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THE UNIVERSITY OF ALBERTA

STRUCTURAL CHANGES IN THE ALBERTA BROILER INDUSTRY

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Structural Changes in the Alberta Broiler Industry" submitted by Gurnam Singh Khehra in partial fulfilment of the requirements for the degree of Master of Science.

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Date April 18/77

ABSTRACT

The Alberta broiler chicken industry has experienced growth, instability and corporate interests in production and distribution as a result of its transition from a supplementary to a specialized commercial enterprise. A relatively elastic supply situation in comparison to demand gave rise to various marketing problems. The concept of supply management was introduced by a producers' marketing board in order to provide conditions of equity and countervailing power to broiler producers at the marketplace. In this regard, the Alberta Broiler Growers' Marketing Board was formed in 1966 in an attempt to bring about stability, planned growth and to check the trend towards vertical integration in production.

A study in 1970 was conducted to analyze the impact of such market regulations on the competitive structure of the Alberta broiler industry. The study revealed that the vertically integrated firms expanded their size of operation at different stages of the production process through acquisitions and mergers. As a result, a single cooperative firm came into possession of 80 percent of the market share of processing and hatching operations and 44 percent of primary broiler producttion. These developments either completely eliminated or severely reduced competition in the processing and hatching segments. The authors of the study recommended restrictions on the growth of this firm and also suggested a future line of action in quota allocation and other regulatory procedures of the Board.

The main purpose of the present study is to analyse the impact of market regulations on the competitive structure of the industry over a longer period of time. Using the 1970 study as a base, a comparative static

analysis of market concentration and vertical integration was made in four segments of the industry at three time intervals. The segments of the industry were production, hatcheries, processing and feed manufacturing. The time intervals were 1967, 1969-71 and 1976.

Market concentration measures such as the Four Firm Concentration Ratio, the Herfindahl Index, the Lorenz Curve, and the Gini Coefficient were applied to quantify the changing trends over time. Percent market share with integrated firms was estimated to show the extent of vertical integration in the industry. The distribution pattern of authorized quota under different size groups and time periods was used to indicate the results of the quota allocation policies of the Board. The importance of knowing the trends in the above mentioned variables is evident from their implications on a firm's behaviour and the resultant social and economic performance of the industry. The present study is based on the assumptions of industrial organization theory, which concludes that market structure may affect a firm's conduct which in turn influences industrial performance.

The following results were derived from the structural analysis of the industry. Quota allocation and other regulatory policies of the Board have reversed the trends toward market concentration and vertical integration in production. They have also somewhat narrowed the inequality in firm size distribution of independent producers.

As a result of the indirect influence of market regulations vertical integration and concentration in the feed manufacturing segment has also declined. The bargaining position of the growers in feed procurement has thus been improved. Instability in market share and the turn over of feed firms is indicative of this behaviour.

The processing and hatching segments of the industry are highly concentrated and have duopolistic and triopolistic market structures. The continuing dominance of a cooperative firm, the industry leader in both segments, and the stability of the firm's market share indicates a lack of competitive environment. According to economic theory and empirical evidence, a firm with a vertically concentrated market structure and dominance and asymmetry in the market share poses a great barrier to the entry of new firms. The Board can, however, make use of its regulatory powers to encourage entry of new firms. The study thus recommends that the Board initiate a plan to break the monopoly situation at regional market levels.

ACKNOWLEDGEMENTS

I snatch this opportunity to express sincere thanks to my supervisor, Dr. M.H. Hawkins for his untiring, competent and logical guidance in successful completion of the present study. I feel deeply indebted to my committee members, Dr. M.L. Lerohl, Dr. A.R. Robblee and Mr. N.A.D. Potter, for their helpful suggestions in improving the quality of the thesis.

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INTRODUCTION

Imports of the Poultry Industry

Poultry products are a relatively inexpensive source of high quality proteins in the Canadian diet. The proportionate share of poultry meat in total meat consumption has increased from 10 percent in 1949 to above 20 percent in 1976. Per capita consumption of poultry meats was 31.1 pounds in 1961 and 45.4 pounds in 1974.[1] Production in turn has almost doubled during this period. The expansion in production and consumption has mainly accrued due to decreases in poultry meat prices relative to other meats.

Poultry are also efficient converters of feed grains. Per unit consumption of feed, broiler chickens produce roughly three times more food energy in meat than beef cattle. Beef cattle requires about eight pounds of feed to produce one pound of meat whereas a broiler chicken requires approximately 2 pounds at the most to produce an equivalent amount of meat.

In Alberta, changes in the production and consumption of poultry meat are similar to those found in the rest of Canada. In 1974, total marketings were 85 million pounds which contributed $41,671,000 towards the cash income of Alberta poultry meat producers.[2] In the same year, poultry processors employed 600 persons and paid $4,044,000 in wages.[3]

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[1] Alberta Agriculture, Agricultural Statistics Year Book (Edmonton: Alberta Agriculture, 1974), p. 59.

[2] Ibid., p. 66.

[3] Statistics Canada, Survey of Poultry Processors, Cat. 32-277 (Ottawa: S.C., 1974), p. [illegible].

Need for the Study

The poultry industry in Canada and in Alberta has experienced growth, instability, and some basic and important structural changes during the last quarter century. Major changes have been:

1) The natural exodus of small farm flocks from commercial production.
2) Vertical integration--both backward and forward.
3) Poultry Growers' Provincial Marketing Boards--horizontal integration.
4) Poultry Growers' National Marketing Agencies--both horizontal and vertical integration.[1]

The first two changes were a natural outcome of open market mechanisms. They emerged in the face of specialized, high risk, capital intensive and market oriented poultry enterprises. The lack of a competitive bargaining position and financial strength of independent producers vis-a-vis highly concentrated product and factor markets also added to these developments. Individual producer's instant responses to changed market conditions and prices on an aggregate created recurrent production and price fluctuations. In the early 60's, price variability in broiler chickens, which was relatively lower than for other poultry, fluctuated 15 percent within one year.[2] The development of vertical integration, a market phenomenon, helped to alleviate this problem but did not solve it

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[1] Excerpts from R.M.A. Loyns, "Poultry Marketing Boards and the Canadian Consumer" (Paper prepared for the Canadian Consumer Council, March 1974), pp. 1-5.

[2] A.W. Wood, "Marketing Boards for Eggs and Poultry" (Paper presented at Poultry Conference, University of Manitoba, November 9, 1965), p.2.

completely. Evidence shows that even the highly vertically integrated U.S. poultry industry has not succeeded in this respect.[1] At the same time development of vertical integration involved economic problems of equity and income distribution. Based on the economic, social and public policy considerations in Canada, the performance of such a marketing system was adjudged unsatisfactory.

Provincial and national marketing boards were developed as a potential solution to these marketing problems. Market regulations of this nature are, however, a mixed blessing because of their positive and negative effect on market performance. According to Walker,[2] stability and economic security are the main positive effects and excess capacity, high prices, costs and profits, entry barriers, etc., are the negative effects. However, these statements are very broad generalizations which need to be verified in individual situations.[3]

The development of the above market regulations changed the nature of competition and pricing behavior in the industry. This is a matter worthy of consideration because the nature of competition determines the methods of price setting which in turn affects industry performance.

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[1] B.W. Marion, and H.B. Arthur, Dynamic Factors in the Vertical Commodity System: A Case Study of the Broiler System (Wooster, Ohio: Ohio Agric. Res. Centre, November 1973), p.11.

[2] H.V. Walker, "Marketing Boards and Quota Policies for Canadian Farm Products: An appraisal of Performance," Canadian Journal of Agricultural Economics, Vol. 16, No. 2 (June 1968), pp. 4-7.

[3] The net results of the Board's operations depend upon a variety of factors. Board regulations, procedures (eg., quota techniques), product characteristics (growth, elasticity, substitutes, etc), kind of leadership, and outside competition are worthy of special mention.

In response to this need the Food Prices Review Board[1] conducted a study which confirmed that in recent years the structure and conduct of the industry has largely been dominated by the policies and actions of the provincial producer marketing boards. Another study by Rizvi[2] evaluated the implications of Canadian broiler marketing boards' quota policies on stability aspects of producer prices and incomes and marketings.

The present study was designed to achieve a different purpose through emphasis on a limited area and an in-depth analysis. The study attempts to analyse the impact of market regulations on market concentration and vertical integration in the Alberta broiler industry. The purpose of knowing the trends in these variables is evident from their implications on the economic and social performance of the firms at the marketplace. This involves consideration of resource allocation and economic efficiency. Such economic indicators can help in evaluating the effectiveness and objectives of a given public policy.

