4. Structural Change: Plant Operations and Locations

Many factors contributed to the growth in poultry plant size over the 1963-92 period. Bugos, Lasley et al., and others cite historical evidence that poultry contracting led to the production of high-quality, uniform-size chickens that could be processed into chicken traypacks, whole broilers, and cut-up and deboned poultry at high rates.

Higher quality birds, combined with a shift in consumer tastes favoring greater poultry consumption, led to a host of new products, ranging from chicken nuggets to chicken traypacks and deboned chicken. Production of the new raw products generally took place in slaughter plants, which added cut-up and processing lines to the end of existing slaughter lines. Further-processed products, e.g., poultry sausages, luncheon meats, and other cooked or otherwise processed raw poultry, were sometimes produced in slaughter plants, particularly for turkeys, but were usually produced in independent plants that received raw poultry from slaughter facilities.

Traditionally, turkey plants faced highly seasonal demand with most production occurring in the last quarter of the year. The shift in consumer tastes toward greater year-round turkey consumption, however, permitted turkey plants to stabilize production, and, thus, avoid production cutbacks and expansions. Generally, stabilizing production rates would be expected to lower production costs because plants would be able to avoid the costs of hiring, training, and laying off employees and starting up and shutting down facilities.

Competitive forces required poultry plants to seek locations that had access to low-cost grain and had optimum climatic conditions, the key inputs to raising poultry, because live-bird inputs comprise the biggest production cost for poultry producers. For chicken production, the low-cost region turned out to be the Southeastern States, where grain costs were relatively low and environmental conditions were ideal. For turkey production, the low-cost regions were the North and South Central States.

In this chapter, we discuss grower contracts, detail the shifts in input and product mixes, investigate the seasonality of turkey production, examine geographic production areas, and consider worker wages. The impact of changes in input and product mixes and production seasonality on plant costs is assessed in later chapters.

Grower Contracts

Bugos et al. argue that the development of specialized poultry breeds and improved feeds, veterinary services, and medicines after World War II greatly reduced the costs of raising chickens and led to the growing of chickens under contract in large confined chicken houses. During the 1950's and early 1960's, it was mainly the feed dealers, seeking to increase the volume of their business, who encouraged contracting. They used contracts to extend credit to growers who suffered financial losses after a bad production batch. Eventually, contracting came to dominate the broiler sector, but under a slightly different framework.

Low-cost chicken production requires a large supply of uniform-size birds. These requirements for birds could be met by the large automated chicken-growing facilities coming on stream in the late 1950's and early 1960's only if growers increased capital investments; incurred substantial short-term financing costs for feed, medicines, chicks, poults, and other inputs; and refined their management skills. Under these high-risk conditions in which a bad batch could easily bankrupt a chicken farmer, growers could be reluctant to undertake chicken farming in the absence of coordinated relationships and cause insufficient chicken supplies for slaughter plants.

In the vertical coordination framework of poultry contracting, integrators accept much of the risk of poultry growing in exchange for greater control over both the quality and quantity of the birds. The usual terms of the contract are such that the integrator provides growers with chick or poult hatchlings and feed from integrator-owned hatcheries and feed mills, and veterinary services, medication, part of the fuel, some litter, and field supervisors to monitor operations. Ownership of the breeding stock, chicks and poults, and most other inputs enables an integrator to develop poultry breeds specifically to meet its market needs and to better control bird production quantities, quality, and costs. The contract grower provides housing, equipment, labor, water, and all or part of the fuel and litter.

Integrators establish contracts with numerous growers, usually located within 20 miles of the plant, who raise the birds until ready for shipment. Integrators control their poultry supply either by increasing or decreasing the number of chicks or poults they place for "grow-out." They may also drop growers in the event of a

market downturn. Growers located the farthest from either the slaughter plant or the feed mill face the greatest possibility of being dropped because of higher transportation costs to or from the manufacturing plant.

In their contractual relationship with growers, integrators usually agree to pay a pre-established fee per pound for live broilers plus a bonus or penalty for performance relative to other growers. This performance bonus is based on the difference between the actual grower settlement cost and the average settlement costs of all growers harvesting their flocks at that time. The total grower payment is a function of the number of chicks placed at a grower, kilocalories per unit of feed provided, and the live pounds at harvest, and is determined mainly by the feed-conversion ratio and losses due to disease or environmental conditions.

