 9. Number of payments reported (\% of respondents), total and by type

| Total <br> Number of <br> Payments <br> Reported | CCC <br> Loan <br> (K1411) | Direct <br> Payments <br> (K1420) | Counter <br> Cyclical <br> Payments <br> (K1421) | Other <br> Federal <br> Payments <br> (K1422) | State and <br> Local <br> Government <br> Payments <br> (K1423) | Conservation <br> Program <br> Payments <br> (K685) |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Short <br> Form | 2502 | 34 | 423 | 531 | 470 | 0 | $1044(18.1 \%)$ |
| $(0.6 \%)$ | $(7.3 \%)$ | $(9.2 \%)$ | $(8.1 \%)$ |  |  |  |  |
| Long <br> Form | 4562 | 261 | 1252 | 1239 | 713 | 224 | 873 |
| $(12.8 \%)$ | $(18.0 \%)$ | $(17.8 \%)$ | $(10.2 \%)$ | $(3.2 \%)$ | $(12.5 \%)$ |  |  |

*A chi-square test was performed to compare total number of payments out of highest possible number of payments (6 types per respondent); $\chi^{2}(1, \mathrm{~N}=76398)=40,090 ; \mathrm{p}<.001$

Long form respondents also reported more types of payments than short form respondents as shown here. These results are likely a combination of short form respondents omitting payments completely and writing in entries that could not be assigned to any of the payment types.

Table 10. Number of government payments reported by individual respondent

|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Short | 3952 | 1254 | 453 | 114 | 0 | 0 | 0 |
| Form | $(68.5 \%)$ | $(21.7 \%)$ | $(7.9 \%)$ | $(2.0 \%)$ |  |  |  |
| Long | 4514 | 1171 | 669 | 416 | 148 | 39 | 3 |
| Form | $(64.9 \%)$ | $(16.9 \%)$ | $(9.6 \%)$ | $(6.0 \%)$ | $(2.1 \%)$ | $(1.0 \%)$ | $(0.0 \%)$ |

### 3.2 Manual Processing and Review Required

Forms received by the National Processing Center (NPC) in Jeffersonville were scanned to electronically capture the form images. These images were used to key enter the data for processing. If there was not enough room on the form for a respondent to enter all their information, respondents were instructed to use an additional sheet to record their data. This instruction appeared in each table on the form. These additional sheets (extension sheets) had to be processed manually by NPC. In addition, data that could not be keyed directly from the form (that is, was not present in the pre-specified list of crops available to the keyers in a drop down menu) had to be manually processed by an analyst. This process, part of the Post Output Special Handling (POSH) requires additional NPC staff and time beyond the regular key entry process.

Short forms required substantial additional handling for both extension sheets and POSH, as shown below. Since a single form can have multiple problems, both the number of forms with problems and the total number of problems is shown. NPC estimated the potential work and resources this would translate to for the 2007 Census based on the sample size for the short form which had been suggested at that time, which is shown in Table 12.

Table 11. Content Test Manual Processing by NPC

|  | Number <br> Keyed | Number of Forms <br> with Extension <br> Sheets (\%) | Number of <br> Forms With <br> Problems <br> (total problems) | \% Forms Needing <br> review by POSH |
| :--- | :---: | :---: | :---: | :---: |
| Short | 5780 | $191(3.3 \%)$ | $1305(2211)$ | $22.6 \%$ |
| Long | 6965 | $29(0.4 \%)$ | $263(407)$ | $3.8 \%$ |

Table 12. NPC processing projections for 2007 Census

|  | Extension Sheets |  | POSH |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | Number <br> Keyed | Number | Staff <br> Days | $\$$ | Problems | Forms <br> With <br> Problems | Staff <br> Days | $\$$ |
| Short | 561,000 | 18,513 | 132 | 46,200 | 214,597 | 126,786 | 613 | 214,550 |
| Long | $1,139,000$ | 4,556 | 33 | 11,550 | 66,557 | 43,282 | 190 | 66,500 |

In addition to the extra processing required by NPC staff for extension sheets, forms are also flagged for further review in the edit process. Under current plans for processing, each of these additional cases would have to be reviewed by a statistician in the edit review process. There are several types of flags that can be set, their definitions and number set by form are shown in the following table. (Any short forms reporting more than specified number of livestock or any greenhouse or nursery area will also be flagged for edit review.)

Table 13. Additional review flags set by NPC by form type

| Flag | Definition | Short Form <br> $(\%)$ | Long Form <br> $(\%)$ | Total |
| :--- | :--- | :---: | :---: | :---: |
| A - Altered Stub | Respondent crosses out a <br> pre-printed entry and <br> writes in something else | $152(2.6 \%)$ | $244(3.5 \%)$ | 396 |
| B - Bracketed Entry | Respondent provides an <br> entry and indicates it is for <br> multiple items | $67(1.2 \%)$ | $74(1.1 \%)$ | 141 |
| D - Double Entry | Two numbers entered in a <br> single cell (only first entry <br> is keyed) | $401(6.9 \%)$ | $90(1.3 \%)$ | 491 |
| R - Remarks | Respondent writes remark <br> to qualify item in a data <br> cell | $251(4.3 \%)$ | $220(3.2 \%)$ | 471 |
| U - Altered Units | Respondent crosses out <br> pre-printed unit and writes <br> another unit | $148(2.6 \%)$ | $114(1.6 \%)$ | 262 |
| Total Forms Keyed |  | 5780 | 6965 |  |

Respondents on the short form crossed out fewer pre-printed entries, because fewer things are pre-printed on the report form. There are substantially more cases of short form respondents entering more than one number in a cell. This is likely a result of the limited number of lines in the tables. Instead of using a separate extension sheet to record this information, the respondent simply adds the information to the existing table. Processes are in place for extension sheets to be keyed by NPC, but double entries must be reviewed by a statistician before being keyed. It should be noted that there are already plans to add an additional line to the hay and field crop table of the short form and fewer respondents known to have multiple crops will be included in the actual Census short form sample.

### 3.3 Comparisons from Follow Up Re-interviews

Follow up interviews were completed with 486 respondents ( 230 long form and 256 short form). (The numbers below include all respondents who answered that particular question. For many questions some respondents did not answer, so total responses will be less.)

Follow up respondents were asked to report how much time it took them to complete the form. There was very little difference between the average amount of time reported to complete the
questionnaire. All answers keyed as 0 were omitted; average time was calculated for the remaining respondents. Similar proportions of respondents also reported using the instruction sheet (short form $65.2 \%$, long form $64.5 \%$ ).

Table 14. Respondent reported time to complete form by form type

|  | Average Reported <br> Time to Complete <br> (minutes) | Range (minutes) | Percent Reporting <br> Use of Instruction <br> Sheet |
| :--- | :---: | :---: | :---: |
| Short Form | 44.46 | $2-300$ | $65.2 \%$ |
| Long Form | 47.87 | $10-480$ | $64.5 \%$ |

Note: if the one respondent who reported 480 is omitted, the average time for the remaining long form respondents is 45.49 minutes.

