Animal Agriculture Economic Analysis:

1997-2006

A report prepared for

United Soybean Board

October 2007

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CONTENTS

SECTION 1: INTRODUCTION 1

SECTION 2: ECONOMIC AND ANIMAL PRODUCT DATABASE 3

SECTION 3: SOYBEAN MEAL USE BY STATE 7

SECTION 4: ECONOMIC IMPACTS OF ANIMAL AGRICULTURE 10

4.1 Output, earnings and employment multipliers 10
4.2 Impact estimates for output and earnings 15
4.3 Tax Effects 17
4.4 Reasonableness of estimates 19

SECTION 5: EFFECTS OF RELOCATION OF ANIMAL AGRICULTURE 21

SECTION 1: INTRODUCTION

US livestock industries are in a state of flux. Globalization, trade liberalization and environmental regulation have increased competitive pressures on animal product producers in many parts of the country. Domestic livestock industries are by far the major source of demand for US soybean meal, and future soybean demand is tightly linked to the health of those industries.

The scale of domestic animal product output is one of the major constraints on US soybean production and profitability. Actions to maintain and expand animal agriculture in the United States by supporting its long-term competitiveness are of critical importance to the soybean industry. In order to act at the state and local levels, one needs data and analysis on the economic importance of animal agriculture at those levels. This report addresses that constraint.

The United Soybean Board has set itself the objective of protecting the interests of US soybean producers by supporting the long-term competitiveness of the domestic livestock industry. In 2004 we identified 23 states that are major current producers of soybeans and animal products as well as states experiencing major relocation of animal agriculture. For the selected states we did the following:

- Compiled data on the breakdown of animal agriculture by species in each state.
- Estimated soy feed consumption in each state by species.
- Analyzed the economic impact of animal agriculture in each state by looking at output, earnings, employment and tax revenue.
- Discussed the main reasons for livestock relocation.
- Identified significant market trends that may change the dynamics of this market.

The following year we added 2004 information to the databases for those 23 states and revised historic data as necessary. We also added five states – California, Delaware, Maryland, Virginia and South Carolina. In 2006 we added 2005 information to the databases and revised historic data for the original 23 states and the additional 5 states. In addition, we added eight more for a total of 36 states. In our last report, we added the final 14 states.

For our current report, we added to the databases 2006 information and revised the historical data where applicable. Additionally, we revised the soybean meal use formulas to reflect recent changes in the mix of protein feeds resulting from biofuel developments.

Section 2 of this report reviews and describes the economic and animal product database for each state that serves as a basis for the associated analysis and graphic presentations. The database itself is in the form of an Excel file for each state. Section 3 details our estimates of soybean meal use by species in each state. Sections 4 and 5 present the impacts of animal agriculture on output, earnings, employment and tax revenue at the state, regional and national levels based on multiplier analysis. Section 6 analyzes the state economic impacts of relocation of animal agriculture.

SECTION 2: ECONOMIC AND ANIMAL PRODUCT DATABASE

A separate Excel file was created for each of the 50 states and these are provided separately on a CD. This section describes the database, using Missouri as an example. Each state database contains information such as: livestock production and value data, economic impact calculations, characteristics of farm operations and operators, agricultural and economic census data, taxation data, and computation of meal use by livestock and poultry. The three tables below display most of the data types that we gathered. A fourth sheet in each Excel file contains information on state income tax structure. A fifth sheet calculates production indexes by species and a sixth sheet contains our calculation of meal use by species.

Annually-released publications from USDA's National Agricultural Statistics Service (NASS) served as the sole source for inventory, quantity of output, and value of production data in the first table. The number of farms, value of sales, and input purchase information came from NASS' 1997 and 2002 Census of Agriculture.

Calculated economic impacts are presented in the lower part of the table along with the multipliers we obtained from the Bureau of Economic Analysis in the Department of Commerce. We applied these multipliers to the value of production to calculate the following indicators of economic impact: output and earnings measured in dollars, and employment measured in number of jobs. Tax revenue effects were separately calculated using methods described in Section 4. The change in economic impact from 1997 to 2006 was computed by applying the multipliers and tax factors to the change over that period in the value of production (at 2006 prices).

Looking more closely at the uses of the livestock products under evaluation, we collected information from the manufacturing series of the 2002 Economic Census. The industries presented in Census results and which are relevant to our analysis are: fluid milk; creamery butter; cheese; dry, condensed and evaporated dairy products; ice cream and frozen desserts; animal (except poultry) slaughtering; meat processed from carcasses; rendering and meat byproducts; and poultry. As demonstrated in the second table below, state-level data is not always available for all the industries selected. For example, in Missouri, data was available for only three of the manufacturing industries: ice cream and frozen desserts, meat processed from carcasses, and poultry. Nevertheless, this information can be useful in communicating the importance of the related processing industries to a state economy. For example, poultry processing in Missouri in 2002 was responsible for:

- ✓ 10,569 direct employees with a $234 million payroll
- ✓ Purchases of $687 million of poultry and other inputs
- ✓ Capital expenditures of $34 million, and
- ✓ Total sales of $1.3 billion of finished product.

