IOWA STATE UNIVERSITY
University Extension

Iowa's Turkey Industry—

An Economic Review

PROJECT FUNDED BY IOWA TURKEY FEDERATION

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Iowa turkey industry is an important agricultural value-added activity providing income and employment opportunities for rural areas in Iowa. The 8.54 million turkeys produced in Iowa each year require 207 full-time equivalent (FTE) employees. At current average wages in this sector, the aggregate annual wage for turkey production totals about $5.6 million. Approximately 1,750 employees work at the four processing facilities in Iowa. Wages and salaries paid at these facilities total about $50 million annually. The combined economic effect of these two components of the turkey industry totals 1,960 workers and $55.6 million of wages and salaries for processing and production.

When all direct and secondary effects are considered, the total impacts include $810.7 million of sales, $158.7 million of personal income, $253.3 million of contribution to the gross state product, and about 4,200 jobs. Based on average state tax yields per income, the Iowa turkey industry generates $13.7 million of state general tax revenues annually.

Most of Iowa's turkey production is done on modern farms that use highly automated facilities for efficient labor utilization. Based on the 2007 levels of production, approximately 9.7 million bushels of corn and 108,000 tons of soybean meal were used by the 8.54 million turkeys produced in Iowa.

Iowa's cost of production for live turkeys is competitive with Minnesota, North Carolina, and Missouri—the top one, two, and five producing states, respectively. Of the top seven producing states, only Minnesota, Arkansas, and Iowa have increased production between 1996 and 2006.

Iowa currently imports nearly 6 million turkeys a year from surrounding states to support the state's two processing facilities. Because of Iowa's processing capacity, feed price advantage, and ability to utilize manure nutrients effectively, there is potential to grow turkey production in the state. Increasing in-state production by 5.6 million birds to more closely match processing capacity could increase economic activity by $120 million and 380 full time jobs.

Rising oil prices have helped support an expanding ethanol industry, which in turn has led to higher feed costs for turkey production. The increasing oil and natural gas prices have also led to a doubling in fertilizer prices between 2002 and 2007. As a result, the nutrient value of turkey manure as a commercial fertilizer substitute has also doubled. In addition, the cost to ship grain from the Midwest to corn deficit regions has increased and Iowa's competitive position to produce turkeys has improved. However, in the short term Iowa producers may suffer significant losses due to the higher cost of feed.

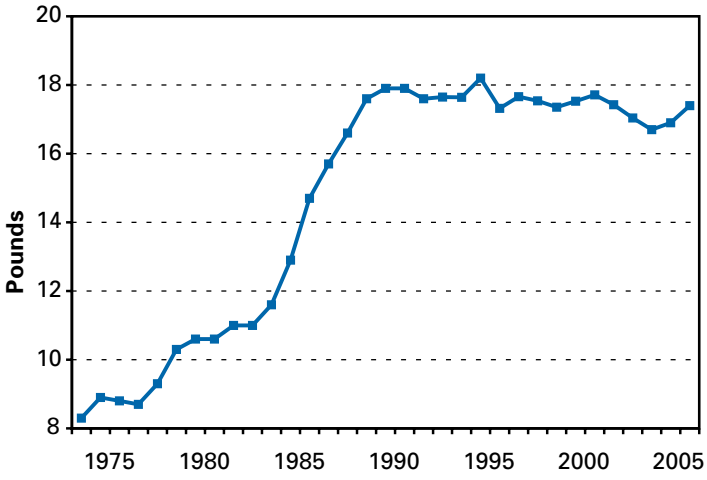
CHAPTER 1

The U.S. and Iowa Turkey Industries: Situation and Outlook

During the 1980s, U.S. turkey production and consumption nearly doubled. Since 1990, however, per capita consumption in the U.S. has slightly, though steadily, declined (Figure 1.1). Producers have yet to see any repercussions from this drop. The industry has limited production to match consumption and returns over feed costs have been above 1998-2000 levels in recent years (Figure 1.2).

FIGURE 1.1

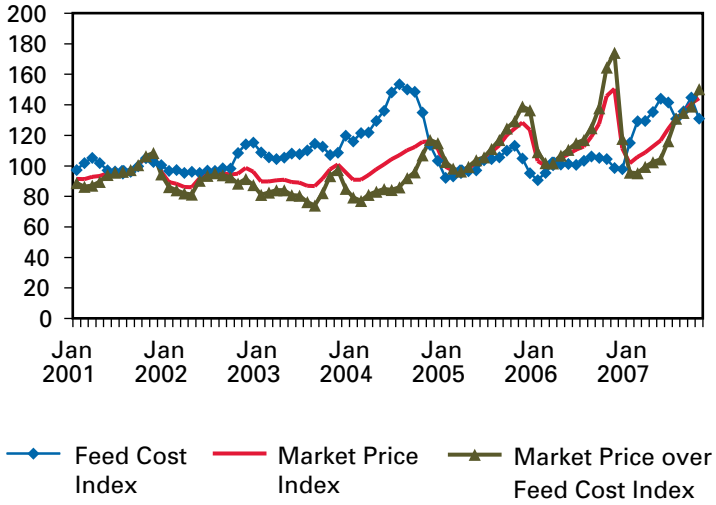
Per Capita Turkey Consumption, U.S.



Source: USDA

FIGURE 1.2

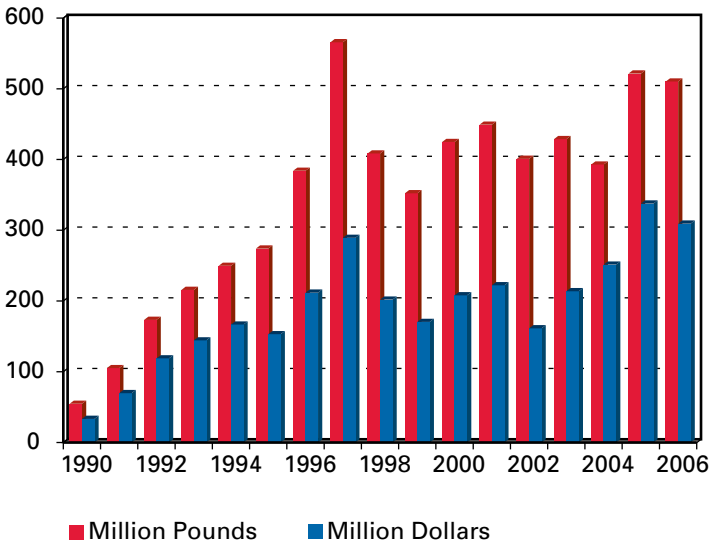
Index of National Turkey Price, Feed Costs, and Gross Return, 1998–2000=100



From 2002 to 2004, production grew at a relatively stable rate as the industry rebounded from the 1997-99 declines. In 2005 and 2006, export demand increased significantly, topping 500 million pounds and $300 million, the highest levels since 1997 (Figure 1.3).

