

Appendix 2. Documentation of baseline values.

Table 2.1. Baseline mean values or ranges of mean values for quantities and prices of calendar years 2002 and 2003 as reported in the referenced publications, and that are used as a baseline in the economic model for estimating the cost of the SRM and AMR interim final rules. (Quantities and prices may be expressed in a range of reported mean values from the referenced sources.)			
Item – Independent Variables (Inputs)	Quantities 1/ 2/ 3/	Prices 4/	References 5/
Establishments:			
• Cattle Slaughtered:			
Commercial cattle (including calves) population presented annually for slaughter under federal inspection, and State inspection, in 2002-2003. Does not include cattle slaughtered on farms/ranches.	36.5-36.75 million head	n/a 6/	22, 23
Proportion of commercial cattle reported as fed-calves, fed-steers, and fed-heifers	80-83 percent	n/a	22, 23
Proportion of commercial cattle reported as cows, and bulls/stags	17-20 percent	n/a	22, 23
Proportion of commercial cattle estimated to be less than 30 months of age	81 percent	n/a	4
Proportion of commercial cattle estimated to be 30 months of age or older	19 percent	n/a	4
Proportion of commercial cattle (excluding calves) slaughtered that are under federal inspection, in 2002-2003.	98.3 percent	n/a	22, 23
Proportion of commercial calves slaughtered that are under federal inspection, in 2002-2003.	97.5 percent	n/a	22, 23

Commercial cattle live weight - average of cattle (excluding calves) at slaughter	1231-1251 pounds	n/a	22, 23
Commercial calves live weight - average of calves at slaughter	312-318 pounds	n/a	22, 23
<ul style="list-style-type: none"> • Non-ambulatory disabled cattle: 			
Non-ambulatory disabled cattle, annually	195,000 head	n/a	35, 4
Proportion of non-ambulatory disabled cattle, as a percent of the total cattle slaughtered annually (calculated)	0.54 percent	n/a	35, 4
Non-ambulatory disabled cattle condemned, annually	50,000 head	n/a	4
Condemnation rate of non-ambulatory disabled cattle, as a percent of the total number of non-ambulatory disabled cattle slaughtered, annually (calculated)	26 percent	n/a	4
Non-ambulatory disabled cattle that were slaughtered and USDA passed as safe and wholesome for use as human food, annually	145,000 head	n/a	4
Proportion of non-ambulatory disabled cattle that were slaughtered and USDA passed as safe and wholesome for use as human food, as a percent of the total number of non-ambulatory disabled cattle slaughtered, annually (calculated)	74 percent	n/a	4

Proportion of non-ambulatory disabled cattle that were slaughtered and USDA passed as safe and wholesome for use as human food, as a percent of the total cattle slaughtered, annually (calculated)	0.4 percent	n/a	4
• Beef Produced:			
Commercial beef production. Does not include cattle slaughtered on farms/ranches.	26.3-27.2 billion pounds	n/a	22, 23
Commercial veal production. Does not include calves slaughtered on farms/ranches.	201.1-205.2 million pounds	n/a	22, 23
Commercial cattle average dressed weight (excluding calves), federal inspections	746-765 pounds	n/a	22, 23
Commercial calves average dressed weight, federal inspections	190-194 pounds	n/a	22, 23
Carcass yield of commercial cattle (excluding calves), as a percentage of live weight, federal inspections (calculated)	60.6-61.2 percent	n/a	22, 23
Carcass yield of commercial calves, as a percentage of live weight, federal inspections (calculated)	60.9-61.0 percent	n/a	22, 23
Carcass yield of commercial cull cows (not fed), as a percentage of live weight	48-51 percent	n/a	10
Gross farm income from cattle and calves, annually, in 2003	n/a	\$44.1 billion	32
U.S. exports of beef, veal, and beef variety meats, annually, in 2003.	2.6 billion pounds	\$3.8 billion	33, 34
Price of boxed beef cut-out (ungraded), in 2003	n/a	\$2.00-\$2.35 per pound	30, 31
Price of boxed beef trimmings (90 percent lean), in 2003	n/a	\$1.00-\$1.40 per pound	30, 31
Discount of boxed beef AMR product, as a percentage of the	n/a	82 percent	17

price of boxed beef trimmings (90 percent lean), in 2001			
The price of boxed beef AMR product, in 2001	n/a	\$0.93 per pound	17
<ul style="list-style-type: none"> Other products affected by rules: 			
Price of ruminant meat-and-bone meal, bulk lots, in 2003	n/a	\$210-290 per ton, or \$0.105-\$0.145 per pound	11
Price of ruminant meat-and-bone meal, bulk 50% lots, in early 2004	n/a	\$69 per ton, or \$0.0345 per pound	4
Price of beef edible rendered products (i.e., soup stock or broth, flavorings, beef extracts, edible gelatin, bouillon, edible tallow, in 2003	n/a	\$0.15-\$0.35 per pound	12
Price of beef market heads with cheek meat, head meat, and tongue, domestic market, in 2003	n/a	\$5.00-\$6.50 per head	12
<ul style="list-style-type: none"> Facilities: 			
Federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), including beef grinding only establishments, in 2002-2003.	4,033 establishments	n/a	23, 24, 25, 29
Proportion of Federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, as a percent of all beef slaughtering or further	84 percent	n/a	23, 24, 25, 29

processing establishments, as a percent of the type of establishments (4,033) described above, in 2003.			
Federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.	3,388 establishments	n/a	23, 24, 25, 29
Proportion of federally-inspected establishments that annually slaughtered only or slaughtered and further processed at least 1 head of cattle (including calves), as a percent of the type of establishments (3,388) described above, in 2003.	21 percent	n/a	23, 24, 29
Proportion of State-inspected establishments that annually slaughtered only or slaughtered and further processed at least 1 head of cattle (including calves), as a percent of the type of establishments (3,388) described above, in 2003.	26 percent	n/a	23, 24, 29
Proportion of federally-inspected and State-inspected establishments that annually only further processed beef (including calves) carcasses or parts of carcasses (excluding those that only grind boneless beef products), as a percent of the type of establishments (3,388) described above, in 2003.	53 percent	n/a	25
Proportion of establishments (all federally-inspected) that FSIS classified as "large," because each of the establishments annually used 500 or more employees for slaughtering cattle or further	1.7 percent	n/a	25

processing of cattle carcasses or parts of carcasses (including calves or carcasses of calves), as a percent of the type of establishments (3,388) described above, in 2003.			
Proportion of federally- and State-inspected establishments that FSIS classified as "small," because each of the establishments annually used between 10 and 499 employees for slaughtering cattle or further processing of cattle carcasses or parts of carcasses (including calves or carcasses of calves), as a percent of the type of establishments (3,388) described above, in 2003.	35.5 percent	n/a	25
Proportion of federally- and State-inspected establishments that FSIS classified as "very small," because each of the establishments annually used fewer than 10 employees for slaughtering cattle or further processing of cattle carcasses or parts of carcasses (including calves or carcasses of calves), as a percent of the type of establishments (3,388) described above, in 2003.	62.8 percent	n/a	25
(1) Specified Risk Materials:			
<ul style="list-style-type: none"> • Brains from cattle 30 months of age or older: 			
Brain yield weight of a live weight 1250 pound animal (calculated).	1 pound	n/a	12, 13, 14
Brain yield weight, as a percentage of live weight	0.08-0.12 percent	n/a	12, 13, 14

Establishments, under federal inspection, that harvested brains from cattle, in 2002	64 establishments	n/a	28
Proportion of establishments, under federal inspection, that were affected because they harvested brains for human food, as a percentage of all establishments (1,594) that slaughter all cattle (including calves)	4 percent	n/a	28
Proportion of cattle 30 months of age or older that were affected, because they were slaughtered, under federal inspection, in affected establishments and available for harvesting their brains for human food, as a percentage of slaughtered cattle 30 months of age or older.	5 percent	n/a	24
Price of frozen brains contracted at the establishment level, in 2003	n/a	\$0.45 per pound	30, 31
Value of U.S. exports of frozen brains, in 2001	n/a	\$298,000 per year	33, 34
<ul style="list-style-type: none"> Spinal cords from cattle 30 months of age or older: 			
Spinal cord yield weight of a live weight 1250 pound animal (calculated).	0.4 pounds	n/a	12, 13, 14
Proportion of spinal cord yield weight, as a percentage of live weight	0.03 percent	n/a	12, 13, 14
Establishments, under federal inspection, that harvested spinal cords for human food (variety meat) export from cattle, in 2002.	12 establishments	n/a	28
Proportion of establishments under federal inspection that were affected because they	0.8 percent	n/a	28

harvested spinal cords (variety meat) for human food for export, as a percentage of all establishments that slaughter all cattle (including calves)			
Proportion of cattle 30 months of age or older that were affected, because they were slaughtered in affected establishments and available for harvesting their spinal cords for human food for export, as a percentage of slaughtered cattle 30 months of age or older.	3.9 percent	n/a	24
Establishments, under federal inspection, that had edible rendering that likely used spinal cord material derived from cattle 30 months of age or older for the production of edible rendered products for human food, in 2002.	10 establishments	n/a	28
Proportion of establishments under federal inspection that were affected because they had edible rendering that likely used spinal cord material derived from cattle 30 months of age or older for the production of edible rendered products for human food, as a percentage of all establishments that slaughter all cattle (including calves)	0.6 percent	n/a	28
Proportion of cattle 30 months of age or older that were affected, because they were slaughtered in affected establishments and available for edible rendering that likely used spinal cord material, as a percentage of slaughtered cattle 30 months of age or older.	2.1 percent	n/a	28
Price of frozen spinal cords	n/a	n/a	n/a

