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# **DYNAMIC FACTORS in Vertical Commodity Systems**

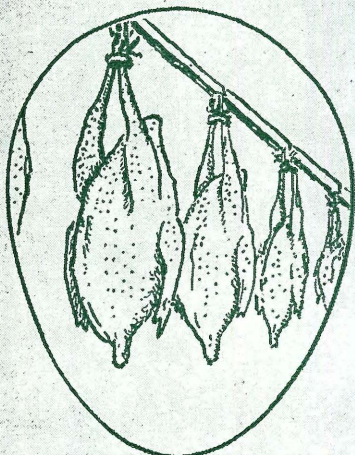
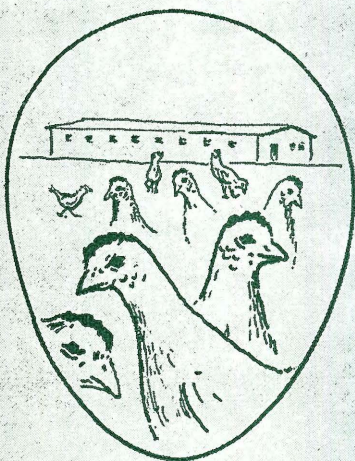
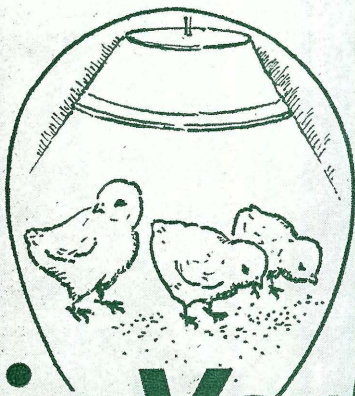
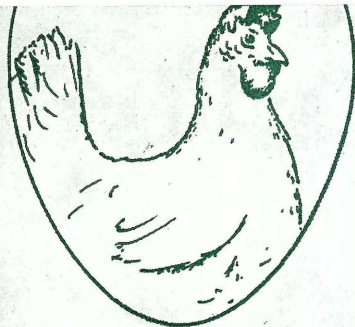
## **A CASE STUDY OF THE BROILER SYSTEM**

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# Dynamic Factors in Vertical Commodity Systems:

## A Case Study of the Broiler System

B. W. MARION and H. B. ARTHUR\*

### INTRODUCTION

The organization of the food and fiber economy has undergone significant changes in recent years. Of particular interest to many have been the changes in the organization and coordination of vertical commodity systems. For a wide variety of reasons, many systems have moved from loosely organized arrays of small firms linked by spot markets toward more compact systems frequently linked by contracts, joint ventures, or vertical ownership, and in which large firms play an important part.

Such changes raise questions for businessmen, policymakers, and academicians concerning the causes of these changes, the effects on various types of performance such as efficiency, progressiveness and equity, and the needed strategy or policy response. But how does one answer such questions? What conceptual models can be employed to provide some clues of what to expect?

Since these changes are essentially vertical in nature and involve several non-market coordinating instruments, existing models are of limited value. The market models of economic theory are primarily concerned with the influence of horizontal competitive relationships upon performance in a particular market. While these models provide useful insights into a given market situation, they are hardly conducive to a systems approach to a vertical commodity complex. Further, the competitive models of economic theory are largely static in nature. J. M. Clark said: "The theoretical models are uniformly presented as operating toward an equilibrium . . . the nature of this equilibrium is the main thing studied . . . In the field of theory, the most challenging opening seems to be for an approach that would shift the emphasis from competition as a mechanism of equilibrium to competition as a dynamic process . . . equilibrium models in general afford no positive interpretation of the forces of progress."<sup>1</sup>

An approach is needed which will encourage a businessman to look beyond the particular market in which he is a participant to understand the vertical system of which he is also a part; and which will encourage policymakers and academicians to supplement their concepts and concerns about competition with a concept of vertical system coordination and behavior in a dynamic perspective.

The central thrust of this research effort was to develop and test a conceptual approach which made use of existing theories where applicable, yet focused primary attention on vertical relationships and on the dynamic forces influencing a vertical system over time. The conceptual approach used is presented in Chapter I and then applied to the vertical broiler system in Chapters II-V. In large part, the approach provides a perspective and a taxonomy or classification scheme to examine vertical commodity systems. In many ways, it is a modest contribution, falling far short of a solid theory of vertical system behavior. However, the perspective and the *handles* it provides are extremely useful in examining the broiler system. Certainly one measure of the usefulness of a model is whether it provides a useful way of viewing the world and identifying relevant questions. From this standpoint, the conceptual approach used was definitely valuable.

The conceptual approach is essentially a combination of several analytical approaches. It utilizes the functional, institutional, and market structure approaches to marketing analysis, yet blends in the decision and authority orientation often found in studies of organizations. In this way, the approach adopts a decision maker focus, but from a system rather than firm point of view. Finally, the perspective of a marketing historian is added to consider the dynamics of vertical systems, and particularly the change forces which have caused the system to evolve over time.

The conceptual approach attempts to draw on and synthesize the concepts and orientations of several academic fields. At least to some extent, it treads

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<sup>1</sup>Clark, J. M. 1961. Competition as a Dynamic Process. The Brookings Institute, Washington, D. C., pp. 43-44.

the middle ground between the economist's focus on markets and the behavior of *groups* of firms, the managerial theorist's preoccupation with the organization and behavior of individual firms, and the historian's concern with broad changes over time. In the process of merging these different concepts, the authors sacrificed some of the precision and rigor possible when the concepts are kept in a more pure form. For this initial effort, such a sacrifice was warranted. It is clearly better to have imprecise answers to the right questions than precise answers to the wrong questions.

While the first concern in this effort was to develop a conceptual approach which would prove useful to businessmen, policymakers, and academicians, this was closely followed by a desire to carefully apply the approach to an agricultural commodity complex. For a variety of reasons, the vertical broiler system was selected for analysis.

The data were collected through a combination of personal interviews, telephone interviews, and various publications. Telephone interviews, due to the entree provided by a few key people, proved to be very effective in obtaining information quickly and efficiently from a widely dispersed sample of individuals. For the most part, the cooperation of the people contacted was excellent.

No standardized interview schedule was em-

ployed. Rather, the interviews were structured around the conceptual model and the questions it provoked. Thirty individuals were interviewed, including key industry, university, and government people.

The central hypothesis throughout this study was that the conceptual model employed would provide useful insights into the dynamic forces and control devices in vertical commodity systems which have a particular influence on why and how coordination and adjustment (two primary dynamic factors in all systems) occur or fail to occur. This hypothesis was confirmed subjectively.

In Chapter I, a perspective of competition and vertical systems is presented, including the conceptual model employed in the following chapters. Chapter II opens the analysis of the broiler system, discussing the objectives, functions, and structures in that system. This is followed by a review of the institutions and arrangements involved in the system in Chapter III, and a discussion of the system decision anatomy in Chapter IV. In Chapter V, the focus changes from the discussion of the component parts and control points in the system in Chapters II-IV to consider the change forces influencing the system over time. Finally, in Chapter VI, some concluding comments are provided, both on the broiler system and on the conceptual approach used in this study.

## CHAPTER I

### AN OVERALL PERSPECTIVE

#### A Perspective of Dynamic Competition

Students of business behavior in a competitive economy interpret the term *competition* in a number of ways. Two of these are particularly relevant in this study.

J. M. Clark defines competition as the effort of business units, acting independently, to make a profitable volume of sales in the face of offers of other sellers of identical or similar products.<sup>2</sup> And while competition normally involves rivalry, Clark suggests that this may or may not be direct and conscious. Under conditions approaching those of pure competition, such as in the case of Midwest corn farmers, rivalry is indirect and is experienced primarily through the "market price." For oligopolistic type markets, however, such as breakfast cereal manufacturing, rivalry is direct and conscious.

Wroe Alderson describes dynamic competition as the search for a differential advantage over competitors—the desire to be different. Alderson suggests this natural driving force means that heterogeneity in markets is the normal and prevailing condition rather than homogeneity; and conditions of disequilibrium tend to exist *except* where the forces of competitive rivalry have "temporarily stalled."<sup>3</sup>

In this study, *the search for a differential advantage as the dominant driving force for private participants in a capitalistic competitive system has been accepted.* While this concept of competition is dynamic by nature and infers the presence of rivalry, Clark points out that such rivalry may take various forms. For the Ohio corn farmer, rivalry takes place primarily in trying to lower his cost of production and anticipate corn prices. For the Kellogg Co., rivalry is more directly focused on vying to be chosen by consumers of breakfast cereal.

To this primary moving force, a secondary and sometimes conflicting force is added. This is *the desire for reasonably peaceful business conditions; i.e., the removal of conflict, stress, and instability.* While there may be exceptions, *open warfare* is normally not desired by businessmen. Conflict, when it reaches certain levels, is unpleasant, increases the level of uncertainty, is probably detrimental to profit, and will lead to resolute action by those involved. Indeed, businessmen would be the first to proclaim the need for laws to assure honest dealings and property rights. This force, then, tends to move the firm and the mar-

ket away from conditions of severe disequilibrium toward a more balanced position of controlled market dynamics.

The third and temporal dimension of dynamic competition is that of a *constantly changing environment.* Because of the changing nature of market institutions and market rules, technology, societal values and tastes, the political environment, and firm and industry organization, firms face conditions akin to a game of chess on a changing board with periodic shifts in the rules. A *relevant* differential advantage today, even if not offset by competitors, may be an irrelevant advantage in the future. The graveyards of business are dotted with firms which achieved and clung to a differential advantage while the changing environment made it irrelevant.<sup>4</sup>

These three forces represent the major dynamic dimensions of competition as perceived by the authors. Broad and pervasive in their presence (but varying in intensity), these forces generate the pressure and stress in firms and industries which stimulate action.<sup>5</sup>

This perspective emphasizes competition as a dynamic, ever-changing process. It suggests that disequilibrium and adjustments are natural parts of this process, not a departure from normality.

While this concept of competition bears most directly on the interaction of competing firms (in their horizontal relationships), it also influences the perspective of vertical relationships. For example, it would be highly inconsistent to embrace the above concept of competition, yet view vertical market systems as equilibrium tending logistics and physical distribution systems.

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<sup>4</sup>See Why Some Companies Perish While Others Prosper; The Lesson of Half a Century. Forbes, Sept. 15, 1967; and Levitt, Theodore. July-August 1960. Market Myopia. Harvard Business Review.

<sup>5</sup>Recognizing that these are broad forces influencing firm, industry, and system behavior, it is worth noting that the individual decision maker often faces choices which are not clear cut. Many decisions are made without a definite goal in mind or without being sure of the consequence of alternative choices. In short, uncertainty and the absence of information are more important elements of the decision environment than are often recognized. Experience suggests that the high level of uncertainty surrounding many decisions results in at least three types of decision making rationale. These include:

a. Reward potential—the selection of alternatives representing an opportunity to bring individual or company rewards; i.e., contributing to the achievement of individual or company goals.

b. Penalty potential—motivation based upon avoiding activities which are illegal or are likely to penalize the individual or firm. These forces may act largely in delimiting the alternatives a decision maker considers.

c. Neutral potential—this might be interpreted as a form of penalty minimizing motivation in that the desire for certainty and safety is the predominant force. Political theorists have defined inertia and default on decisions (muddling through) as an important force in the operation and evolution of the political world. (See Lindblom, Charles. 1968. The Policy Making Process. Prentice-Hall, Inc. Englewood Cliffs, N. J.) This force is also present in decision making at the firm level.

<sup>2</sup>Clark, J. M. 1969. What is Competition? In The Environment of Marketing Behavior, Second Edition, edited by Robert Holloway and Robert Hancock, John Wiley and Sons, New York, p. 195.

<sup>3</sup>Alderson, Wroe. 1957. Market Behavior and Executive Action. Richard D. Irwin, Inc., Homewood, Ill.

Vertical market systems are interrelated social and economic systems which are constantly evolving and adjusting because of pressures and imbalances resulting from horizontal competition, vertical conflict, changes in market rules or arrangements, and environmental forces. It should be clear, however, that this is far from a unanimous point of view. Other economists tend to see vertical systems as equilibrium tending physical transformation, logistics and distribution systems. This latter view tends to emphasize the engineering-economic dimensions of a vertical system, the vertical value adding functions to fulfill a *given* demand, and the efficiency of the system in performing its functions—particularly the physical functions.

This perspective is not incorrect. It is, however, incomplete since it largely ignores the adjustment and adaptation characteristics of vertical systems which are so critical in the long run, the demand influencing functions of systems, and the behavioral dimensions of vertical systems. Explicitly including these characteristics poses definite problems in attempting a rigorous analysis of vertical systems. Their interrelationships with other aspects of system behavior or performance are difficult to examine in any precise way, in part because they are difficult to define or measure. Efforts to develop simulation models of vertical systems often omit some or all of these system characteristics. As a result, many of the most important dimensions of vertical systems unfortunately are overlooked in such models.

The conceptual approach used in this study attempts to embrace the totality of dynamic systems. This includes some factors or incidents which are not easy to measure, either because they are nonrecurrent events or are qualitative in their nature or impact. Particular emphasis is placed on the coordination and adaptation of vertical systems, along with the factors influencing these two central functions of dynamic systems. Since both coordination and adaptation depend heavily upon decisions translating various forces and motivations into actions, attention is also focused on the *decision anatomy* of vertical systems. Since this study is primarily concerned with vertical systems handling agricultural commodities, the terms vertical commodity complex or commodity system are generally used in lieu of the broader term, vertical market system.

#### **Dimensions and Components of a Vertical Commodity Complex**

A *vertical commodity complex* or system is an interdependent array of organizations, resources, functions, rules, information, and human behavior involved in producing, processing, and distributing an agricul-

tural commodity. The terms commodity complex or vertical complex are sometimes used to refer to the total scope of a vertically integrated firm. However, the term is used by the authors in the aggregate sense only.

The boundaries of a commodity complex are arbitrarily defined by the definition of the commodity (e.g., processing vegetables or frozen sweet corn) and by the extent to which the various input systems or output channels are analyzed vertically. That is, where does one start and stop in the vertical system? With the broiler complex, one can begin at the hatchery supply flock level, or can choose to include some of the input systems, such as breeder chick production, feed manufacturing, machinery manufacturing, and even genetic research. Likewise, at the output end of the complex, one can stop short of or include the international broiler system. To confine the analysis to manageable proportions, limits must be set. Yet, the growing awareness of the wide variety of interrelationships affecting a commodity complex encourages expansion of what is considered a relevant part of the complex.

*Industry* refers to a set of one or more organizations similar in the functions performed and the products produced, and related primarily as horizontal competitors. A commodity complex generally includes several industries. The scope and boundaries of an industry become more difficult to define as the typical proprietary boundaries change. The vertical broiler system in previous years, for example, could be logically divided into the breeder, broiler hatchery supply flock, chick hatchery, grow-out, processing, and wholesale-retail industries. Today, the middle four stages plus feed manufacturing are typically within the scope of an individual firm, representing just one industry. To the extent distinct functions can be separated, it is of value to consider these as *stages* in the product flow, even though individual firms may perform all the functions.

The various components of a commodity complex can be classified in a variety of ways. The anatomical breakdown used for this study is:

- **System purpose or objectives.** While systems rarely have objectives representing a consensus of its members, it is often useful to define the implied objectives. What does the system *appear* to be trying to accomplish? In instances where parallel vertical systems exist within the same commodity system (e.g., private labels and national brands), the implicit objectives of such systems are important to distinguish.
- **Stages of the industrialization process and the functions performed.** This is simply a prag-

matic identification of the jobs to be done and the grouping of such jobs at each stage in the value adding process. . . Product characteristics, spatial and temporal dimensions, and product flow channels are also included.

- **Proprietary and authority structure.** This relates to the firms, agencies, and individuals populating the system. It is concerned with who has control or authority over what. Also, how is the risk distributed? The structure of the industries at each proprietary level in a system is also examined.
- **Coordinating and regulating institutions and arrangements.** These include facilitative and restraining instruments which may be both tangible and intangible. Organized market places, trade practices, information systems, government grades and regulations, trade associations, transportation services, and credit services are some of the factors included.
- **Decision anatomy.** This is the network of critical decision points and associated authority distributed throughout the system. In addition to the location of decision points, the type of decisions (unilateral, bilateral, institutional, etc.), and the decision environment (the forces bearing on the decision maker) are relevant considerations.
- **Forces and instruments of change (or inertia).** These include the on-going dynamics of a system leading to or impeding change and adaptation. The evolution of a system and its responsiveness to external and internal pressures and developments are examined, along with the instruments or vehicles of change (new laws, university research, innovative firm, etc.).

The first and last dimensions can be thought of as the primary sources of change and adjustment. These are the pressures, the motivations, the imbalances resulting in action (or inaction) by members of a vertical system. The other four dimensions are the means by which such forces are translated into actions. In a very real sense, they represent the structural anatomy and the nervous system of the vertical complex.

This is the classification scheme used to study the vertical broiler system. Chapters II-V are organized on this basis.

Particular attention is placed on adaptation and coordination of vertical commodity systems, and on competition at different levels in vertical systems. Since adaptation and coordination have received relatively little treatment in the published literature, some comments are in order before turning attention to the broiler system.

### **Adaptation and Evolution of Commodity Complexes**

Vertical systems are generally evolving systems, as opposed to steady state systems. They are continually adjusting and adapting to pressures and imbalances emanating from horizontal competition, vertical conflict, and environmental forces. This is not to suggest, however, that all vertical systems are equally responsive and adaptive. Quite clearly, history suggests this is not so.

The factors influencing a system's adaptability are open to conjecture. McCammon suggested: ". . . institutional change in marketing tends to be a process in which firms and channels maneuver for short-run advantage and in which they adapt almost imperceptibly to environmental disturbances."<sup>6</sup>

Since members of established vertical systems often resist or respond only incrementally to innovations, major innovations—particularly those threatening to restructure the system—are generally introduced by firms or agencies outside the system. Relatively free entry would therefore appear to be important to system adaptability.

The structure and control of the vertical system may also influence its responsiveness and adaptability. Although empirical data are lacking, one might hypothesize that the accuracy with which consumer preferences are transmitted (hence the possibility that system adjustments will be relevant) improves when retail outlets are organized (so they have some power in the market place), are free of significant manufacturer control, and handle the products of several manufacturers, as compared to the opposite extreme of manufacturer owned and controlled retail outlets.

In addition, logic suggests other influences on system responsiveness and adaptability, such as the presence or absence of innovative firms at different levels in a system to set the pace for others, the growth-maturity stage of the system, the existence of government guarantees or other shields from market forces, and the balance of conflict and cooperation in the system.

A commodity complex is very much a living ecological system; it adjusts and adapts, it influences, and in some cases it dies. The control devices in the complex which interpret, respond, and in many cases initiate forces of change or inertia are the decisions in the firms and institutions which are a part of or serve the complex.

Pressures and imbalances, to a certain degree, always exist within a commodity complex. As they reach a threshold of intensity (which varies for dif-

<sup>6</sup>McCammon, Bert C., Jr. 1969. Alternative Explanations of Institutional Change and Channel Evolution. In *The Marketing Channel: A Conceptual Viewpoint*, edited by Bruce Mallen, John Wiley & Sons, New York.

ferent firms), decisions are made to fill the vacuum (a pull pressure) or to relieve the pressure (a push pressure). Members of the commodity complex are likely to respond to remove excessive pressure and conflict as long as the existence of the commodity complex is beneficial to the achievement of their individual goals. If the basic purpose of the complex or the methods of achieving that purpose are in serious disharmony with those of its members, the existing commodity complex is likely to be reorganized or abandoned.

From a historical perspective, the evolving characteristics of a commodity complex are easily observed and explained, at least at a surface level of investigation. Certain critical events can often be defined which significantly altered the characteristics and operations of the commodity complex.

In some cases, they were initiated by the action of a particular company or government agency. Mandatory federal inspection for broilers shipped in interstate commerce went into effect in 1959, and is a case in point. It had the immediate effect of speeding up the demise of small processors and the expansion and modernization of many plants which remained. This soon led to another wave of over-capacity in processing, which in turn spurred competition for the supply of live birds and efforts to *lock in* supplies by contracts. Locking in supplies by contracting was being practiced to some extent before mandatory inspection, and the over-capacity in processing which resulted was an added stimulus to this trend. Mandatory inspection sped up the evolutionary process in the broiler complex, but did not significantly change its direction.<sup>7</sup>

In contrast to mandatory inspection, most change events occur in increments and result from a series of decisions over time. Pinpointing an innovative decision at its beginning may be impossible. The credit and financing situation in today's broiler complex, for example, is the cumulative result of many incremental decisions since World War II. Step by step, feed dealers and other suppliers expanded and liberalized credit to growers until the move to retain ownership of the chicks, supply the feed, and contract for the employment of the growers' labor and facilities was just another incremental step in the evolutionary process.

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<sup>7</sup>Not all parts of the broiler complex went through the same evolutionary process. Broiler production in some of the newer areas such as Georgia, Alabama, and Mississippi was largely initiated under contracts, whereas production in older areas such as New England and Delaware, Maryland, and Virginia evolved from producer ownership and financing of birds, feed, etc. to contract production. In the newer areas, contracts were necessary to encourage production, and allowed integrators to concentrate production near their centers of operations for greater efficiency.

Identification of specific decisions initiating change events may be possible in some cases, but in many may not. At the same time, it is recognized that decisions are the activators of change. The change may be gradual or sudden, may stem from the action of few or many decision makers, and may or may not be traceable to any particular decision. Still, it is known that decision makers, operating with certain goals and influenced by a variety of pressures, made decisions to cause such a change.

#### **Coordination in a Commodity Complex**

To this point, the discussion has concentrated on the evolving or adjusting aspect of system dynamics. The term dynamic also refers to motion. It is to this interpretation that attention is now directed.

The rate of change and adaptation in vertical systems varies greatly. While some are undergoing substantial restructuring and reorganization, other systems have reached a plateau in their evolutionary process. In any case, however, the dynamics involved in the internal operation and functioning of the complex are of continued importance. A variety of inputs are absorbed and transformed by the functions performed by a number of organizations into saleable goods and services. This value adding process, to effectively mesh with market demands, requires coordination.

Because of the interdependence yet independence of members of a commodity complex, coordination of the various functions and organizations is essential if some degree of order and efficiency is to be realized in accomplishing the fundamental purpose of the complex. The need for coordination is a unifying force drawing its power from the community of interests of the members of the complex. The degree of coordination attained depends in part on the level of commitment of system members to the survival of the system and of other system members. This determines the extent to which individual interests will be subordinated to the effectiveness of the total complex.

At any given point in time, coordination of a vertical complex depends upon existing institutions and arrangements (including markets, rules and regulations, trade practices, and facilitating organizations); the flow of information (including its accuracy, quantity, and timing); and decisions.

Existing institutions and arrangements are the instruments or the vehicles through which coordination takes place. They have a strong influence on the extent to which market signals are accurately and promptly relayed to system members, and hence on system responsiveness. For example, one of the benefits from contracts as compared to spot markets in linking system members is the increased information flow which often occurs. If the contract is part of a



long term continuous relationship, higher levels of cooperation and understanding also might be expected, although this depends upon the degree of dependency of each party on the other.

Given the institutions and arrangements and flow of information in the system, management decisions actually perform the coordinating task. In this respect, the concept of a system *decision anatomy* is analytically useful. The decision anatomy refers to the network of decision points and associated authority extending throughout the system. It represents the *nervous system* by which coordination and adjustments take place.<sup>8</sup>

The decision anatomy of a system provides an overall view of the control points and the distribution of authority and influence for the entire system. In some cases, decisions rest on sovereign authority, as in the case of federal regulations; in other cases, the authority is shared between two entities, as is true with bilateral transactions; in still other instances, decisions are unilateral due to property rights, customs, or other bases of authority. Attempting to define and understand the decision anatomy of a system causes one to examine the location and basis of decision controls.

The structure of authority and decisions within organizations in a system also have a bearing on system coordination. Lawrence and Lorsch found, for example, that firms facing rapidly changing and uncertain environments need to have a relatively flat organizational structure in which considerable authority

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<sup>8</sup>For further comments on this approach, see Arthur, Henry B., et al. 1969. *Tropical Agribusiness Structures and Adjustments—Bananas*. Division of Research, Graduate School of Business Administration, Harvard University, Chapter 7.

and freedom is delegated to lower levels. On the other hand, firms in a relatively unchanging business environment can operate with less delegation, tighter internal controls, and simpler channels of communication.<sup>9</sup> Since an organization must carry on transactions with its environment simply to survive, the characteristics of the organization need to be consistent with the various segments of the environments with which it deals. In trying to understand coordination and adaptation in a vertical system, the distribution of decisions and authority, both for the total system and for individual firms, may warrant examination.

The foregoing suggests the importance of understanding the distribution of authority and decisions within a system. Attempting to understand why certain decisions are made requires examining yet another dimension—the set of forces bearing on decision makers. These include: competitive forces, the goals and values of individuals and organizations, their perceived role and power in the system, economic-political-social forces, etc. Both the forces and the interpretation of them may change from one decision point to another. The greater the difference in the set of forces bearing on decision makers at different levels in the system, the more difficult the integration and coordination task.

Chapter I has briefly sketched the perspective and conceptual approach used in analyzing the vertical broiler complex. While far from complete or definitive, it hopefully suggests the general *Weltanschauung* of the authors. With this as background, attention is turned to the vertical broiler system.

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<sup>9</sup>Lawrence, P. and J. Lorsch. 1969. *Developing Organizations: Diagnosis and Action*. Addison-Wesley Co., Reading, Mass.