FIGURE 1.3

U.S. Turkey Exports, by Weight and Value



Source: USDA

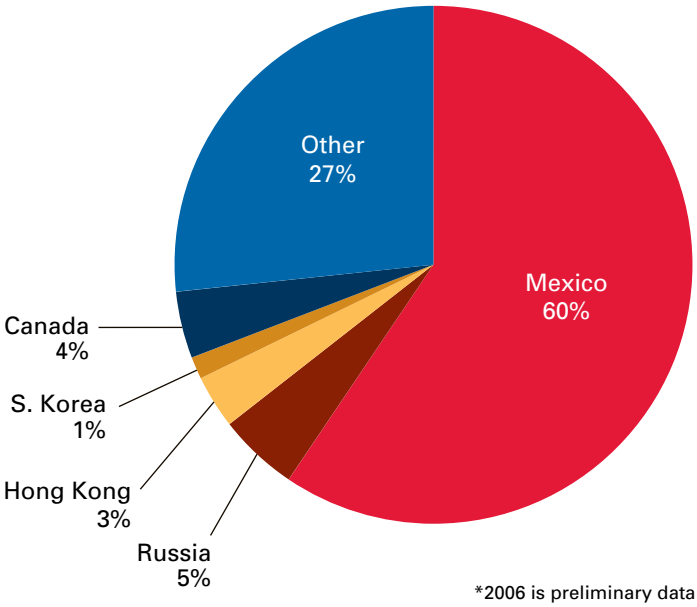
Potential for Growth

Future growth for this industry depends on its ability to meet two significant challenges: increasing domestic consumption of turkey and opening new export markets. Per capita consumption of animal protein in the U.S has grown. The cost of producing turkey is higher than the cost of producing chicken, but less than beef and pork. It will take successful new turkey products to capture shares from these markets.

The U.S. exports approximately 7.7 percent of its total turkey production. Export markets are dominated by Mexico, where demand has grown substantially since 1995 and now represents 60 percent of U.S. exports. Continued growth in Mexico will depend on the strength of its economy (Figure 1.4).

FIGURE 1.4

2006* U.S. Turkey Exports by Country



*2006 is preliminary data

Source: USDA

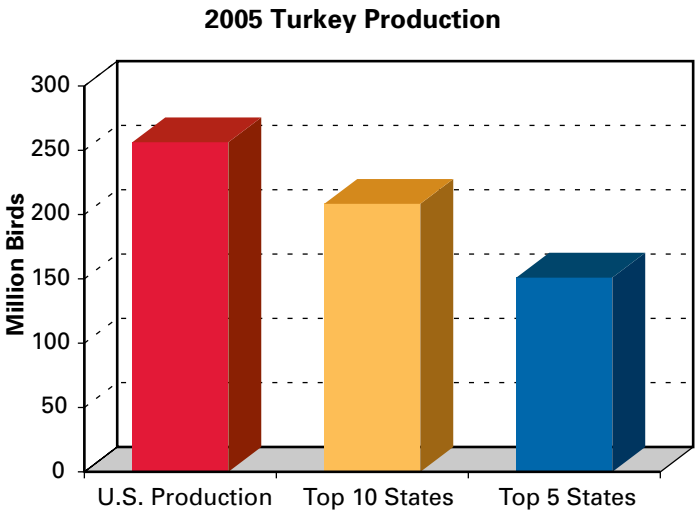
These are highly price sensitive markets that often absorb by-products such as thighs, drumsticks, and mechanically separated meat. These export markets will exist as long as inexpensive by-products are available. However, these low-value export markets are unlikely to create the financial incentives required for further growth in turkey production. This information suggests that the U.S. turkey industry has entered a mature phase with a possible overabundance of buildings and processing capacity. Unless demand from a new product line exceeds production, prices will continue to hover at the break-even point. High-cost producers exit during times of negative returns and lower cost producers prevail and expand during upturns in the market.

Industry Location

The U.S. turkey industry is geographically concentrated with five states producing nearly 60 percent of the total national output (Figure 1.5). Ten states account for 81 percent of total production.

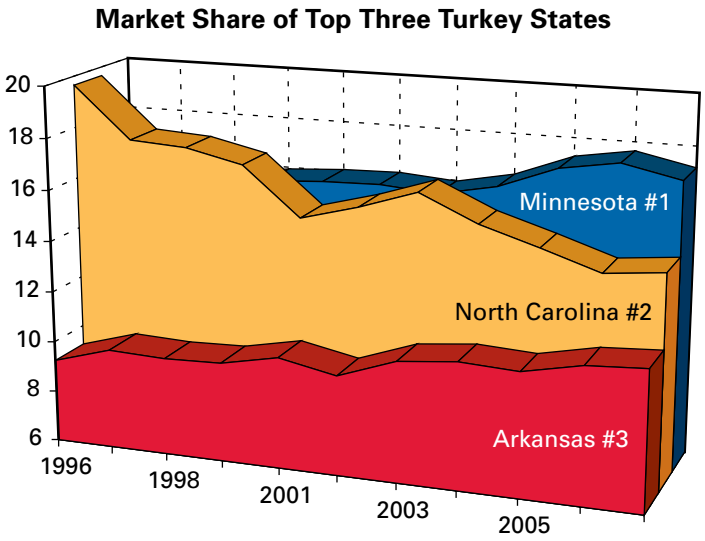
Figure 1.6 illustrates market share changes among the top 3 states over the past 10 years: sales in North Carolina have fallen from 20 to 14 percent as producers shift from turkeys to broilers while growth has occurred in Minnesota (14 to 17 percent, due primarily to the expansion of one producer). Arkansas has also seen an increase, though smaller than Minnesota's.

