The American Meat Institute
Meat Demand Study

The Impact of Proposed
Grain Inspection, Packers and Stockyards Administration
Proposed Rule

Methodology and Documentation

Prepared for

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August 24, 2010

GIPSA Model Methodology and Results

Summary Results:

A regulation proposed by the Grain Inspection, Packers and Stockyards Administration (GIPSA) would, among other things, adversely affect packers' and their suppliers' willingness to use marketing agreements. The proposed rule increases the risk associated with using marketing agreements because it would change long standing judicial precedent and make it easier for a disgruntled supplier to sue and win in a Packers and Stockyards Act lawsuit. In doing so, the proposed rule creates a disincentive for packers to use such agreements.

These limitations in particular will introduce inefficiencies into the existing livestock marketing system, and reduce selling options for livestock producers, while at the same time increasing price, quality and supply variability for packers. Taken together, these inefficiencies will raise retail meat prices for consumers, leading to lower meat sales, less jobs for packers, retailers and most importantly producers. Another result will be seen in lost tax revenues throughout the country.

In 2009, the American Meat Institute commissioned an analysis of the combined impact of the meat processing, poultry processing, hide and skin production and offal production industries (hereafter meat and poultry products). The industry was defined to include not only the production of meat and poultry based products, but meat distribution and retailing. Based on that analysis, the industry contributed about $832 billion in total to the US economy in 2009, or just under 5.9 percent of GDP.[1] All told, about 6.19 million people depended on the industry for their livelihoods, with an estimated 1.3 million of those being livestock producers.

In addition, to providing jobs, wages and economic opportunity, the meat industry was shown to be an important contributor to the public finances of the community. In the case of the meat and poultry products industry, this contribution comes in two forms. First, the traditional direct taxes paid by the firms and their employees provide over $81.224 billion in revenues to the federal, state and local governments. In addition, the consumption of meat and poultry generates $2.4 billion in state sales taxes.[2]

Table 1: Economic Impact of the Meat and Poultry Products Industry (2009)

($ In Billions)	Direct[3]	Supplier[3]	Induced[3]
Output	$ 228.590	$ 377.734	$ 226.080
Jobs	1,816,940	2,581,580	1,794,110
Wages	$ 45.522	$ 84.319	$ 69.851
Taxes			$ 81.224

1 Based on GDP of $14.1 trillion. See: *Gross Domestic Product:* US Department of Commerce, Bureau of Economic Analysis. Available at: http://www.bea.gov/national/. Economic sectors based on IMPLAN sectors.

2 Significant local sales taxes are also generated; however, as there are over 50,000 different taxing jurisdictions these are extremely difficult to calculate.

3 Direct jobs are those involved in the packing, wholesaling, and retailing of meat and poultry products. Supplier jobs include livestock and poultry producers, as well as those working in other companies that supply goods and services to meat packers, wholesalers, and retailers. Induced impacts come about when those working in the direct and supplier sectors spend their income in the regional economy.

Table 1 on the prior page presents a summary of the total economic impact of the industry in the United States.

Were the proposed GIPSA rules to take effect, there would be significant disruptions in the manner in which livestock are supplied to the nation's meat processors. Rather than being able to count on a stable supply of animals, packers will for the most part be subject to an extremely variable "cash" or "spot" market (or a similarly variable futures market) to purchase their livestock. The resultant inefficiencies (as well as the slightly higher prices found on spot markets) will lead to an increase of about 3.33 percent in the retail price of meat at a national level. In the case of most consumer goods consumer demand is impacted by prices. Inefficiencies brought on by the proposed rule will therefore be translated into lower demand. In this case it is estimated that overall consumer demand for meat will fall by 1.68 percent.[4]

As meat sales fall, so too will jobs in the meat industry. Not only will there be fewer opportunities for packers, wholesalers and retailers, but producers and other suppliers will also see a reduction in demand and economic opportunities. All told, it is estimated that about 104,000 people would lose their jobs following the implementation of this rule. This would reduce national GDP by $14.0 billion, and would cost a total of $1.36 billion in lost revenues to the Federal, state and local governments.

Table 2 below presents a summary of how the impact of the Proposed GIPSA rule will impact the meat production industry, and Appendix Table 1 shows the employment impact by state, Appendix Table 2 [5] shows industry figures by state, and Appendix Table 3 shows the consumer impact by state.

