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A Study of Hog Questionnaire Modifications

Douglas G. Kleweno
Michael A. Steiner

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ABSTRACT

This study evaluates effects of changing the placement, order, and wording of questions in list questionnaires used to collect hog survey data. Data were collected in seven States covering two survey periods. Operational and test questionnaire versions were used. The test questionnaires were modified to evaluate changes in the order or wording of some questions, rearranging some groups of questions, and adding new questions. Results indicated significant differences in certain estimates when the order of asking some questions was reversed, when additional questions were asked to break out data for a specific class, and when some sections of the questionnaire were reordered. No significant difference in estimates occurred when a question to clarify farrowing intentions was used or when the location of expected farrowings questions was moved to follow the hog breeding questions.

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SUMMARY

A study was conducted in seven States to evaluate the effect of questionnaire design modifications on hog inventory estimates. Data collection occurred during two survey periods. The list frame sample was divided so certain respondents completed the test questionnaire and other respondents completed the operational questionnaire.

The effects of modifying the operational questionnaire were evaluated using three test questionnaire versions. Multiple changes were made to each test questionnaire. Each test version was designed to evaluate one or more of the questionnaire sections: breeding inventory, market and home use, and expected farrowings. Specific effects evaluated included: (1) changing the position of the expected farrowing questions, (2) reversing the order of market (and home use) hog weight group questions, (3) asking previous 6-month instead of 3-month farrowings for two reporting periods, (4) changing the wording of farrowing intentions questions, and (5) switching the order of sections on breeding and market questions.

The standard operational questionnaire and the test questionnaire versions were evaluated using univariate and multivariate analysis of variance tests for significant differences. The analysis assumed all modifications in the same test instrument were independent. Other criteria for comparison of questionnaires included refusal rates, proportion of questionnaires edited, average amount of editing required for key variables, and enumerator responses to questionnaire changes.

Estimates were significantly affected when (1) the order of market hog weight groups were reversed, (2) previous 6-month farrowings were obtained in two 3-month periods, and (3) hog breeding and marketing inventory sections were asked in reverse order. Questionnaire design changes such as these should be implemented only with caution, given the potential effect on the survey estimates. Further evaluation of asking previous 6-month farrowings is suggested.

Survey estimates were not significantly different when the questionnaire design involved relocating expected farrowing questions immediately after breeding stock questions or rewording farrowing intentions questions to stress sows and gilts have been bred or will be bred. Analysis supported the relocation of the farrowing questions and was also recommended by the enumerator staff. Additional analysis is recommended before changing the wording of farrowing questions due to the limited and inconclusive evidence of this study.

INTRODUCTION

The Statistical Reporting Service (SRS) has conducted probability hog surveys since 1967 to estimate onfarm hog and pig inventory, number of sows farrowed, pig crop, and sows expected to farrow. The questionnaire used to collect data has undergone changes with some questionnaires tested and others not. The primary objective of this study was to evaluate several proposed modifications to the hog and pig inventory section of the questionnaire. The study specifically evaluated the wording, ordering, and placing of questions related to hogs and pigs for market and home use, breeding inventory, and expected farrowings. (Any future reference to market hogs will include home-use consumption).

Placement and wording of questions has often been a matter of great importance in survey practice. In 1936, Hovde sampled a group of researchers and found that 74 percent cited improperly worded questionnaires as the principal defect of research [5]. Stouffer and his collaborators came to a similar conclusion in 1950 [9]. They found that error or bias due to sampling and to methods of questionnaire administration were relatively small when compared to variation due to wording of questions. The Survey Research Centre of London in 1963 found widespread misinterpretation of questions by respondents and pointed out that serious communication problems can exist in survey interviews [1].

In 1978 and 1979, the hog survey questionnaire was changed without testing. The first change involved decreasing the number of market hog weight classes from five to four. Starting in December 1978, the 220 pounds and over weight category was dropped and 180 pounds and over became the heaviest weight class. The effect of this change was a drop in the estimate for market hogs 180 pounds and heavier. A second change involved asking the previous 6-month farrowings rather than the previous 3-month farrowings. This modification changed the level of the survey estimate which resulted in a return to the original question wording.

A study conducted in 1975 by Ford [2] tested the effect of location of acreage questions on the hog questionnaire. The operational hog questionnaire asked these questions at the beginning while the test version asked the same questions at the end. There was no significant difference in total number of hogs reported on the two questionnaire versions; however, the level difference was large enough to be of interest. Dropping the acreage questions entirely caused a significant level difference [6].

A study by Steiner [8] in 1982 evaluated the use of a balance sheet to record hog inventory numbers and alternate ways to obtain farrowing data. The balance sheet approach, which used previous inventory plus current supply minus any disappearance, compared with the regular inventory format on the hog questionnaire, produced significantly different results. The format was disliked by respondents and enumerators. When a difference existed between the two inventory levels, the respondent always indicated the regular inventory to be

correct. The study also recommended a large-scale research project be used to evaluate alternate methods of collecting farrowing data. Initial results from the 1982 study suggested expected farrowing questions should be asked after sow inventory questions.

This project was conducted in seven States as part of the operational hog surveys. The project objective was to examine the effect of questionnaire changes. Specific questionnaire modifications by State are described in table 1. The project was designed to measure the effects of:

- (1) changing the position of the expected farrowings questions,
- (2) reversing the order of market hog weight group questions,
- (3) asking previous 6-month farrowings (farrowings from the previous 4 to 6 months were asked first, followed by farrowings in the last 3-month),
- (4) changing the wording on farrowing intentions questions, and
- (5) switching the order of breeding and market hog sections plus asking farrowings for the last two 3-month periods (Farrowings for the last 3 months were asked first, followed by farrowings from 4 to 6 months before).

This report first discusses the survey design and the questionnaire versions associated with each study. Discussion then covers general analysis methods and the impact of refusals and zero reports by questionnaire version. This is followed by analysis associated with each questionnaire modification and any supported conclusions.

SURVEY DESIGN

Three studies were conducted during the December 1980 and March 1981 Multiple Frame Hog Surveys to study the effects of changing the placement and wording of questions on the hog list questionnaire. Two separate studies were conducted during the December 1980 survey. A third study was conducted during March 1981. The studies were carried out during two different time periods so that the effect of multiple changes in question placement and order on each test questionnaire were removed or were at least reduced. It was assumed that the respondents for each study would react the same if the surveys had been conducted concurrently.

Data collection for this study was conducted concurrent to the regular hog survey. Prior to data collection, each State office reviewed survey procedures with staff to ensure consistent field and office procedures were followed for each questionnaire. The same data collection methods (mail, telephone, and personal interview) were used for the experimental and control groups. It was assumed the method of data collection did not influence the ability to evaluate questionnaire versions.

Each study used a test questionnaire and an operational questionnaire. The questionnaire versions used in each study appear in Appendix B.

The first study conducted in five States in December 1980, evaluated the effect of asking expected farrowings after sow inventory and the effect of reversing the order of the four market hog weight group questions. The change in location of the expected farrowing questions was first evaluated in a small-scale study conducted in Nebraska during the September 1979 Multiple Frame Hog Survey. All interviewers in the 1979 study preferred the change and respondents were able to follow the questionnaire flow with less difficulty.

TABLE 1: STUDY PLAN USED TO EVALUATE THE HOG LIST QUESTIONNAIRE,
 QUARTERLY MULTIPLE FRAME HOG SURVEY, DECEMBER 1980 AND MARCH 1981

Study	States	Questionnaire modifications
I.-December 1980	Iowa Kentucky Minnesota Missouri Nebraska	(1) Changed the position of the expected farrowings questions. Asked number of breeding sows, sows expected to farrow, and then the remaining inventory questions. (2) Reversed the order of weight group questions on market hogs.
II.-December 1980	Ohio Wisconsin	(1) Reversed the order of weight group questions on market hogs. (2) Asked previous 6-month farrowings. First asked farrowings 4 to 6 months before, and then the past 3-month farrowings. (3) Changed wording on farrowing intentions questions.
III.-March 1981	Iowa Ohio Wisconsin	(1) Switched the order of sections on hogs and pigs for breeding and hogs and pigs for market. First, asked number of market hogs, and then asked hogs and for breeding. The order of weight group questions for market hogs was also reversed (2) Asked previous 6-month actual farrowings. First, asked past 3-month farrowings, and then farrowings 4 to 6 months before.

The first study also evaluated the impact that reversing the order of the four market weight groups had on the market hog survey indications. Payne [7] suggested that the order of multiple category questions influenced the response. This study reversed the order of the market weight questions beginning with hogs over 180 pounds to evaluate any ordering effect.

The second study conducted in two States in December 1980 evaluated three possible hog questionnaire changes. A reversal of the four market hog weight groups was done as discussed above. A second part of the study evaluated the effect of asking previous 6-month farrowings (farrowings from 4 to 6 months before were asked first, followed by the previous 3-month farrowings) versus previous 3-month farrowings. Since March 1980, the operational program has asked only 3-month farrowings on the nonextreme operator list questionnaire. However, the extreme operator (large hog farm) list questionnaire and the area frame surveys continue to obtain 6-month farrowings. Since survey estimates from the area frame nonoverlap operators and list frame extreme operators are combined with list frame data to form one estimate, consistency of response is desirable.

A third part of the December 1980 study in Ohio and Wisconsin evaluated the effect of asking 6-month farrowing intentions with the emphasis on "bred or to be bred." The operational (control group) questionnaire asked the respondent to report expected farrowings in the next 6-month. A Nebraska Multiple Frame Hog Survey in September 1979 identified respondents reporting "potential" farrowings rather than expected farrowings so fewer sows were often bred than the operator originally planned. The study test questionnaire was thus designed to emphasize bred sows expected to farrow.

The third study conducted in three States in March 1981 evaluated the effect of reordering the questionnaire sections and reversing the market weight group categories plus asking for previous 6-month farrowing data. The test version began with questions about hogs and pigs for market followed by a request for information about breeding animals. The test version asked market hogs by four weight categories beginning with the heaviest weight class (180 pounds and over). The operational questionnaire asked for breeding hog inventory and then hogs marketed beginning with the lightest weight class (under 60 pounds). The test questionnaire asked the number of sows and gilts farrowed in the past 6-month period beginning with the most recent quarter. The operational questionnaire simply asked for farrowing data the past 3-month.