FIGURE 1.5



Source: USDA

FIGURE 1.6



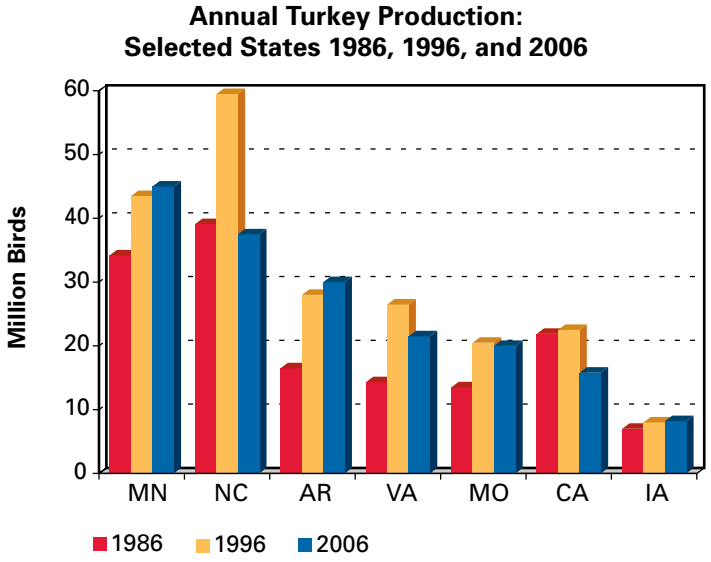
Source: USDA

Iowa's Share of Production

The following series of figures provides a snapshot of production shifts among top turkey producing states. While all the leading states grew during the 1980s, some declined in the 1990s and early 2000s. For example, North Carolina, California, Virginia, and to a lesser extent Missouri, have cut production levels since 1996 (Figure 1.7). Iowa had less growth between 1986 and 1996, but has continued slow steady growth to 2006. Figure 1.8 shows that Iowa's share of total U.S. production declined between the mid-1970s and late 1990s, but has been steadily rising since 1999. Though still trailing Minnesota, Iowa has gained relative to other leading states. Minnesota does have slightly less expensive feed costs than Iowa (see chapter 2), but both have substantially lower feed costs than North Carolina or Arkansas.

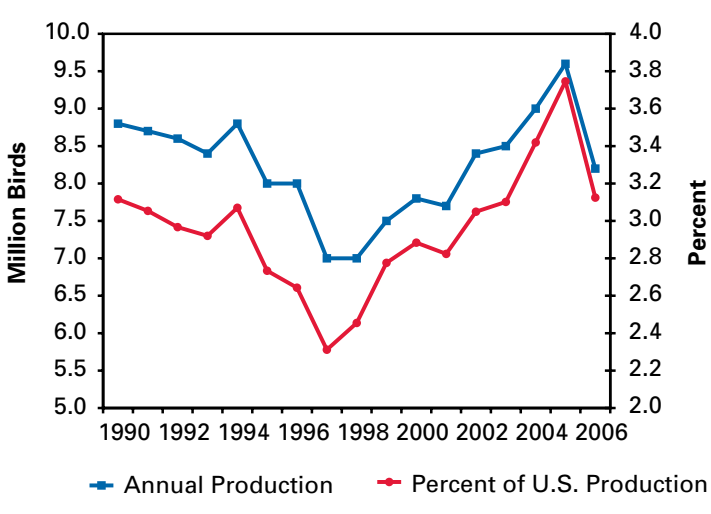
The early location and growth of the industry in North Carolina and Minnesota may be due to companies and individuals in these states that decided to grow turkeys near home. Now that the market is maturing, there seems to be a trend away from maintaining production facilities in high-cost states such as California and North Carolina, and a trend toward more cost-effective regions such as the Midwest. This suggests that feed costs, and particularly feed cost differences, are becoming a more significant factor. It is possible that as cost pressures increase, production will locate where feed costs are lowest, which will give Iowa an advantage. However, the industry will move very slowly. The absence of any major new markets will slow construction of new facilities, and older facilities will remain in production as long as prices cover variable costs.

FIGURE 1.7



Source: USDA

FIGURE 1.8



1998 Data is unavailable

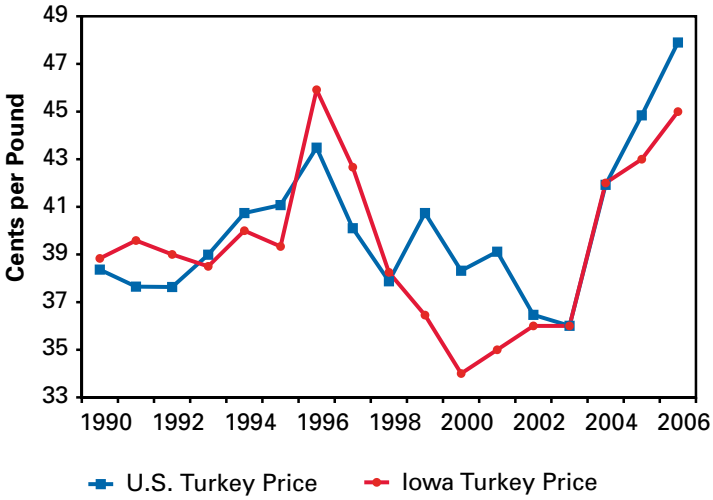
Source: USDA

Prices and Profits

Figure 1.9 shows the annual average prices received by farmers in Iowa and the United States. The figures are quite close: Iowa prices were higher in 1996-1997, but much lower than U.S. prices from 1999 to 2002. They have since rebounded.

FIGURE 1.9

Annual Average Turkey Prices Received by U.S. and Iowa Turkey Producers



Source: USDA

Monthly price data shows market prices strengthened in the last half of 2006, which returned the industry to a profitable status.

Compared to prices in other leading turkey states, Iowa turkey prices have faired relatively well. Since 2000, Iowa prices have averaged below those of Missouri but the same as prices in Minnesota.