(variety meat) contracted at the establishment level, in 2003			
Value of U.S. exports of frozen spinal cords (variety meat), in 2001	n/a	n/a	n/a
<ul style="list-style-type: none"> • Vertebral columns (containing DRG tissue) from cattle 30 months of age or older used for producing beef AMR products: 			
Additional beef trimmings yield from AMR systems (AMR product, derived from vertebral and non-vertebral bone scraps) of cows, added beef trimmings yield per head beyond what would have been produced by hand-debone processes, based on a live weight 1250 pound animal.	4.0 pounds	n/a	16
Total beef trimmings yield from AMR systems (AMR product) derived from bones of cows and bulls, beef trimmings yield per head, based on a live weight 1250 pound animal.	In excess of 7.5 pounds	n/a	17
Proportion of total beef AMR product derived from bones of cows and bulls, yield weight, as a percentage of live weight. (calculated)	In excess of 0.60 percent	n/a	17, 20
Total beef trimmings yield from hand-debone processes that used the same type of bones of cows and bulls that went through AMR systems, beef trimmings yield per head, based on a live weight 1250 pound animal.	In excess of 3.5 pounds	n/a	17
Proportion of total beef trimmings yield from hand-debone processes that used the	In excess of 0.28 percent	n/a	17

same type of bones of cows and bulls that went through AMR systems, beef trimmings yield per head, yield weight, as a percentage of live weight 1250 pounds. (calculated)			
Establishments under federal inspection that produced beef AMR products derived from vertebral columns of cattle 30 months of age or older, in 2003.	24 establishments	n/a	20, 21, 26
Proportion of establishments that were affected because they produced beef AMR products derived from vertebral columns of cattle aged 30 months of age or older, as a percentage of federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.	1.0 percent	n/a	20, 26
Proportion of cattle 30 months of age or older that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, as a percentage of slaughtered cattle 30 months of age or older.	40.0 percent	n/a	24
Discount of beef AMR product, as a percentage of the price of beef trimmings (90 percent lean), in 2001	n/a	82 percent	17
The price of beef AMR product, in 2001	n/a	\$0.93 per pound	17

<ul style="list-style-type: none"> • Edible rendering bone-in process: vertebral columns (including DRG tissue) from cattle 30 months of age or older used for producing beef edible rendered products: 			
Total beef edible rendered products derived from bone-in processes that used vertebral columns of cattle 30 months of age or older, yield per head, based on a live weight 1250 pound animal.	4 pounds	n/a	12, 13, 14
Proportion of beef edible rendered products derived from bone-in processes, yield weight, as a percentage of live weight	0.30-0.34 percent	n/a	12, 13, 14
Establishments under federal inspection that produced beef edible rendered products derived from vertebral columns of cattle, in 2002.	17 establishments	n/a	28
Proportion of establishments that produced beef edible rendered products derived from vertebral columns of cattle, as a percentage of federally-inspected and State-inspected establishments that annually slaughtered or further process beef products (including calves), excluding beef grinding only establishments, in 2003.	0.5 percent	n/a	28
Proportion of cattle 30 months of age or older that were affected, because their vertebral columns were available for edible rendering in affected establishments, as a percentage of slaughtered	2 percent	n/a	24

cattle 30 months of age or older.			
<ul style="list-style-type: none"> Bone-in cuts: (bone-in processes that include primal cuts, sub-primal cuts, and retail cuts) with vertebrae derived from cattle 30 months of age or older: 			
Beef bone-in cuts with vertebrae derived from cattle 30 months of age or older yield weight, based on a live weight 1250 pound animal.	77 pounds	n/a	10
Proportion of beef bone-in cuts with vertebrae derived from cattle 30 months of age or older yield weight, as a percentage of live weight	6 percent	n/a	10
Establishments under federal and State inspection that produced beef bone-in cuts derived from vertebral columns of cattle, in 2003.	3,388 establishments	n/a	25, 29
Proportion of establishments that produced beef bone-in cuts derived from vertebral columns of cattle, as a percentage of federally-inspected and State-inspected establishments that annually slaughtered cattle or further process beef products (including calves), excluding beef grinding only establishments, in 2003.	100 percent	n/a	25
Proportion of cattle 30 months of age or older that were affected, because their vertebral columns were available for bone-in cuts in affected establishments, as a percentage of slaughtered	2 percent	n/a	24, 25

cattle 30 months of age or older.			
Price of boxed beef cut-out (ungraded), in 2003	n/a	\$2.00-\$2.35 per pound	30, 31
Price of boxed beef cut-out (ungraded), with the body of the vertebrae removed, in 2003	n/a	n/a	n/a
<ul style="list-style-type: none"> Market heads (skulls including cheek meat, head meat, and tongues) of cattle 30 months of age or older 			
Beef market head of cattle 30 months of age or older yield weight, based on a live weight 1250 pound animal.	16 pounds	n/a	12, 13, 14
Proportion of beef market head of cattle 30 months of age or older yield weight, as a percentage of live weight	1.0-1.5 percent	n/a	12, 13, 14
Establishments under federal inspection that produced market heads from cattle, in 2002.	88 establishments	n/a	28
Proportion of establishments that produced market heads from cattle, as a percentage of federally-inspected and State-inspected establishments that annually slaughtered cattle (including calves), in 2003.	6 percent	n/a	28
Proportion of cattle 30 months of age or older that were affected, because their heads (skulls) were available for market heads in affected establishments, as a percentage of slaughtered cattle 30 months of age or older.	0.8 percent	n/a	24
Total hand-deboned cheek and head meat, and tongue derived from the head of cattle 30 months of age or older, yield	6 pounds	n/a	12, 13, 14

weight, based on a live weight 1250 pound animal.			
Proportion of total hand-deboned cheek and head meat, and tongue derived from the head of cattle 30 months of age or older, yield weight of a 1250 pound live weight animal, as a percentage of live weight.	0.48 percent	n/a	12, 13, 14
<ul style="list-style-type: none"> Small intestines (including the distal ileum) from all cattle of all ages: 			
Small intestines yield weight, based on a live weight 1250 pound animal.	11 pounds	n/a	12, 13, 14
Proportion of small intestines yield weight, as a percentage of live weight	0.88 percent	n/a	12, 13, 14
Establishments under federal inspection that harvested small intestines from all cattle, in 2002	47 establishments	n/a	28
Proportion of establishments under federal inspection that were affected because they harvested small intestines for human food, as a percentage of all establishments that slaughter all cattle (including calves) of all ages.	3 percent	n/a	28
Proportion of all cattle of all ages that were affected, because they were slaughtered in affected establishments and available for harvesting their small intestines for human food, as a percentage of all slaughtered cattle of all age.	48 percent	n/a	24

