

Animal Agriculture in South Carolina: A Fact Book

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Table of Contents

Introduction	1
Current Status of Animal Agriculture in South Carolina: Comparison with Adjacent States	5
Adult South Carolinians' Opinions about Animal Agriculture	10
Depicting Trends in South Carolina Animal Agriculture	26
Spatial Relationships of Polluted Streams, Animal Agriculture, and Human Populations in South Carolina Watersheds	29
Economics of Regulating Animal Agriculture	41
How Governments Are Responding	44
South Carolina's New Regulations	44
What the Federal Government Is Doing	46
What's Happening in the States	47
What's Happening at the County and Local Levels	49
The Changing Structure of Animal Agriculture	50
Problems and Solutions	53
What Can Be Done?	53
Good News	54
Bad News	55
Other Sources of Nonpoint Pollution	56
Sources of Funding for Farmers	58
Websites of Interest for Agriculture and the Environment	61
Endnotes	65

The Changing Structure of Animal Agriculture

Mellie L. Warner

Animal agriculture is becoming less competitive in the economist's sense of the word. The number of firms (farms) is declining and market power is being concentrated more and more in the hands of integrators/contractors. In a perfectly competitive market, both the buyers and the sellers are price takers. The large number of buyers and sellers guarantees that market power is evenly distributed. But now the structure of agricultural markets is changing. Some even believe that we are about to plunge into a new revolution in agriculture where vertical integration will be the norm and the number of independent firms will be few. (See the slides for Steve Baker's Clemson talk at <http://hubcap.clemson.edu/scafrrs/seminar.html>.)

I. The Poultry Industry⁴²

The poultry industry has become almost totally vertically integrated starting in the 1960's. Several factors have contributed to this. First, because of the relatively short reproductive cycle of chickens (5 months), biological changes such as genetic changes can be made fairly rapidly. The genetic base of poultry is narrow. This helps to reduce management costs and also helps to ensure uniform products for processors and consumers. The two stages of poultry production (hatching and growing) mean fewer stages of production than for livestock. Poultry enterprises tend to be large and specialized.

Some poultry firms have been successful at developing branded products for consumers. They have also innovated new product lines with greater value added. Chicken products have been enthusiastically welcomed by consumers whether at fast food chains, in the grocery freezer, or just as skinless/boneless breasts in the meat case.

The organization of the poultry subsector ensures that capital requirements are shared between the integrator and the contract grower. (The grower provides the land, buildings, and equipment. The integrator owns the feed, the birds, and everything else.) This shifts some risk to the grower. But overall, risk to the grower is limited as is the potential for larger than normal profits.

Little additional integration is expected in the poultry industry because of the high level of integration already existing.

Broiler and Other Meat-Type Chicken

Percent of Sales by Number of Chickens Sold per Farm.

Year	1-29,999	30,000-99,999	100,000-199,999	200,000-499,999	500,000+
1992	.18	3.21	12.73	48.35	35.53
1987	.32	6.68	21.3	47.38	24.31
1982	.47	10.39	28.77	44.63	15.74
1978	.86	17.22	35.62	34.43	11.87
1974	1.73	28.26	70.00 ⁴³		

II. The Hog Industry

The pork industry is following the lead of the poultry industry with respect to vertical integration. The genetic base is narrowing and the biological cycle, while longer than for poultry, is still short enough (12 months) to allow for fairly rapid genetic changes to improve quality and consistency of products. Integrators are building on the tradition of branded processed products such as bacon, ham, and sausage, but have not had the success of the poultry companies in introducing new, high value-added products especially with respect to the fast food industry. Hog operations have increased their sizes and their degrees of specialization. Although large "farrow-to-finish" opera-

tions still exist and there are also two-stage setups, the trend is to have three stages: farrow, nursery, and grow-out (finish). This tends to increase transactions costs, but efficiency gains more than offset them.

As in the poultry industry, the integrator and the contract grower share the capital requirements and the risk. Growers supply the land, buildings, and equipment while the integrators retain ownership of the animals and feed. Growers receive a reasonable return on their investments, but give up the potential for large profits (and losses) from swings in hog and feed prices. Vertical integration in the hog industry is likely to continue to grow.⁴⁴

Writing for the National Pork Producer’s Council, Dennis DiPietre of University of Missouri—Columbia⁴⁵ finds that agriculture is subject to the same evolution from labor-based production to knowledge-based production that the rest of the economy has been experiencing.