The list sample size in each of the States was increased by 25 percent in positive hog strata except extreme operator strata. The experimental group, consisting of the 25-percent sample increase, received the test questionnaire. The control group, consisting of the regular sample, received the operational questionnaire. Table 2 shows the strata and number of completed reports by State for each of the studies.

TABLE 2: STRATA ANALYZED AND COMPLETED REPORTS IN EACH STATE,
 QUARTERLY MULTIPLE FRAME HOG SURVEYS, DECEMBER 1980 AND MARCH 1981

Study	State	Strata	Completed reports	
			Operational	Test
			Number	
I.-December 1980	Iowa	83,84,85,86,87,88	1,405	341
	Kentucky	85,86,87	864	215
	Minnesota	84,85,86,87,88,93	790	197
	Missouri	83,84,85,86,87	1,046	264
	Nebraska	83,84,85,93,94	829	203
	Five States combined		4,934	1,220
II.-December 1980	Ohio	84,85,86,87	953	241
	Wisconsin	85,86,87,93	754	180
	Two States combined		1,707	421
	Seven States combined		6,641	1,641
III.-March 1981	Iowa	83,84,85,86,87,88	1,293	325
	Ohio	84,85,86,87	941	219
	Wisconsin	85,86,87,93	731	176
	Three States combined		2,965	720

ANALYSIS

The analysis is presented in seven sections. The first section discusses the method of analysis used. Section two compares the number of operations reporting hogs and the refusal rates between the test and operational questionnaires. Each of the remaining sections present analysis associated with a change in the hog questionnaire. Statistical tests compare the test questionnaire with the operational questionnaire (control group) by State and across States. The extent of editing and comments by interviewers are also presented.

Method of Analysis

Each sample observation was randomly assigned to 1 of 10 replicates for analysis. This approach simplified the analysis, provided unbiased estimates of the variance even though a systematic sample was originally drawn, and insured the variables analyzed were somewhat normally distributed. The random assignment process was repeated five times to ensure a random assignment to replicates. Earlier multiple frame hog surveys were analyzed in this manner by Nealon, Hall, and Ford [2,3,4,6].

Estimates for the variables of interest were computed for each of the replicates for each questionnaire version studied in a State. Formulae used to compute means and standard errors are given in [3, 4, 6]. An analysis of variance was generated for each of the five random assignments to replicates. The average significance levels were a simple average from the five random replicate assignments. Average significance levels less than or equal to 0.100 were considered significant.

The procedure to analyze editing differences is described as follows: After completion of each survey, States re-keyed all survey data as it was originally reported. This permitted comparison of raw survey data to final edited data by questionnaire version.

Zero Reports and Refusals Compared by Questionnaire Version

The operational and test questionnaires were first compared to determine any significant difference in number of zero hog operations. A zero hog operation was defined to be a questionnaire where no hog inventory was reported by the respondent. If the test questionnaire showed a statistically significant number of zero hog operations, then some change to the operational questionnaire, aside from sampling variation, influenced the respondent. Analysis should differentiate between all completed reports and positive reports.

Table 3 provides a summary of the percentage of operations with no hogs reported by the respondent using the operational and test questionnaire versions. The univariate test results by State were based on the average significance level of the five replicated assignments. Significance levels were also computed at each study level (across State).

There was no significant difference in the proportion of zero hog operations between the test and the operational groups. The proportion of operations with no hogs by State and across States was not affected by the questionnaire version. Results also suggested that the random assignment of zero hog operations to the five replicates was approximately equal. Because the zero operations were not significantly different, further analysis was based on all completed reports and not just positive reports. When the number of reports was very small, however, all completed reports and all positive reports were analyzed separately.

TABLE 3: PERCENTAGE OF OPERATIONS WITH ZERO HOGS REPORTED BY STUDY, STATE AND LIST QUESTIONNAIRE VERSION 1/
 QUARTERLY MULTIPLE FRAME HOG SURVEYS, DECEMBER 1980 AND MARCH 1981

Study	State	Percentage of zero hog operations		Average significance level
		Operational	Test	
		<u>Percent</u>		
I.-December 1980	Iowa	42.77	44.58	.859
	Kentucky	77.07	82.96	.149
	Minnesota	68.61	72.38	.689
	Missouri	60.44	63.81	.255
	Nebraska	63.50	60.89	.389
	Five States combined	61.05	64.00	.340
II.-December 1980	Ohio	83.69	80.43	.462
	Wisconsin	45.24	46.80	.880
	Two States combined	72.89	70.99	.618
	Seven States combined	63.47	65.43	.589
III.-March 1981	Iowa	46.41	49.42	.243
	Ohio	76.20	74.72	.519
	Wisconsin	46.92	48.65	.827
	Three States combined	55.96	57.08	.396

1/ Average significance level ≤ 0.100 was considered significant and was denoted by the symbol*.

Another area of interest was whether the refusal rate was significantly different between questionnaire versions. A significantly higher refusal rate on the test questionnaire would support the continued use of the operational questionnaire. Table 4 provides a summary of the refusal rates by study-State-questionnaire version and the average significance level from the five random assignment of samples to replicates.

If an operator refused to provide any data or did not supply enough data so the report could be used, the operator was considered a refusal. Inaccessibles and known zero operations were not included in the refusal rate computation.

The refusal rate was not significantly different between questionnaire versions tested at the State or combined State level. There was, however, a somewhat higher refusal rate for the test questionnaire in all the States except Kentucky and Missouri.

TABLE 4: REFUSAL RATE BY QUESTIONNAIRE VERSION,
 QUARTERLY MULTIPLE FRAME HOG SURVEYS, DECEMBER 1980 AND MARCH 1981^{1/}

Study	State	Refusal rate		Average significance level
		Operational	Test	
			--Percent--	
I.-December 1980	Iowa	16.04	18.36	.586
	Kentucky	.93	.57	.309
	Minnesota	14.59	17.29	.457
	Missouri	7.94	6.18	.339
	Nebraska	24.11	28.99	.340
	Five States combined	11.33	12.55	.383
II.-December 1980	Ohio	2.52	4.65	.233
	Wisconsin	10.15	14.05	.286
	Two States combined	4.66	7.28	.185
	Seven States combined	9.98	11.45	.126
III.-March 1981	Iowa	17.19	18.86	.627
	Ohio	4.31	5.46	.526
	Wisconsin	11.47	14.86	.427
	Three States combined	11.70	13.75	.164

^{1/} Average significance level ≤ 0.100 was considered significant and was denoted by the symbol*.

Change in Position
of the Expected
Farrowings Questions

A change in the position of the expected farrowings question was tested in Iowa, Kentucky, Minnesota, Missouri, and Nebraska during the December 1980 hog survey. This questionnaire change first asked for the number of breeding sows, then for sows expected to farrow, and finally for the remaining hog and pig inventory.

The analysis examined seven survey items using data for all completed reports. The survey variables analyzed were: (1) total hogs and pigs, (2) sows bred and to be bred, (3) farrowing intentions December, January, and February, (4) farrowing intentions March, April, and May, (5) boars for breeding, (6) sows and boars no longer for breeding, and (7) total hogs and pigs for market.

A univariate analysis of variance was run on each of the seven survey variables for each State and the five States combined for each of the five replicate assignments. A multivariate analysis of variance was run for the three survey variables directly involved in the questionnaire change: sows bred and to be bred, farrowing intentions December through February, and March through May. The Wilks' criterion was used to determine significance level differences for the multivariate tests.

In tables A-1 and A-2 the mean values and average significance levels are given for the survey variables individually and combined by State. An average significance level of less than or equal to 0.100 was considered significant.

For the five States combined, none of the mean values for the survey variables tested were significantly different for the univariate or multivariate analysis of variance tests. The change in the position of the expected farrowings did not affect the overall level of the survey estimates.

In Missouri, the univariate test showed the test questionnaire estimate was significantly lower for March through May average expected farrowing intentions and boars for breeding. Kentucky and Minnesota also showed a significant level difference for the survey item sows and boars no longer used for breeding.

The extent of editing done on the test questionnaire and the operational questionnaire was measured. The percentage of questionnaires edited and mean amount edited are shown in tables A-3 to A-6. The percentage of questionnaires with total hogs and pigs edited was significantly higher for the test questionnaire than the operational questionnaire for the five States combined. Of all the completed questionnaires, 5.83 percent of the operational questionnaires had total hogs and pigs edited compared with 7.19 percent of the test questionnaires. Missouri was the only State with a significant difference in editing of total hog and pigs when the position of expected farrowing questions was changed on the test version. The multivariate test was not significant in any cases.

The effect of the editing on the hog and pig number was next examined. The average edited for total hogs and pigs was 1.98 pigs for all completed operational questionnaires, compared with 2.08 pigs for all completed test questionnaires. This was not a significant change. The univariate analysis of variance showed a significant difference in the average amount edited for sows bred and to be bred in Kentucky. The multivariate test was also significant for the combined variables (sows bred and to be bred and farrowing intentions) in Kentucky. However, the actual extent of editing (in terms of number of pigs) of the variables boars and sows bred and to be bred was relatively small.

Enumerators were asked to evaluate the test questionnaires. Their response was overwhelmingly in favor of the test questionnaire. Sixty-three enumerators said expected farrowings questions were easier to ask on the test questionnaire compared with the regular questionnaire, 26 enumerators said the questionnaire version did not matter, and 9 enumerators said expected farrowings were harder to ask on the test questionnaire version.

One enumerator said there was difficulty in completing the hog inventory questions on the test questionnaire because of the location of the expected farrowings questions. Twelve were undecided and 84 enumerators said that there were no problems in completing the hog inventory questions.

In summary, the change in position of the expected farrowings questions is preferred by enumerators. The change did not significantly affect any of the survey estimates. The change did increase the percentage of questionnaires requiring an edit of the total hog and pig inventory question, but this has little effect on the estimates. The average amount edited, although occasionally different, was not a major concern. Considering the improvement in the flow of the questionnaire, asking sows expected to farrow after number of breeding sows and before the remaining inventory questions is recommended.

Reverse in Order of Weight Group Questions on Market Hogs

A reverse in the order of weight group questions on market hogs was tested in December 1980. The change was tested in seven States: Iowa, Kentucky, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin. The test questionnaire ordered the weight group questions from heaviest market category to lightest market category. The operational questionnaire orders the market hog weight questions from lightest to heaviest market category.

The analysis examines seven survey variables which were directly affected by the test. All completed reports were again used. The variables were: (1) total hogs and pigs, (2) pigs under 60 pounds, (3) pigs from 60-119 pounds, (4) hogs 120-179 pounds, (5) hogs 180 pounds and over, (6) total hogs and pigs for market, and (7) sows bred and to be bred.