Price of small intestines as sausage casings contracted at the establishment level, in 2003	n/a	n/a	n/a
Price of frozen small intestines as trepas (variety meat) contracted at the establishment level, in 2003	n/a	\$0.37 per pound	30, 31
Value of U.S. exports of beef sausage casings, in 2001	n/a	\$18.37 million	33
Value of U.S. exports of frozen small intestines (variety meats), in 2001	n/a	\$14.61 million	33
Value of small intestines in domestic markets, in 2001	n/a	\$5 million	17
Proportion of the value of intestines for export sales, of all sales of intestines, in 2001.	n/a	87 percent	17, 33
Proportion of the value of U.S. exports of beef sausage casings, of all export sales of all intestines, in 2001	n/a	56 percent	17, 33
Proportion of the value of U.S. exports of frozen intestines, of all export sales of all intestines, in 2001	n/a	44 percent	17, 33
<ul style="list-style-type: none"> Tonsils from all cattle of all ages for edible rendering: 			
Tonsils rendered product yield weight, based on a live weight 1250 pound animal.	2.5 pounds	n/a	12, 13, 14
Proportions of tonsils rendered product yield weight, as a percentage of live weight	0.46 percent	n/a	12, 13, 14
Establishments under federal inspection that produced beef edible rendered products derived from tonsils of cattle, in 2002.	17 establishments	n/a	28
Proportion of establishments that produced beef edible rendered products derived from tonsils of cattle, as a	1 percent	n/a	28

percentage of federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.			
Proportion of cattle of all ages that were affected, because their tonsils were available for edible rendering in affected establishments, as a percentage of all slaughtered cattle of all ages.	0.46 percent	n/a	
(2) Segregation of dressed carcasses or parts of carcasses (including vertebral column bones) derived from cattle 30 months of age or older:			
Establishments that segregated dressed carcasses or parts of carcasses that contain vertebral column bone derived from cattle 30 months of age or older.	3388 establishments	n/a	24, 25, 28
Proportion of establishments that segregated dressed carcasses or parts of carcasses that contain vertebral column bone derived from cattle 30 months of age or older, as a percentage of federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.	100 percent	n/a	24, 25, 28
Proportion of cattle 30 months of age or older that were affected, because their	86 percent	n/a	28

carcasses or parts of carcasses were segregated in affected establishments, as a percentage of slaughtered cattle 30 months of age or older.			
Proportion of non-ambulatory disabled cattle that were affected, because their carcasses or parts of carcasses were segregated in affected establishments, as a percentage of slaughtered non-ambulatory disabled cattle.	80 percent	n/a	28
(3) Development of plans and recordkeeping – SRM Rule:			
Establishments that are required to develop a plan to deal with SRMs and to do recordkeeping for SRMs, because they dressed carcasses or processed parts of carcasses that contain vertebral column bone derived from cattle 30 months of age or older.	3388 establishments	n/a	24, 25, 28
Proportion of establishments that are required to develop a plan to deal with SRMs and to do recordkeeping for SRMs, because they processed dressed carcasses or parts of carcasses that contain vertebral column bone derived from cattle 30 months of age or older, as a percentage of federally-inspected and State-inspected establishments that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.	100 percent	n/a	24, 25, 28
(4) Non-ambulatory disabled cattle (including calves): For			

details see information in section on cattle slaughtered and segregation, above.			
(5) AMR process control for the production of beef AMR products derived from vertebral and non-vertebral bone scraps of cattle less than 30 months of age; and pork AMR products derived from vertebral and non-vertebral bone scraps of swine of all ages:			
<ul style="list-style-type: none"> AMR process control for the production of beef AMR products derived from vertebral and non-vertebral bone scrap of cattle less than 30 months of age: 			
Additional beef AMR product as beef trimmings yield from AMR systems (derived from vertebral and non-vertebral bone scraps) of fed cattle; the added beef trimmings yield per head beyond what would have been produced by hand-debone processes.	1.5 pounds	n/a	16, 17
AMR products as beef trimmings yield from AMR systems (derived from vertebral and non-vertebral bone scraps) of fed cattle, beef trimmings yield per head.	4 pounds	n/a	17
Beef AMR product derived from vertebral bone scraps of fed cattle:			

AMR products as beef trimmings yield from AMR systems derived from vertebral bone scraps of fed cattle, beef trimmings yield per head.	3 pounds	n/a	20, 21
Proportion of beef AMR product, derived from vertebrae of cattle less than 30 months of age, yield weight, as a percentage of live weight	0.3 percent	n/a	20, 21
Establishments that produced beef AMR products derived from vertebral columns of cattle less than 30 months of age, in 2003.	18 establishments	n/a	16, 17, 20, 21
Proportion of establishments that were affected because they produced beef AMR products derived from vertebral columns of cattle less than 30 months of age, as a percentage of federally-inspected and State-inspected establishments (3388) that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.	0.53 percent	n/a	16, 17, 20, 21
Cattle less than 30 months of age that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, in 2003	16 million head	n/a	24
Proportion of cattle less than 30 months of age that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, as a percentage of slaughtered cattle less than 30 months of age.	56 percent	n/a	24

Beef AMR product derived from non-vertebral bone scraps of fed cattle:			
Beef AMR product, beef trimmings, yield from AMR systems (AMR product, derived from non-vertebral bone scraps) of fed cattle; beef trimmings yield per head.	2 pounds	n/a	n/a
Proportion of beef AMR product, derived from non-vertebrae of cattle less than 30 months of age, yield weight, as a percentage of live weight	0.16 percent	n/a	n/a
Establishments that produced beef AMR products derived from non-vertebral columns of cattle less than 30 months of age, in 2003.	15 establishments	n/a	20, 21
Proportion of establishments that were affected because they produced beef AMR products derived from non-vertebral columns of cattle less than 30 months of age, as a percentage of federally-inspected and State-inspected establishments (3388) that annually slaughtered or further processed beef products (including calves), excluding beef grinding only establishments, in 2003.	0.44 percent	n/a	20, 21
Cattle less than 30 months of age that were affected, because their non-vertebral columns were available for AMR processing in affected AMR establishments, in 2003	0.2 million head	n/a	20, 21
Proportion of cattle less than 30 months of age that were affected, because their non-vertebral columns were available for AMR processing	0.6 percent	n/a	20, 21

in affected AMR establishments, as a percentage of slaughtered cattle less than 30 months of age.			
<ul style="list-style-type: none"> AMR process control for the production of pork AMR products derived from vertebral and non-vertebral bone scraps of swine of all ages: 			
Commercial hog population presented annually for slaughter under federal inspection, and State inspection, in 2003. Does not include hogs slaughtered on farms.	100.9 million head	n/a	23
Proportion of commercial hogs slaughtered that were under federal inspection	98.8 percent	n/a	23
Proportion of commercial hogs reported as barrows and gilts (market hogs)	96.5 percent	n/a	23
Commercial hogs live weight - average of market hogs at slaughter.	266 pounds	n/a	23
Commercial hogs live weight - average of sows at slaughter.	426 pounds	n/a	23
Commercial pork production.	20 billion pounds	n/a	23
Price of boxed pork trimmings (72 percent lean), in 2003	n/a	\$0.37-\$0.53 per pound	30, 31
Price of boxed pork AMR, in 1998	n/a	\$0.30 per pound	16
Price of pork AMR	n/a	\$0.26-\$0.37 per pound	The price of pork AMR is set to about 70 percent of the price of pork lean trimmings (72 percent lean).

Price of mechanically separated pork or MS(pork)	n/a	\$0.10-\$0.12 per pound	The price of MS(pork) AMR is set to about 22-27 percent of the price of pork lean trimmings (72 percent lean).
Price of porcine meat-and-bone meal, bulk lots, in 2003	n/a	\$280-200 per ton, or \$0.14-\$0.15 per pound	11
Federally-inspected establishments that annually slaughtered hogs.	662 establishments	n/a	23
Federally-inspected and State-inspected establishments that annually slaughtered hogs.	1683 establishments	n/a	23, 24, 29
Federally-inspected and State-inspected establishments that annually slaughtered or further processed hog products, in 2003.	2,350 establishments	n/a	23, 24, 25, 29
Pork AMR product derived from vertebral bone scraps of hogs:			
Additional pork AMR product, (derived bone scraps of hogs); the added pork yield per head beyond what would have been produced by hand-debone processes.	2 pounds	n/a	16
Establishments that produced pork AMR products derived from vertebral columns of sows, in 2003.	6 establishments	n/a	27

Proportion of establishments that were affected because they produced pork AMR products derived from vertebral columns of sows, as a percentage of federally-inspected and State-inspected establishments (2350) that annually slaughtered or further processed pork products establishments, in 2003.	0.26 percent	n/a	23, 24, 25, 29
Sows that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, in 2003	1.1 million head	n/a	24, 27
Proportion of sows that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, in 2003, as a percentage of slaughtered hogs.	1 percent	n/a	24, 27
Establishments that produced pork AMR products derived from vertebral columns of market hogs, in 2003.	15 establishments	n/a	27
Proportion of establishments that were affected because they produced pork AMR products derived from vertebral columns of market hogs, as a percentage of federally-inspected and State-inspected establishments (2350) that annually slaughtered or further processed pork products establishments, in 2003.	0.64 percent	n/a	23, 24, 25, 29
Market hogs that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, in 2003	52.4 million head	n/a	24, 27