The need for this study is based on the following reasons. In 1970, Hurnanen, et al.,[3] conducted a study of the Alberta broiler industry and found a high degree of the market share at different stages of

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[1] Food Prices Review Board, Broiler Chicken Prices II (Ottawa: FPRB, October 1975), p. vi.

[2] Saiyed M.H. Rizvi, "Marketing Boards in Canada--An Evaluation of Their Quota Policies with Special Reference to the Broiler Chicken Industry" (Unpublished Ph. D. thesis, Department of Rural Economy, University of Alberta, Edmonton, 1974).

[3] R.R. Hurnanen, M.H. Hawkins, and T.W. Manning, Vertical Integration and Concentration in the Alberta Broiler Industry, Research Bulletin 8 (Edmonton: Department of Rural Economy, University of Alberta, August 1970).

the production process to be possessed by an individual firm. Using the Board's authority, the authors recommended restrictions on the growth of that firm. They also recommended comprehensive reviews of the structure and conduct prevailing in the industry after intervals of four or five years. Thus, this appeared to be the appropriate time to revisit the industry.

The Alberta Broiler Board currently does not appear to be in favour of the proposed National Chicken Marketing Agency. This view conforms to the recommendations made by the Food Prices Review Board in a recent study.[1] It will therefore be of some importance to examine the conditions which have led to opposing attitude of Alberta broiler growers towards the concept of a national marketing plan.

The Analysis

According to Clodius and Mueller,[2] empirical research in market structure may conveniently be divided into three broad areas: 1) determination and measurement of the nature of market structures actually extant in particular industries, groups of related industries, and the economy as a whole; 2) analysis of the basic technological market and other factors responsible for particular market structures; and 3) testing hypotheses related to the kinds of firm conduct and industrial performance resulting from various kinds of structures. The present study

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[1] Food Prices Review Board, Op. Cit., p. XII.

[2] Robert L. Clodius and Willard F. Mueller, "Market Structure Analysis as an Orientation for Research in Agricultural Economics," Journal of Farm Economics, Vol. 43, No. 3 (August 1961), pp. 523-524.

will analyse some aspects of the first two areas.

The major elements which influence the market structure of an industry are number and size distribution of firms, product differentiation and conditions of entry. These elements have been developed by Fellner, Chamberlain, and Bain, respectively.[1] The market structure of the broiler industry would also include vertical integration and market regulations, important structural elements in the industry. Price elasticity and growth rate of market demand are two other relevant but not equally important variables.[2]

To sum up, the main purpose of the study is to generate current comparative economic statistics similar to those developed by Hurnanen, et al., in 1970. The study is thus restricted to four segments of the industry--production, hatcheries, processing and feed manufacturing. Each segment will be studied in detail with respect to number and size distribution of independent and integrated firms and at different points in time. The analysis so made can be used to supplement the bases for passing judgments regarding the effectiveness of quota and other regulatory devices of the Board on the firms' conduct and performance.

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[1] William John Fellner, Competition Among the Few: Oligopoly and Similar Market Structure (New York: A.A. Knopf, 1949; E.H. Chamberlain, The Theory of Monopolistic Competition (Cambridge: Harvard Press, 1956); Joe S. Bain, Industrial Organization (New York: John Wiley & Sons, 1959).

[2] Richard Caves considers them as elements of structure whereas P.M. Scherer has described them as basic conditions of demand which influence market conduct. Richard Caves, American Industry: Structure, Conduct, Performance (Englewood Cliffs, Prentice-Hall, Inc., 1972), p. 16, and F.M. Scherer, Industrial Market Structure and Economic Performance (Chicago: Rand McNally College Publishing Co., 1970), p.5.

Testing of these hypotheses is, however, beyond the scope of this study.

Objectives of the Study

Specifically, the objectives of the study are:

1. To review the evolution and development of marketing legislation for Canadian poultry producers.
2. To study the development and operation of the Alberta Broiler Growers' Marketing Board and the proposed National Chicken Marketing Agency.
3. To study the factors leading to the Alberta broiler growers' nonsupport of the proposed national marketing plan.
4. To measure and compare the levels of market concentration and vertical integration in the industry at different points in time.
5. To establish the cause and effect relationship of the observed variables in relation to quota policies and programs of the Board.
6. To make policy recommendations based on the results.

Method of Study

Personal interviews with Board officials and members, and government representatives of the poultry division were conducted to get an overall view of the broiler industry. An exhaustive review of the previous study by Hurnanen, et al., was made. This study served as a base to the present study and helped in understanding and evaluating the comparative changes in the competitive structure of the industry.

Factual information and data for the study were collected from various primary and secondary sources. The primary source of data was generated by mailing a questionnaire to all the broiler chicken growers in Alberta.[1] Suitable statistical techniques were employed for the different types of analyses involved. Results are presented in tables and graphs and interpretations and recommendations are made based on the results.

Outline of the Thesis

This thesis consists of seven chapters. Chapter I is devoted to the introduction of the problem studied. Chapter II reviews the evolutionary process in the development of the provincial and federal enabling legislation available to Canadian poultry producers. Chapter III provides the historical background in development and operation of the Alberta Broiler Growers' Marketing Board. Information in this chapter includes the need for the Board and its policies and procedures to achieve various objectives. Elements of the proposed National Chicken Marketing Agency, the need for it and progress made so far in this direction are contained in Chapter IV. This chapter also presents the position of the Alberta Board and Alberta growers towards the national marketing plan. Chapter V provides an overview of the measures of market concentration and monopoly power. Chapter VI comprises the body of the thesis and includes the analytical work which enables study of the implications of quota policies and programs of the Board on market concentration and vertical integration. This is achieved through comparative static analysis on these apsects at three points in time. The last chapter presents a summary, conclusions and recommendations based on

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[1] For details about the questionnaire see: Appendix A.

the results of this study in comparison with the base study.[1]

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[1] In the case of hatcheries, processing and feed manufacturing segments, except for 1976, the statistics presented in the thesis are derived from the research report by Hurnanen, et al., Op. Cit. The source, however, is quoted in individual tables. Tables without any reference to the source are mainly developed by the author from the raw data obtained from primary and secondary sources.

CHAPTER II

EVOLUTION OF MARKETING LEGISLATION IN CANADA

This part of the study provides an overview of the evolutionary process behind the presently available provincial and federal enabling legislation which delegates powers to poultry producers for administering their provincial and national marketing plans.

The application of the marketing board concept to the poultry industry is of relatively recent origin. The first marketing board was established in 1961 by the broiler producers of British Columbia. The marketing problems which necessitated application of this concept, to the poultry industry were mainly a result of the technological and structural developments. The formation of enabling legislation, both provincial and federal, provided a wide scope of authority over production, prices and distribution of poultry products came about through cooperation of the provincial and federal governments.

At the present poultry marketing boards in Canada are functioning both at the provincial and national levels. There are three separate marketing boards representing egg, broiler and turkey producers in every province of Canada.[1] These boards derive authority from their respective provincial agricultural marketing acts. The national agencies for eggs and turkeys have been in operation since January 1973 and February 1974, respectively. These national agencies derive authority from the National Farm Products Marketing Agencies Act 1972 (Bill C-176).

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[1] However, there are a few exceptions: in Quebec there is one board for both broiler and turkey producers; in P.E.I. there is no turkey producers' marketing board; in Newfoundland there are neither turkey nor broiler producers' marketing boards.

History of the Marketing Board Concept

In Canada, the establishment of agricultural marketing boards as a practical attempt to solve producers' problems of fluctuating prices and low incomes have had a long and complex history. According to a recent review paper,[1] this complexity has been due to the original division of power between the federal and provincial governments. Similarly, another review has assessed that: "The development of legislation under which Canadian marketing boards have been established and operated has been affected by and reflects the dual federal-provincial jurisdictions over marketing in Canada."[2]

Canadian Marketing legislation which is based on a constitutional division of power, provides that intraprovincial trade is exclusively under provincial jurisdiction whereas interprovincial and export trade is the domain of the federal government. Two early marketing acts which crossed these jurisdictional limits in trade were declared ultra vires by the Supreme Court of Canada.[3]

During this controversial period the province of British Columbia took the initiative and enacted provincial legislation with powers to control intraprovincial trade. Other provinces followed suit and by

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[1] Kenneth D. Smith and Murray H. Hawkins, "The Canadian Constitution and Its Effects on Marketing Legislation" (Unpublished Paper, Department of Rural Economy, University of Alberta, 1976), pp. 1-21.

[2] M.M. Veeman and R.M.A. Loyns, "The Scope and Nature of Canadian Marketing Boards" (Unpublished Paper, Department of Rural Economy, University of Alberta, 1976), p.5.

