Economic Importance of the Iowa Egg Industry

Authors:
Dan Otto
Maro Ibarburu
Lee Schulz

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Department of Economics
Iowa State University
Ames, Iowa 50011

IOWA STATE UNIVERSITY
Extension and Outreach

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EXECUTIVE SUMMARY

Iowa leads the nation in egg production, producing more than the second and third largest states combined. The United States Department of Agriculture estimates that approximately 52.9 million layers in Iowa produced 14.5 billion eggs in 2011. This level of production consumes 49.2 million bushels of corn and 452,200 tons of soybean meal to feed the layers and 4.2 million bushels of corn and 38,500 tons of soybean meal to feed the growing pullets. In addition, the egg industry is an important value-added activity in Iowa, directly employing an estimated 3,700 hatchery, production, and processing workers in 2011 and generating over $156 million in direct payroll. The multiplier impacts on the Iowa economy are even more impressive, with total labor income of $424 million, nearly 7,960 total jobs, and an economic boost of $657 million.

A number of factors account for the phenomenal growth of the egg industry in Iowa in recent years. First, per capita egg consumption increased from 234 in 1991 to 258 by 2006. Consumption began to decrease in 2007 and has steadied at 247 eggs per person per year for the last four years. Growing population and per capita egg consumption have supported a 1.4 percent annual expansion rate in egg production over the last 21 years. During this same period, Iowa egg production has increased sixfold. Second, Iowa has a competitive advantage due to low feed costs. Feed costs represent approximately 67 percent of costs to produce a dozen eggs and most competing states face higher feed costs than Iowa. Third, Iowa has capitalized on the rapidly growing market for breaker or "processed" eggs, which incur lower transportation costs to major population centers on the East and West Coasts.

If demand allows the egg industry to expand profitably, Iowa is in a favorable position to benefit. The advantages Iowa producers enjoy over their counterparts in other regions are relatively stable. While several factors have driven up corn prices in Iowa, competing regions face the same higher corn prices plus higher shipping costs to import corn from the Midwest. Threats to Iowa's production cost advantage would likely be through technological advances that improve feed efficiency or by industry shifts that reduce pullet costs. Any advantages created by these changes would likely be short-lived as Iowa producers would be able to adopt these changes as well.

CHAPTER 1

Egg Industry Situation and Outlook

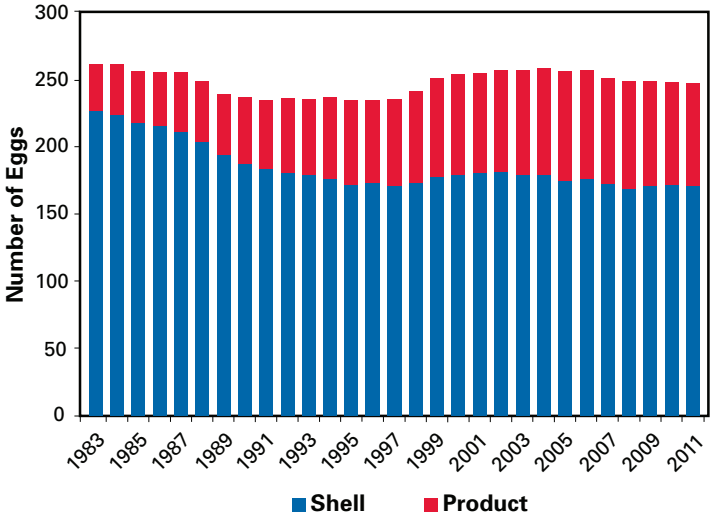
The egg industry is an important value-added activity in the state of Iowa. According to the United States Department of Agriculture (USDA), approximately 52.9 million layers in Iowa consumed an estimated 49.2 million bushels of corn and 452,200 tons of soybean meal during 2011. Iowa was the largest egg producing state prior to 1958, when farm flocks dominated the industry, and the state became number one again in 2001. Iowa also had the fastest growing egg production industry, increasing 150 percent between 1997 and 2006. More recently, the growth rate in Iowa has stabilized to a level similar to other states, which may in part be due to the uncertainty regarding current egg layer housing system discussions. In 2011, Iowa produced more eggs than the second (Ohio) and third (Pennsylvania) largest states combined and more than the 30 smallest producing states combined.

In recent years, the increase in processed egg production, improved transportation, and modernized facilities has encouraged investment in Iowa egg production to capture its significant feed cost advantage. This chapter will examine recent national trends in egg supply and demand and look at Iowa's recent growth in production.