Proportion of market hogs that were affected, because their vertebral columns were available for AMR processing in affected AMR establishments, in 2003, as a percentage of slaughtered hogs.	52 percent	n/a	24, 27
Pork AMR product, trimmings yield from AMR systems, derived from vertebral bone scraps of sows, pork trimmings yield per head.	4 pounds	n/a	27
Proportion of pork AMR product, derived from vertebral bone scraps of sows, yield weight, as a percentage of live weight of sows	0.31-0.33 percent	n/a	27
Pork AMR product, trimmings yield from AMR systems, derived from vertebral bone scraps of market hogs, pork trimmings yield per head.	3 pounds	n/a	27
Proportion of pork AMR product, derived from vertebral bone scraps of market hogs, yield weight, as a percentage of live weight of market hogs.	0.23-0.25 percent	n/a	27
Pork AMR product derived from non-vertebral bone scraps of hogs:			
Establishments that produced pork AMR products derived from non-vertebral bones of sows, in 2003.	2 establishments	n/a	27
Proportion of establishments that were affected because they produced pork AMR products derived from non-vertebral bones of sows, as a percentage of federally-inspected and State-inspected establishments (2350) that annually	0.09 percent	n/a	24, 25, 27

slaughtered or further processed pork products establishments, in 2003.			
Sows that were affected, because their non-vertebral bones were available for AMR processing in affected AMR establishments, in 2003	0.34 million head	n/a	24, 27
Proportion of sows that were affected, because their non-vertebral bones were available for AMR processing in affected AMR establishments, in 2003, as a percentage of slaughtered hogs.	0.3 percent	n/a	24, 27
Pork AMR product, trimmings yield from AMR systems, derived from non-vertebral bone scraps of sows, pork trimmings yield per head.	2 pounds	n/a	n/a
Proportion of pork AMR product, derived from non-vertebral bone scraps of sows, yield weight, as a percentage of live weight of sows	0.47 percent	n/a	n/a
Footnotes: 1/ Quantities and prices may be expressed in a range of reported values from the referenced sources. Quantities are rounded 2/ Totals and percentages based on unrounded data and may not equal sum of classes due to rounding. 3/ Slaughter from State-inspected Talmedge-Aiken plants is included in federally-inspected totals 4/ Prices are market prices at the establishment level 5/ References are in Appendix 1 of the FRIA 6/ n/a means not applicable or not available			

Appendix 2. Documentation of Baseline

References SRM AMR 24Mar04 T2000
3/25/2004 2:14 PM

Table 2.2

Assumptions Made in the Economic Model for the Final Regulatory Impact Analysis of the SRM and AMR Interim Final Rules

Input	Variable Name	Reference Source	Assumptions Made
	Brains SRM 1/:		
Input 103	Brains: / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.0007, 0.0008, 0.0009) 2/: For a 1250 pound live weight bovine, the intact brain yield is taken to be about one pound per animal.
Input 104	Brain export sales: variety meat / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.0007, 0.0008, 0.0009): For a 1250 pound live weight bovine, the intact brain yield for export sales is taken to be about one pound per animal.
Input 105	Brain export sales: variety meat / \$ per Pound	30, 31	Triangular (0.42, 0.45, 0.48), in \$ per pound of intact brain as variety meat
Input 106	Brain domestic sales: variety meat / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.0007, 0.0008, 0.0009): For a 1250 pound live weight bovine, the intact brain yield for domestic sales is taken to be about one pound per animal.
Input 107	Brain domestic sales: variety meat / \$ per Pound	30, 31	Triangular (0.42, 0.45, 0.48), in \$ per pound of intact brain as variety meat
Input 108	less operating costs i.e., labor & energy / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.0007, 0.0008, 0.0009): For a 1250 pound live weight bovine, the intact brain yield is taken to be about one pound per animal. This is the yield associated with the harvesting of the intact brain from the cranial cavity of the skull.
Input 109	less operating costs i.e., labor & energy / \$ per Pound	expert opinion (EO) 3/	Triangular (0.09, 0.10, 0.11), in \$ per pound: The operating cost is taken to be about 22 percent of the sales price. The labor cost is about 95 percent of the operating cost. The capital investment to automate the process is about \$21,000 per establishment for a stainless steel hydraulic skull splitter. Typically, only large establishments have sufficient quantities of brains available to utilize the automated process. The operating cost of an automated system is taken to be about \$0.10 per pound of whole brain (variety meat). The single operator of the automatic machine is able to harvest up to 200-250 brains per hour. A second worker then typically packs the brains in 50-60 pound boxes. The second worker may also be doing other tasks. Hand-sawing the skull in order to harvest the intact brain is difficult and time consuming. Therefore, most of the brain variety meat is collected with the automated system.

Input	Variable Name	Reference Source	Assumptions Made
Input 110	alternative sales for industrial uses i.e., inedible tankage / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.0007, 0.0008, 0.0009): For a 1250 pound live weight bovine, the brain tissue yield for inedible rendering is taken to be about one pound per animal.
Input 111	alternative sales for industrial uses i.e., inedible tankage / \$ per Pound	4, 8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: The bovine meal is taken to have a value only as used for fuel that is equivalent to the energy value of soft coal, in the long-run. However, in the short-run, the current market price of ruminant meal is about \$0.10-\$0.14 per pound. Therefore, the offset of increased sales of alternative product may be understated in the short-run.
Input 112	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.0007, 0.0008, 0.0009): For a 1250 pound live weight bovine, the brain tissue yield for extra processing or additional haul-away is taken to be about one pound per animal.
Input 113	disposal - extra processing or haul-away costs / \$ per pound of brain tissue	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: Haul away of inedible materials (unprocessed) is taken to have a nominal payment of about \$20.00 per semi-trailer load, but a nominal amount of cost is taken to be used for extra handling associated with local processing for inedible rendering or movement to outside rendering facilities. The nominal cost is taken to be about 67 percent of the price of meat and bone meal that is taken to have the value of soft coal, as a fuel source. However, some establishment have their own inedible rendering operation and only have some additional extra processing, if they previously were harvesting brains for variety meat. Other establishments that previously harvested intact brains, do not have inedible rendering operation, and therefore, have some additional haul-away costs.
	Spinal Cords SRM:		
Input 114	Spinal Cords: / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the intact spinal cord yield is taken to be about 0.38 of a pound per animal.
Input 115	Spinal Cord export sales: variety meats / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the intact detached spinal cord yield for export sales as variety meat is taken to be about 0.38 of a pound per animal.
Input 116	Spinal Cord export sales: variety meats / \$ per Pound	EO	Triangular (0.29, 0.30, 0.31), in \$ per pound: The price of intact detached spinal cords (variety meat) for export is taken to be about 67 percent of the price of brains for export.

Input	Variable Name	Reference Source	Assumptions Made
Input 117	Spinal Cord domestic sales: edible rendering / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the spinal cord tissue yield for edible rendering processes and domestic sales is taken to be about 0.38 of a pound per animal.
Input 118	Spinal Cord domestic sales: edible rendering / \$ per Pound	12 and EO.	Triangular (0.15, 0.25, 0.35), in \$ per pound: This is the taken price, at the establishment level, for a bundle of beef edible rendered products (i.e., soup stock or broth, beef flavorings, beef extracts, edible gelatin, bouillon, edible tallow).
Input 119	less operating costs i.e., labor & energy / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the intact spinal cord yield for variety meat for export is taken to be about 0.38 of a pound per animal. This is the yield associated with the harvesting of the intact spinal cord as variety meat from the vertebral column.
Input 120	less operating costs i.e., labor & energy / \$ per pound of spinal cord	EO	Triangular (0.03, 0.04, 0.05), in \$ per pound: The operating cost is taken to be about 13 percent of the sales price. The labor cost is taken to be about 98 percent of the operating cost. If harvested, the spinal cord processing is typically done in small establishments that have excess labor at relatively low wage rates.
Input 121	alternative sales for industrial uses i.e., inedible tankage / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the intact spinal cord yield for inedible rendering is taken to be about 0.38 of a pound per animal.
Input 122	alternative sales for industrial uses i.e., inedible tankage / \$ per Pound	4, 8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: See above assumptions of Input 111 taken on the price of inedible tankage.
Input 123	Spinal Cord extraction/removal cost i.e., labor & energy / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the intact spinal cord yield is taken to be about 0.38 of a pound per animal. This is the yield associated with the removal of the entire spinal cord from the vertebral column.