Basic Livestock and Economic Impact Data

NASS	Missouri	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Inventories											
Jan 1('98 - '07)	**cattle & calves** (1,000 head)	4,350	4,400	4,350	4,250	4,350	4,500	4,350	4,400	4,550	4,500
Dec 1('97 - '06)	**hogs & pigs** (1,000 head)	3,550	3,300	3,150	2,900	2,950	2,950	2,950	2,900	2,700	2,750
Quantity of output	**cattle & calves** (1,000 lbs)	1,164,535	1,128,940	1,152,178	1,187,853	1,186,399	1,186,349	1,154,676	1,169,844	1,234,260	1,126,872
	hogs & pigs (1,000 lbs)	1,411,364	1,420,725	1,237,548	1,214,626	1,204,376	1,159,851	1,100,499	1,141,877	1,115,461	1,294,070
	broilers (1,000 head)	250,000	255,000	258,800	*withheld*	*withheld*	*withheld*	*withheld*	*withheld*	*withheld*	*withheld*
	turkeys (1,000 head)	21,000	22,000	22,000	23,000	24,000	25,500	23,500	21,500	20,500	20,000
	eggs (mil eggs)	1,719	1,732	1,690	1,614	1,791	1,841	1,861	1,865	1,910	1,903
	milk (mil lbs)	2,362	2,367	2,237	2,258	1,949	1,946	1,886	1,847	1,875	1,840
Value of prdxn	**cattle & calves**	825,886	778,616	837,454	1,003,986	999,260	909,313	991,244	1,190,864	1,334,624	1,188,328
$1,000	**hogs & pigs**	712,923	480,286	378,189	503,176	523,240	358,757	386,330	551,601	537,046	528,123
	broilers	403,125	416,670	430,902	*withheld*	*withheld*	*withheld*	*withheld*	*withheld*	*withheld*	*withheld*
	turkeys	225,120	293,360	277,200	272,228	270,600	281,826	253,330	279,930	289,665	317,000
	eggs	84,804	76,636	72,677	69,975	75,688	76,176	99,989	101,395	74,570	74,213
	milk	323,594	369,252	328,839	273,218	290,401	239,358	237,636	302,908	290,625	244,720
	other	8,454	7,727	8,636	8,690	7,767	6,257	7,822	8,881	10,077	8,925
	sheep & lambs	4,429	4,002	3,953	3,605	3,034	3,329	3,878	4,886	5,705	5,424
	catfish	2,022	1,908	2,854	3,117	2,840	1,070	1,954	1,358	1,723	1,156
	trout	2,003	1,817	1,829	1,968	1,893	1,858	1,990	2,637	2,649	2,345
	mink	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Total	2,583,906	2,422,547	2,333,897	2,131,273	2,166,956	1,871,687	1,976,351	2,435,579	2,536,607	2,361,309
Census of AG		**1997**	**2002**								
Number of farms	**Beef cattle ranching and farming** (112111)	49,947	48,441								
(NAICS classification)	**Cattle feedlots** (112112)	2,024	3,029								
	Dairy cattle and milk production (11212)	2,599	2,664								
	Hog and pig farming (1122)	2,444	1,469								
	Poultry and egg production (1123)	1,162	1362								
	Sheep and goat farming (1124)	646	922								
	Animal aquaculture and other animal prdxn (1125,1129)	3,859	8,047								
Value of sales	**cattle & calves**	1,143,320	1,285,288								
$1,000	**hogs & pigs**	841,644	570,551								
	poultry & eggs	755,708	784,986								
	milk & other dairy products	293,411	300,460								
	aquaculture (first Census, 1998)	5,374	11,107								
	other (calculated)	36,613	38,417								
	Total (livestock, poultry & their products)	3,076,070	2,990,809								
Input purchases	**Livestock and poultry purchased**...............farms	29,162	30,120								
	$1,000	574,610	546,196								
	Breeding livestock purchased....................farms	n/a	19,512								
	$1,000	n/a	97,217								
	Other livestock and poultry purchased......farms	n/a	14,508								
	$1,000	n/a	448,979								
	Feed purchased...farms	61,570	69,368								
	$1,000	1,056,896	1,136,939								
Economic impacts		**Output ($000)**	**Earnings ($000)**	**Employment (jobs)**	**Tax ($000)**						
2005 animal ag	**Cattle & calves and milk**	3,903,909	585,830	29,377	133,569						
	Poultry & eggs	1,089,293	165,131	6,924	37,650						
	Hogs & pigs and other	1,531,929	231,844	10,580	52,860						
	Total impact	6,525,132	982,805	46,882	224,079						
Change from '97-'05	**Cattle & calves and milk**	(297,327)	(44,618)	(2,237)	(10,173)						
	Poultry & eggs	(24,153)	(3,661)	(154)	(835)						
	Hogs & pigs and other	(136,546)	(20,665)	(943)	(4,712)						
	Total impact	(458,026)	(68,944)	(3,334)	(15,719)						
		Output ($)	**Earnings ($)**	**Employment (jobs)**		**Tax rates**	**Fed. inc.**	10.4%			
Multipliers	**Cattle & calves and milk**	2.7242	0.4088	20.5			**Fed. SS**	8.4%			
	Poultry & eggs	2.7844	0.4221	17.7			**State inc.**	4.0%			
	Hogs & pigs and other	2.8525	0.4317	19.7			**Total**	22.8%			

Data from the 2002 Economic Census

			All establishments [2]		All employees		Production workers						
commodity	**State**	E [1]	Total	With 20 employees or more	Number [3]	Payroll ($1,000)	Number [3]	Hours (1,000)	Wages ($1,000)	Value added	Total cost of materials ($1,000)	Total value of shipments ($1,000)	Total Capital expenditures ($1,000)
icfrz	MO	–	8	3	853	27,753	737	1,024	23,544	165,489	86,575	251,843	10,689
mfc	MO	2	26	10	1,599	47,263	1,333	2,626	34,151	193,673	212,214	404,875	24,464
pou	MO	–	22	18	10,569	234,282	9,695	19,208	201,879	620,258	687,164	1,317,376	34,003
fm	Fluid milk												
bu	Creamery butter												
ch	Cheese												
dce	Dry, condensed, & evaporated dairy product												
icfrz	Ice cream & frozen dessert												
as	Animal (except poultry) slaughtering												
mfc	Meat processed from carcasses												
r&m	Rendering & meat byproduct												
pou	Poultry												

1 Some payroll and sales data for small single establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. This technique was also used used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of the figures shown: 1–10 to 19 percent; 2–20 to 29 percent; 3–30 to 39 percent; 4–40 to 49 percent; 5–50 to 59 percent; 6–60 to 69 percent; 7–70 to 79 percent; 8–80 to 89 percent; 9–90 percent or more.

2 Includes establishments with payroll at any time during the year.

3 Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

The third table, which appears on the next page, presents state-level data on the number of farms and market value of sales for selected products that was collected by the 2002 Census of Agriculture. Data is cross-tabulated by numerous farm-type categories and is presented first for all farms, then for farms with $50,000 or more in sales of the listed product. Note that not all cattle or hogs are produced on cattle or hog farms. For Census purposes, farms are classified by their primary product but may also be producing other products.

The Census collects and reports farm production expenses for 15 different types of related expenses – we have chosen four for use in our analysis: hired farm labor, contract labor, customwork and custom hauling, and property taxes paid. These expenses are also cross-tabulated by farm-type. Such information may prove useful in any closer examination that USB Board members and others make of the animal agriculture situation in their respective states. We do not explicitly analyze or discuss all of this information in this report. But it can be used to provide some detail on how animal agriculture ripples through the state economy. For example, dairy farms in Missouri did the following in 2002:

- ✓ Employed 3,491 hired laborers
- ✓ Spent $1.7 million on contract labor and $6.1 million on customwork, and
- ✓ Paid $5 million in property taxes.

The last section of this table shows the primary occupation of principal operators as farming or other. The number of days worked off-farm is also reported for all principal operators, regardless of primary occupation.

