Economic Impact of a Tennessee Milk Plant: A Hybrid Model IMPLAN-Based Analysis

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Presentation Outline

- Reasons for the Study
- Hybrid Input-Output Model
- Prior Studies
- Tennessee Model
- Results
- Summary and Conclusions

Why Recent Interest in Local-Regional Processing?

- Economic development types: growth potential of agribusiness processing
- Agribusiness leadership: processing regional production creates markets for farmers, grow farm income and agribusiness processing
- Processors:
  - carbon footprint and shipping costs
  - Local foods market angle

Tennessee Milk Plant Interest

- Milk-based value added processors in Tennessee (ice cream, yogurt) maybe interested in local sourcing
- A possible dried and condescended milk plant could source such operations
- Hence economic impact analysis of such an operation on state economy

Hybrid Input-Output Model

- IMPLAN ready-made model (impose local data totals on national relationships)
- Hybrid model is adjusted ready-made model based on superior data and knowledge
- Model adjustments based on financial records, published data, industry experts
- Fundamental Economic Structure: more natural resource oriented sectors (e.g., agriculture including processing) more likely to need adjustments

Prior Studies: Mostly Milk Sector Contribution Studies

- New Mexico 2005, $1.98 billion output, 14,313 full-time equivalent jobs
- Washington State 2011,18,066 jobs, $0.661 billion labor income, $5.201 billion output
- Virginia 2014, 13,819 jobs, $3.225 billion output and $452.4 million labor income
- Casey 2013, $241.963 million in output due to a new milk condensing plant in Nevada

Tennessee Hybrid Model

- IMPLAN-based I-O for 2013
- Tennessee-based detailed input costs and net returns from USDA-ERS used to adjust dairy coefficients
- Margining of some values not others
- Capital recovery costs of machinery and equipment were adjusted downward (i.e., returns to other property income were reduce)

Dry, condensed, and evaporated dairy product manufacturing

- Data from Economic Census (2015) Dry, Condensed, and Evaporated Dairy Product Manufacturing
- Nevada Study
- Most importantly unpublished industry sources
- Used to adjust coefficients and estimate plant size (especially with regard to fluid milk consumption)

Model Scenarios

- 4 impact scenarios based on level of local milk used
- 1. No increase in TN milk production (plant uses TN milk, but out-of-state milk completely replaces milk diverted to the plant)
- 2. Increase same as RPC (19.154% of supply new TN milk production)
- 3. 50% milk to plant is new TN production
- 4. All milk to the plant is new TN production

Results Under 4 Scenarios

1. No increase in TN milk

Sector	Employment	Labor Income	Gross State Product	Output
		(2013 $)	(2013 $)	(2013 $)
Total	724	50,693,036	89,707,703	288,164,098
Agriculture	4	30,478	98,634	256,563
Mining	1	18,150	30,312	93,580
Construction	8	521,070	455,642	1,386,489
Manufacturing	173	22,257,656	43,706,737	208,519,494
TIPU	80	4,628,611	6,612,374	14,835,760
Trade	143	7,825,430	14,717,108	22,970,967
Service	300	14,219,177	22,315,201	35,565,038
Government	14	1,192,465	1,771,694	4,536,207
Percentage of Total Change				
Agriculture	0.6%	0.1%	0.1%	0.1%
Mining	0.1%	0.0%	0.0%	0.0%
Construction	1.2%	1.0%	0.5%	0.5%
Manufacturing	23.9%	43.9%	48.7%	72.4%
TIPU	11.1%	9.1%	7.4%	5.1%
Trade	19.8%	15.4%	16.4%	8.0%
Service	41.4%	28.0%	24.9%	12.3%

2. RPC increase in TN milk

Sector	Employment	Labor Income	Gross State Product	Output
		(2013 $)	(2013 $)	(2013 $)
Total	1,017	56,564,345	100,353,840	319,641,618
Agriculture	223	2,231,141	4,939,924	19,095,113
Mining	1	20,564	35,078	106,172
Construction	9	561,253	490,556	1,494,306
Manufacturing	174	22,357,390	44,007,242	211,488,312
TIPU	92	5,285,012	7,510,027	16,887,856
Trade	157	8,568,152	16,105,016	25,138,201
Service	345	16,208,615	25,277,884	40,337,644
Government	16	1,332,219	1,988,113	5,094,013
Agriculture	22.0%	3.9%	4.9%	6.0%
Mining	0.1%	0.0%	0.0%	0.0%
Construction	0.9%	1.0%	0.5%	0.5%
Manufacturing	17.1%	39.5%	43.9%	66.2%
TIPU	9.0%	9.3%	7.5%	5.3%
Trade	15.4%	15.1%	16.0%	7.9%
Service	33.9%	28.7%	25.2%	12.6%
Government	1.6%	2.4%	2.0%	1.6%

3. 50% of Plant Supply increase in TN milk

Sector	Employment	Labor Income	Gross State Product	Output
		(2013 $)	(2013 $)	(2013 $)
Total	1,488	66,014,883	117,490,003	370,308,255
Agriculture	577	5,773,357	12,732,529	49,417,893
Mining	1	24,449	42,750	126,440
Construction	10	625,933	546,755	1,667,851
Manufacturing	176	22,517,924	44,490,938	216,266,961
TIPU	110	6,341,563	8,954,901	20,190,938
Trade	179	9,763,649	18,339,011	28,626,610
Service	418	19,410,840	30,046,658	48,019,696
Government	18	1,557,169	2,336,463	5,991,866
Agriculture	38.7%	8.7%	10.8%	13.3%
Mining	0.0%	0.0%	0.0%	0.0%
Construction	0.7%	0.9%	0.5%	0.5%
Manufacturing	11.8%	34.1%	37.9%	58.4%
TIPU	7.4%	9.6%	7.6%	5.5%
Trade	12.0%	14.8%	15.6%	7.7%
Service	28.1%	29.4%	25.6%	13.0%
Government	1.2%	2.4%	2.0%	1.6%

4. 100% Of Plant Supply increase in TN milk

Sector	Employment	Labor Income	Gross State Product	Output
		(2013 $)	(2013 $)	(2013 $)
Total	2,253	81,336,714	145,272,274	452,452,327
Agriculture	1,149	11,516,231	25,366,410	98,579,171
Mining	1	30,747	55,187	159,301
Construction	12	730,795	637,867	1,949,214
Manufacturing	179	22,778,192	45,275,138	224,014,418
TIPU	139	8,054,512	11,297,425	25,546,111
Trade	215	11,701,866	21,960,911	34,282,247
Service	536	24,602,499	37,778,106	60,474,340
Government	23	1,921,872	2,901,231	7,447,524
Agriculture	51.0%	14.2%	17.5%	21.8%
Mining	0.0%	0.0%	0.0%	0.0%
Construction	0.5%	0.9%	0.4%	0.4%
Manufacturing	7.9%	28.0%	31.2%	49.5%
TIPU	6.2%	9.9%	7.8%	5.6%
Trade	9.5%	14.4%	15.1%	7.6%
Service	23.8%	30.2%	26.0%	13.4%
Government	1.0%	2.4%	2.0%	1.6%

Summary and Conclusions

- Assumptions regarding how much milk production would increase in the state are key in driving model results:
  - Jobs: 724 to 2,253
  - Labor income: $50.7 to $81.3 million
  - GSP: $89.7 to $145.3 million
  - Output: $288.1 to $425.4 million
- Economic impacts are sufficiently large to warrant investigation by appropriate leaders regarding feasibility.