A univariate analysis of variance was run on each of the seven survey variables for each State and the seven States combined for each of the five replicate assignments. A multivariate analysis of variance was run for each State and across States for selected variables which are influenced by the questionnaire format changes. These variables are identified in table A-8 as a combined variables category which includes total hogs and pigs, pigs under 60 pounds, pigs 60-119 pounds, hogs 120-179 pounds, and hogs 180 pounds or more. The Wilks' criterion was again used to determine significance levels for the multivariate tests. An average significance level less than or equal to 0.100 was considered significant.

Tables A-7 and A-8 present the mean value and the average significance level of each variable and of the combined variables group. The data are shown for each of the seven States and for all of the States combined.

For the seven States combined, the univariate test showed a significant difference between the operational and test questionnaire versions for the lightest and heaviest market hog weight classes when the order of market hog weight groups was reversed. The average inventory for pigs under 60 pounds dropped when the test questionnaire asked the respondent to report for this category after completing the other three inventory weights. Placement of the 180 pounds and over market hog question first in the group increased the average inventory reported. In Iowa and Nebraska, the average number of heavy hogs reported were significantly higher.

For the seven States combined, the multivariate test showed a significant level difference for certain combined variables when the order of market hog weight group questions was reversed. The multivariate test also showed significantly different levels for the combined variables in Iowa and Nebraska.

The extent of editing for the questionnaire versions is presented by State and for the seven Combined States in tables A-9 through A-12. Table A-9 gives the percentage of questionnaires edited for each variable for each State individually and combined. Table A-10 gives the average significance level for percentage of questionnaires edited in the previous table. Table A-11 shows the average amount edited of each variable by State and for all States combined. The average significance level for amount edited are presented in table A-12.

At the Seven-State level, the univariate analysis of variance was significantly different between the test and the operational versions for editing of total hogs and pigs. The percentage of test questionnaires edited was 6.56 compared with 5.65 percent of the operational questionnaires edited. Missouri was the only State with a significantly higher percentage of editing on the test questionnaire for the variable total hogs and pigs. In Nebraska, the multivariate analysis of variance was significant because the operational questionnaire was edited at

significantly higher levels for variables hogs 180 pounds and over and sows bred and to be bred. A subject for further investigation is the lack of editing of these variables on the test questionnaire. There was no apparent pattern across all States as to the degree of editing of the test versus operational questionnaire. Some States edited certain variables at a higher rate for the test questionnaire while the situation was reversed in other States.

The average amount edited for each variable and the variables combined was rarely significant between the test and operational questionnaires. At the seven-State level, the univariate analysis of variance test indicated a significantly higher average number of hogs from 120-179 pounds edited for the test version. Across all States however, reversing the order of weight group questions on market hogs resulted in a higher average number of hogs and pigs edited for all of the weight variables.

In Nebraska, the multivariate test showed significantly different levels for the average amount edited for all variables combined. There was no significant difference between the test and operational versions at the seven-State level.

To summarize, a reverse in the order of market hog weight group questions significantly affected the survey estimates for the lightest and heaviest weight groups. The 180 pounds and over weight class was biased upward while the less than 60 pounds weight class was understated when respondents were asked to report heavy hogs first. Enumerators were divided as to the approach they preferred. The authors recommend that, with only limited research completed, the operational order of the market hog weight categories be continued. Enumerator training should also stress the importance of completing these questions in the order printed on the questionnaire. A recent report by Weidenhamer [10] suggests that June Enumerative Survey enumerators were inconsistent in the manner they asked weight group questions.

Asking Previous 6-Month Farrowings

The second study conducted in December 1980 in Ohio and Wisconsin tested the effect of asking the previous 6-month farrowings rather than the previous 3-month farrowings. When asking the previous 6-month farrowings, farrowings from 4 to 6 months before were asked first followed by farrowings in the last 3 months. The four survey items evaluated were sows bred and to be bred, sows and gilts farrowed during September through November, pigs from litters in September through November now on hand, and also pigs already sold.

Two data sets were used in the analysis of the test and operational questionnaire versions. The data sets were identified as (1) data set 1: all completed reports, and (2) data set 2: all positive hog reports.

Data set 2 was analyzed because operators with no hogs may be influenced to a much smaller degree by the questionnaire versions than operators with hogs, especially since the number of reports was limited with only two States in the study. There was also the concern that with only 421 test questionnaires, random assignment of the sample may not be equally distributed for zero hog operations.

A univariate analysis of variance was completed on each of the four survey variables for each State and for the two States combined for each of the five replicate assignments. A multivariate analysis of variance was also completed for the three combined variables to test the effect of asking 6-month actual farrowings. The Wilks' criterion was used to determine significance for the multivariate tests.

Tables A-13 and A-14 show the mean values and average significance levels for the survey variables individually and combined by State. An average significance level less than or equal to 0.100 was considered significant.

The univariate test was not significant for the two States combined for any variables. A smaller average number of pigs sold for the September quarter was characteristic however, of the test questionnaire. The number of sows and gilts farrowed during the quarter was also generally lower for the test version for the two States. In Wisconsin, the number of pigs sold was significantly different for the questionnaire versions. It will be shown later that the amount of editing on the pigs sold variable contributed to this difference. Adding a second farrowing category could shift some of the reported pigs to the earlier reporting period. It was probably difficult for the respondent to separate farrowing exactly between the two reporting periods. There is also a problem of memory bias with the earlier reporting period.

For the two States combined, the multivariate analysis of variance on sows and gilts farrowed, pigs from litters now on hand, and pigs from litters already sold was significant for all completed reports. In Wisconsin, the multivariate test was significant for both data sets. In Ohio, there was not significant level differences. Further analysis is needed to evaluate these differences within and between States.

Tables A-15 and A-16 in Appendix A show the percentage of questionnaires edited and the corresponding significance levels in asking previous 6-month farrowings. There were no significant level differences between the questionnaire versions for any of the variables. It was interesting, however, to see a different editing pattern in the two States for the variables being studied. Ohio edited the operational questionnaires previous farrowings variables most frequently. Wisconsin edited the test questionnaires previous farrowings variables most frequently. The reason for the edit difference is not known.

The average amount of editing associated with each variable by State is shown in table A-17. Table A-18 then gives the average significance level for the univariate and multivariate tests on the variables by State and across States for each data set. The univariate test was only significant for the variable pigs from litters already sold. Wisconsin edited the number of pigs in the previous 3-month farrowings at a significantly higher level compared with the previous 6-month farrowings already sold. This was true even though the previous three months farrowings were not edited as often.

In summary, asking previous 6-month farrowings rather than previous 3-month farrowings does affect the survey estimates. While this is a small-scale test, it did indicate that placing another category in front of an existing category can change the level of the response to the existing category. It can also change the editing procedures. It is recommended that further analysis be carried out to evaluate the effect of the questionnaire differences. This is especially critical because the agency combines survey indications where the previous farrowing data are collected using each of the questionnaire formats tested. The editing inconsistencies within a State and between States are problems which also need further investigation.

Change in Wording on Farrowing Intentions Questions

A change in the wording on farrowing intentions questions was also evaluated in Ohio and Wisconsin in December 1980. The study tested the effect of wording expected farrowings questions to emphasize that sows or gilts had been or were going to be bred for future farrowings.

The analysis evaluated the effect of the questionnaire versions on selected survey items. The four survey items analyzed were: (1) sows bred and to be bred, (2) sows expected to farrow December-February, (3) sows expected to farrow March-May, and (4) sows expected to farrow December-May.

Analysis of variance tests were run on each of the survey items for each State and the two States combined for each of the five assigned replicates. The analysis was done on two data sets. The data sets were: (1) data set 1: all completed reports, and (2) data set 2: all positive hog reports.

Table A-19 shows the average value of each survey item for the operational and test questionnaires by State and combined across State for each data set. The corresponding average significance level for each variable appears in table A-20.

There was no significant change in the level of the sows and gilts expected to farrow by inserting the words bred or to be bred. The test questionnaire level of expected farrowing in Wisconsin was lower, however, for all the data sets. This suggests that the respondent was not fully aware of the category of hogs to be reported and that the operational version probably has an upward bias. Before any definite conclusions are drawn, a large scale study will be necessary.

There was no significant level difference in editing between the questionnaire versions. Tables A-21 and A-22 give the percentage of questionnaires edited and mean amount edited for each variable by State and across States. Tables A-23 and A-24 present corresponding significance tests. Wisconsin consistently edited expected farrowings more often on the test questionnaire. Wisconsin and Ohio also changed the average number of sows and gilts expected to farrow more frequently on the test version. There was no significant difference between questionnaire versions for frequency or amount of editing which suggests only modest changes were made.

To summarize, the effect of changing expected farrowing questions was not significant for the variables tested in either State. However, the test questionnaire's emphasis on sows and gilts bred or expected to be bred did result in a generally lower farrowing intentions level. This suggests a potential upward response bias in the operational questionnaire method of asking farrowing intentions. Further analysis is suggested to evaluate the nonsampling error level for farrowing intentions. A more extensive study is also recommended before any program changes are initiated. Another way of asking farrowing intentions could produce significant level differences.

Switch in Order of
Breeding and Market
Hog Sections plus
Asking Previous
6-Month Farrowings

A third study was conducted in Iowa, Ohio, and Wisconsin in March 1981 to analyze the effect of switching the order of hogs for breeding and hogs for market and home-use sections. The test questionnaire asked market hogs by weight category, beginning with the heaviest group, followed by hogs for breeding, and then farrowing intentions and previous 6-month farrowings. When asking the previous 6-month farrowings, the last 3-month farrowings were asked first, followed by farrowings from 4 to 6 months before. The test questionnaire was administered to one-fourth of the sample in each State.

The analysis examined 12 survey items using data for all completed reports. The survey variable analyzed were: (1) total hogs and pigs, (2) market pigs less than 60 pounds, (3) market hogs 60-119 pounds, (4) market hogs 120-179 pounds, (5) market hogs 180 pounds or more, (6) total hogs and pigs for market, (7) sows bred and to be bred, (8) boars for breeding, (9) sows and boars no longer for breeding, (10) previous sows farrowed, (11) previous farrowings on hand, and (12) previous farrowings sold.