Data from the 2002 Census of Agriculture

Missouri: Market Value of Agricultural Products Sold and Government Payments, 2002														
Item		Total	Oilseed and grain farming (1111)	Vegetable and melon farming (1112)	Fruit and tree nut farming (1113)	Greenhouse, nursery, and floriculture production (1114)	Total Other Crop Farming (1119)	Beef cattle ranching and farming (112111)	Cattle feedlots (112112)	Dairy cattle and milk production (11212)	Hog and pig farming (1122)	Poultry and egg production (1123)	Sheep and goat farming (1124)	Animal aquaculture and other animal production (1125,1129)
Cattle and calves	farms	57,957	4,926	65	85	66	1,723	43,613	3,029	2,395	611	545	76	823
	$1,000	1,285,288	112,278	494	582	533	20,108	932,071	128,106	45,588	13,004	13,808	234	18,483
Sales of $50,000 or more	farms	4,733	520	1	1	3	69	3,248	500	162	63	68	-	98
	$1,000	701,042	51,489	(D)	(D)	(D)	5,799	501,247	101,157	16,420	5,614	6,471	-	12,515
Milk and other dairy products from cows	farms	3,233	33	10	-	2	23	422	7	2,587	53	62	1	33
	$1,000	300,460	1,166	(D)	-	(D)	485	8,539	(D)	284,601	894	2,464	(D)	770
Sales of $50,000 or more	farms	1,833	5	2	-	-	2	34	2	1,770	3	11	-	4
	$1,000	271,151	735	(D)	-	-	(D)	3,318	(D)	262,931	320	1,613	-	528
Hogs and pigs	farms	3,752	550	7	5	5	175	804	117	138	1,453	52	21	425
	$1,000	570,551	19,375	15	11	(D)	(D)	4,871	2,642	1,462	524,240	992	19	15,724
Sales of $50,000 or more	farms	897	116	-	-	-	7	21	17	6	630	4	-	96
	$1,000	545,586	14,147	-	-	-	614	1,738	1,572	681	514,955	692	-	11,186
Poultry and eggs	farms	3,103	98	55	28	34	176	698	83	131	76	1,337	113	274
	$1,000	784,986	554	43	(D)	(D)	825	812	38	(D)	(D)	777,794	28	3,554
Sales of $50,000 or more	farms	866	2	-	-	-	1	3	-	1	2	849	-	8
	$1,000	781,534	(D)	-	-	-	(D)	403	-	(D)	(D)	775,586	-	3,236
Total farm production expenses	farms	106,749	17,702	412	936	909	20,478	49,264	3,076	2,749	1,356	1,424	1,008	7,435
	$1,000	4,578,834	1,242,513	27,338	17,204	77,854	287,442	1,050,666	140,931	281,719	581,577	740,863	6,976	123,752
Average per farm	dollars	42,893	70,191	66,355	18,380	85,647	14,037	21,327	45,816	102,480	428,892	520,269	6,921	16,645
Hired farm labor	farms	22,168	5,303	112	201	448	2,342	9,440	688	1,281	428	578	104	1,243
	workers	66,201	14,394	1,497	1,565	3,785	7,010	22,864	1,847	3,491	3,236	2,944	183	3,385
	$1,000	287,744	73,696	3,960	4,013	26,473	18,019	35,565	6,479	18,868	60,708	32,533	109	7,321
Farms with expenses of-														
$1 to $4,999		16,174	3,005	38	166	178	1,846	8,174	504	634	186	274	104	1,065
$5,000 to $24,999		3,850	1,414	49	17	119	296	927	116	481	110	184	-	137
$25,000 to $99,999		1,795	786	14	9	91	172	316	56	145	84	94	-	28
$100,000 to $249,999		248	90	6	4	32	28	19	11	16	27	8	-	7
$250,000 or more		101	8	5	5	28	-	4	1	5	21	18	-	6
Workers by days worked:														
150 days or more	farms	6,169	2,342	49	43	228	456	1,400	179	743	233	315	-	181
	workers	15,340	4,128	290	124	1,497	935	2,352	394	1,682	1,949	1,494	-	495
Less than 150 days	farms	18,836	4,083	94	190	365	2,172	8,657	588	727	323	401	104	1,132
	workers	50,861	10,266	1,207	1,441	2,288	6,075	20,512	1,453	1,809	1,287	1,450	183	2,890
Contract labor	farms	8,584	1,465	62	125	62	1,342	3,824	188	402	102	225	71	716
	$1,000	37,297	6,666	947	285	691	4,132	10,908	573	1,714	2,632	5,472	153	3,123
Farms with expenses of-														
$1 to $999		3,565	414	2	55	-	645	1,744	64	150	22	60	37	372
$1,000 to $4,999		3,552	729	19	66	39	480	1,604	95	175	31	85	25	204
$5,000 to $24,999		1,289	282	32	2	18	197	425	28	69	39	67	9	121
$25,000 to $49,999		109	28	3	2	3	14	42	1	6	2	6	-	2
$50,000 or more		69	12	6	-	2	6	9	-	2	8	7	-	17
Customwork and custom hauling	farms	24,826	6,331	77	125	57	2,799	11,308	877	1,296	325	379	127	1,125
	$1,000	66,851	28,756	916	196	123	5,121	16,276	1,856	6,129	3,036	2,782	118	1,540
Farms with expenses of														
$1 to $999		12,910	1,993	49	73	35	1,650	7,276	508	199	91	166	105	765
$1,000 to $4,999		8,788	2,852	20	50	13	959	3,403	285	591	167	130	22	296
$5,000 to $24,999		2,881	1,354	4	1	8	174	597	79	499	44	60	-	61
$25,000 to $49,999		159	99	2	1	1	7	23	3	6	7	9	-	1
$50,000 or more		88	33	2	-	-	9	9	2	1	16	14	-	2
Property taxes paid	farms	101,982	16,833	400	878	867	19,294	47,409	3,013	2,727	1,307	1,396	910	6,948
	$1,000	144,577	42,144	478	1,534	1,486	19,726	54,400	3,719	5,035	4,984	3,034	574	7,464
Farms with expenses of														
$1 to $4,999		98,186	15,170	388	850	809	18,928	46,425	2,931	2,567	1,172	1,282	909	6,755
$5,000 to $9,999		2,553	1,059	4	4	46	242	731	65	98	80	81	-	143
$10,000 to $24,999		978	457	7	3	6	115	213	14	59	39	17	1	47
$25,000 or more		265	147	1	21	6	9	40	3	3	16	16	-	3
PRINICPAL OPERATOR CHARACTERISTICS														
Primary Occupation:														
Farming		61,035	12,738	282	373	360	9,137	27,907	1,691	2,332	1,052	947	420	3,796
Other		45,762	5,458	183	489	523	11,320	20,534	1,338	332	417	415	502	4,251
Days worked off farm														
None		46,248	9,143	198	380	442	8,890	19,901	1,207	1,753	678	694	308	2,654
Any		60,549	9,053	267	482	441	11,567	28,540	1,822	911	791	668	614	5,393
1 - 49 days		5,386	1,287	47	61	65	1,019	1,994	129	218	80	98	48	340
50 - 99 days		2,837	548	17	14	23	473	1,295	75	81	43	40	21	207
100 - 199 days		7,031	1,133	29	62	79	1,141	3,321	203	139	104	104	84	632
200 days or more		45,295	6,085	174	345	274	8,934	21,930	1,415	473	564	426	461	4,214
- represents zero														
(D) Withheld to avoid disclosing data for individual farms.														