Input	Variable Name	Reference Source	Assumptions Made
Input 124	Spinal Cord extraction/removal cost i.e., labor & energy / \$ per pound of spinal cord	21 and EO	Triangular (0.19, 0.20, 0.21), in \$ per pound: The operating cost is taken to be about \$0.075 per animal. The labor cost is taken to be about 80 percent of the operating cost. About 15 percent of the operating cost is taken for the annual depreciation of equipment (the capital investment including installation cost is taken to be \$4,400 per establishment) that is used by a relatively large proportion of large and some small establishments to remove the spinal cord material by vacuum suction. However, many small establishments and most very small establishments are typically able to remove the spinal cord material by hand and by using low-cost handheld scraper (not mechanized) tools. Also, high pressure water is used in some establishments to force out remnants of spinal cord tissue from the vertebral canal of the vertebral column.
Input 125	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	12, 13, 14	Triangular (0.00025, 0.00030, 0.00035): For a 1250 pound live weight bovine, the intact spinal cord yield for extra processing or additional haul-away is taken to be about 0.38 of a pound per animal.
Input 126	disposal - extra processing or haul-away costs / \$ per pound of spinal cord tissue	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs. However, some establishment have their own inedible rendering operation and only have some additional extra processing, if they previously were harvesting spinal cords for export variety meat. Other establishments that previously harvested intact spinal cords, do not have inedible rendering operation, and therefore, have some additional haul-away costs.
	Vertebral Column - AMR Products SRM:		
Input 127	Vertebral Columns: AMR Processes / Affected Yield as Percent of Live Weight	17, 20, and EO	Triangular (0.03, 0.04, 0.05): For a 1250 pound live weight bovine, the vertebral column scrap, after deboning at the primary and secondary levels, is taken to be about 50 pounds per animal that is 30 months of age or older (i.e., cull cow).
Input 128	AMR production: domestic use / Affected Yield as Percent of Live Weight	17, 20, and EO	Triangular (0.007, 0.0072, 0.0074): For a 1250 pound live weight bovine, the AMR product yield of vertebral column scrap is taken to about 9 pounds per animal that is 30 months of age or older (i.e., cull cow).
Input 129	AMR production: domestic use / \$ per Pound	30, 31 and EO	Triangular (0.70, 0.84, 0.95), in \$ per pound: The price is taken to be 70 percent of the price of beef lean trimmings (90 percent)
Input 130	less AMR operating costs i.e., labor & energy / Affected Yield	17, 20, and EO	Triangular (0.007, 0.0072, 0.0074): For a 1250 pound live weight bovine, the AMR product yield is taken to be about 9 pounds per animal that is 30 months of age or older (i.e., cull cow).

Input	Variable Name	Reference Source	Assumptions Made
Input 131	less AMR operating costs i.e., labor & energy / \$ per Pound	15, 16, EO	Triangular (0.15, 0.20, 0.25), in \$ per pound: The operating cost is taken to be about 24 percent of the price of beef AMR product. The capital investment is taken to be about \$475,000 for an AMR system. The operating cost includes the labor of one operator, energy costs, equipment maintenance cost, and other costs.
Input 132	alternative sales of hand deboned trimmings, 90% / Affected Yield as Percent of Live Weight	17, 20, and EO	Triangular (0.003, 0.0032, 0.0034): For a 1250 pound live weight bovine, the hand-deboned beef product yield of vertebral column scrap is taken to be about 4 pounds per animal that is 30 months of age or older (i.e., cull cows).
Input 133	alternative sales of hand deboned trimmings, 90% / \$ per Pound	30, 31	Triangular (1.00, 1.20, 1.36), in \$ per pound: The price taken is the price of boxed beef trimmings (90 percent lean)
Input 134	less hand debone operating costs i.e., labor & increased insurance premium for carpal tunnel issues / Affected Yield as Percent of Live Weight	17, 20, and EO	Triangular (0.003, 0.0032, 0.0034)
Input 135	less hand debone operating costs i.e., labor & increased insurance premium for carpal tunnel issues / \$ per Pound	15, 16, EO	Triangular (0.20, 0.30, 0.40), in \$ per pound: The operating cost is taken as about 25 percent of the price of boxed beef trimmings (90 percent lean). The raw material is taken to be scrap bones with tags of skeletal muscle still attached. The capital investment is taken to be powered knives, and additional work space. The operating cost is taken to include labor, equipment maintenance costs, health insurance premiums for carpal tunnel syndrome, energy costs, and other costs.
Input 136	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	17, 20, and EO	Triangular (0.03, 0.04, 0.05)
Input 137	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	Vertebral Column - Edible Rendering Products SRM:		

Input	Variable Name	Reference Source	Assumptions Made
Input 138	Edible Rendering: Vertebral Bone-in Processes / Affected Yield as Percent of Live Weight	EO	Triangular (0.03, 0.04, 0.05)
Input 139	Edible Rendering Production: domestic use / Affected Yield as Percent of Live Weight	EO	Triangular (0.003, 0.0032, 0.0034)
Input 140	Edible Rendering Production: domestic use / \$ per Pound	12, and EO	Triangular (0.15, 0.25, 0.35), in \$ per pound: This is the taken price, at the establishment level, for a bundle of beef edible rendered products (i.e., soup stock or broth, beef flavorings, beef extracts, edible gelatin, bouillon, edible tallow).
Input 141	less operating costs i.e., labor & energy / Affected Yield as Percent of Live Weight	EO	Triangular (0.003, 0.0032, 0.0034)
Input 142	less operating costs i.e., labor & energy / \$ per Pound	EO	Triangular (0.05, 0.06, 0.07), in \$ per pound
Input 143	alternative sales for industrial uses i.e., inedible tankage / Affected Yield as Percent of Live Weight	EO	Triangular (0.003, 0.0032, 0.0034)
Input 144	alternative sales for industrial uses i.e., inedible tankage / \$ per Pound	8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: See above assumptions of Input 111 taken on the price of inedible tankage.
Input 145	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	EO	Triangular (0.003, 0.0032, 0.0034)

Input	Variable Name	Reference Source	Assumptions Made
Input 146	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	Vertebral Column - Bone-in Cuts SRM:		
Input 147	Bone-in cuts with vertebrae: / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.0606, 0.0616, 0.0626)
Input 148	Bone-in cuts with vertebrae domestic sales / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.0606, 0.0616, 0.0626)
Input 149	Bone-in cuts with vertebrae domestic sales / \$ per Pound	30, 31, and EO	Triangular (2.00, 2.30, 2.35)
Input 150	Bone-in extraction extra costs to remove body of vertebrae / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.0606, 0.0616, 0.0626)
Input 151	Bone-in extraction extra costs to remove body of vertebrae / \$ per Pound	EO	Triangular (0.11, 0.12, 0.13)
Input 152	alternative sales of cuts without vertebral bodies / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.05, 0.051, 0.052)
Input 153	alternative sales of cuts without vertebral bodies / \$ per Pound	30, 31, and EO	Triangular (2.56, 2.66, 2.76)

Input	Variable Name	Reference Source	Assumptions Made
Input 154	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.0096, 0.0106, 0.0116)
Input 155	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	Market Heads SRM:		
Input 156	Market heads export sales / Affected Yield as Percent of Live Weight	12, 13,14, and EO	Triangular (0.011, 0.013, 0.015)
Input 157	Market heads export sales / \$ per Animal	EO	Triangular (2.30, 2.40, 2.50), in \$ per head
Input 158	Market heads domestic sales / Affected Yield as Percent of Live Weight	12, 13,14, and EO	Triangular (0.011, 0.013, 0.015)
Input 159	Market heads domestic sales / \$ per Animal	EO	Triangular (5.30, 6.00, 6.40), in \$ per head
Input 160	alternative domestic sales of head & check meat / Affected Yield as Percent of Live Weight	12, 13,14, and EO	Triangular (0.0046, 0.0048, 0.005)
Input 161	alternative domestic sales of head & check meat / \$ per Pound	EO	Triangular (0.60, 0.70, 0.80), in \$ per pound:

Input	Variable Name	Reference Source	Assumptions Made
Input 162	less hand debone operating costs i.e., labor, energy & increased insurance premium for carpal tunnel issues / Affected Yield as Percent of Live Weight	12, 13,14, and EO	Triangular (0.0046, 0.0048, 0.005)
Input 163	less hand debone operating costs i.e., labor, energy & increased insurance premium for carpal tunnel issues / \$ per Pound	EO	Triangular (0.20, 0.30, 0.40), in \$ per pound:
Input 164	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	12, 13,14, and EO	Triangular (0.008, 0.0082, 0.0084)
Input 165	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	Small Intestines SRM:		
Input 166	Small Intestine export sales (casings) 40 meters in length / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield is taken to be about 11 pounds per animal.
Input 167	Small Intestine export sales (casings) 40 meters in length / \$ per Pound	30, 31	Triangular (0.16, 0.185, 0.21), in \$ per pound:
Input 168	Small Intestine export sales (trepas) 40 meters in length / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield for export sales is taken to be about 11 pounds per animal.

