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Cash Market Storage Returns for Corn

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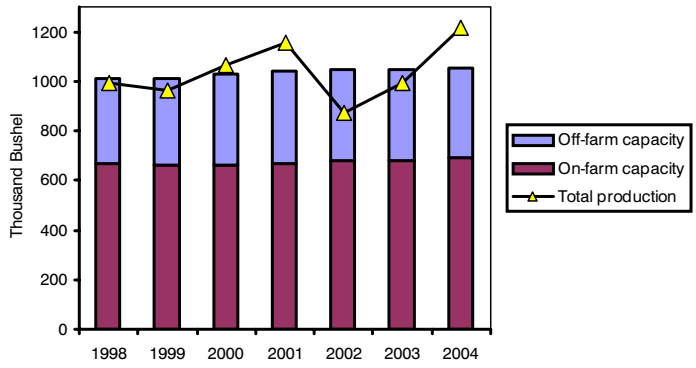
Many producers and grain elevator managers may want to evaluate their interest in building more storage. Two important factors that can help in that decision are an assessment of additional storage needs and a review of past returns to storage. This paper identifies some reasons why storage capacity in Indiana may need to rise and also reviews past returns to storage for corn.

Currently, there are several drivers that may increase corn production in Indiana, and thus increase the need for corn storage. First, soybean acreage in South America continues to increase, intensifying international competition in the soybean market (but not the corn market) and thus putting pressure on the profitability of soybean production relative to corn. Second, the arrival of Asian soybean rust in the United States will increase the cost of producing soybeans, decreasing the profitability of soybean production. In fact, concerns about Asian soybean rust have already caused farmers to decrease soybean acres and shift those acres into corn. The June 30 Acreage Report from USDA reported that soybean acreage in the U.S. has decreased by 3% overall. While crop acreage changes of 2 to 4% are normal, this 3% decrease in soybean acreage is a relatively large change compared to the last four years where planted soybean acreage varied by less than 1%. In addition, shifts away from soybeans may be larger in the eastern Corn Belt, due to higher susceptibility to rust. Third, an existing large corn processor in Indiana has announced their intentions to expand production and a number of companies/ investor groups have announced intentions to build new ethanol facilities. These factors will increase demand for corn relative to soybeans.

In most years, the storage capacity in Indiana is adequate for the crop (Figure 1). The exceptions were 2001 and the enormous 2004 crop where corn and soybean production exceeded

Figure 1. Total Production of Corn and Soybeans and Storage Capacity in Indiana.



Source: Indiana Agricultural Statistics Service 2004.

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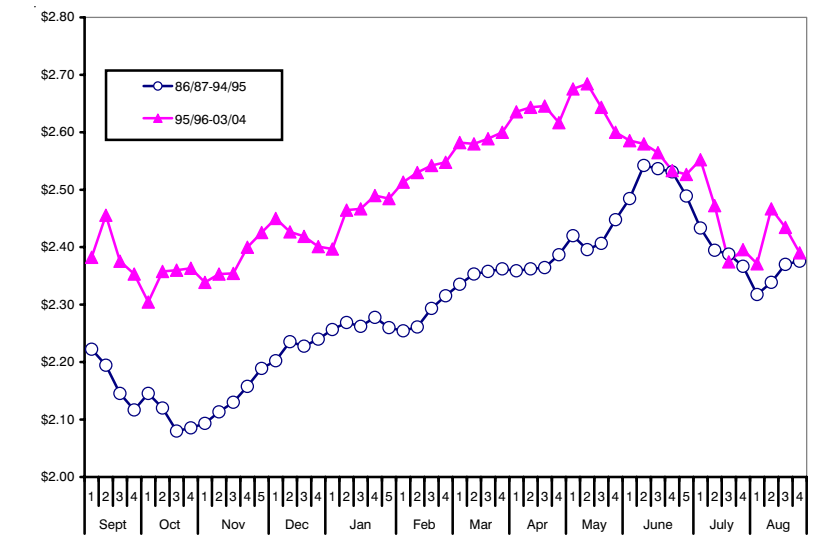
Figure 2. Central Indiana Cash Corn Prices



the total storage capacity in Indiana by 17 million bushels. An increase in corn acreage will increase the total demand for storage because of the larger volumes produced per acre relative to soybeans, and may cause the 2004 storage situation to be repeated. For example, in 2005 the Indiana ratio of corn acres to soybean acres was 52 to 48 and is expected to result in 1.09 billion bushels of corn and soybeans combined, given trend yields. If Indiana farmers continue to shift acreage towards corn, this ratio could shift to 56 to 44 which would increase storage needs by over 48 million bushels. Thus, a shift toward more corn acres could dramatically increase Indiana storage needs in a short period of time.

To look at the impact of a shift in rotation towards more corn from an individual farm perspective, consider a 2000 acre 50-50 corn-soybean operation that shifts towards 56% corn and 44% soybeans by 2010. Assuming trend yields, corn production on this operation would increase by almost 30,000 bushels from 146,400 to 175,168 bushels. In contrast, soybean production would decline by 2,700 bushels from 44,700 to 41,976.