Knoeber and Thurman (1996) reason that growers make major investments in poultry housing and other facilities, with little ability to either diversify or control all outcomes, thereby exposing themselves to: exogenous risks from increases in broiler and feed prices, adverse weather, and other factors; chicken management risks arising from grower decisionmaking; and supply and demand risks due to consumer market turns. Integrators, on the other hand, are owned by investors who are able to reduce their risk by holding a diversified portfolio of investments. These different capacities to mitigate risk provide the opportunity for a contractual relationship in which the party best able to bear a type of risk accepts it.

Using well-accepted economic theory, Knoeber and Thurman argue that integrators take on broiler and feed price risks by designing contracts in which only chicken yields and not broiler and feed prices matter in the calculation of the grower bonus, suggesting that the variable part of grower payments depends only on production outcomes and not on input and output prices. Additionally, integrators bear common uncontrollable (exogenous) production risks, such as weather, by basing grower payments on chicken yields relative to other growers.[9] Chicken growers, on the other hand, bear production risks arising from their own discretionary management decisions. The integrator bears all of the risks of a short-term price change affecting feed and broiler prices. Supply and demand risks are borne by both the integrator and the grower. The integrator risks reduced output, and the grower bears the risk of not having his contract renewed.

Knoeber (1989) uses economic theory to assert that grower contracts may be a superior organization form over spot-market purchases because there are very few growers and very few integrators, giving rise to a lot of uncertainty over the supply and demand of live chickens. Williamson (1983) argues that, under these conditions, contracts are needed to reduce the threat of either a lost market for live chickens for the grower or an insufficient supply of live chickens for the integrator. The contract, however, could be either with integrator-employees on integrator-operated farms, i.e., a single plant with plant-owned farms, or with nonemployee contractors.

Williamson (1983) asserts that rapid productivity changes and the potential effect of exogenous shocks, such as temperature changes, lead to a high degree of outcome uncertainty, suggesting that company-owned farms would dominate production. However, the grower-contract form dominates in the chicken industry.

Knoeber (1989) explains that contracts that require the grower to provide costly housing strongly discourage poor performance by creating a bond with the integrator in which there is a self-selection of high-quality growers, i.e., only a grower who is confident of growing chickens profitably will incur the necessary capital costs. For the grower, integrator compliance with the contract is ensured because cheating any single grower leads to higher bonus payments to other growers and no greater remuneration to the integrator.[10] Additionally, since all growers are compensated with the same formula, the integrator must offer all growers the contract terms demanded by the highest cost grower in order to obtain sufficient bird inputs.[11]

[9] Presumably, regional disease outbreaks and temperatures affect growers similarly, suggesting that weight gains (losses) due to these factors should be similar for all growers and thus would not be considered in the bonus payment.

[10] A lower payment to one grower in a tournament in which growers compete for the same pool of money regardless of payment to any single grower means that other growers receive higher payments than they would otherwise obtain.

[11] Contracts with consistently poor-performing growers, like a poorly performing employee, would likely be terminated. However, contract termination for arbitrary reasons appears unlikely because such measures would discourage new growers from making an investment in bird-growing facilities unless the contract terms offered ample payments for arbitrary integrator decisions. Since the same contract would have to be offered to all growers, arbitrary terminations would likely lead to higher bird-contracting costs for the integrator.

Table 4-1 Grower-contract production dwarfs integrator-owned production in chicken, but not in turkey, slaughter[1]

Year	Coordinated chicken				Coordinated turkey			
	Integrator-owned	Grower-contract production	Grower-contract marketing	Total	Integrator owned	Grower-contract production	Grower-contract marketing	Total
	Percent							
1955	2.0	87.0	1.0	90.0	4.0	21.0	11.0	36.0
1960	5.0	90.0	1.0	96.0	4.0	30.0	16.0	50.0
1965	5.5	90.0	1.5	97.0	8.0	35.0	13.0	56.0
1970	7.0	90.0	2.0	99.0	13.0	42.0	18.0	73.0
1975	8.0	90.0	1.0	99.0	20.0	47.0	14.0	81.0
1977	10.0	88.0	1.0	99.0	28.0	52.0	10.0	90.0
1980	n.a.	n.a.	n.a.	n.a.	28.0	52.0	10.0	90.0
1982	12.0	87.0	0.0	99.0	28.0	54.0	8.0	90.0
1990	n.a.	n.a.	n.a.	n.a.	28.0	55.0	5.0	88.0
1994	14.0	85.0	0.0	99.0	32.0	56.0	5.0	93.0

n.a. = not available.
[1]Integrator-owned is poultry that is raised by the integrator. Production contracts are contracts in which the integrator provides the chicks or poults, feed, etc. to the grower who owns the building and manages the flock during their grow-out period. Marketing contracts are agreements in which a grower agrees to sell an entire batch of live birds to a slaughter plant. The grower provides his (or her) own chicks or poults, feed, and other inputs.
Source: George B. Rogers, "Poultry and Eggs," in *Another Revolution in U.S. Farming?* Ed. by Lyle P. Schertz, ERS, USDA, AER-441, 1979; Manchester (1999).