Input	Variable Name	Reference Source	Assumptions Made
Input 169	Small Intestine export sales (trepas) 40 meters in length / \$ per Pound	30, 31	Triangular (0.32, 0.37, 0.42), in \$ per pound:
Input 170	Small Intestine domestic sales (casings) 40 meters in length / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield for domestic sales is taken to be about 11 pounds per animal.
Input 171	Small Intestine domestic sales (casings) 40 meters in length / \$ per Pound	30, 31	Triangular (0.16, 0.185, 0.21), in \$ per pound:
Input 172	Small Intestine domestic sales (trepas) 40 meters in length / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield is taken to be about 11 pounds per animal.
Input 173	Small Intestine domestic sales (trepas) 40 meters in length / \$ per Pound	30, 31	Triangular (0.32, 0.37, 0.42), in \$ per pound:
Input 174	less operating costs i.e., labor & energy / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield is taken to be about 11 pounds per animal.
Input 175	less operating costs i.e., labor & energy / \$ per Pound	EO	Triangular (0.06, 0.07, 0.08), in \$ per pound:
Input 176	alternative domestic sales for industrial uses i.e., inedible tankage / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield is taken to be about 11 pounds per animal.

Input	Variable Name	Reference Source	Assumptions Made
Input 177	alternative domestic sales for industrial uses i.e., inedible tankage / \$ per Pound	8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: See above assumptions of Input 111 taken on the price of inedible tankage.
Input 178	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0087, 0.0088, 0.0089): For a 1250 pound live weight bovine, the processed small intestine yield is taken to be about 11 pounds per animal.
Input 179	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	Tonsils SRM:		
Input 180	Tonsils domestic sales edible rendering / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0019, 0.002, 0.0021): For a 1250 pound live weight bovine, the tonsil and associated tissue yield for edible rendering processes is taken to be about 2.5 pounds per animal.
Input 181	Tonsils domestic sales edible rendering / \$ per Pound	12 and EO	Triangular (0.15, 0.25, 0.35), in \$ per pound: This is the taken price, at the establishment level, for a bundle of beef edible rendered products (i.e., soup stock or broth, beef flavorings, beef extracts, edible gelatin, bouillon, edible tallow).
Input 182	less operating costs i.e., labor & energy / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0019, 0.002, 0.0021): For a 1250 pound live weight bovine, the tonsil and associated tissue yield for edible rendering processes is taken to be about 2.5 pounds per animal.
Input 183	less operating costs i.e., labor & energy / \$ per Pound	EO	Triangular (0.05, 0.06, 0.07), in \$ per pound:
Input 184	alternative sales for industrial uses i.e., inedible tankage / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0019, 0.002, 0.0021): For a 1250 pound live weight bovine, the tonsil and associated tissue yield for edible rendering processes is taken to be about 2.5 pounds per animal.

Input	Variable Name	Reference Source	Assumptions Made
Input 185	alternative sales for industrial uses i.e., inedible tankage / \$ per Pound	8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: See above assumptions of Input 111 taken on the price of inedible tankage.
Input 186	disposal - extra processing or haul-away costs / Affected Yield as Percent of Live Weight	12, 13, 14, and EO	Triangular (0.0019, 0.002, 0.0021): For a 1250 pound live weight bovine, the tonsil and associated tissue yield for edible rendering processes is taken to be about 2.5 pounds per animal.
Input 187	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	Segregation of SRMs:		
Input 188	SRMs segregation, separation, extra handling, dentition determination / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50)
Input 189	SRMs segregation, separation, extra handling, dentition determination / \$ per Animal	EO	Triangular (0.20, 0.25, 0.30), in \$ per whole carcass: The cost per whole carcass that is taken is based on the additional segregation of SRM materials, because of the SRM interim final rule. Only a portion of the affected establishments have additional costs of segregation. Prior to the SRM rule, establishments already segregated older carcasses and parts of the older carcasses from younger carcasses and parts of If the birth date documentation is not available, then the age of the animal can be estimated by the use of dental checks or dentition methods. Additional labor is necessary for the dentition checks, and the segregation of the cattle by the two age groups. In some cases, establishments have purchased additional saws to split carcasses by age groups.
Input 190	large / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
Input 191	small / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle

Input	Variable Name	Reference Source	Assumptions Made
Input 192	very small / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
Input 193	large / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of disabled cattle
Input 194	small / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
Input 195	very small / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
Input 196	large / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
Input 197	small / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
Input 198	very small / Affected Yield as Percent of Live Weight	10 and EO	Triangular (0.46, 0.48, 0.50): Carcass yield of affected cattle
	Modification of Plans and Record Keeping:		
Input 199	Develop written procedures for SRMs, once annually / \$ per Animal	EO	Triangular (0.01, 0.01667, 0.02), in \$ per animal: The cost is taken to be based on the number of cattle or cattle carcasses affected by the SRM interim final rule.

Input	Variable Name	Reference Source	Assumptions Made
Input 200	SRMs monitoring recordkeeping, daily, 300 days annually / \$ per Animal	EO	Triangular (0.65, 0.65625, 0.67), in \$ per animal: The cost is taken to be based on the number of cattle or cattle carcasses affected by the SRM interim final rule.
	Ban Non-ambulatory Disabled Cattle:		
Input 201	Ban non-ambulatory disabled cattle / Affected Percent Animals	4, 35, and EO	Triangular (0.005, 0.0055, 0.008): The is taken to be the affected cattle (non-ambulatory disabled cattle), as a proportion of all the slaughtered cattle, annually.
Input 202	Ban non-ambulatory disabled cattle / Affected Yield as Percent of Live Weight	EO	Triangular (0.37, 0.38, 0.39): This is taken to be about 80 percent of the carcass yield of cull cows (canners).
Input 203	Ban non-ambulatory disabled cattle / Affected Proportion	4, and EO	Triangular (0.30, 0.40, 0.50): This is taken to be the non-ambulatory disabled cattle that previously (in 2003) were U.S.D.A. inspected and passed fit for human food, as a proportion of all non-ambulatory disabled cattle that previously were presented for slaughter. The proportion probably understate the actual passed rate, or conversely, overstate the USDA condemnation rate of this class of cattle presented for slaughter. Comments are requested on this assumption.
Input 204	Ban non-ambulatory disabled cattle / \$ per Pound	EO	Triangular (1.20, 1.36, 1.40), in \$ per pound as boxed beef trimmings
Input 205	less operating costs i.e., labor / Affected Percent Animals	4, 35, and EO	Triangular (0.005, 0.0055, 0.008)
Input 206	less operating costs i.e., labor / Affected Yield as Percent of Live Weight	EO	Triangular (0.37, 0.38, 0.39): This is taken to be about 80 percent of the carcass yield of cull cows (canners).

Input	Variable Name	Reference Source	Assumptions Made
Input 207	less operating costs i.e., labor / Affected Proportion	4, and EO	Triangular (0.30, 0.40, 0.50):
Input 208	less operating costs i.e., labor / \$ per Pound	EO	Triangular (0.11, 0.12, 0.13), in \$ per pound: This is taken as the operating costs to dress cattle and to further process the derived carcass for boxed beef trimmings.
Input 209	alternative sales for industrial uses i.e., inedible tankage / Affected Percent Animals	4, 35, and EO	Triangular (0.005, 0.0055, 0.008)
Input 210	alternative sales for industrial uses i.e., inedible tankage / Affected Proportion	EO	Triangular (0.50, 0.65, 0.75):
Input 211	alternative sales for industrial uses i.e., inedible tankage / \$ per Pound	8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: See above assumptions of Input 111 taken on the price of inedible tankage.
Input 212	disposal - extra processing or haul-away costs / Affected Percent Animals	4, 35, and EO	Triangular (0.005, 0.0055, 0.008)
Input 213	disposal - extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	AMR Products - System Modification that Reduce Yield:		
Input 216	Vertebral Column Bones / Yield Percent Live Weight	EO	Triangular (0.03, 0.04, 0.05): For a 1250 pound live weight bovine, the vertebral column scrap, after deboning at the primary and secondary levels, is taken to be about 50 pounds per animal that is less than 30 months of age (i.e., fed steer). However, with the exception of the cervical vertebrae, most of the vertebral column is typically fabricated into bone-in cuts.

Table II.