Summary

The U.S. turkey industry has most likely entered a new phase marked by small changes in production and consumption. Individual states may see some growth but it will come at the expense of other states. That noted, increased attention must be paid to reducing costs and matching production and processing capacity. The industry may continue to consolidate. The higher cost of transporting grain to corn deficient regions and the increased value of turkey litter as fertilizer tend to favor the Corn Belt if additional growth is justified. However, without any major new markets, the industry will be slow to relocate. With an industry as finely balanced between profits and losses, any new production without new markets could create an oversupply and cause the industry to return to a loss situation.

CHAPTER 2

Competitiveness of the Iowa Turkey Industry

While U.S. turkey production has leveled off in recent years, there is still competition among regions to determine where production will occur. Cost of production is the long-term measure of competitiveness. This chapter compares production costs of live turkeys in Iowa and the competing states of Minnesota, Missouri, and North Carolina.

Determining accurate production costs is not an easy task for several reasons. Costs vary with operational efficiencies, type and weight of bird produced, type of production systems, age and condition of facilities, and input price changes. In addition, states such as North Carolina have a more integrated structure that provides economies of scale. All of this, coupled with a natural reticence by those involved to provide access to accurate data, makes it difficult to derive accurate and objective measures of production costs.

This analysis attempts to address the regional cost of production by modeling estimated costs first for Iowa and then for competing states. First, cost of production for a typical Iowa turkey production system is estimated based on USDA-reported input prices and interviews with producers to approximate their efficiency. Second, this same production budget with minor adjustments is applied to the three other states using their reported input prices. This approach examines differences 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 North Carolina, where poults may cost significantly less. How much cheaper do North Carolina poult prices have to be to offset the Iowa corn price advantage?

Iowa Production System

Nearly all turkeys are either owned by the processor or contracted for delivery to the processor by independent producers. The processor may raise the birds in its own facility or under a production contract in facilities owned by others. Independent producers sign a marketing contract before the poults are placed to assure a market for the finished birds. There are two significant benefits to this approach: The producer has a supplier for the birds and understands how the price will be established at delivery.

Short-term marketing contracts with processors, which typically cover the delivery of one or two flocks, are primarily for producers whose facilities are paid for and who have little or no out-of-pocket overhead expenses. To encourage investment in facilities, processors may offer longer-term contracts that provide the producer and the producer's lender with some assurance that the investment will cash flow at least until it is paid off.

The typical Iowa independent turkey producer owns the buildings and equipment and provides the labor, feed, and operating inputs to grow the turkeys to processing weight. The producer buys the poults and schedules them to match a delivery date at the processing plant. The poults must be of acceptable genetics, and the nutrition and health programs under which they were raised must conform to best management practices. The price determined in the contract is typically tied to the Uner-Barry price report, a private price reporting service, and also may incorporate the cost of feeding the birds.

Over time, returns to the independent producers and contract growers are competitive, enabling resources to be used to sustain or grow the level of turkey production needed by processors. Growers with a production contract do not face price risk and are paid a relatively predictable return for their investment in facilities and labor. Independent producers earn a return on investment and labor provided, but also expect a higher average return to compensate for the price risk they assume. Some independent producers belong to a co-op that owns a processing company and have integrated closer to the consumer.

Regardless of whether the turkeys are owned by the processor or independent producers, the production system and technology are similar. Iowa produces primarily tom turkeys, which are grown from poults to about 41 pounds in approximately 20 weeks. Feed cost is the single largest expense, representing over 60% of total cost depending on feed prices (Figure 2.1). The bird will receive several different diets during the production cycle matched to its nutritional requirements. Table 2.1 represents the average feed ration for the turkey over its lifetime. Its diet is predominantly corn (56%) and soybean meal (23%) with other ingredients to supply the remainder of its nutritional requirements.

FIGURE 2.1

Distribution of Iowa Turkey Cost of Production

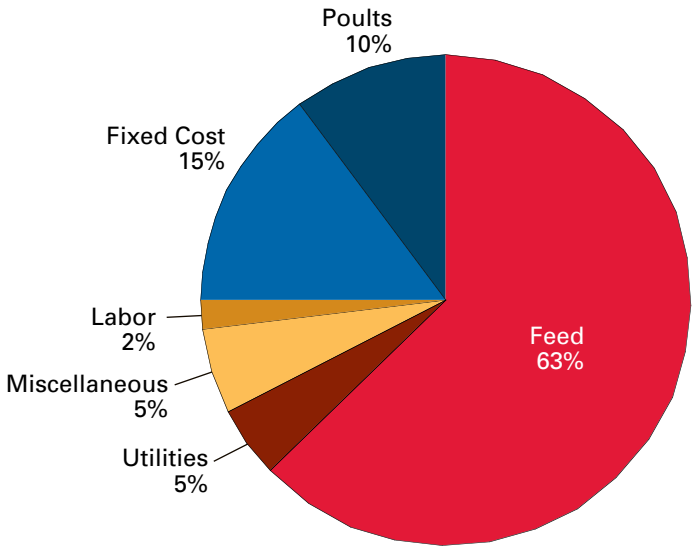


TABLE 2.1

Representative feed ration for life of tom.

Turkey	
Corn	56%
Soybean Meal	23%
Other Ingredients	17%
Blended Fat	4%

Table 2.2 estimates the cost of producing a 41-pound tom turkey in Iowa at $16.60 per bird or $.4048 per pound of live weight. Input prices for corn and soybean meal (SBM) used in this analysis are based on long-run baseline prices forecast in December 2007 by the Food and Agriculture Policy Research Institute (FAPRI). The FAPRI Baseline prices are adjusted to the long-run Iowa basis; these are $3.12/bu for corn and $209/ton for SBM. Other feed input prices are based on 2007 levels. At these prices, the feed cost per bird is estimated at $10.41 or $.254 per pound. Utilities total $0.79/bird, most of which is propane with some electricity. No net cost is associated to litter removal as the nutrient value of the manure because fertilizer offsets the cost of removing and replacing the litter. Miscellaneous costs include bird loading costs, operating and overhead cost for tractors and pickups, flock insurance, and other minor expenses. Labor is estimated at $0.33 per bird based on $28,000 per FTE annual labor cost, including benefits.