Cash Market Storage Returns

In most years, corn prices follow a seasonal pattern. The lowest cash prices of the year occur at harvest, and appreciate to reflect the cost of storage. Figure 2 shows the seasonal pattern for cash corn prices in central Indiana over two time periods of nine years each: average cash prices for the 1986/87 crop year through 1994/95 crop year, and the 1995/96 crop year through

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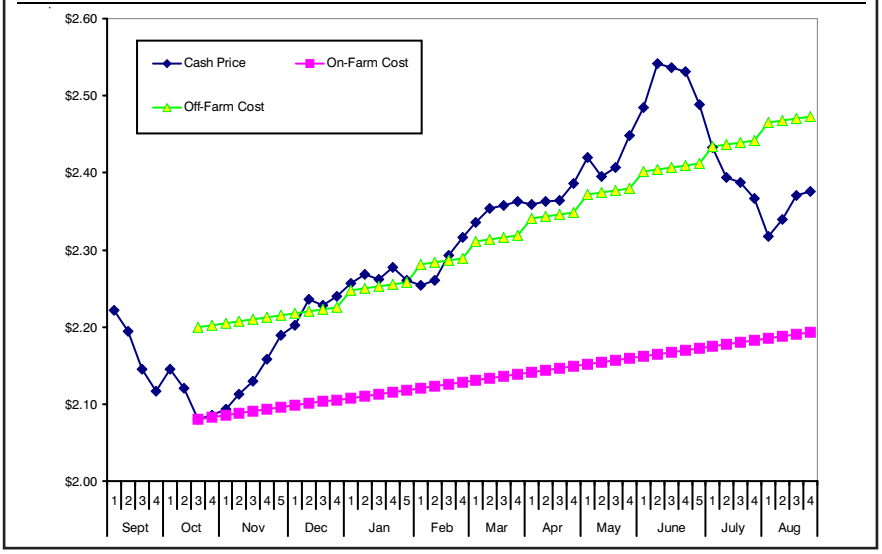
Figure 3. Central Indiana Cash Corn Prices for 1986/87 to 1994/95, With Estimates of On-Farm and Off-Farm Storage Costs



2003/04 crop year. In the more recent time period, cash prices have been roughly $0.15 higher on average than the earlier time period and notably, peak prices have occurred about a month earlier, during the first part of May instead of the middle of June. In the early period, average cash prices appreciated about $0.45 per bushel from harvest lows to spring/summer peaks. In the more recent period, cash prices increased roughly $0.30 to $0.35 between the harvest lows and spring peak prices on average. The larger increases in prices in the early period were associated with higher interest rates which increased storage costs.

Of course, the cost of storage must also be considered. Figures 3 and 4 show the average central Indiana cash corn prices, as well as estimates of on-farm storage and off-farm storage costs. The only cost considered for on-farm storage was the forgone interest on corn that could have been sold at harvest. For the interest rates, we use 6 month CD rates. The cost of off-farm storage is both the interest costs as well as commercial storage charges. For commercial storage charges, we assume $0.12 through January 1 and then $0.02 per month for 1986/87 through 1999/00. For 2000/01 through 2003/04, we assume $0.14 through January 1 followed by $0.025 per month.

One important observation is that the cost of off-farm storage often is about equal to anticipated storage returns. Consequently, over a series of years the storage costs may roughly equate to the price gain. With on-farm storage, producers *on average* have had a gross return of $0.20 to $0.25 above interest cost, and this return does not include the value to the producer of a) drying on-farm to avoid potential excessive commercial moisture deductions and b) gains in logistics efficiency at harvest time. This is the amount of return for the costs of on-farm storage functions which include: handling the corn an extra time, shrinkage, labor to check the grain condition, insurance on stored grain, utilities to run aeration fans and most importantly costs of storage bins and associated equipment. A recent study by Dhuvyetter et al. estimated that the annualized fixed cost associated with building a 25,000 bushel bin is $0.146 per bushel and the variable cost of operating the bin (i.e. conveyance, aeration, insecticide, labor and repairs) is $0.067 per bushel. Adding up these costs, building and operating a 25,000 bushel bin is estimated to cost about $0.213 per bushel per year. Of course these costs will depend on the size and cost of the bin, the price of corn and the cost of utilities, and if you are interested in building on-farm storage the references provide a useful guide.

Have storage returns changed between the two periods?

Figure 5 shows the average central Indiana returns to on-farm corn storage adjusted for the interest costs for 1986/87 to 1994/95 and for 1995/96 to 2003/04. In the more recent time period of 1995/96 to 2003/04:

- There has been an erosion of corn prices and storage returns in the month of December. Two possible explanations include the popularity of deferred pricing (DP) contracts where the producer delivers corn in December for January payment, and a lot of corn is sold for January delivery. Consequently, buyers are not as aggressive in bidding for corn in mid and late December due to the large volume of corn they expect to receive.
- The peak returns have come earlier in May vs. June, consistent with the seasonal corn price pattern shown Figure 2.
- The penalty for storing too long, i.e. past early May, has been much larger.

Figure 4. Central Indiana Cash Corn Prices for 1995/96 to 2003/04, With Estimates of On-Farm and Off-Farm Storage Costs