A univariate analysis of variance was run on each of the survey variables for each State and the three States combined for each of the five replicates. A multivariate analysis of variance was run for selected variables in each State and across States. Inventory items were combined and previous farrowing items (sows farrowed, pigs on hand, pigs sold) were combined for the State-level multivariate tests. The Wilks' criterion was used to determine significant differences.

Analysis of data is presented in tables A-25 through A-30 for the third study of questionnaire design effects. In tables A-25 and A-26, the mean values and average significance levels are given for the

12 survey variables individually and combined by State. The data are shown by questionnaire version. An average significance level of less than or equal to 0.100 was considered significant.

The univariate test at the combined State level indicated a significant level difference for total hogs and pigs inventory, total hogs and pigs for market, and pigs sold from previous farrowings. Only the 120-179 pound inventory class was not significantly different for hogs to be marketed in the three States. In Iowa and Wisconsin, the average survey values were consistently higher for the operational questionnaire. In Ohio, however, the operational questionnaire average survey data values were lower. This inconsistency cannot be totally explained, but suggests that switching the marketing and breeding sections influenced the level of data reported at the aggregate level. Multiple changes to the test questionnaire could have affected test results.

The results from reversing weight group questions for market hogs in the third study were consistent with the second study findings. A significantly larger hog inventory was reported when the weight class category was asked first rather than last in the marketing section. Statistical differences at the State level, however, were apparent only in Iowa.

Asking previous 6-month farrowings on the test questionnaire caused mixed results. The previous 3-month farrowings on the test questionnaire compared with the operational questionnaire gave a lower survey indication for sows farrowed and pigs on hand. Farrowings already sold, however, were significantly higher for the test questionnaire at the three-State level. This conflicted with the SECOND study outcome where the test questionnaire farrowings sold were lower. Further study is suggested.

Multivariate tests indicated significant level differences at the three-State level for combined inventory items and combined previous farrowing items. Iowa was also significantly different at the State level with the test questionnaire showing a much lower total hog inventory.

The frequency of editing required for test and operational questionnaires is shown in tables A-27 and A-28. The percentage of questionnaires edited for an item was generally more for the test questionnaire. For the three States combined, about 6 percent of the completed test questionnaires were edited for total inventory, compared with 5.2 percent of the completed operational questionnaires. The univariate and multivariate tests were not significant in any cases.

The average amount of editing for complete reports is compared by questionnaire version in tables A-29 and A-30. For the three combined States, there was a significantly higher average edited data value for market hogs and pigs weighing less than 60 pounds and over 180 pounds with the test questionnaire. The multivariate test showed a significant

difference in edited data between the questionnaire versions when inventory items were evaluated collectively in Iowa and across all the States. The test questionnaires in all the States were generally edited with larger average amounts of change.

To summarize, the test questionnaire format evaluated in the third study significantly changes the current level of the major hog survey estimates. The operational inventory, marketing, and farrowing data were higher than the test questionnaire data collected. The average amount of editing was also significantly greater for the test questionnaire. A format change to ask hogs and pigs marketed followed by breeding, farrowing intentions, and previous 6-month farrowings would directly affect the current program. A reverse in the order of marketing category weight groups confounded with other questionnaire modifications would also change the level of the total hogs and pigs survey estimate. Except for the item pigs sold, asking previous 6-month farrowings provided a lower 3-month farrowing survey indication when compared with the operational questionnaire. The higher pigs sold level was not consistent with the second study results and suggests further research.

CONCLUSIONS AND RECOMMENDATIONS

Analysis focused on evaluating different questionnaire designs for the hog survey. Conclusions and recommendations were based on response rates, edit levels, comments during data collection, and significant differences in survey estimates between the test and operational questionnaires.

The conclusions were weakened by the introduction of multiple changes in each test questionnaire. Although confounding of effects was minimized by the survey design, it still exists and must be considered when evaluating the results.

A summary of conclusions and recommendations are listed below:

- (1) Moving the expected farrowings questions after the breeding questions simplified data collection and did not affect the survey estimates. This change was implemented prior to publication of this report based on a recommendation presented to Estimates Division.
- (2) Reversing the order of market hog weight group questions changed the level of survey estimates and is not recommended. Placement of the heaviest weight group as the first category increased the level of the estimate of heavy market hogs and required extra editing.
- (3) Asking previous 6-month farrowings on the test questionnaire caused significant differences in the quarterly farrowings estimates. The analysis showed inconsistent and inconclusive results which suggests further evaluation before changing the hog questionnaire.
- (4) Wording of farrowing intentions to emphasize that sows and gilts reported were or will be bred did not significantly change the survey estimate. The proposed clarification, however, was only evaluated in two States. Further evaluation is needed before any conclusions are drawn.

(5) Switching the order of questionnaire sections on hog breeding and market plus asking farrowings for the last two 3-month periods significantly lowered the survey estimates. The test questionnaire also required more editing. Adoption of this test version is not recommended.

(6) Editing of hog data was too inconsistent among States. Continued efforts must be taken to improve the standards and consistency of any review by the statistician. Automated procedures should be improved to diminish hand editing of data.

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APPENDIX A: Data Analysis Summaries

Tables A1-A6: Change in Position of the Expected Farrowing Questions

Tables A7-A12: Reverse in Order of Weight Group Questions on Market Hogs

Tables A13-A18: Asking Previous 6-Month Farrowings

Tables A19-A24: Change in Wording on Farrowing Intentions Questions

Tables A25-A30: Switch in Order of Breeding and Market Hog Sections plus Asking Previous 6-Month Farrowings

The tables for each questionnaire change are presented in the following order:

- Mean and average significance level for each variable (two separate tables)
- Percentage of questionnaires edited and average significance level for each variable (two separate tables)
- Mean amount edited and average significance level for each variable (two separate tables)

Table A-1: CHANGE IN POSITION OF THE EXPECTED FARROWINGS QUESTIONS

Mean Value of Each Variable for Each State and the Five States Combined

All Completed Reports

State	Questionnaire Version	Total Hogs and Pigs	Sows Bred and to be Bred	Farrowing Intentions Dec., Jan., Feb.	Farrowing Intentions Mar., Apr., May	Boars For Breeding	Sows and Boars No Longer For Breeding	Total Hogs and Pigs For Market
Iowa	Operational Test	227.09	27.41	11.66	13.56	1.75	1.30	196.63
		233.98	27.88	13.22	13.08	1.85	1.71	202.54
Kentucky	Operational Test	11.18	1.47	.59	.61	.16	.10	9.44
		9.10	1.59	.45	.72	.13	.03	7.35
Minnesota	Operational Test	88.58	12.28	5.33	5.52	.85	.28	75.18
		96.38	11.85	4.89	5.65	.75	.64	83.14
Missouri	Operational Test	53.72	7.92	3.21	4.09	.79	.45	44.56
		47.21	6.60	2.40	3.18	.46	.37	39.78
Nebraska	Operational Test	129.81	16.68	6.49	8.64	1.14	1.04	110.95
		140.68	15.84	7.34	7.32	1.12	.68	123.04
Five States Combined	Operational Test	107.98	13.68	5.73	6.73	.96	.65	92.68
		110.68	13.45	6.04	6.32	.91	.76	95.56

Table A-2: CHANGE IN POSITION OF THE EXPECTED FARROWINGS QUESTIONS

Average Significance Level for Each Variable and the Variables Combined for Each State and the Five States Combined by Data Set 1/

All Completed Reports

State	Total Hogs and Pigs	Sows Bred And To Be Bred	Farrowing Intentions Dec., Jan. Feb.	Farrowing Intentions March Apr., May	Boars For Breeding	Sows and Boars No Longer For Breeding	Total Hogs and Pigs For Market	Variables Combined <u>2/</u>
Iowa	.692	.846	.265	.708	.784	.260	.699	.376
Kentucky	.320	.766	.386	.553	.399	.012*	.249	.165
Minnesota	.555	.848	.679	.888	.538	.091*	.520	.568
Missouri	.262	.190	.463	.091*	.025*	.683	.318	.176
Nebraska	.418	.612	.772	.303	.932	.149	.323	.137
Five States Combined	.519	.603	.594	.216	.471	.594	.424	.269

1/ Average significant level $\leq .100$ is considered significant and is denoted by *.

2/ Variables Combined: Sows Bred and To Be Bred, Farrowing Intentions Dec. - Feb. and March - May.

Table A-3: CHANGE IN POSITION OF THE EXPECTED FARROWINGS QUESTIONS

Percentage of Questionnaires Edited for Each Variable for Each State
and the Five States Combined by Data Set

All Completed Reports

State	Questionnaire Version	Totals Hogs and Pigs	Sows Bred and to Be Bred	Farrowing Intentions Dec., Jan. Feb.	Farrowing Intentions March, Apr., May	Boars Breeding	Sows and Boars No Longer For Breeding	Total Hogs and Pigs For Market
Iowa	Operational	6.49	1.90	1.90	1.84	1.67	1.56	2.16
	Test	5.81	1.26	.67	1.43	.38	.67	1.43
Kentucky	Operational	5.65	2.61	.64	1.62	1.26	.64	4.42
	Test	5.26	.78	.78	.89	.78	.45	2.57
Minnesota	Operational	5.50	.79	.47	1.57	.09	0	1.82
	Test	9.22	.84	2.41	2.43	.84	.84	2.90
Missouri	Operational	5.04	.93	1.05	1.94	.20	.87	1.39
	Test	8.85	1.89	1.18	1.95	.59	.77	4.08
Nebraska	Operational	6.26	.84	1.43	2.09	.35	.41	2.11
	Test	9.91	0	2.15	1.70	0	0	1.54
Five States Combined	Operational	5.83	1.50	1.15	1.79	.91	.83	2.55
	Test	7.19	1.05	1.22	1.57	.55	.58	2.44

Table A-4: CHANGE IN POSITION OF THE EXPECTED FARROWINGS QUESTIONS

Average Significance Level for Percentage of Questionnaires Edited For Each Variable and the Variables Combined for Each State and the Five States Combined by Data Set 1/

All Completed Reports

State	Total Hogs and Pigs	Sows Bred And To Be Bred	Farrowing Intentions Dec., Jan. Feb.	Farrowing Intentions March Apr., May	Boars For Breeding	Sows and Boars No Longer For Breeding	Total Hogs and Pigs For Market	Variables Combined <u>2/</u>
Iowa	.665	.488	.068*	.726	.051*	.179	.409	.161
Kentucky	.811	.108	.804	.325	.478	.675	.155	.102
Minnesota	.180	.954	.164	.521	.331	.331	.495	.414
Missouri	.067*	.359	.882	.994	.526	.897	.077*	.635
Nebraska	.190	.026*	.578	.695	.097*	.065*	.538	.148
Five States Combined	.047*	.374	.408	.820	.617	.647	.783	.436

1/ Average significant level $\leq .100$ is considered significant and is denoted by *.

