Evolution of Vertical Coordination in the Poultry, Egg, and Pork Industries

Vertical coordination refers to the synchronization of successive stages of production and marketing, with respect to quantity, quality, and timing of product flows. Methods of vertical coordination include open production (also referred to as open, or spot, market), contract production, and vertical integration. In open production, a firm does not commit to selling its output before completing production. Cash (or spot) prices coordinate resource transfer across the stages of production. Contract production is the production of goods and services for future delivery. Before completing production, a producer commits to deliver a particular good to a particular buyer. Contract production involves more interaction between buyers and sellers than open production. Production contracts vary in control allocated and risk transferred across stages. In *market-specific production contracts*, the contractor and producer may negotiate delivery schedule, pricing method, and product characteristics. The contractor usually provides a market for the goods but engages in few of the producer's decisions.[1] In *resource-providing contracts*, the contractor provides a market for the goods, engages in many of the producer's decisions, and retains ownership of important production inputs. While this classification scheme is not unique, it provides a general framework for contract terminology (Martinez and Reed).[2]

In vertical integration, a single firm controls two or more successive stages of vertical coordination. In vertically integrated firms, management directives dictate the transfer of resources across stages.

Movement along the continuum of vertical coordination from open-market production to vertical integration represents the degree to which control of production has shifted to the contractor or integrator as more functions are transferred from the producer (fig. 1).

Figure 1
Methods of vertical coordination along the spectrum of control

Source: Mighell and Jones.

While market-specific production contracts, often referred to as marketing contracts, provide contractors with more control than open-market coordination, the control transferred across stages is usually minimal.

Vertical Coordination in the Poultry and Egg Industries

In the mid-1900s, poultry and egg firms specialized in certain activities, and spot markets were the dominant means of vertical coordination (app. A). Feed was produced in commercial feed mills. Poultry and eggs were sold to slaughter plants and egg-handling facilities that performed many of the marketing functions. By the mid-1950s, however, vertical coordination of these activities through contracts and vertical integration had become increasingly common.

Broilers[3]

Production contracts, whereby the contractor and grower (or a smaller producer) each provide significant inputs into the production process, have been the dominant means of coordinating broiler production since the mid-1950s (fig. 2).[4] Initially, feed companies contracted with broiler growers, spurred by a potentially large and stable market for their feed. As broiler production grew in the South, production contracts evolved to give the contractor more control over production and shift more price and production risk from growers to contractors.

In the 1960s, feed-company contractors became involved in broiler processing by acquiring or constructing processing plants. Contractors, such as

[1]The contractor in an exchange relationship is the firm that controls several stages of production and marketing through contracts. In this report, the term "integrator" is reserved for a firm that controls several stages through vertical integration.

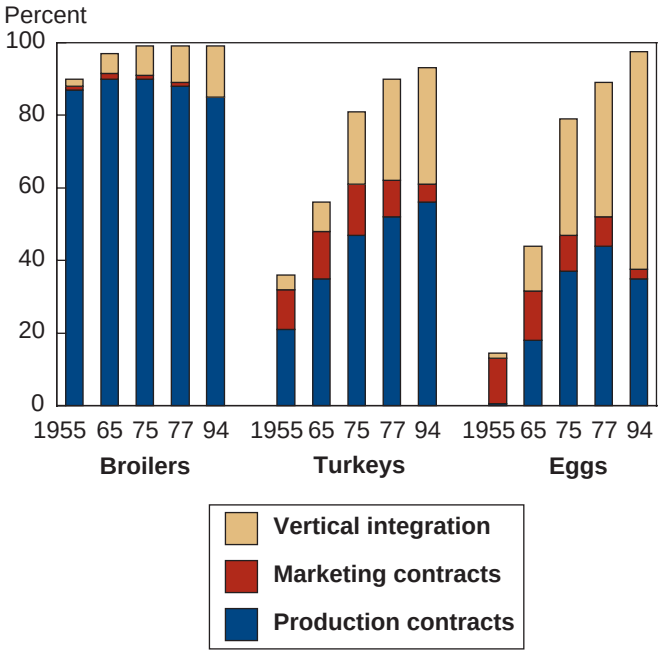
[2]In their ground-breaking 1963 study, Mighell and Jones also include *production-management contracts* in their categorization of production contracts. These contracts are similar to market-specific contracts but give contractors more direct involvement in production decisions.

[3]See Martinez (1999) for more details regarding developments in broiler contracting and vertical integration.