Similar to percentages found in the reported data, the percent of re-interview respondents who had Total Acres Operated by ownership that did not equal Total Acres Operated by land use (K46 <> K798) was greater on the short form (short: 39.6\%; long: 21.35\%). Several comments by short form follow up interview respondents indicated that since they had reported their crop acreage in Section 2, that they did not include those acreages in K798 in Section 3. On the long form, the two series of Total Acres Operated questions appear directly facing each other and are not separated by production questions, as on the short form. The other major problem was short form respondents skipping over this section due to interpreting it to only apply to government payments since the Section title is "Land and Government Payments".

Slightly more short form follow up respondents reported having agricultural activity that they did not include on the form and other problems completing the form. The specific comments given to these two questions are shown in Appendix D and E.

Table 15. Omitted production or problems reporting by form type

|  | Respondents with <br> unreported agricultural <br> activity (percent) | Respondents with other <br> reporting problems <br> (percent) |
| :--- | :---: | :---: |
| Short Form | $9.9 \%$ | $22.3 \%$ |
| Long Form | $7.4 \%$ | $21.2 \%$ |

### 3.4 Calls to the Census Toll Free Telephone Number

Both the long and short forms included a toll free number that respondents could call with questions or for help completing the form. The percentage of operations that called the toll free number was small overall. Operators answering the calls logged comments for problems or actions taken for the calls (multiple comments could be logged for a single call.) A significantly smaller number of comments were logged for the short form sample operations to the toll free number. (The percent of comments logged for operations mailed the updated 2002 form version was $2.4 \%$, the same as the long form.)

Table 16. Comments logged by toll free number operators

|  |  | Total Forms <br> Mailed |
| :--- | :---: | :---: |
| Short Form | 12808 | Total Comments <br> Logged (\%)* |
| Long Form | 14860 | $312(2.4 \%)$ |

* $\chi^{2}(1, \mathrm{~N}=27668)=6.9 ; \mathrm{p}=.009$


### 3.5 Follow Up Re-interview Information from Short Form Respondents

Follow up re-interview respondents who had completed the short form were asked several questions that applied to the short form only. The short form listed a limited set of example crops and livestock while the long form listed all major crops and livestock items. Twenty-three short form respondents (10.4\%) said they had crops or livestock not listed in the printed examples. Fourteen of those reported that they did not include these in the tables. None reported using a separate sheet to report them, thirteen of the fourteen omitted crops/livestock entirely, and 4 reported including something on the form but outside the tables.

Short form tables also had considerably fewer rows in the tables for reporting. Eighteen respondents $(8.2 \%)$ said they did not have enough rows to report all their crops or livestock. Of those, half reported that they omitted crops or livestock from the form. Four reported them on the form outside the table, and 2 put them on a separate sheet. Again, it should be noted that in the Census, operations known to have more commodities than can be reported in the short form tables will be omitted from the short form sample.

Twenty-two short form respondents reported they raised specialty livestock. Of these, nine ( $41 \%$ ) said they did not report the number on hand on the form. (Items included, bison, elk, alligators, horses, bees, rabbits and sheep.) Twenty-four reported producing livestock products, with 12 reporting they did not enter them on the form. (Omitted livestock products included milk, wool, honey, semen, and chicken manure.) The number of operations for which these reporting errors might occur will be minimized in the census, since operations known to have multiple or specialty commodities will not be included in the short form sample. However, if these operations with these characteristics are inadvertently given short forms, there may be some underreporting.

## 4. Discussion and Conclusion

For many respondents, a large number of the questions on the census of agriculture long form do not have to be completed. Therefore, a substantially shorter form could be utilized and allow these respondents to move through the form more quickly. In the 2005 Census Content Test, our gross measures of the time to complete the form (self reported respondent estimates) indicate that the short form is slightly faster to complete. A short form with half the number of pages will also cost less to print and mail. There is potential for substantial savings with the large volume of postal mailings in the census.

However, reducing the size of the form did not increase the number of respondents who returned the forms. The response rate was similar across the two forms in the content test and was
actually slightly lower for the short form than the long form. We should not expect the short form to prompt higher response rates in the census.

The short form also did not perform as well as the long form in several key areas, including reporting of total acres operated, crop production, government payments, milk sales, and horses. The short form is also more likely to prompt omissions, both due to the limited list of examples on the form and limited space to report in the tables. The limited size of the tables is also more likely to increase processing costs both in NPC and NASS analyst review time.

Based on these findings, several changes have been made in the forms and data collection plans for the 2007 Census of Agriculture. For example, the more detailed questions asking about government payments from the long form will be used on both versions of the form. Additional blank lines have also been added to several of the short form write in tables. In addition, the list of characteristics which will exclude operations from the short form sample has been expanded to include those for which we found major underreporting. This includes operations with horses, specialty commodities (such as goats, sheep, bees, aquaculture, mink, pecans, etc.), more than 4 types of livestock or crops, operations with milk cows, operations with other livestock products, etc.

The changes made to the short form based on information gathered in the 2005 Content Test should reduce other reporting errors. In addition, the limited sample targeted for the short form will likely minimize some of the potential data problems (notably under reporting of rare or numerous commodities). However, there is still potential for some negative effect on data quality, and plans for analyzing and processing data from these forms should take this into consideration.

## REFERENCES

Adams, L.L.M. and Gale, D. (1982). Solving the quandary between questionnaire length and response rate in educational research. Research in Higher Education, Vol 17 (3), pps 231-240.

Bogen, K. (1996). The effect of questionnaire length on response rates -- a review of the literature. 1996 Proceedings of the Section on Survey Research Methods. Alexandria, VA: American Statistical Association, 1996. 1020-1025.

Heberlein, T. A. and Baumgartner, T. (1978). Factors affecting response rates to mailed questionnaires: A quantitative analysis of the published literature. American Sociological Review, Vol. 43, pps. 447-462.

Kalantar, J.S. and Talley, N. J. (1999). The effects of lottery incentive and length of questionnaire on health survey response rates: A randomized study. Journal of Clinical Epidemiology, Vol. 52(11), pp. 1117-1122.

United States Department of Agriculture, National Agricultural Statistics Service. (2006). 2005 Content Test Final Report. Washington, DC: USDA, National Agricultural Statistics Service.

APPENDIX A.: Examples of Major Differences Between the Long and Short Forms.
1a. Field Crops and Hay table - Short Form
Note: Respondent has to enter the unit of measure in column 4; sales are collected in last column.