## CHAPTER II

### THE VERTICAL BROILER COMPLEX: OBJECTIVES, FUNCTIONS, AND STRUCTURES

"Among agricultural industries none changed so profoundly in the two decades following World War II as those of poultry and eggs. Changes came in technology, organization, and location."<sup>10</sup>

In part because of its rapid change, much has been written about the U. S. broiler system, that vertical system extending from the foundation breeder of broiler chickens to the consumer.<sup>11</sup> This report does not attempt to summarize the various studies made by others, but rather focuses particular attention on the dynamic forces and control devices involved in the rapid changes and considerable success realized by this vertical system.

#### The Broiler Success Story

American consumers ate approximately 37 lb. of broilers per capita in 1971. This represented a four-fold increase in consumption since 1950 (8.7 lb.), and nearly a 60% increase since 1960 (23.4 lb.).<sup>12</sup> Many of the reasons behind this dramatic growth are well documented. Technological developments in genetics, feeding, disease control, housing, and mechanization provided a major thrust. Changes in the structure, financing, and organization of the broiler complex also played significant roles, as fewer but larger volume firms emerged which performed many of the functions in the vertical complex. These and other forces resulted in a significant reduction in the cost per pound of broilers.

During the same period, the cost of red meat was steadily trending upward. Stimulated in addition by frequent retail-specializing, the development of fried chicken fast food outlets, and increasing consumer incomes, broilers drew strong consumer support and patronage.

That is a thumbnail sketch of the broiler success story, a drama widely proclaimed in this country and around the world.<sup>13</sup> Yet, it tells little about the actors creating the drama; of the work, risks, trials, and errors which evolved into an efficient industrialized system; of the reasons behind the changes made; of the problems, conflicts, and change forces shaping the

system; or of the extent to which the changes resulted from outside forces thrust upon the system, or from inside forces emanating from private decisions.

Time, space, and information limitations preclude complete documentation of the actors, decisions, and reasons contributing to the evolution of the broiler complex. However, sufficient instances have been selected to demonstrate the important forces influencing the degree of coordination and adaptability of the system, including the role of decisions as the control network for such forces in the broiler complex.

#### The Broiler Complex as a System

"The primary function of almost any industry can be thought of as the efficient bringing together—the integrating—of the resources, products, and services needed to provide an end product that will best satisfy the needs of customers."<sup>14</sup>

This is certainly true of the broiler system. And the dramatic reduction in the cost per pound of broilers and concomitant increase in consumption suggest that the system has performed well in accomplishing this task. However, while this is the general purpose of most industries and vertical systems, the more specific foci may vary from system to system. Thus, it is useful to define the apparent objectives of a system.

#### System Objectives

"Almost every industry exists because it has a market to serve. Serving the market is the prime objective, to which most others are subordinate regardless of how important they seem to be at the moment. Individual firm objectives must be compatible with this and other overall industry objectives if the firm is to survive in a competitive world."<sup>15</sup>

Many readers may be bothered by the idea of system objectives, since this suggests collective agreement by system members on certain goals. In fact, of course, this does not occur in an explicit fashion. However, certain implicit purposes or objectives can be derived from the accomplishments and behavior of a vertical system. That is, what does the system seem to be trying to achieve? It is in this sense that this term is used.

The notion of system objectives is suggested because it is conceptually useful in examining various

<sup>10</sup>National Commission on Food Marketing. June 1966. Organization and Competition in the Poultry and Egg Industries. Tech. Study No. 2, U. S. Government Printing Office, p. 1.

<sup>11</sup>In addition to the above, see for example Tobin & Arthur, 1964. Dynamics of Adjustment in the Broiler Industry. Division of Research, Graduate School of Business Administration, Harvard University, and the series of publications on Marketing New England Poultry by the New Hampshire Agricultural Experiment Station.

<sup>12</sup>Poultry and Egg Situation. PES 261 and PES 272, Economic Research Service, U. S. Dept. of Agriculture, April 1970, p. 19, and June 1972, p. 15.

<sup>13</sup>For a popularized version of the broiler success story, see Sawyer, Gordon. 1971. The Agribusiness Poultry Industry—A History of Its Development. Exposition Press, Inc., Jericho, N. Y.

<sup>14</sup>Tobin and Arthur, *op cit.*, p. 5. The term industry as used by Tobin and Arthur is synonymous with the terms vertical system or vertical complex used in this report.

<sup>15</sup>Arthur, Henry, et al., *Tropical Agribusiness . . .*, *op. cit.*, p. 116. This is not to suggest, however, that firms must always adjust their objectives to be compatible with the purposes of an existing system. In some instances, a firm whose objectives (profit, stability, growth, etc.) are incompatible with system objectives may survive by leaving an existing vertical system and organizing another system that will facilitate the achievement of its objectives.

vertical systems. It would also seem to be useful for members of a system to compare their interests and goals with the *objectives* of the system as they perceive them. Are they in harmony?

In many cases, the objectives of a system are the result of system members trying to achieve other goals, such as profits, growth, or survival. The system's objectives may in fact be the means or a by-product of member firms achieving their individual goals.

In the U.S. broiler complex, providing wholesome fresh broilers to consumers at the lowest possible price seems to have been the overriding system objective for several years.<sup>16</sup> The more specific subobjectives have changed over time, however. For example, in the pre-World War II period, wholesome broilers meant New York-dressed birds which were largely not federally inspected. By the early 1960's, wholesome broilers meant ready-to-eat eviscerated broilers which were predominantly federally inspected. Now, the interpretation is once again shifting as increasing quantities are being sold through fried chicken carryout restaurants, and in pre-cooked or further processed forms. A definite desire to shift away from fresh undifferentiated broilers is apparent.

The basic objective of the vertical broiler complex has remained oriented toward filling a market need, and doing so efficiently. The more specific objectives have changed as consumer desires have shifted and as the firms in the system have developed new ways of satisfying consumer demands.

Ancillary objectives which appear to have been present in the U. S. broiler system include expansion of the total consumption of broiler meat world wide and attainment of stability in broiler supplies and prices.

Efforts to expand total consumption have largely relied on increased efficiencies placing broilers in a favorable cost position relative to other meats. In economists' terms, the efforts have focused more on moving outward along the demand curve for fresh broilers, rather than on shifting the curve through advertising, product development, etc. More interest is now being shown in the latter approaches in the U.S. as opportunities to reduce broiler costs have largely been exploited, and much of the consumption increases to be gained from lower broiler costs have already been realized.

Increases in the foreign consumption of broilers have resulted from two different and to some extent competing efforts by members of the U. S. broiler sys-

<sup>16</sup>This objective is the result of member firms trying to out-do their competitors in order to hold or expand markets. Competition to sell chicks, feed, equipment, and other inputs led to technological advances which were quickly adopted by broiler firms. Low priced, quality broilers resulted, although it's doubtful that individual member firms held this as a goal.

tem. Fresh and frozen broilers and broiler parts have been exported by U. S. firms to other countries. The 100 million lb. exported in 1971 represented about 1.28% of the total slaughtered.<sup>17</sup>

Of greater importance have been the efforts by U. S. firms (breeders and integrators) to export technology and/or develop subsidiaries in foreign countries. The development of foreign broiler industries has helped alleviate the world's nutrition problems and at the same time contributed to the expansion of total broiler production and consumption.

The 1969 Annual Report of International Basic Economy Corporation states:

" . . . the company's (i.e., its subsidiary, Arbor Acres) proven genetic research capability has been a key force in the establishment of a modern poultry industry in 23 other nations. . . when Arbor Acres began its breeding operation in Argentina, only a very small part of the poultry consumed in the country was commercially produced . . . within a relatively short time, Arbor Acres demonstrated that its techniques could raise a bird to market in 8½ weeks as opposed to 13 weeks, and do it at about one-third of the cost."<sup>18</sup>

The president of one of the U. S. foundation breeding companies estimated that approximately one-half of the income of U. S. breeders was from foreign operations in 1969. The world market for meat stock breeders was estimated at \$60 million in 1971, and is expected to grow to \$75 million by 1975. U. S. and Canadian sales are expected to represent only 40 percent of the world market by 1975 because of the more rapid growth of foreign markets.<sup>19</sup>

**Attainment of Stability.** "The instability problem, with its recurrent distress prices, has preoccupied the industry more than almost any other."<sup>20</sup>

Figure 1 indicates the average farm broiler prices from 1956 to 1972. The long term decline in broiler prices continued through 1961, but has leveled off since then. However periodic price depressions continue to characterize the system—most recently in 1970, 1971, and 1972. Monthly prices show even greater gyrations. For example, while the average farm price during 1971 was 13.7 cents per pound, the monthly prices ranged from 12.1 to 15.6 cents per pound (Figure 2).<sup>21</sup>

<sup>17</sup>Poultry and Egg Situation, June 1972. PES-272, Economic Research Service, U. S. Dept. of Agriculture, pp. 21 and 28.

<sup>18</sup>1969 Annual Report, International Basic Economy Corporation, New York, p. 12.

<sup>19</sup>See An Anniversary Talk with Went Hubbard, Broiler Industry, Garden State Publishing Co., Sea Isle City, N. J., August 1971.

<sup>20</sup>Tobin and Arthur, *op. cit.*, p. 6.

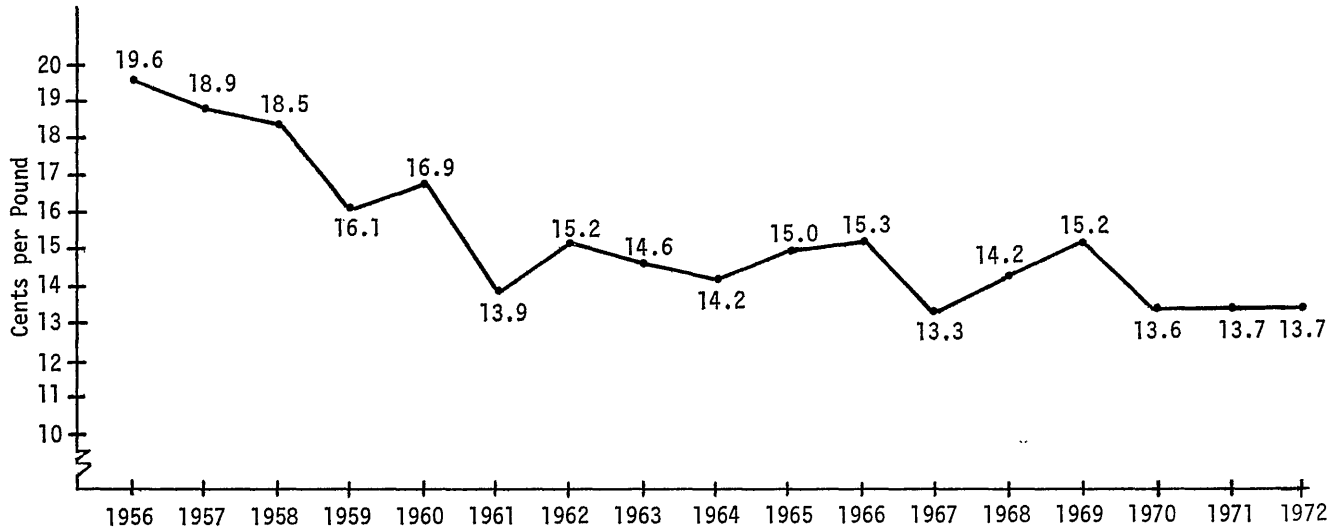
<sup>21</sup>These prices are not the amount paid to contract broiler growers for their services; rather, they represent the derived value of live broilers based on prices received by integrators for ready-to-cook broilers.

The pounds slaughtered and farm prices by month during 1970 and 1971 are shown in Figure 2. Although integrators reduce production for the fall months and increase production for the summer

months in response to fluctuations in demand, the production adjustments are often not sufficient to achieve uniform prices.

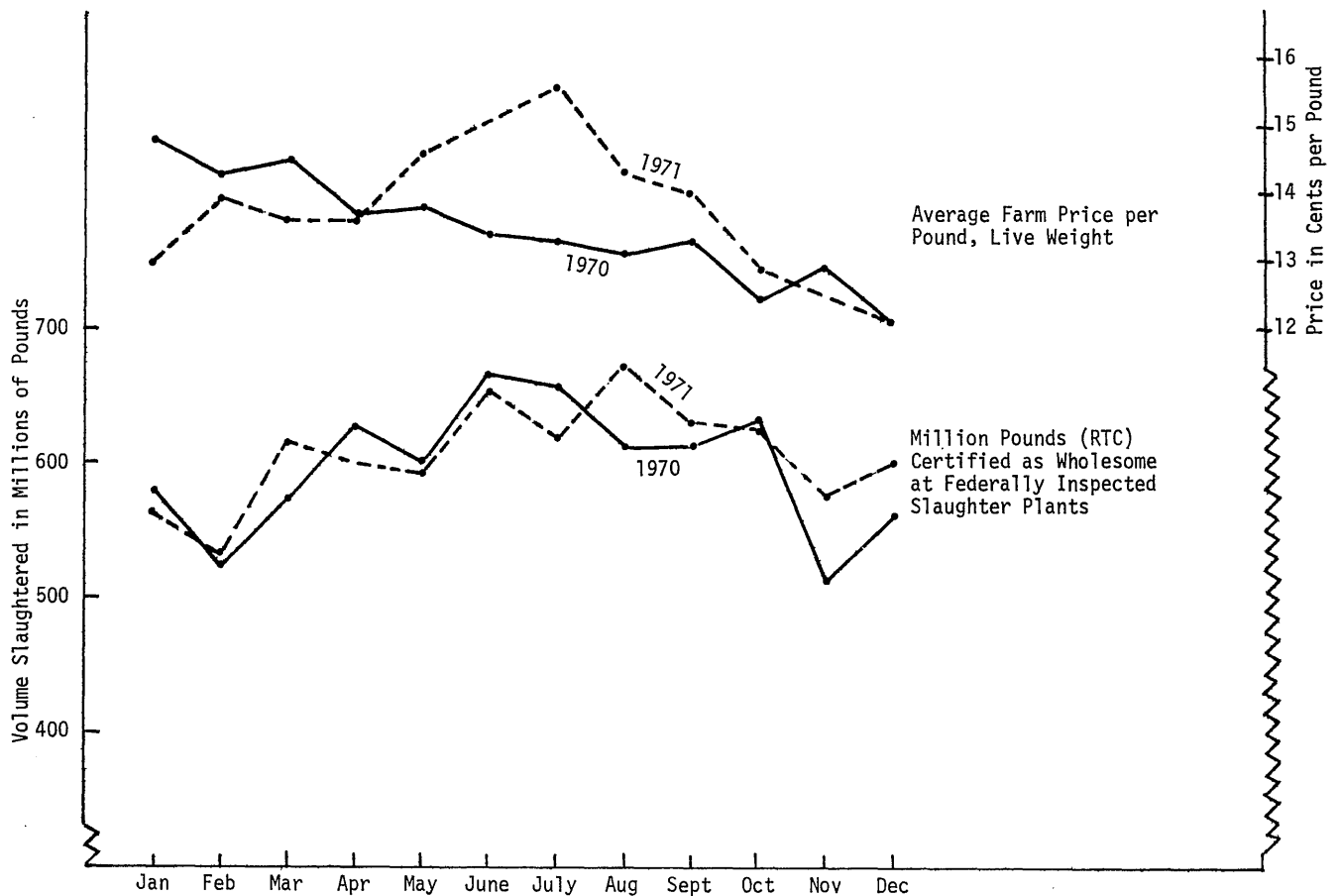
A variety of efforts within the industry and by

**FIG. 1.—Average Prices Received by Producers per Pound of Live Weight Broilers.**



Source: ERS 232, Selected Statistical Series for Poultry and Eggs Through 1965, Revised May 1966, Economic Research Service, U.S.D.A., also PES 261 and 272, Poultry and Egg Situation, April 1970 and June 1972, Economic Research Service, U.S.D.A., Washington, D.C.

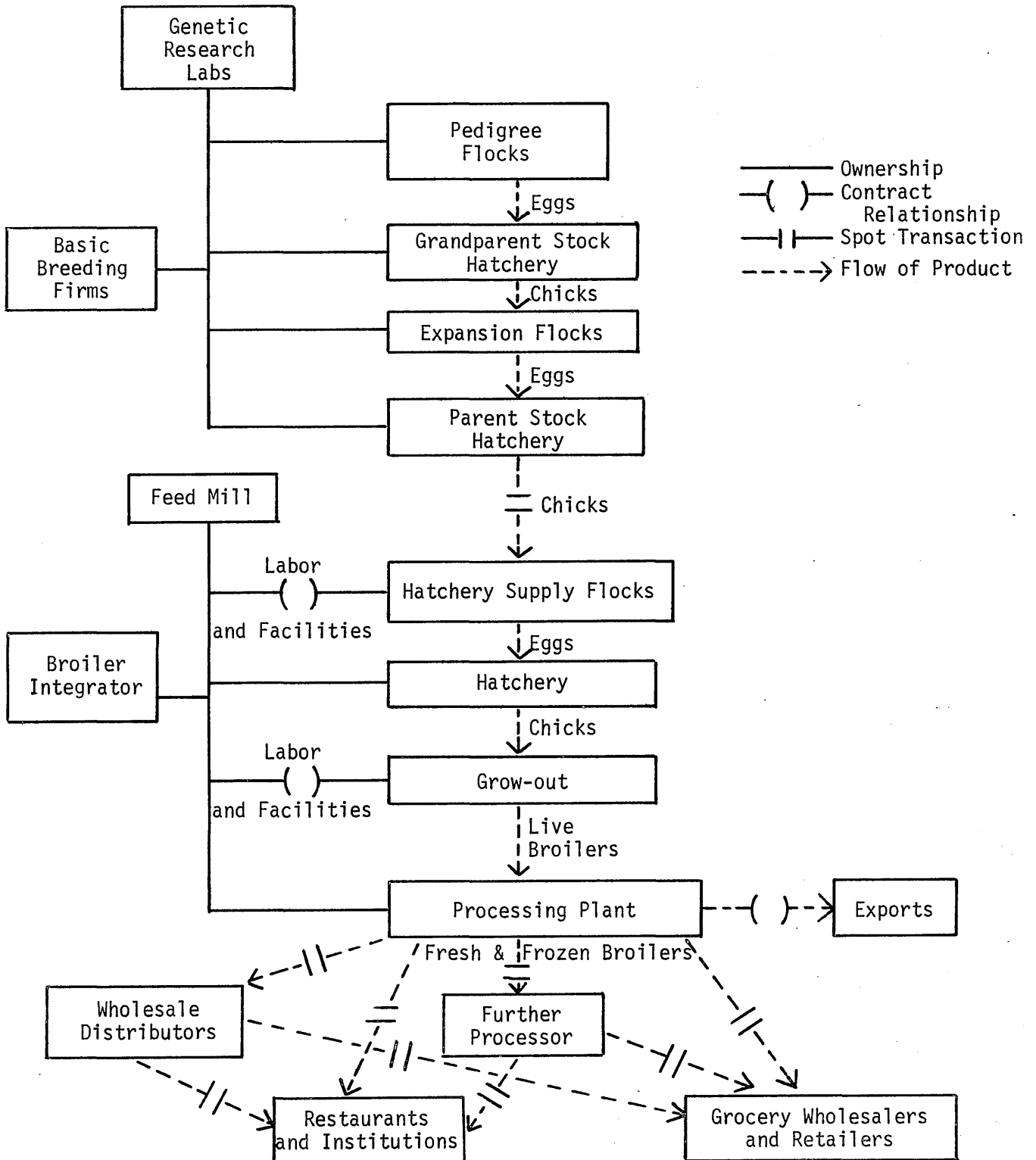
**FIG. 2.—Volume Slaughtered and Farm Prices by Month, 1970 and 1971.**



the federal government have been aimed at the instability problem. Although many have held hopes that greater stability would be realized as the industry moved increasingly into the hands of professional managers, little if any progress is apparent.

*Stages of the Industrial Process, Proprietary and Authority Structure, and the Functions Performed*  
 Figure 3 shows the stages of the industrial process involved in converting research and development in the breeder's genetic laboratories into ready-to-eat

**FIG. 3.—Stages, Proprietary Structure, and Linkages Typical of the Broiler System in 1970.**



broilers at a restaurant or retail store. The stages involved have remained much the same over the last decade or two. In some cases, an additional stage of pullet raising is inserted between the parent stock hatchery and the hatchery supply flock stage. Frequently, however, this function is performed at the hatchery supply flock stage.

The wholesale distributor or broker stage has gradually declined in importance as both processor sellers and retail buyers have increased in size and in the propensity to deal direct.<sup>22</sup> Many distributors still perform a warehousing and store delivery function. Some of the more successful distributors have become more innovative and aggressive in the service performed for the seller and the buyer. Some provide custom cutting and packaging services for retail firms, while most have become more diligent as local representatives of their clients' product.<sup>23</sup>

While the stages involved have remained relatively constant, changes have taken place in the functions performed (or tasks to be done) at different stages—and the way these functions are performed.<sup>24</sup> The former is largely the result of organizational changes in the industry; the latter of technological developments.

At one time, many of the stages shown in Figure 3 were in the hands of separate firms. The stages were linked by market transactions. Foundation breeders sold chicks to hatchery supply flock producers, who sold eggs to hatcheries, who sold chicks to broiler growers, who sold grown broilers to processing plants, who sold dressed broilers to distribution agencies. Under this arrangement, the product moved through six to eight separate entities on its journey to the consumer. At each firm, decisions were made which could affect the coordination and stability of the total system. Since each firm took possession of the product, it accepted responsibility for obtaining the necessary inputs, transforming the product, selling their output, providing the necessary financing, and managing their risk exposure. Rapid growth and price instabilities made this proprietary and authority structure untenable, particularly for broiler growers who faced heavy financial requirements and a high exposure to price fluctuations.

<sup>22</sup>One source estimates that 40% of RTC broilers were shipped direct to retailers and institutions in 1955, and that by 1970 this had increased to approximately 75%. Another source estimates that 53% of RTC broilers were sold through distributors in 1960 and 43% in 1970. The trend is the same in both cases but the magnitude varies considerably.

<sup>23</sup>For two reports on successful distributors, see *Broiler Industry*, April 1968 and April 1971.

<sup>24</sup>The functions performed at any stage can be grouped into four or fewer categories. These are procurement of inputs; transformation, storage, and transportation operations; sale or discharge of products; and custodial requirements (financing, risk bearing, management information).

The proprietary and authority structure which has emerged during the last 15 years is one involving only three major commercial entities: the primary breeder, the broiler integrator, and the retail or institutional outlet. The causes behind and routes by which this restructuring took place will be discussed later.

Figure 3 indicates the ownership arrangements for the various stages and the types of market linkages which most frequently tie the present U. S. broiler system together. It does not attempt to indicate all of the functions involved or who makes the decisions controlling such functions.

At the primary breeder level, the genetic research lab, pedigree flocks, and grandparent stock hatchery tend to be located together, often at the headquarters of the breeding firm. The development and laboratory testing of new birds occurs at this level, as does the planning of the total operation for both the short and long run.

The breeder maintains ownership and control through the grandparent expansion flocks and the parent stock hatchery, which are usually distributed geographically to serve the various broiler growing areas. Although the breeder maintains ownership of the grandparent flocks, he may lease the facilities from a producer-investor who constructs them to his specifications, own them outright, or in a few cases contract for the labor and facilities of a poultry producer. In most cases, the managers of the expansion flocks are employees of the breeding firm.

Male and female chicks from the same strain or generation are distributed to the expansion flocks from the grandparent stock hatchery. After being raised to laying age (6 to 8 months), these males and females are used to multiply the strain by producing eggs for the parent stock hatchery for 7 to 8 months. The parent stock hatchery in an area collects the eggs from the expansion flocks, hatches them into chicks, sorts them by sex, culls out inferior chicks, disposes of that sex of chicks which will not be used for crossbreeding, and delivers the male or female chicks to the integrator's hatchery supply flocks, where they will be crossbred and used as parents of broiler chicks to be grown, slaughtered, and marketed.

In general, breeders have not integrated into providing their own feed and similar supplies. Feed, medication, equipment, and other supplies tend to be purchased via spot transactions from firms producing these inputs. Feed manufacturing would appear to represent the best prospect for integration because of the volume used by breeders. However, the geographic dispersion of their operations raises questions concerning its economic feasibility. Further, although feed represents a large share of the variable expense

of producing breeding chicks, it represents a relatively small portion of the total cost.

Primary breeders have generally specialized in either male or female birds. This continues to be true although most breeding companies are now offering birds of both sexes. At least to some extent, this has been an outgrowth of foreign operations where it has proven desirable to provide both pullets and cockerels. Providing both male and female birds gives the breeder more control over the genetic make-up of the broiler chicks, which offers definite advantages.

