

Appendix 6. Quantity estimates of affected AMR products.

The estimates of AMR product affected by the AMR interim final rule are based on the general model which used the following information:

- (1) Baseline used for analysis is CY 2003, before the BSE case was reported on December 23, 2003;
- (2) Average fed-cattle live weight at slaughter was 1250 pounds, in 2003; and the average swine live weight at slaughter was respectively 265 or 300 pounds for noncompliance affects or system-modification effects on AMR production, in 2003, (source: NASS 2004, and expert opinion); and
- (3) Beef or pork AMR product yields were expressed as percent of average live weight (source: FSIS Beef AMR Products Survey of 2002; FSIS Pork AMR Products Survey of 2003, and expert opinion).

Using these data, a model was developed which estimates the annual amount of AMR affected. The relationships forming the model are based on the following parameters.

W_{live} = 1250 pounds per slaughtered fed-cattle, in 2003 (the average live weight of slaughtered fed-cattle, in pounds), or, for pork AMR products, the average swine live weight at slaughter in the class was respectively 265 or 300 pounds for noncompliance affects or system-modification effects on AMR production, in 2003;

Y_{pht} = average yield of AMR as percent of average live weight of affected animals in the class that were processed in affected AMR systems, (W_{live}), in percent;

N_a = average number of affected animals in the class that were processed in affected AMR systems, annually, in millions of heads (estimated from the FSIS BSE SRM Survey of 2002, and the FSIS beef AMR products regulatory test results of 2003 (FSIS MARCIS 2003), or FSIS Pork AMR Products Survey of 2003, and expert opinion);

N_{avl} = the number of animals in the class that were available for processing in all available AMR systems, annually, in millions (estimated from the FSIS BSE SRM Survey of 2002, and the FSIS beef AMR products regulatory test results of 2003 (FSIS MARCIS 2003), or FSIS Pork AMR Products Survey of 2003);

Then:

Q_a = average quantity yield of AMR product per head, in pounds, or

$$Q_a = (Y_{plwt}) \times (W_{lwt});$$

P_a = the proportion of affected animals in the class available for AMR processing calculated as a percent of the total available animals in the class for AMR processing (N_{avi}), in percent, or

$$P_a = (N_a/N_{avi}); \text{ and}$$

Q_t = Average total pounds of AMR affected, annually, in millions, or

$$Q_t = (Q_a)(N_a), \text{ or}$$

$$Q_t = (Y_{plwt}W_{lwt})(P_a N_{avi})$$

Appendix Table 6.1 contains an example of a part of the model that was used to estimate the total pounds of AMR products affected, annually. The entire model was run using the @Risk® software program (Palisade Corporation). The model used uncertainty distributions for designated independent variables. The model results were obtained after a simulation run of 50,000 iterations across the selected distributions of values on independent variables in the model. The distributions of values on independent variables were based on survey data, laboratory results data, and reference data. The simulation model estimated the average distributions of the output or dependent variables. The 5th and 95th percentiles of the 90 percent confidence interval were estimated in the model.

Appendix Table 6.1. Pounds of a AMR affected. /1

| | (Y_{plwt}) | (Q_a) | (N_a) | (N_{avi}) | (P_a) | (Q_i) |
|--|--|--|--|--|--|---|
| Advanced Meat Recovery (AMR) Products Affected | Yield as percent of average live weight /2 of slaughtered animal $(W_{lwt}) /3$ | Yield per animal, in pounds $(Y_{plwt}) \times (W_{lwt})$ | Number of affected animals processed in affected AMR systems | Number of animals that are available for processing in all available AMR systems | Affected animals, share of total available animals in the class (N_{avi}) , (N_a / N_{avi}) | total pounds of AMR affected, annually, in millions $(Q_a) \times (N_a)$ |
| | percent | pounds | thousand | thousands | percent | thousand |
| Beef vertebrae products: Lower yield effect because of modifications to AMR system, and $W_{lwt} = 1250$ pounds | 0.04 | 0.51 | 2,720 | 16,000 | 17.0 | 1,387 |
| Pork vertebrae products: Lower yield effect because of modifications to AMR system, and $W_{lwt} = 300$ pounds | 0.02 | 0.06 | 1,070 | 53,500 | 2.0 | 64 |
| Beef vertebrae products: Lost yield effect because of noncompliant AMR system, and $W_{lwt} = 1250$ pounds | 0.24 | 3.0 | 640 | 16,000 | 4.0 | 1,920 |
| Pork vertebrae products: Lost yield effect because of noncompliant AMR system, and $W_{lwt} = 265$ pounds | 1.14 | 3.02 | 1,070 | 53,500 | 2.0 | 3,231 |

Footnotes:

/1 Estimated pounds of affected Advanced Meat Recovery (AMR) Products, in 2003. All values are estimates of average distributions unless otherwise identified. The 5th and 95th percentiles of the 90 percent confidence interval bounded by lower and upper confidence limits were estimated in the model but are not shown in this table. The details are in the appendix.

/2 Average live weight (W_{lwt}) of affected slaughtered fed cattle = 1250 pounds (NASS 2004); Average live weight (W_{lwt}) of slaughtered market swine = 265 pounds and used for noncompliance class of effects (NASS 2004); Average live weight (W_{lwt}) of affected slaughtered market and mature swine = 300 pounds and used for system-modification class of effects (NASS 2004, and expert opinion)

/3 Yield as percent of average live weight of slaughtered animal (W_{lwt}), in percent (NASS 2003 & 2004, AMS 2003 & 2004; FSIS Beef AMR Products Survey of 2002, FSIS Pork AMR Products Survey of 2002, and expert opinion)