Fixed costs are the annualized expense of the facilities. Turkey production is typically separated into three phases to reduce the spread of disease from older to younger birds and to allow for more specialized labor. Most poults fed in Iowa originate from out-of-state hatcheries. There are two growing systems common in Iowa. One type has a brooder barn and two finisher barns on the same farm. The birds stay 6-7 weeks in the brooder barn and 14 weeks in one of the finisher barns. The second system has the brooder and finisher buildings on separate farms. In this system, birds stay in a brooder barn 5 weeks before they're transferred to one of three finisher buildings on another farm, where they'll be housed for 15 weeks. The estimated cost in 2007 of a brooder and two finisher farms to handle 28,000 bird flocks was approximately $2.15 million; the operation typically turns 6.0 flocks per year. The annualized facility including depreciation, interest, repairs, taxes, and insurance is estimated to be $2.44 per bird or $.059 per pound of live weight.

TABLE 2.2

Estimated cost of producing 41-pound tom turkeys in Iowa.*

Input	Per Bird	Per Lb.
Feed	$10.41	$0.254
Poults	$1.72	$0.042
Utilities	$0.79	$0.019
Miscellaneous	$0.90	$0.022
Labor	$0.33	$0.008
Fixed Cost	$2.44	$0.059
Total	**$16.60**	**$0.405**

** FAPRI Baseline forecast of corn and SBM prices. Other prices based on 2007.*

Sensitivity Analysis

Using the input prices and production assumptions discussed above, the total cost of production in Iowa is $16.60 per bird or 40.5 cents per pound (live weight). A sensitivity analysis was conducted to determine the impact on costs because one assumption about prices or production parameters changes while other variables remain constant. Table 2.3a shows changes in corn and SBM prices. The bold numbers indicate the baseline case reflected in Table 2.2, where total cost was 40.5 cents per pound. However, if feed input prices increase to $4.00 corn and $300 SBM the estimated cost per pound increases to 45.7 cents.

TABLE 2.3a

Impact on Iowa tom turkey cost of production ($/lb) from changes in corn and soybean meal prices.

	Corn Price				
SBM	**$3.00**	**$3.12**	**$3.50**	**$4.00**	**$4.50**
$200	0.399	0.402	0.413	0.426	0.440
$209	0.402	**0.405**	0.415	0.429	0.443
$250	0.414	0.418	0.428	0.442	0.456
$300	0.430	0.433	0.444	0.457	0.471
$350	0.445	0.449	0.459	0.473	0.487

Table 2.3b shows the impact of changing other variables by 10 percent from their original base value. Feed efficiency has the largest impact because a 10 percent improvement reduces cost by 2.5 cents per pound. A 10 percent change in inputs not related to feed has a much smaller impact.

TABLE 2.3b

Iowa turkey cost of production ($/lb) and impact of a 10% change in selected non-feed variables.

	Feed Efficiency	Other Feed	Poult Price	Non-Feed Variable	Fixed Cost
Base Value	2.75	$75.00	$1.72	$2.03	$2.44
-10%	0.380	0.395	0.401	0.400	0.399
Base Cost	**0.405**	**0.405**	**0.405**	**0.405**	**0.405**
+10%	0.430	0.415	0.409	0.410	0.411

Iowa's Competitive Position

One of the key determinants of the future success of Iowa's turkey industry is whether it is competitive with other states. If national production expands, which states will profit? If the industry downsizes, who will likely cut back? Iowa's neighboring states of Minnesota and Missouri have similar input prices but produce more turkeys than Iowa, and both also produce more turkeys than they process. North Carolina is the second largest turkey production state but its numbers have declined over the last 10 years. How does Iowa compare with these three states on the cost of producing turkeys?

Table 2.4 compares prices and costs of selected inputs in Iowa with costs in Minnesota, Missouri, and North Carolina. These prices and indexes are derived from industry sources and Department of Energy and USDA published data. The price and wage indexes are five-year averages for each state relative to that of Iowa. The heating index is a monthly average temperature below 70° relative to that of Iowa. Minnesota has lower feed prices and wages than Iowa, but higher energy costs. North Carolina and Missouri have lower heating requirements and wages than Iowa. Building costs are higher in Iowa and Minnesota because of the more severe climate. A case could be made that the Iowa structures, although more expensive, will last longer than those built in North Carolina. If this is true, then the North Carolina building cost advantage will be lower than what is shown here.

TABLE 2.4

Prices and price indexes for turkey production inputs for Iowa, Minnesota, Missouri, and North Carolina.

State	Corn Price ($/bu)	SBM Price ($/ton)	Propane Price Index	Heating Index	Electric Price Index	Wage Index	Capital Investment ($ mil.)
IA	$3.12	$209	1.00	1.00	1.00	1.00	2.15
MN	$3.06	$206	1.15	1.27	0.94	0.94	2.15
MO	$3.25	$212	1.15	0.81	0.87	0.82	1.87
NC	$3.63	$240	1.39	0.50	1.00	0.82	1.59

Source: Corn and SBM prices are FAPRI Baseline (December 2007) for the US adjusted for historic state basis. Price and wage indexes are 5-year averages relative to Iowa (Department of Energy and USDA). Heating index is based on the monthly average temperature below 70° relative to Iowa.

Tables 2.5 through 2.7 show the sensitivity cost of production to changes in selected variables in these competing states assuming the same cost of production budget. The four states have similar costs of producing 41-pound tom turkeys given the assumptions in the model. At the initial input prices listed in Table 2.4, the cost of production for Iowa, Minnesota, Missouri, and North Carolina is 40.5, 40.8, 39.8, and 40.7 cents per pound, respectively. Thus, in this budgeting exercise the differences in feed prices are offset by differences in facility, heating, and labor costs. In reality, producers may change what or how they produce to remain competitive.

TABLE 2.5a

Impact on Minnesota tom turkey cost of production ($/lb) from changes in corn and soybean meal prices.

	Corn Price				
SBM	**$3.00**	**$3.06**	**$3.50**	**$4.00**	**$4.50**
$200	0.405	0.406	0.419	0.432	0.446
$206	0.407	**0.408**	0.421	0.434	0.448
$250	0.420	0.422	0.434	0.448	0.462
$300	0.436	0.437	0.450	0.463	0.477
$350	0.451	0.453	0.465	0.479	0.493

TABLE 2.5b

Impact on Minnesota tom turkey cost of production ($/lb) from changes in selected variables.

