

U.S. DAIRY

MARKETS & OUTLOOK

The Economic Impact of the Dairy Industry

Some regions of the country today are actively pursuing the growth of their dairy industry. In other areas, dairy is declining without its neighbors appreciating what is being lost. How can the dairy industry's advocates demonstrate the value of the dairy industry to the state or nation?

There are many things that dairy farming brings to a community, but the most measurable is its impact on the economy. It is a common thing for advocates for industrial projects, stadiums, or mega-malls to cite the "multiplier effect" that such a project will have on the regional economy. The same can be done for the dairy industry, and using multipliers from the U.S. Bureau of Economic Analysis, this paper will outline the industry's impacts on the national and state economies.

What is a Multiplier?

As it is usually used, an economic multiplier is a measure of the larger effect that a change in economic activity (like a factory closing or a new farm) has on the regional economy. This effect is generally more than just the direct income or employment of the factory or farm, because one business creates demand for other businesses, and the money people earn from those businesses also drives more demand. This paper discusses multipliers that show the impact that an industry's additional sales to final users have on a region's economic activity, including 1) total economic output, 2) household earnings, and 3) employment.

The following tables contain "final demand multipliers" estimated by the Commerce Department's Bureau of Economic Analysis (BEA), as part of their regional "input-output" model of the U.S. economy. This model builds and uses estimates of the inputs each industry needs from each other industry to produce a million dollars of output, and estimates impacts on household earnings, as well.

BEA's model uses detailed economic data to do regional impact analysis for the nation, the states, and even the individual counties. They can also generate multipliers for metropolitan areas or any other multi-county region, even across state lines. The model also generates detail on the effect that each industry has on each other industry, but here we will present only dairy's total effects on all industries.

Output Multipliers

Output multipliers show how much the economy's output is increased by an additional dollar of sales from an industry. For example, if dairy farms in Missouri sold an additional million dollars of milk, it would boost the state's economy by \$3,109,300, based on BEA's output multiplier of 3.1093.

This includes those new farm sales and organizations work together to drive demand for dairy products on behalf of America's dairy farmers, through the programs of the American Dairy Association®, the National Dairy Council®, and the

sales from other businesses coming from that spur to the state's economy. However, these multipliers include none of the effects on processing, food service, or retail industries that use milk and its products; they account only for impacts on the industries supplying inputs that dairy farms use.

Earnings Multipliers

Impacts on household income are included in the output multiplier, but they are also accounted for separately through an earnings multiplier. This shows how much household earnings are increased by an additional dollar of sales from an industry. Our million dollars in new Missouri dairy farm sales would generate \$618,600 in additional household earnings in state, using the earnings multiplier of 0.6186.

Employment Multipliers

Another number of clear interest is the employment impact of an industry. The employment multipliers are the number of jobs created by increasing annual industry sales by one million dollars. Our million-dollar dairy farm sales increase in Missouri would create 28 new jobs in state, based on an employment multiplier of 27.7751. (See Table 1.)

Why Are the U.S. Multipliers Bigger?

A look at the U.S. multipliers shows that they are larger than the same numbers for the individual states. This is because a state won't capture all the benefits of a new activity in the state; there are interregional spill-over effects. For example, a Florida dairyman may buy more feed from Georgia when he increases production, or a Georgia dairy farmer may buy a tractor assembled in Georgia from parts made in Indiana. As a result, there is a bigger boost to the nation's economy, including the home state, than to the home state alone. That also means that the impact, for example, of Florida dairy farms on Georgia's economy is not captured in either the Georgia numbers or the Florida numbers, although it is included in the U.S. totals. These interregional effects also explain why the states have differing multipliers: each is more or less able to supply an industry's inputs from in state.

Impact of Dairy Farming

Table 1 shows the economic impact of dairy farming on all 50 states, individually and collectively. Farm receipts for milk and cream are used as a measure of final output. These are averaged over 5 years ending with 2002 to minimize distortions from year-to-year price fluctuations.