Turkey slaughter plants also developed integrated supply networks, but not to the same extent as chicken slaughter plants. Table 4-1 illustrates the degree to which contract production and owner-integrated production co-exist in the United States. The interior cells show that 14 percent of chickens and 32 percent of turkeys were grown on integrator-owned farms in 1994.

Table 4-1 also shows that, as early as 1955, about 90 percent of all chickens were purchased under grower contracts, but that only about one-fifth of turkeys were purchased in this fashion, and that grower contracting in turkey production more than doubled between 1955 and 1977.[12] Knoeber (1989) attributes differences in the extent of contracting for chickens and turkeys to the number of growers participating in compensation tournaments. He suggests that turkey production requires fewer growers, making a compensation scheme based on performance relative to average production less workable. Unfortunately, data limitations prevent us from exploring this hypothesis.

[12] Alden Manchester (personal communication) points out that contract production can occur in which there are very few growers. For example, a *Turkey World* magazine article points out that two growers supply all the turkeys to an integrator in South Carolina.

Input and Product Mix

Increased line speeds permitted huge increases in average plant size for both chicken and turkey integrators, but required millions of uniform-size birds. Since the integrated form of production and automated slaughter systems were well established by the 1960's (Bugos et al.), there were only modest changes in the composition of bird inputs, i.e., live chickens versus live turkeys or unprocessed chicken meat, after 1967 (table 4-2).

In contrast to bird inputs, poultry output changed dramatically after 1960 as poultry consumption soared and product type shifted from primarily whole birds to poultry traypacks, semi-prepared chicken parts for use in restaurants, chicken nuggets and patties, and other poultry products. These demand changes led to a major shift in plant product mix, with processed chicken output (chickens in Styrofoam traypacks and further-processed products) as a share of total output more than doubling (table 4-3) and cut-up and deboned chicken as a share of total chicken output climbing by 300 percent (table 2-2) over the 1967-92 period. Over the same period, further-processed turkey products as a share of output more than doubled (table 4-3) and cut-up and deboned turkey as a share of total output rose by 700 percent (table 2-2).

Large chicken slaughter plants produced about six times as many consumer traypacks as a share of output than did their middle-size competitors in 1972 and about three times as much in 1992 (table 4-4), suggesting that there may be economies-of-scope in traypack production.[13] We further examine this issue in chapter 6. Table 4-4 also indicates that traypacks as a share of chicken production dropped in large plants but that the average volume of traypacks per plant rose.

[13]Economies of scope are said to exist when a plant produces two or more products at a lower cost than if those products were produced separately in single-product plants.

Table 4-2: Both chicken and turkey slaughter plants specialize in one primary bird species

Census year	Liveweight chicken inputs in chicken industry	Liveweight turkey inputs in turkey industry
	Percent of pounds of total meat inputs	
1967	83.0	93.8
1972	96.5	97.6
1977	95.7	97.2
1982	99.6	98.7
1987	99.9	99.9
1992	99.0	100.0

Source: Longitudinal Research Database, U.S. Dept. of Commerce, Bureau of the Census.

Presumably, bulk cut-up and deboned chicken as a share of chicken output rose as chicken traypacks declined because of increased exports to Russia and a surge in shipments to plants that produce ground chicken, nuggets, and other processed chicken.

Like the large chicken slaughter plants, large turkey slaughter plants produced substantially more further-processed products than their smaller competitors (table 4-5). One plausible explanation is a desire to fill excess capacity with nonseasonal products. The increase in turkey parts and further-processed turkey occurred in both large and medium-size plants and mirrored a shift in consumer demand.