Table 2: Economic Cost of the Proposed GIPSA Rules

	Direct	Supplier	Induced	Total
Jobs (FTE)	30,518	43,443	30,151	104,112
Wages	$764,318,247	$1,415,726,892	$1,172,971,419	$3,353,016,558
Economic Impact	$3,838,461,850	$6,350,851,492	$3,795,974,168	$13,985,287,510

Methodology

Three separate models were constructed in order to develop the estimates presented in the Executive Summary above. First, the Meat and Poultry Industry Economic Impact Model (Model) for the United States (2009) was developed by John Dunham and Associates based on data provided by Dun and Bradstreet (D & B), the US Department of Agriculture and various state agriculture departments. The analysis utilizes the Minnesota IMPLAN Group Model in

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4 This implies a price elasticity of demand of about -0.44, meaning that for a 10 percent increase in the price of meat, demand will fall by about 4.4 percent. This decrease in demand could be due to either smaller sales volumes, or a substitution of lower cost products (like chicken) for higher cost products like lamb. Demand elasticity data are from the US Department of Agriculture, see: You, Z., J.E. Epperson, and C.L. Huang, *A Composite System Demand Analysis for Fresh Fruit and Vegetables in the United States*, Journal of Food Distribution Research, (October 1996):11-22

5 Most recent data available for number of livestock on farms and number of operations with livestock and broiler chickens obtained from: National Agricultural Statistics Service, United States Department of Agriculture. Cash receipts from farm marketings obtained from *Meat and Poultry Facts* 2009, Sterling Marketing, Inc., 2009. Labor expenses for livestock workers is the sum of both hired and contract labor expenses in livestock obtained from United States Department of Labor, *The National Agricultural Workers Survey*, Census of Agriculture, (2002).

order to quantify the economic impact of the meat and poultry products industry on the economy of the United States. The model adopts an accounting framework through which the relationships between different inputs and outputs across industries and sectors are computed. This model can show the impact of a given economic decision – such as a factory opening or operating a sports facility – on a pre-defined, geographic region. It is based on the national income accounts generated by the US Department of Commerce, Bureau of Economic Analysis (BEA).[6]

Producer employment is based on a census of federal and state inspected facilities as of 2009. The Federal government and 27 states inspect meat processors and slaughterhouses.[7] Data were gathered from the Federal and state agriculture departments, entered into a database and physically located in a geographic analysis system. All told, there were almost 8,500 plants identified (although there were some duplicates). These data provided the number of plants and the physical location; however, none of the government entities had employment data available. In order to estimate employment, data were gathered from D & B for companies that reported a primary SIC of 2011 (establishments primarily engaged in the slaughtering of cattle, hogs, sheep, lambs, and calves for meat to be sold or to be used on the same premises in canning, cooking, curing, freezing, and in making sausage, lard, and other products; SIC 2015 (establishments primarily engaged in slaughtering, dressing, packing, freezing, and canning poultry, rabbits, and other small game, or in manufacturing products from such meats, for their own account or on a contract basis for the trade. This industry also includes the drying, freezing, and breaking of eggs; and SIC 2013 (establishments primarily engaged in manufacturing sausages, cured meats, smoked meats, canned meats, frozen meats and other prepared meats and meat specialties, from purchased carcasses and other materials. Products include bologna, bacon, corned beef, frankfurters (except poultry), luncheon meat, sandwich spreads, stew, pastrami, and hams (except poultry). Prepared meat plants operated by packinghouses as separate establishments are also included in this industry. These data were matched to the inspected location data where possible by company name, phone number, and physical location. For those establishments where a match could not be found econometric techniques were used to estimate an employee count. All told, the number of estimated employees was within 99 percent of estimates from the actual employment levels as found in the IMPLAN tables.[8]

Jobs were then assigned to meat or poultry processing and slaughtering based either on allocations provided by the departments of agriculture or based on the national percentage of jobs in each industry.[9]

For hides, skins and offal producers, employment at specific locations reported to D & B by the companies as of April 2009 for a number of industries including some companies with a primary SIC code of 2833 - establishments primarily engaged in manufacturing bulk organic and inorganic medicinal chemicals and their derivatives, as well as some companies with the primary

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6 The IMPLAN model is based on a series of national input-output accounts known as RIMS II. These data are developed and maintained by the U.S. Department of Commerce, Bureau of Economic Analysis as a policy and economic decision analysis tool.

7 These states are: Alabama, Arizona, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Minnesota, Missouri, Mississippi, Montana, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, Utah, Virginia, Vermont, West Virginia, Wisconsin, and Wyoming. Source: *FSIS Review of State Meat and Poultry Inspection Programs*, United States Department of Agriculture, March 2010.

8 IMPLAN employment levels are based on county employment data as reported by the US Department of Labor, Bureau of Labor Statistics.

9 Based on the input output accounts of the United States as compiled by IMPLAN.

SIC 5159 this industry's products are animal hair, bristles, feathers, furs and hides, broom corn, raw cotton, hops, unprocessed or shelled-only nuts, tobacco leaf, raw silk, and bovine semen.[10] Data are as of April 2009.

Wholesale employment consists of the number of jobs by facility as reported to D & B by companies with a primary SIC code of 5147. This industry consists of wholesale distributors of fresh, cured, and processed (but not canned or frozen) meats and lard. Data are as of April 2009.