## SECTION 2 CROPS AND LIVESTOCK

CROPS

1. At any time during 2005, did this operation harvest any field crops or hay and forage crops? Exclude crops grown on land rented to others. Examples include -

| - Alfalfa hay | - Alfalfa seed | - Dry edible beans | - Rye for grain | - Tobacco |
| :--- | :--- | :--- | :--- | :--- |
| - Small grain hay | - Barley for grain | - Emmer and spelt | • Ryegrass seed | - Wheat, Durum |
| - Wild, dry hay | - Buckwheat | - Fescue seeds | - Sorghum for grain | - Wheat, Spring |
| - Other hay (clover, fescue, timothy, etc.) | - Corn for grain | - Oats | - Sorghum for silage | - Wheat, Winter |
| - Alfalfa haylage, grass silage, or greenchop | - Corn for silage | - Peanuts | - Soybeans | - Other field crops, |
| - Other haylage, grass silage, or greenchop | - Cotton | - Rice | - Sugarbeets for sugar | specify below |



## 1b. Field Crops Section - Long Form

Note: Unit of measure is pre-printed in Total Quantity Harvested column; Hay is collected in a separate section; sales are collected in another separate section.

## SECTION 5 FIELD CROPS

1. Were any field crops, such as com, wheat, rice, etc., harvested from this operation in 2005 ? Include your landlord's share and crops grown under contract. Exclude crops grown on land rented to others.
1011Yes - Complete this section 3 [ No - Go to SECTION 6
2. For those crops not printed in the following table, enter the crop name and codp from the list below for any other field crop harvested in 2005. Report quantity harvested in the unit specified with the crop name.


## 2a. Other Livestock and Livestock Products Table - Short Form

 Note: Horses listed as first example above table.| 9. At any time during 2005, did you or anyone else raise, produce, or sell any other livestock or livestock products on this operation? Examples include - |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| - Horses - Milk goats, goat milk - Milk from <br> - Hogs, breeding - Angora goats, mohair - Colonies <br> - Hogs, other - Other goats - Llamas, <br> ${ }_{1037}$   | s $\bullet$ Mule <br> 正  <br> as  | burros, donkeys <br> s, mink <br> deer, elk | - Sheep, wool <br> - Fish in captivity <br> - Livestock products, specify <br> - Other livestock, specify |  |
| Livestock and Their Products <br> If more space is needed, use a separate sheet of paper | Number on hand December 31, 2005 | Total number sold or moved from this operation in 2005 |  |  |
|  |  |  | \$ | 00 |
|  |  |  | \$ | 00 |
|  |  |  | \$ | . 00 |
|  |  |  | \$ | . 00 |

2b. Other Animals and Livestock Products Section - Long Form Note: "Horses and ponies" individually listed in table.


## 3a. Government Payments - Short Form



## 3b. Government Programs - Long Form

## SECTION 4 CONSERVATION PROGRAMS AND CROP INSURANCE

1. Were any acres in this operation enrolled in any federal conservation programs or covered by any crop insurance in 2005?
1151Yes - Complete this section 3No - Go to SECTION 5
2. How many acres in this operation were enrolled in the Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), Farmable Wetlands Program (FWP), or Conservation Reserve Enhancement Program (CREP), on September 30, 2005? $\qquad$

| Number of Acres |  |
| :---: | :---: |
|  |  |
| Dollars |  |
| $\$$ |  |
| Number of Acres |  |
|  |  |
|  |  |

## SECTION 24 FEDERAL AND STATE AGRICULTURAL PROGRAM PAYMENTS

1. Did this operation receive any Federal, State, or local agricultural program payments in 2005? Exclude CCC loan payments. Also exclude CRP, WRP, FWP, and CREP payments reported in SECTION 4. 1036Yes - Complete this section 3No - Go to SECTION 25 below
2. Amount received from -

None

a. Direct payments as defined under the 2002 Farm Act.
. . . . . . . . . . . 1420
b. Counter-cyclical payments, loan deficiency payments (LDPs), marketing loan gains, and net value of commodity certificates. Include payments received through cooperatives.
c. Other Federal agricultural program payments. Include disaster payments and market loss payments, peanut quota compensation payments, national dairy market loss payments, non-insured assistance program, EQIP (Environmental Quality Incentives Program), livestock programs, and any other Federal programs. Exclude any type of insurance payments received.
d. State and local government agricultural program payments. 1423$\$$
\$ .00

## APPENDIX B: Sample Distribution by Form and Operation Type

## GENERAL SAMPLE CATEGORIES

The table below describes the different subsamples of interest for the 2005 Census Content Test. Once a record was sampled for one of the categories below, it was removed from further sampling. List codes with small populations were sampled first with hopes that the needed sample sizes would be met for all categories.

Populations were sorted by Statepoid and then a systematic sample was created to ensure a geographic coverage in all States. Note: there were two exceptions below.

List Group 52 - Ten percent of the samples were from Oklahoma.
List Group 64 - Twenty-five percent of the sample were from North Carolina.
[List Groups 23, 87, \& 88 - Poultry contractors, multi-county operations, and multi-state operations were originally included as target groups. However, these were subsequently removed and not sampled separately. To avoid renumbering all the assigned list codes, these groups remain in the listing with zero (0) as the number of samples pulled.]

## General Sample

| Category | Criteria | Census <br> Data Type | List <br> Group | Count <br> in pool | Long <br> Form <br> Sample | Short <br> Form <br> Sample | 2002 <br> Form <br> Sample |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Direct sales | K920>50 | Rawdata | 1 | 68252 | 200 | 200 | 25 |
| Organics | K1069, K1350, <br> ELMO304: any $>0$ | Rawdata | 2 | 7995 | 200 | 200 | 25 |
| CCC loans | K1411>20 | all types | 3 | 86628 | 200 | 100 | 25 |
| Other government <br> payments | K1412>20 | all types | 4 | 427912 | 200 | 300 | 25 |
| Farm related income | sum(K992, K993, <br> K994, K1401, <br> K1402, K1403)>20 | Rawdata | 5 | 382337 | 100 | 100 | 25 |
| Other production <br> expense $>5000$ | K1518>5000 | Rawdata | 6 | 77507 | 100 | 50 | 25 |
| Landlord expense | K1519>20 | all types | 7 | 34243 | 200 | 100 | 25 |
| Migrant workers | K1573=1 | Rawdata | 8 | 10999 | 100 | 50 | 25 |
| Reservation land use | K1053>0 | Edited | 9 | 5669 | 100 | 50 | 25 |
| Family corporation | K1681=1 | Rawdata | 10 | 46597 | 50 | 20 | 25 |
| 10+ stockholders | K1683=1 | Rawdata | 11 | 1846 | 50 | 20 | 25 |
| Farm occup and $>99$ days <br> off farm | K928=1, K929>3 | Rawdata | 12 | 175979 | 200 | 100 | 25 |
| Other occup and <50 days <br> off farm | K928=2, K929<3 | Rawdata | 13 | 104577 | 200 | 100 | 25 |
| No days off the farm | K929=1 | Rawdata | 14 | 554431 | 200 | 100 | 25 |
| Hispanic | K927=1 | Rawdata | 15 | 19994 | 100 | 100 | 25 |
| Hired manager | K1576=1 or ELMO | Rawdata | 16 | 50339 | 200 | 20 | 25 |