Input	Variable Name	Reference Source	Assumptions Made
Input 217	AMR production / Yield Percent Live Weight	16, 17, and EO	Triangular (0.0023, 0.0024, 0.0025): For a 1250 pound live weight bovine, the AMR product yield of vertebral column scrap is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer). Typically, only the cervical vertebrae are available as bone scrap for further processing in an AMR system.
Input 218	AMR production / \$ per Pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), in \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).
Input 219	compliance modifications lower yield / Yield Percent Live Weight	EO	Triangular (0.000308, 0.000408, 0.000508): For a 1250 pound live weight bovine, the reduced yield of AMR product of vertebral column scrap is taken to be about 0.51 of a pound per animal that is less than 30 months of age (i.e., fed steer). The reduced yield is because of modifications or adjustments to AMR system in order to produce compliant AMR product derived from vertebral column bones.
Input 220	compliance modifications lower yield / \$ per Pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), in \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).
Input 221	compliance modifications extra costs / Yield Percent Live Weight	EO	Triangular (0.001892, 0.001992, 0.002092): For a 1250 pound live weight bovine, the affected yield of AMR product of vertebral column scrap is taken to be about 2.49 pounds per animal that is less than 30 months of age (i.e., fed steer). The affected yield is because of modifications or adjustments to AMR system in order to produce compliant AMR product derived from vertebral column bones.
Input 222	compliance modifications extra costs / \$ per Pound	EO	Triangular (0.02, 0.03, 0.04), in \$ per pound: The extra costs to modify operations of the AMR system are taken to include some machine modification (e.g., capital investment in new screens) and process adjustments that increase operating costs per pound of yield (e.g., increased maintenance costs).
Input 223	alternative sales of product for edible rendering uses i.e., gelatin sales / Yield Percent Live Weight	EO	Triangular (0.003, 0.0032, 0.0034): For a 1250 pound live weight bovine, the AMR product yield of vertebral column scrap for edible rendering is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer). Typically, only the cervical vertebrae are available as bone scrap for further processing in an edible rendering system.
Input 224	alternative sales of product for edible rendering uses i.e., gelatin sales / \$ per Pound	12 and EO	Triangular (0.15, 0.25, 0.35), \$ per pound: This is the taken price, at the establishment level, for a bundle of beef edible rendered products (i.e., soup stock or broth, beef flavorings, beef extracts, edible gelatin, bouillon, edible tallow).

Input	Variable Name	Reference Source	Assumptions Made
Input 225	less operating costs i.e., labor & energy / Yield Percent Live Weight	EO	Triangular (0.003, 0.0032, 0.0034): For a 1250 pound live weight bovine, the AMR product yield of vertebral column scrap for edible rendering is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer). Typically, only the cervical vertebrae are available as bone scrap for further processing in an edible rendering system.
Input 226	less operating costs i.e., labor & energy / \$ per Pound	EO	Triangular (0.05, 0.06, 0.07), \$ per pound
Input 227	alternative sales of product for industrial uses i.e., inedible rendering / Yield Percent Live Weight	EO	Triangular (0.003, 0.0032, 0.0034)
Input 228	alternative sales of product for industrial uses i.e., inedible rendering / \$ per Pound	EO	Triangular (0.02, 0.03, 0.04), \$ per pound
Input 229	disposal i.e., net extra processing or haul-away costs / Yield Percent Live Weight	EO	Triangular (0.003, 0.0032, 0.0034)
Input 230	disposal i.e., net extra processing or haul-away costs / \$ per Pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
Input 231	AMR production / Yield Percent Live Weight	EO	Triangular (0.0015, 0.0016, 0.0017): For a 1250 pound live weight bovine, the AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., fed steer or cull cow). Typically, only the briskets are available as bone scraps of cattle less than 30 months of age, and briskets, ribs and scapulas are available as bone scraps of cattle 30 months of age or older, for further processing in an AMR system.
Input 232	AMR production / \$ per Pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).

Input	Variable Name	Reference Source	Assumptions Made
Input 233	AMR production - sows / Yield Percent Live Weight	EO	Triangular (0.0031, 0.0032, 0.0033): For a 426 pound live weight sow, the AMR product yield of vertebral column scrap and other bone scrap is taken to be about 4 pounds per animal (i.e., sow).
Input 234	AMR production - sows / \$ per Pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 235	AMR production - market swine / Yield Percent Live Weight	EO	Triangular (0.0023, 0.0024, 0.0025): For a 265 pound live weight market swine, the AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 pounds per animal (i.e., barrow or gilt).
Input 236	AMR production - market swine / \$ per Pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 237	compliance modifications lower yield / Yield Percent Live Weight	EO	Triangular (0.0002164, 0.0002264, 0.0002364): For a 300 pound average live weight hog, the AMR product lower yield of vertebral column scrap and other bone scrap is taken to be about 0.06 of a pound per animal. The lower yield is typically from reducing the operating pressure and dwell time, and from eliminating the processing of pelvis bones that contain DRG tissues.
Input 238	compliance modifications lower yield / \$ per Pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).
Input 239	compliance modifications extra costs / Yield Percent Live Weight	EO	Triangular (0.0100943, 0.0110943, 0.0120943): For a 300 pound average live weight hog, the AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 (2.94) pounds per animal.
Input 240	compliance modifications extra costs / \$ per Pound	EO	Triangular (0.02, 0.03, 0.04), \$ per pound: The extra costs to modify operations of the AMR system are taken to include some machine modification (e.g., capital investment in new screens) and process adjustments that increase operating costs per pound of yield (e.g., increased maintenance costs).

Assumptions Made in the Economic Model for the Final Regulatory Impact Analysis of the SRM and AMR Interim Final Rules

Input	Variable Name	Reference Source	Assumptions Made
Input 241	AMR production - sows / Yield Percent Live Weight	EO	Triangular (0.0045948, 0.0046948, 0.0047948): For a 426 pound live weight sow, the AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., sow).
Input 242	AMR production - sows / \$ per Pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 243	AMR production - market swine / Yield Percent Live Weight	EO	Triangular (0.0036735, 0.0037735, 0.0038735): For a 265 pound live weight market swine, the AMR product yield of non-vertebral column scrap is taken to be about 1 pounds per animal (i.e., barrow or gilt)
Input 244	AMR production - market swine / \$ per Pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
	AMR Products - Noncompliant Products:		
Input 247	AMR production / Yield Percent Live Weight	EO	Triangular (0.0023, 0.0024, 0.0025): For a 1250 pound live weight bovine, the AMR product yield of vertebral column scrap is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer). Typically, only the cervical vertebrae are available as bone scrap for further processing in an AMR system.
Input 248	AMR production / \$ per pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).
Input 249	noncompliance / Yield Percent Live Weight	EO	Triangular (0.0023, 0.0024, 0.0025): For a 1250 pound live weight bovine, the noncompliant AMR product yield of vertebral column scrap is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer). Typically, only the cervical vertebrae are available as bone scrap for further processing in an AMR system.
Input 250	noncompliance / \$ per pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).

Input	Variable Name	Reference Source	Assumptions Made
Input 251	alternative sales of noncompliant product for industrial uses i.e., animal feed sales / Yield Percent Live Weight	EO	Triangular (0.0023, 0.0024, 0.0025): For a 1250 pound live weight bovine, the noncompliant AMR product yield of vertebral column scrap is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer).
Input 252	alternative sales of noncompliant product for industrial uses i.e., animal feed sales / \$ per pound	EO	Triangular (0.02, 0.03, 0.05), \$ per pound: The noncompliant beef AMR product is taken to be processed in inedible operations. The bovine meal is taken to have a value only as used for fuel that is equivalent to the energy value of soft coal, in the long-run. However, in the short-run, the current market price of ruminant meal is about \$0.10-\$0.14 per pound. Therefore, the offset of increased sales of alternative product may be understated in the short-run.
Input 253	disposal i.e., net extra processing or haul-away costs / Yield Percent Live Weight	EO	Triangular (0.0023, 0.0024, 0.0025): For a 1250 pound live weight bovine, the noncompliant AMR product yield of vertebral column scrap is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer).
Input 254	disposal i.e., net extra processing or haul-away costs / \$ per pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
Input 255	AMR production / Yield Percent Live Weight	EO	Triangular (0.0015, 0.0016, 0.0017): For a 1250 pound live weight bovine, the AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., fed steer or cull cow). Typically, only the briskets are available as bone scraps of cattle less than 30 months of age, and briskets, ribs and scapulas are available as bone scraps of cattle 30 months of age or older, for further processing in an AMR system.
Input 256	AMR production / \$ per pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).
Input 257	noncompliance / Yield Percent Live Weight	EO	Triangular (0.0015, 0.0016, 0.0017): For a 1250 pound live weight bovine, the noncompliant AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., fed steer or cull cow). Typically, only the briskets are available as bone scraps of cattle less than 30 months of age, and briskets, ribs and scapulas are available as bone scraps of cattle 30 months of age or older, for further processing in an AMR system.