SECTION 3: SOYBEAN MEAL USE BY STATE

The reason for soybean growers to be concerned about the future of animal agriculture in the United States is that domestic consumption of soybean meal by livestock, poultry and other species is the single largest source of demand for US soybeans.

To calculate soybean meal use by species in 2005/06 in each state, we began with 2006 production data published by NASS. Since most animals are fed for prolonged periods before they are slaughtered, fiscal year meal disappearance should roughly correspond to calendar year production or marketings. Comparing the live/slaughter weight production data for beef, pork and poultry to carcass/ready-to-consume production data in USDA's World Agricultural Supply and Demand Estimates, we calculated a three-year average (2004-2006) product yield per pound of animal production for each livestock product (except for eggs and milk, which we assigned a yield ratio of 1.00). The figures we calculated for beef, pork and poultry are close to the official conversion factors USDA last published in 1992, which are now a bit out of date.

Using the new product yield estimates, we then applied feed conversion ratios to estimate protein meal used in feed per unit of meat, egg or milk production. The factors usually cited for the number of pounds of meal needed to produce a pound of chicken or some other meat assume a ration built around corn and soybean meal. However, there are many other protein sources going into the national feed mix including meat and blood meal, fish meal, urea, synthetic amino acids, corn gluten meal, other oilseed meals, and increasingly, distillers dried grains (DDG).

As in earlier reports, we attempted to reconcile our soybean meal estimates to that total disappearance of protein feeds by adjusting downwards the calculated amount of soybean meal. For prok and egg production, consumption in 2005/06 is estimated at 82% of the amount calculated for a straight corn-SBM ration. For broilers and turkeys we used a factor of 88%. For beef cattle we used a factor of 20% and for dairy 30% because of the heavy use of cottonseed, gluten feed, distillers' grains and urea to meet cattle protein requirements.

In addition to the main species, other outlets for soybean meal as feed include aquaculture and petfood, plus much smaller markets like mink, goats, sheep, horses, ducks, geese, etc. In the past we have estimated that this "other" category accounts for about 5% of total soybean meal used nationally in domestic feeding. We have used the same figure in our state estimates, but one should be aware that this will under- or over-estimate such use for certain states. For example, it underestimates use of soybean meal in aquaculture in states like Louisiana.

The table on the next page presents the results of these calculations. In total, the state estimates add up to 30.8 million tons of SBM consumption for feed in 2005/06. Applying our formulas to the national animal product output figures gives a total of 32.1 million tons since these include output for some states not separately reported. This is quite close to USDA's 33.2 million ton estimate of total domestic meal disappearance, which also includes production of soy flour, concentrate and isolate for human and animal consumption.

Swine accounted for 8.5 million tons of soybean meal use, broilers 12.8 million and beef cattle 2.6 million. Within each state it is easy to see which animal production sectors are responsible for most of the local demand for soybean meal. By state, Iowa was the leader at 3.2 million tons, followed closely by North Carolina with 3.1 million, and then Georgia and Arkansas at 2.2 million tons and 2.1 million tons, respectively.

Soybean Meal Use by Species in 2005/06
(1,000 short tons)

State	Beef Cattle	Hogs & Pigs	Broilers	Turkeys	Eggs	Dairy Cattle	Other	Total
Alabama	29	23	1,495	-	52	2	84	1,685
Alaska	-	-	-	-	-	-	-	-
Arizona	33	19	-	-	-	47	5	105
Arkansas	31	36	1,651	171	85	3	104	2,082
California	116	21	-	125	132	466	45	906
Colorado	113	103	-	-	28	31	14	289
Connecticut	1	-	-	-	21	4	1	27
Delaware	-	2	474	-	-	1	25	503
Florida	25	3	116	-	76	26	13	259
Georgia	21	38	1,889	-	125	17	110	2,199
Hawaii	2	1	-	-	3	1	-	6
Idaho	62	3	-	-	5	131	11	211
Illinois	35	440	-	26	34	24	29	588
Indiana	15	452	-	135	171	40	43	856
Iowa	106	2,485	-	80	359	50	162	3,241
Kansas	240	242	-	-	-	-	25	508
Kentucky	40	54	418	-	30	16	29	587
Louisiana	14	2	-	-	12	5	2	34
Maine	1	1	-	-	28	7	2	38
Maryland	4	5	343	8	19	13	21	412
Massachusetts	1	1	-	4	2	3	1	14
Michigan	22	145	-	51	62	85	19	385
Minnesota	61	1,010	60	355	76	100	87	1,751
Mississippi	15	46	1,225	-	40	4	70	1,400
Missouri	66	392	-	186	49	22	38	752
Montana	53	23	-	-	3	4	4	129
Nebraska	280	427	8	-	81	13	43	852
Nevada	9	1	-	-	-	7	1	17
New Hampshire	1	-	-	-	1	4	-	5
New Jersey	1	-	-	2	12	2	1	17
New Mexico	35	-	-	-	-	92	7	133
New York	135	10	-	4	29	145	17	340
North Carolina	17	1,143	1,338	330	68	11	153	3,061
North Dakota	46	19	-	10	-	6	4	86
Ohio	28	265	64	56	195	58	35	701
Oklahoma	124	379	354	-	19	15	47	938
Oregon	33	3	-	-	20	27	4	88
Pennsylvania	30	146	206	57	174	129	39	780
Rhode Island	-	-	-	-	-	-	-	-
South Carolina	10	31	370	113	33	3	29	590
South Dakota	90	217	-	46	22	18	21	414
Tennessee	33	28	286	-	8	13	19	387
Texas	396	79	875	-	131	86	82	1,649
Utah	22	86	-	-	24	21	8	162
Vermont	3	-	-	4	1	31	2	41
Virginia	28	45	350	163	21	21	33	660
Washington	36	3	-	-	34	66	7	146
West Virginia	9	1	94	27	7	2	7	148
Wisconsin	68	66	44	-	33	281	26	519
Wyoming	31	19	-	-	-	1	3	54
Total	**2,570**	**8,514**	**11,662**	**1,954**	**2,325**	**2,153**	**1,534**	**30,757**
National Total	**2,450**	**8,516**	**12,824**	**2,173**	**2,360**	**2,182**	**1,604**	**32,108**

SECTION 4: ECONOMIC IMPACTS OF ANIMAL AGRICULTURE

4.1 Output, earnings and employment multipliers

To estimate the impact of livestock production on the overall economy of any given geographic area, it is necessary to quantify the relationship between the livestock industry and each of the other major components of the area's economy. So-called input-output (I-O) models are commonly used for this purpose. Given the great amount of detailed information that is required to build and maintain a national I-O model, there are comparatively few of them in operation. One of the most elaborate of these models is the Regional Industrial Multiplier System (RIMS II) operated by the Bureau of Economic Analysis in the US Department of Commerce. This is the model used in this analysis.