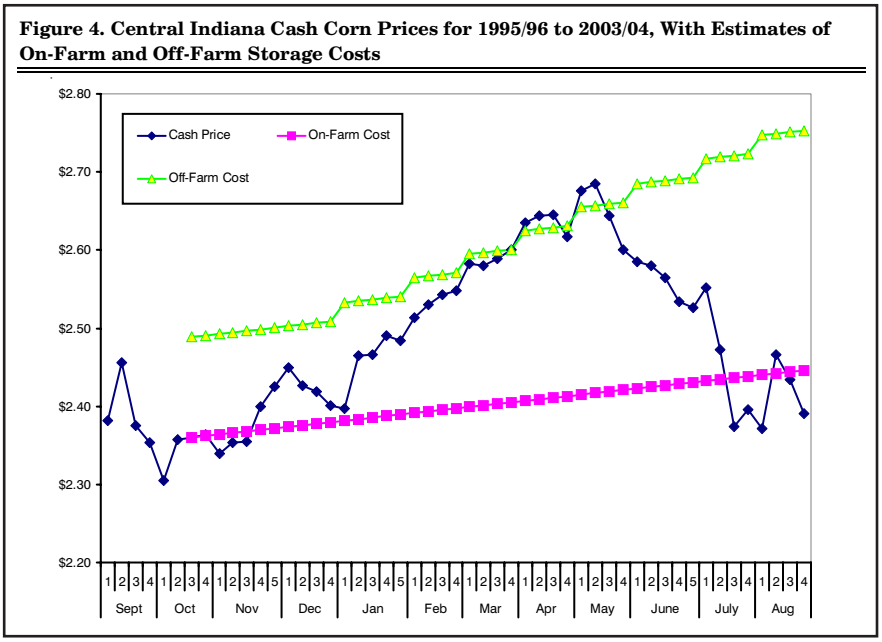
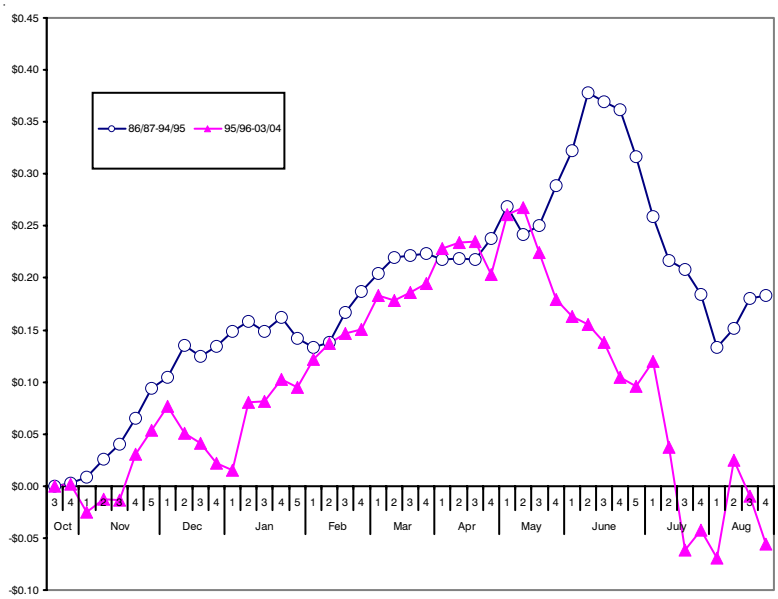


Figure 5. Central Indiana Returns to On-Farm Corn Storage Adjusted for Interest Costs.

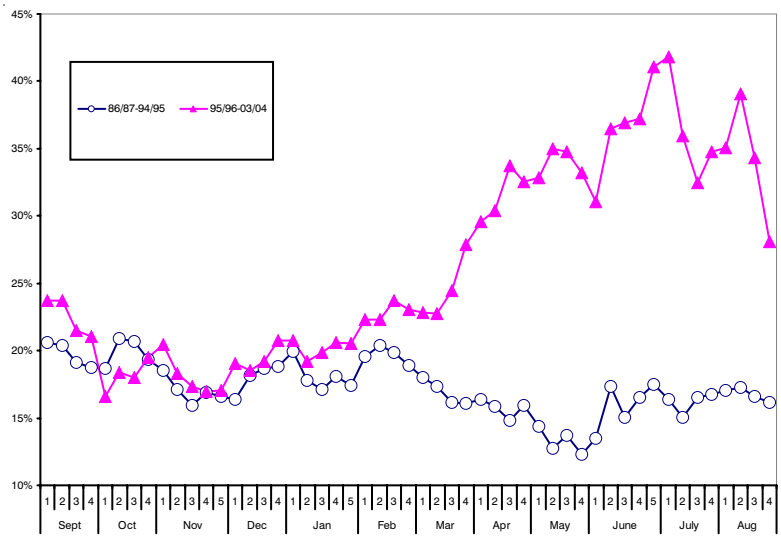


Corn Price Volatility

One note of caution with respect to storage returns regards the cash price volatility. While on average, storage returns have been somewhat similar between time periods, cash corn prices have been much more volatile recently. Figure 6 shows the average coefficient of variation, which is a measure of variability or volatility, of cash prices for each week during the marketing year for two time periods: 1986/87 through 1994/95 and 1995/96 through 2003/04. For the coefficient of variation, higher values mean that prices are more volatile and smaller values mean that prices are less volatile. Up to February, the volatility of cash prices is moderate and roughly the same between the two time periods. However, after February the cash corn price has become much more volatile in recent years. One explanation for the increased cash corn price volatility is the Freedom to Farm Bill which decoupled production decisions from government payments.

What does this increased volatility mean? Basically, you can expect positive storage returns on average, but they won't be consistent. Some years will offer positive returns and other years will have negative returns and there can be wide swings in those returns. Looking at the last six years, only the 2003/04 crop year offered positive returns the entire storage season (due to the short crop), and these returns were very large, up to $1.08 in the second week of April. Two of the crop years, 1998/99 and 2002/03, mostly offered negative returns to storage, and the other 3 crop years were mixed.

Figure 6. Central Indiana Cash Corn Price Volatility: Coefficient of Variation



Summary and Implications

There are three take-home messages from this analysis. First, if corn acreage in Indiana increases, then storage needs will correspondingly increase. Second, on average the cash market has provided $0.20 to $0.30 above interest costs for on-farm storage into April and May. Corn price seasonality has shifted with peak storage returns occurring earlier, now in May instead of June, and that the penalty for storing too long into the summer has become much larger. This means that producers should be wary of storing corn unpriced after May. Third, the volatility in on-farm corn storage returns has become much larger for producers storing past February, which means that price risk management has

become much more important. The authors are currently analyzing the returns to hedged storage (storing with corn priced in the futures market) as compared to speculative storage (storing for returns in the cash market), so look for this analysis in a future issue of the Purdue Agricultural Economics Report.

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Indiana's Poultry Meat Industry

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Kevin T. McNamara, Professor

United States per capita poultry meat consumption (broiler and turkey) has increased more than two fold over the past 30 years. The consumption of poultry meat products is expected to continue to increase. This increase in future consumption growth will continue to be supported by the poultry industry's ability to develop and market a variety of "ready to cook" and "ready to eat" products. The growth in consumption means industry growth, which translates into improved farm income in poultry producing states like Indiana. Increased poultry investment in Indiana will improve farm income through backward linkages to the farm. It will also add income and employment in the processing, marketing and distribution sectors of the industry.

