

POULTRY SCIENCE AND TECHNOLOGY

GUIDE

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The North Carolina Poultry Industry

The poultry industry in North Carolina is highly integrated and includes all dimensions of production and marketing ranging from poultry hatcheries, live production, and feed mills to processing and transporting raw materials and processed products. This publication will promote better understanding of North Carolina's highly integrated poultry industry through a description of its structure and organization.

Poultry Commodities

The commercial poultry industry in North Carolina includes broilers and roasters, turkeys, table eggs, ducks, and quail. Broilers are young meat-type chickens generally raised to 4 to 4.5 pounds live weight. A recent trend toward specialized products such as chicken and turkey nuggets and deli-type products has resulted in technological changes in raising broilers sex-separate and in using newly developed processing equipment.

As a standard practice, turkeys are raised sex-separate. Hen turkeys (females) reach the market at 12 to 15 weeks of age at a live weight of 12 to 15 pounds. Tom turkeys (males) are ready for market at 16 to 19 weeks of age, when they weigh 22 to 29 pounds. Hens are most often sold for baking as a whole bird while toms are often used for further processed products such as turkey breast roast and turkey ham.

Layers kept in automated cage facilities are responsible for nearly all table eggs produced in North Carolina. The eggs are washed, graded, and weighed before being

placed in egg cartons for shipment to retail outlets. The most recent construction of table egg facilities indicates a trend toward inline production (a practice that incorporates both processing and production on the farm) and marketing systems.

Duck and quail products, two poultry commodities relatively new to North Carolina, have grown to be a significant part of the commercial poultry industry in the state.

In addition to being a part of broiler and turkey production in North Carolina, broiler and turkey hatching eggs are exported to other states and countries. For example, broiler hatching eggs produced in North Carolina are shipped to support the broiler industries in Virginia, Maryland, Delaware, Pennsylvania, and Canada. Furthermore, North Carolina has three primary broiler and turkey breeder firms that supply breeder stock both nationally and worldwide. And North Carolina's turkey hatching eggs and poult are shipped over the entire east coast and to several foreign countries.