RIMS II is based on a benchmark I-O table developed by BEA in 1997. It is comprised of approximately 500 industries. The model traces the interactions among these industries so that the effect of a given level of output in one industry on all other industries can be measured. These measures take the form of multipliers or factors that can be applied to output measured in dollars. They indicate the total economic activity in the state associated with a dollar of sales in that industry. In addition to measuring the value of output, multipliers are also derived for measuring impacts on earnings and employment. The employment multiplier is the number of total jobs in the state associated with one million dollars of sales in that industry.

Given the complexity of tracing these effects throughout the economy, some simplification in methodology is required to keep the task manageable. The first simplifying step in constructing RIMS II was to collapse the nearly 1,200 industries identified in the Census Bureau's North American Industry Classification System (NAICS) to a smaller number of industries. (NAICS replaced the old Standard Industrial Classification system). For purposes of this analysis, unique multipliers are available for three sets of livestock production:

- Cattle and dairy farming
- Poultry and egg production
- Swine, aquaculture, and other animal production

A second important step in estimating multipliers is in defining the geographic region of interest. The RIMS II model permits the region of enquiry to be as small as an individual county or as large as the entire nation. The choice of region can have an important effect on the outcome, depending on whether the associated industries are located within the region. As a general rule, the more broadly the region is defined the greater the likelihood that associated industries are represented within the region and the larger the multipliers. For this analysis, we have defined individual states as the regions of principal interest. While there are variations in the degree to which associated industries are represented (and, correspondingly, in the size of the multipliers), states are generally of sufficient size to capture most of the impact of livestock production.

For comparative purposes, we have also developed multipliers for Delmarva and for the nation as a whole. Multipliers for these larger regions can be compared to individual state multipliers as a basis for judging the relative importance of impacts that cross state borders.

The first table below presents the multipliers for beef and dairy cattle (officially described as Industry 112100 Cattle ranching and farming). Leaving aside Delaware and Hawaii which have low multipliers due to their small size, state output multipliers ranged from about 1.9 in several states to almost 3.1 in Texas. For the United States the output multiplier was 3.9. Earnings multipliers were mostly within the 0.3-0.5 range, rising to over 0.7 for the country as a whole. Employment multipliers were as low as 6.5 in Delaware and over 30 in Montana and Oklahoma.

The second table below presents the RIMS-II multipliers for poultry and egg production. Output multipliers range from 1.4 for several states to 2.8 for Missouri, and the national multiplier is 3.5. The earnings multipliers are marginally lower than those for cattle. The employment multipliers are quite a bit lower in most cases, ranging from 6.2 in Delaware to 25.2 in Oklahoma, and the national multiplier is 23.6.

Finally, the multipliers for Industry 112A00 Animal production, except cattle, poultry and eggs (i.e. swine and the smaller sectors like aquaculture) are shown in the third table below. They are broadly similar to those for cattle.

Beef and Dairy Cattle			
	Final-demand multiplier		
State	Output ($)	Earnings ($)	Employment (jobs)
Alabama	2.2987	0.3697	15.0
Alaska	2.1080	0.2855	21.3
Arizona	2.5738	0.4192	14.6
Arkansas	2.0228	0.3110	15.0
California	2.5421	0.4279	15.3
Colorado	2.8869	0.4762	21.3
Connecticut	1.9876	0.2918	12.2
Delaware	1.5955	0.1964	6.5
Delmarva	2.4273	0.3826	16.6
Florida	1.9543	0.3197	13.0
Georgia	2.4047	0.3961	12.8
Hawaii	1.6384	0.2537	12.0
Idaho	2.7297	0.4339	17.9
Illinois	2.3062	0.3753	20.8
Indiana	2.2357	0.3427	22.8
Iowa	2.2341	0.3455	20.2
Kansas	2.7607	0.4140	28.1
Kentucky	2.3512	0.3591	25.9
Louisiana	2.0872	0.3284	23.5
Maine	2.0750	0.3270	22.5
Maryland	2.2233	0.3291	12.6
Massachusetts	2.0911	0.3098	21.8
Michigan	2.4027	0.3777	19.2
Minnesota	2.4775	0.3936	19.1
Mississippi	1.9293	0.2951	13.7
Missouri	2.7242	0.4088	20.5

Beef and Dairy Cattle			
	Final-demand multiplier		
State	Output ($)	Earnings ($)	Employment (jobs)
Montana	2.6981	0.4182	31.8
Nebraska	2.6066	0.4055	18.8
Nevada	2.2895	0.3337	15.6
New Hampshire	2.3422	0.3390	17.6
New Jersey	1.9500	0.2892	14.6
New Mexico	2.4940	0.3835	15.2
New York	2.4202	0.3468	18.3
North Carolina	2.1317	0.3417	12.2
North Dakota	2.2925	0.3377	19.1
Ohio	2.5059	0.4006	20.2
Oklahoma	2.8744	0.4558	30.5
Oregon	2.5600	0.4045	25.2
Pennsylvania	2.7097	0.4250	26.9
Rhode Island	1.8263	0.2575	15.6
South Carolina	1.9794	0.3089	14.4
South Dakota	2.5273	0.3824	16.3
Tennessee	2.6935	0.4220	20.5
Texas	3.0584	0.5135	28.8
Utah	2.7512	0.4455	22.7
Vermont	2.3105	0.3388	18.6
Virginia	2.5210	0.3786	26.0
Washington	2.7783	0.4481	19.7
West Virginia	2.2311	0.3870	18.1
Wisconsin	2.4666	0.3911	20.2
Wyoming	2.3003	0.3319	22.8
United States	3.8698	0.7162	29.9