Seasonality

A major production problem for turkey slaughter plants prior to the 1970's arose from the seasonality of demand due to the much higher consumption during the end-of-the-year holiday season than during other parts of the year. Since turkey is a perishable product, seasonality of demand means that production also has to be seasonal, which would require excess plant and grower capacity during much of the year. This excess capacity normally implies higher production costs and should encourage plants to try to balance production

Turkey industry marketing programs led to the introduction of turkey traypacks and luncheon meats and other further-processed products. This, combined with

Table 4-3: Slaughter plant product mix requires fewer whole birds as it becomes more complex

Product mix	1963	1967	1972	1977	1982	1987	1992	1997
				Percent of total slaughter production				
Poultry in Styrofoam traypacks								
Chicken	n.a.	n.a.	13.9	15.8	20.5	24.2	21.9	24.3
Sausage, lunch meat, and other further-processed products (from cut-up, deboned, or whole birds)								
Chicken	n.a.	n.a.	2.7	2.1	5.1	6.5	9.6	11.4
Turkey	n.a.	n.a.	10.4	14.6	19.3	16.2	22.2	20.6
Bulk domestic: Cut-up, deboned, and whole birds in large containers								
Chicken	97.4	98.9	82.3	78.7	69.9	64.6	60.8	46.0
Turkey	97.7	97.4	87.7	82.7	78.7	82.9	73.6	68.2
Bulk export: Cut-up, deboned, and whole birds in large containers								
Chicken	2.6	1.1	1.1	3.4	4.5	4.7	7.1	18.3
Turkey	2.3	2.6	1.9	2.7	2.0	0.9	4.2	11.2

n.a. = not available.
Sources: U.S. Dept. of Commerce, Bureau of the Census, Longitudinal Research Data Base, 1963-97; U.S. Dept of Agriculture, Economic Research Service, *United States Egg and Poultry Statistical Series, 1960-90,* 1991; National Turkey Federation and the National Chicken Council for 1992 and 1997 raw bird processing data.

increased poultry consumption due to health concerns and declining prices, enabled turkey producers to reduce production seasonality. Table 4-6 illustrates these changes for four major animal slaughter industries. Using a ratio of production workers in the first quarter to production workers in the last quarter of each year from 1963-92 as a measure of seasonality, the table shows that production schedules were approximately in balance for cattle, hogs, chickens, and poultry processing. There was a sharp change in seasonality for turkeys, however, rising from 0.38 in 1963 to almost completely in balance in 1992.

Lasley et al. (1983) assert that the shift to a more balanced production schedule required very little expansion of existing facilities and resulted in higher annual capacity utilization rates. Greater in-plant processing, however, required plants to either add cut-up and processing operations to the end of existing production lines or build entirely new processing facilities. As we later see, turkey slaughter plants chose both options.

In terms of production costs, higher capacity utilization means that greater output can be produced with existing equipment. Additionally, the integrated poultry system relies on a continuous flow of young turkeys for lowest cost production, meaning that if growers have excess capacity for much of the year, they would likely demand a premium price for stopping and starting their growing operations. Similarly, workers would likely demand a wage premium as compensation for working only on a temporary basis. As a result, for turkey slaughter plants, poultry meat input costs and labor costs should decline as production schedules become more balanced. We investigate costs associated with turkey seasonality in chapter 7.

Plant Location

Prior to World War II, the Delmarva Peninsula (Delaware, Maryland, and Virginia) chicken growers dominated the northeastern broiler market and produced a majority of the chickens raised in the United States. During World War II, however, the Government required Delmarva growers to sell their output to military bases near Washington, DC, leaving the northeastern market open to other producers. Southern firms filled the market void and retained their market position thereafter.

Structural changes in the poultry industry, combined with increasing consumer demand for poultry products,

Table 4-4: Chicken traypack production in the chicken Industry, 1972-92

Year	Output share and mean production of chicken traypacks					
	Large plants (400 or more employees)		Medium plants (100-399 employees)		Small plants (up to 99 employees)	
	Percent of output	*Mean lbs (millions)*	*Percent of output*	*Mean lbs (millions)*	*Percent of output*	*Mean lbs. (millions)*
1972	30.4	20.9	5.4	1.9	11.2	0.9
1982	26.5	32.2	5.2	2.7	10.8	1.4
1992	20.5	33.2	7.1	3.7	N.A.	N.A.

N.A. = not available.
Source: Longitudinal Research Database, U.S. Dept. of Commerce, Census Bureau.