Industry Structure

Production and Marketing

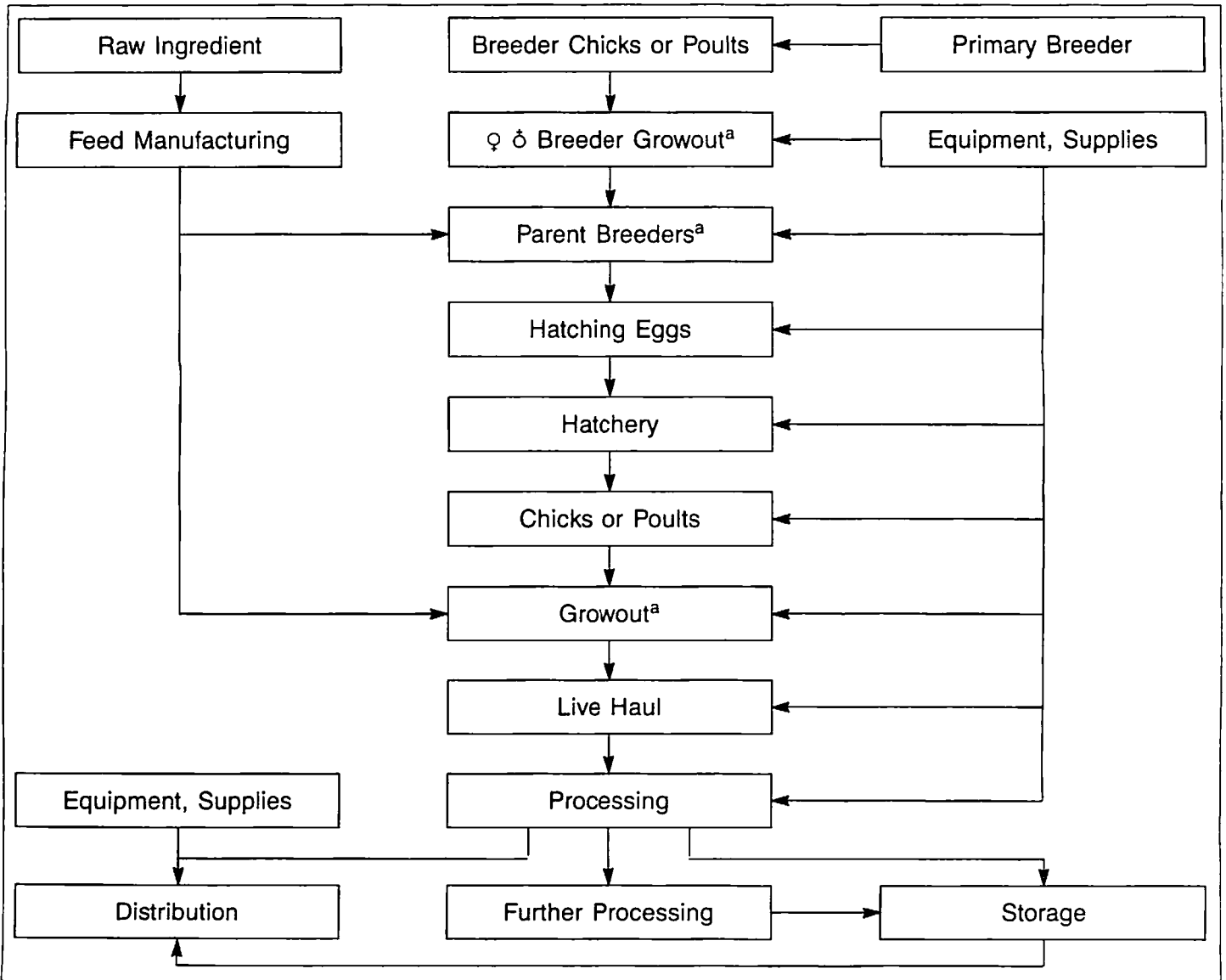
The poultry industry in North Carolina (as well as the United States) is vertically integrated. Vertical integration generally combines two or more stages of production and marketing. A few independent producers of turkeys and commercial eggs remain in North Carolina, but they usually have contractual arrangements with other firms to market their products, to process and market the producers' own products, or to control some other dimension of production such as feed manufacturing. Therefore, most of these independent poultry producers are also involved in vertical integration.

A large proportion of the industry is totally vertically integrated, which means all activities starting with the raw materials to marketing the final product to the consumer are incorporated within one organization (hereafter referred to as integrators). Estimates show that nearly 100 percent of North Carolina's broiler industry is totally integrated in addition to 90 percent of its commercial eggs and 85 percent of its turkeys. Figure 1 shows a schematic of a typical integrated broiler or

turkey operation. In many cases, however, integrated commercial egg organizations are not identical to this schematic because pullet chicks are supplied directly from the primary breeders, a step that eliminates the need for a hatchery. Figure 1 also indicates that the actual live production is accomplished mainly with contracts between farmers and integrators and occasionally with company-owned housing facilities.

Contracts with farmers vary, but most stipulate that the farmer provide the house, equipment, labor, utilities, insurance, taxes, and other miscellaneous farm expenses. Integrators generally supply the feed, day-old or adult birds, medications, and supplies. In return for their investment and time, farmers are paid by the quantity (pound or dozen) of the product produced. Both parties can benefit from this arrangement. Farmers avoid a large capital investment in feed and birds and enjoy a reduced market risk, while integrators benefit from having less long-term investment and a steady, known supply of products. According to a 1985 N.C. Poultry Federation survey, 3,868 poultry farmers work under contract arrangements in North Carolina.

Figure 1. Flow Chart of a Typical Integrated Broiler or Turkey Operation.



Product Value

The annual farm value of North Carolina poultry and egg products exceeded \$1 billion for the first time in 1984. In addition, the \$1.297 billion estimate for North Carolina poultry products (Table 1) exceeded the farm value of any other North Carolina agricultural product in 1986.