Per capita annual U.S. egg consumption peaked in 1945 at 403, reached its lowest level in 1991 at 234, and steadily increased to 258 in 2006. In 2007, consumption began to decrease and steadied at 246 to 248 eggs per person per year from 2009 to 2011 (figure 1.1). Increasing population and rising per capita consumption have enabled the industry to expand production 32 percent from 1991 to 2011.

FIGURE 1.1

U.S. per capita egg consumption by processing type.



The growth in egg consumption over the past three decades occurred primarily in egg products rather than shell eggs (figure 1.1). In 1983, approximately 13 percent of egg production was consumed as egg products. By 2000, this figure had grown to 29 percent, from where it increased at a lower rate to stabilize at about 31 percent. On a per capita basis, annual shell egg consumption declined 25 percent from 1983 to 2011, while product egg consumption increased 118 percent. Production for shell egg consumption has increased 4.8 percent or about 0.2 percent per year between 1983 and 2011. Product egg production has increased 191 percent during the same period. Because Iowa's primary competitive disadvantage is distance to major population centers, this trend benefits Iowa because processing reduces transportation costs relative to shipping whole eggs for retail sales. Food manufacturers that use egg products are less likely to locate in highly populated areas, further reducing shipping distances. Yet Iowa egg producers can still sell into the higher value shell egg market, if economics favor it.

Industry Size and Location

The top 10 egg producing states account for 70 percent of the total U.S. production (figure 1.2). California, the leading producer in 1988, was passed by Ohio in 1997, which held the top spot until Iowa became number one in 2001. Indiana and Pennsylvania round out the top five producing states, which account for 52 percent of U.S. egg production. Of the top five states, California has reduced egg production and market share over the last 23 years (figure 1.3). Ohio has reduced egg production and market share over the last 15 years. Indiana and Pennsylvania have had relatively stable production and market share. Texas, Michigan, Minnesota, Florida, and Nebraska round out the top 10.

The Iowa egg industry has experienced rapid expansion over the past decade. Figure 1.4 shows the 24-year trends in Iowa egg production and the share of U.S. production. Since 1990, Iowa's layer inventory increased over 9 percent per year and egg production increased 9.7 percent per year. This expansion caused Iowa's production share to increase from slightly more than 3 percent in 1990 to more than 15.7 percent by 2011.

FIGURE 1.2

Production of top 5 and top 10 egg producing states, 2011.

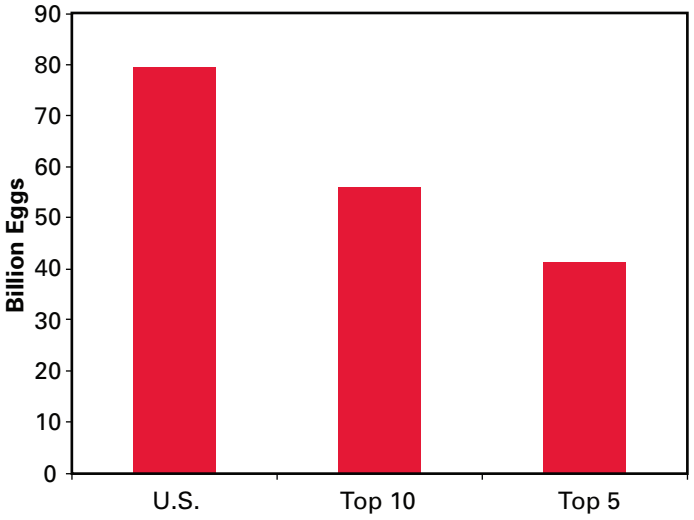


FIGURE 1.3

Market share of the top 5 egg producing states, 1988–2011.