[3] These acts were the British Columbia Produce Marketing Act (1927), which enabled the formation of the first producers' marketing board in Canadian history, and the National Farm Products Marketing Act (1934) commonly known as the Dominion Marketing Act. For more details regarding these earlier acts refer to: L.E. Poetschke and W.M. Mackenzie, <u>The Development of Producer Marketing Boards in Canadian Agriculture</u> (Edmonton: Department of Political Economy, University of Alberta, 1957).

1956 all but Newfoundland had passed their own respective legislation.[1]

Ultimately, the Agricultural Products Marketing Act (1949)[2] was passed as federal legislation which enabled the provincial boards to deal with interprovincial and foreign trade, although they had no control over imports into the province.[3] Most of the provinces which had enacted their provincial legislation rewrote it to avail themselves of opportunities provided under this act. This act, as amended in 1957, also made it possible for the boards to raise funds through producer levies.

In both of the earlier direct taxation acts (i.e., British Columbia (1927) and Dominion Marketing Act (1934)), the Privy Council, while upholding the Supreme Court decision, made it clear that this type of scheme could only be established through cooperative legislation between both levels of government.[4] Since the 1950's (i.e., after the War Measures Act), both provincial and federal governments have been enacting legislation to regulate farm products which involve interprovincial and export trade using the cooperative approach as suggested by the Privy Council.

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[1] The provincial legislations differ from others in many respects such as number of farm products eligible under the act, method of establishing and powers to be delegated to commodity boards, etc. Newfoundland passed its legislation in 1966, Alberta in 1955. Provincial boards and commissions are established under these acts. Provincial milk boards are under the specific act known as the Milk Control Act.

[2] This act was necessary to lift the controls of the War Measures Act which became ineffective after the war.

[3] Provincial boards still lack this provision. However, during the chicken and egg war' in 1970-71, boards were allowed by individual provincial governments to impose restrictions on imports. These were later declared unconstitutional by the Supreme Court of Canada.

[4] Kenneth D. Smith and Murray H. Hawkins, Op. Cit.

The National Farm Products Marketing Agencies Act 1972 (commonly known as Bill C-176), a federal enabling legislation, is one of the outcomes of that cooperation. This act provides for the establishment of a national marketing agency in any farm product which involves interprovincial and export trade provided the majority of the producers are in favour of such an agency.[1] So far, only two national agencies, one in eggs and another in turkeys, are in operation. They began operation in 1973 and 1974, respectively. A National Chicken Agency is in the final stages of formation.[2]

The need for this federal enabling legislation originated from severe marketing and price problems, particularly in poultry products in the 1960's. The provincial poultry marketing boards reasonably solved problems in marketing and prices by using a 'supply management' tool. The peculiar nature of the product and existence of producing areas with and without 'supply management' led to interprovincial trade disputes in 1970-71. These disputes became commonly known as 'chicken and egg war'.[3] This became a major economic and political issue and a

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[1] This act excludes the commodities under the control of the Canadian Wheat Board and Canadian Dairy Commission. These federal boards were established in 1935 and 1967, respectively, under separate specific acts.

[2] Provincial broiler-chicken boards came into operation on a wider scale over a shorter period of time in comparison to those for eggs and turkeys. In the case of a national agency in chickens, things are a bit different because provincial boards are less agreeable in reaching a commonly acceptable solution. The details will be given in a section devoted to a National Chicken Marketing Agency.

[3] Provincial fluid milk boards and tobacco boards are also under a similar kind of supply management. They have never experienced interprovincial trade disputes of such a nature. For more details on this aspect refer to: A.E. Safarian, <u>Canadian Federalism and Economic Integration</u> (Information Canada, 1974); and R.M.A. Loyns, "Poultry Marketing Boards and the Canadian Consumer " (Paper presented for Canadian Consumer Council, Ottawa, March 1974).

national marketing plan in coordination with provincial marketing plans was thought to be a feasible solution. In the initial stages this federal act faced some controversy and took a relatively long time to reach final acceptance. This occurred because a few clauses of the act as such were not acceptable to hog and cattle producers who faced a different production and marketing environment.[1] Part of the story is told by Loyns:

> After prolonged public debate throughout this country, in committee and in the House of Commons, Parliament gave final reading and Parliamentary assent to the national marketing legislation Bill C-176, on December 30, 1971. The drama surrounding this Bill probably overshadows that associated with any other agricultural legislation in the history of Canada, from the trade war among provinces in 1970 and 1971, to the almost single-handed battle in Committee of the Hon. Jack Horner, to the marathon all-night session of Parliament in which the Bill was finally passed. The Senate, in all its pomp and ceremony and involving whatever remains of its waning authority, added to the drama and agony of the Minister of Agriculture by prolonging for several days passage of the Bill through Senate.[2]

The National Farm Products Marketing Agencies Act finally became a reality in 1972. This act provided for the establishment of the National Farm Products Marketing Council and authorized the establishment of national marketing agencies for farm products. Under provisions of the Act, the Minister of Agriculture appointed six members to the Council effective April, 1972. The duties of the Council as in Sec (6) of the Act were:

1. To advise the Minister of Agriculture on all matters relating to the establishment and operation of agencies under this act, with a view to maintaining and promoting an efficient and competitive agriculture industry.

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[1] For more information see: "A Look at Bill C-176 (With Amendments)" Organized Farmer, special section, April 1971, pp. 1-6.

[2] R.M.A. Loyns, "What Farmers Should Know About Bill C-176" (Paper presented at one of a series of Agricultural Conferences sponsored by the Faculty of Agriculture, University of Manitoba, February 16, (Winnipeg) and 18 (Brandon), 1972), p.3.

2. To ensure that agencies are maintaining efficient and competitive production and marketing practices and are sensitive to the interests of producers and consumers (Section 22 of the Act).
3. To work with agencies in promoting more effective marketing of farm products in interprovincial and export trade.

The council was thus empowered to establish and supervise the operations of the various agencies established to administer the marketing plans of regulated farm products. The Council was also provided with other essential powers for carrying out the above duties under the Act.

Provincial and National Acts in Poultry

In brief, the provincial and national poultry boards derive their powers from two parallel acts, i.e., the Agricultural Marketing Acts of the respective provinces and the National Farm Products Marketing Agencies Act 1972 (Bill C-176). The provincial marketing acts and the National Agencies Act (Bill C-176) provide for the establishment of supervisory bodies (i.e., Provincial Councils and the National Council). The main functions of these councils at their respective levels are to develop the marketing plans and to enable the boards to administer these plans, provided the majority of the affected producers are in favour of the plans. At the provincial and national levels, the councils have the authority to establish Industry Advisory Committees. The membership of these committees is drawn from the associations being affected by the regulation.

Council members are appointed by the respective governments which they represent and are responsible to their Minister of Agriculture. The powers and duties of these supervisory bodies vary from province to province depending upon the variations in the provisions of the respective provincial acts.

CHAPTER III

DEVELOPMENT AND OPERATION OF THE ALBERTA BROILER GROWERS' MARKETING BOARD

Need for the Board

Exceptionally low and unstable prices[1] and the consequent increase of vertical integration in production are said to be the major reasons for establishment of the Board. According to Falkenberg, ex-chairman of the Alberta Broiler Producers' Marketing Board, "'the boom and bust' nature of the business forced many small growers out of business in the early sixties. Integrated processing companies started growing large quantities of broiler chicken to keep their processing plants in operation. As well, some of the largest growers were bought out by processors."[2] Under these circumstances, the broiler growers of Alberta preferred to opt for the marketing board concept to achieve effective countervailing power at the marketplace.

Development of the Board

The drive to establish the Board was initiated after a meeting of the broiler growers with the Alberta Department of Agriculture on October 15, 1964. At this meeting, the Alberta Broiler Growers' Association was formed. The Assocation executive, in consultation with the Alberta Agri-

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[1] Broiler prices to growers fell as low as 14 cents and 17 cents per pound live weight in 1961 and 1964, respectively. In previous years prices were invariably above 20 cents. See Agriculture Canada, Poultry Market Review (Ottawa: Market Information Service, Poultry Division, various annual issues).