	Feed Efficiency	Other Feed	Poult Price	Non-Feed Variable	Fixed Cost
Base Value	2.75	$75.00	$1.50	$2.28	$2.44
-10%	0.383	0.398	0.404	0.403	0.402
Base Cost	**0.408**	**0.408**	**0.408**	**0.408**	**0.408**
+10%	0.433	0.419	0.413	0.414	0.414

TABLE 2.6a

Impact on Missouri tom turkey cost of production ($/lb) from changes in corn and soybean meal prices.

	Corn Price				
SBM	**$3.00**	**$3.25**	**$3.50**	**$4.00**	**$4.50**
$200	0.388	0.395	0.401	0.415	0.429
$212	0.391	**0.398**	0.405	0.419	0.433
$250	0.403	0.410	0.417	0.431	0.445
$300	0.419	0.426	0.432	0.446	0.460
$350	0.434	0.441	0.448	0.462	0.476

TABLE 2.6b

Impact on Missouri tom turkey cost of production ($/lb) from changes in selected variables.

	Feed Efficiency	Other Feed	Poult Price	Non-Feed Variable	Fixed Cost
Base Value	2.75	$75.00	$1.50	$1.90	$2.11
-10%	0.372	0.388	0.394	0.394	0.393
Base Cost	**0.398**	**0.398**	**0.398**	**0.398**	**0.398**
+10%	0.424	0.409	0.402	0.403	0.403

TABLE 2.7a

Impact on North Carolina tom turkey cost of production ($/lb) from changes in corn and soybean meal prices.

	Corn Price				
SBM	**$3.00**	**$3.63**	**$3.50**	**$4.00**	**$4.50**
$200	0.377	0.394	0.391	0.405	0.418
$240	0.389	0.407	0.403	0.417	0.431
$250	0.392	0.410	0.406	0.420	0.434
$300	0.408	0.425	0.422	0.436	0.449
$350	0.423	0.441	0.437	0.451	0.465

TABLE 2.7b

Impact on North Carolina tom turkey cost of production ($/lb) from changes in selected variables.

	Feed Efficiency	Other Feed	Poult Price	Non-Feed Variable	Fixed Cost
Base Value	2.75	$75.00	$1.50	$1.77	$1.80
-10%	0.379	0.396	0.403	0.402	0.402
Base Cost	**0.407**	**0.407**	**0.407**	**0.407**	**0.407**
+10%	0.434	0.417	0.411	0.411	0.411

Corn and soybean meal prices are based the individual states' historical relationship with a baseline projection prepared by FAPRI. Iowa and Minnesota are corn surplus states and historically have some of the lowest priced corn in the nation. New demand from ethanol production has pushed all corn prices higher, including prices in Iowa and Minnesota. Missouri produces less corn than Iowa or Minnesota. In addition, much of the turkey production is in parts of the state where corn is not produced and thus must be moved to feed mills, usually by trucks. Much of the corn and soybean meal fed in North Carolina is imported by rail directly by the integrated turkey producers. Thus, the net price in corn importing regions such as North Carolina is the price of corn where it is purchased (for example Iowa, Illinois, or Indiana) plus the cost of transportation. Rail rates for corn are directly tied to the price of energy through the railroad's diesel fuel surcharge. The cost of moving a bushel of corn from Chicago to Raleigh, NC, increased 50 percent from 2003 to 2007.

Regional Competitiveness with Higher Energy Prices

What has been the impact of Iowa's growing ethanol industry on the competitiveness of the state's turkey production? Although corn prices have increased with demand, higher oil prices are a driving force behind increased ethanol production. Higher energy prices improve the competitive position of Iowa and other corn surplus states compared to corn deficient states like North Carolina or California for two reasons: transportation and fertilizer.

Railroads are the most efficient method of shipping corn from corn surplus regions such as the Midwest to the corn deficit regions on the coast. Rail shipping rates are quoted at a fixed amount per mile plus a diesel fuel surcharge. Diesel fuel prices doubled between October 2003 and 2007 and rail rates between Chicago and Raleigh, NC, increased over 60 percent. During the same period, rail rates between Omaha and Oakland, CA, increased 75 percent. While Iowa corn prices have increased, corn prices in deficit regions have increased even more due to higher transportation costs. Iowa must transport the final product further than North Carolina or California to reach consumers. However, there are less pounds of whole birds, and particularly turkey products, than there are of feed to produce the live bird.

Higher energy prices have also resulted in higher fertilizer prices for crop producers. Nitrogen, phosphorous, and potassium, the major crop nutrients, doubled in price between April 2002 and April 2007. As a result the nutrient value of the turkey litter (manure and bedding) has also doubled in value. Turkey growers that produce crops can capture this value in fertilizer savings. Alternatively, turkey growers or brokers that clean buildings can sell the litter to crop farmers as replacement for commercial fertilizer. At 2007 commercial fertilizer prices, turkey litter has over $30/ton of crop nutrients when applied following a nutrient management plan. Not all turkey producing regions can utilize litter for crop nutrients. First, corn deficit regions are already short on cropland. Pasture acres may not capture as much value as crop acres for fertilizer. Some regions with more litter than land face a litter disposal cost that is greater than its value and are looking into burning litter as an energy source. This option has high capital cost and lower value than fertilizer.

Conclusions

While Iowa's cost of production is similar to neighboring states, access to lower priced corn and soybean meal gives the Iowa turkey grower an advantage over competitors in North Carolina and other corn deficit states. However, there is evidence to suggest that growers in North Carolina have found ways to offset this disadvantage. These technologies and facilities may be built in Iowa to capture these advantages as well. The state's competitive advantage lies in locally produced grain and utilizing manure nutrients as crop fertilizer. The current higher energy prices amplify these advantages over corn importing regions.