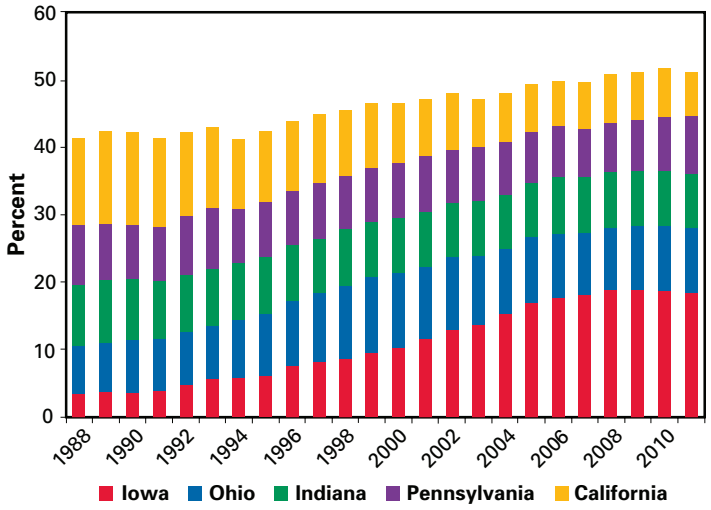
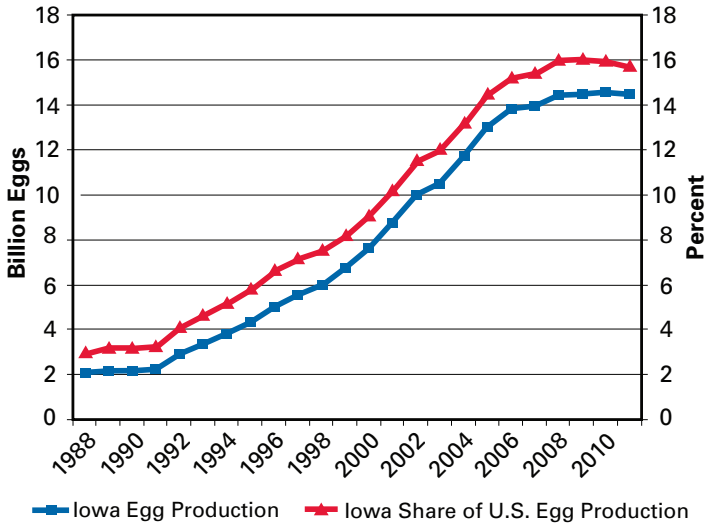


FIGURE 1.4

Iowa egg production and share of U.S. production.



Prices and Profits

Iowa egg prices are consistently below the national average, recently fluctuating between 37 cents and 91 cents per dozen and displaying an upward trend (table 1.1). The spread between the Iowa price and the national average price ranged from 1 cent to 3 cents per dozen and has averaged 2.1 cents per dozen since 2000. The industry was relatively unprofitable in 2005 and 2006, but prices have been stronger since and at profitable levels in spite of higher feed costs.

TABLE 1.1

Iowa and the United States: Layers and egg production.

	Iowa				United States			
	Average No. Layers 1,000[a]	Annual Eggs per Layer[a]	Total Egg Production Million[a]	Price, Cents/Doz.[b]	Average No. Layers 1,000[a]	Annual Eggs per Layer[a]	Total Egg Production Million[a]	Price, Cents/Doz[b]
1988	8,073	255	2,059	38.8	278,587	251	69,878	44.2
1989	8,505	252	2,140	53.0	270,415	250	67,503	61.3
1990	8,261	260	2,151	56.1	270,946	251	68,134	62.8
1991	9,047	248	2,247	53.5	275,451	252	69,465	58.6
1992	11,091	262	2,902	39.4	278,824	254	70,749	45.6
1993	13,221	252	3,328	45.9	284,770	253	71,936	51.6
1994	14,686	259	3,808	42.1	291,035	254	73,903	49.2
1995	16,717	258	4,318	44.3	294,350	254	74,764	50.6
1996	19,066	264	5,023	59.9	298,270	256	76,377	64.2
1997	21,187	261	5,527	54.8	303,604	255	77,532	58.7
1998	23,044	259	5,969	48.3	312,035	255	79,690	52.5
1999	25,623	264	6,754	40.8	322,354	257	82,715	45.2
2000	28,423	270	7,665	43.5	327,908	257	84,412	44.7
2001	32,924	266	8,762	41.7	335,521	256	85,851	43.2
2002	37,276	268	9,997	41.3	337,498	257	86,779	42.9
2003	39,362	267	10,512	61.0	337,218	259	87,299	62.8
2004	44,156	266	11,734	55.4	342,765	261	89,295	57.3
2005	48,957	266	13,041	36.8	343,767	262	90,028	39.0
2006	51,708	268	13,846	39.7	346,166	263	90,895	42.0
2007	52,565	265	13,925	78.8	344,082	263	90,568	81.4
2008	53,488	270	14,421	91.1	339,106	266	90,121	94.1
2009	53,864	269	14,497	65.5	337,401	268	90,434	68.2
2010	54,161	269	14,590	68.2	340,140	269	91,472	70.4
2011	52,938	273	14,468	76.4	338,171	272	91,897	79.0

Source: [a] United States Department of Agriculture National Agricultural Statistics Service. [b] Iowa Egg Industry Center.