The sale of chicks to the integrator for his hatchery supply flocks represents the first market transaction in the vertical broiler system. The subsequent four stages of the system are in most cases under the control of the integrator, as is feed manufacturing. At two of these stages, the hatchery supply flock and the grow-out operation, the integrator frequently does not own the facilities or provide the labor, but instead contracts with producers for their labor and facilities. More variance exists at the hatchery supply flock stage where some integrators have both company-owned and contracted operations. In some instances, the integrator operates separate pullet rearing farms, and contracts the egg laying operations. In nearly all

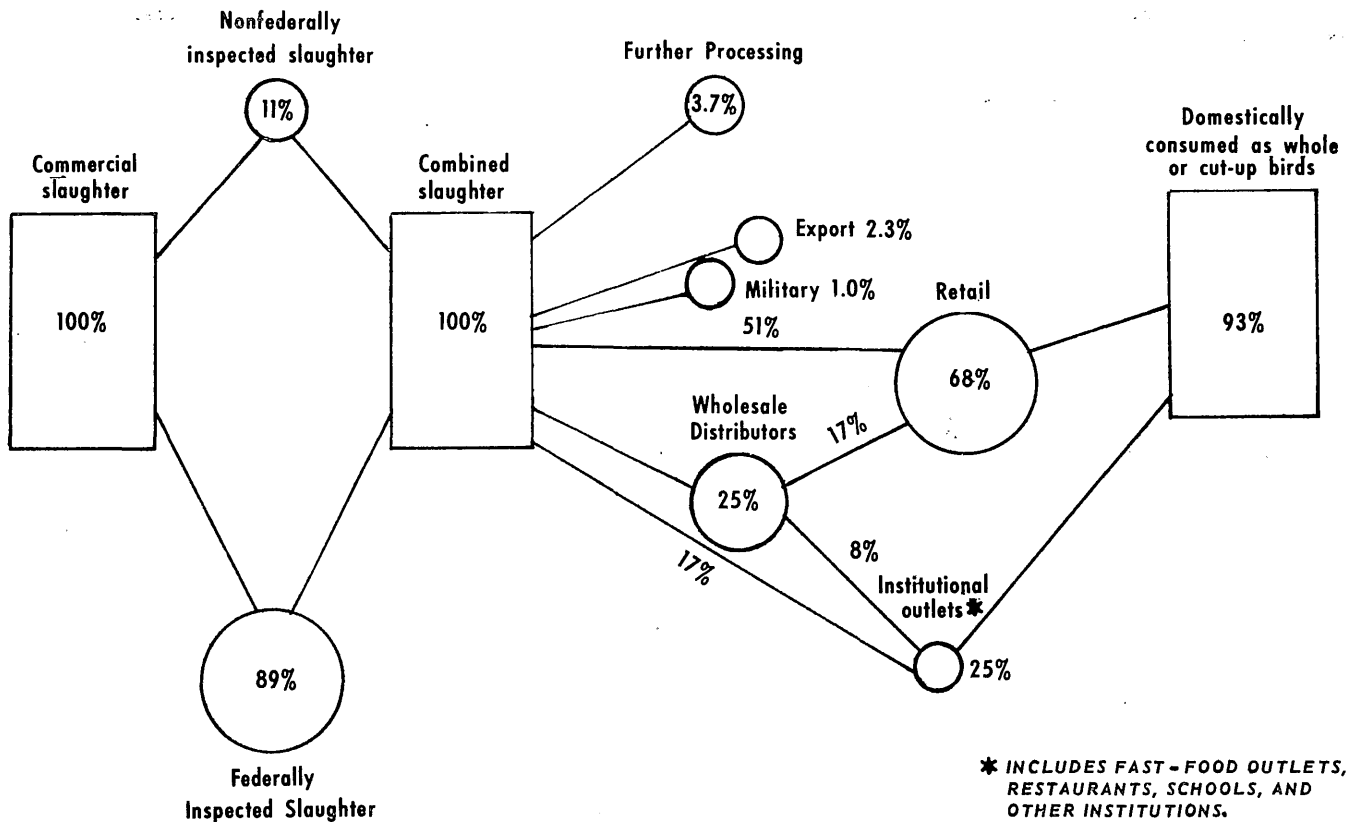
cases, however, the integrator retains ownership of the birds throughout, provides the feed, medication, in some cases litter and fuel, and definite management guidelines for the flock manager. Although operations may be conducted by others, commercial control remains in the hands of the integrating firm.

Arrangements for the grow-out function are more uniform across integrators. While the quantity being produced at integrator-owned facilities has slowly increased (5 to 7% of total), it is estimated that 90 to 95% of the broilers are produced under some type of contractual arrangement.<sup>25</sup> The types and specific terms of grower contracts vary considerably; however, the grower primarily provides the labor, buildings and equipment, and in some cases fuel, utilities, and litter. In turn, the growers are usually guaranteed a fixed amount per pound or per bird produced, with additional payments dependent upon feed conversion efficiency and/or the market price.<sup>26</sup>

<sup>25</sup>Gallimore, William and James Vertrees, May 1968. Contract Arrangements in the Poultry Industry. Marketing and Transportation Situation, U. S. Dept. of Agriculture.

<sup>26</sup>For a good analysis of grower contracts, see P & SA-1, The Broiler Industry, Packers and Stockyards Administration, U. S. Dept. of Agriculture, August 1967, and MRR 814, A Comparison of Returns to Poultry Growers, Economic Research Service, U.S.D.A., Feb. 1968.

FIG. 4.—Major Marketing Channels for Ready-to-Cook Broilers, 1969.



Source: The Chicken Broiler Industry: Structure, Practices and Costs. MRR 930, Economic Research Service, U. S. Dept. of Agriculture, p. 30.

The integrator's hatchery collects eggs from the hatchery supply flocks, hatches the eggs, culls poor chicks, and distributes broiler chicks to the grow-out operations. The processing plant performs the broiler assembly function, processes the birds, and distributes the end products to institutions, retail firms, further processors or exporters.

The major marketing channels for broilers in 1969, as reported in a U.S.D.A. study, are shown in Figure 4. The percentage sold through wholesale distributors is open to some question. A study conducted by Dr. Robert Wunderle of the National Broiler Council found that 43% of the broilers in 1970 were marketed through distributors, 42% were sold direct to retail organizations, and 7% were sold direct to restaurants and institutions.<sup>27</sup>

Both sources estimate that approximately one-fourth of all broilers are sold through restaurants and institutions. About one-half of this or 12% is sold through fried chicken outlets.

Nearly 80% of all broilers are marketed as iced or CO<sub>2</sub> chilled birds, 13% in chill pack, and 8% as frozen broilers.<sup>28</sup> Overall, about one-fifth are marketed cut-up; the remainder as whole birds. In the case of chill pack broilers, however, cut-ups represent about 55% of the total volume (Figure 5).

Since deep chill or chill pack broilers are sold entirely through retail stores, they represent nearly

20% of the volume sold through retailers. Frozen broilers, either raw or pre-cooked, make up only about 5% of retail broiler volume. The remaining 75% come from iced or CO<sub>2</sub> chilled broilers. Since iced or CO<sub>2</sub> chilled broilers are distributed unpackaged from processors, the majority of consumer packaging continues to be performed by retail firms (predominantly at the store level although gradually shifting to the warehouse level).

Deep-chill prepackaged broilers have made steady though not spectacular gains in acceptance by retail operators, indicating a continued shift of the cutting and packaging functions from retail firms to processors.<sup>29</sup> This trend seems destined for a sharp increase due to stiffer sanitation laws for stores and central meat plants, increasing store wage rates, and an increasing number of potential suppliers of deep

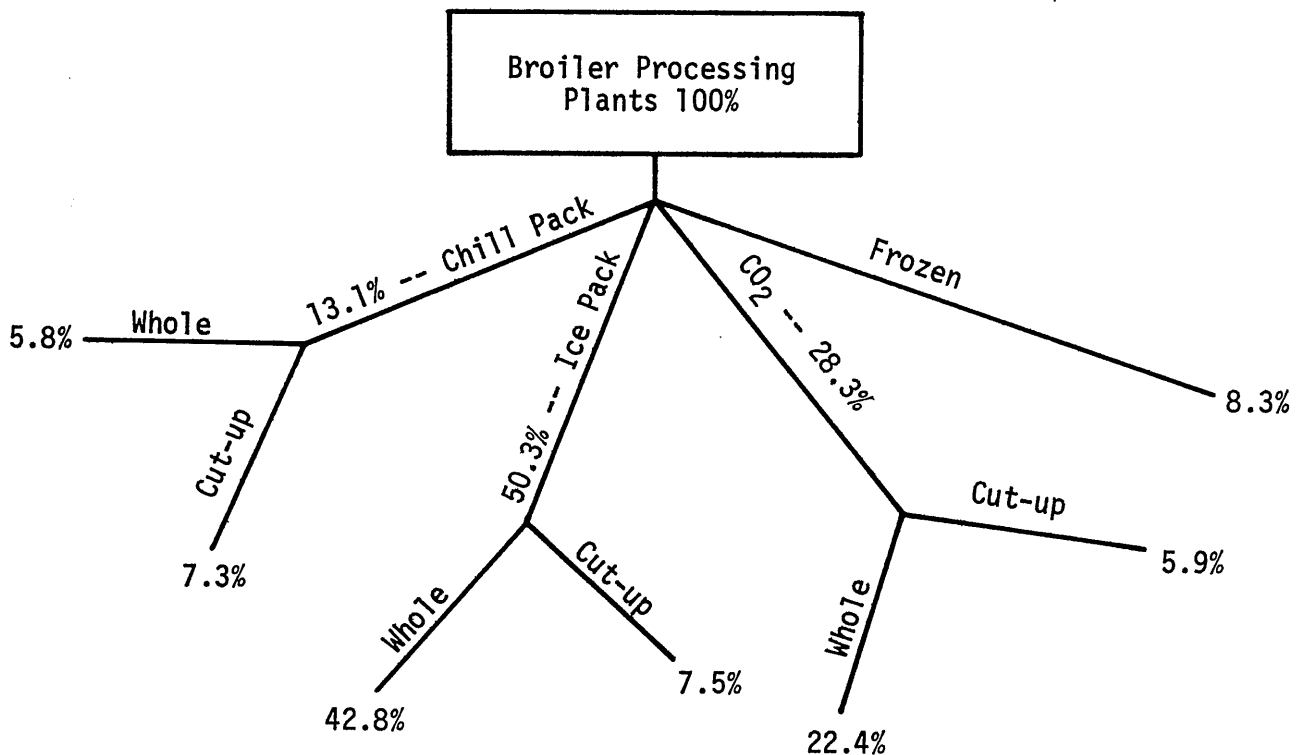
<sup>28</sup>Deep chill or chill pack broilers are packaged into consumer packages at the processing level under carefully controlled conditions of sanitation and refrigeration, crust frozen, and then maintained at 28° F. until delivered to retail stores. To maintain temperatures of 28-29° F. throughout distribution, processors have often performed the delivery function in their own fleet of trucks. With stringent quality control, the shelf life at the retail store is more than adequate for normal sale and consumption requirements.

This is the most common method used for processor packaged broilers, but not the only one. The use of CO<sub>2</sub> within packages has received some experimentation but is not widely used. Still another approach is the Crystal Pak used by Bayshore Foods. Both of the latter methods utilize less expensive methods of chilling and holding packaged broilers than the deep chill process.

<sup>29</sup>The staff of Broiler Industry magazine predicts that 50% of all chicken will be packaged at other than retail store levels in 3 to 5 years. This compares to 20-25% in 1971 (deep chill and frozen). See Broiler Industry, April 1972, p. 45.

<sup>27</sup>From phone conversation and article in Broiler Industry, June 1971, p. 28.

FIG 5.—Estimated Form in Which Broilers Were Distributed, 1970.





chill broilers. Holly Farms, the first firm to successfully prepackage broilers on a large scale, realized a premium of 4 to 5 cents per pound in 1969 for chill packed whole birds compared to iced broilers.<sup>30</sup>

Delivery of deep chill, ice pack, or CO<sub>2</sub> chilled broilers may be either direct to retail stores or to the chain or wholesaler warehouse. While central warehousing of meats appears to be increasing, an Ohio study indicated that about 80% of the chain and affiliated organizations studied had store-door deliveries of broilers.<sup>31</sup> Only in the case of large chains was an appreciable percentage distributed through the chain warehouse. Since relatively few processors provide store-door delivery service, chains and affiliated organizations without central warehousing often depend upon broiler distributors to serve their stores.

As Figure 3 indicates, the market linkage between integrators and the various distribution organizations tends to be via spot transactions. This varies considerably, however. Formula pricing arrangements have been tried and are utilized to some extent.<sup>32</sup> These are more workable with chill pack broilers in which the processor is packaging with the retailer's label. The buyer-seller relationship in this case is more stable. Retailers are more reluctant to change suppliers for small price differences (in fact are unable to in the very short run). Negotiated formula pricing agreements may stay in effect for relatively long periods, with only occasional revisions as costs or competitive factors in the broiler system change. This type of arrangement does not obviate occasional departures from the formula, however, in order to relieve inventory buildups at the processor level, or for the processor to help with a retail special which the retailer wishes to run.

<sup>30</sup>A Review of the Federal Company, Equitable Securities, Morton and Co., Inc., New York, Dec. 1969, p. 5. A premium of 4 to 5 cents was realized on whole birds. A premium of 8 to 10 cents was realized for cut-up fryers. Recent conversations with retail meat merchandisers suggest that this premium may have been reduced some in the 4 years since 1969. Recent price quotes indicate a premium of 3.25 cents on whole birds and 6.75 cents on cut-up fryers.

<sup>31</sup>Stout, T. T., M. H. Hawkins, and B. W. Marion. Oct. 1968. Meat Procurement and Distribution by Ohio Grocery Chains and Affiliated Wholesalers. Res. Bull. 1014, Ohio Agri. Res. and Dev. Center, Wooster, p. 5.

<sup>32</sup>Formula pricing arrangements provide for prices which are a stipulated amount above or below a recognized market price (for example, Chicago iced broilers). The price quotations for 1 day are often used to determine the formula base for the entire week. Under this arrangement, the function of the retail buyer is simplified to quantity and timing arrangements. The forces of inertia are evident in formula pricing arrangements. During earlier periods when sufficient live broilers were traded to allow meaningful market quotations, live broiler prices (which the retail buyer could then convert to ready-to-cook prices) were used as the basis for formula buying arrangements. Live broiler quotations from North Carolina or Georgia continue to be popular as the price base for formula arrangements, even though live prices are based on industry estimates of the value of live birds, using a ready-to-cook market price as a standard. For example, one formula used to estimate the value of live broilers at a particular location is:

Price of RTC Iced Broilers, Chicago — Freight to Chicago — 8 1/2 ¢/lb. for processing costs, shrink, and profit X .73 (dressing percentage) = Estimated Value of Live Broilers

Formula pricing has been somewhat less successful with iced or CO<sub>2</sub> chilled broilers which are un-packaged and undifferentiated.<sup>33</sup> While formulas have been tried, the processor is in a more vulnerable position since retailers can easily change suppliers. In *up* markets, the processor finds himself bound to a formula which prevents him from charging as much as he might without a formula, and on *down* markets, his retail customers can often find other suppliers who will sacrifice in order to *unload*. From the processors' standpoint, formula pricing is equitable only during a relatively stable market.<sup>34</sup>

Vertical integration or forward purchase contracts are rarities in linking distribution firms with the rest of the broiler system. The Kroger Co. has recently acquired an integrated broiler complex to provide part of its retail requirements. Kentucky Fried Chicken entered into broiler production in 1968 and expanded further in 1972. However their processing plants supply only 5-10% of the total sales of the nearly 4,000 Kentucky Fried Chicken outlets. At least in part, Kentucky Fried Chicken's broiler production operations are viewed as a hedge against price risks. With fixed retail selling prices, the company is particularly sensitive to periodic high prices for fresh chickens. By being involved in broiler production, high broiler prices and integrator profits during certain periods will help offset lower retail profits, and vice versa.

Kentucky Fried Chicken has further hedged its price risk by negotiating 12-month forward purchase contracts with other broiler processing plants. Their vulnerability to fluctuating broiler prices is thus reduced by the use of three procurement methods: their own production, forward purchase contracts, and spot transactions.<sup>35</sup>

**Time Dimension.** Adding a time dimension to the various functions and stages of the broiler system provides added insight into the dynamics of the system. Both coordination and adjustments in the system are heavily influenced by the temporal aspects of various decisions and tasks. Figure 6 reflects the time dimensions discovered by Tobin and Arthur in 1963. Relatively minor changes in time interval have occurred since their study.

<sup>33</sup>While most iced or CO<sub>2</sub> broilers are undifferentiated, this is not universally true. Foster Farms in California has a well-established brand identity for its broilers in the San Francisco market, and Perdue Foods has more recently established its brand in the New York City market, using wing tags. See later section on product differentiation for elaboration.

<sup>34</sup>Although two-thirds of the organizations studied in the Ohio study (Stout, et al., *op cit.*, p. 19) reported the use of formula pricing on broilers in 1964-65, interviews during 1970 of a wider variety of organizations indicated formulas are infrequently used for iced and CO<sub>2</sub> broilers. The feeling that formula arrangements provide "always a ceiling, but never a floor" has stimulated processors to move away from formula type arrangements with retail firms.

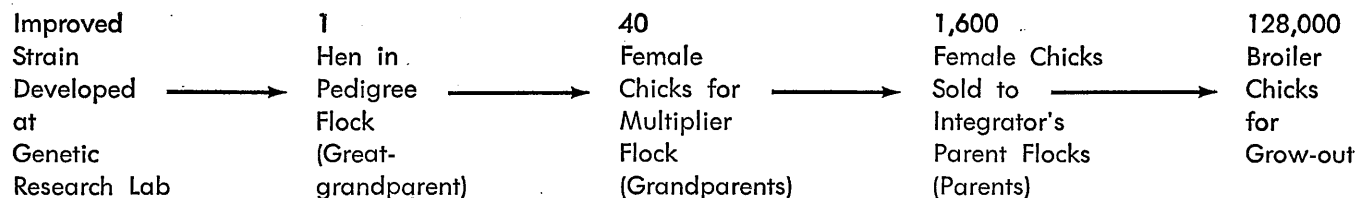
<sup>35</sup>See Broiler Industry, June 1972, p. 50, and July 1972, p. 24.

**FIG. 6—Broiler Production Time Intervals (Time Cycle, Starting with Receipt by Basic Breeder or His Associate of an Order for New Hatchery Flock Chicks).\***

	Number of Days
From shipment of primary setting eggs to hatchery to placing of chick in hatchery supply flock:	
for egg shipment	2
to handle at hatchery	1
to incubate	21
to sex and sort	1
to deliver chick to flock	1
Total for this stage	26
From placement of chick in hatchery supply flock to delivery of commercial broiler hatching eggs to hatchery:	
days to pullet's first egg	168
typical laying period	245
to sort and deliver to hatchery	1
Total for this stage	169 (to first egg) 414 (to last egg)
From receipt of broiler hatching egg to delivery of chick to broiler house:	
to handle egg at hatchery	1
to incubate	21
to grade, de-beak	1
to vaccinate and deliver	1
Total for this stage	24
From placing of chick in broiler house to delivery of 3.4 lb. live broilers to dressing plant:	
days to reach 3.4 lb., including few hours delay	60
From arrival of broilers at dressing plant to loading for shipment to warehouse or store	1
Total time affecting finished broiler production	280 (to first impact) 525 (to final impact)

This figure does not deal sufficiently with the time dimensions of the primary breeder. The 26 days shown from receipt of order to the delivery of chicks to hatchery supply flocks is only possible if the breeding companies have sufficient multiplier flocks to immediately fill such orders.

Expansions and contractions at the breeder level require considerable time. Breeders interviewed said they worked on a 3 to 5-year planning schedule. This planning horizon is necessary to expand or contract their pedigree program, and to develop multiplier flocks incorporating the minor strain improvements continually being developed. The multiplier process is approximately as follows:<sup>86</sup>



After the cross is made in the genetic research lab and a female chick hatched for the pedigree flock, at least 18 months are required before chicks can be placed with integrators from the multiplier flocks. (Offspring of the pedigree flock could be placed with integrators before this for test purposes, but this saps off chicks which would otherwise be going to multiplier flocks and thus are rather costly test birds.) Assuming 8 months to raise chicks to laying age and an 8-month period of egg production for both the pedigree flock and the multiplier flocks, plus nearly a month for egg handling, hatching, and chick handling at two points in the breeder's multiplication process, the chicks hatched for the pedigree flock require planning for chick sales 18-34 months ahead. Figure 7 shows these time requirements graphically.

Early placements are often for field testing by integrators. Field tests involve another 9 to 10 months before the integrator is able to evaluate the performance of the new birds in the hatchery supply flock and as parents of grown-out broilers. Thus, it is likely to be 27 months or more from the time a chick carrying some improvement is hatched at the primary breeders until field test results from customers are available.

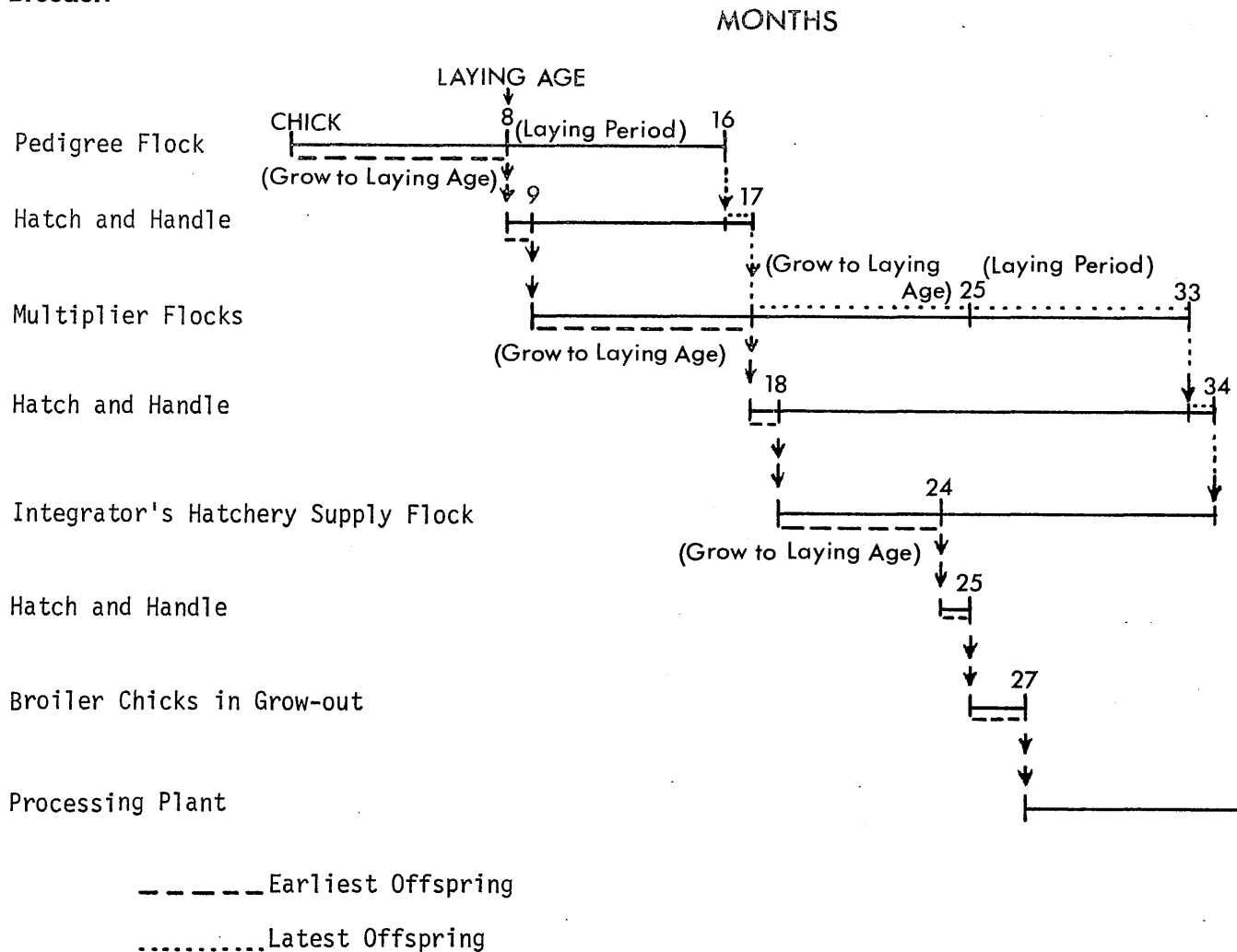
Decisions to cycle out an existing strain and replace it with an improved modification do not depend entirely on the field tests of integrators. Tests conducted by the breeders themselves play an important role, and provide more lead time than the results of integrator field tests. Once the decision has been made to commercially market an improved bird, some time is required to develop sufficient grandparent stock to handle volume orders for the bird.

The foregoing summarizes the approximate time dimensions of primary breeding companies. While they definitely work with certain biological time constraints, the time requirement may vary considerably from the minimums suggested if problems are encountered at certain points.

\*Source: Tobin, B. F. and H. B. Arthur. 1964. **Dynamics of Adjustment in the Broiler Industry**. Division of Research, Graduate School of Business Administration, Harvard University, Boston, p. 48.

<sup>86</sup>Once a new or improved strain is developed at the genetic research lab, the rest of the multiplication process is necessary in order to provide capacity for commercial sales. No additional cross-breeding is involved until the hatchery supply flock level, where one company's females are crossed with that or another company's male birds to produce broiler chicks.

**FIG. 7.—Time Dimensions of First and Last Offspring of Chick in Pedigree Flock of Primary Breeder.**



At the integrator level, the planning horizon is somewhat shorter. However, a decision to expand the hatchery supply flocks will not result in increased broilers *coming off stream* until  $9\frac{1}{2}$  months later. And the production resulting from such a decision will continue to influence broiler output until  $17\frac{1}{2}$  months later. An 18-month planning horizon is not unusual. While changes in the hatchery supply flock are the most desirable and most fundamental method of adjustment, other means of adjusting the future flow of broilers include:

- extending or contracting the laying period of hatchery supply flocks
- directing hatching eggs into other channels (table egg, breaking, etc.)
- tightening or loosening the standards for hatchable eggs, or for placeable broiler chicks
- selling or purchasing broiler chicks.