Input	Variable Name	Reference Source	Assumptions Made
Input 258	noncompliance / \$ per pound	30, 31, and EO	Triangular (0.85, 1.00, 1.10), \$ per pound: The price taken for beef AMR product that is compliant. The price taken is about 70 percent of the price of boxed beef lean trimmings (90 percent lean).
Input 259	alternative sales of noncompliant product for industrial uses i.e., animal feed sales / Yield Percent Live Weight	EO	Triangular (0.0015, 0.0016, 0.0017): For a 1250 pound live weight bovine, the noncompliant beef AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., fed steer or cull cow). Typically, only the briskets are available as bone scraps of cattle less than 30 months of age, and briskets, ribs and scapulas are available as bone scraps of cattle 30 months of age or older, for further processing in an AMR system.
Input 260	alternative sales of noncompliant product for industrial uses i.e., animal feed sales / \$ per pound	8 and EO	Triangular (0.025, 0.03, 0.035), in \$ per pound: See above assumptions of Input 111 taken on the price of inedible tankage, or other industrial uses.
Input 261	disposal i.e., net extra processing or haul-away costs / Yield Percent Live Weight	EO	Triangular (0.0015, 0.0016, 0.0017): For a 1250 pound live weight bovine, the noncompliant beef AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., fed steer or cull cow). Typically, only the briskets are available as bone scraps of cattle less than 30 months of age, and briskets, ribs and scapulas are available as bone scraps of cattle 30 months of age or older, for further processing in an AMR system.
Input 262	disposal i.e., net extra processing or haul-away costs / \$ per pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
Input 263	AMR production - sows / Yield Percent Live Weight	EO	Triangular (0.0093, 0.0094, 0.0095): For a 426 pound live weight sow, the noncompliant AMR product yield of vertebral column scrap and other bone scrap is taken to be about 4 pounds per animal (i.e., sow).
Input 264	AMR production - sows / \$ per pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 265	AMR production - market swine / Yield Percent Live Weight	EO	Triangular (0.0112207, 0.0113207, 0.0114207): For a 265 pound live weight market swine, the AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 pounds per animal (i.e., barrow or gilt).

Input	Variable Name	Reference Source	Assumptions Made
Input 266	AMR production - market swine / \$ per pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 267	noncompliance / Yield Percent Live Weight	EO	Triangular (0.0112962, 0.0113962, 0.0114962): For a 265 pound average live weight hog, the noncompliant AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 pounds per animal.
Input 268	noncompliance / \$ per pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 269	alternative sales of noncompliant product for MS(pork) / Yield Percent Live Weight	EO	Triangular (0.0112207, 0.0113207, 0.0114207): For a 265 pound average live weight hog, the noncompliant AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 pounds per animal.
Input 270	alternative sales of noncompliant product for MS(pork) / \$ per pound	30, 31, and EO	Triangular (0.10, 0.11, 0.12), \$ per pound: The price taken for mechanically separated pork, MS(pork) product that is compliant. The price taken is about 25 percent of the price of boxed pork trimmings (72 percent lean).
Input 271	disposal i.e., net extra processing or haul-away costs / Yield Percent Live Weight	EO	Triangular (0.0112962, 0.0113962, 0.0114962): For a 265 pound average live weight hog, the noncompliant AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 pounds per animal.
Input 272	disposal i.e., net extra processing or haul-away costs / \$ per pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
Input 273	AMR production - sows / Yield Percent Live Weight	EO	Triangular (0.0046, 0.0047, 0.0048): For a 426 pound average live weight sow, the pork AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal.

Input	Variable Name	Reference Source	Assumptions Made
Input 274	AMR production - market swine / Yield Percent Live Weight	EO	Triangular (0.0036735, 0.0037735, 0.0038735): For a 265 pound average live weight market swine, the pork AMR product yield of non-vertebral column scrap is taken to be about 1 pound per animal.
Input 275	noncompliance / Yield Percent Live Weight	EO	Triangular (0.0046, 0.0047, 0.0048): For a 426 pound average live weight hog, the noncompliant AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal.
Input 276	noncompliance / \$ per pound	30, 31, and EO	Triangular (0.26, 0.31, 0.37), \$ per pound: The price taken for pork AMR product that is compliant. The price taken is about 70 percent of the price of boxed pork trimmings (72 percent lean).
Input 277	alternative sales of noncompliant product for MS(pork) / Yield Percent Live Weight	EO	Triangular (0.0046, 0.0047, 0.0048): For a 426 pound average live weight hog, the noncompliant AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal.
Input 278	alternative sales of noncompliant product for MS(pork) / \$ per pound	30, 31, and EO	Triangular (0.10, 0.11, 0.12), \$ per pound: The price taken for mechanically separated pork, MS(pork) product that is compliant. The price taken is about 25 percent of the price of boxed pork trimmings (72 percent lean).
Input 279	disposal i.e., net extra processing or haul-away costs / Yield Percent Live Weight	EO	Triangular (0.0046, 0.0047, 0.0048): For a 426 pound average live weight hog, the noncompliant AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal.
Input 280	disposal i.e., net extra processing or haul-away costs / \$ per pound	8 and EO	Triangular (0.01, 0.02, 0.03), in \$ per pound: See above assumptions of Input 113 taken on the cost of extra processing or haul-away costs.
	AMR Products - Additional Testing:		
Input 283	AMR production / Yield Percent Live Weight	EO	Triangular (0.0023, 0.0024, 0.0025): For a 1250 pound live weight bovine, the AMR product yield of vertebral column scrap is taken to be about 3 pounds per animal that is less than 30 months of age (i.e., fed steer). Typically, only the cervical vertebrae are available as bone scrap for further processing in an AMR system.

Input	Variable Name	Reference Source	Assumptions Made
Input 284	AMR production / Yield Percent Live Weight	EO	Triangular (0.0015, 0.0016, 0.0017): For a 1250 pound live weight bovine, the AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal (i.e., fed steer or cull cow). Typically, only the briskets are available as bone scraps of cattle less than 30 months of age, and briskets, ribs and scapulas are available as bone scraps of cattle 30 months of age or older, for further processing in an AMR system.
Input 285	AMR production - sows / Yield Percent Live Weight	EO	Triangular (0.0093, 0.0094, 0.0095): For a 426 pound live weight sow, the noncompliant AMR product yield of vertebral column scrap and other bone scrap is taken to be about 4 pounds per animal (i.e., sow).
Input 286	AMR production - market swine / Yield Percent Live Weight	EO	Triangular (0.0112207, 0.0113207, 0.0114207): For a 265 pound live weight market swine, the AMR product yield of vertebral column scrap and other bone scrap is taken to be about 3 pounds per animal (i.e., barrow or gilt).
Input 287	AMR production - sows / Yield Percent Live Weight	EO	Triangular (0.0046, 0.0047, 0.0048): For a 426 pound average live weight sow, the pork AMR product yield of non-vertebral column scrap is taken to be about 2 pounds per animal.
Input 288	AMR production - market swine / Yield Percent Live Weight	EO	Triangular (0.0036735, 0.0037735, 0.0038735): For a 265 pound average live weight market swine, the pork AMR product yield of non-vertebral column scrap is taken to be about 1 pound per animal.
Input 289	CNS-type tissue tests / \$ per test	EO	Triangular (80.00, 94.00, 110.00), \$ per test: The cost of testing for CNS-type tissues (brain, spinal cord, DRG, trigeminal ganglia) is taken to be the resulting cost when using a mix of different test kits of the immunohistopathologic (IMH) (a relatively high-cost test method that is specific for detecting the targeted tissues) and ELISA (a relatively lower cost test method that is less specific for detecting the targeted tissues). However, the food industry has yet to demonstrate a sufficiently significant correlation of the ELISA test to the more specific IMH test.
Input 290	iron duplicated on same sample / \$ per test	EO	Triangular (40.00, 60.00, 100.00), \$ per test: The percent iron test is to be duplicated on the same sample. The percent protein test is to be done once per sample. Most of the large establishments are taken to have their established in-establishment laboratories, or corporate-centralized laboratories that can do the iron and protein tests for a cost that is considerably less than the commercial laboratories. The small establishments typically use the commercial laboratories. Depending on quantities and contract arrangements, the commercial laboratories are taken to charging about \$40 to \$100 per sample to run the percent protein and duplicate iron tests.
	AMR Products - Additional Plans & Recordkeeping:		
Input 291	Recordkeeping - annual review of plan / \$ per Hour	EO	Triangular (29.00, 30.00, 31.00), \$ per hour, for the total cost of wages and benefits

Input	Variable Name	Reference Source	Assumptions Made
Input 292	Recordkeeping - daily collection and recording of data / \$ per Hour	EO	Triangular (29.00, 30.00, 31.00), \$ per hour, for the total cost of wages and benefits
	AMR Products - Additional Packaging & Storage:		
Input 293	Package & hold / \$ per Pound	EO	Triangular (0.005, 0.01, 0.015), \$ per pound, for the total cost of boxing and holding, in frozen storage, AMR products: AMR products are taken to be packaged in about 60 pound boxes. Then AMR products are typically frozen and stored pending test results. In order to be labeled as AMR product the test results are to be negative for CNS-type tissues (spinal cord and DRG), and within the limits of calcium and excess iron contents.
Footnotes:			
1/ Specified risk material (SRM) for BSE (Bovine Spongiform Encephalopathy)			
2/ The triangular distribution contains the minimum, the most likely, and the maximum values, respectively.			
3/ expert opinion (EO)			