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Table 1. Annual Economic Impact of Dairy Farming

State	Farm Receipts, Milk & Cream, Avg. 1998-2002	Total Impact on State and U.S. Economy					
		Output		Household Earnings		Employment	
		\$ Million	Multiplier	\$ Million	Multiplier	\$ Million	Multiplier
Alabama	\$52.5	2.2213	\$116.5	0.4745	\$24.9	24.4672	1,283
Alaska	3	2.1180	6.0	0.4098	1.2	21.0091	59
Arizona	400	2.5438	1,016.7	0.5585	223.2	20.8154	8,319
Arkansas	68	2.1035	143.7	0.4337	29.6	22.2232	1,519
California	4,075	2.2673	9,240.0	0.5028	2,049.1	19.2160	78,312
Colorado	256	2.6896	687.7	0.5804	148.4	22.6403	5,789
Connecticut	74	1.7331	127.5	0.3419	25.1	13.3842	985
Delaware	23	2.0391	47.0	0.3447	8.0	17.3749	401
Florida	401	1.8859	756.2	0.4224	169.4	19.9334	7,992
Georgia	214	2.3106	493.5	0.4999	106.8	21.1943	4,526
Hawaii	28	1.6326	46.3	0.3453	9.8	13.5591	384
Idaho	877	2.6681	2,340.3	0.5680	498.2	25.9811	22,789
Illinois	282	3.1291	883.0	0.6567	185.3	27.7026	7,818
Indiana	333	2.8725	956.8	0.5724	190.7	25.7484	8,577
Iowa	509	2.9551	1,505.0	0.6184	314.9	28.9490	14,743
Kansas	206	2.9327	603.8	0.5765	118.7	22.7910	4,692
Kentucky	242	2.5617	619.7	0.5260	127.2	28.3775	6,865
Louisiana	100	2.4293	243.8	0.5112	51.3	24.4668	2,456
Maine	101	1.9819	199.2	0.4346	43.7	20.3709	2,048
Maryland	195	2.6289	512.7	0.5232	102.0	21.9673	4,284
Massachusetts	60	1.8127	108.2	0.3619	21.6	15.4384	922
Michigan	788	2.4391	1,922.0	0.5076	400.0	17.9318	14,131
Minnesota	1,235	2.9125	3,596.0	0.6070	749.4	23.6353	29,182
Mississippi	80	2.2157	176.9	0.4596	36.7	24.2274	1,935
Missouri	296	3.1093	920.9	0.6186	183.2	27.7751	8,226
Montana	44	2.4691	107.7	0.5215	22.8	25.6409	1,119
Nebraska	152	2.8868	439.1	0.6026	91.7	26.5270	4,035
Nevada	59	2.2620	133.5	0.4357	25.7	16.6633	983
New Hampshire	48	2.0137	96.8	0.3988	19.2	18.2282	876
New Jersey	37	2.2146	81.8	0.4263	15.7	19.0670	704
New Mexico	700	2.3375	1,636.9	0.4891	342.5	21.4023	14,987
New York	1,695	2.1532	3,650.7	0.4119	698.4	16.7225	28,353
North Carolina	188	2.2283	418.4	0.4710	88.4	22.2115	4,170
North Dakota	84	2.6980	227.3	0.5463	46.0	27.9631	2,356
Ohio	616	2.9492	1,817.6	0.6030	371.6	27.3230	16,839
Oklahoma	186	2.2673	422.7	0.4692	87.5	22.2168	4,142
Oregon	245	2.5328	620.7	0.5359	131.3	20.3678	4,991
Pennsylvania	1,647	2.5687	4,231.6	0.5304	873.8	23.2303	38,269
Rhode Island	4	1.6687	6.9	0.3114	1.3	17.0553	71
South Carolina	56	2.1331	120.1	0.4522	25.5	21.8241	1,228
South Dakota	211	2.7047	571.9	0.5643	119.3	25.6463	5,423
Tennessee	208	2.5814	537.6	0.5318	110.7	26.6069	5,541
Texas	793	2.8126	2,230.8	0.6185	490.6	27.7369	21,999
Utah	214	2.7816	594.9	0.5891	126.0	24.6917	5,281
Vermont	392	1.9352	757.7	0.3990	156.2	18.2661	7,152
Virginia	291	2.1938	637.4	0.4463	129.7	22.0191	6,398
Washington	773	2.3592	1,824.6	0.5110	395.2	17.6394	13,642
West Virginia	38	1.7692	66.5	0.3402	12.8	20.1215	756
Wisconsin	3,048	2.6127	7,962.7	0.5517	1,681.4	21.8764	66,673
Wyoming	9	2.0892	18.7	0.4285	3.8	21.6485	194
United States	\$22,637	3.9954	\$90,444	0.9132	\$20,672	34.1615	773,319

Sources: USDA/NASS; Bureau of Economic Analysis; National Milk Producers Federation