[2] Howard Falkenberg, "The Marketing Board Approach" (Paper presented at Alberta Feed Industry Conference, September 28, 1972), p.2.

cultural Products Marketing Council,[1] prepared a marketing plan. This plan was finally established with Order-in-Council number 69 on January 13, 1966. The plan was given the name The Alberta Broiler Growers Marketing Plan 1965 and it was:

> A plan to promote, control and regulate the transportation, processing, packing, storage and marketing of broiler chickens in the Province of Alberta.[2]

The purpose of the plan was:

1. To maintain a fair stabilized price for the regulated product;
2. To develop and maintain the orderly marketing of the regulated product;
3. To provide a uniform high quality of regulated product for the market;
4. To maintain adequate advertising and promotion of the regulated product;
5. To ensure a continuous yearround supply of the regulated product for the trade and consumer markets; and
6. To work with marketing boards having similar objectives which may be established in other provinces of Canada.[3]

The Alberta broiler growers endorsed this plan with a majority vote on May 18, 1966.[3] In total 83 growers registered and only 11 voted

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[1] The Alberta Farm Products Marketing Act (1955), as amended in 1965, provides for the establishment of such a Council to supervise the operations of the boards established under the Act. The Council is also authorized to appoint an Industry Advisory Committee drawn from different segments of the industry.

[2] For details of the plan see: Province of Alberta, Alberta Regulations 17/66", The Alberta Gazette. Vol. 62, No. 2 (January 31, 1966) pp. 22-26.

[3] The growers marketing less than 2,000 birds a year and others who started marketing only after August 31, 1965 were not eligible to register and vote for the plan. See: Ibid., p. 23.

against the plan. The Alberta Minister of Agriculture appointed a provisional board of five registered growers. The Board was delegated responsibility for the operation, regulation, supervision and enforcement of the plan.

The Board was given extensive powers under the plan. These delegated powers were licensing of growers, processors and other dealers, collecting service charges from growers and achieving compliance with regulations. Over and above these basic powers, the Board was given authority to regulate the quantity of produce in form and place and its rate of flow to the market. The Board also set the minimum producer paying price.

To make effective use of these delegated powers, the Board proceeded as follows:

A. Established an office, appointed a secretary-manager and other staff to keep various records and perform day-to-day administrative operations.

B. Formulated policies, regulations, orders and procedures[1] to establish and regulate criteria with respect to:

i) Various aspects of basic quota control such as initial quota allocation, its increases in future and transfer of quota rights.

ii) The various aspects of supply management such as: a) estimate of demand in broilers--information requirements for the purpose and its source; b) fix and administer the marketing quota to

[1] In compliance with the provisions of the Act, the regulations and any Orders-in-Council, the Board is authorized to establish and amend procedures, etc., for effective control over its various operations.

achieve the desired level of marketings as assessed in a);[1] and c) fix and administer the minimum producer paying prices.

Operations of the Board

The Board started its operations on September 1, 1966. The total authorized quota as of October 1966 was 1,198,000 square feet. This quota was alloted to 106 growers, both independent and integrated.

The first and foremost problem while establishing the marketing board was to reach an objective basis for initial quota allocations. To keep the start up problems and speculation aspect to quota rights at a minimum, growers who started marketings during the twelve month period prior to Board formation and growers who marketed less than 2,000 birds a year were not allocated any quota. These two categories of growers were not eligible for plebiscite.[2]

After the preliminary stages of putting various policies and regulations together, the Board's primary powers of controlling supply and minimum producer prices became effectively operational on January 1, 1967.

The various features of the Board's operations such as controlling basic quota, licensing, raising funds, assessing the demand and supply situation, fixing and administering marketing quota and minimum producer

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[1] The Act provides control over marketings. Marketing quota is some percentage of basic quota; this generally varies between 80 and 120 percent of basic quota depending upon the market conditions. Basic quota allows placement of one bird per sq. ft. per cycle. Therefore, at 100 percent marketing quota, both are equal.

[2] See Province of Alberta, "Alberta Regulations 17/66," *Op. Cit.*, p. 23.

prices, and other policy matters are described below.[1]

Basic Quota Control[2]

1. New quota allocations are made according to specified criteria and conditions as provided in Board regulations and policy. In general, 35 percent of quota is allocated to new growers and 65 percent to existing growers.
2. Quota rights are not freely transferable (sale, purchase, lease, etc.). Transfers are allowed only under the specific conditions and discretionary powers of the Board. Quotas are the property of the Board and are attached to the premises (growing facilities).
3. No single grower can possess more than 3 percent of the total outstanding quota.
4. Integrated firms are in possession of quota above this maximum limit.[3] Their quotas are frozen.

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[1] The legal power to carry out various operations is derived from Board policies, regulations and instructions. These are continually changing. At one time policies and instructions of the Board became regulations after registeration. This provided added strength to the Board in court decisions. Province of Alberta, "Alberta Regulations, 354/72," The Alberta Gazette, (December 15, 1972), pp. 1125-1134, presents a comprehensive compilation of previous regulations of the Board.

[2] For details see: Appendices B-1, C-1 and C-2.

[3] The Integrated firms bought a few broiler farms after the inception of the Board's operations. Late in 1969, a regulation was passed by the Board to stop this development. See sub-section (6) of Section 11 in Appendix B-1, extracts from Province of Alberta, "Alberta Regulations 354/72," Op. Cit., p. 1129.

Marketing Quota Control[1]

1. The Board has indirect control over supply through its marketing quota system.[2]
2. To achieve orderly marketing, information about the supply and demand situation is required. This information is compiled from weekly reports about placements, marketings, imports, exports, and inventory position of broilers. The weekly report is supplied to processors and wholesalers for use in market planning.
3. The Board uses the weekly reports as a base for making short term demand projection. This information is supplemented with current market developments and business intuition.[3]
4. The marketing quota level to supply the market in accordance with estimated demand is fixed. Instructions about this change and effective dates are sent to growers, hatcherymen and processors. Entries of the change are also made in the individual grower's register. Later these figures are compared with actual

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[1] For details of legal powers to control supply, i.e., marketing quota, see: Appendix B-2, extracts from Ibid., pp. 1125-1134.

[2] Hereinafter the word supply if used in this connection will represent indirect control on broiler production.

[3] An Industry Advisory Committee has also been attached to the Board since its inception. The primary activities of the Committee are to advise the Board on matters such as fixing marketing quota and minimum producer prices. The membership of the Committee is drawn from various segments of the broiler industry. The members are appointed by their respective associations. Since 1974 the Committee also has had one member from the Canadian Consumer Association, Alberta Division.

marketings. Any discrepancy from allowed levels is brought to the attention of the grower. The Board generally requires a compensating cutback for overproduction.

5. Any anticipated shortage in supply[1] is met by revising marketing quota percentage, issuing special production permits[2] to growers or changing the replacement cycle. All these actions can be taken only with the direction and permission of the Board.

6. There is no restriction over imports and exports. The wholesalers and processors are however, required to supply to the Board data regarding these aspects on a weekly basis.

7. Any producer who markets less than 2,000 broilers per year is exempted from Board regulations.

8. Minimum producer prices are fixed in consultation with the Industry Advisory Committee. Growers and processors are informed about the change and effective date.

   a. Minimum producer prices are on f.o.b. plant basis. Only for about a year in 1967-68 were prices paid on f.o.b. farm basis.

   b. Minimum producer prices on an ungraded basis have been paid since 1974. Previous to that they were paid on a grading basis.

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[1] Supply shortages can be due to temporary shutdowns by growers, underestimates of actual demand, or unavoidable circumstances (i.e., fire, disease, etc.).

[2] Marketing permits invariably are issued for one batch of broilers at a time. The marketing permits on an average comprise about 7 percent of total yearly broiler production in Alberta.

Issue License and Raise Funds

1. All persons engaged in production, processing and marketing of broilers must be licensed by the Board. Licenses expire on December 31st of each year and have to be renewed. Licenses are issued free of charge.
2. A service charge of one-fifth of a cent per pound of live weight is deducted from the sale proceeds of each broiler grower. Processors make these deductions on behalf of the Board.[1]

Board Members and Registered Producers[2]

1. All five provisional Board members were reelected by the registered growers at the first annual meeting held in November, 1967.
2. The term of office, in general, is three years with two term limit. However, this can be extended to a third term if the majority of the producers agree at the annual meeting.
3. The minimum quorum for a Board meeting is three members. With regard to general meetings the minimum quorum is 20 registered producers or 10 percent of the registered producers, whichever is greater. Ten or more registered producers can call for a special general meeting.
4. One annual meeting of registered producers is essential, and should be held within 12 to 15 months of the previous annual

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[1] In 1977 the service charge was reduced to one-eighth of a cent per pound of liveweight.

[2] For details on conduct of elections, terms of office, etc., see: Province of Alberta, "Alberta Regulations 348/73", The Alberta Gazette, Vol. 69, No. 18 (September 29, 1973), pp. 778-783. This is an amended version of "Alberta Regulations 17/66."

meeting.

5. Any grower marketing under a permit is registered. Permit growers have all the rights, privileges and obligations of quota holders except they cannot hold office.