CHAPTER 2

Competitiveness of the Iowa Egg Industry

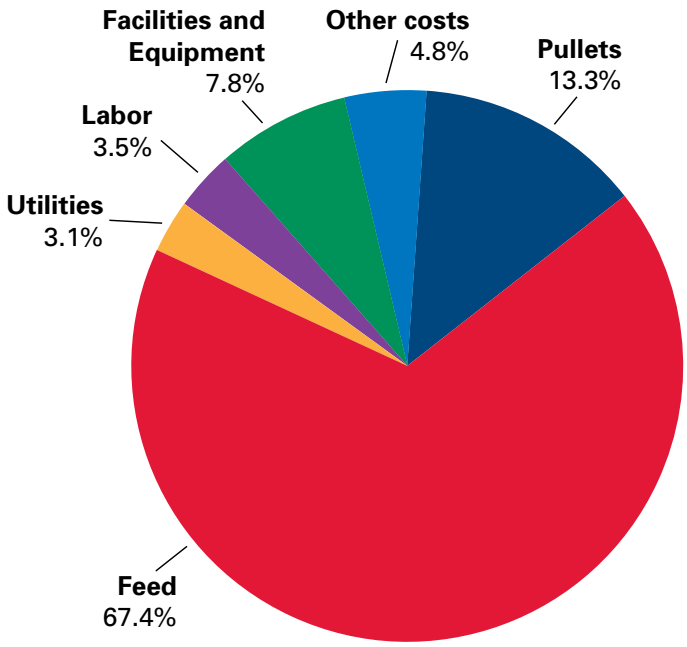
The Iowa egg industry has expanded considerably in recent years, increasing in eggs produced and share of U.S. production. This expansion is fueled by the increased demand of a growing population and rising egg product consumption. The continued sustainability and growth of Iowa's egg sector will depend upon the state's competitiveness compared to other regions, especially those closer to major market centers. Higher energy prices and higher corn prices are changing the cost of producing animal proteins, including eggs. However, Iowa still maintains a competitive position.

The primary advantage Iowa producers enjoy over other egg producing regions is access to lower cost feed. Figure 2.1 represents the percentage breakdown of egg production costs in Iowa. Feed is the largest component, representing approximately 67 percent of production costs. Consequently, feed prices can have a dramatic impact. Iowa has a feed price advantage due to its extensive feed-grain production and will likely maintain that advantage for the foreseeable future.

Higher oil prices have resulted in additional cost of feed transportation from the Midwest to corn-deficient regions. While feed prices have increased everywhere, they have increased more in corn-importing regions.

FIGURE 2.1

Distribution of Iowa egg production costs.



Cost of Egg Production in Iowa

Determining accurate and objective production costs is difficult because costs vary with operational efficiencies, production systems, age and condition of facilities, and input prices. This is compounded by a natural reluctance by producers to provide access to accurate data.

This analysis attempts to address the regional cost of production by modeling estimated costs for Iowa and for competing states. First, costs for a typical Iowa egg production system are estimated based on producer reported input prices, *Feedstuffs* reported corn and soybean meal prices, and interviews with industry

experts to approximate production efficiency. Second, this same production budget with minor adjustments is applied to two other states, using their reported input prices. This approach examines the difference in cost of production due to input prices. Finally, a sensitivity analysis for each state is used to determine the impact on cost of production to changes in key variables. The sensitivity analysis serves two functions: (1) it illustrates the magnitude of error in the cost of production if one of the underlying assumptions is wrong, and (2) it allows cost advantages to be compared across regions. For example, Iowa has lower feed costs than California, which has lower heating costs. This raises the question, how much cheaper do California heating prices have to be to offset the Iowa corn price advantage?

Cost of production for Iowa is based on an economic model developed for this analysis with input from egg industry experts including producers, lenders, nutritionists, and building contractors. The diet is corn (67 percent), soybean meal (22 percent), and limestone (8 percent), and the remainder is vegetable oil, vitamins and minerals, and amino acids. Input prices for corn and soybean meal used in this analysis are based on weekly prices reported by *Feedstuffs*. Limestone is assumed to cost $40/ton and the other feed ingredients cost $1,000/ton. The transportation and milling cost is assumed to be $13/ton.

In addition to feed cost, other expenses are listed in table 2.1. Pullets were valued at $3.32 per bird and were productive over an 80-week laying/molting/laying cycle (producing 35 dozen eggs per hen housed). Spent hens were disposed of at no value. The land, buildings, and equipment were valued at $2,563,000 for a facility with a capacity of 110,000 hens. Power consumption and labor requirements were constant among all states considered in the study at 450,000 kw-hrs and 4,500 man-hours per year, respectively, for a 110,000 hen-laying barn. Other utilities included were 900 gallons of diesel, 150 gallons of gasoline, 800 gallons of natural gas, and 3,300 gallons of propane in colder regions where occasional heating may be required.