Data on the retail sectors are all based on data from D & B as of April 2009. Data on total employment by zip code was obtained from D & B's Zapdata system for establishments with the following primary SIC codes:

- 5411 Grocery Stores
- 5812 Eating Places
- 5813 Drinking Places
- 5421 Meat and Fish Markets
- 5431 Fruit and Vegetable Markets
- 5441 Candy, Nut, and Confectionery Stores
- 5451 Dairy Products Stores
- 5461 Retail Bakeries
- 5499 Miscellaneous Food Stores

Employment figures were then multiplied by the percentage of sales of meat in each store type as calculated by the US Department of Commerce Bureau of the Census.[11] The resulting figure was then adjusted to remove seafood sales from the calculation. The resulting figures were then allocated to states and congressional districts based on the percentage of total establishments in each zip code falling within the particular boundary.

Once the initial direct employment figures have been established, they are entered into a model linked to the IMPLAN database. The IMPLAN data are used to generate estimates of direct wages and output in each of the three sectors: production, wholesaling and retailing. IMPLAN was originally developed by the US Forest Service, the Federal Emergency Management Agency and the Bureau of Land Management. It was converted to a user-friendly model by the Minnesota IMPLAN Group in 1993. The IMPLAN data and model closely follow the conventions used in the "Input-Output Study of the US Economy," which was developed by the BEA.

The Economic Impact Analysis provides a base level of employment, jobs and taxes in the industry (See Table 1 above). These data were then linked to a meat demand model for each state in the country. This demand model is based on a series of demand functions created for each of the 50 states and the District of Columbia, and examines not only in-state demand for meat products, but cross-state sales that can occur due to differential meat prices in each of the states. In other words, the model estimates in-state demand of own-state taxed sales of meat, exports to and imports from other states. The model can be "shocked" with different price

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10 Not in both cases only companies engaged in manufacturing and selling animal products were included in these data.

11 See: *Table 2.4.5U. Personal Consumption Expenditures by Type of Product,* US Department of Commerce, Bureau of Economic Analysis, Revised October 31, 2008.

changes (in this case a National price change) and the resulting adjustments to demand are calculated.

The general methodology is an estimation of current demand equation linked to a non-linear programming model of the import and export patterns. Initial demand is assumed to be equal to current retail sales in each state as based on the Economic Impact Model of the Meat Industry (2009). Each state's current demand is obtained in dollars, and linked directly to the cross-border methodology. Since the Impact Model includes all types of meat, poultry, and offal the total demand can be assumed to approximate the weighted-average demand of all of these products across the state.

Obtaining a weighted average price is more complicated since comprehensive (series level) data are only available for livestock. Since the model being developed depends more on the percentage change in price, average retail prices are calculated based on livestock prices per hundredweight obtained from the US Department of Agriculture.[12] After converting the chicken price to the same units as the other data was presented in, these raw livestock prices are then multiplied by a processing margin which reflects the value added by the packer who converts livestock into cuts of meat.[13] The resulting prices were weighed to reflect actual consumption patterns calculated from the average household expenditure on the four meats in the Consumer Expenditure Survey.[14] This gives a weighted producer price for meat. This was then adjusted by applying transportation, wholesale and retail margins from the US Department of Commerce, Bureau of Economic Analysis.[15]

The calculation outlined above provides a national average price for meat products, but the model is based on differential prices on a state by state basis. In order to calculate this, the national price is multiplied by an index of the relative cost of groceries in each state obtained from the Missouri Economic Research and Information Center.[16] The resultant product provides an average price for each state.

The price and volume data are entered into the demand model.

Linear Programming Model

A non-linear programming model is used to determine consumption and trade patterns based on the current values developed above and any subsequent price shocks. The model contains a series of matrices that are multiplied together to produce a trade flow matrix. The first matrix is a distance matrix that contains adjusted centroid distances among all 50 states and the District of

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12 United States Department of Agriculture, National Agricultural Statistics Service, Quickstats 1.0. 2010. Data are monthly prices on the following products: Pork = Sows prices per 100 lbs., Chicken = Broilers, price per lb., Lamb = Lamb, prices per 100 lbs., Beef = Cattle 500+lbs, prices per 100 lbs. See www.nass.usda.gov/Data_and_Statistics/Quick_Stats_1.0/index.asp

13 Processing margins are obtained from IMPLAN and reflect the value added by meat and poultry processors. The margins are weighted with the poultry margin accounting for 24 percent of the total.

14 Bureau of Labor Statistics, Consumer Expenditure Survey, 2008, Table 4500: Selected Age of Reference Person: Average Annual Expenditures and Characteristics, All Consumer Units http://www.bls.gov/cex/

15 Stewart, Ricky et. al., U.S. Benchmark Input-Output Accounts, 2002, US Department of Commerce, Bureau of Economic Analysis, October 2007.