Table 2. Economic Impact Multipliers: Dairy Processing

State	Creamery Butter			Dry, Condensed, & Evap. Dairy Prod.			Fluid Milk			Ice Cream & Frozen Desserts			Natural, Processed & Imitation Cheese		
	Output	Earn'gs	Jobs	Output	Earn'gs	Jobs	Output	Earn'gs	Jobs	Output	Earn'gs	Jobs	Output	Earn'gs	Jobs
AL	1.0000	0.0000	0.00	1.0000	0.0000	0.00	1.7481	0.2919	10.79	1.9810	0.3717	13.93	1.6269	0.2406	10.67
AK	1.0000	0.0000	0.00	1.0000	0.0000	0.00	2.3697	0.3807	16.20	1.6481	0.2681	11.79	1.0000	0.0000	0.00
AZ	1.0000	0.0000	0.00	2.1888	0.3520	11.40	2.8449	0.5425	18.14	2.1983	0.4259	16.37	1.0000	0.0000	0.00
AR	1.0000	0.0000	0.00	1.5386	0.1939	7.59	1.6311	0.2548	9.97	1.8386	0.3267	12.24	1.5794	0.2158	8.07
CA	2.9158	0.5009	18.53	2.2297	0.3643	11.47	2.7913	0.5356	16.77	2.3509	0.4657	12.83	2.7713	0.4929	15.96
CO	1.0000	0.0000	0.00	1.0000	0.0000	0.00	2.1605	0.3917	12.95	2.0632	0.4025	12.53	2.3445	0.3879	11.88
CT	1.0000	0.0000	0.00	1.0000	0.0000	0.00	2.3673	0.3993	12.20	1.9442	0.3484	9.50	2.1634	0.3329	10.81
DE	1.0000	0.0000	0.00	1.0000	0.0000	0.00	1.6555	0.2307	8.62	1.0000	0.0000	0.00	1.5327	0.1851	7.43
FL	1.9848	0.3145	14.11	1.7528	0.2652	10.05	2.1406	0.3929	14.77	1.8765	0.3643	13.14	1.9563	0.3269	12.60
GA	1.0000	0.0000	0.00	1.7906	0.2691	8.37	2.0867	0.3754	12.39	2.0852	0.4108	12.38	1.9482	0.3189	10.67
HI	1.0000	0.0000	0.00	1.0000	0.0000	0.00	1.8396	0.3090	10.04	1.7728	0.3218	13.02	1.0000	0.0000	0.00
ID	1.0000	0.0000	0.00	2.2366	0.3442	14.19	2.8925	0.5308	22.06	2.3016	0.4264	18.69	3.0483	0.5181	21.76
IL	2.6349	0.4254	11.70	2.0635	0.3150	8.92	2.2481	0.4024	12.24	2.4319	0.4696	12.98	2.4705	0.4033	11.81
IN	1.0000	0.0000	0.00	1.9436	0.2748	9.61	2.2959	0.3889	14.46	2.1724	0.3948	13.56	2.2214	0.3421	13.16
IA	1.0000	0.0000	0.00	1.9269	0.2710	10.22	2.1463	0.3652	13.89	2.2080	0.4004	13.77	2.3540	0.3628	14.40
KS	1.0000	0.0000	0.00	1.0000	0.0000	0.00	1.7694	0.2783	9.91	1.8665	0.3285	11.10	1.6642	0.2329	9.85
KY	3.0410	0.4733	19.39	2.2526	0.3328	14.37	2.9333	0.5159	22.78	2.4612	0.4405	17.00	2.6952	0.4377	19.87
LA	1.0000	0.0000	0.00	1.8729	0.2739	10.85	2.2902	0.4042	16.32	1.0000	0.0000	0.00	1.0000	0.0000	0.00
ME	2.5939	0.4207	19.35	1.0000	0.0000	0.00	2.5056	0.4613	18.63	2.0550	0.3910	15.47	2.2273	0.3756	15.59
MD	1.0000	0.0000	0.00	2.2151	0.3333	11.46	2.9269	0.5168	19.04	2.2833	0.4187	13.72	2.6109	0.4286	15.91
MA	1.0000	0.0000	0.00	1.9966	0.2936	8.71	2.5045	0.4367	14.08	2.1579	0.3984	10.65	2.2518	0.3612	13.25
MI	2.9910	0.4912	17.36	2.2270	0.3447	10.54	2.8675	0.5268	16.83	2.4299	0.4632	14.96	2.6268	0.4444	14.68
MN	3.2075	0.5402	18.01	2.5285	0.4081	13.07	3.1835	0.5938	20.13	2.6348	0.5075	15.98	3.3628	0.5866	20.57
MS	1.0000	0.0000	0.00	1.6532	0.2205	8.51	1.8499	0.3037	12.40	1.0000	0.0000	0.00	1.0000	0.0000	0.00