2/ Variables Combined: Sows Bred and To Be Bred, Farrowing Intentions Dec. - Feb. and March - May.

Table A-5: CHANGE IN POSITION OF THE EXPECTED FARROWINGS QUESTIONS

Mean Amount Edited of Each Variable for Each State
and the Five States Combined by Data Set

All Completed Reports

State	Questionnaire Version	Totals Hogs and Pigs	Sows Bred and to Be Bred	Farrowing Intentions Dec., Jan. Feb.	Farrowing Intentions March, Apr., May	Boars For Breeding	Sows and Boars No Longer For Breeding	Total Hogs and Pigs For Market
Iowa	Operational	3.12	.06	.07	.05	.01	.01	.58
	Test	2.26	.08	.01	.21	.01	.01	.30
Kentucky	Operational	.99	.13	.03	.10	.02	.01	.72
	Test	1.15	.02	.02	.06	.01	.01	.82
Minnesota	Operational	1.51	.04	.06	.26	.01	0	1.49
	Test	2.32	.01	.20	.30	.01	.01	.69
Missouri	Operational	1.17	.05	.12	.19	.01	.06	.29
	Test	1.65	.21	.06	.13	.01	.04	1.76
Nebraska	Operational	3.23	.15	.21	.39	.01	.05	1.89
	Test	4.16	0	.33	.31	0	0	.75
Five States Combined	Operational	1.98	.08	.08	.16	.01	.02	.84
	Test	2.08	.07	.09	.18	.01	.01	.81

Table A-6: CHANGE IN POSITION OF THE EXPECTED FARROWINGS QUESTIONS

Average Significance Level for Amount Edited of Each Variable and the Variables Combined for Each State and the Five States Combined by Data Set 1/

State	All Completed Reports							Total Hogs and Pigs For Market	Variables Combined <u>2/</u>
	Total Hogs and Pigs	Sows Bred And To Be Bred	Farrowing Intentions Dec., Jan. Feb.	Farrowing Intentions March Apr., May	Boars For Breeding	Sows and Boars No Longer For Breeding			
Iowa	.395	.753	.160	.419	.134	.918	.377	.395	
Kentucky	.785	.052*	.444	.521	.121	.236	.857	.081*	
Minnesota	.365	.189	.336	.526	.331	.331	.373	.392	
Missouri	.487	.193	.399	.618	.331	.588	.138	.527	
Nebraska	.564	.346	.483	.669	.137	.346	.133	.136	
Five States Combined	.497	.454	.612	.967	.040*	.135	.697	.825	

1/ Average significant level $\leq .100$ is considered significant and is denoted by *.

2/ Variables Combined: Sows Bred and To Be Bred, Farrowing Intentions Dec. - Feb. and March - May.

**Table A-7: REVERSE IN ORDER OF WEIGHT GROUP
QUESTIONS ON MARKET HOGS**

Mean Value of Each Variable for Each State and the Seven States Combined

All Completed Reports

State	Questionnaire Version	Total Hogs and Pigs	Pigs Under 60 pounds	Pigs From 60-119 Pounds	Hogs From 120-179 Pounds	Hogs 180 pounds and Over	Total Hogs and Pigs For Market	Sows Bred and to be Bred
Iowa	Operational Test	227.09	75.15	53.22	41.28	26.98	196.63	27.41
		233.98	66.86	49.41	41.33	44.94	202.54	27.88
Kentucky	Operational Test	11.18	3.84	2.94	1.42	1.24	9.44	1.47
		9.10	2.83	2.12	1.49	.92	7.35	1.59
Minnesota	Operational Test	88.58	28.68	21.23	15.72	9.55	75.18	12.28
		96.38	26.14	21.73	19.35	15.92	83.14	11.85
Missouri	Operational Test	53.72	18.31	11.15	8.38	6.72	44.56	7.92
		47.21	16.02	8.87	7.49	7.40	39.78	6.60
Nebraska	Operational Test	129.81	42.34	30.47	22.58	15.56	110.95	16.68
		140.68	37.35	28.06	32.43	25.19	123.04	15.84
Ohio	Operational Test	33.01	10.03	7.35	6.74	3.98	28.10	4.38
		33.38	11.55	5.57	4.41	6.05	27.57	5.17
Wisconsin	Operational Test	81.83	30.44	18.14	11.91	7.59	68.08	12.45
		76.60	26.24	14.80	14.50	8.23	63.77	11.56
Seven States Combined	Operational Test	95.44	31.62	22.17	16.82	11.15	81.76	12.24
		97.34	28.36	20.16	17.82	17.38	83.72	12.12

**Table A-8: REVERSE IN ORDER OF WEIGHT GROUP
QUESTIONS ON MARKET HOGS**

Average Significance Level for Each Variable and the Variables Combined
for Each State and the Seven States Combined by Data Set 1/

All Completed Reports

State	Total Hogs and Pigs	Pigs Under 60 pounds	Pigs From 60-119 pounds	Hogs From 120-179 pounds	Hogs 180 pounds and Over	Total Hogs and Pigs For Market	Sows Bred and To Be Bred	Variables Combined <u>2/</u>
Iowa	.692	.192	.454	.986	.005*	.699	.846	.005*
Kentucky	.320	.227	.367	.907	.252	.249	.766	.321
Minnesota	.555	.658	.872	.329	.117	.520	.848	.199
Missouri	.262	.290	.176	.505	.631	.318	.190	.403
Nebraska	.418	.319	.546	.037*	.037*	.323	.612	.002*
Ohio	.972	.778	.443	.269	.242	.952	.656	.303
Wisconsin	.591	.295	.198	.318	.668	.594	.631	.378
Seven States Combined	.669	.073*	.103	.106	.001*	.578	.658	.001*

1/ Average significance level $\leq .100$ is considered significant and is denoted by *.

2/ Variables Combined: Total Hogs and Pigs, Pigs under 60, Pigs 60-119, Hogs 120-179, and Hogs 180.

**Table A-9: REVERSE IN ORDER OF WEIGHT GROUP
QUESTIONS ON MARKET HOGS**

Percentage of Questionnaires Edited for Each Variable for Each State and the Seven States Combined

All Completed Reports

State	Questionnaire Version	Total Hogs and Pigs	Pigs Under 60 pounds	Pigs From 60-119 Pounds	Hogs From 120-179 Pounds	Hogs Over 180 pounds	Total Hogs and Pigs For Market	Sows Bred and to be Bred
Iowa	Operational	6.49	2.16	2.64	2.36	1.81	2.16	1.90
	Test	5.81	2.92	1.77	1.77	1.29	1.43	1.26
Kentucky	Operational	5.65	1.91	1.92	1.64	2.03	4.42	2.16
	Test	5.26	.90	.79	.91	2.23	2.57	.78
Minnesota	Operational	5.50	3.85	3.91	1.20	.91	1.82	.79
	Test	9.22	4.00	4.80	3.52	4.22	2.90	.84
Missouri	Operational	5.04	3.98	4.11	1.74	.70	1.39	.93
	Test	8.85	5.59	4.06	1.47	.88	4.08	1.89
Nebraska	Operational	6.26	1.58	2.08	1.03	1.21	2.11	.84
	Test	9.91	1.75	2.35	2.57	0	1.54	0
Ohio	Operational	4.43	2.74	2.97	2.76	2.29	2.67	2.44
	Test	2.69	2.09	1.71	1.50	2.30	1.14	1.14
Wisconsin	Operational	6.15	1.63	.89	.35	.28	1.73	1.69
	Test	7.68	3.61	3.93	1.85	.69	1.52	2.22
Seven State Combined	Operational	5.65	2.58	2.76	1.81	1.52	2.52	1.65
	Test	6.56	2.83	2.43	1.79	1.77	2.20	1.13

**Table A-10: REVERSE IN ORDER OF WEIGHT GROUP
QUESTIONS ON MARKET HOGS**

Average Significance Level for Percentage of Questionnaires Edited For Each Variable and the Variables Combined for Each State and the Seven States Combined by Data Set 1/

All Completed Reports

State	Total Hogs and Pigs	Pigs Under 60 pounds	Pigs From 60-119 pounds	Hogs From 120-179 pounds	Hogs 180 pounds and Over	Total Hogs and Pigs For Market	Sows Bred and To Be Bred	Variables Combined <u>2/</u>
Iowa	.665	.349	.410	.584	.557	.409	.488	.392
Kentucky	.811	.184	.153	.272	.848	.155	.108	.620
Minnesota	.180	.923	.599	.211	.110	.495	.954	.329
Missouri	.067*	.328	.970	.764	.797	.177*	.359	.296
Nebraska	.190	.863	.860	.335	.002*	.538	.026*	.036*
Ohio	.287	.948	.473	.445	.641	.236	.349	.415
Wisconsin	.533	.202	.077*	.142	.577	.894	.577	.388
Seven States Combined	.054*	.225	.642	.303	.278	.905	.494	.413

1/ Average significance level \leq .100 is considered significant and is denoted by *.

2/ Variables Combined: Total Hogs and Pigs. Pigs under 60, Pigs 60-119, Hogs 120-179, and Hogs 180.