[4]Continuous time series data sets that document methods of vertical coordination are generally not available. National surveys and individual State studies provide some indications of these developments at particular points in time.

Figure 2

Poultry and eggs produced under contracts and vertical integration



Note: According to Roy (1963), independent broiler production accounted for 95 percent of total production in 1950.
Sources: Rogers (1979); Manchester.

Ralston-Purina, Allied Mills, Central Soya, Cargill, and ConAgra, controlled broiler production capacity from feed mills to processing and marketing.

In the early 1970s, broiler price swings caused many feed companies to reduce their investments in the poultry business (Strausberg). Processors, such as Tyson Foods and Hudson Foods, then took over the role of contractor. Today, nearly all broiler production and processing is coordinated through production contracts between growers and processors. Contract terms typically specify that the processors will provide the baby chicks, feed, and management and veterinary services. The growers provide the labor and chicken houses and receive a payment per pound of live broilers produced, based on a grower's performance relative to other growers.

Turkeys

Before 1950, turkey growers operated independently, obtaining financing from traditional sources (local banks, production credit associations) to pay for feed, poults, and supplies (Roy, 1972). However, in the 1950s, the industry experienced financial setbacks, and these traditional sources became more reluctant to finance turkey growing. Consequently, hatcheries provided poult financing, and feed companies provided both feed and poult financing as a means to expand feed production. These financial arrangements eventually evolved into production contracts that shifted risk from grower to contractor.[5] By 1961, feed companies accounted for 65 percent of total turkey production under contract (Gallimore). To coordinate production and processing, many feed companies also owned hatcheries and acquired processing facilities. As the turkey industry developed throughout the 1960s, processors became increasingly involved in turkey production decisions (Manchester). Processors began raising their own turkeys or contracting to better schedule production and ensure supplies.[6] By 1977, as fewer outlets existed for independent growers, the share of turkeys sold on the U.S. spot market fell to only 10 percent of turkeys produced.

Today, production contracts account for about 56 percent of turkey production and vertical integration accounts for about 32 percent. Production contracts in the turkey industry are similar to resource-providing production contracts in the broiler industry: the grower provides the buildings, equipment, and labor, and the processor provides poults, feed, veterinary services, and managerial assistance. Most growers receive a fee per bird or per pound that may include performance incentives for feed conversion and reduced turkey mortality rates (Lasley, Henson, and Jones). Vertically integrated operations, in which the processor owns all production facilities and hires labor to care for the birds, are more prevalent in the turkey industry than in the broiler industry.

Eggs

In the egg industry, significant increases in contracting by feed companies and processors began in the late 1950s. As in the broiler industry, contracts in the egg industry evolved to give the contractor more control over production and reduce growers' price and production risks. Grower returns became less dependent on market prices, as flat-fee payments (for example, per bird, per dozen eggs) or payments related to produc-

[5]Similar to the broiler industry, turkey production contracts evolved from financing arrangements, in which the contractor sometimes participated in the management decisions, to risk-sharing arrangements (Gallimore and Vertrees).

[6]According to Gallimore and Irvin, unlike the broiler industry, processors, rather than feed companies, were "the major coordinators in the turkey industry."

tion efficiency became more common (Rogers, Conlogue, and Irvin). Today, production contracts account for more than a third of eggs produced. In a typical production-contract arrangement, the contractor provides layers, feed, and other supplies, and the grower provides labor and facilities. All eggs produced under the contract belong to the contractor, and the grower is paid a fee based on the number of eggs produced, with performance incentives.