The above largely involve short-term adjustment procedures which are less efficient in the use of re-

sources than adjustments at the supply flock level. However, since estimates of demand 9-18 months in advance are frequently less than perfect, these procedures are useful for more immediate adjustments.

These adjustment procedures take place before the grow-out operation. Once chicks are placed with growers, in all but rare cases they are grown to market weight (approximately 3.5 lb. live) and processed. At this point additional adjustments may occur to balance integrator supplies with orders from distributors. Inter-integrator sales of live or processed broilers occur to some extent, although no figures are available to indicate the magnitude of such transfers. Tyson Foods, for example, reportedly grow more broilers than needed for their market outlets, and hence sell some to other processors. Holly Farms, on the other hand, market more birds than they grow.<sup>87</sup>

Industry representatives estimated that such transactions have declined and are relatively unim-

<sup>87</sup>Broiler Industry, June 1971, p. 18.

portant for the industry in total. Current usage of inter-company sales are largely for short-run adjustments from week to week.

At the distribution level, the time dimension varies by type of establishment. Retail food firms may plan their sales strategies 2 to 4 weeks (occasionally up to 8 weeks) in advance, but seldom place firm orders with processors more than 3 days to a week in advance of needs. Since broilers are sold within 2 to 3 days after receiving them, the time exposure of retail firms is very limited.

Although the planning horizon of institutional outlets, fast food restaurants and further processors may be somewhat longer than retail grocery organizations, forward contracts are still rather sparsely used. Spot transactions continue to characterize the linkage between integrators and eating establishments. Although contractual arrangements are more frequently used with further processors (soup and potpie manufacturers, for example), spot transactions are still the dominant method of procurement. One notable exception to this pattern is the procurement contract recently developed with 20 processors by Kentucky Fried Chicken. These contracts include a base price which is in effect for a 12-month period.<sup>88</sup>

**Short Run vs. Long Run.** Viewing a vertical system in different time horizons, two general sets of functions emerge. In the short run, where the system, institutions, and entities are taken as given, the relevant functions are those necessary to accomplish an accepted system objective. The focus is on the everyday activities and tasks, on the methods of coordination and routine decisions, within an existing vertical system. In the foregoing discussion, the concern was with short and intermediate term functions. An existing system and on-going member firms with facilities, manpower, and financing were assumed.

From a longer time horizon, changes in the system occur. The adjustment function becomes more apparent. Firms expand and contract, enter and leave the industry. Proprietary and authority structures are altered. Strategic decisions resulting in re-deployment of firm assets; changes in the system's objectives, organization, and coordination; and changes in the institutions and arrangements influencing the system all come into clear focus as critical dimensions of an evolving, adaptive commodity system. In the long run, adjustment and strategy functions enter the scene. These too are *tasks to be done*—and very critical ones. They are performed by the top levels of management and in some cases by governmental agencies.

At the same time, the adjustment function of a system is inescapably related to its more routine func-

tions. Conflicts and imbalances occurring in the performance of routine functions are often the catalyst for adjustment decisions of a strategic nature.

Neil Chamberlain commented on the difficult balance between routine and strategic functions of a firm.<sup>89</sup>

“. . . the business firm is constantly subject to two pressures which must be maintained in some sort of balance. There must always be a tendency toward systematic, coherent, efficient organization if the firm's existing goals are to be achieved and if the complex of relationships is to be held together at the present point in time. There must always be a tendency toward a state of equilibrium. At the same time, there must also be a tendency toward a breakup of existing relationships and the formation of new ones, because of the intrusion of unavoidable environmental changes and the firm's purposiveness with respect to them. There must be a tendency toward disturbing present relations, toward introducing an element of disequilibrium.

“. . . Without systematic coordination, the firm cannot survive in its present environment. Without taking actions now looking to a changed system of relationships, the organization cannot survive beyond the present.”

Both types of functions are important. Because of their interdependency, an understanding of one type is greatly facilitated by an understanding of the other. In even stronger terms, an understanding of the routine functions of a system is *required* in order to understand the adjustment functions.

So far, the routine functions performed by the broiler system and the proprietary organizations performing such functions have been discussed. No attempt was made to specify in complete detail the functions involved since many are self-evident when the structure of authority is understood.

Much of the focus has been on the physical functions involved in the vertical broiler system; i.e., hatching, chick delivery, grow-out, broiler assembly, processing, etc. Obviously, these must be supported by auxiliary functions such as financing, information gathering, etc.

It is useful to consider the central flow of the product and the physical functions involved as the main stream of the vertical system. At each stage, tributaries feeding in other functional inputs contribute to the product of the main stream. The system is an integrative process—the synthesis of resources, products, and services to satisfy the objectives of the system. In the short run, the control and coordination of this integrative process is a primary de-

<sup>88</sup>Broiler Industry, June 1972, p. 50, and July 1972, p. 24.

<sup>89</sup>Chamberlain, Neil W. 1968. *Enterprise & Environment*, McGraw-Hill Book Co., New York, p. 10.

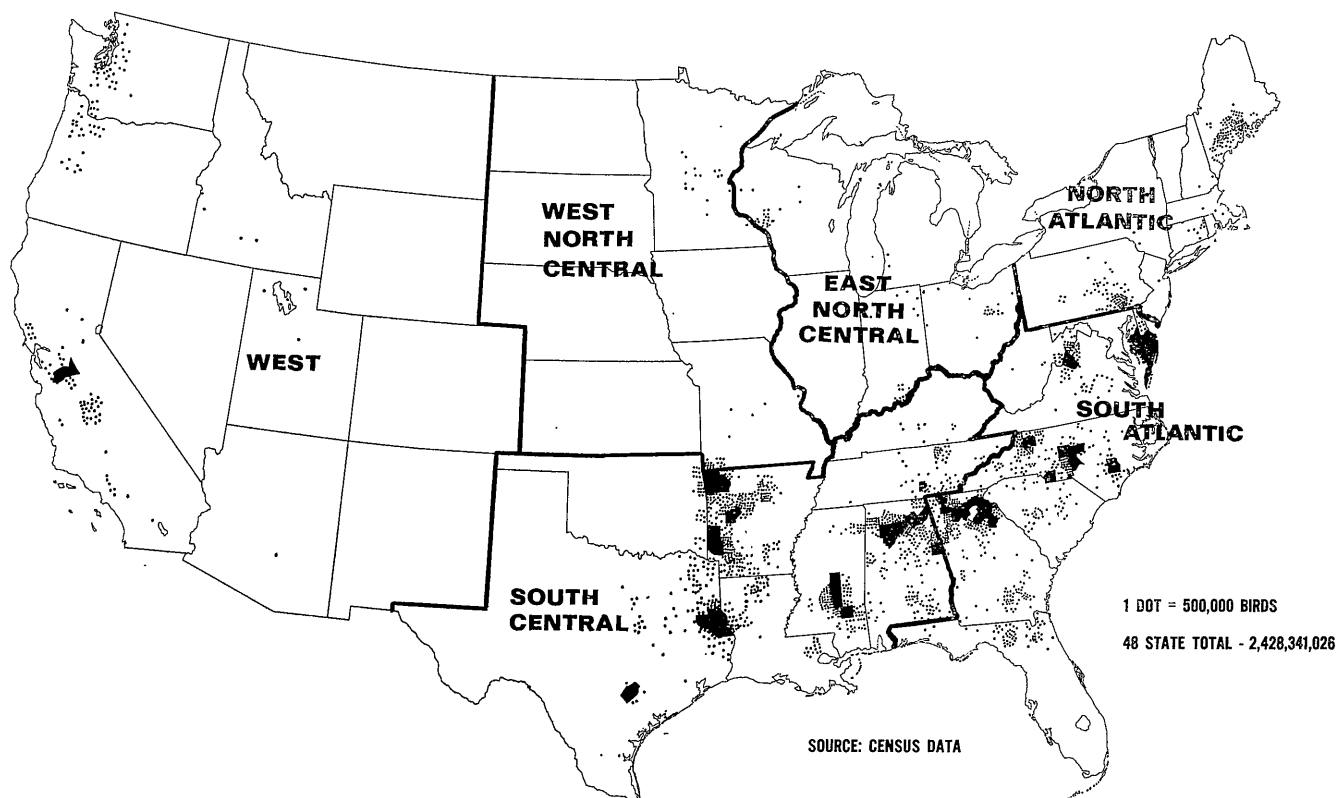
terminant of the efficiency and effectiveness of the system. In the long run, the adaptive characteristics of the system take on greater importance as the system responds to both internal and external pressures for change. Just how the system responds is one of the main concerns of the present effort.

**Spatial Dimensions.** The performance of the various functions in the vertical broiler complex is also influenced by geographic factors. The broiler grow-out function is now heavily concentrated in the South Atlantic and South Central regions (Figure 8). Eighty-nine percent of the broiler production occurred in these regions in 1971. The South Central region alone has expanded its share since 1950; all other re-

gions have declined in their proportion of U.S. broiler production (Table 1). Differences in the availability of alternative employment opportunities, the willingness to take directions from someone else, and differences in input costs (particularly of feed) appear to have been the most important factors in the redistribution of broiler production.<sup>40</sup>

<sup>40</sup>An interregional competition study by the University of Maryland estimated the 1967 cost of producing and marketing broilers in Delmarva (Delaware and Maryland) and eight other major broiler states. Compared to Delmarva, the comparative advantage for other states was 2.6 to 3.4 cents per pound (RTC) for five states (Arkansas, Georgia, North Carolina, Mississippi, and Alabama), and 0.1 to 1.6 cents per pound for the other three (Texas, Maine, and Virginia). Low costs of production generally accounted for much of the difference. See Via, James and John Crothers. March 1970. The Delmarva Poultry Industry in Interregional Competition, M. P. 750, Agri. Exp. Sta., University of Maryland, College Park, Md.

**FIG. 8.—Number of Broilers and Other Meat-Type Chickens Sold, 1969.**



Source: Poultry and Egg Situation, Economic Research Service, U.S.D.A., Nov. 1972.

**TABLE 1.—Regional Shares in Production of Broilers, for Selected Years, 1950-71.**

Regions	1950	1955	1959	1964	1967	1971
North Atlantic	13	13	6	6	5	5
East North Central	8	7	5	3	2	1
West North Central	4	4	3	2	1	1
South Atlantic	47	43	42	43	43	41
South Central	20	27	36	42	45	48
Western	8	6	5	4	4	4
United States	100	100	100	100	100	100

Source: Poultry & Egg Situation. Nov. 1968. PES 254, U. S. Dept. of Agriculture, Economic Research Service, p. 10; also Chicken and Eggs. April 1972. Statistical Reporting Service, U. S. Dept. of Agriculture, p. 10.

Only ten states accounted for 84% of the broilers produced in 1971 (Table 2). Arkansas has replaced Georgia as the leading broiler-producing state. The next most important 12 states produce 13% of the nation's broilers, leaving only 3% being produced

by the remaining 28 states. Figure 9 shows the surplus-deficit position of states in 1967.

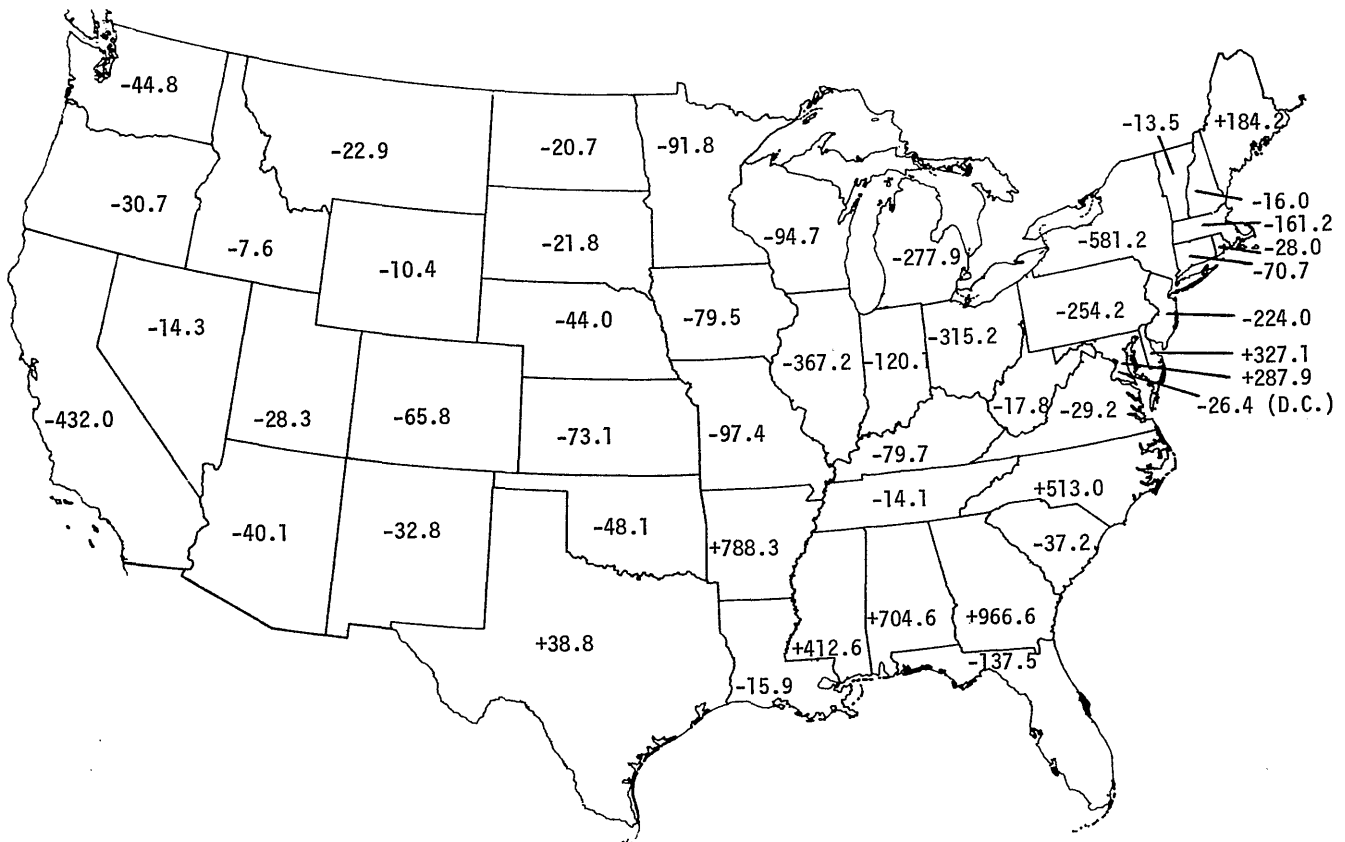
As these data suggest, southern states clearly dominate broiler production in the U. S. Some farmers who entered broiler production under relatively

**TABLE 2.—Ten States Leading in Broiler Production, 1965-71, by Rank in 1971.**

	1965	1967	1969	1971
	Million Birds			
Arkansas	320	365	415	476
Georgia	403	447	442	431
Alabama	285	325	353	384
North Carolina	234	263	281	290
Mississippi	168	197	221	248
Maryland	145	151	174	181
Texas	142	161	171	172
Delaware	109	127	134	126
California	60	69	77	89
Maine	68	74	73	72
Ten State Total	1,935	2,180	2,339	2,469
United States	2,334	2,591	2,787	2,947
	Percent			
Ten States as Percentage of United States	83	84	84	84

Source: The Chicken Broiler Industry, May 1971. MRR 930, ERS, USDA, p. 6; also *Poultry and Egg Situation*. April 1972 and June 1972. PES 271 and 272, ERS, USDA, pp. 10 and 12, respectively.

**FIG. 9.—Surplus-Deficit Position of States in Million Pounds of Ready-to-Cook Broiler Meat, 1967.**



Source: Via, James and John Crothers. March 1970. *The Delmarva Poultry Industry in Interregional Competition*. MP 750, Univ. of Maryland, Agri. Exp. Sta., College Park, Md., p. 9.

attractive conditions have found exiting more difficult.

"In the early 1950's many underemployed farmers throughout the South were given an opportunity to produce broilers under contract. About all they needed to do was build a broiler house. Buildings in that period were of low-cost construction, pole-type housing (constructed with homegrown lumber in many cases) and covered with rolled composite roofing material. Nearly all houses had dirt floors. Many farmers were able to improve their economic positions through broiler growing, especially those engaged in small cotton or other crop enterprises."<sup>41</sup>

"Limited alternative uses for existing investments in broiler enterprises and limited off-farm employment, principally in the South, have kept many farmers in broiler production in spite of excess capacity and generally low returns."<sup>42</sup>

Because the broiler integrator distributes chicks, feed, and other inputs to the grow-out operations, provides field supervision, and collects the grown birds for delivery to the processing plant, significant economies can be realized when grow-out areas are concentrated. Henry, *et al.* indicated in 1960:

"Each mile added to the average one-way length of haul between broiler farms and central servicing and processing facilities increases total costs of chick delivery, feed delivery, fieldman assistance, and live-hauling by about 1.4 cents per 100 lb. of live birds."<sup>43</sup>

This is, servicing flocks 50 miles away would cost the integrator 0.7 cents per pound more than servicing a flock adjacent to his facilities. With profit margins typically less than 0.5 cents per pound, this difference is indeed significant. This source also concluded:

"Optimum processing plant size depends upon production density of the supply area, but total costs do not change sharply with changes in plant sizes. Plant size is not as critical as production density in determining the competitive positions of broiler processors and associated businesses."<sup>44</sup>

This has resulted in a rather natural division of supply areas within some states, with individual integrators concentrating their activities and facilities around a central location. This appears to be more frequently the case in the South Central region than in the Delmarva area. Spatial concentration by in-

tegrators carries economic benefits to the integrator, but may provide fewer alternative *partners* for contract growers.<sup>45</sup>

Harold Breimyer states: "If, as many predict and some fear, the broiler industry becomes concentrated in a few hands, the consequences will be far reaching. To contract growers, the incisive one will be to limit, to circumscribe, the opportunities available to them."<sup>46</sup>

A reduction in the total number of buyers does not necessarily result in a decline in the number available to individual growers, or in a decline in their bargaining power. Broiler growers are also declining in number and increasing in average size. Good growers are generally in strong demand. And while the economic advantages of encouraging concentrated production may limit the number of integrators available to individual growers, the high cost of transporting feed, chicks, and live broilers also limits the area an integrator can economically service. Depending upon the demand conditions for broiler growers in an area, the growers may find themselves in strong or weak bargaining positions. In those areas where processing capacity has expanded more rapidly than broiler production, keen competition between integrators is likely in order to attract a sufficient number of contract growers. More favorable contracts are likely to result.

In areas where the volume of production from willing growers exceeds the demand requirements of integrators, the opposite situation may well exist. This is particularly likely in areas which are declining in production.

While there are strong economic forces supporting geographic concentration by integrators and partitioning of supply areas, the extent to which such a trend is evident could not be determined by the very mixed comments received on this issue. Eastern Market Research Service, Inc. found in 1966 that growers in selected areas of Georgia and Alabama typically had eight to nine contracting companies operating in their area. Nearly all growers in this study felt they could change contractors freely. Other sources of information suggest that this condition continued to exist in 1970, with competition for good growers extremely keen.

<sup>41</sup>P & SA-1, The Broiler Industry, Packers & Stockyards Administration, U. S. Dept. of Agriculture, August 1967, p. 13.

<sup>42</sup>*Ibid.*, p. 14.

<sup>43</sup>Henry, William R., Joe Chappell, and James A. Seagraves. June 1960. Production Density, Plant Size, Alternative Operating Plans and Total Unit Costs. Tech. Bull. 144, North Carolina Agri. Exp. Sta.

<sup>44</sup>*Ibid.*, p. 3.

<sup>45</sup>Holly Farms, for example, accept no new growers more than 50 miles away from processing plants (Broiler Industry, Sept. 1971, p. 50). While this appears to be fairly typical for the industry, some integrators are attempting to concentrate growers within 20 miles of their processing plants.

<sup>46</sup>Breimyer, Harold. 1965. Individual Freedom and the Economic Organization of Agriculture. Univ. of Illinois Press, Urbana, Ill., p. 217.

Representatives of grower organizations and government agencies take a different position, indicating that while good growers do have adequate alternatives, the average and marginal growers often do not. Although these differences in opinion are unresolved, they raise the issue of the greater value to contracting firms of good growers over poor growers. While most contracts attempt to reflect the value of different qualities of growers through feed conversion incentives, or contracts considering total production costs, these provisions apparently do not reflect fully the differences in the value of different growers.

At present it appears that an integrator may have different territorial limits for different quality growers. For example, he may equate a marginal grower 5 miles away with an average grower 20 miles away and a good grower 50 miles away. If this is true, the good grower obviously has many more contractors who consider him within their territory. If it is possible to develop contracts accurately reflecting the differences in the value of different growers, this would be an important step toward increasing the alternatives for average and poor growers, and would tend to decrease the area served by contracting companies. Since some of the benefits from good growers are difficult to evaluate in monetary terms (i. e., reliability, cooperation, and fewer headaches and uncertainties), the development of contracts equalizing the desirability of different growers may not be possible. It appears to merit further investigation, however.

Some predict the economic benefits from increasing production density will eventually lead to broiler factories, in which the breeding flock, hatchery, grow-out units, feed manufacturing plant, and processing plant will all be located at one place and connected by automatic transfer equipment.<sup>47</sup> Even if this does not occur for some time, it seems likely that future grow-out units will increasingly be located closer to the integrator input-supplying and processing units.

**The Horizontal Structure of Various Stages in the Vertical System.** At the same time the broiler system has become vertically more compact, horizontal concentration has also taken place at all levels. At the primary breeder level, industry representatives estimate that three female breeders sell nearly 90% of the female chicks, and that four male breeders represent a similar share of the cockerel market in the United States. The president of one breeding company has predicted that by 1975 the poultry breeding business will be in the hands of 10 firms worldwide.

An estimated 40 million breeder chicks were sold in the United States in 1969, of which 35 million were

females. In numbers, the market for female breeder chicks is approximately seven times the size of the cockerel chick market. Cockerel chicks sell for three to four times the price of pullet chicks, however, resulting in a U. S. dollar market for cockerels roughly one-half the size of that for pullet chicks. It should be noted that the genetic research costs in developing a male breeding line are similar to those in developing a female line, even though the size of markets differs substantially.

In the U. S., Arbor Acres (subsidiary of IBEC) and Vantress Farms (subsidiary of Artnell Co.) are the leading breeders of female and male chicks, respectively. Each of these companies captures approximately 50% of their respective markets. While these two companies have worked independently in the U. S., they operated jointly in penetrating foreign markets until Dec. 1971. The *package deal* thus provided to foreign customers was an important incentive for other American breeders to develop both male and female chicks in order to compete. Pilch Co. (now Pilch-DeKalb), for example, developed a cockerel in 1966 in order to compete in foreign markets with Cobb and Hubbard (both of whom had male and female lines), as well as the Arbor Acres-Vantress joint program.<sup>48</sup>

While market share figures for world breeder chick sales are unavailable, the smaller U. S. breeders have apparently been more successful in adapting to the needs and requirements of broiler production in foreign countries than in the United States. One industry representative suggested that the smaller companies moved faster and more aggressively in developing foreign markets, in part because of their size and compact management and in part because they were willing to sacrifice short-term profits for a longer run market position. In the case of some of the smaller breeders, their overseas operations may actually be supporting their domestic operations.

Because different vertical broiler systems are encountered in various foreign countries, the functions performed and the method of organization of U. S. breeders varies considerably in their overseas operations. In some cases, grandparent flocks are established which are owned and operated by the U. S. firm. More typically, however, chicks for grandparent flocks are sold to franchisees in the host country, who then perform the remaining multiplication and sales functions. Henry Saglio of Arbor Acres indicated that in many foreign countries, hatcheries, feed mills, and processing plants tend to be tied together, but that the grow-out operation and hatchery supply

<sup>47</sup>Garren, Henry. Feb. 1967. One Million Broilers a Week on 400 Acres. Broiler Industry, pp. 70-72.

<sup>48</sup>Based upon telephone interviews with Chester Pilch of Pilch-DeKalb and Henry Saglio of Arbor Acres.



flocks are usually independently operated. He expects this pattern to continue for some time. Arbor Acres had broiler and/or egg operations in 23 countries in 1971. In some of the less developed countries, they have found it necessary to develop and operate the entire vertical complex; i.e., they have assumed the functions of the U. S. broiler integrator, as well as performing the breeding functions.

Concentration at the integrator level in the U. S. has also increased but remains much lower than at the primary breeder level. Using the pounds slaughtered as an indicator of size, Table 3 shows the increasing concentration that occurred from 1960 to 1968. The largest integrator in 1968, Ralston Purina Co. processed an estimated 5.6% of the nation's broilers that year.<sup>49</sup> In late 1971, Purina's dramatic decision to dispose of its broiler complexes left Holly Farms and Gold Kist as the estimated volume leaders.

The largest 20 firms, 18 of which slaughtered 1% or more of the U. S. total, accounted for 47% of the broilers processed, and the 45 largest firms slaughtered two-thirds of the nation's broilers in 1968.<sup>50</sup> A total of 153 firms processed broilers in 1968. Concentration has increased at the integrator level, although slowly since 1964. Compared to other food manufacturing industries, the present concentration level is relatively low.

The structure at the distribution level of the broiler system varies by type of distributor. The structure of food retailing is slightly less concentrated than at the integrator level. For example, the 20 largest retail food chains captured 40% of the U. S. grocery sales in 1970.<sup>51</sup> However, the structure of

<sup>49</sup>Henry, William R. August 1969. 1969 Ranking of U. S. Broiler Plant Leaders. Broiler Industry, p. 26.

<sup>50</sup>Ibid., p. 26; also PES 259, Poultry & Egg Situation, ERS, USDA, Nov. 1969, pp. 10-11.