## General Sample

| Category | Criteria | Census Data Type | List Group | Count in pool | Long <br> Form <br> Sample | Short <br> Form Sample | 2002 <br> Form Sample |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | manager flag=1 |  |  |  |  |  |  |
| Abnormal | ELMO abmormal id $>0$ |  | 17 | 2801 | 50 | 25 | 0 |
| Computer O/S record | ELMO218=58 |  | 18 | 65705 | 200 | 200 | 25 |
| Census I/S now O/S on ELMO | ELMO218=61 but AS (3, 4, 6, 11, 16, 17, 50) |  | 19 | 51385 | 200 | 200 | 0 |
| Active Status $=08$ | ELMO active status $=08$ with a List to List link |  | 20 | 72835 | 150 | 150 | 0 |
| Bison | $\begin{aligned} & \text { sum }(\text { K886,K887 })>2 \\ & \text { or ELMO691>2 } \end{aligned}$ | Rawdata | 21 | 3396 | 100 | 50 | 25 |
| Unlisted livestock on census | sum(K857,K858)>2 | Rawdata | 22 | 2044 | 150 | 150 | 25 |
| Poultry contractor w/ birds | $\begin{aligned} & \hline \text { ELMO759, } \\ & \text { ELMO764, } \\ & \text { ELMO771: } \\ & \text { any }>1000 \\ & \hline \end{aligned}$ |  | 23 | 21 | 0 | 0 | 0 |
| Poultry contractee | $\begin{aligned} & \text { ELMO759, } \\ & \text { ELMO764, } \\ & \text { ELMO771 = } \\ & \hline \end{aligned}$ |  | 24 | 24502 | 100 | 200 | 25 |
| Short rotation woody crops | K1025>1 | Rawdata | 25 | 2689 | 100 | 100 | 25 |
| Refusals | ELMO person status contains 'REFUSAL' |  | 26 | 28983 | 100 | 100 | 25 |
| Horse farms inactive on ELMO | Inactive horse farms with active <br> websites: AS (3, 4, $6,11,16,17,18,50)$ |  | 27 | 50 | 25 | 25 | 0 |
| Rents in all land | K44=K46 | Rawdata | 28 | 77162 | 200 | 200 | 25 |
| Has AUM land | K54 >0 in 1997 | all types | 29 | 28109 | 200 | 200 | 25 |
| Has summer fallow | K791>1 | Rawdata | 30 | 19789 | 100 | 100 | 25 |
| Government payments only | TVP $=0$, TVPG>0 | calculated | 31 | 124055 | 300 | 300 | 25 |
| Crop insurance | K1067>1 | Imputation /rawdata | 32 | 310018 | 150 | 150 | 25 |
| Tobacco | ELMO382>O |  | 33 | 58437 | 400 | 200 | 25 |
| Potatoes | ELMO360>0 |  | 34 | 8688 | 300 | 200 | 25 |
| Sweet potatoes | ELMO380>0 |  | 35 | 2186 | 200 | 100 | 25 |
| Ginseng | K767>0 | Rawdata | 36 | 304 | 50 | 50 | 20 |
| Cotton in TX, AZ, CA, NM | ELMO325>0 |  | 37 | 13192 | 200 | 50 | 25 |
| Rice in AR, LA, CA, MO, TX | ELMO365>0 |  | 38 | 7101 | 200 | 200 | 25 |
| Multiple types of wheat | Count(K572, K728, K578) >1 in regions <br> $3,8,9,10,11$ | Rawdata | 39 | 4970 | 200 | 300 | 25 |

General Sample

| Category | Criteria | Census Data Type | List Group | Count in pool | Long <br> Form <br> Sample | Short <br> Form <br> Sample |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Has one wheat crop | Count(K572, K728, K 578 ) $=1$ in regions $3,8,9,10,11$ | all types | 40 | 42621 | 100 | 300 | 25 |
| Has corn for grain and silage | K67>1 and K70>1 | Rawdata | 41 | 48666 | 100 | 300 | 25 |
| Hay | ELMO344>0 or ELMO345>0 |  | 42 | 890250 | 200 | 400 | 25 |
| Christmas trees | ELMO942>0 |  | 43 | 17906 | 100 | 200 | 25 |
| Maple | $\begin{aligned} & \text { ELMO902>0 or } \\ & \text { ELMO903>0 } \end{aligned}$ |  | 44 | 7179 | 100 | 200 | 25 |
| Tobacco transplants possibility | ELMO382>0 and (ELMO913>0 or ELMO916>0) |  | 45 | 411 | 150 | 100 | 25 |
| Nursery | Nursery codes from Census and ELMO |  | 46 | 56786 | 300 | 200 | 25 |
| Asparagus | ELMO515>0 |  | 47 | 2618 | 100 | 100 | 25 |
| Squash | ELMO558>0 |  | 48 | 10322 | 100 | 100 | 25 |
| Peas | $\begin{aligned} & \text { Count(ELMO574, } \\ & \text { ELMO559, } \\ & \text { ELMO551)>0 } \end{aligned}$ |  | 49 | 7289 | 300 | 100 | 25 |
| Processed vegetables | VEGP>0 or <br> Sum(ELMO517, <br> ELMO522, <br> ELMO537,ELMO5 <br> 41, ELMO549, <br> ELMO556, <br> ELMO562, <br> ELMO565, <br> ELMO573)>0 | calculated | 50 | 10611 | 200 | 100 | 25 |
| Any vegetables | ELMO500>0 |  | 51 | 56235 | 300 | 400 | 25 |
| Pecans | ELMO416 |  | 52 | 14561 | 200 | 100 | 25 |
| Peaches | CA and AZ: <br> ELMO451>0 and <br> ELMO452>0 |  | 53 | 317 | 50 | 50 | 20 |
| Berries | K1043>. 1 or Sum(ELMO426, ELMO428, ELMO435, ELMO464, ELMO465, ELMO467, ELMO468, ELMO487, ELMO488) >0 | Rawdata | 54 | 16612 | 200 | 200 | 25 |
| Beef cow total $=$ cattle total | $\begin{aligned} & \text { K803=K804, } \\ & \text { K804>20 } \end{aligned}$ | Rawdata | 55 | 16790 | 350 | 200 | 25 |
| Edit changed cattle parts | $\begin{aligned} & \text { Sum(K804, K805, } \\ & \text { K1206) }>0 \end{aligned}$ | edited/ imputed | 56 | 59195 | 350 | 200 | 25 |
| Milk | K1340>20 | Rawdata | 57 | 47703 | 100 | 250 | 25 |