DePietre defines three paradigms of pork production:

- **The Pig Producer**—swine production is a way to use labor during the crop “off season.” Grains can be fed to the pigs when grain prices are low. Characteristics are labor-intensive production with little management.
- **Meat Producers**—lean meat is produced efficiently and at low cost. Record keeping and other intensive management practices abound. Pork production is separated from crop production. The ability to produce quality for specialized export markets may be affected.
- **Food Producers**—this post-industrial paradigm is just beginning to emerge. The focus is on the food that hits the plate. Differentiated pork products with multiple quality characteristics will be emphasized. Management/knowledge and capital requirements are great while labor requirements are relatively small. However, most management comes from above. The integrators provide the decision-making while the growers “push buttons.”

The evolution of pork production through these paradigms will also contribute to the movement away from a competitive market as products become more differentiated. Vertical and horizontal integration will also play a major role.

Hogs and Pigs, Percent of Inventory by Size Group, U.S.

Year	1-99 head	100-499 head	500-999 head	1000-1999 head	2000-4999 head	5000+ head
1997	3.0	12.0	14.0	16.0	20.0	35.0
1992	5.5	25.5	22.0	19.0	28 ⁴⁶	
1987	7.16	32.07	22.81	16.97	12.88	8.11
1982	9.18	36.35	23.68	16.04	9.81	4.94
1978	13.78	43.28	20.25	12.33	6.92	3.41

III. The Beef Cattle Industry

The beef cattle industry does not lend itself to vertical integration as well as the poultry and pork industries. The biological cycle is longer (24 months) and the genetic base is broad, so genetic modifications to improve quality and achieve uniform products are more difficult and time-consuming. There are three production stages (cow-calf, stocker, and feeding) which increase transactions costs and capital requirements. The large rangeland or pasture requirements of cow-calf operations also have slowed integration in this sector. Beef is still marketed mainly as a commodity and efforts to introduce new, branded products have mostly failed.⁴⁷

However, the cattle-feeding and meat-packing industries have also participated in the trend toward larger and fewer firms. From 1972 to 1995, the number of feedlots in the 13 main cattle-feeding states declined from 104,340 to 41,365 while the average marketings per feedlot increased from 2,287 head to 5,648 head. Even more striking is the fact that in 1995 the largest 1,936 feedlots averaged 10,897 head while the rest averaged only 58 head.⁴⁸

Meat packing is a highly concentrated industry with the top four firms accounting for an estimated 80 percent of United States steer and heifer slaughter in 1996. Firms have grown in order to take advantage of lower average costs associated with larger plant sizes. Economists have been studying whether concentration in meat packing has led to lower prices for inputs (fed cattle) and higher prices for outputs (wholesale meat). So far, the effects found have been small. Efficiency gains may have been enough to offset the price changes found.⁴⁹

Most of the trend toward concentration in the beef cattle market has been horizontal (fewer, larger firms in each stage of production.) However, there are instances of vertical integration such as packer ownership of cattle, contracting into the stocker stage and retained ownership of cattle into the feedlot.

Beef Cows, Percent of Inventory by Size Group, U.S.

Year	1-49 head	50-99 head	100-499 head	500+ head
1997	30.3	19.5	36.2	14
1992	32.6	19.6	47.8 ⁵⁰	
1987	23.21	12.9	34.3	29.59
1982	24.49	13.01	34.06	28.44

Cattle and Calves, Percent of Inventory by Size Group, U.S.

Year	1-49 head	50-99 head	100-499 head	500-999 head	1000+ head
1997	12.4	13.8	38.5	11.4	23.9
1992	14	14.1	38.7	33.2 ⁵¹	
1987	14.93	15.04	38.21	10.31	21.52
1982	15.74	16.04	38.83	9.98	19.41
1978	16.36	16.7	37.27	9.71	19.95

IV. The Dairy Industry

The dairy cattle industry has followed a pattern of fewer farms with cows and fewer overall cows while the average number of cows per farm has grown along with total and per-cow milk production. Dairy cooperatives market most of the bulk milk produced on America's dairy farms. In 1993 and 1994, coops delivered 86 percent of the total milk delivered to plants and handlers. The number of coops has decreased over the years while their size has grown. Bargaining-only cooperatives act as middlemen to negotiate prices between farmers and processors. Manufacturing/processing coops process the raw milk into dairy products such as butter and cheese.⁵²

For decades, government programs eliminated the risk of very low milk prices for producers. A phase-down of price supports in the 1980's has led to extreme price volatility. Price supports are due to expire by 2000. Larger and fewer cooperatives, due in part to mergers, may result in increased bargaining power. Many observers feel that vertical integration will also increase as a result of more volatile prices and possible changes in the Federal milk marketing order system.

Milk Cows, Percent of Inventory by Size Group, U.S.

Year	1-29 head	30-49 head	50-99 head	100-199 head	200+ head
1997	3.5	11.5	26	20	39
1994	4.6	14	28.7	19.3	33.4
1991	6.3	16.6	31.7	45.4 ⁵³	