<sup>51</sup>Market Structure of the Food Industries. MRR 971, ERS, USDA, Sept. 1972, p. 96.

**TABLE 3.—Shares of Federally Inspected Young Chickens Slaughtered and Number of Plants Operated by the Four, Eight, and Twenty Largest Firms.\***

Year	Four Largest Firms	Eight Largest Firms	Twenty Largest Firms	Total Number of Federally Inspected Processing Entities
1960	12	18	32	286
1964	18	28	44	201
1968	18	29	47	153
		Number of Plants Operated		
1960	21	31	52	288**
1964	36	51	80	
1968	31	48	84	274

\*Federally inspected plants accounted for 90% of the U. S. production of young chickens in 1968.

\*\*For 1962.

Source: Faber, F. L. and William W. Gallimore. Nov. 1964. Changes in Firm and Plant Size in Broiler and Turkey Processing. In PES-259, ERS, USDA.

the fried chicken fast-food industry is highly concentrated, with the largest firm, Kentucky Fried Chicken (a subsidiary of Heublein as of 1971), representing 65 to 80% of this industry's sales.<sup>52</sup> Approximately 75% of KFC's volume is sold through franchised outlets. While all broilers are purchased to KFC specifications, retail outlets buy in some cases from local processors, in some cases from distributors who have a procurement franchise with KFC, and in some cases from company-owned distribution centers.

Other types of food service operations are predominantly single unit organizations. In 1967, 77% of the sales of eating establishments (which constitute about 50% of the total food service market) were realized by single unit firms. This share is declining, however, as multi-unit organizations such as Howard Johnsons, McDonalds and Kentucky Fried Chicken have captured an increasing share of this market. In 1967, firms with 11 or more units represented 5% of all eating places, but accounted for 14% of sales.<sup>53</sup>

Concentration ratios, by themselves, tell relatively little about the dynamics of the broiler industry. In combination with other factors, however, they can provide useful insights. Two additional market structure variables normally considered by economists to influence industry conduct and performance are the degree of product differentiation and the level of entry barriers. These variables also warrant examination.

*Product Differentiation:*<sup>54</sup> With a few exceptions, broilers are generally sold to consumers under the retail store's label. Foster Farms in California and Perdue Foods on the East Coast are two of the better known exceptions. Both have successfully differentiated ice packed birds identified with wing tags. Perdue, for example, entered the New York City market with 50,000 broilers per week around the beginning of 1969. Concentrating on independent stores and small chains, and using heavy radio and TV adver-

<sup>52</sup>KFC sold an estimated 750 million lb. of broilers in fiscal 1971, or 10.3% of U. S. production. (See Broiler Industry, Oct. 1971 and July 1972.) The proportion of all broilers sold through fast food and carryout restaurants is estimated at 12 to 15% by industry and government sources. (See MRR 971, p. 49.)

<sup>53</sup>In 1969, \$35 billion worth of food and non-alcoholic beverages was consumed away from home. Of this total, \$10.5 billion (30 percent) was consumed at institutions, and \$24.0 billion (70 percent) at public food service firms. Separate eating places, in which the sale of food was the primary source of revenue, accounted for 68 percent of public food service sales. See MRR 971, *op. cit.*, pp. 103-108.

<sup>54</sup>A product is defined from the perspective of potential buyers. Thus, the physical properties of a product may only partly define it; a more complete view is the bundle of utilities perceived by buyers. Following this interpretation, Product A is differentiated from Product B if the two products are perceived by some buyers to represent different bundles of utilities. Those buyers who perceive that Product A more nearly satisfies their wants will prefer Product A to Product B. One measure of the degree of this preference is the price difference required to achieve indifference.

tising, Perdue's volume grew to an estimated 700,000 broilers per week in mid-1971. This represented more than 50% of the butcher trade in New York City.<sup>55</sup>

Efforts to establish processor brands have frequently involved persuading two audiences, consumers and retail meat personnel, of the superior nature of a particular brand of broilers. Accustomed to thinking of broilers as a commodity, retail meat personnel must be convinced through a variety of means that broilers can be converted into an advertised branded product which at least in part is pre-sold to consumers. To accomplish this, a variety of advertising and promotional programs have been tried. Some of the more successful ones have involved careful selection of media and programs so that retail meat personnel are exposed to ads beamed at consumers. Sponsoring baseball or football broadcasts, for example, may be an inefficient means of reaching homemakers, but an effective means of reaching retail meat cutters.

In addition to advertising campaigns, other ingredients of some of the successful efforts to establish processor brands have included: providing point of purchase material to retailers, conducting educational programs with retail personnel on effective methods of merchandising broilers, and maintaining high quality standards and a streamlined distribution system which produces colder, fresher, lower bacteria count broilers with fewer processing defects.

One of the problems faced by processors attempting to establish a consumer franchise for their brand of ice pack broilers is maintaining brand identity of the birds. Wing tags have proven reasonably successful with broilers sold whole. When cut up at the retail store, however, the wing tags are frequently discarded by retail personnel.

In addition, consumers have difficulty in detecting quality differences in broilers. Even though higher quality standards are maintained, consumers may not recognize or appreciate the superiority of the product. For these reasons, the critical importance of differentiating broilers to the retail trade is understandable. Successfully differentiating branded broilers to consumers and/or the retail trade places the processor in a much stronger position in negotiating with retail customers. Price premiums of 1 to 4 cents per pound over other ice pack broilers have been realized. Even with these premiums, there are some who question whether the processors involved are any more profitable than they would be if they had stayed with *cord wood*. With no data available to resolve the issue, one can only surmise that the firms involved are

either realizing or expect to realize some profit benefits or they would soon abandon their efforts.

Other integrators have effectively differentiated their broilers to distributors by packaging at the processing plant. The development of deep-chill, processor-packed broilers by Holly Farms provided definite advantages to retailers by transferring the cutting and packaging functions back to the processor. Other integrators have since developed similar products, resulting in Holly Farms losing some of its differential advantage. Except for some recent efforts by a few integrators on a limited scale, chill pack broilers have been packaged with the retailer's label, not the processor's. Thus, any consumer franchise which has been developed has centered on the retailer. Unless this trend is reversed, as more processors provide chill pack products, the premium over ice packed boilers is likely to decline to reflect the cost of cutting and packaging broilers at the processing plant, plus the added value of chill pack broilers due to lower moisture content.

The above examples refer to a relatively small proportion of the fresh broilers marketed (about one-fifth of those sold through retail stores). The remainder of the broilers sold through retail food firms are very much a commodity in nature. Sold on a plant or federal grade basis, the retail buyer can easily change suppliers if dissatisfied with quality control, price, or delivery services.

Broilers sold through restaurants and institutions provide an opportunity to differentiate through the cooking procedure. Kentucky Fried Chicken, for example, has established a strong brand identity among consumers. In selling to such accounts, integrators can gain some differential advantage by the size and uniformity of their birds. Fried chicken operators prefer small and uniform broilers for portion and cost control purposes. The difficulty in obtaining adequate supplies of birds of the desired size and uniformity has been one of the reasons given by Kentucky Fried Chicken for its acquisition of production and processing operations.<sup>56</sup>

Moving back to the breeder level, significant product differentiation is found in the chicks sold to integrators for their hatchery supply flocks. The price of chicks is relatively unimportant. Integrator purchase decisions depend, instead, on the performance of the birds both in the hatchery supply flocks (liveability, nervousness, rate of lay, etc.), and as

<sup>55</sup>See *Broiler Industry*, Nov. 1968, p. 58; August, 1969, p. 12; Sept. 1969, p. 20; and July 1972, p. 24.

At least one integrator contends that price was more of a factor than adequate supplies of small uniform birds. Weighing devices at many processing plants allow sorting of birds into very narrow weight classes. Since small birds are more expensive per pound to produce, integrators are reluctant to accept orders for small birds without an adequate premium.

<sup>56</sup>Broiler Industry Editorial Previews, May 1971, Garden State Publishing Co., Sea Isle City, N. J. Fifty percent of the butcher trade represents about 15% of the total New York City market.

parents of broiler chicks (rate of gain, feed conversion, disease susceptibility, ease of sexing, etc.). The large number of performance criteria involved may be weighted differently by different integrators, and in fact may be of varying importance to different types of operations. Differentiation depends upon the types of trade-offs integrators are willing to make and the importance placed on certain performance characteristics. In most cases, more than one breed of female or male chicks is utilized by an integrator.

Since breeders continually make modifications in their chicks and integrators adjust their performance criteria, the competitive balance shifts to some extent over time. Entirely new birds are introduced rarely, however, (one in 20 years, for example) so that dramatic shifts in breeder competitive advantages are relatively infrequent.

The breeders' service and assistance programs are integral parts of their efforts to gain a differential advantage. The performance of their chicks is strongly influenced by environmental and management factors at the grow-out and hatchery supply flock. The extent to which breeder fieldmen are able to encourage integrator practices which bring out all that has been bred into their chicks may well determine how their chicks are evaluated.

**Barriers to Entry:** Caves defines three general types of entry barriers.<sup>57</sup> These are: scale economies, absolute cost barriers, and product differentiation.

An appraisal of the three enterprise levels of the broiler industry suggests that barriers are moderate to high at the primary breeder level, and low to moderate at the integrator and distributor levels. Product differentiation is unimportant as a barrier except at the breeder level, where it is largely dependent up-

<sup>57</sup>Caves, Richard. 1967. *American Industry: Structure, Conduct, and Performance*. Second Edition. Prentice-Hall, Inc., Englewood Cliffs, N.J., pp. 22-28.

on the genetic development of breeder chicks. Thus, the barrier is largely due to the technical ability and time investment of existing breeders. (One breeder estimated it would take 8 to 10 years to develop and market an entirely new bird.) A successful breed is carefully controlled and continuously upgraded as new developments are introduced.

Because of the heavy investment in genetic research, and the time required to develop experience and a *gene pool*, primary breeding companies are characterized by high fixed costs and low variable costs. This represents a situation where significant economies of scale are present; a situation which has led to the demise of several small breeders, to expansion in foreign countries, and to the present high level of concentration. Entry into primary breeding has tended to occur through mergers for very logical reasons.

Economies of scale, although definitely present, are not as important at the integrator level as at the primary breeder level. Table 4 indicates the average cost-per bird in 1964 for different volume operations for four of the integrator's functions. Feed mixing and distribution costs are not shown, but follow a similar pattern.<sup>58</sup>

As this table shows, the optimum scale of output is dependent upon the density of broiler production. At a density of 1000 lb. of broilers per square mile per year, costs were minimized in an operation putting out 7 million birds per year. Regardless of density, economies were small beyond 9.9 million birds per year. This volume would represent about 0.33% of 1969 broiler production.

<sup>58</sup>See Burbee, C. R., E. T. Bardwell, and A. A. Brown. Sept. 1965. *Marketing New England Poultry*. 7. Economics of Broiler Feed Mixing and Distribution. Bull. 484, Agri. Exp. Sta., Univ. of New Hampshire, Durham. As the figures from these studies suggest, there are diseconomies from dispersed, low density patterns of production. It should be noted, however, that biological uncertainties mean increased disease risks from highly concentrated and very dense patterns of production. This trade-off is present both in broiler grow-out and hatchery supply flock distribution.

**TABLE 4.—Long-run Average Costs for Six Poultry Marketing Systems Operating at 100 Percent of Capacity with Broiler Production at Three Density Levels.**

System	Output Birds per year (million)	Processing	Hatching	Broiler Assembly			Chick Distribution			Combined Costs		
				1,000	5,000	25,000	Density Level in Pounds*			1,000	5,000	25,000
							1,000	5,000	25,000			
							(cents per bird)					
A	1.19	13.311	2.180	3.034	2.230	1.810	.241	.204	.190	18.816	17.925	17.491
C	3.56	11.536	1.400	3.343	2.265	1.880	.184	.128	.104	16.463	15.329	14.920
E	7.11	10.392	1.174	3.952	2.545	1.901	.208	.118	.088	15.726	14.229	13.555
F	9.88	10.007	1.105	4.393	2.741	1.950	.246	.121	.081	15.751	13.974	13.143
G	14.82	9.597	1.062	.....	2.989	2.100	.....	.138	.093	.....	13.786	12.852
H	19.76	9.247	1.037	.....	3.217	2.289	.....	.134	.090	.....	13.635	12.663

\*Density levels refer to pounds of broilers per square mile per year.

Source: Burbee, Clark R. and Edwin T. Bardwell. May 1964. *Marketing New England Poultry*. 6: Economies of Scale in Hatching and Cost of Distributing Broiler Chicks. Bull. 483, Agri. Exp. Sta., Univ. of New Hampshire, Durham, p. 45.

While this picture may have changed some since 1964, and recognizing also that added scale economies may well accrue from multi-plant operation, it still appears unlikely that a large share of the broiler market is required to realize the economies of scale available. Note, however, that these economies relate to production and processing costs only, not to total firm operation. The economies of scale in marketing, financing, information systems, etc. are not considered.<sup>59</sup> Even with these included, it seems unlikely that the economies of scale represent more than a modest barrier to entry.

Operating an integrated broiler firm successfully requires definite managerial skills at each stage, and in providing overall planning and coordination. Such a bundle of managerial and technical ability represents one of the important entry barriers into the integrated broiler business. Because of this, most firms entering this segment of the vertical complex have done so through merging with an existing integrator.

The generally low and unstable profits in the broiler industry present a further entry barrier. For public corporations, in particular, the mercurial profit pattern of the industry tarnishes its attractiveness.

Compared to other industries, the barriers to entry into the integrated broiler industry are not high. For many agriculturally related businesses, however,

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<sup>59</sup>Robinson suggests that five factors determine the optimum size of a business. These are: technical (where minimum costs of production are determinable), managerial (where there are eventual diseconomies of coordination), financial (where size contributes to advantageous funding), marketing (an optimum sales unit, including multiple products), and risk and fluctuation (related to the power to survive industrial vicissitudes). See Robinson, E. A. G. 1964. *The Structure of Competitive Industry*. Cambridge Economic Handbook 6, Univ. of Chicago Press, pp. 12-93.

the management, capital, and risk involved may pose a substantial entry barrier.

This rather abbreviated discussion of the horizontal structure of the three enterprise levels in the broiler system provides some additional insights into the economic forces operating within the system. One additional factor warrants brief comment—the importance of broilers to the various firms involved. This ranges from nearly 100% of the firm's business for several breeders, some independent or regional integrators, and some fried chicken firms, to only about 3% of the sales of retail food stores.<sup>60</sup>

No current data are available on the percentage of sales attributable to broilers in large diversified firms such as Central Soya, Pillsbury, Swift, etc. The National Commission on Food Marketing found that of the 1964 sales of the first two plus Purina, 12% came from poultry and egg sales. The contribution of the broiler enterprise to the total value added and total profits realized by these companies would more accurately reflect the importance of broilers; unfortunately, these figures are not available.

The proportion of the sales represented by broilers provides some indication of the importance of the broiler complex to various firms. Breeders and integrators who are devoted nearly 100% to broilers are obviously much more vulnerable to poor times than those companies with their *eggs in more baskets*. Although this might lead one to expect more responsible behavior from those companies heavily committed to broilers, this has not always been the case.

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<sup>60</sup>Fresh fryers typically represent 10-14 percent of retail meat sales; meat sales generally account for about 22 percent of total store sales.

## CHAPTER III

### COORDINATING AND REGULATING INSTITUTIONS AND ARRANGEMENTS

The vertical broiler system has historically been relatively unencumbered by government regulations and programs, particularly compared to other agricultural industries. Price supports, production allotments, and market orders have not been applied to broilers. Regulation of supplies and price has been left to the participants in the vertical system and a competitive market system. The results have not always been satisfactory from the viewpoint of system members due to the frequent price depressions mentioned earlier.

While the broiler system has remained relatively free of the supply and price controls evident in many commodity systems, a large number of institutions and arrangements still influence its behavior. Some of these are the market rules affecting all U. S. industries, such as property rights, the legality of contracts, anti-trust regulations, tax regulations, and freight rate regulations. Others are services or regulations specifically directed to the broiler complex. Only the latter will receive comment here.

Institutions providing information are of particular importance to the coordination of a market regulated industry. The various communication networks that relay information on current outlook, new technology, etc. are an integral part of the vertical broiler system. Some of the more important information sources are:

*U.S.D.A. Market News*—provides daily reports on conditions in six eastern markets, the number and size of birds slaughtered in major producing areas, and once a week the prices paid in 14 markets for trucklot sales of ice packed broilers; also provides a nine-city weighted average price each Monday.

*U.S.D.A. Broiler Marketing Guide*—published quarterly; provides analysis of expected future supply and demand conditions and guidelines for industry adjustment of hatchery supply flock size and the number of broiler chicks placed.

*U.S.D.A. Poultry and Egg Situation*—published five times per year; provides a wide array of statistics on poultry industries (broilers, eggs, and turkeys).

*U.S.D.A. Breeder Placement Report*—published monthly; reports the number of breeder chicks placed in hatchery supply flocks.

*U.S.D.A. Chick and Egg Placement Report*—published weekly; reports the number of eggs set and broiler chicks placed.

*U.S.D.A. Eggs, Chickens and Turkeys*—published monthly; provides monthly information on the number

of broiler chicks hatched and the number of pullet chicks placed for hatchery supply flocks.

*Poultry Survey Committee Report*—prepared by five university economists and published quarterly by American Feed Manufacturers Assoc.; provides outlook information for poultry industries.

*Computone*—privately run computerized price forecasting system available only to processors on a subscription basis; provided a price reporting system when first organized, but was later discontinued.

*Urner-Barry Report*—privately operated; provides daily price information for New York market; not as widely used for broilers as for eggs.

*Iced Broiler Futures, Chicago Board of Trade*—while not its primary function, the futures market provides estimates of expected prices for broilers of deliverable quality for future months.

*Trade publications—Feedstuffs, Broiler Industry, Poultry Meat, Poultry Times, and others*; these publications provide a wide variety of information about factors affecting the broiler system.

*University and U.S.D.A. studies*—published periodically in bulletin form, often providing in-depth analysis of some aspect of the broiler system.

The above sources provide a considerable amount of information about the vertical broiler system. Industry personnel have found them of varying value and normally supplement such information with their own observations and interfirm communications.

Because a variety of forces influence broiler prices in addition to the quantity of broilers marketed, price forecasting efforts have met with mixed results. Dr. William R. Henry of Georgia State University indicated in a telephone interview that econometric price forecasting models have been disappointing in their results. Even though Dr. Henry has been able to forecast broiler supplies with reasonable accuracy 8 to 10 months in advance, his price forecasting efforts have been frustrating. Tobin and Arthur referred to this problem in their 1964 report:

“There have been many occasions when the broiler market has been unusually weak or unusually strong, considering the supplies of broilers pressing on the market. No really satisfactory explanations have been forthcoming”.<sup>61</sup>

This problem is reflected in the contents of the quarterly Broiler Marketing Guides for 1969 and 1970. The Sept. 1969 Supplement estimated that a 6% increase in broilers slaughtered during the first

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<sup>61</sup>Tobin and Arthur, *op. cit.*, p. 94.

quarter of 1970 over the first quarter of 1969 would result in ready-to-cook wholesale prices of 27 to 29 cents, approximately the same as the previous year.<sup>62</sup> Although an increase of not more than 5% was encouraged by the Guide, the industry responded by increasing production about 13% during the first quarter of 1970. Price estimates in the 1969 Supplement had indicated that this large an increase would result in prices of 26 to 27 cents. The actual average price realized in the first quarter of 1970 was 27.9 cents.<sup>63</sup>

For those not acquainted with the broiler system, this level of error may appear small. However, broiler integrators operate with small profit margins per pound. For example, the National Commission on Food Marketing found that the median annual net income before taxes for broiler processors for the years 1960 to 1964 varied from 0.12 to 0.33 cents per pound.<sup>64</sup> Thus, price estimates erroneous by as much as 1 cent provide limited help to the industry.

The above illustration does not reflect the typical accuracy of the U.S.D.A. Broiler Marketing Guide. Interviews with industry personnel indicated this was one of their most useful sources of outlook information. The illustration does indicate two types of problems confounding efforts to stimulate greater stability in the broiler system. The difficulty of accurate price projections is one; the uncertain reaction of broiler integrators to outlook and guideline information is the other. Collectively, the industry has much to gain by attempting to regulate supplies to maintain stable and profitable price levels. But individual integrators may well try to benefit from the higher prices they think will result from the restraint of their competitors by expanding their output. While a few integrators have attempted a degree of industry leadership by publicly stating their output intentions,<sup>65</sup> the impact of this effort on the industry is difficult to assess.

Other institutions and arrangements have important effects on the broiler system. Some of these are aimed at providing information or protection for consumers. The 1957 Poultry Inspection Act, for example, made federal inspection mandatory by 1959 for processing plants engaged in interstate commerce. Under the Wholesome Poultry Act of 1968, intrastate plants now must conform to the same standards of sanitation and wholesomeness as interstate plants. Regulations on packaging and labeling also attempt

<sup>62</sup>Supplement to 1969 Broiler Marketing Guide, C&MS, USDA, Washington, D. C., Sept. 1969, p. 9.

<sup>63</sup>PES 261, Poultry and Egg Situation, ERS, USDA, Washington, D. C., April 1970, p. 7.

<sup>64</sup>National Commission on Food Marketing, Tech. Study 2, *op. cit.*, p. 61.

<sup>65</sup>The action of Purina in this respect is noted in the Nov. 1968 issue of *Broiler Industry*, p. 22.

to ensure that adequate and non-deceptive information is provided to consumers.

Federal grades for broilers are utilized on an optional basis by processors. In large part, federal grades are facilitators of communication and exchange between buyers and sellers, and only secondarily information for consumers. USDA Grade A is widely used as a standard for exchange and represents the majority of the birds graded. Grades B and C tend to be traded under the processor's plant grade. Since federal grading is optional and is performed on a fee basis, the extent to which broilers are federally graded varies considerably from one processor to another.

Pricing and exchange arrangements in the vertical broiler complex have previously received comment. Contractual arrangements with specified terms are heavily used to link broiler integrators with broiler growers and with hatchery supply flock managers. While it is commonly recognized that such contracts replace spot transactions as a type of bilateral agreement for exchange, contracts should also be noted as important catalysts for technological change. By specifying certain growing conditions, integrators have accelerated the adoption of improved housing and cultural practices.

Forward sale contracts are used to a limited extent in the sale of broilers to eating establishments and further processors, but not to the extent that many integrators would like. Formula pricing arrangements, which are not firm contracts but rather agreements on the procedure for determining price if an order is placed, are used to some extent between processors and retailers (particularly for chill pack broilers), but appear to be declining in importance.

The use of the organized futures market on the Chicago Board of Trade, which could stimulate or be stimulated by more forward contracting, has been somewhat limited at the time of writing at all three enterprise levels in the system. Broiler integrators, perhaps the most likely users of broiler futures, generally do not use them as an important part of their commercial business. Several integrators said they use them spasmodically, or are experimenting to determine their potential use by the firm.<sup>66</sup> The futures market for feed ingredients is much more widely used by these firms than the iced broiler futures.

Within a highly integrated system where ownership and contract arrangements serve as coordinating and exchange devices, the number and role of spot transactions is significantly reduced. In the vertical broiler system, spot transactions continue to charac-

<sup>66</sup>Changes in Dec. 1971 to make the iced broiler futures contracts deliverable are expected to improve the usefulness of these contracts by encouraging a closer relationship to the cash market.

terize the sale of breeder chicks to integrators, the sale of ice pack broilers to retailers and eating establishments, and the purchase by breeders and integrators of necessary inputs such as health supplies, equipment, and feed ingredients. The nature of these spot transactions varies from little (if any) price negotiation in the purchase of breeder chicks to considerable price checking and negotiating in the sale of broilers to retail firms. In the latter case, an appreciable number of transactions do not carry a definite price, but rather are based on a specified day's price. (One might consider these short-term formula prices, pertaining only to this week or next week.) This practice diminishes the base of the *market price* and poses additional problems to the Market News Service and other price reporting services.

### Institutions Affecting Demand

While government programs directly controlling prices or supplies have not applied to the broiler industry, various government activities do influence the effective total demand for broilers. Table 5 indicates the end use of broilers slaughtered during the fourth quarters of three consecutive years. Government programs and activities heavily influence the quantity of broilers going into export, military, and USDA channels. While the proportion of broilers going into these channels varies over time, 3.3% of the available broilers were diverted to these outlets in the fourth quarter of 1969.

USDA purchases have been for the School Lunch Program, food for the needy, and for distribution to other countries under the Public Law 480 program. Total purchases in 1971 were 50 million lb.<sup>67</sup>

Broiler exports increased to a peak of 172 million lb. in 1962, two-thirds of which went to Common Market countries.<sup>68</sup> A substantial increase in duties on U. S. broilers going into the Common Market was imposed in late 1962 and 1963, and increased further in 1965 (14 to 18 cents per pound on ready-to-cook broilers).<sup>69</sup> The effect has been to seriously erode broiler exports to Common Market countries. Exports to these countries dropped from 113 million lb. in 1962 to 27 million lb. in 1965 to 1.5 million lb. in 1970.<sup>70</sup> Exports to all other countries gradually increased from 60 million lb. in 1962 to 91 million lb. in 1970 (aided by subsidies on broiler exports to Switzerland and Greece). This increase has been far too gradual to offset the declines from Common Market countries; the net effect has been a drop of more than 40% in broiler exports over an 8-year period. The 78 million pounds *lost* represented 1% of the broilers slaughtered in 1970.

<sup>67</sup>PES 272, Poultry and Egg Situation, ERS, USDA, June 1972, p. 28.

