

**APPENDIX 4**  
**SURVEY WEIGHTING PROCEDURES**

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

1. Compute initial sampling weights by stratum (HACCP size).
2. Adjust the initial sampling weights for unknown eligibility.
3. Use weighting class adjustments to adjust the weights for nonresponse to the survey.

Each step in the weighting procedures is described below.

**Initial Sampling Weights.** Each establishment 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 ( $N$ ). Thus, the initial sampling weight for each stratum is calculated as follows:

$$W_0 = \frac{N}{n}$$

For the Large and Small stratum in which a census is being taken, the initial sampling weight is equal to 1. For each stratum, the sum of the initial sampling weights across all sampled establishments is equal to the population.

**Adjustment for Unknown Eligibility.** Adjustment factors will be calculated within each stratum to adjust for sample points for which the eligibility status is unknown.<sup>1</sup> The adjustment factor for establishments with unknown eligibility is calculated as follows:

$$F_1 = \frac{N}{n}$$

The adjustment factor for establishments with known eligibility is equal to 1 (i.e.,  $F_1 = 1$ ).

The adjusted weight for each establishment in a stratum is equal to

$$W_1 = W_0 \times F_1$$

**Nonresponse Adjustment.** Nonresponse may cause bias in survey estimates if establishments choosing not to respond would have provided answers to questions that differ systematically from answers provided by establishments that choose to respond. Prior to the nonresponse adjustment, a nonresponse bias analysis will be conducted to examine the

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<sup>1</sup> It is anticipated that the eligibility status for some establishments will be unknown because a telephone number is not available or a telephone number is available but eligibility cannot be determined during the survey administration period.

characteristics of respondents and nonrespondents to determine if they are statistically different. Nonresponse adjustments, 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. These adjustments also ensure that, within each weighting class, respondent weights sum to the population counts of eligible establishments.

The selection of weighting classes will be based on the findings from the nonresponse bias analysis, sample size, and information available for both respondents and nonrespondents. Based on the first round of the survey, it is anticipated that HACCP size and/or region will be used as weighting classes. Because of the small number of establishments in some cells, it may be necessary to collapse some weighting classes.

The adjustment factors ( $F_2$ ) within each weighting class is calculated as follows:

$$F_2 = \frac{N_{1j}}{N_{2j}}$$

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

$$W_2 = W_1 \times F_2.$$

The adjusted weight will vary by size and region. Based on the first round of the survey 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 ( $W_2$ ). For each stratum, the sum of the final adjusted weights across all respondents to the survey is equal to the population of eligible establishments.