Indiana's poultry meat industry includes the production and processing of the three most common avian species: broilers (young chickens), turkeys and ducks. In 2004, the total output of poultry meat products was estimated at 607 million pounds with an approximate monetary value of $475 million dollars (survey of Indiana Poultry Meat Firms). The value of output for the turkey sector was higher than that of the broiler and duck sectors. Poultry meat production was supported by six poultry meat firms, two firms representing each bird group. These firms are vertically integrated, i.e. the processor owns and controls several of the poultry meat production stages. The processor typically owns a hatchery, a feed mill, and grow-out houses where birds are raised and the facility where birds are slaughtered, processed and further processed.

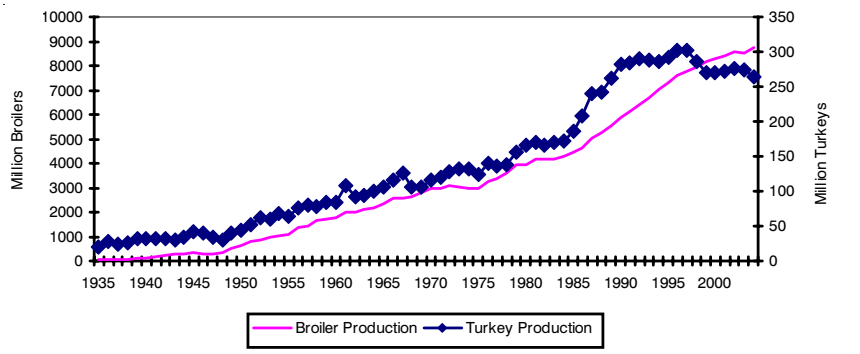
The Indiana poultry meat industry represents a source of employment, income generation, and national recognition to the state. In terms of employment, the industry paid salaries to 3,344 people involved in the administrative and processing side of the industry, and provided income to 596 contract farmers who raised the ducks, turkeys and broilers in 2004. The total income for production, processing and administrative employees totaled $150 million, with contract farmers receiving about 36% of the total income. Also, Indiana can boast about two national rankings: 1st in duck production, with the two Indiana duck companies producing 73% of ducks consumed in the U.S. (Ammeson), and 7th in the production of turkeys (NASS).

The purpose of this paper is to describe how the Indiana poultry industry operates. First the evolution from small enterprises to vertically integrated firms at the U.S. level is described. Secondly the different production stages and their coordination are explained. Thirdly the cost structure of the Indiana poultry meat industry is described. The varied final product mix of Indiana poultry products and their relevance to the American and world consumers is then discussed. Finally, an economic outlook of the Indiana poultry industry is presented.

From Small Enterprises to a Vertically Integrated Poultry Industry

The poultry meat industry has evolved from a barnyard enterprise to a highly specialized, capital intensive, well coordinated industry in less than 100 years. A century ago the poultry meat industry was almost nonexistent. Chicken meat was a byproduct of egg production. Hens that had outlived their fertility and any surplus roosters were slaughtered for their meat. The production of turkeys on the other hand was a seasonal enterprise that peaked around Thanksgiving time. In 1935, the U.S. production of

Figure 1. Turkey and Broiler Production in the U.S.



Source: ERS, USDA.

turkeys and broilers was estimated at 20 and 42 million birds respectively. It was the red meat rationing during World War II that provided a major thrust for the poultry industry (Martinez and Stewart). The production of poultry meats increased to fill the protein need of the American people. By 1960, the production of turkeys and broilers had increased to 84 million and 1.8 billion birds. Presently, turkey production in the U.S. stands at 264 million birds (7.3 billion pounds) while broiler production at 8.7 billion (45.8 billion pounds) (Figure 1).

After World War II, the poultry industry followed two major tendencies: poultry farms and processing plants became fewer and larger, and production and processing stages became more coordinated (Ollinger et. al.; Martinez; Lasley; Lasley et.al.). There were several technological advances that permitted an increase in the size of poultry farms to achieve economies of size, i.e. lower production costs per bird at larger production levels. Improvements in disease control enabled flocks to be grown in confinement. New feed formulations allowed improvements in feed efficiency. Several equipment innovations resulted in labor and cost savings including: automatic feeders and ventilation equipment. Genetic research also allowed the development of poultry breeds with good meat characteristics and improved feed conversion (Martinez). In 1954 there were no farms that sold 100,000 or more broilers in the U.S., but by 1964 these represented about 12.5% of total broiler farms, and by 2002 these had increased to approximately 60% (Agricultural Census Reports).

There were also introductions of high-speed processing equipment in processing plants that allowed a higher throughput at lower costs which resulted in increases in plant size. The increasing importance of larger processing plants in the manufacturing of finished poultry meats can be seen by their share of total industry output (Table 1). In 1967, large chicken slaughtering plants (more than 400 employees) produced about 29% of total output. By 1992, this had increased to 88%. Similarly, for the turkey slaughtering and processing plants, bigger facilities were responsible for the bulk of finished poultry meats in the U.S. (Lasley et.al.).