MO	2.3487	0.3456	11.86	2.1376	0.3040	10.32	2.5608	0.4334	16.11	2.2939	0.4043	14.36	2.7707	0.4300	16.06
MT	1.0000	0.0000	0.00	1.5161	0.1974	8.15	1.6854	0.2737	10.96	1.7163	0.3071	11.08	1.0000	0.0000	0.00
NE	2.2473	0.3141	11.03	1.6414	0.2088	7.81	1.7004	0.2649	9.31	1.0000	0.0000	0.00	1.9245	0.2677	10.06
NV	1.0000	0.0000	0.00	1.9131	0.2712	8.70	2.5588	0.4342	14.77	1.8767	0.3326	10.92	1.0000	0.0000	0.00
NH	1.0000	0.0000	0.00	1.0000	0.0000	0.00	2.5490	0.4348	16.17	2.0845	0.3715	13.02	2.2698	0.3564	15.09
NJ	2.4215	0.3579	10.17	2.1006	0.2993	9.39	2.6389	0.4426	14.84	2.2922	0.4052	12.02	2.5152	0.3893	13.37
NM	1.0000	0.0000	0.00	2.0086	0.2937	11.72	2.6403	0.4652	18.55	1.9927	0.3544	15.52	2.7744	0.4489	18.15
NY	1.0000	0.0000	0.00	2.0277	0.2790	8.33	2.5915	0.4265	13.98	2.0993	0.3576	10.71	2.7616	0.4182	13.14
NC	1.0000	0.0000	0.00	1.0000	0.0000	0.00	1.7404	0.2929	10.64	1.9157	0.3659	12.50	1.6367	0.2450	9.39
ND	2.2550	0.3010	14.61	1.6259	0.1977	8.19	1.8647	0.2829	11.94	1.7934	0.2874	12.92	1.9122	0.2602	12.34
OH	3.3252	0.5523	19.55	2.5511	0.4054	14.27	3.2558	0.5981	22.85	2.7222	0.5180	17.98	3.0391	0.5207	20.32
OK	1.0000	0.0000	0.00	1.7263	0.2443	9.80	1.9647	0.3354	13.57	1.9435	0.3627	13.58	1.8064	0.2775	12.68
OR	2.6645	0.4095	13.33	1.9597	0.2828	9.57	2.3928	0.4163	14.11	2.1525	0.3881	12.81	2.4131	0.3845	13.80
PA	3.1366	0.5135	17.27	2.3482	0.3683	12.84	3.0184	0.5507	20.21	2.5309	0.4797	15.70	2.8930	0.4892	18.03
RI	1.0000	0.0000	0.00	1.0000	0.0000	0.00	2.2962	0.3708	14.96	1.9777	0.3435	11.62	2.0870	0.3057	11.70
SC	1.0000	0.0000	0.00	1.7445	0.2444	8.82	1.9471	0.3302	12.80	2.0454	0.3791	15.46	1.7902	0.2708	11.97
SD	1.0000	0.0000	0.00	1.8449	0.2527	9.91	2.1528	0.3634	14.20	2.0578	0.3665	13.34	2.3512	0.3590	15.02
TN	3.1678	0.5199	19.43	2.3752	0.3694	13.63	3.0389	0.5536	22.64	2.6313	0.4961	17.94	2.7670	0.4683	19.95
TX	2.3694	0.3931	14.98	1.9895	0.3146	10.85	2.4494	0.4592	16.03	2.2278	0.4423	14.55	2.1968	0.3776	14.01
UT	3.2124	0.5434	21.44	2.3537	0.3785	14.76	3.0557	0.5728	22.45	2.4751	0.4776	18.75	3.2213	0.5640	22.15
VT	1.0000	0.0000	0.00	2.0390	0.2935	11.08	2.4954	0.4336	17.61	2.1552	0.3833	12.59	2.6807	0.4252	17.70
VA	1.0000	0.0000	0.00	2.1790	0.3235	11.62	2.7201	0.4779	18.96	2.3218	0.4240	13.40	1.0000	0.0000	0.00
WA	2.4232	0.3910	11.36	2.0986	0.3263	10.01	2.7177	0.5051	16.03	2.1392	0.4072	12.35	2.4649	0.4231	14.15
WV	1.7959	0.2311	12.23	1.0000	0.0000	0.00	2.0943	0.3250	14.89	1.7017	0.2760	11.24	1.0000	0.0000	0.00
WI	3.1202	0.5146	18.04	2.3503	0.3691	13.14	2.9573	0.5460	19.68	2.4952	0.4744	15.47	3.1332	0.5362	19.59
WY	1.0000	0.0000	0.00	1.0000	0.0000	0.00	1.3878	0.2039	8.11	1.4346	0.2415	8.41	1.4634	0.1838	8.92
US	4.1191	0.7871	25.48	3.1890	0.5921	18.86	4.1256	0.8591	28.61	3.4595	0.7332	22.48	4.2729	0.8430	28.10