**Table A-11: REVERSE IN ORDER OF WEIGHT GROUP
QUESTIONS ON MARKET HOGS**

Mean Amount Edited of Each Variable for Each State and the Seven States Combined

All Completed Reports

State	Questionnaire Version	Total Hogs and Pigs	Pigs Under 60 pounds	Pigs From 60-119 Pounds	Hogs From 120-179 Pounds	Hogs 180 pounds and Over	Total Hogs and Pigs For Market	Sows Bred and to be Bred
Iowa	Operational	3.12	.60	.69	.42	.14	.58	.06
	Test	2.26	1.83	1.21	.95	.63	.30	.08
Kentucky	Operational	.99	.41	.27	.08	.07	.72	.13
	Test	1.15	.18	.53	.91	.26	.82	.02
Minnesota	Operational	1.51	2.43	1.75	.37	.33	1.49	.04
	Test	2.32	1.67	2.59	1.17	1.96	.69	.01
Missouri	Operational	1.17	1.38	1.30	.46	.09	.29	.05
	Test	1.65	.95	.73	.35	.07	1.76	.21
Nebraska	Operational	3.23	1.17	1.28	.51	.39	1.89	.15
	Test	4.16	1.15	1.17	1.57	0	.75	0
Ohio	Operational	.87	.37	.34	.43	.08	.58	.08
	Test	.55	1.20	.12	.09	1.23	.48	.06
Wisconsin	Operational	1.18	.57	.17	.17	.03	.50	.19
	Test	.99	1.32	.96	.05	.01	.41	.24
Seven States Combined	Operational	1.77	.91	.79	.35	.15	.78	.09
	Test	1.79	1.16	.99	.76	.63	.67	.07

**Table A-12: REVERSE IN ORDER OF WEIGHT GROUP
QUESTIONS ON MARKET HOGS**

Average Significance Level for Amount Edited of Each Variable and the Variables Combined
for Each State and the Seven States Combined by Data Set

All Completed Reports

State	Total Hogs and Pigs	Pigs Under 60 pounds	Pigs From 60-119 pounds	Hogs From 120-179 pounds	Hogs Over 180 pounds	Total Hogs and Pigs For Market	Sows Bred and To Be Bred	Variables Combined <u>2/</u>
Iowa	.395	.144	.409	.303	.194	.377	.753	.498
Kentucky	.785	.162	.584	.185	.427	.857	.052*	.182
Minnesota	.365	.476	.554	.210	.239	.373	.189	.408
Missouri	.487	.412	.225	.747	.701	.138	.193	.409
Nebraska	.564	.973	.891	.268	.004*	.133	.346	.042*
Ohio	.494	.313	.238	.180	.154	.138	.145	.394
Wisconsin	.732	.320	.241	.202	.267	.902	.744	.245
Seven States Combined	.764	.509	.444	.075*	.106	.471	.657	.280

1/ Average significance level < .100 is considered significant and is denoted by *.

2/ Variables Combined: Total Hogs and Pigs, Pigs under 60-119, Hogs 120-179, and Hogs 180.

Table A-13: ASKING SIX MONTHS ACTUAL FARROWINGS

Mean Value of Each Variable for Each State
and the Two States Combined By Data Set

State	Data Set <u>1</u> / 2	Sows Bred and To Be Bred		Sows and Gilts Farrowed During September-November		Pigs From Litters In September-November Now on Hand		Pigs From Litters In September-November Already Sold	
		Oper.	Test	Oper.	Test	Oper.	Test	Oper.	Test
Ohio	1	4.38	5.17	1.84	2.29	12.79	13.62	.73	2.65
	2	20.16	22.13	8.47	9.81	58.82	58.34	3.37	11.37
Wisconsin	1	12.45	11.56	5.20	4.14	31.66	26.84	7.63	2.65
	2	16.88	15.41	7.05	5.51	42.94	35.77	10.35	3.53
Two States Combined	1	6.65	6.96	2.78	2.81	18.09	17.33	2.67	2.65
	2	18.29	18.39	7.66	7.42	49.77	45.78	7.34	7.01

1/Data Set 1: All completed reports.
Data Set 2: All positive hog reports.

Table A-14: ASKING PREVIOUS SIX MONTHS ACTUAL FARROWINGS

Average Significance Level for Each Variable and the Variables Combined for Each State and the Two States Combined By Data Set 1/

State	Data Set <u>2/</u>	Sows Bred and To Be Bred	Sow and Gilts Farrowed During Sept.-Nov.	Pigs From Litters In Sept.-Nov. Now on Hand	Pigs From Litters In Sept.-Nov. Already sold	Variables Combined <u>3/</u>
Ohio	1	.656	.652	.889	.194	.395
	2	.656	.692	.811	.162	.436
Wisconsin	1	.631	.133	.287	.002*	.005*
	2	.445	.076*	.178	.002*	.003*
Two States Combined	1	.879	.627	.604	.129	.096*
	2	.921	.823	.743	.778	.663

1/ Average significance level $\leq .100$ is considered significant and is denoted by *.

2/ Data Set 1: All completed reports.

Data Set 2: All positive hog reports.

3/ Variables Combined: Sows and gilts farrowed, pigs from litters now on hand, and pigs from litters already sold.

Table A-15: ASKING PREVIOUS SIX MONTHS ACTUAL FARROWINGS

Percentage of Questionnaires Edited for Each Variable for Each State
and the Two States Combined By Data Set

State	Data Set <u>1</u> / 2	Sows Bred and To Be Bred		Sows and Gilts Farrowed During September-November		Pigs From Litters In September-November Now on Hand		Pigs From Litters In September-November Already Sold	
		Oper.	Test	Oper.	Test	Oper.	Test	Oper.	Test
Ohio	1	2.44	1.14	3.54	2.72	3.76	2.66	2.42	1.35
	2	11.08	4.87	16.08	11.67	17.07	11.39	11.00	5.77
Wisconsin	1	1.69	2.22	2.66	4.07	3.58	6.38	1.80	2.54
	2	2.29	2.96	3.61	5.42	4.85	8.50	2.44	3.39
Two States Combined	1	2.23	1.44	3.29	3.10	3.71	3.70	2.25	1.68
	2	6.10	3.80	9.01	8.19	10.15	9.78	6.15	4.45

1/Data Set 1: All completed reports.
Data Set 2: All positive hog reports.

Table A-16: ASKING PREVIOUS SIX MONTHS ACTUAL FARROWINGS

Average Significance Level for Percentage of Questionnaires Edited for Each Variable and the Variables Combined for Each State and the Two States Combined By Data Set 1/

State	Data Set <u>2/</u>	Sows Bred and To Be Bred	Sow and Gilts Farrowed During Sept.-Nov.	Pigs From Litters In Sept.-Nov. Now on Hand	Pigs From Litters In Sept.-Nov. Already sold	Variables Combined <u>3/</u>
Ohio	1	.349	.854	.669	.539	.814
	2	.281	.656	.290	.642	.537
Wisconsin	1	.577	.349	.127	.555	.489
	2	.593	.358	.145	.619	.512
Two States Combined	1	.464	.549	.284	.866	.7031
	2	.438	.791	.758	.743	.931

1/ Average significance level $\leq .100$ is considered significant and is denoted by *.

2/ Data Set 1: All completed reports.

2/ Data Set 2: All positive hog reports.

3/ Variables combined: sows and gilts farrowed, pigs from litters now on hand, and pigs from litters already sold.

Table A-17: ASKING PREVIOUS SIX MONTHS ACTUAL FARROWINGS

Mean Amount Edited of Each Variable for Each State
and the Two States Combined By Data Set

State	Data Set <u>1/</u>	Sows Bred and To Be Bred		Sows and Gilts Farrowed During September-November		Pigs From Litters In September-November Now on Hand		Pigs From Litters In September-November Already Sold	
		Oper.	Test	Oper.	Test	Oper.	Test	Oper.	Test
Ohio	1	.08	.06	.25	.30	1.02	1.58	.16	.37
	2	.36	.27	1.15	1.29	4.62	6.77	.75	1.58
Wisconsin	1	.19	.24	.20	.39	1.92	2.64	1.49	.25
	2	.26	.31	.27	.51	2.61	3.52	2.03	.34
Two States Combined	1	.12	.09	.24	.32	1.27	1.88	.54	.34
	2	.31	.28	.65	.86	3.48	4.96	1.47	.89

1/Data Set 1: All completed reports.
Data Set 2: All positive hog reports.

Table A-18: ASKING PREVIOUS SIX MONTHS ACTUAL FARROWINGS

Average Significance Level for Amount Edited of Each Variable and the Variables Combined for Each State and the Two States Combined By Data Set 1/

State	Data Set <u>2/</u>	Sows Bred and To Be Bred	Sow and Gilts Farrowed During Sept.-Nov.	Pigs From Litters In Sept.-Nov. Now on Hand	Pigs From Litters In Sept.-Nov. Already sold	Variables Combined <u>3/</u>
Ohio	1	.345	.812	.618	.601	.883
	2	.223	.718	.748	.531	.818
Wisconsin	1	.744	.317	.522	.028	.152
	2	.727	.331	.589	.018	.132
Two States Combined	1	.681	.387	.418	.216	.435
	2	.668	.558	.576	.557	.785

1/ Average significance level $\leq .100$ is considered significant and is denoted by *.

2/ Data Set 1: All completed reports.

 Data Set 2: All positive hog reports.

3/ Variables Combined: Sows and gilts farrowed, pigs from litters now on hand, and pigs from litters already sold.

Table A-19: CHANGE IN WORDING ON FARROWING INTENTIONS QUESTIONS

Mean Value of Each Variable for Each State
and the Two States Combined By Data Set

State	Data Set <u>1</u> / 2	Sows Bred and To Be Bred		Sows Expected To Farrow Dec.-Feb.		Sows Expected To Farrow March-May		Sows Expected To Farrow Dec.-May	
		Oper.	Test	Oper.	Test	Oper.	Test	Oper.	Test
Ohio	1	4.38	5.17	1.92	2.81	2.19	2.70	4.11	5.49
	2	20.16	22.13	8.84	12.03	10.07	11.48	18.92	23.51
Wisconsin	1	12.45	11.56	5.20	5.02	6.04	5.95	11.24	10.97
	2	16.88	15.41	7.05	6.69	8.19	7.93	15.24	14.62
Two States Combined	1	6.65	6.96	2.84	3.43	3.27	3.60	6.11	7.03
	2	18.29	18.39	7.82	9.06	9.00	9.51	16.82	18.56

1/Data Set 1: All completed reports.

2/Data Set 2: All positive hog reports.

Table A-20: CHANGE IN WORDING ON FARROWING INTENTIONS QUESTIONS

Average Significance Level for Each Variable and the Variables Combined for Each State and the Two States Combined By Data Set 1/

State	Data Set <u>2/</u>	Sows Bred and To Be Bred	Sows Expected To Farrow Dec.-Feb.	Sows Expected To Farrow March-May	Sows Expected To Farrow Dec.-May
Ohio	1	.656	.477	.644	.506
	2	.656	.434	.741	.489
Wisconsin	1	.631	.872	.967	.981
	2	.445	.653	.821	.885
Two States Combined	1	.879	.631	.756	.880
	2	.921	.510	.796	.621

1/ Average significance level $\leq .100$ is considered significant and is denoted as *.

2/ Data Set 1: All completed reports.

Data Set 2: All positive hog reports.