The preceding presentation fairly completes the discussion about the main features of various policies and procedures of the Board. The net impact of such actions on the conduct and performance of various agents dealing with the industry will, however, depend upon the spirit with which they are carried out. Chapter VI of this thesis is devoted to the study of the aggregate effect of ten years of Board regulations in shaping the competitive structure of the industry.

CHAPTER IV

THE PROPOSED NATIONAL CHICKEN MARKETING AGENCY[1]

The National Chicken Marketing Agency is a concept developed in order to achieve coordination of the various provincial chicken producers' marketing boards in Canada. Legal support of the utilization of dual federal and provincial authority and jurisdiction is provided by the National Farm Products Marketing Agencies Act 1972 (Bill C-176). Under this act the chicken producers of Canada can establish a national marketing plan and an agency to administer the plan. The Canadian Broiler Council, a national voluntary organization of chicken marketing boards, initiated the idea of establishing such an agency in 1968. However, there was no suitable legislation available at that time. The requisite legislation was, however, in the process of development and became a reality in 1972.

Need for the National Agency

After a few years of operation, some of the provincial chicken marketing boards had experienced limitations in operating their isolated marketing management programs. The apparent limitation was in the sphere of interprovincial trade which became excessively competitive in the late 60's and early 70's. The dimensions of this interprovincial trade rivalry became commonly known as the 'chicken and egg war' of 1970-71. In the minds of the poultry producers, this trade war was the cause and consequence of hopes

[1] The Agency is in its final stages of establishment and is likely to become a reality in Summer 1977. The final public hearings were held in Fall, 1976. They were based on the revised proposal submitted by the Canadian Broiler Council.

for a national marketing plan. According to Loyns: "The period beginning in 1969, when clear indication was obtained that national-marketing-board-legislation would become a reality, produced a number of severe pressures on the Canadian Poultry Industry."[1]

During the years of interprovincial trade problems, Quebec the single largest unregulated broiler producing (40%) province was marketing its surplus production across Canada.[2] These low priced imports were adversely affecting the prices which regulated markets tended to raise through marketing management.[3] Voluntary restraints suggested by the Canadian Broiler Council had rarely worked and the provincial trade restrictions of 1970-71 were usually of short duration. As a consequence, the chicken growers of Canada were seeking a permanent solution to the problems of excessive competition and the consequent instability and income uncertainty in the broiler industry. The chicken producers of Quebec established a marketing board in 1971 and introduced supply management. Competition in interprovincial trade was subsequently normalized.

With these developments Canadian chicken producers did not feel an immediate necessity for a national agency. Instead, the emphasis of individual boards was shifted towards bargaining for equitable market shares and other terms and conditions of the national plan. A reference to this fact

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[1] R.M.A. Loyns, "Poultry Marketing Boards and Canadian Consumer," Op. Cit., p. 34.

[2] On the other hand, the Quebec Egg Marketing Board (FEDCO) was imposing restraints on the marketing of eggs originating outside the province. The Quebec Superior Court ruled the case in favour of the Board on July 31, 1970. Other provinces erected similar trade barriers to protect their provincial markets from excessive competition.

[3] Special subsidies in production (mortgage loans at 2 percent) and freight rates were available to the chicken growers of Quebec. The chicken industry was highly integrated, dominated by fee basis growing arrangements. See: V. Landreth, "What's Behind Quebec's Big Upsurge in Broilers and Turkey Production," Canada Poultryman, Vol. 57, No. 7 (July 1970), pp. 8-10.

is given here: "Canadian consumer capacity increased, the idea of national market diminished and the conditions for a difficult task of negotiating provincial allocations under a national scheme were fostered."[1]

The low cost chicken imports[2] from U.S.A. which had been on the increase since 1974 resulted in downward pressure on domestic prices, particularly in central Canada. These imports or threat of imports in future have revitalized the drive to establish a national agency. Under the GATT agreement, chicken growers could control such imports if they establish a national supply system.[3]

Time Element and the National Agency

After the passage of Bill C-176, national agencies in eggs and turkeys became operational in January 1973 and February 1974, respectively. However, in the case of chickens, the various provincial boards could not reach a common agreement. The major controversial issue between the boards was a lack of objective criteria to establish initial quota shares. The historical five year average production as provided in Section 24 of the Act was not acceptable to some of the producer boards.

In a meeting with the Department of Agriculture held on January 22, 1972 in Ottawa, the Canadian Broiler Council expressed the view that "the basis set out in Section 24 is not acceptable to a number of provinces whose production and market has increased in the preceding five year period,

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1 M.M. Veeman and R.M.A. Loyns, Op. Cit., p. 13.

2 The reason for imports as assessed by the National Council is shortage of special kind of birds and low U.S. prices. The imports from U.S. were 6.5, 17.9 and 55 million pounds in 1974, 1975 and 1976, respectively.

3 Under such arrangements the federal government can fix the quota of imports to historic levels.

though it may have some appeal to those provinces whose production and market has declined during that period."[1] A proposal to amend Section 24 so as to permit a more equitable and acceptable formula for initial quotas was suggested.

The Canadian Broiler Council finally submitted the first proposal to the National Council late in 1973. The specific objective of the plan was to establish an orderly and stable market in broilers by keeping the domestic market in order. The National Council, after analyzing the opinion of producers in favour of this proposal to establish a national agency, concluded: "In its review of the proposal, Council felt that a majority of the producers, particularly those in the province of Quebec, had not endorsed the provisions of the proposal."[2] The general areas of disagreement were criteria used in establishing the share between Quebec and Ontario and particular principles of the plan.

The Canadian Broiler Council resubmitted the proposal in 1974. The National Council held public hearings in May 1974 and made suggestions to the Canadian Broiler Council on a few aspects of the proposal. The Canadian Broiler Council submitted a revised proposal and public hearings were held across Canada in Fall 1976 in order to establish the merits of a National Chicken Marketing Agency. The necessary groundwork for the establishment has now been completed and many think the Agency will become a reality in Summer 1977.

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1 "Report of Ottawa Meeting, January 2, 1972" (Unpublished minutes of a meeting held by the Canadian Broiler Council with C.D.A., Ottawa, 1972. Discussion at the meeting concerned the implementation of a national marketing plan and the establishment of a marketing agency for broiler chickens under the Farm Products Marketing Agencies Act (Bill C-176).

2 National Farm Products Marketing Council, Annual Report (Ottawa: NFPMC, 1973-74), p. 14.

Proposed National Chicken Marketing Plan[1]

The Canadian Broiler Council submitted a revised plan in Fall 1976. This plan provided the basis for public hearings to establish the National Chicken Marketing Agency. The two major concerns of Canadian broiler producers have been to rationalize interprovincial trade and imports or threat of imports from the United States of America.

The objectives of the revised plan were:

1. Coordination and improvement of the existing orderly marketing of chickens.
2. Orderly management of chicken imports.[2]

The essential elements of the revised plan were:

1. The establishment of a National Chicken Marketing Agency to exercise the necessary authority and to administer the plan.
2. The participating provincial boards will undertake to remain in the plan for an initial period of two years. An agreement will be signed by the provincial and federal governments and the participating boards before the plan comes into effect.
3. There shall not be any restrictions over interprovincial trade. Prior consent of the Agency and consultations with the receiving province(s) will, however, be required.[3]

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[1] Contents given here are extracts from the proposal which the Canadian Broiler Council submitted to the National Council on August 10, 1976 for establishment of the National Agency.

[2] This refers to imports originating outside Canada. Authority to exercise controls is held by the federal government and is not under the provisions of the Act (Bill C-176).

[3] This is a combination of two contradictory functions. These are given as subsection (3) and (5) of Sec. 3 in the proposed Plan. For details and a critique about these and other ambiguities of the proposal, see: J.J. Richter, et al., "A Submission on the Proposal for a National Chicken Marketing Plan for Canada to the National Farm Product Marketing Council" (Depart-

4. The Agency shall assume responsibility for the development of new uses for chicken and export markets. Also, to ensure compliance with provincial allocation, provincial boards shall be required to provide an acceptable guarantee of cooperation with the Agency's quota decisions.

5. Provincial boards shall act as agents of the Agency in raising [illegible] levies from producers and in performing other such duties.

6. The Agency shall [illegible] represented by one director from each province, each holding office for one year and each having the right to one vote.

7. A Consultative and Advisory Committee shall be established to advise the Agency and council on various matters. The members of the committee shall represent the interests of producers, consumers, the trade, allied industries and the public in general.

8. [illegible] shall function as [illegible] referee in resolving disputes regarding allocation of provincial market shares and in determining penalties to offending parties.