Source: RIMS-II, BEA, Department of Commerce

State	Poultry and eggs – Final-demand multiplier: Output ($)	Earnings ($)	Employment (jobs)
Alabama	2.3258	0.3707	13.1
Alaska	1.3122	0.1744	8.9
Arizona	1.6063	0.2582	8.1
Arkansas	2.5719	0.3956	16.2
California	2.0003	0.3345	11.0
Colorado	2.1844	0.3641	15.2
Connecticut	1.6043	0.2377	8.0
Delaware	1.7098	0.2116	6.2
Delmarva	2.1919	0.3446	12.4
Florida	1.6697	0.2698	10.1
Georgia	2.5099	0.4187	11.8
Hawaii	1.3933	0.2101	17.0
Idaho	2.2475	0.3581	13.6
Illinois	2.7283	0.4542	21.4
Indiana	2.7067	0.4231	23.5
Iowa	2.4927	0.3828	17.9
Kansas	2.4512	0.3685	24.4
Kentucky	2.5921	0.3925	21.8
Louisiana	2.1206	0.3350	22.0
Maine	1.8591	0.2929	18.4
Maryland	2.1961	0.3282	10.7
Massachusetts	1.4888	0.2219	14.9
Michigan	1.7259	0.2751	12.3
Minnesota	2.7032	0.4386	24.7
Mississippi	2.4207	0.3688	15.4
Missouri	2.7844	0.4221	17.7

State	Poultry and eggs – Final-demand multiplier: Output ($)	Earnings ($)	Employment (jobs)
Montana	2.0680	0.3199	17.4
Nebraska	2.4933	0.3859	17.7
Nevada	1.4058	0.2072	9.8
New Hampshire	1.6195	0.2364	14.8
New Jersey	1.7064	0.2567	11.2
New Mexico	1.7154	0.2587	9.2
New York	1.6652	0.2408	10.9
North Carolina	2.4661	0.4009	12.5
North Dakota	2.1166	0.3092	15.2
Ohio	2.6857	0.4386	24.4
Oklahoma	2.5344	0.4039	25.2
Oregon	2.1126	0.3314	16.3
Pennsylvania	2.3941	0.3823	19.6
Rhode Island	1.3917	0.1975	16.1
South Carolina	1.7758	0.2740	11.5
South Dakota	2.3047	0.3445	14.5
Tennessee	2.7260	0.4314	17.3
Texas	2.3534	0.3955	19.8
Utah	2.2839	0.3806	15.8
Vermont	1.7700	0.2135	13.3
Virginia	1.9290	0.2944	17.7
Washington	2.0663	0.3322	13.2
West Virginia	1.4819	0.2058	10.8
Wisconsin	2.1999	0.3523	15.4
Wyoming	1.3616	0.1922	10.3
United States	3.5120	0.6508	23.6

Source: RIMS-II, BEA, Department of Commerce

State	Swine and other: Final-demand multiplier: Output ($)	Earnings ($)	Employment (jobs)
Alabama	2.3674	0.3823	15.3
Alaska	1.8039	0.2436	12.5
Arizona	2.0310	0.3306	11.1
Arkansas	2.4220	0.3748	16.2
California	2.2867	0.3850	13.1
Colorado	2.6432	0.4392	19.4
Connecticut	1.7784	0.2626	9.7
Delaware	1.6887	0.2084	9.8
Delmarva	2.3477	0.3674	15.0
Florida	1.8385	0.2998	11.8
Georgia	2.5571	0.4256	13.1
Hawaii	1.5410	0.2365	11.3
Idaho	2.5364	0.4058	16.9
Illinois	2.8344	0.4689	22.1
Indiana	2.6906	0.4180	24.1
Iowa	2.5313	0.3920	19.8
Kansas	2.6307	0.3965	20.6
Kentucky	2.5078	0.3827	22.8
Louisiana	2.2034	0.3493	23.2
Maine	1.9585	0.3095	16.9
Maryland	2.2697	0.3383	12.3
Massachusetts	1.8366	0.2732	18.7
Michigan	2.1502	0.3408	16.3
Minnesota	2.6926	0.4329	24.6
Mississippi	2.2495	0.3446	15.8
Missouri	2.8525	0.4317	19.7

State	Swine and other: Final-demand multiplier: Output ($)	Earnings ($)	Employment (jobs)
Montana	2.4855	0.3859	21.9
Nebraska	2.6326	0.4099	18.1
Nevada	1.8050	0.2648	12.1
New Hampshire	1.8821	0.2740	18.3
New Jersey	1.9694	0.2948	15.2
New Mexico	2.0514	0.3143	12
New York	2.0032	0.2889	12.1
North Carolina	2.4919	0.4038	13.7
North Dakota	2.3188	0.3419	23.3
Ohio	2.7575	0.4473	26.6
Oklahoma	2.7566	0.4406	27.0
Oregon	2.4121	0.3815	22.4
Pennsylvania	2.5149	0.3990	21.1
Rhode Island	1.6685	0.2356	17.4
South Carolina	1.9703	0.3077	13.8
South Dakota	2.5005	0.3776	15.6
Tennessee	2.6079	0.4122	18.1
Texas	2.6687	0.4505	24.4
Utah	2.5490	0.4206	17.9
Vermont	1.9856	0.2885	13.4
Virginia	2.2087	0.3348	19.5
Washington	2.4749	0.4000	17.7
West Virginia	1.7286	0.2403	13.3
Wisconsin	2.3216	0.3711	17.5
Wyoming	1.8779	0.2699	15.7
United States	3.8032	0.708	27.4

Source: RIMS-II, BEA, Department of Commerce

4.2 Impact estimates for output and earnings

Impact estimates were derived as follows. The 2006 value of production estimates (as reported by NASS) were aggregated into the three livestock categories described above (i.e. beef/dairy, broiler/turkey/eggs, and hogs/other) for each of the 50 states under study. Each of these values was multiplied by its respective output multiplier to yield the dollar value impact of that sector on each state's economy. The sums of the livestock category impacts represent the overall impact of the livestock industry on the economy of each state.

The impact on earnings has been calculated in a similar manner. That is, the value of production estimate for each category was multiplied by its respective earnings multiplier. The resulting value represents the dollar value of earnings of households employed by all industries throughout the state associated with the production of each category of livestock.

Employment impacts were calculated in similar fashion, using the employment multipliers generated through the RIMS II model. The resulting estimate represents the number of jobs in each state attributable to livestock production.