<sup>68</sup>Selected Statistical Series for Poultry and Eggs Through 1965, ERS 232, ERS, USDA, Washington, D. C., May 1966, p. 22.

<sup>69</sup>PES 244, Poultry and Egg Situation, ERS, USDA, Washington, D. C., Nov. 1966, p. 29.

<sup>70</sup>Selected Statistical Series, *op. cit.*, p. 22, and Poultry and Egg Situation, PES 261, April 1970, p. 40, and PES 269, Nov. 1971, p. 24.

**TABLE 5.—Broiler Slaughter, Disappearance, and End Use During Fourth Quarters, 1967-1969.**

	1967	1968	1969*	Percent Change <sup>†</sup> in 1969 from 1968
	Million Lb. Ready-to-Cook			
Slaughter: <sup>‡</sup>	1569	1626	1806	+11.0
Disappearance—Total	1562	1624	1798	+10.7
Exports	21	23	20	—11.7
Military**	19	20	18	—10.0
USDA <sup>††</sup>	27	18	23	+28.8
Domestic Sales	1494	1563	1737	+11.1
Indicated End Use:				
Further Processed	61	58	76	+30.6
Cut-up	391	355	409	+15.2
Whole Carcass	1110	1211	1313	+ 8.4
	Pounds			
Per Capita Disappearance:				
Total	7.84	8.07	8.84	+ 9.5
Domestic Sales	7.64	7.90	8.67	+ 9.7
	Cents per Pound			
9-City Wholesale Price: <sup>‡‡</sup>	23.20	25.53	27.45	+ 7.5

\*Preliminary.

<sup>†</sup>From unrounded data.

<sup>‡</sup>Includes estimate of slaughter in non-federally inspected plants.

\*\*Based on month of purchase. The decline in 1969 results largely from relatively larger purchases of cut-up broilers without necks and giblets as compared to whole carcass birds.

<sup>††</sup>Based on contract month of shipment.

<sup>‡‡</sup>Simple averages of Monday prices.

Source: Broiler Marketing Guide, Third Quarter 1970. March 1970. PMG-11, Consumer and Marketing Service, USDA, Washington, D.C., p. 5.

While exports, USDA purchases, etc. represent a small proportion of total broiler sales, they can have an important incremental effect on price. Dr. Ralph Baker, poultry economist at The Ohio State University and Ohio Agricultural Research and Development Center, estimates that while only 1.5% of U. S. broiler production was exported in 1968, this increased domestic broiler prices by 0.5 cents per pound, an amount greater than the typical profit margins of broiler companies.<sup>71</sup>

The exclusionary tactics of other countries are natural. Many have chosen to import breeder stock and technology and to erect tariffs to protect the development of a domestic broiler industry, rather than import dressed broilers. As might be expected, U. S. broiler integrators are vitally interested in efforts to reduce foreign trade barriers. Their trade associations have encouraged such efforts by the U. S. government. On this point, many of the primary breeding companies find themselves in conflict with integrators. Since the foreign market for breeder chicks depends on the rate of development of indigenous broiler industries, breeding companies generally favor those policies consistent with this. Some of these companies were instrumental in persuading the officials of the Common Market to raise their barriers in the early 1960's. The increased tariffs have stimulated the domestic broiler industries in these countries and expanded the market for breeder chicks, even though it has nearly eliminated EEC countries as markets for U. S. dressed broilers.

In such matters, industry trade associations can play an important role in representing industry interests before government agencies. It is well to keep in mind, however, that trade associations are not line decision points within the vertical system. Rather, they operate as catalysts, information sources, and implementers of collective decisions. Where strong and effective leadership is present, trade associations are much more than responders to the desires of their members. They serve as important catalytic agents—stimulating their members to awareness on issues individual firm managers may not perceive because of limited perspectives. Still, their effectiveness ultimately depends upon the support, cooperation, and collective action of their members.

The more important trade associations servicing the broiler system are:

*National Broiler Council*—represents primarily processors and integrators; activities include lobbying, the domestic promotion of broilers, educational programs for members and the retail trade, and occasional trade surveys.

*Poultry and Egg Institute of America*—its recent merger with American Poultry and Hatchery Federation gives the Institute more balanced representation of all members of the vertical broiler complex as well as other poultry interests. Before the merger, the Institute was integrator-poultry distributor in orientation, active in programs to stimulate quality control in the marketing of poultry products, heavily involved in lobbying, and conducted overseas promotion for U. S. broilers. The APHF, on the other hand, represented primarily breeders and hatchery operators in broilers and other poultry industries, was production oriented, and had not been very active in broilers except for lobbying efforts.

*Poultry and Egg National Board*—essentially a promotional organization for poultry and egg products; financed by voluntary donations from a broad cross-section of the various poultry industries; basically egg oriented since that industry is the major source of funds.

*Southeastern Poultry and Egg Association*—regional in representation, members include a cross section of the vertical broiler system with emphasis on local and regional independent processor-integrators; conducts extensive educational program covering many aspects of broiler business; also active in lobbying.

*National Broiler Marketing Association*—organized as a cooperative in 1970 by a group of regional and independent broiler integrators, NBMA is not a trade association like the above organizations. Its thrust, however, is toward industry-wide cooperation in order to balance supply with demand for market stability. A key function of the cooperative has been communication with its members concerning market conditions and prices, and recommendations for voluntary adjustments in broiler production and marketing. The cooperative represented an estimated 50% of U. S. broiler production in 1971. However, advisory statements by the Justice Department in 1971 and 1972 have raised questions about the eligibility of integrators for membership in a Capper-Volstead antitrust exempt cooperative. The future of NBMA is surrounded by uncertainty at the time of writing.<sup>72</sup>

In addition to the above, three somewhat smaller regional associations operate to represent broiler companies and other poultry interests in their areas. These are the Pacific Egg and Poultry Association, the Southwestern Egg and Poultry Association, and the Northeastern Poultry Producers Cooperative Organization (NEPPCO).

The changing nature of the industry has brought the need for changes in the trade associations. The American Poultry and Hatchery Federation was in-

<sup>71</sup>Baker, Ralph. July 1969. Poultry Exports Worth \$100 Million at Home. *Broiler Industry*, p. 25.

<sup>72</sup>For information on NBMA, see *Broiler Industry*, Nov. 1971 and Sept. 1972.



initially an association of independent hatcherymen. The Poultry Institute, on the other hand, focused heavily on the needs of poultry processors and poultry distributors. With the demise of the independent hatcherymen in broilers and the absorption of this function by integrators, such a division of associations was unnecessary. In 1971, the two associations merged, becoming the Poultry and Egg Institute of America. The addition of the National Broiler Council to this group has been proposed by some parties on the grounds that it would allow a more cohesive and consistent approach on public policy issues.

Primary breeders tend to belong to most of the major trade associations. Since their customers are the dominant members of most of these associations, situations where a conflict of interest occurs are likely to be resolved in favor of the broiler integrators. The breeders have a separate association, Poultry Breeders

of America (an offshoot of APHF), which represents their interests.

The above associations do not represent the interests of broiler growers. Two of the major farm organizations, American Farm Bureau Federation and National Farmers Organization, have attempted with limited success to represent growers in recent years on public policy issues and in bargaining for more favorable contract terms.

In addition to the institutions and arrangements so far discussed, a number of ancillary institutions provide essential services to the vertical broiler system. Corporate and cooperative suppliers of equipment and supplies, credit institutions, and university and government research programs all provide important services and may affect the coordination and adjustment of the broiler system.

## CHAPTER IV

### THE DECISION ANATOMY OF THE BROILER SYSTEM

The operation and evolution of the vertical broiler system does not automatically take place. It occurs as a result of numerous decisions, both past and present, which are backed by the authority to carry them out and make them meaningful. The array of decision points extending throughout the broiler complex is like its nervous system.<sup>78</sup> It is the network through which both coordination and adjustments take place. The network of decision points and associated authority is referred to in this publication as the *decision anatomy* of the vertical system.

The decision anatomy of the system provides an overall view of the control points and distribution of authority for the entire system at a point in time.

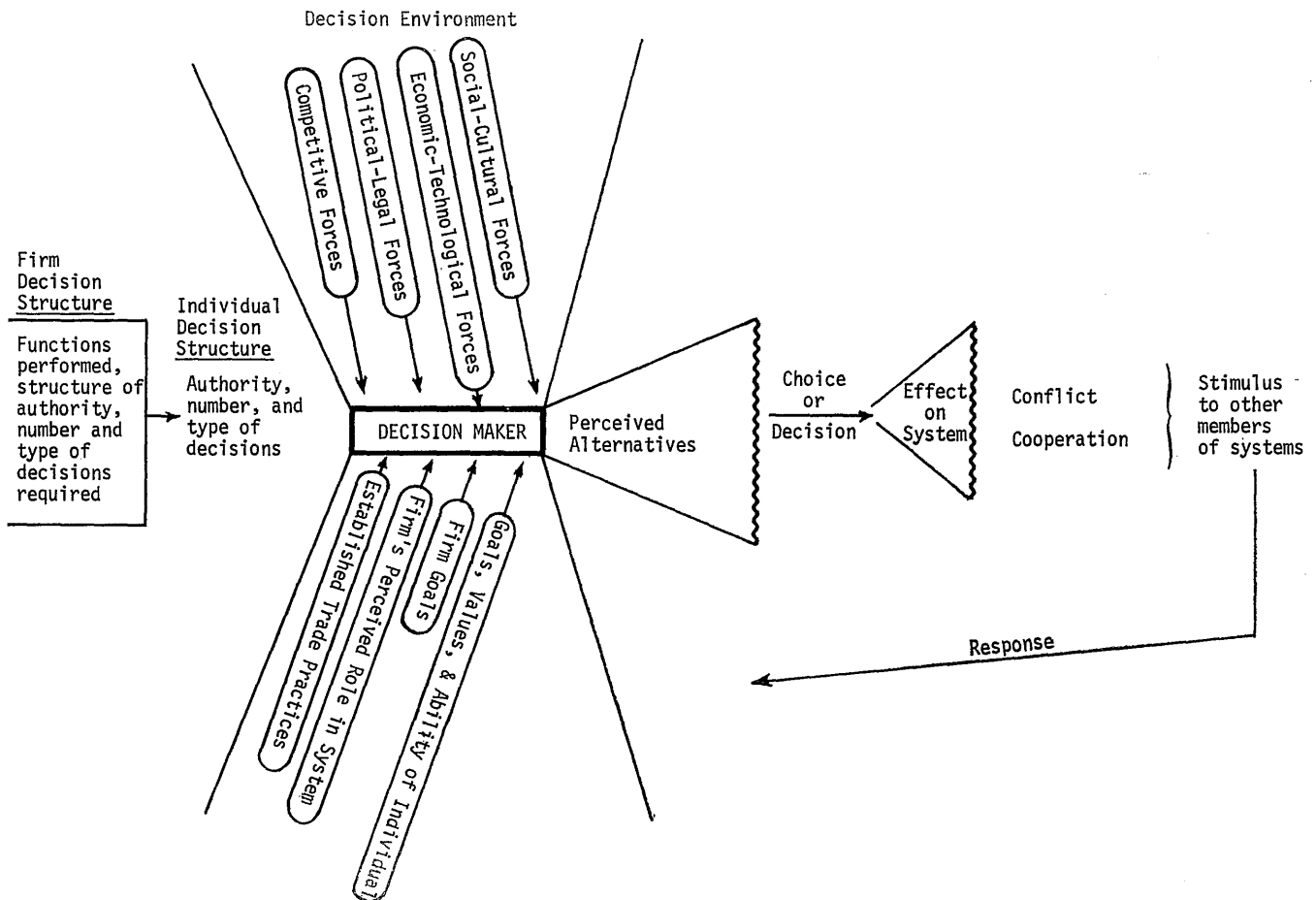
<sup>78</sup>Unlike the nervous system of animals, which carries impulses from the brain to the various structural parts, the decision anatomy of a vertical system is a nervous system with several brains sending impulses up and down the system; i.e., there is no central control point. Much of the coordination is attained through voluntary consensus, often arrived at through bargaining and free choices.

Through time, as the distribution of authority shifts, the decision anatomy also changes.<sup>74</sup>

The system level of aggregation poses problems of oversimplification, since decisions and authority are traced only to the firm or organizational level. Firms or agencies do not make decisions. Rather, decisions are made by individuals and groups of individuals as they perform certain roles within the firms and other organizations making up the system. Therefore, it becomes useful to identify two additional types of decision formations which operate within, and are components of, the system's decision anatomy. These are the *firm decision anatomy* and the *individual decision structure*. The firm decision anatomy refers to the network of decisions and associated distribution of

<sup>74</sup>The distribution of authority in a vertical system does not necessarily define the points where decisions are made. Some decisions rest on no clearly identified authority. Rather, they depend upon who wants to grab the ball.

**FIG. 10.—A Conceptual Model of a Decision Maker Within a Vertical System.**



authority within individual firms. The individual decision structure refers to the scope of authority of an individual and the number and type of decisions in which he is involved.

In all three decision formations (the decision anatomy of the system, the firm, and the individual decision structure), the focus of attention is on the structure of authority, the decision points (where decisions are made), and the type of decisions involved (bilateral, unilateral, multi-firm, or institutionally imposed). The main difference between the three is the level of aggregation where attention is focused.

At all three levels, important factors influence decisions. These include the set of forces bearing on decision makers, such as the competitive environment, constraints on the alternatives which can be considered, the goals and values of individuals and organizations, and the economic-political-social environment. This set of forces is referred to as the *decision environment* for the system, firm, or individual. Thus, decision makers are viewed as key parts of a vertical system, dependent upon the structure of authority within the system and within the firm, but strongly influenced in any particular decision by the decision environment

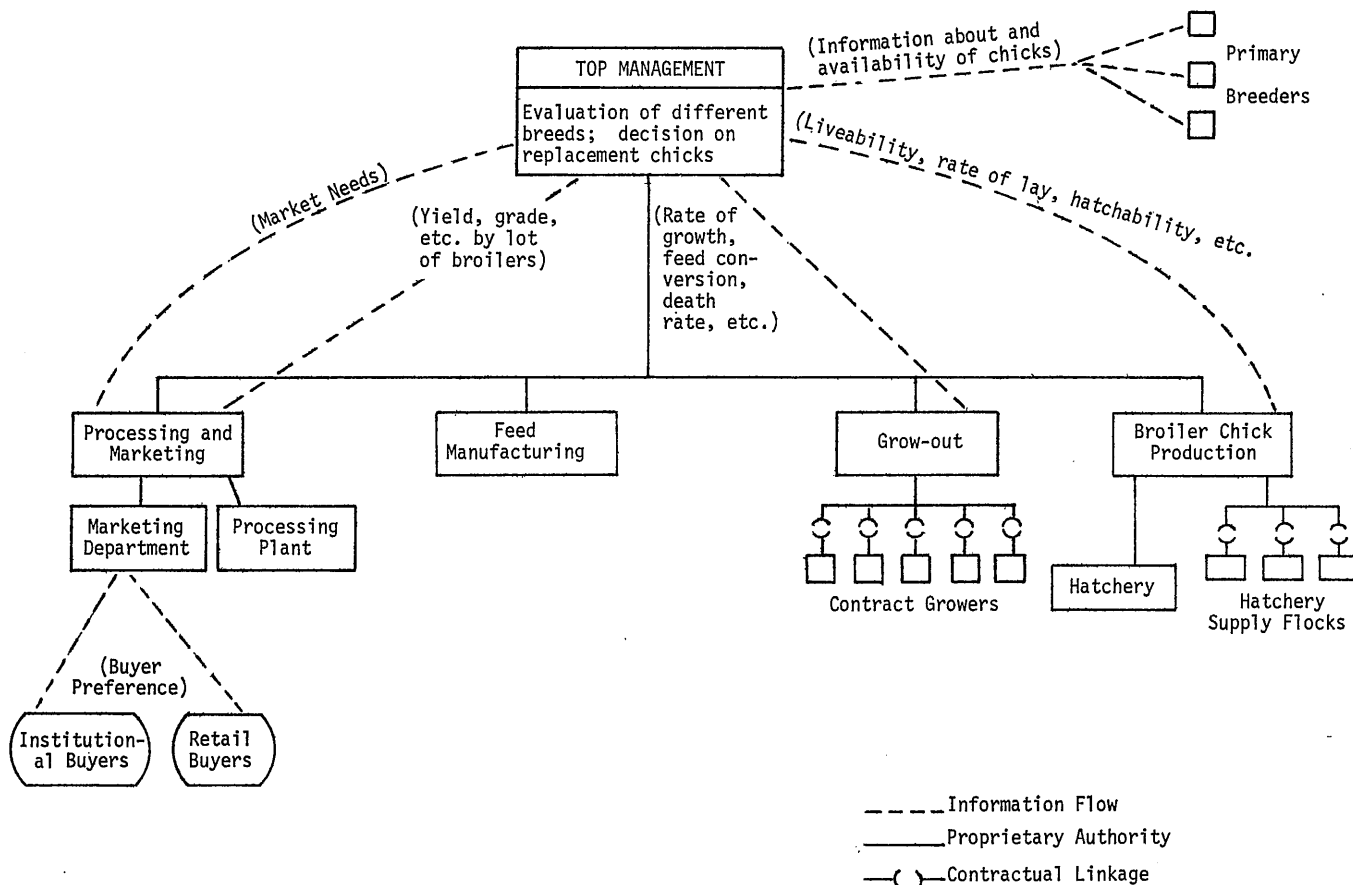
at that point in time. This concept is illustrated in Figure 10, along with the interactions occurring within the system.

The decision anatomy of the firm largely defines the decision structure of the individuals in the firm, which in turn influences the alternatives considered for a particular decision. The alternatives considered are also affected by the perception of individuals, and by the screening and modification of information on environmental forces as the information flows up or down the organization. As Figure 10 suggests, the individual decision maker seldom considers all of the available alternatives.

A subset of the broiler decision anatomy may be the easiest way to illustrate the concept. Consider the management of a primary breeding company whose main concern is the sale of breeding chicks to broiler integrators for their hatchery supply flocks. The network of decisions affecting that action would be of particular interest to understand.

Unfortunately, the decision anatomies of integrators vary widely, making generalizations difficult. For illustrative purposes, a moderate-sized, specialized, broiler integrator is used. Such a firm may well

**FIG. 11.—Decision Structure for Selection of Breeder Chicks by Specialized Broiler Integrator.**



operate with only one overall profit center, and with top management making the final decision on the breed, quantity, and timing of chicks purchased. These decisions are likely to depend, however, on information flowing to central management from the various operating departments. A simplified diagram of this decision process is in Figure 11.

Understanding who makes the breeding chick decision in this firm would be of value. However, knowing the information on which the decision is based and the criteria used by the decision maker may be even more critical. These factors which make up the decision environment for this particular decision maker are critical for the fieldmen of the breeding firm to understand. They may well determine where he can most fruitfully work with the integrator to communicate the built-in capabilities and enhance the evaluation of his firm's chicks. The information upon which top management evaluates different breeds can also provide valuable feedback to the management of the breeding company, helping them identify the strengths and weaknesses of their product under field conditions.<sup>75</sup>

In this particular example, the decision concerning the breed of chicks selected is unilaterally made by the top management of the integrator firm. As depicted, price is not an important part of the decision process, while past performance data from the broiler chick production division, grow-out division, and processing and marketing division are important inputs to the breeder chick replacement decision. The bilateral agreement (transaction) resulting from the breed selection decision involves negotiations primarily on the quantity and timing of chicks to be delivered.

The decision anatomy for an integrator with several profit centers—organized either by function, by geographic region, or both—may be quite different. The regional manager or the manager in charge of broiler chick production may then make the decision on the breed of chick replacements. His authority may be constrained, however, by a list of breeds approved by firm headquarters. If the decision is made or strongly influenced by the manager of broiler chick production, the liveability, ease of management, rate of lay, and egg hatchability of breeding hens is likely to receive more emphasis than the performance of the broiler chicks in the grow-out farms, or the yield and desirability of the carcass from the processing opera-

tion. All factors should of course be considered if they affect the integrator and the ultimate market it serves. Where the decision on buying breeder stock is delegated to one division of a company, the needs of other divisions must be adequately recognized if the overall performance of the firm is to be optimized.

While this discussion has emphasized economic factors and rational decision processes, it is well to recognize the human dimensions involved in the decision anatomy. The goals and values of individual decision makers, the personal relationships between buyer-seller representatives, and industry acceptance and recognition of certain types of actions and trade practices all enter into the decision process. Although they may be difficult to define, they are a part of the decision environment.

The foregoing has utilized the decision anatomy concept from the point of view of an individual firm with a specific purpose. As the reader can appreciate, similar applications of the concept could be made by other firms in the vertical system, by trade associations attempting to influence government programs, or by public agencies seeking to change certain aspects of the system's operation by educational means. In all cases, the relevant decision points and structure of authority, plus those factors influencing the decision, provide very critical and dynamic insights.

#### **Decision Anatomy of the Total System**

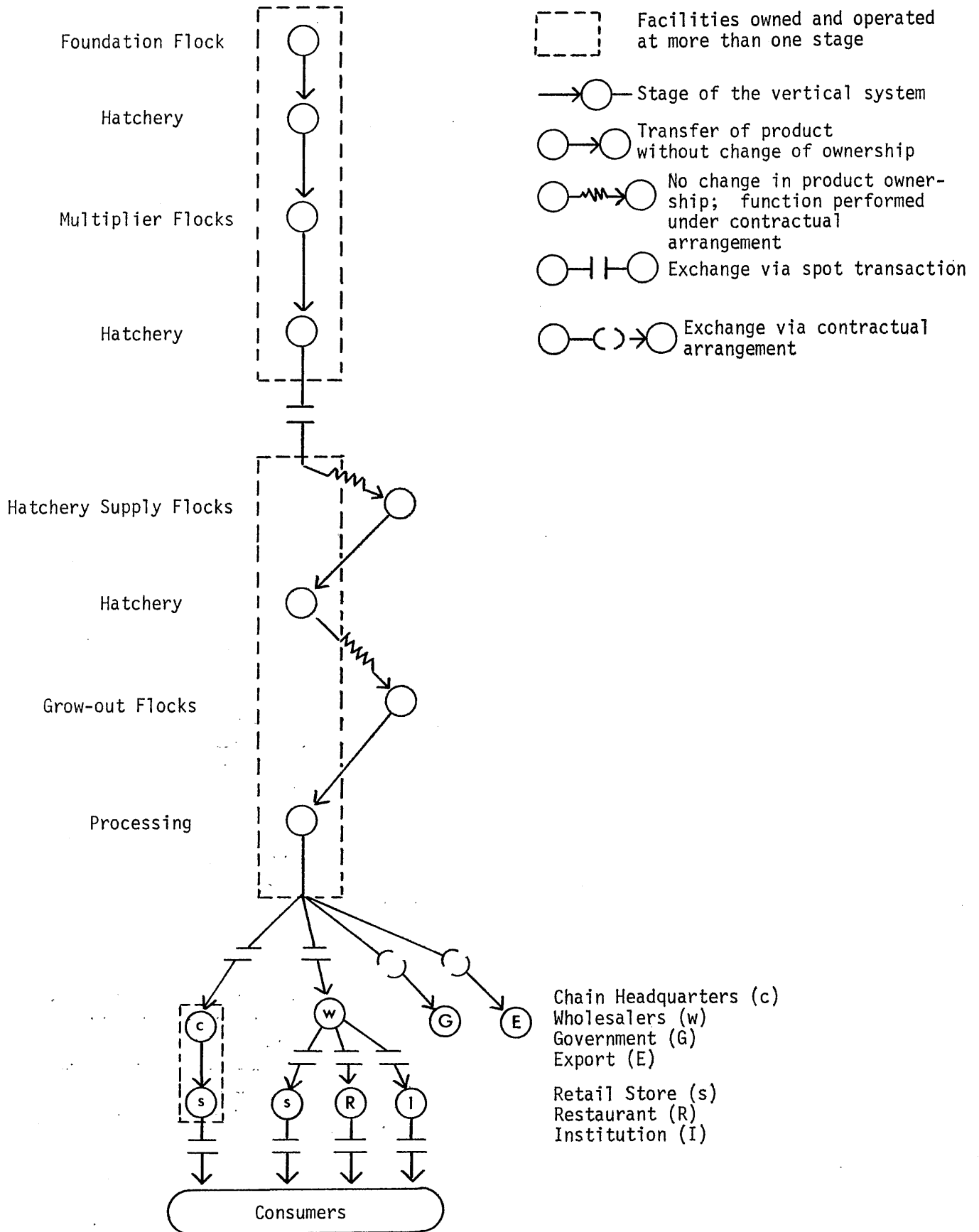
Expanding the decision anatomy concept to consider the total vertical system entails some loss of detail. The variety of decision anatomies within individual firms for different types of decisions are sufficiently complicated to tax one's ability to comprehend when looking only at a part of the system. Attempting to consider them for the overall vertical system would seem to be an exercise in futility and frustration.

For this reason, in defining the system's decision anatomy, the firm's decision anatomy is ignored. The approach focuses instead on the locations and characteristics of bilateral decisions (transactions), multi-firm decisions (through trade associations, for example), and institutionally imposed decisions (e.g., government regulations). The remaining decisions necessary for the system to function and adapt are attributed to unilateral decisions (or intra-firm negotiated decisions) made within firms at different stages of the system, without attempting to fathom the inner workings of the firms involved.