Prior to the 1950's, poultry growers acted independently: buying chicks and poults (young turkeys) from a private hatchery and feed from a feed dealer. When birds had achieved an appropriate weight, these were sold to the processor that offered the best price. As production expanded, larger capital investments were necessary to build the facilities to raise birds. Large financial requirements coupled with fluctuations in the price of marketable birds due to spot market pricing made poultry production a risky business. At the time, large feed companies became interested in the poultry industry as an important market for their feed. These companies extended credit to ease the grower's capital constraints. Feed companies also made contractual arrangements with the growers for them to buy their feed, and in exchange the feed companies would buy their

Table 1. Share of Total Industry Value by Large Poultry Slaughtering and Processing Plants

Census Year	Chickens	Turkeys	Poultry Processing
1967	29%	16%	-
1972	34%	15%	41%
1977	45%	29%	51%
1982	65%	35%	53%
1987	76%	64%	65%
1992	88%	83%	71%

Source: Ollinger et.al.

production at a guaranteed price. Most growers favored the use of contracts with feed companies. By 1955, about 88% of broiler production was already being produced under this type of contractual arrangement. Feed companies continued to become more directly involved in the poultry business by acquiring their own hatcheries and processing facilities. In the 1970's though, depressed poultry prices and high input costs made some feed companies exit the poultry industry. Processors were in the best position to assume control of the linked poultry production stages and thus became the principal integrators or owners of poultry firms (Martinez; Ollinger et. al.)

Poultry Production Stages and their Coordination

Nowadays most poultry meat firms, including the six operating firms in Indiana, function under a similar organizational arrangement: the processor owns and controls most of the production stages and makes contractual arrangements with individual farmers for the raising of birds. The processor is also referred to as the integrator of the production stages for the poultry operation. Following is a description of the distinct stages for the production of poultry meat supplemented with Indiana information (Figure 2):

➤ Primary Breeders

Primary breeders are responsible for maintaining pure blood lines and developing cross-bred blood lines of broilers, turkeys and ducks. Each line of birds has different genetic characteristics. To provide an adequate gene pool for future desirable characteristics, several diverse lines of birds need to be maintained. *Both duck firms in the state have their own primary breeding flocks.*

➤ Replacement Farms

The day-old chicks which are bought from the primary breeders are raised in the replacement farms. In these farms, birds are kept until they reach the age of sexual maturity. These mature birds are known as "parent stock". Historically, broilers, turkeys and ducks raised for meat consumption have had white feathers. The white feathers give birds a cleaner look when raised indoors and any white pinfeathers look less unappetizing if the birds are not completely plucked at the time of slaughter (Bugos). *Indiana processing firms may own replacement farms or may contract with independent farmers.*

➤ Breeder Farms

Sexually mature birds from replacement farms are moved to breeder farms. Male and female birds are kept together for the production of fertile eggs from which the commercial broilers, turkeys and ducks (fifth generation birds) will hatch. *Indiana processing firms may own breeder farms or may contract with independent farmers.*

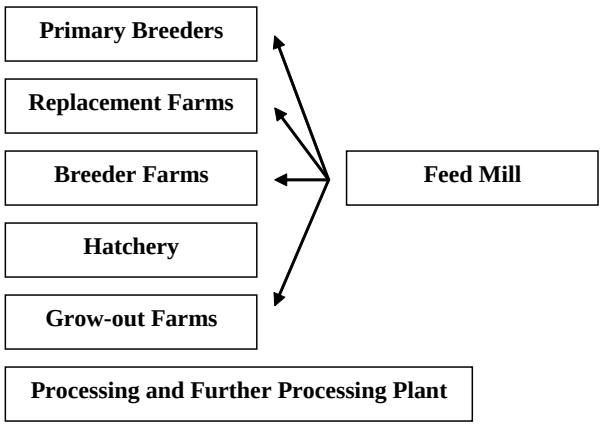
➤ Hatchery

The hatcheries are typically owned by the processor. Fertilized eggs obtained from breeder farms are sent to the hatchery. Eggs are placed in large-scale incubators. At the time of hatching, chicks (one-day old broilers), ducklings (one-day old ducks) and poults (one-day old turkeys) are vaccinated and prepared for transport to the next stage. The respective hatching times for broilers, ducks and turkeys are 21, 28 and 28 days. *Each of Indiana's six meat producing firms has at least one hatchery.*

➤ Grow-out Farms

Grow-out farms raise the newly hatched birds up to market weight. The market weight for all birds may vary, yet the typical weights of live broilers, ducks and turkeys are 3, 6 to 7, and 38 pounds (tom turkeys) respectively. *In the state of Indiana, there are more than 400 grow-out farms which supply the processors with birds that have reached the adequate market weight. These grow-out farms are typically*

Figure 2. Stages of Poultry Meat Production



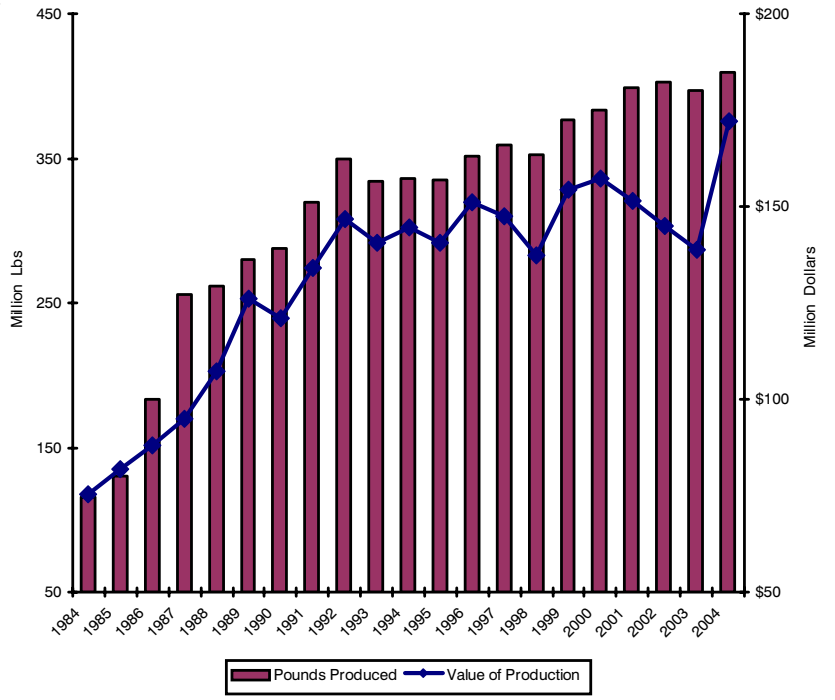
within a 30 mile radius of the processor. Duck production occurs in the northeast region of the state, turkey production is centered in the southwest region, and broiler production occurs in the southeast and northeastern counties.