CHAPTER 3

Employment and Income Effects of Turkey Production and Processing in Iowa

The presence of the Iowa turkey industry is an important agricultural value-added activity providing income and employment opportunities for rural areas in Iowa. As indicated previously, most of Iowa's turkey production is done on modern farms that use highly automated facilities for efficient labor utilization. Based on the average labor requirements indicated by the operating budgets, the 8.54 million turkeys produced in Iowa require 207 FTE employees. At current average wages in this sector, the aggregate annual wage for turkey production bill totals to about $5.6 million.

At the processing level, records indicate a considerable number of birds are imported into Iowa for processing. Total processing numbers for 2007 indicate that about 14.1 million turkeys will be processed in Iowa, which means 5.5 million birds are brought in from surrounding states. Secondary data from 2006 indicate that about 1,750 employees worked at the four processing facilities in Iowa. Wages and salaries paid at these facilities totaled about $50 million annually. The combined economic effect of these two components of the turkey industry totals 1,960 workers and $55.6 million of wages and salaries for the processing and production levels.

The linkages among components of the Iowa turkey industry are schematically displayed in Figure 3.1. Because of the close integration between growers and processors, we consider the production and processing component to be the core of the industry. The backward linkages consist of suppliers of inputs including feedgrains, supplements, veterinary, and utilities. Based on the 2007 levels of production, approximately 9.7 million bushels of corn and 108,000 tons of soybean meal were used by the 8.54 million turkeys produced in Iowa. Total feed costs were estimated to be $88.9 million based on $3.12/bushel corn and $209/ton SBM prices[1] and 2007 prices for other ingredients. Costs of other inputs including labor, depreciation, transportation, and miscellaneous expenses totaled $52.8 million for the Iowa turkey industry.

The agricultural production and processing activities identified as the core of the Iowa turkey industry also are responsible for generating economic effects beyond farm and processing facility. 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 (I-O) model for the state of Iowa was used to identify and estimate the value of these linkages. An I-O 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 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 our analysis, the dollar value of activity at the grower and processor level (core level) is used as the direct effect, or inputs, to the model. The value of the 14.1 million turkeys processed and the 8.54 million produced in Iowa serve as the direct effects that stimulate the successive rounds of economic activity that is captured by our I-O model. The results from this I-O analysis are presented in Table 3.1. When all direct and secondary effects are considered, the total impacts include $810.7 million of sales, $158.7 million of personal income, $253.3 million of contribution to the gross state product, and about 4,200 jobs. Based on average state tax yields per income, the Iowa turkey industry generates $13.7 million of state general tax revenues annually.

[1] *Corn and soybean meal prices based on long-run projected prices from FAPRI December 2007 Baseline.*

FIGURE 3.1

Iowa turkey production and processing industry, 2007

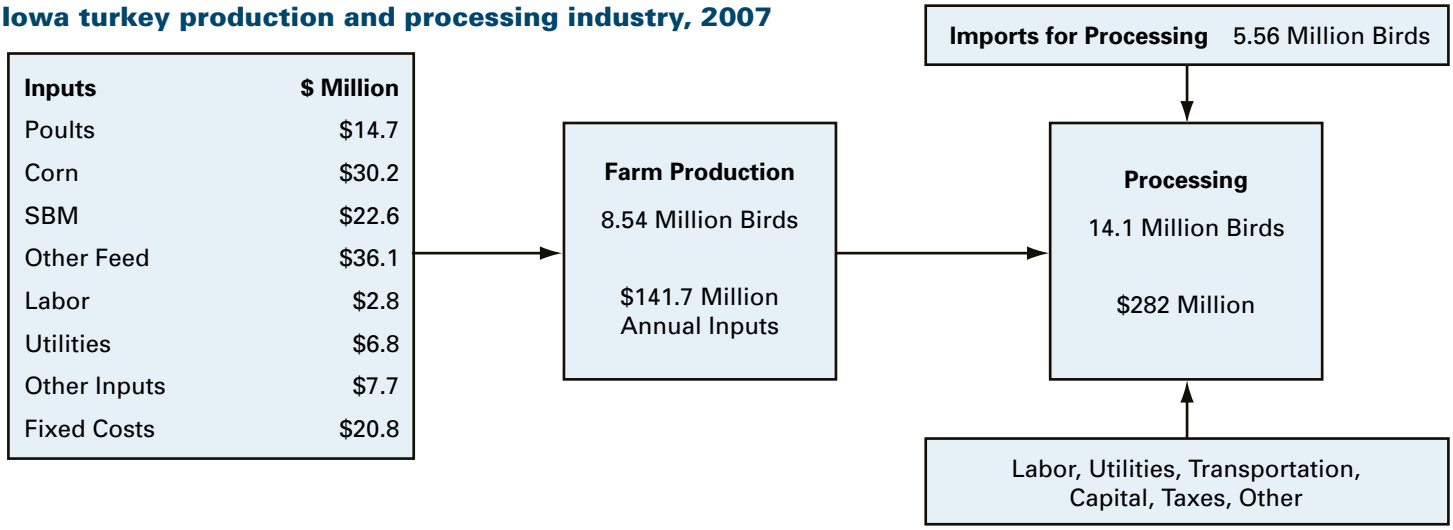


TABLE 3.1

Economic importance of turkey industry in Iowa.

Sectors	Total Sales	Labor Income	Value Added to GDP	Jobs
Agriculture	$194,329,920	$31,450,672	$70,989,104	280
Construction and Utilities	$10,548,083	$2,734,792	$7,058,263	42
Manufacturing	$428,108,704	$62,027,252	$71,494,640	2,100
Transportation and Utilities	$15,110,485	$6,222,788	$8,330,181	143
Wholesale and Retail Trade	$36,378,332	$13,998,364	$24,058,448	405
Finance, Insurance and Real Estate	$25,164,428	$6,609,885	$14,870,596	164
Professional Services	$66,934,320	$28,493,258	$34,874,228	699
Other Services	$34,093,756	$7,164,643	$21,692,130	389
Total	**$810,668,028**	**$158,701,653**	**$253,367,590**	**4,221**

Source: IMPLAN Model for Iowa

Growth Potential

The current turkey processing capacity in Iowa exceeds the level of in-state turkey production as indicated by the 5.56 million birds brought in from surrounding states for processing at Iowa facilities. This need to import birds from surrounding states suggests a plausible development scenario with potential for rural economic benefits. Increasing in-state turkey production to close this gap could utilize inputs produced in Iowa and support additional jobs in rural places. Using our farm level impact models, we estimate the economic impact of 5.56 million additional turkeys valued at $82 million. This new economic activity is focused at the producer level and does not generate any additional processing-level jobs.