Economic Impact of 2006 Animal Agriculture in Selected States					
States	Output ($mil.)	Earnings ($mil.)	Employment (jobs)	Income and sales tax ($mil.)	Property Tax ($mil.)
Alabama	7,011	1,119	40,663	255	23
Alaska	13	2	125	0	0
Arizona	2,536	413	14,372	94	13
Arkansas	9,028	1,389	58,174	317	35
California	15,356	2,587	89,811	590	126
Colorado	7,261	1,199	53,508	281	38
Connecticut	181	27	1,890	6	7
Delaware	1,307	162	4,768	37	3
Florida	2,059	336	13,396	63	56
Georgia	9,104	1,516	43,591	346	60
Hawaii	84	13	673	3	1
Idaho	6,060	964	39,747	220	32
Ilinois	4,245	697	35,382	152	46
Indiana	4,513	699	41,965	155	54
Iowa	14,732	2,279	119,853	520	102
Kansas	9,940	1,491	99,023	340	73
Kentucky	3,937	599	38,392	137	47
Louisiana	659	104	7,345	24	10
Maine	355	57	2,212	13	8
Maryland	1,780	265	9,078	61	19
Massachusetts	115	17	1,191	4	7
Michigan	3,623	571	28,538	130	53
Minnesota	10,890	1,745	92,779	398	59
Mississippi	5,849	892	38,026	203	30
Missouri	6,525	983	46,882	224	79

Economic Impact of 2006 Animal Agriculture in Selected States					
States	Output ($mil.)	Earnings ($mil.)	Employment (jobs)	Income and sales tax ($mil.)	Property Tax ($mil.)
Montana	2,643	410	30,732	93	65
Nebraska	13,090	2,036	93,754	464	106
Nevada	508	74	3,459	14	6
New Hampshire	122	18	924	4	6
New Jersey	99	15	704	3	16
New Mexico	3,559	547	21,686	125	16
New York	4,383	636	33,090	145	92
North Carolina	12,602	2,044	66,434	466	56
North Dakota	2,013	297	16,913	68	22
Ohio	5,079	819	43,976	187	62
Oklahoma	9,434	1,499	97,984	342	72
Oregon	2,240	354	21,857	81	45
Pennsylvania	7,399	1,166	69,873	255	94
Rhode Island	8	1	65	0	1
South Carolina	1,324	205	8,902	47	20
South Dakota	5,420	819	34,728	154	68
Tennessee	3,069	483	21,749	110	60
Texas	24,643	4,139	228,366	778	262
Utah	2,161	352	17,152	80	15
Vermont	924	135	7,432	31	16
Virginia	3,442	521	33,444	119	49
Washington	3,693	596	26,117	112	49
West Virginia	623	86	4,783	20	11
Wisconsin	10,428	1,654	84,877	377	141
Wyoming	1,393	201	13,654	38	18
Total	**247,460**	**39,231**	**1,904,037**	**8,683**	**2,349**
National Total	**451,347**	**83,613**	**3,364,322**	**19,064**	**2,350**

Across all states, the output impact of animal agriculture ranges from $1-25 billion at the state level. The total of the state level calculations is $247 billion, but if one applies the multipliers at the national level, the economic impact of animal agriculture totals $451 billion. The effect on household earnings at the national level is $84 billion, and the sector creates well over 3.3 million jobs. At the state level, the employment impacts exceed 10,000 jobs in 35 of the states and top 100,000 jobs in 2 states.

4.3 Tax Effects

As shown in the preceding table, we estimate that animal agriculture results in $19 billion in federal and state income and employment tax payments, plus $2.4 billion in property tax payments. The methodology behind these estimates is described below.

The economic activity associated with the production of livestock also generates tax revenue for local, state, and federal governments. These taxes are applied in many different forms, depending on jurisdiction. Nationally, about 60 percent of all tax revenues are collected at the federal level with the remaining 40 percent spread among the several thousand state and local jurisdictions.

The USDA's Economic Research Service reports that farm households paid nearly $40 billion in taxes in 1996, the most recent year for which this information is available. Of this total, most was paid in the form of federal income taxes (48 percent), federal Social Security/self-employment taxes (26 percent), local property taxes (13 percent), and state and local income taxes (12 percent). For this analysis, we will focus on income taxes, Social Security/self-employment taxes, and property taxes.

In calculating federal income taxes, farm households include income from all sources (farm and non-farm). Given the several adjustments, deductions, and exemptions that are allowed for farming enterprises, the average effective tax paid on farm income is relatively low. In 1996 (the most recent year for which information is available), the combined reported income of the 2.2 million farm households was entirely from non-farm sources. That is, farm income losses more than matched farm income gains when netted out across all farm households. Even among farms with annual sales in excess of $250,000, two-thirds of reported income was from non-farm sources.

Based on the distribution of farm households with sales above $250,000 among the federal tax brackets in 1996, adjusted for the lower tax rates adopted in 2001 and 2002, we estimate an average federal income tax rate of about 14 percent for these households. This should be considered an upper bound, however, since much of the income generated through the farming enterprises of these households is either taxed at a low rate or not taxed at all.

The other important federal tax is the self-employment (Social Security) tax. This tax has two components: the old age, survivor, and disability (OASDI) portion and the Medicare hospital insurance (HI) portion. While self-employed farmers are required to pay both the employer and employee shares of this tax (15.3 percent of net farm profit), they also receive an income tax deduction for one-half of the tax as well as a 7.65 percent exclusion of self-employment income. The Economic Research Service (ERS) reports that the average effective Social Security tax rate for all farmers was 10 percent in 1994. As with the estimate of the federal income tax rate, this should probably be considered an upper bound. According to ERS, a combination of higher self-employment taxes and reduced retirement benefits has provided farmers with an incentive to adopt changes in farm business operations designed to minimize their self-employment taxes. Thus, the effective rate could be lower than 10 percent, though we have no basis on which to estimate it.

While the incomes of livestock and crop producers are most directly impacted by the economic activity associated with livestock production, the earnings of workers in many other industries are impacted too, though to a lesser extent. Since the workers in these industries also pay taxes, the indirect impact of the livestock industry on the tax revenues originating in these industries should also be considered. This includes workers across a diversified array of input, service, manufacturing, and distribution industries. Given the diversity of industries and occupations represented, we have used the 2001 average effective federal tax rates for all households, as estimated by the Congressional Budget Office. CBO estimates that the average effective individual income tax rate was 10.4 percent in 2001 and that the average effective social insurance tax rate was 8.4 percent the same year.[1]

State and local income tax rates are highly variable ranging from no tax in several states to as high as 11 percent for the highest income bracket in one state. Typically they are in the 3 to 6 percent range. Most state income taxes are progressive, though a few are flat. ERS estimates the average rate for farm households at 4 percent. We have used that rate in estimating the state and local tax effects with two exceptions. First, a value of zero has been assigned to the states that have no state income tax. Second, for those states that have a flat tax, their actual rates have been used.

In estimating tax impacts, we have opted to use CBO's estimated average rates for federal taxes and to apply these rates across the board to earnings in all industries. While this yields a somewhat lower estimate than that derived from using the average rates estimated by ERS for farmers, the CBO estimates are more recent and if anything, are probably still higher than the rates currently in use for farm production. The estimates are calculated by multiplying the sum of the federal and state tax rates by the total earnings impact estimate for each state.

In the case of property taxes, we have used the figures collected in the most recent Census of Agriculture. These were for 2002 but would have been at somewhat higher levels in 2006. The property taxes paid in each state by each type of livestock operation are shown in the database.