Figure 12 presents another scheme of the vertical broiler system, showing the ownership of facilities at different stages, and the movement and methods of exchange of the product. This provides a skeleton on which a more comprehensive view of the overall decision anatomy can be developed. While it falls far

<sup>75</sup>Comparing the results realized by integrators with their own field tests provides breeding companies with insights into the extent to which the potential performance of their birds is being realized. Henry Saglio of Arbor Acres said in the August 1968 issue of *Broiler Industry*, "We've put more potential into our birds . . . than even most of our branches are getting out of them through management! . . . this is true . . . among many of our customers."

**FIG. 12.—Facilities Ownership and Linkages in Vertical Broiler System.**



short of presenting the complete picture, it provides a general overview of the structure of authority based on ownership of facilities and the product.

To flesh this out, information is needed concerning bilateral, multi-firm, and institutionally imposed decisions.

**Bilateral decisions** refer to market transactions which are single decisions subscribed to by two independent parties, each of whom has authority to carry out the agreement. These link the proprietary entities in the vertical system through the exchange of product, and are the means by which many resource inputs are obtained for integration into the industrialization process. Product exchange tends to occur via spot transactions. The nature of these transactions differs greatly, however, from the consumer purchase at the supermarket to the purchase of chicks by broiler integrators. In the latter case where ongoing relationships between relatively few firms stimulate awareness of their mutuality of interests, a close working relationship tends to emerge. In this environment, mutual compromises often occur. For example, when an integrator makes a decision to reduce his tentative advance order for replacement chicks, he may moderate the impact of this reduction on breeding companies by cutting his breeding flock a month earlier than intended. Conversely, during a period of expansion when replacement chicks may be in short supply, the primary breeder is likely to give priority to those integrators who have attempted to help him during periods of retraction. Because of their long-term working relationships, the primary breeder will seldom take advantage of favorable market conditions by raising the price of his chicks.

Somewhat similar relationships affect the spot transactions linking breeders or integrators with the suppliers of their primary inputs (equipment, health products, feed or feed ingredients, etc.). The importance of long run, mutually beneficial relationships tends to temper individual bilateral decisions.

The relationship between integrators and distribution firms tends to be more distant, although long-term working relationships also develop at this stage, particularly where chill pack or branded broilers are involved. For the most part, however, the buyers for large retail or restaurant chains are strongly concerned about having alternative suppliers to protect their bargaining position. A definite aversion to becoming dependent on a single supplier is apparent. This philosophy is not conducive to close long-term working relations.

Integrator-distributor bilateral decisions represent one of the most powerful decision points in the system. These decisions have had a major influence on the type and form of broilers marketed (fresh, deep

chill or frozen, packaged or unpackaged, distributor brand or processor brand, etc.) and on the heavy emphasis on price in the system. The obsession of many retailers with price merchandising and gross profit as a measure of profitability, plus their aversion to becoming dependent on single suppliers, have been definite impediments to the acceptance of deep chill broilers.

The contractual arrangements characterizing some of the bilateral decisions might suggest working relations which are more long range than spot transactions. However, this varies widely. For example, forward sale contracts with government agencies or with foreign governments tend to be isolated or separate transactions, with sealed bids submitted for certain product specifications.

However, contracts with hatchery supply flock operators for the employment of their facilities and labor occur largely under a long-term continuous relationship. The same is true to a somewhat lesser extent of the contracts with broiler growers. The number of hatchery supply flock operators is considerably less than the number of contract growers. Sound management of individual flocks is, therefore, more critical in the former than the latter. Not surprisingly, the turnover rate of growers contracting with a particular integrator is normally higher than for hatchery supply flock operators under contract.

Contracts are also used as vehicles to stimulate technological change. Although integrators may not own the facilities and equipment for the grow-out or supply flock operations, they may effectively control them by stipulating certain environmental conditions as requisites for contracting. The use of contracts in this way has accelerated the rate of technological change at the producer level. At the same time, it has created hardships by tending to keep some producers in perpetual debt. Where the financing of new equipment and facilities is arranged by the integrator, an added measure of control by the integrator is provided. This does not necessarily mean such control is used for exploitive purpose; however, it does affect the freedom of producers entering into contractual agreements.

The foregoing provides some elaboration concerning the characteristics of bilateral decisions within the broiler system. In attempting to generalize about these decisions, the most typical relationships have been presented. It is recognized that there are many departures from the relationships presented.

**Multi-firm and institutionally imposed decisions** are those occurring due to the collective agreement of many firms in an industry, normally through their trade associations. In fact, industry associations exist as a result of such decisions. Except in directing the

activities and concerns of their trade associations, multifirm decisions generally lack (in fact, are legally prevented from exercising) the authority needed for implementation of some actions, especially those relating to price. The expression of multi-firm decisions is generally through the educational, promotional, and service programs, and the lobbying activities of their trade associations.

Institutionally imposed decisions are those decisions resting on outside or sovereign authority for implementation. They include the host of decisions made by various governmental agencies which the industry or system is obliged to accept, once they have been made. In large part, such decisions are collective (not unilateral in their origin), since the interests of the various parties involved are considered. Institutionally imposed decisions often represent a compromise or blending of multi-firm decisions and the desires of other groups. There is frequently a close relationship (although not necessarily a high correlation) between multi-firm and institutionally imposed decisions.

The various governmental regulations affecting the broiler system are the result of past institutional decisions. Some of these provide rather direct constraints on industry *conduct* (regulations on inspection of processing plants, packaging, labeling, unfair competitive practices, etc.). Others, such as anti-trust regulations, provide constraints on both the *structure* and *conduct* of the industries in the broiler system. Still others influence the system largely through their economic impact (e.g., freight rates, tax regulations, export/import tariffs and restrictions, etc.).

In addition to the above set of institutionally imposed decisions, the system's decision anatomy also reflects decisions based upon industry preference, but which only public institutions have the authority to implement. The nature and coverage of USDA Market News on broilers, the development of a futures market on ice packed broilers, and the availability of a federal grading service on broilers all represent this type of situation. However, these programs are used on an optional basis by system members.

Finally, the many unwritten customs, rules, and trade practices operating in most vertical systems to define what is ethically and socially desirable are also included as institutional decisions. While these are often difficult to define, they often function to encourage cooperation within the system and the *fair* treatment of system members.

The purpose of this discussion is not simply to review the various institutions and arrangements affecting the vertical broiler system. It is to stress the idea that these, too, result from decisions of various types and lend themselves to the decision-anatomy

concept. The decision points, the structure of authority and influence, and the objectives of the organizations involved help in understanding the various regulating and coordinating institutions and arrangements from a dynamic rather than static perspective.

**Unilateral decisions**—Bilateral, multi-firm, and institutionally imposed decisions play an essential part in the coordination and adjustment of the vertical broiler complex. They provide a type of check and balance within the system, influence the environment within which it operates, and have a significant impact on the distribution of income to the various organizations and resources involved. Yet, important as these are, the bulk of the activities in the system result from unilateral decisions made within firms.

The various types of decisions are not separate and distinct, however, but are rather highly interrelated and interdependent. Unilateral decisions on the size and quality of broilers produced are reflections of information received from bilateral transactions with customers. Still, the authority to decide the quality and size of broilers rests with the integrator. Since it is a unilateral decision, the process of reaching a decision and implementing it is likely to be quicker and easier. But the chance of the decision being inconsistent with the welfare of the system may be greater than where two compensating interests are bilaterally balanced.

In trying to understand the overall decision anatomy for the broiler system, it is a useful simplification to differentiate the various unilateral decisions only by the proprietary entity where they are made. The broiler integrator generally decides the feed ration and medication program for his broilers. Contract growers have little if any responsibility for these decisions. Going beyond this point to examine the hierarchy of authority within the integrator firm, which determines who makes the feed and medication decisions, would bring a degree of complexity unwarranted for the present purpose.

This simplification of reality carries inherent dangers. It makes it too easy to assume that the various unilateral decisions made within a firm are coordinated and consistent; that they reflect the objectives and policies of *the* firm. This is not true. In fact, it represents one of the serious limitations of large, diversified companies. The organization of some broiler integrators, for example, results in decisions and actions not too dissimilar from those expected if the various divisions were separate firms (i.e., a non-integrated system). This situation (which one independent called intra-company intercourse) appears to be declining as a problem in the industry since profit centers have been broadened and more central coordination encouraged.

These comments about the overall system's decision anatomy build upon the earlier discussion of system functions, proprietary and authority structure, and institutions and arrangements. It is well to keep in mind that a system is an industrialization process in which the various inputs and functions are integrated to achieve some end objective. The decision points in a system tend to parallel the array of functions performed in this vertical integration process. The authority and constraints associated with

particular decision points determine the extent to which a decision point controls a particular function. Bilateral or multi-firm decisions where the authority is shared among more than one entity involve less control than decisions where the authority is solely within one entity, either due to sovereign power, property rights, or legal agreement. Understanding the configuration and dynamics of decisions and authority in a vertical complex provides valuable insights into the points of leverage and control in a system.

## CHAPTER V

### FORCES AND INSTRUMENTS OF CHANGE

The evolving, rapidly changing nature of the vertical broiler system represents the response and adjustment of the system to several interacting change forces. Seven categories of change forces generating much of the change in the broiler complex have been defined. In studying the system's evolution, the domino effect of change is very evident; the changes resulting from certain forces created new imbalances and opportunities, which in turn became forces for additional change. Where one starts in this *chain of change* is somewhat arbitrary. The forces identified are:

- New technology
- Rapid growth in the volume of broilers produced and consumed
- Unstable supply and price conditions
- Changes in the goals of firms, and in the methods of achieving these goals
- Conflict between the vertical members of the system concerning distribution of returns, control over decisions, and the performance of functions
- Protection of national, regional, or vocational interests
- Competitive rivalry; the quest for a differential advantage.

Change results when a decision is made which transforms into action those forces pressing for or inviting change. Both the force and the decision are essential requisites for change to occur. Within the vertical broiler complex, change forces have been activated through all types of decisions; unilateral, bilateral, multi-firm or industry, institutionally imposed (rules and regulations), and institutional in collaboration with the industry (public services and institutions). The type of decision involved has depended upon the perceived type of change needed, the structure of authority to make the decision required, and how and by whom the pressures for change were interpreted.

With some exceptions, the broiler complex appears to have been alert and responsive to pressures and imbalances developing within or outside the broiler system. This certainly is in part responsible for the relatively low level of regulation affecting the system.

The force of competitive rivalry has been so omnipresent in the post-World War II history of the broiler system that no attempt will be made to comment on its role separately. Because of the relatively unregulated nature of the industry, competitive forces have been allowed to operate rather freely. This dynamic force is interwoven with the other six forces.

#### New Technology

Advances in broiler breeding, feeding, disease and health control, housing, processing, shipping, and management procedures have provided fundamental forces to transform the broiler complex from an assemblage of atomistic, loosely organized, and small volume industries to the present highly industrialized vertical system. These advances are reflected in a decline in the feed required to produce a pound of broilers from 3.6 lb. in 1950 to 2.5 lb. in 1963 to an estimated 2.2 lb. in 1969.<sup>76</sup> The time required to grow a 3.5 lb. broiler was reduced during this 20-year period from 10-12 weeks to about 8½ weeks.<sup>77</sup> Tests of caged broilers reveal that the time requirement may be reduced to 6½ weeks through this innovation in housing.<sup>78</sup> Most of these changes were cost reducing or quality improving in nature, or both.

The sources of the many technological changes which have significantly reduced the cost of delivering broilers to the retail meat counter have received

<sup>76</sup>Source of 1950 and 1963 figures was USDA, Poultry and Egg Situation, Nov. 1963, p. 13; 1969 figure is based on industry estimates.

<sup>77</sup>PES 261, Poultry and Egg Situation, ERS, USDA, April 1970, p. 11.

<sup>78</sup>Haffert, William. Nov. 7, 1969. A Dazzling Decade of Change. Mimeo of speech at AMA Agribusiness Seminar, St. Louis, Mo.



comment in several studies on the broiler industry. Some originated from university or government research efforts (particularly since the late 1950's); others from research and experimentation by commercial firms which were a part of, or supplied inputs to, the broiler system. In part, they were due to a national commitment to research in agriculture, and in part a result of a competitive private enterprise system.

The implementation of the newly developed technology was yet another matter, since it called for many unilateral investment decisions and changes in management practices.

"Given the explosive forces of technology in the poultry industries in the period since World War II, it was inevitable that the enterprise system would find ways to implement them rapidly. There was no important barrier to block rapid adoption of the new technologies . . . It is reasonably clear that the physical production efficiencies actually achieved would not have come as rapidly if it would have been required that traditional agriculture— independently organized into autonomous decision-making units—should have prevailed."<sup>79</sup>

The net effect of technological advances was to place broilers in a very favorable competitive position relative to other meats for the patronage of American and foreign consumers—broilers that were meatier and more desirable than their ancestors. Stimulated by promotions in supermarkets, consumer purchases grew rapidly, creating another pressure for change as the system attempted to reorganize to meet the rapidly growing market.

#### **Rapid Growth**

At the end of World War II (1945), the U. S. broiler industry produced 366 million broilers annually. Approximately 25 years later, the volume produced had mushroomed eight-fold to 3.0 billion birds. Such a growth rate is not accomplished easily or painlessly. It required a major reorganization of the vertical system.

Experience with birds bred with improved meat characteristics during World War II and in the years following convinced many of the need for and profit opportunity from developing a meat-type commercial broiler. As genetic research developed a more desirable bird, and a combination of technological changes reduced the cost of production, the potential growth of the industry attracted more participants. As new and often inexperienced growers entered production, and as existing growers expanded production to meet market demand and avail themselves of scale econo-

mies, the need for credit increased greatly. A number of capital sources were instrumental during the rapid growth of the 1950's; feed manufacturers and dealers, who were anxious to gain and maintain a share of this growth industry, extended considerable amounts on open account; commercial banks and agricultural credit institutions were other sources. In some cases, lenders were too liberal in providing financing, allowing undercapitalized, marginal growers to enter the business, only to be promptly washed out with the first serious price depression.

The scramble to *get aboard* was not in perfect balance with the growth in demand, resulting in fluctuating prices which increased the risks of those involved. Many growers found themselves in a highly vulnerable position with an undercapitalized operation, a continual need to expand and re-equip their operation (which would weaken their financial position further), and an unstable market price. They reacted by seeking others in the vertical complex willing to share the risks involved and provide financing assistance. Feed manufacturers and meat packers were logical candidates for some type of joint venture with producers. Both had very strong interests in the growth and development of the broiler industry.

#### **Unstable Supply and Price Conditions**

Because the actions of system members have not been constrained or modified by government price or supply controls, the collective impact of many independent decision makers has been fully reflected in market prices. The periods of price depression since 1956 are shown in Figure 1; 1959, 1961, 1967, and 1970-72 stand out in particular.

The changes stimulated by the pains of instability included very fundamental adjustments in the organization of the system (concentration and vertical integration), changes in the institutions and information networks serving the system, and a re-examination by firms of their goals and methods of achieving such goals. Some examples may help bring the nature of these changes to life.

#### *Vertical Integration*

**Swift and Co.**—As a large meat packer, Swift and Co. has been processing and distributing poultry for more than 60 years. In the 1930's it added some hatcheries to supply broiler chicks to growers, and also entered into agreements to purchase various growers' birds at the market price. By the mid-1950's, rapid technological change and industry instabilities spurred growers to ask Swift to share the market risks. Concerned with maintaining a reliable supply of broilers, the company entered into grower contracts with formula prices tied to a prevailing market price. These contracts had floor prices, below which losses were

<sup>79</sup>National Commission on Food Marketing, Tech. Study 2, *op. cit.*, p. 10.

shared by the three parties to the contract—the grower, Swift, and a feed manufacturer.

Following the drastic price recessions of 1959 and 1961, many growers sought to avoid the risks of a mercurial market altogether. So, in 1959 Swift began retaining ownership of the birds throughout and employing growers and their facilities by contract. This practice gradually expanded until it was the norm for the company by the mid-1960's. In 1962, Swift tied in its feed manufacturing operations by developing plants in broiler production areas to realize available cost economies.

From the standpoint of company objectives, these moves can be interpreted as largely defensive in nature. Throughout, the primary concern was to protect their supply sources in order to be able to serve their customers. Company officials indicate that the moves toward further integration were made grudgingly; inch by inch they were drawn into the industry. Once started, the forces seemed irreversible.

Swift reduced their growing operations in recent years; in 1971, the company was estimated to be the fifth largest processor of broilers in the U. S.<sup>80</sup>

**Tyson Foods**—From a trucker of live broilers in the 1930's, the Tyson family business gradually mushroomed into the nation's largest specialized broiler company. In 1968, the company was the fourteenth largest processor of broilers in the U. S.<sup>81</sup> By 1972, Tyson was estimated to be the third largest broiler processor.

In this case, the gradual expansion and diversification of the family enterprise seems to have stemmed largely from taking advantage of growth opportunities. Having become involved in the live trucking of chickens in the 1930's, the elder Tyson found that farmers were having difficulty obtaining chicks. Sensing a profit opportunity, he bought a hatchery and began selling baby chicks to the same farmers whose grown birds he transported to market. Having sold chicks to a farmer, he also knew when to contact him to truck his grown birds, thus assuming a coordinating role for the farmers he served.

During World War II, growers were having difficulty obtaining feed; the Tyson family entered the feed business in order to fill this need and opportunity.

When mandatory federal inspection of poultry processing plants in 1959 forced many small plants to close and provided a natural climate for interested new entrants, the Tysons opened their first processing plant. This provided even greater opportunities to increase the sales of chicks and feed. Shortly follow-

ing this, they found it necessary to maintain ownership of the birds and to contract with growers for the grow-out function. Step by step, the company moved from one opportunity to another—to the position of a fully integrated broiler operation.

During the 1960's, the company orientation shifted from a strong focus on production to a deep commitment to marketing. The impact of iced broiler price fluctuations has been cushioned through marketing chill pack and cooked broilers, and by developing forward contracts with further manufacturers. Recently, the company has successfully test marketed the Tyson brand of chill pack broilers in the Denver market—providing yet another avenue to avoid the *fickle fate* of commodity prices.

In addition, the company has diversified by developing a completely integrated egg operation, has processed and sold Cornish hens and ducks for some time, and in 1972 was in its sixth year of hog production.

**Ralston Purina**—As a major feed manufacturer, and with feed representing about 70% of the cost of growing broilers, a common interest between Purina and broiler growers was natural. During the 1950's, expanding growers relied for their feed upon the trade credit provided by the company on open account. New mills were constructed in producing areas in order to compete in price and service.

In the late 1950's, when growers indicated they were unable or unwilling to accept the market risks, the company became involved in contracts guaranteeing a minimum return to growers (initially in conjunction with their feed dealers and later in conjunction with processors).

With the financial crisis of 1961, Purina found the future of many of its mills (as well as independent mills it was supplying with feed) in jeopardy as many small and medium-sized processor-integrators were on the brink of bankruptcy. The series of mergers Purina consummated at that time placed it firmly in the integrated broiler business with hatchery supply flocks, hatcheries, and processing plants. In large part, the acquisitions were to defend sizeable *chow sales* in an area.<sup>82</sup> Like Swift, Purina felt gradually drawn into the industry by its efforts to protect its basic business.

By 1968, Purina was estimated to be the largest processor of broilers in the U. S. In 1971, the company announced plans to launch a full line of branded poultry products, including several pre-cooked frozen broiler products, chill pack broilers, and eggs, as well as frozen turkeys, ducks, Cornish hens, etc. All prod-

<sup>80</sup>Letter from W. V. Smith, Swift Dairy and Poultry Co., Oct. 4, 1971.

<sup>81</sup>Henry, William, August 1969. 1969 Ranking of U. S. Broiler Plant Leaders. Broiler Industry.

<sup>82</sup>This was not true of all acquisitions, however. A broiler company in Maine was acquired primarily to provide Purina with management personnel experienced in the broiler business.

ucts were to be marketed under Purina's brand, backed by heavy promotions. Unfortunately, the plans for this effort took shape during a period of seriously depressed broiler and egg prices. In the fall of 1971, Purina decided to divest of their broiler and egg operations—a decision causing shock waves throughout the broiler system. The mercurial prices and earnings in the broiler business had proven too inconsistent with the image Purina was trying to project to the investment community—that of a diversified food and farm supply company. When it left the industry, Purina was the third or fourth largest broiler processor.

The impact of Purina's exit can only be estimated. Since nearly all of their facilities were sold to other operators, little change in production and processing capacity occurred. Some industry personnel felt that independent regional integrators, in particular, would miss the stabilizing influence and the price umbrella provided by Purina.

Purina's move does raise questions concerning the future of diversified nationals in the broiler system. Regional integrators have demonstrated greater growth, aggressiveness, and willingness to *ride out* price depressions than the diversified nationals during the past decade. It may be that only those nationals with a strong commodity orientation will choose to continue contracting and processing broilers if serious price instability continues.

**Holly Farms**—Unlike the previous examples, in which the firms moved a step at a time in integrating the various stages of the broiler system, Holly Farms became a fully integrated broiler company through one multi-firm decision. In Dec. 1961, 16 privately owned corporations were consolidated into one privately owned holding company, Holly Farms Poultry Industries. Among the 16 companies were three hatcheries, a feed mill with grain purchasing and hauling subsidiaries, five broiler contractors, one breeder-flock company, a poultry processing plant, and three related companies. In consolidating five previously independent stages of the broiler system within one company, four market linkages were replaced by intracompany transfers, and the objectives at each stage were modified to be consistent with the best interests of the total company.

The forces causing the creation of Holly Farms are described as purely economic.<sup>83</sup> Most of the companies involved had been doing business with each other prior to the merger and were successful on their own. Their combined long run appraisal of the

<sup>83</sup>The information on Holly Farms is largely based upon the authors' correspondence with Arthur Upshaw, vice president of the Federal Company, which acquired Holly Farms in 1968. Mr. Upshaw was an officer of one of the 16 companies merged to create Holly Farms in 1961.

broiler industry suggested that they must either integrate individually, and compete with each other, or join forces by consolidating into one company.

The performance of the consolidated company has demonstrated the strength of tight coordination over a substantial part of the vertical broiler system under alert management. From 1962 to 1970, Holly's dollar sales of poultry more than quadrupled. An important part of this sales growth was due to the successful introduction of *Holly-Pak* poultry in 1964.<sup>84</sup> Although other poultry processors had previously attempted to prepackage broilers at the processing plant, Holly was the first to successfully do so on a commercial scale. To win its *million dollar gamble*, Holly found it necessary not only to control quality closely at all levels (including delivery to retail stores by Holly trucks), but also to place heavy emphasis on understanding and working closely with retailers. The total marketing program which emerged was probably more extensive and more strongly retailer oriented than originally envisioned. However, because of this, it has provided Holly with a distinct competitive advantage. Holly-Pak represented more than 80% of Holly Farms' volume in 1969.

While Holly-Pak has provided strong enterprise differentiation for Holly as a supplier, the fact that retailer labels have generally been used has prevented their development of a consumer recognized brand of fryers. With such a significant breakthrough in marketing broilers, it would seem logical that Holly might have seized this opportunity to develop their own brand of fryers. Many in the industry wonder why they did not. In large part, the explanation seems to lie in Holly's relationship with retail firms. The successful introduction of Holly-Pak depended upon retailer acceptance of Holly-Pak and of Holly Farms as their sole (or at least major) supplier of fresh fryers. Retailers are generally reluctant to become dependent upon a single supplier of a product as important as broilers, particularly a product which carries the processor's brand. If they had insisted on packing only under their own label, Holly Farms management might well have found that many food chains would accept Holly as one of their suppliers, but not the sole or even primary source of fryers. By offering to package with store labels, the chance of becoming the major supplier of chains was greater.

The development of chill pack broilers by other integrators in recent years has eroded some of Holly Farms competitive advantage and yet has also removed retailer anxiety in accepting an innovation available from only one supplier. More retail firms

<sup>84</sup>Broilers prepackaged at the processor level and distributed in fresh form are referred to as chill pack or deep chilled broilers by the industry. Holly-Pak is Holly Farms' identification for this marketing method.

are willing to accept the chill pack form of broilers with alternative sources of supply. These changes may also have had some influence on the willingness of retailers to accept processor brands of chill pack broilers. At the time of writing, Tyson and Purnell have successfully penetrated the Denver and Memphis markets with processor branded chill packs; Holly has announced plans to test its brand in the Chicago market.

Like many other broiler companies, Holly has actively sought ways to diversify in recent years. A joint venture with Safeway Stores, initiated in 1969, led Holly into the fried chicken carry-out business. By 1972, these outlets were realizing good results. A substantial increase in the number of these outlets is planned. A dog food made from chicken is now being marketed by Holly, and several convenience foods made from chicken are under development. In addition, the company has done some exploration into the hog and catfish industries, utilizing the same organization and coordination concepts effective in broilers.

In 1972, Holly Farms was estimated to be the largest processor of broilers in the United States.

#### *Concentration*

The ebb and flow of the fortunes of broiler firms has resulted in many marginal and poorly financed firms being forced out of the system. The forces of new technology and rapid growth have provided advantages to well-financed firms, which could implement new technology and expand capacity without serious financial constraints. The periodic price depressions in the industry have severely tested the financial structure of participants—again favoring somewhat larger firms (and their associated growers and suppliers) with a strong capital base and good access to the capital markets.

In addition to the need for a sound financial base, the characteristics of the system also place a premium on efficient production and intra-firm coordination. Although in recent years marketing has received more attention, it is a critical success factor for only a few integrators.

The net effect of these factors has been a reduction in the number of integrators and primary breeders; i.e., increased concentration in both industries. While the requisite characteristics of successful firms would seem to favor the large, diversified, national firms, the well-managed specialized, regional integrators have been more than able to hold their own to date. If marketing expertise becomes more important (the development and marketing of new branded broiler products, for example), the large national integrators may be able to realize some comparative advantage.