Official data for duck and broiler production in the state are not published to avoid disclosure of the activities of individual firms. The production of turkeys on the other hand is monitored by Indiana Agricultural Statistics. Figure 3 shows the production volume and farm gate value of turkey production in the state. In 1984, approximately 116 million pounds of turkey (6.3 million turkeys) were produced in the state. By 2004, production had increased by 253% to 410 million pounds (13.3 million turkeys). The increase in poundage has occurred due to an increasing number of turkeys raised in the state and mostly because of the ever increasing body weight of turkeys. With bigger turkeys, processors are able to glean more meat with fewer birds. The farm gate value for turkeys raised in Indiana in 2004 was $172 million.

➤ Feed Mill

A feed mill operation is responsible for the formulation of the different feeds utilized during the distinct stages of production. Each feed mill has a grain receiving operation, an ingredient storage area, a mixing system and a pellet-making operation. Corn and soybean meal are the main feed ingredients, with the addition of nutritional supplements such as amino acids, macro and micro minerals. *In 2004 about 17 million bushels of corn and the equivalent to 184,000 tons of soybean meal were used in Indiana as feed ingredients for the production of poultry. This is equivalent to 1.8% of corn and 3% of soybeans produced in the state in 2004. Five poultry meat firms in the state own their own feed mill.*

Figure 3. Indiana Turkey Production (Lbs) and Its Monetary Value



Source: Indiana Agricultural Statistics

➤ Slaughter, Processing and Further Processing Plant

After birds have reached a marketable weight, these are hauled to the processing plant. At the processing plant, birds are slaughtered, de-feathered, eviscerated, trimmed and chilled through an automated system. The main outputs of processing are edible and un-edible bird parts. Heads, some of the feathers, blood, and inedible viscera (also known as inedible offal) are sent to a private rendering plant which grounds and cooks the poultry residues to manufacture poultry fat and meal for animal feed. Duck feathers are also dried, processed, and baled for sale in the production of coats and comforters. Some of the turkey feathers are also sold. The edible meat may be packaged as whole carcasses, cutup parts, de-boned meat, or sent to a further processing operation. At a further processing operation, poultry meats become the primary ingredients for ready-to-cook or ready-to-eat products such as chicken nuggets, marinated duck meat, stuffed breasts, and turkey sausages. Final processed products are then distributed to the different markets: retail stores, food service institutions, further processors and exports. *Each Indiana poultry meat firm owns its own processing/further processing facility. Even though processing facilities are highly mechanized, the processing of poultry meats is labor intensive. This production stage accounts for the majority of employment in the industry.*

The processor or integrator typically has ownership of the breeding stock, hatchery, meat

birds from the time they are hatched until they are slaughtered and marketed, the feed mill and most other minor inputs. This allows the processor to be able to develop and produce birds that meet the specific market needs, and to more effectively control the quantity, quality and cost of birds to be processed. Because of high investments required to construct and maintain breeder farms, replacement farms and grow-out farms, it is common for processors to contract with individual farmers located in the vicinity of the processing plant to raise the birds. Under a typical contract, farmers agree to provide housing, equipment, labor, utilities and litter material to grow the birds. The processor on the other hand agrees to provide the farmer with one-day old birds, feed, medicine, expert supervision to monitor farmer operations, and a pre-established payment per pound for live birds including a bonus or penalty dependent on relative performance to other contract growers (Ollinger et al.) Through this contractual arrangement, the processor always has control over the birds to be processed. Poultry meat supply can either be increased or decreased by the number of birds that are placed in grow-out farms.

Cost Structure of the Indiana Poultry Meat Industry

This section describes the cost structure of the Indiana poultry meat industry. Data was obtained from a survey administered to the 6 poultry firms in the state. The data represents the cost structure of the poultry industry at the processor level.

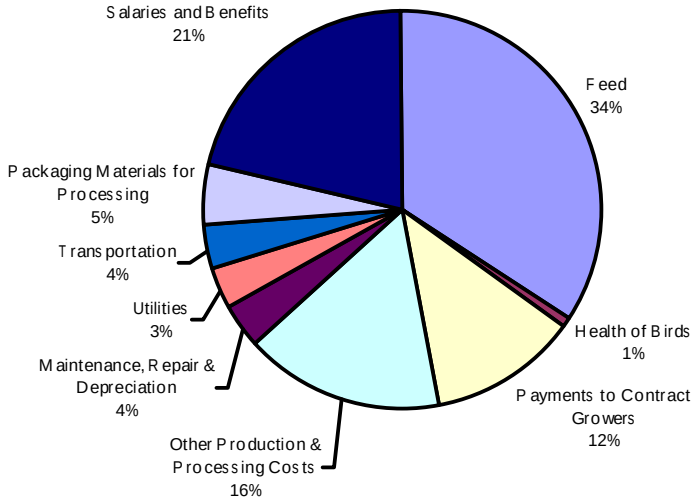
The cost structure of the Indiana poultry meat industry is presented in Figure 4. Three inputs represent 66% of the total cost of poultry meat production. The highest cost to the processors is the feed, representing about 32% of total cost. Besides corn and soybean meal, other minor ingredients such as meat and bone meal, bakery meal, distiller's grain, amino acids, macro and micro minerals are purchased to compliment the feed. Any price increases in feed ingredients would have a major effect on the cost of producing poultry products. A 10% increase in corn and soybean meal cost would represent and extra expense of $8 million to the poultry meat sector. The second highest cost category is the salaries and employee benefits paid to administrative and processing personnel representing 22% of total costs. In 2004 the poultry meat industry had 3,344 employees and paid salaries of approximately $96.3 million. The average income for each employee was $28,809. And the third cost category is payment to contract growers which represents 12% of total costs. A total of 596 contract farmers were paid $53.7 million in wages.