General Sample

| Category | Criteria | Census Data Type | List Group | Count in pool | Long <br> Form <br> Sample | Short <br> Form <br> Sample |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Cattle in selected states: $47,1,42,19,20,48,8,6$, 4, 53 | ELMO610>0 |  | 58 | 334566 | 350 | 200 | 25 |
| COF capacity<100 | ELMO621<100 |  | 59 | 81455 | 200 | 0 | 25 |
| COF capacity>99 | ELMO621>99 |  | 60 | 26261 | 200 | 0 | 25 |
| Layers | $\begin{aligned} & \text { Sum(K892, } \\ & \text { K893)>2 or } \\ & \text { sum(ELMO758, } \\ & \text { ELMO759, } \\ & \text { ELMO760, } \\ & \text { ELMO761, } \\ & \text { ELMO762)>0 } \\ & \hline \end{aligned}$ | Rawdata | 61 | 121321 | 200 | 200 | 25 |
| Pullets | $\begin{aligned} & \hline \text { Sum(K1221, } \\ & \text { K895) }>2 \text { or } \\ & \text { sum(ELMO757, } \\ & \text { ELMO763) }>0 \\ & \hline \end{aligned}$ | Rawdata | 62 | 15901 | 200 | 150 | 25 |
| Broilers | $\begin{aligned} & \hline \text { Sum(K898, } \\ & \text { K899)>2 or } \\ & \text { sum(ELMO753, } \\ & \text { ELMO764, } \\ & \text { ELMO765, } \\ & \text { ELMO766)>0 } \\ & \hline \end{aligned}$ | Rawdata | 63 | 42907 | 200 | 150 | 25 |
| Turkeys | $\begin{aligned} & \hline \text { Sum(K1223, } \\ & \text { K1224)>2 or } \\ & \text { sum(ELMO754, } \\ & \text { ELMO770, } \\ & \text { ELMO771, } \\ & \text { ELMO772, } \\ & \text { ELMO775)>0 } \\ & \hline \end{aligned}$ | Rawdata | 64 | 16806 | 200 | 100 | 25 |
| Poultry hatch | $\begin{aligned} & \text { K916>1 or } \\ & \text { sum(ELMO751, } \\ & \text { ELMO752, } \\ & \text { ELMO753, } \\ & \text { ELMO754) }>0 \\ & \hline \end{aligned}$ | Rawdata | 65 | 18228 | 200 | 150 | 25 |
| All other poultry | Other poultry codes from Census and ELMO where sum>4 | Rawdata | 66 | 32547 | 200 | 400 | 25 |
| Hogs in IA and NC | $\begin{aligned} & \text { K815>1 or } \\ & \text { ELMO633>1 } \end{aligned}$ | Rawdata | 67 | 10813 | 300 | 200 | 25 |
| Sheep in selected states: 6, 54, 51, 47, 30, 56 | $\begin{aligned} & \text { Sum }(\text { K824, } \\ & \text { K825)>2 or } \\ & \text { ELMO640>1 } \end{aligned}$ | Rawdata | 68 | 9785 | 200 | 100 | 25 |
| Bees | $\begin{aligned} & \text { Sum }(\text { K839, K840, } \\ & \text { K841)>3 or } \\ & \text { sum(ELMO660, } \\ & \text { ELMO662, } \\ & \text { ELMO663)>0 } \\ & \hline \end{aligned}$ | Rawdata | 69 | 27396 | 100 | 100 | 25 |
| Horses in selected states: $12,51,36,21,48,19,32$ | $\begin{aligned} & \text { Sum(K830, K831, } \\ & \text { K833, K834)>2 or } \end{aligned}$ | Rawdata | 70 | 128925 | 400 | 200 | 25 |

General Sample

| Category | Criteria | Census Data Type | List Group | Count in pool | Long <br> Form <br> Sample | Short <br> Form <br> Sample | 2002 <br> Form <br> Sample |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { sum(ELMO674, } \\ & \text { ELMO675)>0 } \end{aligned}$ |  |  |  |  |  |  |
| Other listed livestock | Other livestock codes from Census and ELMO | Rawdata | 71 | 113452 | 200 | 400 | 25 |
| Livestock products exc. Milk | $\begin{aligned} & \text { Sum(K828,K849,K8 } \\ & 41, K 970, K 1305)>3 \end{aligned}$ | Rawdata | 72 | 29384 | 200 | 200 | 25 |
| Vegetable contract | K1312>500 | Rawdata | 73 | 109 | 50 | 0 | 20 |
| Other livestock contract | K1310>100 | Rawdata | 74 | 95 | 50 | 0 | 20 |
| Custom fed cattle contract | K1308>100 | Rawdata | 75 | 1567 | 100 | 0 | 25 |
| Horses in selected states coded as services: 12, 51, 36, 21, 48, 19, 32 | [Sum(K830, K831, K833, K834)>2 or sum(ELMO674, ELMO675)>0] and ELMO674=2 | Rawdata | 76 | 190 | 50 | 50 | 20 |
| Rangeland>10000 | K796>10000 | Rawdata | 77 | 2554 | 200 | 100 | 25 |
| Age>60 | $\begin{aligned} & \text { ELMO dtbirth < = } \\ & 01 / 01 / 46 \end{aligned}$ |  | 78 | 717750 | 300 | 300 | 25 |
| Peanuts | ELMO354>0 |  | 79 | 9702 | 200 | 100 | 25 |
| Fruits/nuts | K121>.1 or | Rawdata | 80 | 116735 | 200 | 400 | 25 |
| Other cattle=total cattle | K803=K1206 | Rawdata | 81 | 62889 | 200 | 200 | 25 |
| Hairsheep | Hand provided list keyed into file |  | 82 | 30 | 20 | 10 | 0 |
| Landlord only | Active status =04 |  | 83 | 238949 | 300 | 300 | 0 |
| Operators>5 | K1575>5 | Rawdata | 84 | 3267 | 50 | 0 | 25 |
| 85/45s | (AS=0 and OD=85) with OD45 | ignored farmflag | 85 | 11415 | 100 | 100 | 0 |
| Partnerships | (AS=0 and OD in $(0,45,85,99))$ with OD=44 | ignored farmflag | 86 | 141953 | 100 | 100 | 0 |
| Multi-county operations | $\begin{aligned} & \hline(\mathrm{AS}=0 \text { and } \mathrm{OD}= \\ & \text { any), with } \\ & \text { polinktype } 25 \text { from } \\ & \mathrm{AS}=09 \text { and (parent } \\ & \text { state }=\mathrm{AS} 09 \text { state } \\ & \text { for all AS09s) } \\ & \hline \end{aligned}$ | ignored farmflag | 87 | 443 | 0 | 0 | 0 |
| Multi-state operations | ( $\mathrm{AS}=0$ and $\mathrm{OD}=$ any), with polinktype 25 from AS=09 and (parent state <> AS09 state for one or more AS09s) | ignored farmflag | 88 | 179 | 0 | 0 | 0 |
| Vegetables under glass | K503>400 |  | 89 | 1418 | 75 | 50 | 25 |
| Hispanic changed |  |  | 91 | 523 | 100 | 100 | 25 |
| Reservation county |  |  | 92 | 1079 | 75 | 75 | 25 |
| EDR respondents- I | File provided by Gail Gregory |  | 93 | 1567 | 50 | 50 | 13 |