Power and utility costs were calculated from statewide average commercial electricity rates reported by the U.S. Department of Energy (DOE). Wage rates for each state were statewide average wages paid by livestock operations (Agricultural Prices, USDA NASS). Given these assumptions, the economic model estimates the cost of producing eggs in Iowa to be 71.33¢/dozen FOB the facility (table 2.1).

TABLE 2.1

Iowa egg cost of production budget.

Input	¢/Dozen
Pullet	9.49
Feed	48.07
Utilities	2.23
Labor	2.51
Facilities and equipment	5.58
Other costs	3.45
Total Costs	**71.33**

Table 2.2 presents total production cost estimates at various combinations of corn and soybean meal prices and the impact of changes in key price and production variables. The bolded blue values are the initial values represented in table 2.1. Note that a 67¢/bushel increase in corn price increases the cost of producing eggs approximately 3.02¢/dozen. A $33/ton increase in soybean meal price increases the cost of producing eggs approximately 1.39¢/dozen. The largest non-feed expense factor is the price of pullets. A 10 percent increase in this expense increases the cost of producing eggs 0.95¢/dozen. Production efficiency is paramount, when a 10 percent decrease in eggs per layer results in nearly a 7.93¢/dozen higher cost of production.

TABLE 2.2

Iowa cost of egg production (¢/doz) at different corn and soybean meal prices and due to a 10 and 20 percent change in selected variables.

SBM/ Corn	$5.32	$5.99	$6.65	$7.32	$7.98
$267	62.51	65.53	68.55	71.56	74.58
$301	63.90	66.92	69.94	72.96	75.98
$334	65.29	68.31	**71.33**	74.35	77.37
$367	66.69	69.71	72.73	75.74	78.76
$401	68.08	71.10	74.12	77.14	80.16

	Labor	Utilities	Pullet	Facilities	Eggs/Hen
Initial value	2.51	2.23	9.49	5.59	273
-10%	71.08	71.11	70.38	70.77	79.26
Base	**71.33**	**71.33**	**71.33**	**71.33**	**71.33**
+10%	71.58	71.56	72.28	71.89	64.85

Iowa's Competitive Position

The Iowa model discussed is used as the starting point to estimate production costs in California and Pennsylvania. These two states are among the top five U.S. producers. While they are located away from the feed-producing region of the Midwest, they are located closer to the population on the coasts. The same production system was used in all three states because they use similar facilities for commercial egg production. The analysis accounts for different prices for production inputs but does not adjust for possible differences in land for the production site, construction materials, or labor. The sensitivity analysis does address differences in cost of production due to annualized facility and equipment costs.

Table 2.3 compares the relative price of inputs and total for egg production in Iowa, California, and Pennsylvania. The corn and soybean meal price are based on *Feedstuffs* reported prices. The labor cost differences are based on reported prices from USDA. The utilities index uses DOE prices for electricity and propane and industry experts to determine the quantities used in each state for a similar facility. Values greater than one suggest the cost of the input is more than in Iowa, and values less than one suggest the cost is lower than Iowa's. Iowa has the lowest feed, utility, and total cost of the states considered in the study.

TABLE 2.3

Input prices, indexes, and cost of production for Iowa, California, and Pennsylvania.

	Corn ($/bu)	SBM ($/ton)	Labor ($/hr)	Utilities Index	Total cost (¢/dozen)
Iowa	6.65	334	14.00	1.00	71.33
California	8.25	375	14.59	1.21	80.97
Pennsylvania	7.60	365	11.46	1.33	77.19

Tables 2.4 and 2.5 describe the cost of production and the impact on that cost due to changes in prices of feed and other selected variables for California and Pennsylvania, respectively. As with table 2.2, the bolded blue values are the initial values.

TABLE 2.4

California cost of egg production (¢/doz) at different corn and soybean meal prices and due to a 10 percent change in selected variables.

SBM/ Corn	$6.60	$7.42	$8.25	$9.07	$9.90
$300	70.35	74.09	77.84	81.58	85.32
$338	71.92	75.66	79.40	83.14	86.89
$375	73.48	77.22	**80.97**	84.71	88.45
$413	75.05	78.79	82.53	86.28	90.02
$450	76.61	80.36	84.10	87.84	91.58

	Labor	Utilities	Pullet	Facilities	Eggs/Hen
Initial value	2.62	2.71	10.38	5.59	273
-10%	80.70	80.70	79.93	80.41	89.96
Base	**80.97**	**80.97**	**80.97**	**80.97**	**80.97**
+10%	81.23	81.24	82.00	81.53	73.61

TABLE 2.5

Pennsylvania cost of egg production (¢/doz) at different corn and soybean meal prices and due to a 10 percent change in selected variables.