16 Missouri Economic Research and Information Center, *Cost of Living Index, 2010 Q1*, Grocery Sub-Index, See: www.missourieconomy.org/indicators/cost_of_living/index.stm

Columbia.[17] These are adjusted by a population density function that stretches the actual distance in the high traffic east coast states, and reduces them between western states.[18] The next matrix contains population data – given price differentials and distances between states, the volume of trade is adjusted by the number of people living in a state.[19] The fourth matrix contains the price differentials between each state pair, and the last matrix is a calculated matrix containing expected consumption and trade patterns. The import (or export) values in this matrix are calculated according to the formula:

Import(ij) = Price(ij)*Pop(i)*1/(1+EXP(-U*Distance(ij))

where i denotes the importing state and j is the exporting state. Price(ij) is the price differential, Pop(i) is the population of the importing state, and distance ij is the distance between the pair. The term u is the parameter to be estimated for the distance function in the shape of a sigmoid.

The value of u is determined based on a minimization function that sets the model parameter to the point where the total trade curve is tangent to a 45 degree line. Below this point, trade between states is surprised, while above it trade explodes exponentially. An in-state elasticity of -.44 is used to calculate lost demand outside of the interstate modeling structure.[20]

The demand model is then shocked with a price change which reflects the impact of the key provisions of the proposed GIPSA rule – the shift from the current system of livestock supply based on a combination of spot market purchases, futures contracts and marketing agreements to one dominated by spot prices.

The estimated cost was developed by comparing the spot price index (developed above) to the behavior of the Producer Price Index for meat over the same period. This comparison showed that producer prices had risen much more slowly than our measure of spot meat prices.

With current meat prices set as a baseline, two scenarios for the future evolution of the retail price of meat were developed. The first was based on the assumption that the weighted average price of meat would rise in line with the historic trend growth rate in producer prices, while the other assumes that retail prices will track the historical trend in spot prices. This provides an estimate of the possible increase in meat prices from a switching supply sources from the contract market to the spot market. The simulation was conducted over a period of 43 months, which is the length of the meat price "cycle" observed in the data.

The result of this analysis is that the proposed GIPSA rule will increase meat prices by 3.33 percent, which would lead to a national decrease in sales of 1.68 percent or about 1.35 billion dollars.

The change in sales is linked back to the Industry Economic Impact Model, which is adjusted to reflect the lower sales volume. The resulting change in employment, output, wages, and taxes are reported in Table 2 and in Appendix Table 1.

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17 State-to-state centroid distance data were obtained from Caliper Corp

18 US Department of Commerce, Bureau of the Census, Data for 2007

19 US Department of Commerce, Bureau of the Census, Data for 2009.

20 You, Z., J.E. Epperson, and C.L. Huang, *A Composite System Demand Analysis for Fresh Fruit and Vegetables in the United States*, Journal of Food Distribution Research, (October 1996):11-22