Table 4-5: Turkey parts and processed poultry production in turkey industry, 1982 and 1992

Year	Mean production and output share of turkey parts and processed poultry					
	Large plants (400 or more employees)		Medium plants (100-399 employees)		Small plants (up to 99 employees)	
	Percent of output	*Mean lbs (millions)*	*Percent of output*	*Mean lbs (millions)*	*Percent of output*	*Mean lbs. (millions)*
1982	37.3	31.0	26.1	9.1	d	d
1992	58.5	87.4	28.5	16.3	d	d

"d" means that data could not be disclosed due to confidentiality concerns.
Source: Longitudinal Research Database, U.S. Dept. of Commerce, Census Bureau.

brought further concentration of chicken production in the Southeast and turkey production to the Middle South States (tables 4-7, 4-8, and 4-9). Note that slightly different regional definitions are used in each table.

The increase in chicken production in the Southeast from 55.7 percent of total U.S. production in 1963 to 65.4 percent in 1992 (table 4-7) came mainly at the expense of the category called Rest of the U.S. More dramatic than this regional shift is the change in the number of counties in which chickens are raised commercially. McBride (1997) found that the number of counties with farms that sold broilers declined by about 45 percent over the 1969-92 period and that the mean number of chickens per farm more than tripled to 237,000 head. He also found that 50 percent of broiler production came from 51 counties in 1992 versus only 37 in 1969.

Lasley et al. (1988) attribute locational changes to differences in feed costs, indicating that feed costs per pound of chicken produced were almost the same in 1972 in the Southern, Northeastern, and West Coast States, but that, by the early 1980's, the Southern States had $0.05 per-pound lower costs than the other regions. Despite this cost difference, close proximity to the large consumer markets in the Northeast for central Atlantic chicken producers and the west coast for southwestern chicken producers encouraged continued production in those regions.

Table 4-6: Seasonality differs substantially only for turkey slaughter plants prior to 1987

Year	Cattle slaughter	Hog slaughter	Chicken slaughter	Turkey slaughter	Poultry processing
			Ratio		
1963	.98	1.00	.94	.38	N.A.
1967	.99	1.00	.97	.45	N.A.
1972	.97	.98	.92	.50	.89
1977	.97	.98	.96	.53	.89
1982	1.02	1.01	1.00	.79	.91
1987	.92	.96	.96	.92	.96
1992	.96	.94	.90	.97	.95

Table units are ratio of production workers during the first quarter of the year (Jan.-March) to production workers during the last quarter of the year (Oct.-Dec.).
Source: Longitudinal Research Database, U.S. Dept. of Commerce, Bureau of the Census.

Table 4-7: Most chicken slaughter products are produced in the Southeast

Year	Southeast	Central Atlantic	Southwest	Rest of U.S.
	Market share of chicken slaughter industry on pounds of output basis			
1963	55.7	14.9	10.0	19.4
1967	55.8	14.7	8.4	21.1
1972	59.9	11.6	8.5	20.0
1977	62.8	14.7	10.5	12.0
1982	62.1	16.4	13.3	8.2
1987	68.2	15.6	9.8	6.4
1992	65.4	15.1	10.8	8.7

Notes: The Southeast includes AL, AR, GA, FL, LA, MS, NC, SC, TN; Central Atlantic includes DC, DE, MD, VA, and WV; Southwest includes TX, OK, AZ, NM, and CA; and, Rest of U.S. is all other States.
Source: Longitudinal Research Database, U.S. Dept. of Commerce, Bureau of the Census.

Table 4-8: Most turkey slaughter output is concentrated in the Middle South States

Year	Middle South	North Central	Rest of U.S.
	Market share of turkey slaughter industry pounds output		
1963	16.3	46.1	37.6
1967	31.0	33.2	35.8
1972	31.1	38.2	30.7
1977	36.6	40.5	22.9
1982	41.4	34.7	23.9
1987	51.1	31.1	17.8
1992	51.9	33.4	14.7

Notes: The Middle South includes AR, GA, MO, NC, SC, TN, and VA; North Central includes IL, IN, IA, MI, MN, ND, NE, OH, SD, and WI; and, Rest of U.S. includes all other States.
Source: Longitudinal Research Database, U.S. Dept. of Commerce, Bureau of the Census.

Table 4-9: Further-processed poultry output in the chicken and turkey slaughter regions

Year	Southeast	North Central	Rest of U.S.
	Market share of pounds of further-processed poultry output		
1972	25.3	49.3	25.4
1977	31.5	37.1	31.4
1982	37.9	35.4	26.7
1987	38.9	30.9	30.2
1992	43.7	30.8	25.5

Notes: The Southeast includes AL, AR, GA, FL, LA, MS, NC, SC, TN, and VA; North Central includes IL, IN, IA, MI, MN, ND, NE, OH, SD, and WI; and, Rest of U.S. includes all other States.
Source: Longitudinal Research Database, U.S. Dept. of Commerce, Census Bureau.