The results of this scenario are presented in Table 3.2. At the farm level, we would anticipate an additional 134 FTE jobs with about $4.0 million of wages to raise Iowa turkey production to 14.1 million birds. The additional secondary impact in the local economy can be analyzed with our I-O models. Total combined direct and secondary impacts include $119 million of sales, $14.5 million of income and 381 total jobs. These production and secondary jobs would tend to be located in rural areas of the state near where the birds would be produced.

TABLE 3.2

Economic impact of 5.6 million additional turkeys in Iowa.

Sectors	Total Sales	Labor Income	Value Added to GDP	Jobs
Agriculture	$87,811,416	$5,657,610	$23,709,132	137
Construction and Utilities	$1,426,746	$368,745	$1,034,049	5
Manufacturing	$8,745,624	$896,103	$1,877,219	14
Transportation and Utilities	$3,629,061	$1,413,184	$1,986,358	29
Wholesale and Retail Trade	$5,418,966	$2,072,615	$3,606,772	52
Finance, Insurance and Real Estate	$3,006,575	$727,571	$1,820,001	21
Professional Services	$6,526,075	$2,658,676	$3,029,612	86
Other Services	$3,337,197	$723,931	$2,077,572	37
Total	**$119,901,659**	**$14,518,436**	**$39,140,714**	**381**

Source: IMPLAN Model for Iowa

Thus, having processing capacity in Iowa that is in excess of the state's current production provides an opportunity for turkey production to expand. Additional investment in production facilities and ongoing operations would provide a significant increase in employment and value added to Iowa's economy.

CHAPTER 4

Summary and Emerging Issues

The Iowa turkey industry is an important value-added enterprise for the state and generates significant economic activity and employment in rural Iowa. In 2006 Iowa raised 8.2 million turkeys and processed over 14 million by importing nearly 6 million from surrounding states. Turkey production and processing employ over 1,900 Iowans directly and an additional 2,300 people through indirect and induced employment. It accounts for over $810 million in total sales and $253 million value-added activities.

Iowa's cost of production for live turkeys is competitive with Minnesota, North Carolina, and Missouri, the top one, two, and five producing states, respectively. Of the top seven producing states, only Minnesota, Arkansas, and Iowa have increased production between 1996 and 2006. Iowa has higher non-feed costs than Missouri and North Carolina due to higher facility, heating, and labor prices. However, Iowa corn and soybean meal prices are lower than these two states, making it competitive on cost of production. Although feed prices have risen with the growing renewable fuels industry, so has the cost of transporting corn from the Midwest to corn deficit regions. Thus, Iowa's feed cost advantage has increased.

Iowa currently imports nearly 6 million turkeys a year from surrounding states to support the state's two processing facilities. Because of Iowa's processing capacity, feed price advantage, and ability to utilize manure nutrients effectively, there is potential to grow turkey production in the state. Increasing in-state production by 5.6 million birds to more closely match processing capacity is expected to increase economic activity by $120 million and 380 full time jobs. In order to capture this opportunity for growth in turkey production and economic activity in rural Iowa, the industry and state will have to address potential challenges and emerging issues.

Emerging Issues and Challenges

Increasing turkey production will require additional production facilities. These facilities are a significant capital investment and require financing and a stable market environment over the life of the facility. Regardless of the production site developed, the cost of facilities for modern turkey production is a multi-million dollar investment. Farmers investing in these facilities may enter a production contract with a processor. Farmers that belong to the Iowa-based processing cooperative may have to purchase additional processing shares in addition to the production facilities. The high capital requirement is often a barrier to entry for young farmers and is a concern for the continued success and growth of the industry. Innovative business models or loan programs that lower the capital barrier are needed to attract new producers and will help retain the value of existing sites if there is more opportunity for young farmers to buy into the industry.

Environmental management and regulations are ongoing issues of all livestock and poultry producers. The increasing oil and natural gas prices have led to a doubling in fertilizer prices between 2002 and 2007. As a result the nutrient value of turkey manure as a commercial fertilizer substitute has also doubled. At 2007 commercial fertilizer prices, turkey litter has over $30/ton of crop nutrients when applied following a nutrient management plan in a corn-soybean rotation. It is high in organic matter and nitrogen, phosphorous, and potassium. The challenge is to have cost effective methods to handle, store, transport, and apply turkey litter in a manner that is economically efficient and environmentally sound. While soil conditions and crop needs differ, a nutrient plan that applies litter every third or fourth year can be an effective management strategy to product water resources and capture the greatest nutrient value. Additional research, education, and demonstrations are needed to assure crop farmers of the full benefit of turkey litter as a soil amendment and fertilizer. Likewise, additional work is needed on effective equipment, timing, and quality control of litter application to capture the greatest value. Work is also needed to quantify and minimize the risk to water quality of handling and application methods.

Practical solutions are needed that optimize litter value while assuring the public that water resources are protected.

Rising feed costs due to increased demand for feedstuffs from biofuel production are a major concern for Iowa turkey producers. Corn prices in early 2008 are double the 10-year average of 1997-2006 and soybean meal prices are rivaling their highest prices in history. Feed cost represents over 60 percent of cost of production and will initially cut into producer returns. Longer term the industry will contract until prices rise to a point where they will cover the higher costs. The concern is over who will be the remaining producers and if they will be in Iowa. Transportation costs to ship grain from the Midwest to corn deficit regions have increased and Iowa should continue to be a cost competitive region to produce turkeys. However, in the short term Iowa producers can suffer significant losses.

Another macro concern is demand for turkey products from U.S. and export customers. Per capita turkey consumption that increased dramatically in the 1990s has drifted gradually lower in recent years. Turkey also faces significant competition from chicken and pork production, both of which continue to set new records for supply. Turkey products must continue to address consumer expectation for a safe, wholesome, affordable mealtime alternative. Industry innovation in new product development and efficient production and processing systems will be necessary to assure the long-term success of the industry.