Appendix 1: Employment Impact of Proposed GIPSA Rule by State

State	Initial Direct Jobs	Direct Jobs Lost	Initial Producer Jobs	Producer Jobs Lost	Initial Supplier Jobs	Supplier Jobs Lost	Initial Induced Jobs	Induced Jobs Lost	Initial Total Jobs	Total Jobs Lost
Alabama	33,127	567	72,815	1,223	102,029	1,746	39,078	669	174,234	2,981
Alaska	2,610	44	64	1	790	13	1,253	21	4,653	78
Arizona	23,717	396	2,026	34	10,674	178	14,674	245	49,064	820
Arkansas	44,506	751	88,417	1,485	147,023	2,480	78,606	1,326	270,136	4,557
California	187,877	3,142	57,811	971	166,221	2,780	169,220	2,830	523,318	8,752
Colorado	27,948	467	10,094	170	27,177	454	23,281	389	78,405	1,311
Connecticut	15,105	252	1,967	33	6,723	112	9,060	151	30,888	516
Delaware	10,946	183	1,762	30	8,712	146	7,825	131	27,483	461
District Of Columbia	4,289	72	-	-	742	12	530	9	5,561	93
Florida	90,875	1,518	10,659	179	47,428	792	64,659	1,080	202,962	3,391
Georgia	72,041	1,206	83,388	1,401	152,751	2,557	87,231	1,460	312,023	5,224
Hawaii	7,268	126	1,275	21	3,907	68	4,533	79	15,708	272
Idaho	7,430	130	3,748	63	8,704	152	5,759	101	21,892	383
Illinois	82,550	1,390	31,587	531	105,560	1,778	103,102	1,736	291,211	4,904
Indiana	41,775	699	21,145	355	51,794	866	38,895	651	132,464	2,216
Iowa	45,098	756	45,034	756	105,514	1,768	70,596	1,183	221,208	3,707
Kansas	19,242	333	11,270	189	29,594	512	21,616	374	70,452	1,219
Kentucky	27,679	463	37,938	637	58,578	980	28,052	469	114,309	1,912
Louisiana	25,305	423	9,681	163	23,182	388	19,481	326	67,968	1,136
Maine	7,493	125	1,886	32	4,639	78	4,987	83	17,119	286
Maryland	27,892	466	6,052	102	17,655	295	19,229	321	64,776	1,083
Massachusetts	35,444	592	1,570	26	14,743	246	23,283	389	73,470	1,228
Michigan	51,661	864	24,488	411	47,374	792	36,585	612	135,620	2,267
Minnesota	39,645	664	29,206	491	69,818	1,169	52,621	881	162,084	2,713
Mississippi	22,567	390	35,782	601	56,795	980	27,642	477	107,004	1,847
Missouri	43,364	731	70,791	1,189	121,874	2,055	63,476	1,070	228,714	3,856
Montana	6,976	117	6,747	113	12,430	208	6,435	108	25,841	432
Nebraska	21,146	354	13,747	231	45,944	770	33,459	561	100,549	1,685
Nevada	9,338	156	107	2	2,551	43	4,408	74	16,298	272
New Hampshire	7,066	118	163	3	1,932	32	3,634	61	12,633	211
New Jersey	43,427	726	8,155	137	29,731	497	32,590	545	105,747	1,768
New Mexico	8,800	147	2,010	34	5,784	97	5,705	95	20,288	339
New York	89,008	1,488	25,662	431	62,050	1,037	62,565	1,046	213,623	3,571
North Carolina	56,422	944	19,037	320	57,241	958	48,391	810	162,055	2,711
North Dakota	5,503	92	4,233	71	7,961	133	3,788	63	17,253	289
Ohio	74,872	1,253	52,092	875	98,059	1,640	66,308	1,109	239,238	4,002
Oklahoma	23,953	412	45,341	762	70,896	1,218	33,629	578	128,477	2,208
Oregon	19,260	322	8,505	143	19,426	325	15,945	267	54,631	913
Pennsylvania	75,915	1,270	61,864	1,039	121,907	2,039	87,184	1,459	285,007	4,768
Rhode Island	5,398	90	69	1	1,447	24	2,816	47	9,660	161
South Carolina	28,283	473	16,826	283	33,381	558	22,068	369	83,733	1,401
South Dakota	6,228	107	3,816	64	9,021	155	6,689	115	21,938	377
Tennessee	32,804	574	28,199	474	45,672	799	27,211	476	105,687	1,848
Texas	143,483	2,401	161,111	2,706	294,155	4,922	160,806	2,691	598,444	10,013
Utah	13,857	235	10,586	178	21,728	368	13,910	236	49,495	838
Vermont	4,061	68	7,643	128	10,117	169	3,594	60	17,772	297
Virginia	54,099	920	55,768	937	97,010	1,649	49,483	841	200,592	3,410
Washington	34,916	584	18,980	319	40,492	677	28,968	484	104,376	1,746
West Virginia	8,162	140	13,943	234	17,739	304	4,196	72	30,097	515
Wisconsin	43,651	731	40,525	681	83,086	1,391	53,956	903	180,692	3,025
Wyoming	2,861	48	1,006	17	1,823	30	1,102	18	5,785	97
United States	1,816,942	30,518	1,266,592	21,274	2,581,583	43,443	1,794,114	30,151	6,192,639	104,112