#### *Changes in Institutions and Arrangements*

The combined effect of technological advances, rapid growth, and price instabilities produced several changes in the institutions and arrangements affecting the vertical broiler complex. One of the natural reactions of an industry buffeted by price instability is to seek information allowing more accurate planning and coordination. The broiler industry has encouraged the USDA to modify existing reports and to create new reports providing greater insights into intermediate and long-run supply, demand, and price conditions. The Breeder Placement Report and the Chick and Egg Placement Report are of this type. In recent years, the industry asked the USDA to develop recommendations for adjustments in the quantities of broilers at various stages in the *pipeline*. The widely used quarterly Broiler Marketing Guide is the result.

As the broiler complex became more integrated, the price reporting system suffered from thinness of trading in intermediate items. The volume of hatching eggs, broiler chicks, and live broilers involved in market transactions gradually dwindled. As a result, the base for market reports on these items became unstable, and the validity of price reports was questioned. In 1965, USDA changed its market news reporting from live broiler quotations to ready-to-eat broiler prices—as reflected by processor sales information and distributor procurement data.

The industry has expressed the need for additional information for the price-discovering process. On the grounds that the prices of consummated wholesale transactions may be unrepresentative because of the thin volume traded, particularly during the first two days of the week, the industry encouraged the USDA in 1970 to attempt reporting bid and offer price data in addition to existing price reports. At the time of writing, this has not been attempted.

The development of futures markets for broilers, first for frozen broilers in 1962 and then for ice-packed broilers in 1968, represents another effort by the industry to develop procedures which would broaden the market, and incidentally provide one measure of the level at which buyers and sellers are willing to put their price expectations *on the line*. Thus, a vehicle is made available for transferring to others the impact of price fluctuations.<sup>85</sup> However, from the limited number of firms interviewed, it appears neither integrators nor distributors as yet use the broiler futures market as an important part of their commercial business. In spite of this, trading has grown sufficiently on the iced broiler futures to make it a well-established market. This market is still largely untested as a hedg-

<sup>85</sup>See Arthur, Henry B. 1971. *Commodity Futures as a Business Management Tool*. Harvard University, Boston.

ing medium. The changes made in Dec. 1971 to make the contracts deliverable should result in a closer relationship to the cash market and make the contracts more useful for hedging purposes.

The National Broiler Marketing Association organized in 1970 represents yet another institution created to help deal with price instability. Its history is too brief and its future too uncertain to allow evaluation.

#### **Changes in Firm Goals and Methods of Achieving Goals**

Periodic price depressions and the progressive increase in the size of broiler firms have stimulated a re-examination by many firms of their goals in the broiler business and the most appropriate methods of achieving such goals. The presence of publicly held firms with professional management has resulted in greater concern for return on investment as a primary criterion.

One characterization of the shift in integrator goals is:

1950's—How many chickens are you growing?

Early 1960's—How many chickens are you killing?

Late 1960's—What's your return on investment?

One might expect that the presence of more large firms whose stockholders are interested in both the growth and stability of earnings would be a tempering and moderating influence. From 1961 to 1967, greater stability was apparent. However, the depressed prices in 1967 and 1970-72 suggest that the system is still subject to the periodic price depressions which have been one of its most troublesome characteristics.

Distress conditions have also stimulated examination of the organizational problems within individual firms. Many integrators were initially organized with several profit centers within their broiler operation (e.g., the hatchery supply flocks, hatcheries, grow-out division, processing plants, marketing department, and feed mills may all have been profit centers). This posed internal problems of transfer pricing, financing, the distribution of risk, allocation of overhead expenses, etc. For example, a firm basing its transfer prices on the *costs* at each stage of production could easily place its processing or marketing division in a situation where it absorbed all risks of price fluctuations. This procedure has proved disastrous to the careers of some of the men heading these divisions, and created undesired friction within firms. It would seem reasonable, however, to make each operation a *cost center*, not owning the birds, but taking as its target a standard cost formula adjustable for the different operating scales and types of operations.

In any event, integrators have generally moved toward a single profit center covering all broiler operations. However, the pattern still differs widely from firm to firm. Establishing transfer prices based upon a market price has become increasingly difficult; further, pricing at intermediate stages serves very little purpose within an integrated firm. Hence, it seems likely that firms will continue to move toward a single commodity profit center for the entire integrated operation, and use other criteria such as cost and performance standards to evaluate the effectiveness of individual departments and divisions.

The mercurial market price for broilers has effectively convinced many processor-integrators of the vulnerability involved in marketing undifferentiated commodities. It is only natural that these firms have taken action to reduce their dependence on the market for ice packed broilers. The development of chill pack broilers is a step toward enterprise differentiation, even though it has normally not been used to establish a brand preference with consumers. Cooked broilers, boneless products, and branded fresh broilers represent other attempts to move away from a *cordwood* market.

Another avenue of escaping the perils of commodity marketing is to diversify into other functions or industries. A few processor-integrators have entered the fast food business. Several have started, or are considering, the development of integrated catfish, hog, and/or egg operations. Unfortunately, these industries also tend to be characterized by a strong commodity orientation. Still, it may be a way of hedging one's bets that two or more commodities will not be ill at the same time.

#### **Conflict Between Members of the Vertical System**

The problem of coordinating the activities of vertical system members is not always easy to accomplish. Conflicts frequently arise. An important function of buyer-seller negotiations is to resolve these conflicts, usually through compromise, to the mutual satisfaction of both parties. Deeper conflicts that persist over time may eventually develop into pressures which must be reconciled for the health of the system. Conflicts may arise over many issues, including the distribution of returns, control over decisions in the system, the sharing of risks, satisfactory performance of a function, etc.

Within the broiler complex, the most apparent point of conflict in recent years has been between broiler integrators and contract growers. Issues involved include grower payments, the length of contracts, the clarity of contracts, methods of settlement, the length of time between batches, the forced adoption of new technology, and others. Many of these

issues relate to the lack of adequate communication and understanding between integrators and growers concerning the many facets of their relationship. This, coupled with the feelings of many growers that they have little power in bargaining over contracts, represents the seeds of the conflict which has occurred.

Until recently, relatively little group action has been taken by growers. Cooperatives have not been a strong element in broiler growing. Farm organizations, with occasional exceptions, have not been important spokesmen or leaders for broiler growers.

The efforts of the American Farm Bureau Federation and the National Farmers Organization in trying to organize grower bargaining associations in recent years have been aimed at resolving some of the grower-integrator problems. Their activity has stimulated the clarification of contracts and settlement terms to some extent and is credited with *tidying up* some aspects of integrator-grower relations. The impact of future bargaining activities, if pursued with reason, could be beneficial to the long-run welfare of the system. The timing of bargaining activities is critical, however. During periods of depressed prices, integrators are naturally more reluctant to grant concessions on grower payments. And if integrators are forced to pay too high a fee for the employment of growers and their facilities, they will find it profitable to develop more grow-out facilities of their own.

The results of bargaining efforts will be of considerable concern to the system. Unfortunately, what is regarded as equitable largely depends upon the perspective of the viewer.

The other most frequent point of conflict in the broiler system is the integrator-large chain relationship. Since large chains tend to emphasize a low price appeal, some integrators feel they have exerted a continual downward pressure on prices, and have given little encouragement to higher quality standards or to product innovations. Some integrators also claim that certain chains continually *clip* them by reporting low weights on delivered ice packed broilers.<sup>86</sup>

Many of these conflicts reflect a desire by integrators for more bargaining power and/or a more cooperative working relationship with large chains in which the long run welfare of the broiler system is considered. These types of conflicts are certainly not unique to this particular interface.

#### **Protection of National, Regional, or Vocational Interests**

The protection of self-interest is a rather fundamental instinct, whether it concerns an individual fighting for his job or a nation protecting its economic

welfare. Several changes have resulted from this force in the broiler system. The tariff barriers imposed by the Common Market have already received comment. These, in turn, set in motion a counter force by the U. S. broiler industry and government to negotiate a reduction in such tariffs, to find products (such as broiler parts) not severely penalized by the tariff, and to develop trade with other countries. Progress has been made in the last two areas, but has still not offset the impact of the E.E.C. tariff.

Labor unions were among the primary forces behind the Poultry Products Inspection Act of 1957. As poultry processing began to shift geographically from the North to non-union areas of the South, local unions in the North tried to protect meat cutter jobs by encouraging local health departments to establish health codes which would act as barriers to ready-to-cook poultry being shipped into their metropolitan areas. This soon precipitated conflicts between local, state and federal health agencies—and to some extent between state and federal departments of agriculture. As is often the case, the health barriers imposed restrictions and complications not at first anticipated.

As local barriers were eliminated, labor unions moved toward organizing processing plants. In some cases, unfounded criticisms of the health standards of processing plants were allegedly made public for union leverage. This exposed the vulnerability of non-federally inspected processors to such accusations, and prompted many larger processors to support mandatory federal inspection.

Mandatory federal inspection, which was implemented in 1959, created several second-order changes. Many small processors chose to leave the industry. Others chose this as an appropriate time to enter processing. Still other firms, which had to remodel plants to conform, also expanded capacity. The net effect was a significant increase in processor capacity, which in turn brought greater competition for growers, and the encouragement of increased production. These second-order effects of the 1957 law probably played a large part in the price depression of 1961. As a result, some of the new entrants to the industry had relatively short lives.

The consumerism wave of recent years is credited with being the primary force behind the Wholesome Poultry Products Act of 1968.<sup>87</sup> This act extended the provisions of the 1957 act to cover intra-state processing plants, and provided for additional safeguards at the processing level.

<sup>86</sup>For an interesting commentary on the role of industry trade associations in this legislation, see Broiler Industry, Dec. 1968. This chronicle is of particular interest for the strategy involved, and the positioning of the association to realize a politically acceptable and industry acceptable piece of legislation.

<sup>86</sup>Poultry Meat Magazine, Watt Publishing Co., Mt. Morris, Ill., July 1971, p. 13.

Many other changes could be cited which reflect one or more of these change forces. In nearly all cases, the dynamics of competitive, profit seeking entities, interacting with their environment, played a major role. The maintenance and balancing of these competitive forces is certainly a major concern of those involved in public policy.

#### **Deterrants to Desired Adjustments**

There are relatively few impediments to desired adjustments in the broiler system. One of the most frequently mentioned deterrants is the cash accounting privilege available to *producers* for tax purposes. This allows an integrator to use cash accounting for his hatchery supply flocks, hatchery, grain inventories, and grow-out operations. Industry sources indicate that independent integrators use cash accounting to a greater extent than diversified national firms.

One effect of cash accounting is to stimulate continued expansion in order to reduce tax payments, a situation which works contrary to the stability needs of the industry. However, there is a lack of unanimity on whether it should be discontinued.

"Some sharply criticize cash basis accounting as the biggest single cause of overproduction in the poultry industry, since it is the only way a producer can postpone paying taxes on inventory. Others argue that without it, many of the smaller companies could not survive."<sup>88</sup>

In addition to stimulating increases in production, cash accounting may also result in misinterpreta-

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<sup>88</sup>Broiler Industry, Dec. 1968, p. 30.

tion of the profitability of broiler operations since costs are not associated with particular lots of broilers. A firm which builds up grain inventories prior to the end of the year charges this expense to that year's broiler crop rather than allocating it to the cost of the broilers which will consume it. Some firms keep two sets of books, one cash and one accrual, in order to avoid the problem of deceptive accounting results.

The lack of importance of grower cooperatives in the broiler system might also be considered a deterrant to desired adjustments. Their presence might well have stimulated group action by contract growers at an earlier time to improve contract terms and clarity, increase grower-integrator understanding, and maintain more balanced and equitable integrator-grower relations. The recent bargaining efforts, which have sometimes taken the form of confrontation and *pain bargaining*, might have taken place under more favorable conditions if there had been earlier efforts to improve communication and resolve conflicts.

The development of more information on expected supplies 6 to 12 months ahead might benefit the stability of the industry. In addition to existing information on breeder chick placements, information on changes in industry capacity might also be useful in estimating future supplies. The effect of such information is certainly far from clear, however. Supply projections often stimulate action by individual firms which alters future supplies. The strong influence of independent decision makers trying to outguess their competitors would continue to exist and might very well result in continued price instabilities.

## **CHAPTER VI**

### **CONCLUDING COMMENTS**

The vertical broiler system of 1972 is probably the most tightly coordinated commodity system in U. S. agriculture.<sup>89</sup> In approximately 2 decades, it has moved from a loosely organized system which typically involved five or six firms linked by open markets, to a system in which only three entities are often involved, and which is tightly bound together by contracts and vertical ownership. Because of its rapid transition from a market coordinated system to an entrepreneurally planned system, it represents a particularly popular system to examine, to determine the relative advantages of different coordinating instruments.

One of the ironies of the broiler system is that although individual integrators have developed tightly coordinated vertical networks, the system in the ag-

gregate has continued to have coordination problems, if relatively stable prices and profits are used as criteria. This points out the important distinction between the coordination of individual firm vertical networks and coordination of the total vertical system. Many people have expected improved coordination of the total broiler system as fewer, larger, and professionally managed firms populated the system. This has not occurred. While only about 40 broiler integrators represent two-thirds of the broilers slaughtered, there are still enough to prevent collusive agreements. The responsiveness of the total system in shifting resource allocations still depends upon the composite effects of many individual decision makers as they try to outguess the market and their competitors. To date, the results have been mercurial prices and profits, with consumers the main beneficiaries.

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<sup>89</sup>Some competitors for this title include canning crops, some forest products, and a number of specialties.

In most cases, vertical integration in the broiler system has resulted from desires to shift risk, to obtain financing, to protect existing businesses, to assure supplies, to implement new technology, or to seize growth opportunities. It is often assumed that the present organization of the system provides greater efficiency and coordination than a comparable system linked by open markets. This may be true, although there is no solid evidence that integrated systems are inherently superior to market coordinated systems or vice versa. It is clear that the integrated broiler system has substantially lowered the cost of broilers, and has likely achieved this cost reduction faster than possible with a market coordinated system. It is also clear that an integrated system embodies certain efficiencies, particularly those related to transactions. The number of salesmen and buyers is considerably less in an integrated system than in a market coordinated system. What is not known is the extent to which these transactional efficiencies may be offset by inefficiencies in the other aspects of an integrated operation.

McCammon contends that entrepreneurially planned systems reach their peak of efficiency quicker than market coordinated systems.<sup>90</sup> However, there is also some evidence that over time, the former become more rigid systems that are less adaptable and responsive to exogenous forces. Unfortunately, much of this remains in the area of speculation.

Because the broiler system has become fully integrated, it does not provide two vertical networks, one integrated and the other coordinated by markets, for comparison. Given the same technology, scale of operations, etc., this would be an extremely useful comparison since it would indicate, at least in one instance, if and why one coordination method is superior to the other.

The change forces and responding decisions which have brought the broiler system to its present position represent a fascinating example of an evolving, energetic, free enterprise system. To a large extent, change has occurred through a series of decisions, each of which created small incremental changes, but whose cumulative effect has been substantial. Pinpointing an innovative decision as the genesis of a change is often impossible for this reason.

In a few cases, however, change has been more episodic in nature, resulting from the action of a particular business manager or government official. Poultry inspection laws enacted in 1957 and in 1968 were of this type. The earlier law in particular represents an episodic change which created sizeable waves affecting the entire industry. Gradual but cumulative

changes, on the other hand, tend to generate *ripples* of imbalance which can be more easily adjusted to, but also which can be more easily ignored by firms in the industry.

Many of the changes creating the present industrialized broiler system stem from the relatively unfettered forces of competitive rivalry. Aggressive and innovative entrepreneurial actions have created economic results which are without question laudable.

However, the performance of the system is not without its critics. Many of these are concerned with the important role of large agribusiness firms as contractors, and the relegation of growers to the status of poorly paid hired hands.

The limited evidence on this subject suggests that while growers have not been overwhelmed with prosperity, neither have integrators; that large agribusiness firms such as Purina may possess many types of power, but are still unable to manage broiler prices to any degree; and that the big benefactor of the broiler system evolution has been the American consumer.

The sociological effects of contracting on Maine broiler growers were studied by Prof. Louis Ploch, University of Maine, first in 1957 and later in 1963. The results indicated little resentment toward the system of contract growing or toward contracting firms; nor was there evidence that contracting had significantly reduced their perceived independence. Most growers affirmed the value of independence and saw little conflict between this philosophy and their position as contract growers.<sup>91</sup> While these results relate to a somewhat unique geographic area of broiler production and may not hold true in other areas, they lend no support to the notion that growers have been deprived of their dignity and independence. However, additional studies are warranted to examine in a more comprehensive fashion the sociological and economic impact of contract production on the farm families involved.

Members of the broiler system might also question its performance, not from the standpoint of public welfare, but from the standpoint of the firms and people inhabiting the system. Severe price depressions entail both economic and social costs. Investments and jobs are lost. Competitors leave the industry. Potential new entrants are deterred. Can this type of performance be considered good? What are the alternatives?

Given the nature of the broiler system, stable prices depend upon increased *horizontal* coordination at some stage in the system. The National Broiler Marketing Association was created largely for this

<sup>90</sup>McCammon, Bert C., Jr. 1970. System Management. In Vertical Marketing Systems. Edited by Louis P. Bucklin, Scott, Foresman and Co., Glenview, Ill.

<sup>91</sup>Ploch, Louis A. Nov. 1965. Maine's Contract Broiler Growers—A Restudy. Misc. Pub. 669, Maine Agri. Exp. Sta., Orono.



purpose. Whether it will be allowed to function in a supply influencing capacity depends largely on the Justice Department's eventual ruling on whether integrators qualify as *producers*, and hence can be members of an anti-trust exempt Capper-Volstead cooperative. Indeed, whether this exemption can be used to sanction an industry-wide monopoly is a question that may be raised, either in the Congress or the courts.

Even if integrators are deemed eligible so that the road is cleared for NBMA to expand its membership to represent a larger proportion of total output, the success of NBMA in stabilizing prices at a profitable level will still depend upon its ability to persuade its members to follow supply adjustment and pricing guidelines; also on the actions of non-members. After its first year of operation, NBMA claimed it was responsible for improving prices by 1 cent per pound or more by encouraging members to tailor the volume slaughtered to weekly patterns of consumption, and through the influence of its supply adjustment and pricing guidelines.<sup>92</sup>

To date, NBMA depends entirely on the cooperation of its members. Whether this is a sufficient basis for long run price stability remains to be seen. The spirit of cooperation is likely greater during and immediately following a severe price depression than during profitable periods.

The impact of any horizontal coordination effort, such as NBMA, on consumer prices is a justified concern. In the case of NBMA the public interest dangers appear relatively small since:

- NBMA has no actual control over prices or supplies. It depends entirely upon persuasion with its members.
- A significant portion of broiler production is likely to continue to be represented by firms which are not members of NBMA. This should act as a check on NBMA.
- While the members of NBMA can legally exchange information on market condition, prices, etc., the co-op remains subject to most of the antitrust statutes concerning predatory practices, price discrimination, or efforts to monopolize. The Secretary of Agriculture, the Federal Trade Commission, or the Justice Department may intercede if prices are unduly enhanced.
- NBMA members would continue to have an incentive to increase their individual profits. If prices increased to very profitable levels, individual firms would be expected to expand production, regardless of the NBMA guidelines. The number of broiler integrators is still too large for any supply control collusion to exist for long.

<sup>92</sup>Broiler Industry, Nov. 1971, pp. 30, 35.

This type of collective action does seem to combine the checks and balances necessary to protect the public interest. Whether it can be effective in stabilizing prices, investments, and jobs in the broiler system is open to conjecture. Since instability tends to eliminate present or potential competitors, and involves definite costs to the system, stable prices at a reasonable level could bring long-run public benefits as well as industry benefits.

Instability and low profits have not prevented the broiler system from providing many commendable benefits to consumers. Instability, however, is not desirable per se. Hence, the study raises these questions:

1. Is instability inherent in the nature of the broiler system, whoever conducts its functions?
2. Is there need for more and better information?
3. Would greater stability be achieved if two of the remaining three stages were more closely integrated—or all three (forward contracting with retailers, for example)? Or does the answer lie in increased horizontal coordination of some type?
4. Is complete refragmentation an answer, with diffusion at each stage in the system?
5. Should a *system authority* proscribe production flows? If so, should this be an industry association or cartel (as in some countries), or a government authority? Has anything been learned from Canada or other countries in this regard?

The vertical broiler system most clearly represents the evolving nature of the agricultural economy from a production oriented, loosely coordinated, atomistic, and unsophisticated economy where rural values were very evident—to a market oriented, highly coordinated, large firm economy that reflects the values of an industrialized economy. The social and economic gains and losses from this transition are poorly understood. The broiler system has provided consumers with wholesome broilers at the lowest cost in history, and yet has been unsuccessful in achieving an acceptable degree of price stability. Other gains and losses involved have been only partially evaluated.

There is a pressing need to understand and evaluate the causes and results of the transitions occurring in the organization of the agricultural economy. Since many of these changes involve shifts in vertical relationships, existing models dealing largely with horizontal relationships are inadequate. For this reason, a vertical conceptual approach was used in this study.

#### **Comments About the Conceptual Approach**

The conceptual framework used in this study posits vertical market systems as interrelated social and

economic systems in which coordination is required to effectively integrate the functional inputs of system members. These systems are constantly evolving and adjusting due to pressures from horizontal competition, vertical conflict, changes in market rules or arrangements, and environmental forces. In the previous chapters, the vertical broiler system has been examined by using this perspective and the taxonomy of vertical systems described in Chapter I.

One of the primary concerns of this effort was to develop and test a conceptual approach which adequately dealt with the dynamic characteristics of vertical commodity systems; which provided insights into how and why coordination and adaptation, the two primary dynamic dimensions of vertical systems, occur or fail to occur. This was accomplished in a modest way with the conceptual approach used in studying the broiler system. From a researcher's standpoint, the taxonomy of vertical systems provided a useful way of thinking about and classifying the many dimensions, characteristics, forces, and interrelationships in a vertical market system. This in turn facilitated identification of the critical aspects of a vertical complex needing examination. It focused attention on many of the relevant questions which needed to be answered.

It is acknowledged that this is a modest contribution to the analysis of vertical market systems. The conceptual approach in this study proved useful, yet was also seriously deficient in its ability to rigorously address normative or positive system relationships. The approach itself proposes no new hypotheses concerning system behavior or performance that are sufficiently explicit to allow testing, even though it does implicitly challenge the adequacy of many existing hypotheses and tests. These are serious weaknesses which need to be overcome if vertical systems analysis with a dynamic orientation is to find expanded applications in the public policy arena.

For use by industry personnel, these weaknesses are less critical. As a perspective and a way of subjectively understanding the dynamics of a vertical system, the conceptual approach employed in this study should be of considerable value.

A major obstacle in developing more definitive models of vertical market systems is the paucity of research on the interface of firms within a vertical complex. The behavioral dimensions of conflict, cooperation and power are in particular need of further understanding. The effects of these forces on system coordination, adaptation, efficiency, innovativeness, and other aspects of performance become clearly ap-

parent in such a study as the present one. Unfortunately, these variables could not be treated in this study with the thoroughness they deserve.

Studies are needed which examine the role of these behavioral dimensions and their interrelationships with horizontal competitive forces. Stern and his colleagues have done some exploratory studies of conflict and power in market channels with reasonable results.<sup>98</sup> If these behavioral variables can be measured and analyzed, more definitive models of vertical market systems should be possible.

The organization and coordination of many vertical commodity systems are undergoing considerable change. Contracts, joint ventures, and vertical ownership are generally increasing in importance as methods of coordination and interfirm linkage. The extent to which these instruments replace spot markets because of long term advantages vs. short run or one-time benefits is not known. For example, where vertical integration is entered into to accelerate the adoption of new technology, or to by-pass unreasonable union contracts, the benefits may be short run in nature. Where this is true, could disintegration then occur without impairing system performance?

Logic suggests that the more permanent types of linkages should provide some lasting technical efficiency benefits. Exchange should be more efficient, goals should be more in harmony, and resources should be more efficiently utilized. The extent to which this is true (if at all) is not known. These arrangements also appear to move firms toward a partnership relationship and away from an adversary relationship. This suggests increased vertical cooperation, which may enhance system performance. Whether this is true, or whether coercion and constrained conflict characterize inter-firm relations in these situations, is open to conjecture.

With the present state of the arts, there are no conceptual models adequately dealing with these types of unknowns. Certainly the conceptual approach employed in this study is not yet sufficiently developed to meet the challenge. However, the *Weltanschauung* suggested by this approach—how one sees the world—carries strong appeal in addressing critical questions concerning the organization and coordination of vertical commodity complexes. At this point in time, this may be a needed and useful contribution.

<sup>98</sup>See Rosenberg, Larry J. and Louis W. Stern. Nov. 1971. Conflict Measurement in the Distribution Channel. *Journal of Marketing Research*; also El-Ansary, Adel I. and Louis Stern. Feb. 1972. Power Measurement in the Distribution Channel. *Journal of Marketing Research*.

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Green Springs Crops Research Unit, Green Springs, Sandusky County: 26 acres

Jackson Branch, Jackson, Jackson County: 344 acres

Mahoning County Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres

North Central Branch, Vickery, Erie County: 335 acres

Northwestern Branch, Hoytville, Wood County: 247 acres

Pomerene Forest, Laboratory, Keene Township, Coshocton County: 227 acres

Southeastern Branch, Carpenter, Meigs County: 330 acres

Southern Branch, Ripley, Brown County: 275 acres

Western Branch, South Charleston, Clark County: 428 acres