APPENDIX 4

SURVEY WEIGHTING PROCEDURES

This appendix describes the survey weighting procedures. Survey weights will be computed in two steps:

1. Compute initial sampling weights.

2. Use weighting class adjustments to adjust the weights for nonresponse to the survey.

Each step in the weighting procedures is described below. Because of FSIS inspection responsibilities, we anticipate being able to determine the eligibility of all nonrespondents. Therefore, an adjustment for unknown eligibility is not expected to be necessary.

Initial Sampling Weights. Each plant in the sample (i.e., sample point) will be assigned an initial sampling weight. The initial sampling weight (W_0) is equal to the inverse of the selection probability, where the selection probability is equal to the sample size (n) divided by the population (N). Because a census will be taken, the initial sampling weight is equal to 1, i.e., $W_0 = 1$. The sum of the initial sampling weights across all sampled plants is equal to the population.

Nonresponse Adjustment. Nonresponse may cause bias in survey estimates if plants choosing not to respond to the survey would have provided answers to questions that differ systematically from answers provided by plants that choose to respond. Prior to the nonresponse weight adjustment, a plant-level nonresponse bias analysis will be conducted to compare the plant characteristics of respondents and nonrespondents to determine if they are substantially different. We will use plant characteristics known for both responding and nonresponding plants and will work with FSIS to identify these characteristics. Any variable for which the distribution of plants is significantly different between the two groups will be a candidate to be used in forming weighting classes for a weighting class nonresponse adjustment. Based on the first round of surveys, it is anticipated that plant size and/or region will be used as weighting classes.

A nonresponse weight adjustment, implemented with the computation and application of adjustment factors in each weighting class, can help reduce nonresponse bias to the extent that weighting classes are homogeneous. This adjustment also ensures that, within each weighting class, respondent weights sum to the population counts of eligible plants. Because of the small number of plants in cells, the number of weighting classes will be small, and it may be necessary to collapse some weighting classes.

The adjustment factors (F_1) within each weighting class are calculated as follows:

$$F_1 = .$$

The adjusted weight for each responding plant in a weighting class is equal to

$$W_1 = W_0 \ x \ F_1.$$

The adjusted weight will vary by weighting class. Based on the first round of surveys we expect the survey design effect to be small and to have little effect on the standard errors of the aggregated responses.

All results will be weighted using the final adjusted weights (W_1). The sum of the final adjusted weights across all respondents to the survey is equal to the population of eligible plants.