Appendix 2: Industry Facts by State

State	Cattle and Calves on Farms	Sheep and Lambs on Farms	Hogs on Farms	Number of Operations with Beef Cattle	Number of Operations with Sheep and Lambs	Number of Operations with Hogs	Number of Operations with Broiler Chickens	Cash Receipts from Farm Marketings of Cattle and Calves	Cash Receipts from Farm Marketings of Sheep and Lambs	Cash Receipts from Farm Marketings of Hogs	Hired and Contract Labor Expenses for Livestock Workers
Alabama	1,260,000	N/A	140,000	22,000	-	750	2,263	$ 331,749	$ -	$ 34,079	$ 188,604,396
Alaska	14,000	N/A	1,400	100	-	40	22	$ 1,877	$ -	$ 306	$ 16,917,550
Arizona	1,020,000	150,000	167,000	5,300	5,000	380	101	$ 637,016	$ 6,102	$ 43,057	$ 172,442,542
Arkansas	1,810,000	N/A	200,000	25,000	-	1,100	2,408	$ 494,614	$ -	$ 95,075	$ 216,622,937
California	5,250,000	660,000	100,000	11,800	4,100	1,400	374	$ 1,822,856	$ 30,717	$ 33,217	$ 1,460,588,988
Colorado	2,600,000	410,000	710,000	11,600	1,600	1,200	291	$ 3,058,056	$ 113,923	$ 175,882	$ 380,831,867
Connecticut	52,000	N/A	2,900	N/A	N/A	N/A	96	$ 8,168	$ -	$ 305	$ 23,293,784
Delaware	21,000	N/A	7,500	250	-	80	778	$ 7,465	$ -	$ 3,115	$ 30,688,279
District Of Columbia	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A
Florida	1,700,000	N/A	20,000	16,700	-	1,900	376	$ 405,124	$ -	$ 3,226	$ 390,538,014
Georgia	1,110,000	N/A	195,000	17,700	-	1,100	2,170	$ 291,990	$ -	$ 62,244	$ 227,974,523
Hawaii	150,000	N/A	13,000	850	-	230	59	$ 24,305	$ -	$ 3,359	$ 38,855,094
Idaho	2,110,000	210,000	36,000	7,400	1,200	660	233	$ 1,183,446	$ 19,439	$ 9,586	$ 325,073,124
Illinois	1,200,000	58,000	4,250,000	14,800	1,900	2,900	370	$ 581,032	$ 2,634	$ 971,218	$ 212,657,285
Indiana	860,000	50,000	3,600,000	12,700	2,000	3,400	594	$ 253,482	$ 2,070	$ 923,843	$ 258,916,776
Iowa	3,950,000	200,000	19,000,000	21,000	3,500	8,300	738	$ 2,881,656	$ 30,266	$ 4,758,635	$ 535,064,019
Kansas	6,300,000	80,000	1,810,000	26,000	1,200	1,500	270	$ 6,239,795	$ 5,455	$ 421,076	$ 405,670,295
Kentucky	2,300,000	40,000	350,000	38,000	1,400	1,500	909	$ 574,379	$ 2,206	$ 83,315	$ 428,384,286
Louisiana	890,000	N/A	10,000	12,400	-	720	410	$ 191,011	$ -	$ 1,709	$ 78,780,813
Maine	89,000	N/A	4,900	N/A	N/A	N/A	214	$ 13,330	$ -	$ 782	$ 56,612,963
Maryland	185,000	24,000	30,000	2,500	800	410	783	$ 70,118	$ 1,121	$ 7,400	$ 127,954,769
Massachusetts	43,000	N/A	11,000	N/A	N/A	N/A	114	$ 8,223	$ -	$ 1,250	$ 43,581,660
Michigan	1,070,000	78,000	1,080,000	7,800	2,300	2,700	1,088	$ 384,943	$ 4,274	$ 250,885	$ 314,809,874
Minnesota	2,400,000	140,000	7,200,000	14,400	2,500	4,400	1,195	$ 1,095,348	$ 16,489	$ 2,046,905	$ 509,844,505
Mississippi	960,000	N/A	365,000	16,000	-	680	1,478	$ 150,134	$ -	$ 73,904	$ 166,032,288
Missouri	4,250,000	83,000	3,100,000	52,000	2,200	3,000	978	$ 1,216,820	$ 5,142	$ 876,503	$ 331,148,418
Montana	2,600,000	255,000	175,000	11,100	1,500	490	150	$ 1,003,050	$ 17,533	$ 42,246	$ 193,653,163
Nebraska	6,350,000	71,000	3,100,000	18,300	1,300	2,200	321	$ 7,068,679	$ 10,144	$ 728,702	$ 439,243,951
Nevada	450,000	67,000	2,900	1,300	250	90	31	$ 185,168	$ 3,642	$ 737	$ 54,870,735
New Hampshire	39,000	N/A	2,400	N/A	N/A	N/A	120	$ 5,349	$ -	$ 339	$ 11,256,282
New Jersey	38,000	N/A	8,000	930	-	270	158	$ 5,187	$ -	$ 940	$ 45,936,591
New Mexico	1,540,000	120,000	1,500	8,200	2,900	400	86	$ 999,419	$ 4,923	$ 235	$ 248,862,114
New York	1,380,000	62,000	77,000	6,800	1,800	1,900	636	$ 144,664	$ 2,983	$ 9,462	$ 489,314,831
North Carolina	850,000	28,000	9,600,000	15,000	1,300	2,800	1,879	$ 197,650	$ 784	$ 2,170,806	$ 269,133,546
North Dakota	1,760,000	88,000	155,000	9,700	680	350	126	$ 705,903	$ 6,289	$ 39,217	$ 51,859,972
Ohio	1,280,000	130,000	2,010,000	17,400	3,400	3,700	1,027	$ 356,646	$ 11,204	$ 434,662	$ 277,877,090
Oklahoma	5,400,000	80,000	2,290,000	47,000	1,900	2,700	857	$ 2,436,638	$ 3,078	$ 558,580	$ 351,648,948
Oregon	1,240,000	220,000	17,000	12,900	3,200	1,300	398	$ 517,238	$ 12,686	$ 5,433	$ 218,690,289
Pennsylvania	1,590,000	100,000	1,140,000	12,300	3,800	3,600	1,499	$ 493,627	$ 5,795	$ 182,141	$ 370,350,536
Rhode Island	5,000	N/A	1,700	N/A	N/A	N/A	18	$ 787	$ -	$ 287	$ 2,306,407
South Carolina	380,000	N/A	225,000	8,200	-	810	512	$ 126,404	$ -	$ 48,789	$ 75,608,492
South Dakota	3,700,000	305,000	1,190,000	13,800	1,700	960	141	$ 1,699,376	$ 26,898	$ 393,124	$ 173,315,375
Tennessee	1,980,000	34,000	185,000	42,000	1,300	1,500	959	$ 534,092	$ 1,709	$ 39,848	$ 135,948,428
Texas	13,600,000	870,000	760,000	132,000	8,700	4,500	1,872	$ 6,895,625	$ 28,711	$ 130,691	$ 1,135,916,711
Utah	810,000	290,000	730,000	5,600	1,600	610	106	$ 301,492	$ 17,600	$ 167,601	$ 161,101,432
Vermont	270,000	N/A	3,000	N/A	N/A	N/A	149	$ 51,667	$ -	$ 383	$ 49,341,381
Virginia	1,470,000	75,000	365,000	22,000	2,100	1,200	738	$ 395,946	$ 4,884	$ 61,841	$ 222,792,659
Washington	1,080,000	53,000	23,000	10,100	2,400	1,500	467	$ 605,380	$ 2,227	$ 5,562	$ 370,253,311
West Virginia	415,000	33,000	5,000	10,700	1,300	1,000	334	$ 113,545	$ 3,911	$ 970	$ 38,014,218
Wisconsin	3,350,000	85,000	360,000	14,800	2,800	3,200	1,723	$ 820,222	$ 5,344	$ 112,800	$ 731,854,891
Wyoming	1,350,000	420,000	87,000	4,800	900	270	49	$ 598,510	$ 32,497	$ 61,110	$ 65,083,966
United States	94,521,000	5,747,000	64,887,000	765,350	83,130	75,450	32,668	$ 48,189,201	$ 442,680	$ 16,077,382	$ 13,126,124,368