SBM/ Corn	$6.08	$6.84	$7.60	$8.36	$9.12
$292	67.25	70.70	74.15	77.60	81.05
$328	68.77	72.22	75.67	79.12	82.57
$365	70.29	73.74	**77.19**	80.64	84.09
$401	71.82	75.26	78.71	82.16	85.61
$438	73.34	76.79	80.23	83.68	87.13

	Labor	Utilities	Pullet	Facilities	Eggs/Hen
Initial value	2.06	2.97	9.99	5.59	273
-10%	76.99	76.89	76.19	76.63	85.77
Base	**77.19**	**77.19**	**77.19**	**77.19**	**77.19**
+10%	77.40	77.49	78.19	77.75	70.17

Iowa's feed price advantage has been relatively stable, but the demand for corn from ethanol production has led to higher corn prices in Iowa and elsewhere. In addition, the rising energy prices that help fuel ethanol expansion have also increased the cost of shipping grain from the Midwest to grain-deficient regions such as the East and West Coasts. For example, rail rates to ship corn from Omaha, Nebraska, to Los Angeles increased 63 percent, or approximately $0.61/bushel, between March 2004 and October 2012. As a result, producers operating in other states will have to focus on improving non-feed costs to offset Iowa's advantage. California producers would have to reduce non-feed costs by 9.63¢/dozen, nearly 39 percent, to produce eggs at the same cost as an Iowa producer. Pennsylvania's feed costs are 5.07¢/dozen higher than Iowa's, and its non-feed costs will have to decrease 24 percent to match Iowa's cost of production.

The largest non-feed cost items provide the greatest opportunity for producers in other regions to compensate for Iowa's feed-cost advantage. At a cost of 9.5¢/dozen, pullet depreciation represents the largest non-feed cost item in the production budget and 13 percent of the total production costs. Pullet development costs, however, are primarily feed related, thereby favoring Iowa producers. Furthermore, any innovations that decrease a competitor's non-feed portion of pullet development costs could also be adopted in Iowa. Therefore, any cost advantages derived from lower cost pullets would likely be short-lived. Consequently, Iowa will likely maintain an advantage in pullet production as well as feed costs.

Fixed asset depreciation is the second largest non-feed item in the production budget at approximately 7.8 percent of total costs. Fixed assets include buildings, cages, and other production equipment. Annual depreciation costs are primarily determined by the initial cost and expected useful life of the assets. The initial cost accounted for in this analysis includes the price of the land, cost of building materials, site preparation, and construction costs. While macroeconomic factors may impact some of these costs, construction standards and site selection regulations will also impact cost and may differ by state.

Combined, labor and energy costs comprise 6.7 percent of egg production costs. Although there is a relatively small input cost, Iowa does have the advantage of lower utility rates. Any climate-related cost advantage would be realized through lowered energy requirements or lower construction costs to maintain an ideal laying environment in the building. Because region-specific electrical or natural gas utilization values were not available, the production cost estimates assume constant power consumption among all regions of the country. The total electric bill is substantially less than the feed cost advantage. Furthermore, any labor saving innovations adopted in competing states would be available in Iowa.

Production efficiency exerts a significant influence over production costs. Efficiency improvements achieved in other states could threaten Iowa's cost advantage. If California producers improve eggs per layer by 13.5 percent, they will offset Iowa's feed-cost advantage. Pennsylvania producers would need to improve eggs

per layer by 8.2 percent to offset Iowa's feed-cost advantage. Production efficiency is primarily related to diet, environmental conditions, genetics, and other factors controlled by management. Consequently, feed conversion improvements achieved in other areas would also be available to Iowa producers, which suggests competitive gains would be short-lived.

A major disadvantage for Iowa producers is lack of proximity to population centers. Pennsylvania producers are closer to the urban areas on the East Coast. California producers are closer to the population centers on the West Coast. Table 2.6 estimates the cost per dozen of transporting shell eggs from central Iowa to markets near New York City and Los Angeles. It also compares the shipping cost associated with production areas closer to these population centers. The freight rate is based on current commercial rates for refrigerated trucks. The rate from Des Moines to a West Coast market would cost around $2.38 per loaded mile; the rate from Des Moines to the East Coast was found to be closer to $2.71 per loaded mile.

TABLE 2.6

Shell egg transportation to population centers (¢/doz).