Income statistics show a strong growth pattern within the poultry industry in North Carolina. A closer analysis indicates that some poultry commodities have faster growth than others. Table 2 compares this growth in poultry commodities in North Carolina over the past 20 years, while Table 3 makes a similar comparison for the United States poultry industry over the past 10 years. The number of eggs produced in North Carolina and the United States has remained rather stable for the past 10 years. This lack of growth can be traced to the static demand for table eggs in the United States.

A contrasting case can be made for broiler and turkey commodities. The number of broilers grown in North Carolina increased 43 percent since 1976, paralleling the increase in broiler production in the United States. An even stronger growth pattern has occurred in North Carolina's turkey industry, with the number of turkeys grown in the state increasing 134 percent in the past 10 years. This means that turkey production in North Carolina has grown much more than national production. This growth pattern for turkeys and broilers in North Carolina, as well as the nation, has strengthened primarily because people are eating more of these products.

Geographic Location

Poultry production and its supporting functions are located throughout North Carolina and the United States. Energy considerations play a key role in determining where a poultry industry is located. This is because the cost of transportation of both raw and finished products is a significant portion of the total product cost.

How the states rank in broiler production since 1966 is shown in Table 5, turkey production in Table 4, and egg production in

Table 1. Farm Value of North Carolina's Poultry and Eggs for 1986.

Product	1986 Values
Broilers	\$ 669 million
Turkeys	342 million
Eggs	220 million
Miscellaneous poultry	66 million
	\$1.297 billion

Source: USDA-Statistical Research Service, POU 3-1 (87).

Table 6. The state ranking for broiler production has changed little over the last 20 years. Major production areas are in the Southeast (Arkansas, Georgia, Alabama, and North Carolina) and the eastern shore of Delaware and Maryland, while California contributes a large portion of the west coast's supply.

In contrast, the state ranking for turkey production has

changed with North Carolina rising from ninth position in 1966 to first in 1986. The state ranking for table egg production has fluctuated over the past 20 years due to changes in transportation costs. These changes can be traced to the early 1970s when the Southeast had strong growth patterns. Then when energy costs for transporting grain and processed products rose this trend gave a competitive edge to the Midwest and Northeast. This shift due to transportation costs did not occur in broiler and turkey production, however, because brooding required less energy due to milder climates and this tended to offset the higher transportation costs.

Figure 2 shows the geographic location of general poultry production within North Carolina as total farm value of poultry. The leading North Carolina counties for broilers are Chatham, Duplin, Moore, Randolph,

Union, Wayne, and Wilkes. Geographic concentration of turkey production is even more evident with Duplin, Union, and Wayne Counties the largest producers. Table egg production is spread throughout the state with Nash, Pitt, and Stanly Counties the largest producers.

Hatcheries, Feed Mills and Processing Plants

Hatcheries, feed mills, and processing plants make key contributions to the production of poultry. There are 24 feed mills, 29 hatcheries and 14 processing plants connected with the state's broiler commodity. The turkey commodity is served by 16 feed mills, eight hatcheries, and five processing plants. The egg commodities here have 11 feed mills, only two hatcheries, and 19 processing plants. Over 15,700 people are employed in hatcheries, feed mills, and processing plants.

Table 2. North Carolina Poultry Production — Farm Value and Percentage Change, 1966-1986, 1976-1986.

Product	Production in Millions			% Change	
	1966	1976	1986	1966-86	1976-86
Broilers					
No. produced		265.0	315.6	450.5	70
Farm value	\$141.9	\$297.9	\$669.0	371	124
Turkeys					
No. produced	5.6	16.7	39.1	598	134
Farm value	\$ 21.8	\$ 99.3	\$341.8	1,467	244
Eggs					
No. produced	2,717.0	2,756.0	3,400.0	25	23
Farm value	\$102.1	\$154.1	\$219.9	115	43

Source: For 1966 data: N.C. Agricultural Statistics, No. 116, 25-27. For 1976 data: N.C. Agricultural Statistics, No. 137, 53. For 1986 data: USDA, Statistical Reporting Service, POU 3-1 (87).

Table 3. United States Production and Farm Value of Poultry and Eggs and Percentage Change 1976-1986.