## General Sample

| Category | Criteria | Census <br> Data Type | List Group | Count in pool | Long <br> Form <br> Sample | Short <br> Form <br> Sample | 2002 <br> Form <br> Sample |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EDR respondents- II | Sampled from remainder of LC 93 |  | 94 | 1567 | 50 | 50 | 12 |
| Special Case |  |  |  |  |  |  |  |
| Aquaculture | Hand provided list |  | 90 | 0 | 0 | 10 | 0 |
| Totals |  |  |  |  | 14,995 | 12,905 | 2,000 |

APPENDIX C: Response rates by form type and subsample

| List Group |  | Long Form Sample | Long Form returns | Short Form Sample | Short form returns | Long Form Response Rate | Short form Response Rate | Diff. in Response Rate |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Direct sales | 200 | 132 | 200 | 115 | 66.00 | 57.50 | 8.50 |
| 2 | Organics | 200 | 130 | 200 | 123 | 65.00 | 61.50 | 3.50 |
| 3 | CCC loans | 200 | 111 | 100 | 48 | 55.50 | 48.00 | 7.50 |
| 4 | Other government payments | 200 | 119 | 300 | 169 | 59.50 | 56.33 | 3.17 |
| 5 | Farm related income | 100 | 61 | 100 | 60 | 61.00 | 60.00 | 1.00 |
| 6 | Other production expense>5000 | 100 | 53 | 50 | 23 | 53.00 | 46.00 | 7.00 |
| 7 | Landlord expense | 200 | 117 | 100 | 49 | 58.50 | 49.00 | 9.50 |
| 8 | Migrant workers | 100 | 51 | 50 | 22 | 51.00 | 44.00 | 7.00 |
| 9 | Reservation land use | 100 | 45 | 50 | 19 | 45.00 | 38.00 | 7.00 |
| 10 | Family corporation | 50 | 33 | 20 | 9 | 66.00 | 45.00 | 21.00 |
| 11 | 10+ stockholders | 50 | 33 | 20 | 12 | 66.00 | 60.00 | 6.00 |
| 12 | Farm occup and >99 days off farm | 200 | 109 | 100 | 57 | 54.50 | 57.00 | -2.50 |
| 13 | Other occup and < 50 days off farm | 200 | 127 | 100 | 68 | 63.50 | 68.00 | -4.50 |
| 14 | No days off the farm | 200 | 126 | 100 | 54 | 63.00 | 54.00 | 9.00 |
| 15 | Hispanic | 100 | 53 | 100 | 52 | 53.00 | 52.00 | 1.00 |
| 16 | Hired manager | 200 | 86 | 20 | 10 | 43.00 | 50.00 | -7.00 |
| 17 | Abnormal | 50 | 24 | 25 | 12 | 48.00 | 48.00 | 0.00 |
| 18 | Computer O/S record | 200 | 121 | 200 | 130 | 60.50 | 65.00 | -4.50 |
| 19 | Census I/S now O/S on ELMO | 200 | 131 | 200 | 109 | 65.50 | 54.50 | 11.00 |
| 20 | Active Status $=08$ | 150 | 65 | 150 | 67 | 43.33 | 44.67 | -1.33 |
| 21 | Bison | 100 | 41 | 50 | 31 | 41.00 | 62.00 | -21.00 |
| 22 | Unlisted livestock on census | 150 | 62 | 150 | 83 | 41.33 | 55.33 | -14.00 |
| 24 | Poultry contractee | 100 | 62 | 200 | 95 | 62.00 | 47.50 | 14.50 |
| 25 | Short rotation woody crops | 100 | 62 | 100 | 56 | 62.00 | 56.00 | 6.00 |
| 26 | Refusals | 100 | 45 | 100 | 38 | 45.00 | 38.00 | 7.00 |
| 27 | Horse farms inactive on ELMO | 25 | 6 | 25 | 9 | 24.00 | 36.00 | -12.00 |
| 28 | Rents in all land | 200 | 106 | 200 | 96 | 53.00 | 48.00 | 5.00 |
| 29 | Has AUM land | 200 | 93 | 200 | 102 | 46.50 | 51.00 | -4.50 |
| 30 | Has summer fallow | 100 | 53 | 100 | 54 | 53.00 | 54.00 | -1.00 |
| 31 | Government payments only | 300 | 209 | 300 | 212 | 69.67 | 70.67 | -1.00 |
| 32 | Crop insurance | 150 | 84 | 150 | 77 | 56.00 | 51.33 | 4.67 |
| 33 | Tobacco | 400 | 211 | 200 | 108 | 52.75 | 54.00 | -1.25 |
| 34 | Potatoes | 300 | 166 | 200 | 112 | 55.33 | 56.00 | -0.67 |