	Production Center		
Destination	**Iowa**	**California**	**Pennsylvania**
Los Angeles	16.7	1.9	
New York City	12.5		1.7

Iowa's transport cost is 10.8¢/dozen higher than the cost from Pennsylvania to New York City and 14.8¢/dozen more than California to Los Angeles. This comparison assumes a minimal trucking distance for producers in California and Pennsylvania to reach the city; actual costs may be higher. When competing against these regions for the table egg market, Iowa may be vulnerable to transportation costs. Iowa is compensating for this freight disadvantage to major cities by sending a disproportionate number of eggs into the breaker market for further processing.

Conclusions

If demand remains strong enough to sustain prices at a profitable level despite higher feed costs, the egg production industry will continue to expand. Iowa continues to benefit from a production environment favorable to expansion. In the foreseeable future, Iowa producers will continue to hold a competitive production advantage over egg producers in other regions. The balance between the cost of transporting feed to production areas near population centers and the cost to transport eggs and egg products will impact regional competitiveness. Threats to Iowa's production cost advantage would come from technological advances that improve feed efficiency, reduced pullet costs, or increased transportation costs. Iowa egg production may easily adapt to advances in technology and efficiency, but the challenge of product transport to the major population centers is a growing hindrance to competing in those markets.

CHAPTER 3

Economic Impacts

The rapid expansion of the egg industry in Iowa has taken place primarily in large integrated laying and processing facilities. Based on monthly average prices, the total market value of egg production in Iowa was about $1.069 billion in 2011. This represents 15.75 percent of total U.S. production, according to the USDA. About two-thirds of Iowa egg production goes into egg-breaking facilities for further processing, and the remaining portion goes into retail outlets as shell eggs. The additional processing at the egg-breaking facilities represents value-added agricultural activity that brings jobs and income into the Iowa economy, mainly in rural areas.

The growth of the Iowa egg industry is positive employment news for rural areas of Iowa. Data from Iowa Workforce Development (IWD) for the egg processing NAICS code (311999) suggest there are about 2,300 employees at 35 egg-processing facilities in Iowa. Most of these are concentrated in north-central Iowa, where high levels of corn production are also located. Total annual wage and salary income in 2011 for these workers totaled about $106 million, according to IWD data.

The egg processing activities are usually integrated with the egg production operations, although employment and wage data on production is reported separately to IWD. For 2011, data reported to IWD for the egg production NAICS code (112310) indicated 1,448 employees at 40 facilities in Iowa, up from 38 facilities in 2009. Aggregate wage and salary income to production workers totaled $49.8 million in 2011.

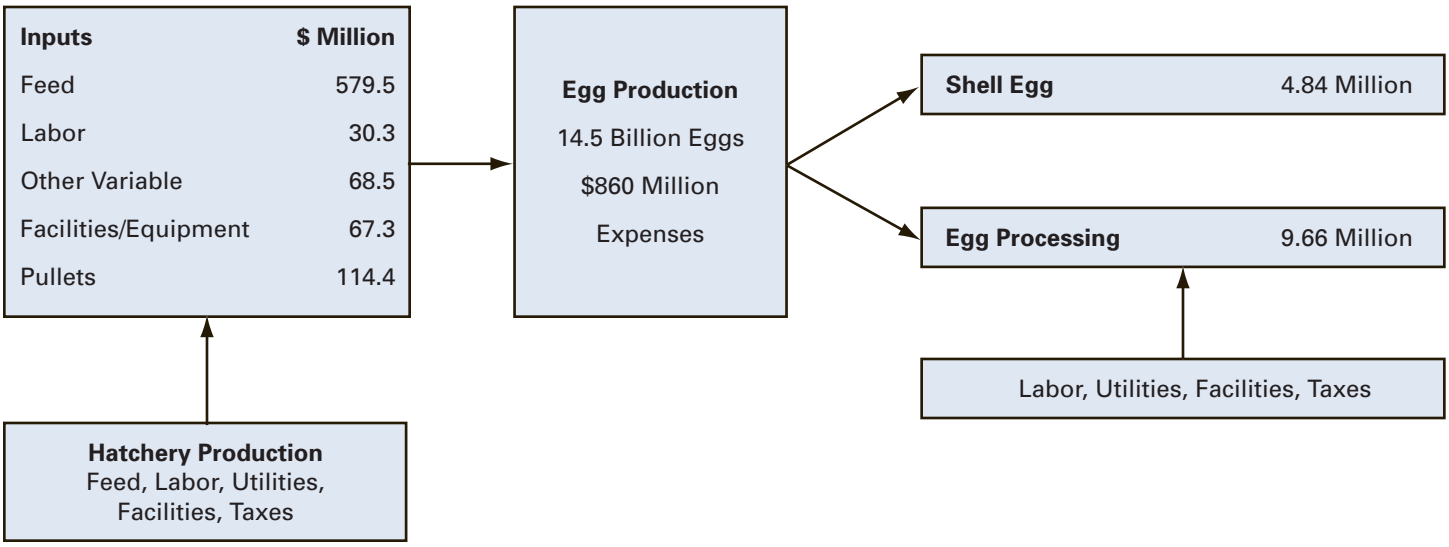
The number of egg production and processing facilities reported by IWD is less than the 2,966 farms in Iowa that are listed as producing eggs in the 2007 Census of Agriculture. This number is up considerably from the 2002 Census of Agriculture, which listed 1,934 farms with layers. In both years, a large majority of this total number is composed of farms with less than 100 layers and would include individuals producing for niche markets such as free-range eggs. At the higher end, there were 41 farms in Iowa with over 100,000 layers in 2007, compared to 46 farms of this size in 2002. Our report focused on the economic impacts of the large-scale commercial egg production and processing facilities.