The National Agency which shall be established to administer the proposed plan shall hold the following powers and responsibilities:

1. To establish the size of the national market and provincial shares.[1]

2. To adjust the national and provincial allocations as required.

a) The Agency shall use the following criteria when making future

[1] The basic market shares will represent two classes of chickens (i.e., under 4 pounds and 4 pounds and over, eviscerated weight).

[illegible] allocations to the provinces:

i) Any significant change in consumer demand,

ii) The ability of any province to meet its allocated production,

iii) The total market requirements within each market area,

iv) The proportion of market demand in a province which is met by production in that province,

v) The [illegible] advantage of production and marketing of chicken.

3. [illegible] regulate the interprovincial and export trade in [illegible].

4. [illegible] for exports and imports.

5. [illegible] exercise the federal authority over interprovincial and export trade and the provincial authority over intraprovincial trade.

6. [illegible] in interprovincial trade and monitor interprovincial [illegible] of live or processed chicken in any form.

7. To [illegible] information regarding hatching, producing, processing, [illegible] and marketing of chickens.

The provincial marketing boards shall have the following jurisdiction in the [illegible] marketing plan:

1. The provincial boards shall maintain their authority to establish producer prices in the province. However, they will be required to maintain [illegible] realistic price relationships with other provinces and to promptly inform the Agency of any price change affected.

2. The boards will effectively regulate the placements and marketings of individual chicken producers so that the total of these marketings does not exceed total provincial allocations.

3. Each provincial board shall remain the sole authority to allot and control intraprovincial basic authorized quotas and marketing quotas to producers.[1]

The Proposed National Agency and the Alberta Board

Since its inception, the interprovincial trade policy of the Alberta Board has been to serve its normal distributive area regardless of provincial boundaries. A study by Copeland[2] shows that in 1971, 14.3 percent of the chicken processed in Alberta were sold outside the province.

The Board endorses that fair trade practices guided by distributive efficiency should determine the size and extent of the market area. Marketing boards in Ontario and British Columbia, the provinces which have traditionally been net importers most often did not give support to this policy. The market area concept for them is provincial boundaries irrespective of geographic or economic considerations. This lack of unanimity in interprovincial trade policy is one of the reasons for the delay in the establishment of the National Chicken Marketing Agency.

The Alberta Board was not in favour of the so-called unfair trade practices which Quebec producers adopted prior to supply management in their operations. The Alberta Board, along with others, therefore initiated the move to establish a national marketing plan in chickens. The major concern was to regulate trade between provinces on an equitable basis.

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[1] Individual boards shall, however, sign a security bond to the Agency with a liability to keep provincial production within the allocated limits.

[2] J.H. Copeland and M.H. Hawkins, Orderly Marketing in the Alberta Broiler Chicken Industry, Applied Research, Bulletin 18 (Department of Rural Economy, University of Alberta, Fall 1976), p. 16.

After the Quebec market was regulated in 1971, the excessive trade pressures were restored to normal. The Alberta board also resumed trade with its normal distributive area in British Columbia.[1]

All through the process of establishing a national agency, the Alberta Board, like others, has been an interested observer. In 1974, at public hearings in Winnipeg, the Alberta Board did not agree with the surplus removal program of inventory control and the criteria which were outlined in order to share future market expansion among the provinces. The Board suggested that each province should be given the opportunity to meet demand increases in its respective market area.

In recent years the intent of the National Agency has evolved into an attempt to control low cost actual imports or the threat of imports of U.S. chickens. However, in the past two years, the Alberta market has experienced little detrimental pressure from U.S. imports. The Board, in its tenth annual report, stated: "Until mid-August 1976, Alberta growers' paying prices period we did have a degree of isolation from the rest of Canada."[2] However, the Alberta market is not completely isolated from the rest of Canada. In 1976, 3 million pounds of chickens produced in other provinces were sold in the Alberta market. After August 1976, the Board had to reduce grower paying prices by 1.5 cents per pound liveweight to stay competitive with the rest of the Canadian market.

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1 The Province of British Columbia, like others, imposed import restraints in 1970-71.

2 Alberta Broiler Grower's Marketing Board, Tenth Annual Report (Edmonton: ABGMB, November 1976), p. 11.

The degree of isolation available to the Alberta market from competition of firms in Eastern Canada is mainly due to discriminatory freight rates. According to the National Transportation Act of 1967, the freight rates are higher on incoming than outgoing processed goods from Alberta. This provides a natural protection to the local industry.[1] At the same time, an adequate, assured and timely supply of the right quality and kind of chickens provided by Alberta growers to processors is another reason which discourages local traders from buying outside the province.

In November 1975, at a meeting with the Canadian Broiler Council held in Edmonton, the Alberta Board withdrew its support of the national marketing proposal. At the public hearings held by the National Council in Edmonton a year later, the Alberta Broiler Grower's Association presented a brief opposing the proposed veto powers of Central Canadian producers; the cost of production pricing formula, and the bases to be used for future market allocations among the provinces. In these hearings across Canada, Alberta was the only province which did not endorse the proposal.

The Alberta Board has continuously been trying to preserve the following basic characteristics in the proposed national chicken marketing plan:

1. Initial and future quota allocations based on the market area concept.
2. A simply organized national agency which is responsive to local market conditions.
3. A provincial pricing structure not tied to the cost of production formula.

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[1] For details on this aspect see: Kenneth H. Norrie, "Western Economic Alienation -- An Overview" (Unpublished paper, Department of Economics, University of Alberta, 1976), pp. 12-17.

Upon conclusion of the public hearings across Canada, a meeting of the Canadian Broiler Council and the National Council was held. The conclusions of this meeting apparently opposed the characteristics desired by the Alberta Board. Keeping in mind the problems and opportunities of the Alberta growers, this decision was not acceptable to the Board. The growers were informed of these developments.

> The clause that established the market area concept was removed for legal reasons. The National Council wants a pricing mechanism tied to a formula. There will also be a common quota system within two years of operation and a few other things to give added strength to the Agency.[1]

The Alberta broiler producers have a unique approach to supply management programs such as production cycle, pricing system, product quality and quota policies. Their market conditions and provincial geography are also unique in Canada. The Alberta market is growing because of low unemployment rates and increasing population. The annual rate of population increase in Alberta since 1961 has been 2.5 percent as compared to 1.8 percent in Canada. The criteria for assessing advantages and disadvantages of joining or staying out of the national marketing plan are thus different for Alberta broiler growers.

One part of the mailed questionnaire (Appendix A) was aimed at getting Alberta broiler growers' opinion about the proposed National Chicken Marketing Agency. The opinions of the 49.2 percent (62 growers) who responded are given in Table 4.1.

As shown in the table, 36 percent of the producers were not in favour of the National Agency. About 10 percent had placed their confidence

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[1] Alberta Broiler Growers' Marketing Board, Newsletter (Edmonton: ABGMB, December 28, 1976).

in the Board. Forty-four percent of the producers indicated that they were undecided. Only 11 percent of the growers supported the proposed national chicken marketing plan.

A majority of the growers who were undecided indicated a need for more information in order to decide for or against the National Agency. The Board is going to arrange regional meetings with growers in April, 1977 to acquaint them with the pros and cons of the National Agency in regard to the Alberta broiler industry.

Table 4.1

Alberta Broiler Growers' Opinions About the National Agency

Particulars.	Number of Respondents	Percent of Respondents
In favour of the Agency	7	11.3
Not in favour of the Agency	22	35.5
Not yet decided	27	43.5
Will accept whatever Board decides	6	9.7
TOTAL	62	100.0

CHAPTER V

MEASURES OF CONCENTRATION AND MARKET POWER

This chapter is devoted to an overview of the various measures of market concentration and monopoly power. A discussion about these measures is presented in relation to their application to structural change in the Alberta broiler industry. Data availability and the suitability of the selected measures are the main considerations when making selection for actual application.

There are two major categories of measures-- indexes of market concentration and indexes of monopoly power. However, they serve the same purpose because market concentration is related to market power. High market concentration is one of the many factors which contribute toward monopoly power. The main difference in both the measurement tools is that indexes of monopoly power attempt to quantify the actual monopoly power exercised by individual firms in a given market. The concentration indexes, on the other hand, seek to measure the potential for market power evident in the market as a whole.

The commonly used indexes of monopoly power and market concentration are discussed below.

Indexes of Monopoly Power[1]

The Lerner Index

The index is given by the forumla $M = \frac{P - MC}{P}$, where P represents price per unit of output and MC represents marginal cost per unit of

[1] For details on various monopoly measures refer to: James V. Koch, Industrial Organization and Prices (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1974), pp. 51-60; and Eugene M. Singer, Antitrust Economics (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1968), pp. 63-72.

output. This index measures the departure of price from the marginal cost associated with monopoly. Price theory says that a firm in a purely competitive market structure has price equal to marginal cost. This makes M equal to zero. The value of the Lerner Index is thus directly associated with the degree of monopoly power a firm holds.