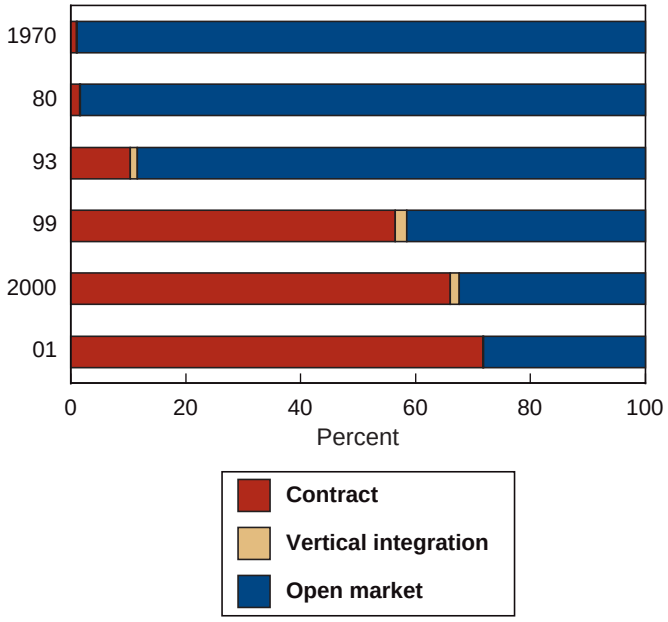
In the mid-1970s, large owner-integrated operations in the egg industry expanded rapidly. Most vertically integrated operations resulted from forward integration by producers into processing (Rogers, 1976). Integrators produce, pack, and market eggs in their own facilities and may also mix feed, operate hatcheries, and raise pullets (Rogers, 1979). Compared with vertical integration in the broiler and turkey industries, vertical integration in the egg industry is more commonly used to coordinate production and processing and accounts for 60 percent of eggs currently produced.[7]

Vertical Coordination in the Pork Industry

Since the early 1990s, the pork industry has experienced significant changes in vertical coordination (fig. 3). Marketing contracts between large producers and processors have become increasingly common. Contract terms typically specify that the producer will deliver a certain quantity of hogs to the processor at a certain time. The producer may receive a formula-based price, typically a spot-market price (for example, the Iowa/Southern Minnesota market quote), with premiums or discounts based on size and quality of the hogs.

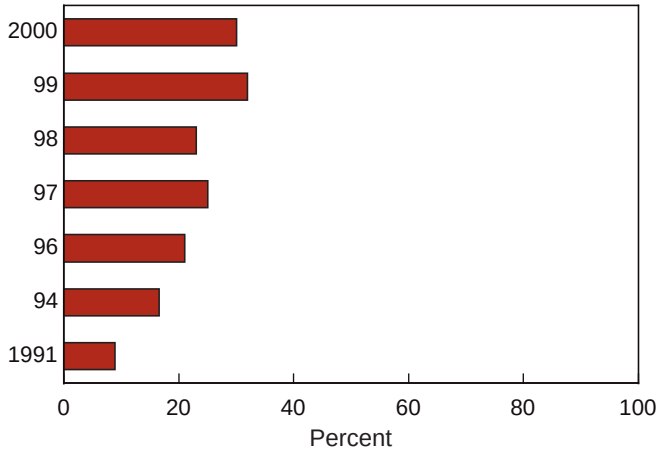
Production contracts also are becoming more common in the pork industry (fig. 4). Under the terms of these contracts, the contractor, typically a large producer or processor, provides management services, feeder pigs, veterinary services, and other inputs. The grower provides land, facilities, and labor to feed the hogs to market weight.[8] The grower receives a fixed payment, with premiums for efficient production. As in the poultry industry, processors in the pork industry may own feeder pigs and establish production contracts with

Figure 3
Share of hogs delivered to processors via contracts and vertical integration



Sources: Hayenga et al., 1996; Marion; University of Missouri and National Pork Producers Council; and Kelley.

Figure 4
Share of hogs produced through production contracts



Note: Shares for 1996 through 2000 are as of December 1 each year.
Sources: Plain and USDA[a].

[7] As in the turkey industry, cooperatives were an important force in the egg industry, performing such functions as assembling, packing, and distribution (Rogers, 1971; 1976). Cooperatives used marketing contracts with producer-members to address quality control and secure egg supplies. As production contracts and larger vertically integrated operations became more dominant in the industry, marketing contracts declined. Today, marketing contracts account for less than 3 percent of eggs produced.

[8] While finishing contracts are the most common arrangement, production contracts may also be used for nursing or farrowing.

growers to feed the hogs to market weight. Packer-owned hogs increased from 6.4 percent of U.S. hog production in 1994 to 24 percent in 2000, reflecting Smithfield Foods' (the Nation's largest hog producer and processor) recent purchases of two leading hog producers (Messenger, April 2000). Most of these hogs are priced using formula-based marketing contracts with the production unit (Grimes and Meyer).[9]

Hog producers and processors may enter into both production and marketing contracts. For example, Prestage Farms, the Nation's fourth-largest hog producer, produces its hogs under production contracts with growers. Prestage then sells the hogs to Smithfield Foods, using marketing contracts at market-indexed prices.

[9]Grimes and Meyer categorize these contracts as formula-based marketing contracts. In our classification scheme, these contracts are best described as production contracts because the processor owns significant production inputs.