Appendix 3: Consumer Impact

State	Initial Cost to Consumers	Extra Cost to Consumers	Population	June 2010 Unemployment Rate
Alabama	$ 1,063,128,531	$ 35,451,537	4,625,354	10.3%
Alaska	$ 159,023,195	$ 5,302,855	681,235	8.5%
Arizona	$ 1,517,499,784	$ 50,603,194	6,343,952	9.1%
Arkansas	$ 571,823,738	$ 19,068,278	2,830,047	7.5%
California	$ 10,243,026,798	$ 341,568,336	36,418,499	12.3%
Colorado	$ 1,499,173,681	$ 49,992,084	4,844,568	7.8%
Connecticut	$ 1,007,267,073	$ 33,588,757	3,493,006	8.5%
Delaware	$ 267,084,029	$ 8,906,298	861,804	8.7%
District Of Columbia	$ 311,401,726	$ 10,384,135	588,373	9.8%
Florida	$ 5,318,925,509	$ 177,367,156	18,182,321	11.2%
Georgia	$ 2,581,594,989	$ 86,086,966	9,509,254	9.8%
Hawaii	$ 438,194,217	$ 14,612,211	1,280,273	6.3%
Idaho	$ 355,701,330	$ 11,861,368	1,493,713	9.1%
Illinois	$ 3,188,242,705	$ 106,316,500	12,829,014	10.8%
Indiana	$ 1,749,365,766	$ 58,335,096	6,335,595	9.8%
Iowa	$ 836,557,507	$ 27,896,203	2,984,391	7.0%
Kansas	$ 716,576,489	$ 23,895,265	2,778,599	6.3%
Kentucky	$ 1,122,823,464	$ 37,442,150	4,234,999	10.2%
Louisiana	$ 1,211,161,304	$ 40,387,901	4,342,582	6.2%
Maine	$ 410,171,746	$ 13,677,762	1,315,069	8.4%
Maryland	$ 1,651,100,796	$ 55,058,311	5,618,250	6.9%
Massachusetts	$ 2,095,152,880	$ 69,865,861	6,469,770	9.1%
Michigan	$ 2,494,120,388	$ 83,170,001	10,045,697	13.7%
Minnesota	$ 1,452,057,460	$ 48,420,927	5,181,962	7.0%
Mississippi	$ 549,807,296	$ 18,334,108	2,918,790	10.7%
Missouri	$ 1,533,092,396	$ 51,123,152	5,874,327	8.8%
Montana	$ 250,115,000	$ 8,340,441	956,496	7.1%
Nebraska	$ 453,175,406	$ 15,111,780	1,770,896	4.9%
Nevada	$ 664,524,869	$ 22,159,529	2,546,235	14.0%
New Hampshire	$ 410,396,216	$ 13,685,247	1,312,298	6.3%
New Jersey	$ 2,306,997,071	$ 76,930,107	8,658,668	9.6%
New Mexico	$ 474,142,579	$ 15,810,960	1,962,226	8.1%
New York	$ 4,900,358,404	$ 163,409,439	19,428,881	8.2%
North Carolina	$ 2,377,611,117	$ 79,284,833	9,036,449	10.0%
North Dakota	$ 183,099,750	$ 6,105,722	638,613	3.8%
Ohio	$ 3,007,365,877	$ 100,284,904	11,473,983	10.7%
Oklahoma	$ 767,254,969	$ 25,585,211	3,606,200	6.3%
Oregon	$ 1,027,468,304	$ 34,262,396	3,735,524	10.8%
Pennsylvania	$ 3,214,952,465	$ 107,207,175	12,418,756	8.7%
Rhode Island	$ 297,710,751	$ 9,927,590	1,054,306	12.4%
South Carolina	$ 1,246,657,008	$ 41,571,556	4,403,175	10.4%
South Dakota	$ 204,555,589	$ 6,821,198	795,757	4.5%
Tennessee	$ 1,664,973,812	$ 55,520,926	6,144,104	10.3%
Texas	$ 6,150,934,430	$ 205,111,680	23,845,989	8.1%
Utah	$ 578,534,596	$ 19,292,061	2,663,500	7.0%
Vermont	$ 163,908,852	$ 5,465,774	620,738	6.7%
Virginia	$ 2,087,442,507	$ 69,608,747	7,698,738	6.7%
Washington	$ 1,867,221,664	$ 62,265,169	6,453,083	8.7%
West Virginia	$ 372,733,524	$ 12,429,331	1,810,358	8.9%
Wisconsin	$ 1,387,397,621	$ 46,264,752	5,598,453	8.2%
Wyoming	$ 149,982,821	$ 5,001,391	522,833	7.2%
United States	$ 80,553,590,000	$ 2,686,174,335	301,237,703	9.5%