| 35 | Sweet potatoes | 200 | 103 | 100 | 46 | 51.50 | 46.00 | 5.50 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 36 | Ginseng | 50 | 36 | 50 | 32 | 72.00 | 64.00 | 8.00 |
| 37 | Cotton in TX, AZ, CA, NM | 200 | 87 | 50 | 23 | 43.50 | 46.00 | -2.50 |
| 38 | Rice in AR, LA, CA, MO, TX | 200 | 85 | 200 | 60 | 42.50 | 30.00 | 12.50 |
| 39 | Multiple types of wheat | 200 | 101 | 300 | 156 | 50.50 | 52.00 | -1.50 |
| 40 | Has one wheat crop | 100 | 65 | 300 | 168 | 65.00 | 56.00 | 9.00 |
| 41 | Has corn for grain and silage | 100 | 51 | 300 | 155 | 51.00 | 51.67 | -0.67 |
| 42 | Hay | 200 | 94 | 400 | 189 | 47.00 | 47.25 | -0.25 |
| 43 | Christmas trees | 100 | 70 | 200 | 128 | 70.00 | 64.00 | 6.00 |
| 44 | Maple | 100 | 58 | 200 | 100 | 58.00 | 50.00 | 8.00 |
| 45 | Tobacco transplants possibility | 150 | 86 | 100 | 50 | 57.33 | 50.00 | 7.33 |
| 46 | Nursery | 300 | 200 | 200 | 108 | 66.67 | 54.00 | 12.67 |
| 47 | Asparagus | 100 | 60 | 100 | 54 | 60.00 | 54.00 | 6.00 |
| 48 | Squash | 100 | 49 | 100 | 48 | 49.00 | 48.00 | 1.00 |
| 49 | Peas | 300 | 127 | 100 | 49 | 42.33 | 49.00 | -6.67 |
| 50 | Processed vegetables | 200 | 104 | 100 | 52 | 52.00 | 52.00 | 0.00 |
| 51 | Any vegetables | 300 | 149 | 400 | 189 | 49.67 | 47.25 | 2.42 |
| 52 | Pecans | 200 | 114 | 100 | 53 | 57.00 | 53.00 | 4.00 |
| 53 | Peaches | 50 | 26 | 50 | 16 | 52.00 | 32.00 | 20.00 |
| 54 | Berries | 200 | 107 | 200 | 104 | 53.50 | 52.00 | 1.50 |
| 55 | Beef cow total = cattle total | 350 | 182 | 200 | 94 | 52.00 | 47.00 | 5.00 |
| 56 | Edit changed cattle parts | 350 | 217 | 200 | 119 | 62.00 | 59.50 | 2.50 |
| 57 | Milk | 100 | 60 | 250 | 133 | 60.00 | 53.20 | 6.80 |
| 58 | Cattle in selected states: $\begin{aligned} & 47,1,42,19,20,48,8 \\ & 6,4,53 \end{aligned}$ | 350 | 183 | 200 | 105 | 52.29 | 52.50 | -0.21 |
| 59 | COF capacity<100 | 200 | 110 | 0 | 0 | 55.00 |  |  |
| 60 | COF capacity>99 | 200 | 86 | 0 | 0 | 43.00 |  |  |
| 61 | Layers | 200 | 101 | 200 | 105 | 50.50 | 52.50 | -2.00 |
| 62 | Pullets | 200 | 119 | 150 | 87 | 59.50 | 58.00 | 1.50 |
| 63 | Broilers | 200 | 97 | 150 | 81 | 48.50 | 54.00 | -5.50 |
| 64 | Turkeys | 200 | 99 | 100 | 52 | 49.50 | 52.00 | -2.50 |
| 65 | Poultry hatch | 200 | 129 | 150 | 75 | 64.50 | 50.00 | 14.50 |
| 66 | All other poultry | 200 | 121 | 400 | 221 | 60.50 | 55.25 | 5.25 |
| 67 | Hogs in IA and NC | 300 | 162 | 200 | 98 | 54.00 | 49.00 | 5.00 |
| 68 | Sheep in selected states: $6,54,51,47,30,56$ | 200 | 101 | 100 | 51 | 50.50 | 51.00 | -0.50 |
| 69 | Bees | 100 | 62 | 100 | 58 | 62.00 | 58.00 | 4.00 |
| 70 | Horses in selected states: 12, 51, 36, 21, 48, 19, 32 | 400 | 193 | 200 | 89 | 48.25 | 44.50 | 3.75 |
| 71 | Other listed livestock | 200 | 112 | 400 | 203 | 56.00 | 50.75 | 5.25 |


| 72 | Livestock products exc. Milk | 200 | 117 | 200 | 125 | 58.50 | 62.50 | -4.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 73 | Vegetable contract | 50 | 22 | 0 | 0 | 44.00 |  |  |
| 74 | Other livestock contract | 50 | 19 | 0 | 0 | 38.00 |  |  |
| 75 | Custom fed cattle contract | 100 | 47 | 0 | 0 | 47.00 |  |  |
| 76 | Horses in selected states coded as services: $12,51,36,21,48,19$ $32$ | 50 | 14 | 50 | 14 | 28.00 | 28.00 | 0.00 |
| 77 | Rangeland>10000 | 200 | 94 | 100 | 42 | 47.00 | 42.00 | 5.00 |
| 78 | Age>60 | 300 | 191 | 300 | 185 | 63.67 | 61.67 | 2.00 |
| 79 | Peanuts | 200 | 70 | 100 | 36 | 35.00 | 36.00 | -1.00 |
| 80 | Fruits/nuts | 200 | 111 | 400 | 214 | 55.50 | 53.50 | 2.00 |
| 81 | Other cattle=total cattle | 200 | 121 | 200 | 118 | 60.50 | 59.00 | 1.50 |
| 82 | Hairsheep | 20 | 12 | 10 | 4 | 60.00 | 40.00 | 20.00 |
| 83 | Landlord only | 300 | 184 | 300 | 179 | 61.33 | 59.67 | 1.67 |
| 84 | Operators>5 | 50 | 25 | 0 | 0 | 50.00 |  |  |
| 85 | 85/45s | 100 | 48 | 100 | 52 | 48.00 | 52.00 | -4.00 |
| 86 | Partnerships | 100 | 56 | 100 | 56 | 56.00 | 56.00 | 0.00 |
| 89 | Vegetables under glass | 75 | 42 | 50 | 27 | 56.00 | 54.00 | 200 |
| 91 | Hispanic changed | 100 | 58 | 100 | 51 | 58.00 | 51.00 | 7.00 |
| 92 | Reservation county | 75 | 33 | 75 | 30 | 44.00 | 40.00 | 4.00 |
| 93 | EDR respondents- I | 50 | 40 | 50 | 37 | 80.00 | 74.00 | 6.00 |
| 94 | EDR respondents- II | 50 | 37 | 50 | 42 | 74.00 | 84.00 | -10.00 |
| 90 | Aquaculture | 0 | 0 | 10 | 7 |  | 70.00 |  |
| Total |  | 14,995 | 8,174 | 12,905 | 6851 | 54.51 | 53.09 |  |

APPENDIX D: Comments regarding agricultural activity not included on the report form

| Form | State | Comment |
| :--- | :---: | :--- |
| short | 5 | HE SOLD A COUPLE OF GUARD DOGS. |
| short | 6 | NICE SIMPLE FORM-EASY TO FOLLOW-WROTE IN SOME MINOR IDEAS |
| short | 16 | BASICALLY LETTUCE \& BERRIES \& NURSERY STOCK REPOTTED AND <br> REGROWN TO LARGER SIZES, CHICKENS \& EGGS-NOTHING ELSE; |
| short | 16 |  |
| short | 16 | UNUSED PASTURE LAND. |
| short | 16 | DID NOT INCLUDE SMALL PIECES OF DRY LAND FARMS. |
| short | 16 | 2 ACRES OF SOYBEANS PLANTED BY A NEIGHBOR ON PART OF <br> ACREAGE WHERE NON-BEARING STRAWBERRIES WERE LOCATED <br> short |
| short | 17 | AFTER THE STRAWBERRY SEASON |


|  |  | AS PER TONNAGE OF GRAVEL REMOVED |
| :--- | :---: | :--- |
| long | 26 | PA-116 MONIES NOT RECORDED, DID NOT REMEMBER TO DO SO. |
| long | 29 | FARM RELATED BUSINESS. |
|  |  | SOLD \$2000 OF CUT FLOWERS, NOT INCLUDED IN ITEM 6 SECTION21 <br> COST OF FIRE PREVENTION PROGRAMS ARE NOW REQUIRED OF <br> URBAN \& RURAL OPERATORS BY STATE \& LOCAL GOV. |
|  | 41 | 42 | | HAS 18 FRUIT TREES. THE SCREENER IN SECTION II ASKS FOR |
| :--- |
| 20 OR MORE FRUIT TREES. |