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[1] Congressional Budget Office, *Effective Federal Tax Rates: 1979 – 2001*, April 2004.

4.4 Reasonableness of estimates

In order to test whether the estimates of output impact are plausible, we compared them to the total economic output for each state. The Department of Commerce periodically estimates not just the national gross domestic product (GDP) but also the gross state product (GSP) for each state. The most recent data available are for 2006 and are shown in the table below, along with the output impact estimates calculated above, and the ratio of the impact estimate to gross state product.

Share of Output Impact on Gross State Product, 2006

	Output ($mil.)	Gross State Product ($mil.)	Share (%)
Alabama	7,011	160,569	4%
Alaska	13	41,105	0%
Arizona	2,536	232,463	1%
Arkansas	9,028	91,837	10%
California	15,356	1,727,355	1%
Colorado	7,261	230,478	3%
Connecticut	181	204,134	0%
Delaware	1,307	60,361	2%
Florida	2,059	713,505	0%
Georgia	9,104	379,550	2%
Hawaii	84	58,307	0%
Idaho	6,060	49,907	12%
Ilinois	4,245	589,598	1%
Indiana	4,513	248,915	2%
Iowa	14,732	123,970	12%
Kansas	9,940	111,699	9%
Kentucky	3,937	145,959	3%
Louisiana	659	193,138	0%
Maine	355	46,973	1%
Maryland	1,780	257,815	1%
Massachusetts	115	337,570	0%
Michigan	3,623	381,003	1%
Minnesota	10,890	244,546	4%
Mississippi	5,849	84,225	7%
Missouri	6,525	225,876	3%

Share of Output Impact on Gross State Product, 2006			
	Output ($mil.)	Gross State Product ($mil.)	Share (%)
Montana	2,643	32,322	8%
Nebraska	13,090	75,700	17%
Nevada	508	118,399	0%
New Hampshire	122	56,276	0%
New Jersey	99	453,117	0%
New Mexico	3,559	75,910	5%
New York	4,383	1,021,944	0%
North Carolina	12,602	374,525	3%
North Dakota	2,013	26,385	8%
Ohio	5,079	461,302	1%
Oklahoma	9,434	134,651	7%
Oregon	2,240	151,301	1%
Pennsylvania	7,399	510,293	1%
Rhode Island	8	45,660	0%
South Carolina	1,324	149,214	1%
South Dakota	5,420	32,330	17%
Tennessee	3,069	238,029	1%
Texas	24,643	1,065,891	2%
Utah	2,161	97,749	2%
Vermont	924	24,213	4%
Virginia	3,442	369,260	1%
Washington	3,693	293,531	1%
West Virginia	623	55,658	1%
Wisconsin	10,428	227,230	5%
Wyoming	1,393	29,561	5%
National Total	247,460	13,061,309	2%

We find the estimates to be quite plausible. For most states the impact of totally eliminating animal agriculture in the state as a percentage of total economic activity is in the single digits – typically 1-8 percent. But in states where livestock and poultry industries are a bigger part of the state economy, the impacts are in the 10-17 percent range, which seems reasonable.

SECTION 5: EFFECTS OF RELOCATION OF ANIMAL AGRICULTURE

In the database for each state, we also calculate the economic impacts of the change in output between 1997 and 2006. This can be a bit misleading because one has to work with dollar sales figures and these are influenced by price changes as well as by animal numbers. We therefore used 2006 unit values to calculate the output changes. Also, our multipliers are for categories that aggregate beef and dairy production, poultry and egg production, and swine and "other". Thus, for example, a decline in dairy can be masked by an increase in beef cattle.

Nevertheless, it is instructive to examine the magnitude of changes that can occur in a state economy over this ten-year period. In the table on the following page we apply our multipliers to the change in value of production between 1997 and 2006. The table shows the total impact for each state and region calculated in the database. (The impact for each of the three separate livestock segments is shown in the Excel database for each state.)

Overall, the increased value of animal agriculture production in the 50 states resulted in almost $20 billion in total economic output when one sums up the state numbers. More than 90% of this growth was in states west of the Mississippi. This produced a $3.1 billion increase in household incomes and over 145,000 jobs. At the national level, where multipliers are higher, the positive impact on economic output was nearly $34 billion by the end of the period. This resulted in $6.3 billion in additional income and 248,000 jobs.

Economic Impact of Change from 1997 to 2006				
States	**Output ($mil.)**	**Earnings ($mil.)**	**Employment (jobs)**	**Tax ($mil.)**
Alabama	334	53	1,696	12
Alaska	-2	0	-14	0
Arizona	635	100	3,609	23
Arkansas	-218	-34	-1,510	-8
California	3,127	527	19,781	120
Colorado	533	88	3,924	21
Connecticut	-60	-9	-355	-2
Delaware	46	6	154	1
Florida	-287	-46	-1,782	-9
Georgia	672	113	2,997	26
Hawaii	-53	-8	-433	-2
Idaho	2,126	338	13,942	77
Ilinois	-599	-99	-4,762	-22
Indiana	174	27	1,746	6
Iowa	3,666	567	28,260	129
Kansas	1,313	197	13,190	45
Kentucky	659	99	4,717	23
Louisiana	-101	-16	-1,133	-4
Maine	-85	-14	-516	-3
Maryland	-260	-39	-1,380	-9
Massachusetts	-58	-9	-602	-2
Michigan	659	104	5,184	24
Minnesota	1,072	173	10,417	39
Mississippi	311	47	1,877	11
Missouri	-458	-69	-3,334	-16
Montana	-304	-47	-3,631	-11
Nebraska	1,797	279	12,958	64
Nevada	22	3	147	1
New Hampshire	-16	-2	-121	-1
New Jersey	-48	-7	-355	-2
New Mexico	741	114	4,517	26
New York	113	18	853	4
North Carolina	-177	-28	-995	-6
North Dakota	683	101	5,702	23
Ohio	371	60	3,174	14
Oklahoma	1,286	205	13,019	47
Oregon	37	6	369	1
Pennsylvania	143	23	1,074	5
Rhode Island	-4	-1	-37	0
South Carolina	-232	-36	-1,558	-8
South Dakota	893	135	5,708	25
Tennessee	152	24	681	6
Texas	995	167	8,433	31
Utah	323	53	2,310	12
Vermont	-45	-7	-359	-1
Virginia	-254	-38	-2,494	-9
Washington	-238	-38	-1,683	-7
West Virginia	13	2	103	0
Wisconsin	424	67	3,516	15
Wyoming	-166	-24	-1,655	-4
Total	**19,655**	**3,123**	**145,353**	**705**
National Total	**33,758**	**6,257**	**248,317**	**1,427**