Product	Production in Millions		% Change
	1976	1986	1976-86
Broilers			
No. produced	3,273.6	4,646.3	41.9
Farm value	\$2,945.0	\$6,780.1	130.2
Turkeys			
No. produced	140.0	206.8	47.7
Farm value	\$ 824.8	\$1,951.6	136.6
Eggs			
No. produced	64,511.0	68,514.0	6.2
Farm value	\$3,113.4	\$3,515.2	12.9

Source: For 1976 data: USDA, Statistical Bulletin No. 677, 14 & 18 (81). For 1986 data: USDA, Crop Reporting Board, POU 3-1 (87).

Table 4. Rank of States in Turkey Production, 1966-1986.

State	Year	Rank	Turkey Production in Millions
North Carolina	1966	9	(5.3)
	1976	3	(16.7)
	1986	1	(39.1)
Minnesota	1966	1	(16.4)
	1976	1	(24.4)
	1986	2	(34.2)
California	1966	2	(16.9)
	1976	2	(17.5)
	1986	3	(21.9)
Arkansas	1966	5	(6.5)
	1976	4	(10.1)
	1986	4	(16.5)
Virginia	1966	7	(6.2)
	1976	7	(7.3)
	1986	5	(13.8)
Missouri	1966	3	(10.0)
	1976	5	(9.7)
	1986	6	(13.5)
Indiana	1966	10	(4.2)
	1976	9	(5.2)
	1986	7	(9.3)
Pennsylvania	1966	15	(1.9)
	1976	11	(3.7)
	1986	8	(7.8)
Iowa	1966	4	(7.2)
	1976	8	(6.5)
	1986	9	(7.0)
Wisconsin	1966	8	(5.5)
	1976	10	(5.1)
	1986	10	(6.1)
Texas	1966	6	(6.3)
	1976	6	(9.3)
	1986	N/A ¹	

¹ Texas has not been separated to avoid disclosing individual operations.

Source: For 1966 data: USDA, Statistical Reporting Service, POU 2-3 (67), 10. For 1976 data: USDA, Statistical Reporting Service, Statistical Bulletin No. 677. For 1986 data: USDA, Statistical Reporting Service, POU 3-1 (87).

Figure 2. Leading Poultry Production Counties in North Carolina.