The South Central States' share of slaughtered turkeys doubled from 1963 to 1967, and then rose by another two-thirds from 1967 to 1992. The North Central region's market share, after losing almost 13 percent between 1963 and 1967, has held steady since then, while market share in the rest of the country continuously dropped and now accounts for only 15 percent. Lasley, Henson, and Jones (1983) suggest that lower heating and ventilation costs and the proximity to the grain-producing areas give South Central States an edge in turkey production over the States outside of the North Central region. The North Central region has even lower feed costs than South Central States, but higher environmental control expenditures.[14]

Further-processing firms located their plants near the main poultry-growing regions of the Southeast and Middle South (chickens and turkeys) and North Central (turkeys) regions. Most of the change over the 1972-92 period came as the Southeast / Middle South regions increased their market share to over two-fifths of total output. This gain came at the expense of the North Central Region, which dropped from about one-half to three-tenths of total processed poultry production. Further processing in the rest of the country remained fairly constant. Although precise cost differentials are not available, proximity to slaughter plants and, perhaps, lower labor costs likely contributed to poultry processor locational choice.

The shift to greater regional concentration in poultry production matches what occurred in cattle and hog slaughter. MacDonald et al. indicate that beef production in the 15 largest cattle slaughter States rose from about 68 percent of the U.S. total to 85 percent between 1963 and 1992, while hog production in the 12 largest hog slaughter States increased from about 64 to 75 percent.

[14]Death due to heat stress is a major temperature-related cost of turkey production and is much more likely to occur in the South than in the North Central region. Chickens, by contrast, thrive in the warmer climates of the South. Thus, North Central poultry growers can compete much more effectively against South Central poultry growers in turkeys than in chickens.

Wages

Using mainly nonunion labor in rural areas, poultry producers have been able to compensate workers with far lower wages than red meat producers pay. Table 4-10 shows average wages per production worker (wages) by year and plant size for both red meat and poultry producers.

Table 4-10: Average hourly wages in meatpacking, by year, industry, and plant size

Industry code and number of employees	1967	1972	1977	1982	1987	1992
			Payroll per production-worker-hour ($)			
SIC 2011 (red meat)						
0-19	2.50	3.74	6.26	5.35	6.06	7.17
20-99	2.70	3.71	5.69	6.88	7.79	8.23
100-249	2.90	4.01	5.96	8.23	7.77	8.77
250-499	3.29	4.36	6.33	9.43	8.40	8.46
500-999	3.45	4.82	7.06	10.13	8.90	8.76
1,000 or more	4.04	5.33	8.44	10.00	8.50	8.65
Industry average	3.36	4.51	6.86	9.06	8.27	8.56
SIC 2015 (poultry)						
0-19	1.92	2.50	3.37	5.00	5.78	6.81
20-99	1.81	2.78	3.38	5.10	5.77	8.10
100-249	1.76	2.42	3.52	5.23	6.33	7.16
250-499	1.72	2.40	3.43	4.98	5.96	7.33
500-999	1.79	2.35	3.48	5.14	6.17	7.39
1,000 or more	n.a.	n.a.	3.74	4.91	6.30	7.38
Industry average	1.76	2.40	3.48	5.06	6.16	7.37
Consumer Price Index	1.00	1.25	1.82	2.89	3.40	4.20

Wages are production worker payroll divided by production worker hours.
Red meat producers are mainly cattle and hog slaughter plants. Poultry producers are mainly chicken and turkey slaughter and processed-poultry producers.
Source: Census of Manufactures, Industry Series, for relevant years.

Wage differentials were most striking over the 1967-77 period when wages in red meat were almost twice as high as those in poultry. After 1977, the wage gap began to narrow, largely because of a faster rate of increase in poultry wages. For example, from 1977-92, average poultry industry nominal wages more than doubled, but red meat nominal wages rose by only about 28 percent overall and declined by about 5 percent after 1982. Adjusted for consumer prices, real poultry wages have remained almost constant over the 1967-92 period, while beef slaughter wages have plummeted.[15] Notice also that the wages paid to workers in the largest red meat plants were much higher than in small plants until 1992, when there was almost no difference. Wages between large and small poultry plants have been about the same.

[15] The Consumer Price Index is widely considered to overstate inflation; thus, real wages likely declined much more modestly in red meat slaughter and not at all in poultry.