Table A-21: CHANGE IN WORDING ON FARROWING INTENTIONS QUESTIONS

Percentage of Questionnaires Edited for Each variable for Each State
and the Two States Combined By Data Set

State	Data Set <u>1</u> / 2	Sows Bred and To Be Bred		Sows Expected To Farrow Dec.-Feb.		Sows Expected To Farrow March-May		Sows Expected To Farrow Dec.-May	
		Oper.	Test	Oper.	Test	Oper.	Test	Oper.	Test
Ohio	1	2.44	1.14	2.58	2.30	2.38	2.30	2.70	1.35
	2	11.08	4.87	11.70	9.87	10.82	9.87	12.28	5.77
Wisconsin	1	1.69	2.22	0.85	2.12	0.93	3.27	1.14	3.27
	2	2.29	2.96	1.16	2.82	1.26	4.36	1.54	4.36
Two States Combined	1	2.23	1.44	2.09	2.25	1.97	2.57	2.26	1.89
	2	6.10	3.80	5.73	5.94	5.40	6.80	6.19	4.98

1/Data set 1: All completed reports.
Data Set 2: All positive hog reports.

Table A-22: CHANGE IN WORDING ON FARROWING INTENTIONS QUESTIONS

Average Significance Level for Percentage of Questionnaires Edited for each variable and the Variables Combined for Each State and the two States Combined By Data Set

State	Data Set <u>2/</u>	Sows Bred and To Be Bred	Sows Expected To Farrow Dec.-Feb.	Sows Expected To Farrow March-May	Sows Expected To Farrow Dec.-May
Ohio	1	.349	.472	.391	.569
	2	.281	.600	.474	.571
Wisconsin	1	.577	.733	.322	.574
	2	.593	.675	.589	.563
Two States Combined	1	.464	.435	.189	.366
	2	.438	.535	.315	.335

1/ Average significance level $\leq .100$ is considered significant and is denoted as *.

2/Data Set 1: All completed reports.

Data Set 2: All positive hog reports.

Table A-23: CHANGE IN WORDING ON FARROWING INTENTIONS QUESTIONS

Mean Amount Edited of Each Variable for Each State
and the Two States Combined By Data Set

State	Data Set <u>1/</u>	Sows Bred and To Be Bred		Sows Expected To Farrow Dec.-Feb.		Sows Expected To Farrow March-May		Sows Expected To Farrow Dec.-May	
		Oper.	Test	Oper.	Test	Oper.	Test	Oper.	Test
Ohio	1	.08	.06	.07	.18	.05	.18	.13	.27
	2	.36	.27	.34	.79	.24	.79	.58	1.17
Wisconsin	1	.19	.24	.11	.15	.12	.28	.20	.43
	2	.26	.31	.16	.20	.17	.37	.27	.57
Two States Combined	1	.12	.09	.09	.17	.07	.21	.15	.32
	2	.31	.28	.24	.46	.20	.56	.40	.84

1/Data Set 1: All completed reports.

Data Set 2: All positive hog reports.

Table A-24: CHANGE IN WORDING ON FARROWING INTENTIONS QUESTIONS

Average Significance Level for Amount Edited of Each Variable and the Variables Combined For Each State and the two States Combined By Data Set 1/

State	Data Set <u>2/</u>	Sows Bred and To Be Bred	Sows Expected To Farrow Dec.-Feb.	Sows Expected To Farrow March-May	Sows Expected To Farrow Dec.-May
Ohio	1	.345	.472	.391	.569
	2	.223	.600	.475	.571
Wisconsin	1	.744	.733	.322	.574
	2	.727	.675	.317	.563
Two States Combined	1	.681	.435	.189	.366
	2	.668	.536	.315	.335

1/ Average significance level $\leq .100$ is considered significant and is denoted as *.

2/ Data Set 1: All completed reports.

— Data Set 2: All positive hog reports.

TABLE A-25 SWITCH IN ORDER OF BREEDING AND MARKET HOG SECTIONS PLUS ASKING
PREVIOUS SIX MONTHS FARROWINGS

Mean Value of Each Variable for Each State and the Three States Combined

All Completed Reports

Variables	Questionnaire Version	Iowa	State Ohio	Wisconsin	Three States Combined
Total Inventory	Operational	223.46	19.59	69.64	135.44
	Test	202.27	22.12	62.03	119.68
Pigs 60 lbs.	Operational	69.39	6.80	25.08	42.74
	Test	59.33	6.83	21.33	35.66
Pigs 60-119 lbs.	Operational	48.20	3.67	11.69	28.60
	Test	35.92	3.89	9.05	21.03
Hogs 120-179 lbs.	Operational	47.64	3.53	13.50	28.48
	Test	39.92	4.19	11.44	23.46
Hogs 180 + lbs.	Operational	27.58	2.45	7.15	16.54
	Test	38.85	3.76	8.65	22.26
Total Market Hogs & Pigs	Operational	192.81	16.45	57.42	116.36
	Test	174.02	18.67	50.47	102.41
Breeding-					
Sows	Operational	27.99	2.83	10.99	17.39
	Test	25.65	3.06	10.67	15.66
Boars	Operational	1.67	.22	.86	1.08
	Test	1.67	.24	.72	1.04
Sows/Boars	Operational	.99	.09	.37	.61
No Longer Used	Test	.93	.15	.17	.57
Sows Farrowed	Operational	10.56	1.14	4.14	6.58
	Test	9.96	1.21	3.34	5.99
Pigs on Hand	Operational	73.36	7.61	25.16	45.15
	Test	65.04	7.30	20.34	38.57
Pigs Sold	Operational	3.99	.53	4.61	2.92
	Test	8.34	.58	5.54	5.05

TABLE A-26 SWITCH IN ORDER OF BREEDING AND MARKET HOG SECTIONS PLUS ASKING
PREVIOUS SIX MONTHS FARROWINGS

Average Significance Level for Each Variable and the Variables Combined
for Each State and the Three States Combined ^{1/}

All Completed Reports

Variables	Iowa	State Ohio	Wisconsin	Three States Combined
Total Inventory				
Pigs 60 lbs.	.127	.432	.274	.092*
Pigs 60-119 lbs.	.097*	.957	.192	.079*
Hogs 120-179 lbs.	.063*	.914	.147	.061*
Hogs 180 + lbs.	.243	.471	.291	.153
	.001*	.164	.186	.001*
Total Market Hogs & Pigs	.121	.437	.269	.096*
Breeding-				
Sows				
Boars	.374	.621	.732	.202
Sows/Boars	.976	.941	.812	.783
No Longer Used	.742	.431	.173	.514
Combined-Inventory Variables	.051*	.341	.156	.068*
Sows Farrowing				
Pigs on Hand	.483	.717	.313	.273
Pigs Sold	.353	.893	.343	.261
	.147	.812	.326	.074*
Combined Farrowing Items	.196	.546	.166	.078*

^{1/} Average significance $\leq .100$ is considered significant and is denoted by the symbol *.

TABLE A-27 SWITCH IN ORDER OF BREEDING AND MARKET HOG SECTIONS PLUS ASKING
PREVIOUS SIX MONTHS FARROWINGS

Mean Amount Edited of Each Variable for Each State and the Three States combined

All Completed Reports

Variable	Questionnaire Version	Iowa	State Ohio	Wisconsin	Three States Combined
Total Inventory	Operational	7.46	1.39	5.26	5.15
	Test	8.03	1.83	5.68	6.02
Pigs 60 lbs.	Operational	.90	.73	.96	.85
	Test	1.85	.91	1.70	1.59
Pigs 60-119 lbs.	Operational	1.51	1.15	1.46	1.38
	Test	1.23	1.37	2.23	1.47
Hogs 120-179 lbs.	Operational	1.51	.41	1.28	1.11
	Test	2.15	.45	1.13	1.35
Total Market Hogs and Pigs	Operational	1.78	1.33	2.28	1.70
	Test	2.15	1.83	3.41	2.32
Breeding-					
Sows	Operational	1.08	.61	1.47	.97
	Test	1.23	.91	1.70	1.24
Boars	Operational	.84	.41	.72	.70
	Test	.62	.45	.57	.57
Sows/Boars No Longer used	Operational	.28	.14	.30	.24
	Test	.31	.0	.57	.27
Sows Farrowed	Operational	1.08	.59	1.57	.96
	Test	.92	.91	1.70	1.07
Pigs on Hand	Operational	1.84	.55	2.80	1.53
	Test	2.77	1.37	2.84	2.43
Pigs Sold	Operational	.28	.0	1.24	.31
	Test	.31	.45	2.23	.73

TABLE A-28 SWITCH IN ORDER OF BREEDING AND MARKET HOG SECTIONS PLUS ASKING
PREVIOUS SIX MONTHS FARROWINGS

Average Significance Level for Percentage of Questionnaires Edited For
Each Variable and the Variables Combined for Each State and the Three
States Combined 1/

All Completed Reports

Variables	Iowa	State Ohio	Wisconsin	Three States Combined
Total Inventory	.532	.481	.686	.309
Pigs 60 lbs.	.431	.881	.217	.176
Pigs 60-119 lbs.	.612	.902	.937	.861
Hogs 120-179 lbs.	.478	.973	.810	.417
Hogs 180 + lbs.	.407	.678	.396	.210
Total Market Hogs & Pigs	.616	.730	.476	.391
Breedings	.596	.846	.813	.418
Sows/Boars	.710	.973	.798	.513
Sows/Boars No Longer used	.935	.211	.613	.767
Combined - Inventory Variables	.228	.338	.378	.167
Sows Farrowed	.891	.531	.713	.841
Pigs on Hand	.417	.297	.994	.272
Pigs Sold	.969	.110	.506	.132
Combined-Sows Far., Pigs on Hand and Pigs Sold	.412	.126	.439	.207

1/ Average Significance $\leq .100$ is considered significant and is denoted by the symbol *.