Appendix 4: Questions and Answers About the Study

1. **What is defined as "meat" in the study?**

   Meat as defined in the study is a combination (weighted average) of all edible meats including beef, pork, lamb, poultry and offal.

2. **What jobs are included as "direct" and what are included as "supplier" and "producer?"**

   This is a model of the meat processing industry, so direct jobs include people working in meat packing, processing, meat wholesaling and meat retailing. Suppliers to the processing industry include livestock producers (farmers and ranchers) as well as firms that provide equipment, utilities, transportation, packing supplies, business services, etc. to the processors, wholesalers and retailers. A "producer" as defined in this study is a livestock producer – a farmer or a rancher.

3. **What does "induced" economic impact mean?**

   Induced economic impacts are those effects that are due to the re-spending of income by people working as direct employees of the meat processing industry or by those working for supplier firms. This would include their spending on things like housing, utilities, entertainment, cars, etc. It is what is commonly called the "multiplier effect."

4. **The impact in some states seems counter-intuitive. For example, how can Connecticut, a small agricultural state, lose more producer jobs than say, Wyoming, which is typically considered a "big" agricultural state?**

   Production jobs do not necessarily correlate with livestock production. In this case producer jobs are those jobs directly involved in the farming of meat animals. These could be owner-operators of farms or hired laborers. Jobs are counted in full-time-equivalent units so someone working half time on a ranch for example would be counted as half a job. In Wyoming where animals are produced on an open range, the amount of labor per dollar of output is very low, while in New England, where animals are generally produced on smaller farms, it will take more people (or units of labor) to produce the same output.

5. **When looking at job losses and economic impact by state, what are the key variables that come into play that affect that bottom line?**

   There are a number of factors, but the most important are 1) the mix of industries in a state. For example, if a meat processor uses particular machines that are only produced in Ohio, then there would be a large impact in Ohio relative to the amount of meat actually produced there; 2) the mix of land, labor and capital availability in a state. (States with a lot of land and few people will have higher output per employee of livestock production.); and 3) the relative price levels in a given state. Higher cost states may generate more economic output without necessarily generating more "goods."

6. Does this model account for all aspects of the proposed GIPSA rule? If not, why?

No, the model only accounts for the effects that the proposed GIPSA rule will have on the input price of livestock into meat processing companies and how that translates into higher consumer prices. If the rule changes the way in which companies do business – if it changes the amount of capital that they need to hold, the mechanization of processes, or the mix of animal types that they use – those effects are not included since the model is based on the current production system and technologies. It cannot control for these changes.

7. Is the price elasticity of demand for meat a figure that is widely used in these kinds of models?

Yes, the price elasticity is used to help determine how consumers will react to higher meat prices. Our elasticity estimate is roughly -0.44375 suggesting that a 10 percent increase in the retail price of meat will reduce demand by 4.44 percent.

8. How will the proposed GIPSA rule affect different types of meat consumers' purchase?

If the proposed rule increases prices to the extent that we believe, then consumers will react by purchasing less meat. They could react by purchasing either a smaller volume of meat, or by changing the mix of products that they buy – substituting cheaper poultry for more expensive lamb for example. The model looks at meat as if it is a single product so it can't determine these substitution effects.

9. How can you predict the impact on consumers and their response?

We know what when prices rise in a production system where there is competition the increased costs will be passed on to the consumer. We also know that for what economists call "normal goods," higher prices lead to reduced demand. Because meat is a normal good, any increased costs from the proposed rule will lead to reduced demand. This model only examines the costs associated with the way in which processors must purchase meat from producers – particularly a reduction in the use of marketing agreements. This will add significantly to the cost of the livestock purchased by the processors – a cost that will be passed on and lead to roughly a two percent decline in meat sales.

10. How can we be sure these numbers are accurate?

No economic analysis comes with a guarantee of a future impact, and all models are based on assumptions and estimates. However, this analysis was built on widely accepted principles of economic modeling and in consultation with industry experts. All of the assumptions have been made available and are documented. If they are generally correct, then the results will be generally correct.

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