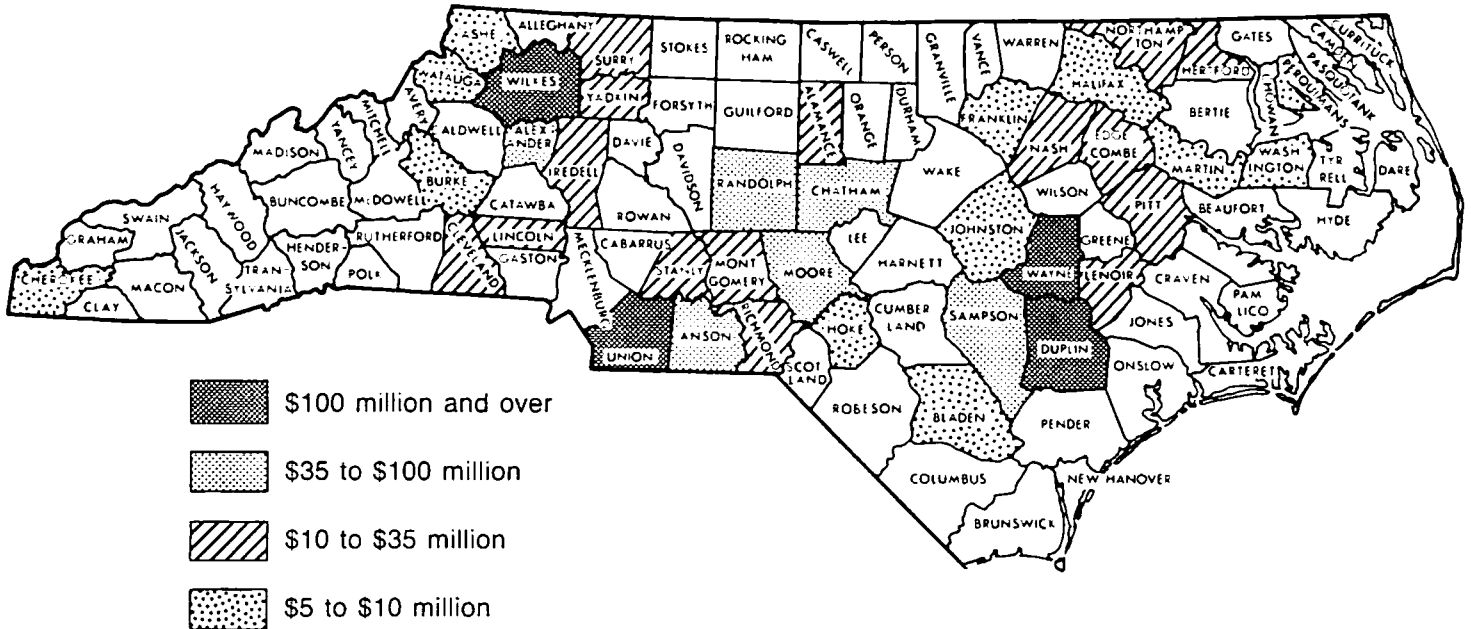


Table 5. Rank of States in Broiler Production, 1966-1986.

State	Year	Rank	Broiler Prod. in Millions	State	Year	Rank	Broiler Prod. in Millions
Arkansas	1966	2	(361.8)	Texas	1966	7	(152.9)
	1976	1	(540.4)		1976	7	(181.7)
	1986	1	(786.8)		1986	7	(238.6)
Georgia	1966	1	(456.2)	Delaware	1966	8	(118.0)
	1976	2	(451.5)		1976	8	(160.0)
	1986	2	(697.4)		1986	8	(196.8)
Alabama	1966	3	(324.1)	California	1966	10	(67.0)
	1976	3	(430.2)		1976	9	(105.0)
	1986	3	(587.5)		1986	9	(184.8)
North Carolina	1966	4	(265.0)	Virginia	1966	11	(50.3)
	1976	4	(315.6)		1976	11	(75.7)
	1986	4	(450.5)		1986	10	(154.2)
Mississippi	1966	5	(183.7)	Pennsylvania	1966	12	(44.0)
	1976	5	(257.4)		1976	10	(75.1)
	1986	5	(335.7)		1986	11	(101.9)
Maryland	1966	6	(154.6)				
	1976	6	(199.0)				
	1986	6	(263.9)				

Source: For 1966 data: USDA, Statistical Reporting Service, POU 2-3 (67), 10. For 1976 data: USDA, Statistical Reporting Service, Statistical Bulletin No. 677. For 1986 data: USDA, Statistical Reporting Service, POU 3-1 (87)

Table 6. Rank of States in Egg Production, 1966-1986.

State	Year	Rank	Eggs Produced in Billions
California	1966	1	(7.6)
	1976	2	(8.6)
	1986	1	(7.8)
Indiana	1966	8	(2.4)
	1976	4	(3.1)
	1986	2	(5.6)
Pennsylvania	1966	4	(3.2)
	1976	8	(2.7)
	1986	3	(4.7)
Georgia	1966	2	(4.5)
	1976	2	(5.6)
	1986	4	(4.3)
Ohio	1966	13	(2.2)
	1976	11	(2.0)
	1986	5	(3.9)
Arkansas	1966	6	(2.6)
	1976	3	(3.8)
	1986	6	(3.7)
North Carolina	1966	7	(2.6)
	1976	7	(2.8)
	1986	7	(3.4)
Texas	1966	5	(2.6)
	1976	8	(2.4)
	1986	8	(3.3)
Alabama	1966	10	(2.3)
	1976	5	(2.9)
	1986	9	(2.7)
Florida	1966	14	(2.0)
	1976	6	(2.8)
	1986	10	(2.7)
Minnesota	1966	9	(2.3)
	1976	9	(2.2)
	1986	11	(2.3)

Source: For 1966 data: USDA, Statistical Reporting Service, POU 2-3 (67), 10. For 1976 data: USDA, Statistical Reporting Service, Statistical Bulletin No. 677. For 1986 data: USDA, Statistical Reporting Service, POU 2-3 (87).



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