**TABLE A-29 SWITCH IN ORDER OF BREEDING AND MARKET HOG SECTIONS PLUS ASKING
PREVIOUS SIX MONTHS FARROWINGS**

Mean Amount Edited of Each Variable for Each State and the Three States combined

All Completed Reports

Variable	Questionnaire Version	Iowa	State Ohio	Wisconsin	Three States Combined
Total Inventory	Operational	6.84	1.49	3.24	4.59
	Test	8.36	2.12	3.37	5.82
Pigs 60 lbs.	Operational	.76	.45	.49	.62
	Test	2.12	1.31	.76	1.05
Pigs 60-119 lbs.	Operational	1.33	.58	.50	.97
	Test	2.37	.71	.62	1.48
Hogs 120-179 lbs.	Operational	1.42	.23	.55	.91
	Test	2.43	.42	.48	1.36
Hogs 180 + lbs.	Operational	.70	.25	.29	.49
	Test	1.92	.88	.82	1.47
Total Market Hogs & Pigs	Operational	3.26	1.21	1.69	2.44
	Test	3.61	1.68	1.81	2.81
Breeding-					
Sows	Operational	.34	.18	.23	.27
	Test	.56	.21	.36	.43
Boars	Operational	.02	.01	.03	.02
	Test	.03	.02	.03	.03
Sows/Boars No Longer Used	Operational	.02	.01	.02	.02
	Test	.02	.01	.01	.02
Sows Farrowed	Operational	.32	.10	.25	.24
	Test	.51	.14	.36	.39
Pigs on Hand	Operational	2.53	.58	1.25	1.72
	Test	3.12	.83	1.63	2.18
Pigs Sold	Operational	.24	.0	.88	.25
	Test	.31	.0	.69	.31

TABLE A-30 SWITCH IN ORDER OF BREEDING AND MARKET HOG SECTIONS PLUS ASKING
PREVIOUS SIX MONTHS FARROWINGS

Average Significance Level for Each Variable and the Variables Combined
for Each State and the Three States Combined 1/

All Completed Reports

Variables	Iowa	State Ohio	Wisconsin	Three States Combined
Total Inventory	.231	.361	.817	.129
Pigs 60 lbs.	.127	.287	.427	.094*
Pigs 60-119 lbs.	.286	.426	.768	.167
Pigs 120-179 lbs.	.341	.313	.863	.193
Pigs 180 + lbs.	.186	.211	.143	.043*
Total Market Hogs and Pigs	.473	.531	.763	.268
Breeding				
Sows	.312	.728	.443	.148
Boars	.791	.693	.869	.472
-Sows/Boars No Longer Used	.897	.931	.642	.896
Combined-Inventory Variables	.087*	.127	.196	.093*
Sows Farrowed	.383	.563	.519	.317
Pigs on Hand	.486	.536	.512	.363
Pigs Sold	.531	-	.583	.464
Combined-Sows Far., Pigs on Hand and Pigs Sold	.167	.373	.376	.178

1/ Average Significance Level $\leq .100$ is considered significant and is denoted by the symbol *.

APPENDIX B: Questionnaire Versions

Operational Version for First and Second Study-December 1980: Iowa, Kentucky, Minnesota, Missouri, Nebraska, Ohio, Wisconsin

Test Version for First Study-December 1980: Iowa, Kentucky, Minnesota, Missouri, Nebraska

Test Version for Second Study-December 1980: Ohio, Wisconsin

Operational Version for Third Study-March 1981: Iowa, Ohio, Wisconsin

Test Version for Third Study-March 1981: Iowa, Ohio, Wisconsin

HOG AND PIG INVENTORY

December 1980

Now I want to ask you about the hogs and pigs on the land you operate, regardless of ownership. Include hogs and pigs purchased and still on hand.
First I would like to ask about HOGS and PIGS FOR BREEDING.

3. How many are:	}	a. Sows, gilts, and young gilts bred and to be bred?.....	301
		b. Boars and young males for breeding?.....	302
		c. Sows and boars no longer used for breeding?.....	303

Now let's talk about the HOGS and PIGS for MARKET and HOME USE on the land you operate. (Exclude breeding hogs already reported in Item 3.)

4. How many are:	}	a. Under 60 pounds? (Include pigs not yet weaned.)	311
		b. 60 -- 119 pounds?.....	312
		c. 120 -- 179 pounds?.....	313
		d. 180 pounds and over? (Exclude hogs no longer used for breeding)	314

5. Add Items 3a through 4d:	Then the total hogs and pigs now on the land you operate is	300
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Is that correct? YES Continue. NO Correct answers in 3, 4, and 5.

FARROWING INTENTIONS

6. How many of the _____ SOWS and GILTS are EXPECTED TO FARROW: (Item 3a)	
a. From now through December 1980, January and February 1981?	331
b. During March, April and May 1981?.....	332

PREVIOUS THREE MONTHS FARROWINGS

9. How many SOWS and GILTS FARROWED during September, October and November 1980, until now?	326	
10. How many PIGS from these (Item 9) litters are:	a. Now on hand?.....	327
	b. Already sold?.....	328

HOG AND PIG INVENTORY

Now I want to ask you about the hogs and pigs on the land you operate, regardless of ownership. Include hogs and pigs purchased and still on hand First I would like to ask about HOGS and PIGS FOR BREEDING.

3. How many are:

- a. Sows, gilts, and young gilts bred and to be bred? 301
- Of the SOWS and GILTS (reported in Item 3a) how many are EXPECTED TO FARROW:
- 1. From now through December 1980, January and February 1981? 331
- 2. During March, April and May 1981? ... 332
- b. Boars and young males for breeding? 302
- c. Sows and boars no longer used for breeding? 303

Now let's talk about the HOGS and PIGS for MARKET and HOME USE on the land you operate. (Exclude breeding hogs already reported in Item 3.)

1. How many are

- a. 180 lbs. and over (Exclude hogs no longer used for breeding) 314
- b. 120 - 179 pounds? 313
- c. 60 - 119 pounds? 312
- d. Under 60 pounds? (Include pigs not yet weaned) 311

5. Add Items 3a through 4d: Then the total hogs and pigs now on the land you operate is 300
Is that correct?

YES Continue NO Correct answers in 3, 4, and 5.

REVIEW THREE MONTHS FARROWINGS

9. How many SOWS and GILTS FARROWED during September, October and November 1980, until now? 326

10. How many PIGS from these (Item 9) litters are:

- a. Now on hand? 327
- b. Already sold? 328

- 2 -
HOG AND PIG INVENTORY

Now I want to ask you about the hogs and pigs on the land you operate, regardless of ownership. Include hogs and pigs purchased and still on hand.

First I would like to ask about HOGS and PIGS FOR BREEDING.

3. How many are:
- a. Sows, gilts and young gilts bred and to be bred?
 - b. Boars and young males for breeding?
 - c. Sows and boars no longer used for breeding?.....

Now let's talk about the HOGS and PIGS for MARKET and HOME USE on the land you operate. (Exclude breeding hogs already reported in Item 3.)

4. How many are
- a. 180 pounds and over? (Exclude hogs no longer used for breeding).....
 - b. 120-179 pounds?.....
 - c. 60-119 pounds?.....
 - d. Under 60 pounds? (Include pigs not yet weaned)

5. Add Items 3a through 4d: Then the TOTAL HOGS and PIGS now on the land you operate is
is that correct?

YES Continue NO Correct answers in 3, 4, and 5.

FARROWING INTENTIONS

6. How many of the _____ SOWS and GILTS:
(Item 3a)

- a. Have been bred and are EXPECTED TO FARROW from now through December 1980, January and February 1981?.....
- b. Have been bred or will be bred and are EXPECTED TO FARROW during March, April and May 1981?.....

PREVIOUS SIX MONTHS FARROWINGS

7. How many SOWS and GILTS FARROWED during June, July and August 1980?.....

8. How many PIGS from these (Item 7) litters are:
- a. Now on hand?
 - b. Already sold?.....

9. How many SOWS and GILTS FARROWED during September, October and November, until now?

10. How many PIGS from these (Item 9) litters are:
- a. Now on hand?
 - b. Already sold?.....

HOG AND PIG INVENTORY

March 1981

Now I want to ask you about the hogs and pigs on the land you operate, regardless of ownership. Include hogs and pigs purchased and still on hand.
First I would like to ask about HOGS and PIGS FOR BREEDING.

3. How many are:	{ <ul style="list-style-type: none"> a. Sows, gilts, and young gilts bred and to be bred?..... b. Boars and young males for breeding?..... c. Sows and boars no longer used for breeding?..... 	301
		302
		303

Now let's talk about the HOGS and PIGS for MARKET and HOME USE on the land you operate. (Exclude breeding hogs already reported in Item 3.)

4. How many are:	{ <ul style="list-style-type: none"> a. Under 60 pounds? (Include pigs not yet weaned.) b. 60 - 119 pounds?..... c. 120 - 179 pounds?..... d. 180 pounds and over? (Exclude hogs no longer used for breeding) 	311
		312
		313
		314

5. Add Items 3a through 4d:	Then the total hogs and pigs now on the land you operate is	300
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YES Continue. NO Correct answers in 3, 4, and 5.

FARROWING INTENTIONS

6. How many of the _____ (Item 3a) SOWS and GILTS are EXPECTED TO FARROW:	
a. From now through March, April and May 1981?	331
b. During June, July and August 1981?	332

PREVIOUS THREE MONTHS FARROWINGS

9. How many SOWS and GILTS FARROWED during December 1980 and January and February 1981 until now?	326
10. How many PIGS from these (Item 9) litters are:	327
	328

HOG AND PIG INVENTORY

Third Study
March 1981

Now I want to ask you about the hogs and pigs on the land you operate, regardless of ownership. Include hogs and pigs purchased and still on hand.

First I would like to ask about HOGS and PIGS for MARKET and HOME USE (Exclude breeding hogs)

3. How many are

{	a. 180 pounds and over? (Exclude hogs no longer used for breeding.)	314
	b. 120 - 179 pounds?	313
	c. 60 - 119 pounds?	312
	d. Under 60 pounds? (Include pigs not yet weaned.)	311

Now let's talk about the HOGS and PIGS FOR BREEDING on the land you operate.

4. How many are:

{	a. Sows, gilts, and young gilts bred and to be bred?	301
	b. Boars and young males for breeding?	302
	c. Sows and boars no longer used for breeding?	303

5. Add items 3a through 4c

Then the total hogs and pigs now on the land you operate is

Is that correct?

300

YES Continue. NO Correct answers in 3, 4, and 5.

FARROWING INTENTIONS

6. How many of the _____ SOWS and GILTS are EXPECTED TO FARROW:
(Item 4a)

a. From now through March, April and May 1981?	331
b. During June, July and August 1981?	332

PREVIOUS SIX MONTHS FARROWINGS

7. How many SOWS and GILTS FARROWED during December 1980 and January and February 1981 until now?

326

8. How many PIGS from these (Item 7) litters are:

{	a. Now on hand?	327
	b. Already sold?	328

9. How many SOWS and GILTS FARROWED during September, October and November 1980?

322

10. How many PIGS from these (Item 9) litters are:

{	a. Now on hand?	323
	b. Already sold?	324