The linkages among components of the Iowa egg industry are schematically displayed in figure 3.1. Because of the close integration between growers and processors in the Iowa egg industry, the production and processing components are considered the core of the industry. The backward linkages consist of suppliers of inputs including feed-grains, supplements, veterinary, and utilities. Based on the 2011 levels of production, approximately 49.2 million bushels of corn and 452,200 tons of soybean meal were used by the 52.9 million layers in Iowa. Total feed costs based on 2011 prices were estimated to be $579.5 million based on prices of $6.65/bushel for corn and $334/ton for soybean meal and other ingredients. Costs of other non-labor inputs, including depreciation, transportation, and miscellaneous expenses, totaled $250.2 million for the Iowa egg industry.

The egg production and processing activities identified as the core of the Iowa egg industry also are responsible for generating economic effects beyond the farm and processor levels. The purchases made and incomes earned in these core sectors spill over and impact the rest of the regional and state economy via the economic linkages. An input-output model is used to identify and estimate the value of these linkages within the state. An input-output model is essentially a generalized accounting system of a regional economy that tracks the purchases and sales of commodities between industries, businesses, and final consumers. Successive rounds of transactions stemming from the initial economic stimulus (such as a new plant or a community business) are summed to provide an

FIGURE 3.1

Iowa egg production sector without considering processing sector.



estimate of direct, indirect, induced (or consumer-related), and total effects of the event. The impacts are calculated using the IMPLAN Input-Output modeling system, originally developed by the U.S. Forest Service and currently maintained by the Minnesota IMPLAN Group. The modeling system is widely used by regional scientists to estimate economic impacts.

In this analysis, the dollar value of activity at the producer and processor level (core level), which we identify as $1.069 billion, is used as the direct effect, or input, to the model. The value of incomes and jobs at the hatcheries and the 14.5 billion eggs produced and processed in Iowa serve as the direct effects that stimulate the successive rounds of economic activity that is captured by the I-O model. The hatcheries and pullet production are inputs toward producing 14.5 billion eggs. The market value for these eggs and egg products of $1.069 billion incorporates the value of the intermediate inputs and poultry production. The direct labor inputs are 2,870 jobs at the hatcheries, production, and processing levels.

Using the $1.069 billion of sales as the direct input, the results from this I-O impact analysis are presented in table 3.1. When all direct and secondary effects are considered, the total impacts include over $2.02 billion of output sales, $424 million of personal income, $656 million of contribution to the gross state product, and about 7,960 jobs. Based on average state tax yields per income, the Iowa egg industry generates $19.3 million of state general tax revenues annually. These numbers reflect a substantial increase in impacts since 2002 because the level of annual egg production grew at an average rate of 4.8 percent per year, increasing from 9.8 billion to 14.5 billion in 2011.

TABLE 3.1

Economic contribution of egg industry in Iowa.

Sectors	Total Sales	Value-added	Labor Income	Jobs
Agriculture	$516,988,744	$105,484,773	$92,788,787	1,055.6
Mining	$ 195,665	$70,680	$32,689	0.8
Construction	$8,319,223	$3,991,249	$3,354,276	76.7
Manufacturing	$960,717,176	$226,962,793	$143,498,058	2,385.2
Transportation and Public Utilities	$92,964,634	$48,240,625	$28,084,783	511.8
Trade	$104,429,623	$79,842,475	$47,339,231	1,030.7
Service	$324,862,300	$186,643,855	$103,825,290	2,827.9
Government	$15,943,838	$ 5,291,897	$5,179,267	70.7
Total	**$2,024,421,204**	**$656,528,346**	**$424,102,380**	**7,959.6**

Source: Iowa Input-Output Model.

REFERENCES

Agricultural Prices, USDA National Agricultural Statistical Service, various issues