APPENDIX E: Comments regarding any other problems reporting

| form | state | comment |
| :---: | :---: | :---: |
| short | 1 | HE HAD DIFFICULTY SEPARATING ACREAGE FOR VEGETABLES THERES NOT |
|  |  | ENOUGH ROOM TO LIST EACH CROP HE ALSO THOUGHT THE HEADING FOR |
|  |  | SECTION 3 WAS MISLEADING. |
| short | 6 | MOST OF THE QUESTIONS DO NOT APPLY |
| short | 6 | MISREAD QUESTION IN SEC. 1 ABOUT ACRES RENTED OUT |
| short | 12 | I DIDN'T HAVE INFORMATION FOR MY EXPENSES |
| short | 13 | WOULD HAVE HAD GREAT TROUBLE IF MORE HAD APPLIED TO ME. |
| short | 16 | TOO DETAILED; WOULDN'T HAVE EXPENSES, UNTIL TAXES DONE; DIFFICULT TO CONVERT SMALL QUANTITIES INTO ACRES |
| short | 16 | IF DATA DID NOT APPLY, OPERATOR CROSSED IT OUT. |
| short | 17 | TIME OF YEAR - RECORD BOOK - TAX MAN - FEBRUARY BETTER TIME |
| short | 17 | MR FISK WAS VERY RELUCTANT TO COMPLETE CENSUS FORM BECAUSE HE FEELS IT IS NOBODY ELSE'S BUSINESS |
| short | 19 | REQUIRED A LOT OF TIME. |
| short | 21 | CONFUSSING |
| short | 23 | K1094--PUT BIRTHDATE (SECTION 15). |
| short | 24 | WHERE TO SPECIFY SHE HAS ONLY PERSONAL USE CROPS (GARDEN) |
| short | 25 | TIME--TAKES TOO MUCH TIME TO COMPLETE. |
| short | 26 | DID NOT TAKE THE TIME TO READ ALL ITEMS AS CLEARLY AS POSSIBLE. |
| short | 26 | GREAT EDUCATION AND LANGUAGE PROBLEMS |
| short | 26 | HE DID NOT HAVE ALL OF HIS INFORMATION YET TO BE ABLE TO COMPLETE THE FORM ACCURATELY. |
| short | 26 | DID NOT ALWAYS UNDERSTAND SOME QUESTIONS AND IF IT WASN'T LISTED THEN NOT INCLUDED-JUST LEFT IT OUT. |
| short | 27 | NOT ENOUGH ROOM FOR VEGETABLE CROPS |
| short | 27 | SHOULD'VE SAID ON SEC3 THAT IT WAS FOR ALL LAND, RENT \& OWN |
| short | 28 | HE HAD PROBLEMS UNDERSTANDING SOME OF THE QUESTIONS. |
| short | 28 | SOME OF QUESTIONS WERE REPEATING THEMSELVES AND TOO LENGTHLY. MISTAKENLY REPORTED AUM ACRES BECAUSE DID NOT UNDERSTAND. |
| short | 29 | WAS NOT SURE IF SHE WAS TO INCLUDE HER HOUSE AS PART OF THE FARM? (SHE DID) |
| short | 29 | THERE WAS NO PLACE TO RECORD SALE OF COW-CALF PAIRS. |
| short | 30 | ABSENTEE LNDLRD, LIVE IN MT \& HAVE 160 AC FARM IN TX I DO NOT ACTIVELY OPERATE. RNT ALL LND OUT ON SHARES. LND RNTD TO OTH NOT SUBTRCTD FROM TTL AC OWNED. SEC 2 OK, EX IN SEC3 |
| short | 34 | SOME COST CATEGORIES IN QUESTION - LABOR QUESTIONS SPECIFIC |
| short | 35 | VERY STRAIGHT FORWARD EXPERIENCED REPORTING IN WORKING WITH USDA SOIL CONSERVATION IN THE PAST |
| short | 37 | WILL NOT GIVE FINANCIAL INFORMATION TO ANYONE NO AGRI-TOURISM ANIMALS NOT FOR SALE/SLAUGHTER |
| short | 37 | HER OPERATION IS SMALL, MANY CROPS HARD TO PUT ON FORM |
| short | 38 | I DID READ QUESTIONNAIRE QUESTIONS GOOD. MADE MISTAKES ON |
| short | 40 | DID NOT UNDERSTAND ITEM 6 IN SEC. 1 ABD DID NOT UNDERSTAND THAT SEC. |


|  |  | 3 WAS FOR ALL LAND. THOUGHT IT WAS FOR GOV. PMT. |
| :--- | ---: | :--- | :--- |
| short | 40 | DID NOT UNDERSTAND SEC. 1, ITEM 6. DID NOT UNDERSTAND SEC. 3, ITEM 5 |
|  |  | SHOULD EQUAL SEC. 1 ITEM 4. |


| long | 47 | FARMERS CONCERNED ABOUT UPCOMING NEW REGULATIONS RAISING CA |
| :--- | ---: | :--- |
| long | 47 | CATTLE; EXMAPLE:NEW REQUIREMENTS INVOLVING IN LIVESTOCK. |
| long | 48 | HE RECEIVED 12000 FOR PEANUT PAYMENT. |
| long | 53 | RAN OUT OF SPACE IN SECTION 10 BUT ADDED 2 ADDITIONAL LINES DID THE |
|  |  | RIGHT THING! |
| long | 55 | WOOL ADDED VALUE FOR SPINNING AND WEAVING. |


[^0]:    ${ }^{1}$ Jaki S. McCarthy is a statistician with the Research and Development Division of the National Agricultural Statistics Service, USDA, Room 305, 3251 Old Lee Highway, Fairfax, VA 22030; email: jaki_mccarthy@ nass.usda.gov. The author would like to thank the entire 2005 Census Content Test Team, many of whom contributed the individual analyses cited.

[^1]:    ${ }^{2}$ Some of the sample categories (sample subgroups) did not have the same number of sample cases for the long and short forms. The weighted response rate for the short form shown in the table was calculated by reweighting the short form subsamples to the long form subsample sizes. This short form response rate is more comparable than the gross unweighted response rate.

[^2]:    ${ }^{3}$ Differences due to some types of operations being selected or responding at a higher or lower rate for the two forms are expected to be minimal, but cannot be ruled out. In addition, it is clear that there are reporting errors in the data, but there was no attempt made to edit any of the data collected. Finally, since the sample was not drawn to allow population estimates, this analysis cannot be used to measure the impact of the forms on population estimates.