Source: Bureau of Economic Analysis

Note: States with 1.000 and 0.000 impacts do not have the industry in question.

BEA’s multipliers were applied to these numbers to estimate the economic output, household earnings, and employment generated by dairy farming in the state. The state totals sum to less than the U.S. totals, because of the interregional spillovers discussed above. For the U.S., average dairy farming receipts of \$22.6 billion were responsible for overall economic output of \$90.4 billion, household earnings of \$20.6 billion, and 773,319 jobs.

Impact of Dairy Processing

Table 2 contains economic multipliers of several dairy processing industries. These individual processing industries can be added to present an aggregate impact with limited double-counting (mostly the use of milk powders in processing other dairy products), although the direct use of about 5% of milk in other food processing is missed. An estimate of these dairy processing impacts for 2002 is presented in Table 3, based on production and estimated processor prices. Similar calculations can be made for the impact of each dairy processing industry on your state’s economy with the state multipliers in Table 2.

Final Remarks

The economic impacts of dairy processing include the dairy farm impacts for the milk they buy, because the

farm and the processor are two stops in the same supply chain. The 5% of milk used directly by food processors is probably greater than the milk use that is double-counted when adding the five dairy processing industries together; so we can reasonably estimate the overall economic impact of the U.S. dairy industry – farming through processing – to be \$140 billion in economic output, \$29 billion in household earnings, and well over 900,000 jobs. The impacts of dairy farming account for about two-thirds of dairy’s overall output effect and over four-fifths of the employment impact.

These numbers don’t count additional food processing, food service, wholesale, or retail value-added. Increased consumer demand for milk and its products boosts all these sectors as well, so that its multiplied impact can be even greater. Dairy farming and processing clearly have great impact beyond the farm and plant gates. Their contribution, especially in rural communities, can be essential to a healthy local economy. BEA’s multipliers are the best available. We hope by making them more readily accessible, that we can help the dairy industry better demonstrate its greater economic value to the public, the business community, and their representatives.

Thanks to Zöe Ambargis and Bruce Matson for their help.

Table 3. Economic Impacts of Dairy Processing, 2002

State	Production (mil. lbs.)	Wholesale Price (per lb.)	Value of Production (millions)	Multipliers			Impacts		
				Output	Earn'gs	Jobs	Output (millions)	Earnings	Jobs
Butter	1,355.1	\$1.0931	\$1,481.3	4.1191	0.7871	25.48	\$6,101.5	\$1,165.9	37,745
Dry, Condensed, & Evap.*	1,512.2	\$0.9043	\$1,367.5	3.1890	0.5921	18.86	\$4,360.9	\$809.7	25,794
Fluid Milk	54,216.0	\$0.2461	\$13,339.9	4.1256	0.8591	28.61	\$55,035.1	\$11,460.3	381,671
Ice Cream/Frozen Desserts	7,689.7	\$1.0980	\$8,443.6	3.4595	0.7332	22.48	\$29,210.7	\$6,190.9	189,809
Cheese	8,599.0	\$1.1855	\$10,194.1	4.2729	0.8430	28.10	\$43,558.4	\$8,593.6	286,490
TOTAL			\$34,826.4				\$138,266.6	\$28,220.4	921,510

Sources: Bureau of Economic Analysis; USDA/NASS; USDA/AMS, National Milk Producers Federation

* Includes the value of some dry milk products used in other dairy industries; excludes bulk condensed and evaporated milk.

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Dairy Management Inc.
 O'Hare International Center
 10255 West Higgins Road, Suite 900
 Rosemont, IL 60018-5616