This index also defines monopoly power in terms of slope of the demand curve. This is because when the objective function of the firm is to maximise profits and an equilibrium condition holds, the Lerner Index is equal to the inverse of the price elasticity of demand.

The approach has limitations of data availability. Most of the available cost accounting data do not provide estimates of the marginal cost. Marginal cost is also biased under the influence of the objective function of the firm under consideration. According to Scherer[1], if the objective function of the firm is something other than to maximise profits, marginal costs incurred will be higher than they would have been under the spur of competition.

The Bain Index

Bain proposed profit rates as a measure of monopoly power. He suggests that divergence between price and average cost rather than price and marginal cost as proposed by Lerner[2], should be considered as an indicator of monopoly power. He justifies his index on the grounds that it is possible to view the divergence between price and average cost as evidence, on a probability basis, of the existence of a discrepancy between

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[1] F.M. Scherer, Op. Cit., p. 50.

[2] A.P. Lerner, "The Concept of Monopoly and the Measurement of Monopoly Power," Review of Economic Studies, Vol. 1 (1934), pp. 157-175.

price and marginal cost. He emphasises that profits, however, are not a sure condition of monopoly, although they are, if persistent, a probable indication.[1]

According to economic theory, when the firm's average cost curve is tangent to its demand curve at a given level of output, the firm earns no excess profits. As shown in Figure 5.1 at output level OQ, when per unit average cost is AC' and price OP', a price-marginal cost discrepancy exists although price and average cost are equal. Price remaining the same, reduction in average cost to, AC, leads to excess profits (shown by the shaded area in the figure). These excess profits are the result of monopoly power and/or imperfections in the market.

The index is operational in nature but faces the problem of inadequacy of required type of data. It has application only if long run equilibrium conditions hold because in disequilibrium even a purely competitive firm may earn positive profits. The variability of reported profits over short run fluctuations and the diversity of accounting procedures to account for depreciation and loss writeoffs can also create ambiguities.

The Rothchild Index

This index measures the degree of monopoly by taking the ratio of the slope of the firm's demand curve to the slope of the industry's demand curve. Both these curves are represented by FF' and II', respectively as shown in Figure 5.2. In pure competition a firm's demand curve is horizontal with zero slope. The index will, therefore, be zero. In pure monopoly only one firm exists; the firm and the industry are thus identical.

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[1] J.S. Bain, "The Profit Rates as a Measure of Monopoly Power," Quarterly Journal of Economics, Vol. 55 (February 1941), p. 273.

Figure 5.1
Graphic Presentation of
The Bain Index

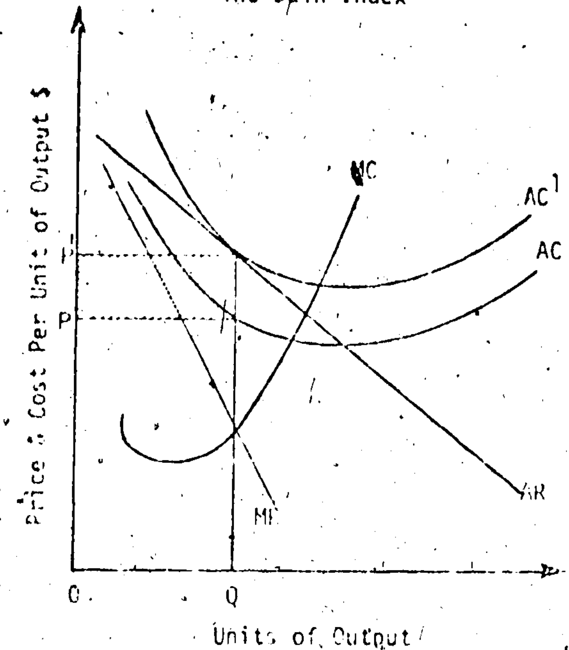


Figure 5.2
Graphic Presentation of
The Rothchild Index

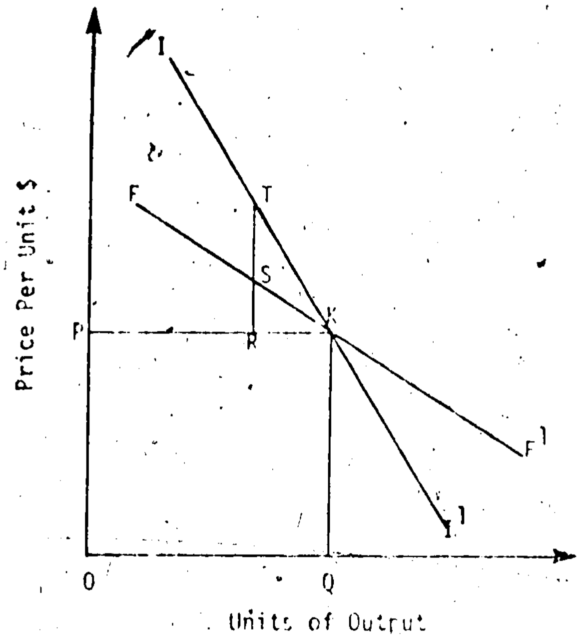
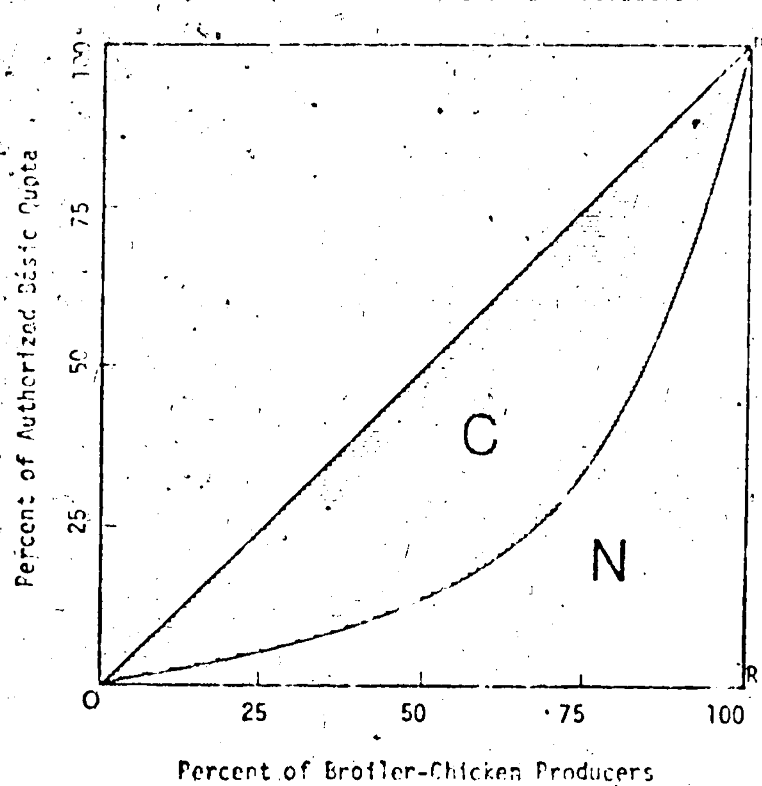


Figure 5.3
Hypothetical Lorenz Curve Showing
Concentration in Primary Broiler Production



The index value is equal to unity. It is between pure competition and pure monopoly that there exists various degrees of monopoly. With reference to Figure 5.2, the Rothchild Index equals:

$$\frac{\text{slope of the firm's demand curve}}{\text{slope of the industry's demand curve}} = \frac{\text{slope of } FF'}{\text{slope of } II'} = \frac{\frac{RS}{RK}}{\frac{RT}{RK}} = \frac{RS}{RT}$$

This index also suffers from data limitations. The index is based on demand considerations for the product but ignores important sources of monopoly power such as supply and cost conditions. According to Singer,[1] where the demand curve of the firm has shifted during the period of time considered, an econometric problem arises in identifying the demand curve. He argues that the practicality of using slopes of different types of demand curves for the empirical evaluation of the degree of monopoly is questionable. Because of these limitations, empirical studies regarding monopoly power often rely on this index.

There are other measures of monopoly power such as advertising intensity and the Papandreau Index, also known as cross elasticity of market demand between firms. None of the above discussed monopoly measures are applied in the present study. This is because of nonavailability of the required type of data and the measurement needs of the present study.

Indexes of Market Concentration

The dispersion of firm size and fewness of firms in a given market affect the conduct and performance of firms in the market.[2] A perfect

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[1] Augene M. Singer, Op. Cit., p. 70.