Packaging of poultry meats is important to maintain the integrity of the final poultry meat products throughout the supply chain. Packaging (paper and plastic) represents 5% of total cost. Transportation costs, either by company owned vehicles or contracted transportation services, and the maintenance, repairs and depreciation of facilities represent 4% each of the total costs. Utilities and the cost of pharmaceuticals and contracted veterinarian services represent 3% and 1%. Other production and processing costs which may include condiments and other meats used in further processing, insurance, purchase of breeding stock, office supplies, processing personnel supplies, sanitary and cleaning supplies, marketing expenses, property taxes and insurance represent the remaining 17% of total cost.

Indiana Poultry Meat Products for the Domestic and International Market

The varied product mix of Indiana duck, broiler and turkey

Figure 4. Cost Structure of the Indiana Poultry Meat Industry



Source: Survey of Indiana Poultry Meat Firms

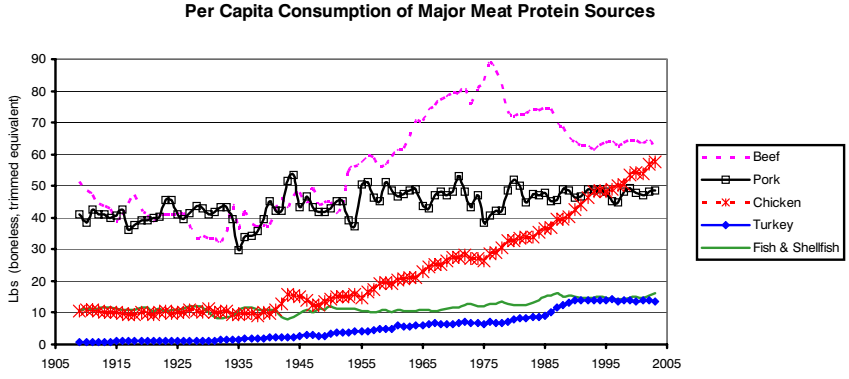
Table 2. Product Mix for Poultry Meat Processors in the State

Ducks	Broilers	Turkeys
- Whole duckling (w/o marinade) - Bone-in parts: whole leg, breast quarter - Boneless breast (w/o skin) - Giblets - Livers - Tongues & Feet *Further Processed Products* - Duck sticks - Pre-cooked and marinated breast filets, whole legs and fully cooked, ready to eat half ducks	- Whole broilers - Cut-up parts: breasts, thighs, drumsticks, leg quarters, wings *Further Processed Products* - Lemon-pepper rotisserie chicken - Chicken cordon bleu - Chicken with broccoli and cheese - Breaded chicken parts - Flavored, seasoned chicken parts	- Fresh/Frozen whole turkeys - Cut-up parts: breast, tenderloins, thighs, wings, drums, scapula, breast skin, wing tips, tails *Further Processed Products* - Ground turkey - Turkey sausages - MST – mechanically separated turkey

processors is destined for either the domestic or export markets. The U.S. market has a general preference for the white meats, while the dark meats are preferred by consumers of foreign markets. White meat is obtained primarily from breast meat, while the dark meat is obtained from the bird's drums, thighs, de-boned meat, whole legs and leg quarters. Table 2 lists the varied product mix by species of poultry meat processors in the state of Indiana. Besides whole birds and cut-up parts, the industry is also involved in further processing the meats to obtain products that are "ready to cook" and "ready to eat".

Domestically, consumption of poultry meat products, unlike beef and pork, has been increasing. In 1960 the per capita consumption of broiler and turkey meat (in boneless, trimmed equivalent) stood at 19.1 and 4.9 lbs. By 2003, per capita consumption for both poultry meats had nearly tripled (Figure 5). It is estimated that Americans consumed about 71.6 pounds of poultry meat (on a boneless, trimmed-weight equivalent basis) of which 57.5 pounds were broiler meat, 13.7 pounds were turkey meat and 0.34 pounds were duck meat (ERS).

Figure 5. Historical Per Capita Consumption of Meats in the U.S.



Source: ERS

There are several factors that have caused an increase in the consumption of poultry meats. First of all, the market for meats in general has increased due to increases in the U.S. population and the rising of disposable incomes due to increasing two-income households. Another important factor is the lower real prices for poultry products at retail level, resulting in lower relative prices compared to other meat groups. This has occurred due to gains of production and marketing efficiency brought about by the cost reducing technologies adopted by poultry farms and processors, in addition to the vertical integration of the feed, hatchery, breeding and processing stages (Martinez; Lasley, Henson and Jones.; Lasley et.al.). After adjusting for inflation, consumers paid less than 40% for poultry meat products in 2002 than what they paid in 1960 (Figure 6).

Poultry meats have also been marketed as healthier meat alternatives, such as having lower saturated fat content than beef (Ollinger et. al.). The poultry industry has also catered to the desire for convenience of the American consumer. Cut-up poultry meats were meant to save cutting time, cooking time and poultry waste for retailers and end consumers (Lasley). Further processed poultry products, such as ready-to-cook and ready-to-eat poultry products which include rotisserie chicken, turkey hams, pre-cooked and pre-marinated duck legs, and sausages are also available for consumers. Consumption of poultry products that cater to convenience are on the rise, with cutup parts being an important segment of how broilers are marketed (Figure 7). In 2004, further processed products

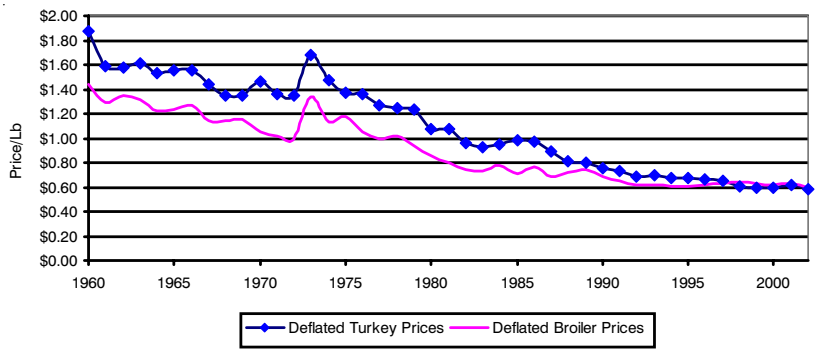
represented about 50% of total broiler meat marketed in the U.S., followed by cut-up parts at 42% and whole birds as 8%.

There has also been a marketing push by fast food restaurants, such as Chick-fil-A which continually introduce new chicken menus, and other restaurants that have recently started offering diverse chicken and turkey meals in their menus. For broiler meat consumed in the U.S., about 42% is marketed through food service institutions, of which 60% is accounted for by fast food restaurants.

About 72% of turkey meat consumed in the U.S. is marketed through retail stores and 28% is destined for the food service sector. Consumption of turkey meat has also been on the rise and is not just for Thanksgiving anymore. Similar to the broiler industry, diversified value added products can now be purchased year round.

Dark poultry meats are exported to foreign markets. Of total U.S. production, about 16.4% of broiler meat, 8% of turkey meat and 10.4% of duck meat were exported in 2004. Historical export quantities of broiler and turkey meat are presented in Figure 8. From 1990 to 2003, total exports of broiler and turkey meat has almost quintupled from 1.2 billion pounds 5.3 billion pounds. This increase in exports has occurred due to competitively priced, high quality U.S. products and income increases in the importing countries (Salin et.al.). Most of the poultry exports are destined to Russia, Mexico, Japan, Canada, China, Hong Kong, Taiwan, Latvia and Estonia. In 2004 avian disease outbreaks in a number of states restricted total poultry exports by 3% (Blayney) Countries such as China, Hong Kong, Japan and South Korea banned imports of U.S. poultry meats. This year export restrictions have been lifted.

Figure 6. Deflated Retail Prices for Poultry Meats



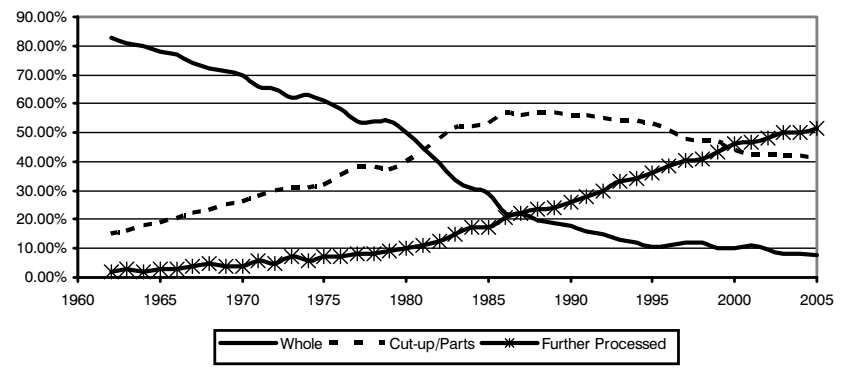
Source: ERS, USDA. Prices deflated by CPI 1982-1984 = 100.

Outlook for the Indiana Poultry Meat Industry

Domestic consumption of poultry meat products is forecasted to continue growing (Blayney). Assuming no future bans on U.S. poultry meat exports due to avian diseases, exports of poultry meats are also expected to continue to rise due to the economic development of U.S. trading partners (Salin), and the opening of new markets due to free trade agreements, including the recent free trade agreement with the Dominican Republic and Central America (DR-CAFTA). The increase in demand of poultry meats will drive the increase in supply of poultry meat products.

The increase in demand offers great opportunities for Indiana processors. Indiana processors have the capacity to expand production and supply part of the increasing demand for poultry meat products. Two factors give the Indiana poultry meat industry a comparative advantage over other states: feed and market access. Indiana offers low cost feed ingredients such as corn and soybeans. Feed represents 32% of the total cost of producing and processing meats. Any savings on feed has a relatively large weight on production costs. The second

Figure 7. Historical Marketing of Broiler Products



Source: ERS, USDA

advantage is market access. Indiana processors are close to major urban areas such as Chicago, Detroit, Louisville, St. Louis and Indianapolis, with an efficient transportation system to distribute their products to the eastern U.S. markets. With increasing fuel prices, Indiana processors will face lower distribution costs than producers located farther away from major markets. There is also excess capacity by the industry that can be taken advantage of as the demand for poultry meat products continues to increase. Indiana's poultry meat industry will continue to play an important role in the supply of high quality duck, broiler and turkey meat products to the American consumer.

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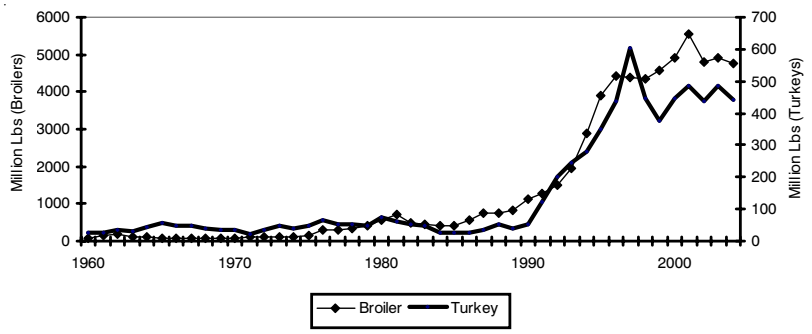
Figure 8. U.S. Broiler and Turkey Exports



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