[2] James V. Koch, Op. Cit., p. 146.

concentration index which can incorporate both influences has not yet been developed. Data limitations often pose a restraint on the use of these measures. A choice among the available concentration indexes is thus made, depending upon the measurement needs and data availability.[1]

Two types of concentration indexes are frequently employed to measure market concentration in a given market. These measures are classified as partial and summary indexes. Partial indexes analyse only a portion of the firms, whereas summary indexes involve all of the firms.

A Four Firm Concentration Ratio, a partial index and the Lorenz Curve, the Gini Coefficient, and the Herfindahl Index are summary indexes commonly used as measures of market concentration and implied market power. The market share of all the firms in the four selected segments and the three time intervals considered in the study are available to facilitate the application of these techniques.

Market size is generally measured in units such as sales, assets, employment and net value added. In the present case, the purchase and sales data about chicks, feed and broiler chickens and basic authorized quota with individual growers have been used to estimate percent market share of individual firms in different segments of the industry. The Lorenz Curve and the Gini Coefficient have been applied only to the primary production segment. The application of these measures in other segments where firms are few in number is not considered of any special use. The Herfindahl Index is considered a relatively better choice under such market conditions.

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[1] For details on available concentration measures and their strengths and weakness refer to: Eugene M. Singer, Op. Cit., pp. 136-155 and V. Koch, Op. Cit., pp. 145-152.

Four Firm Concentration Ratio

A Four Firm Concentration Ratio is the market share attributed to the top four firms. It is the most frequently used partial index because of its easy application. The concentration ratio can be extended up to the top 8 firms, 12 firms and so forth. The proponents of partial indexes consider them superior measures of market concentration. This is because concentration ratios are related to the theory of oligopoly.

According to Adelman,[1] fewness is an essential part of the economic theory and study of competition and monopoly. He argues that an ordinary percentage measure is superior for studies of business concentration.

Because concentration ratios are partial measures, they do not indicate the complete size distribution of the firm in a given market. The relative market share of individual firms which comprise the concentration ratio is also not known.

The Lorenz Curve

The Lorenz Curve as a measure of inequality of relative concentration takes into account the total number of firms in an industry. Both axes of the curve are expressed in percentage terms. The percent of firms cumulated from the smallest sized firm are shown on the horizontal axis and the percent of the economic variable under study is on the vertical axis.

The Lorenz Curve of an industry with firms of identical size will pass through the diagonal line OP, as shown in Figure 5.3. When the Lorenz Curve traces its path below the diagonal line of perfect equality,

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[1] M.A. Adelman, "Differential Rates and Changes in Concentration," Review of Economics and Statistics, Vol. 41 (February 1959), p. 68.

it indicates the presence of inequality. In hypothetical Figure 5.3, the shaded area shows the extent of market concentration and inequality in firm size distribution of broiler producers.

The Lorenz Curve has limitations as a measure of market concentration. According to Singer,[1] the direct relationship between the number of firms and the position of the Lorenz Curve has been advanced as a reason for invalidating its use for measuring business concentration.

The Gini Coefficient

Gini Coefficient is a measure of dispersion based on the Lorenz Curve. The Gini Coefficient for the hypothetical Lorenz Curve in Figure 5.3 will be $C \div (C + N)$. Here C represents the area of concentration (shown as shaded area) and N represent the area of nonconcentration.[2] When there is perfect equality of firms, the Lorenz Curve coincides with the diagonal line and the value of the Gini Coefficient is zero. On the other hand, if there is one firm in the industry, the Gini Coefficient is equal to unity revealing total inequality.

The Gini Coefficient as a measure of the Lorenz Curve suffers from the limitations of the latter. In certain situations it can derive paradoxical inferences. The Gini Coefficient for duopolist or tripolist firms with an equal market share is equal to zero but one could hardly conclude that monopoly power is absent under such market conditions.

The shape of the Lorenz Curve and the value of the Gini Coefficient

[1] Eugene M. Singer, Op. Cit., p. 143.

[2] In the given figure, C + N comprise the lower part of the triangle shown as OKM. Area of this triangle $= \frac{100 \times 100}{2} = 5000$.

are sensitive to errors in defining the number of firms in the industry. In the present study, application of the Lorenz Curve and the Gini Coefficient was made on the primary production segment in order to estimate changes in market concentration and inequality in firm size distribution as a result of the market regulations. The number of all the producers and their market shares were available to facilitate application of these measures with a minimum amount of bias. However, actual application has shown that the Herfindahl Index, a summary measure like the Gini Coefficient, has provided relatively consistant estimates.

The Herfindahl Index

The Herfindahl Index is the squared sum of the relative market share of individual firms. This is given by the formula:

$$H = \sum_{i=1}^{N} (S_i)^2$$

where S_i represents the market share if i^{th} firm and N represents the total number of firms. Similar to a Gini Coefficient, the value of an H-Index varies between 0 and 1, but without the serious flaws of the former.[1] The H-Index is sensitive to the fewness and inequality of the firms. This quality makes it an acceptable measure of business concentration. The value of the H-Index declines with an increase in the number of firms and rises with increasing inequality in the size of the firms. Therefore, the technique has similarities with other important and useful mea-

[1] For empirical evidence on relative strengths of the H-Index in comparison to commonly used partial measures see: Almarin Phillip, "A Critique of Empirical Studies of Relations Between Market Structure and Profitability," Journal of Industrial Economics, Vol. 24, No. 4 (June 1976), pp. 241-249.

sures of monopoly such as the Lerner Index, the Bain Index, and the Rothchild Index. The H-Index thus has the capabilities of serving as a composite measure.

Similar to the other static measures of market concentration discussed above, the H-Index has limitations in its approach.[1] Grossack has proposed an integrated approach which considers both static and dynamic aspects of market concentration. This technique mainly involves the linear regression of the terminal year market shares of all the firms in the industry with their shares in the initial year.[2] This approach has relevance to the feed manufacturing segment of the broiler industry because of its competitive and dynamic market behavior. This type of analysis, however, has not been made due to lack of adequate data.

Competitive Rating Index

Various measures of concentration considered in this study do not include value judgments and conduct of the participants in a given marketplace. To overcome the limitations of these static measures, Hawkins[3] has suggested a supplementary device termed a Competitive Rating Index. The approach basically derives its support from the concept of workable or effective competition developed by Clark and later expanded by Sosnick

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[1] M.A. Adelman, "Comment on the 'H' Concentration Measure as a Numbers Equivalent," Review of Economics and Statistics, Vol. 49, No. 1 (February 1968), pp. 99-101.

[2] For details on the methodology used in this approach see: Irvin M. Grossack, "Toward An Integration of Static and Dynamic Measures of Industry Concentration," Review of Economics and Statistics, Vol. 47, No. 3 (August 1965), pp. 301-308.

[3] For details on deminsions and procedures to develop this technique see: M.H. Hawkins, "Aggregating Competitive Behavior in the Food Industry," Canadian Journal of Agricultural Economics, Vol. 16, No. 2 (June 1968), pp. 13-19.

and Markham.[1] The outcome of the application of this technique thus compensates in realism what it loses in precision. The Competitive Rating Index is a composite index which can be developed by incorporating subjective factors, procurement and pricing factors, extent of vertical integration, market share and other such factors relevant to the industry under study.

Parlby, et al.,[2] when critiquing Mallen's report[3] on the Canadian retail food industry, commended the usefulness of this method. According to the authors, use of this method, which has more interpretive and predictive powers, is likely to provide more realistic results about market concentration than would be obtained if a concentration ratio were used. However, quality of the results using this technique will depend upon the extent of the user's training, skill and perceptions. This technique has not been applied in the present study mainly because of time and resource limitations.

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[1] J.M. Clark, Competition as a Dynamic Process (Washington, D.C.: The Brookings Institute, 1961); Stephen H. Sosnick, "Toward a Concrete Concept of Effective Competition," American Journal of Agricultural Economics, Vol. 50, No. 4 (November 1968), pp. 827-853; J.W. Markham, "An Alternative Approach to the Concept of Workable Competition," American Economic Review, Vol. 40, No. 3 (June 1950), pp. 349-361.

[2] G. Parlby, et al., "Critical Review of the Mallen Report," Canadian Journal of Agricultural Economics, Vol. 24, No. 3 (1976), p. 45.

[3] Bruce Mallen. A Preliminary Paper on the Levels, Causes and Effects of Economic Concentration in the Canadian Retail Food Trade (A Study of Supermarket Market Power, Commissioned by the Food Price Reivew Board. Montreal: Concoridia University, Faculty of Commerce and Administration, 1976).

CHAPTER VI

RESULTS AND DISCUSSION OF STRUCTURAL CHANGES IN THE INDUSTRY

Background

The Alberta Broiler Growers' Marketing Board has the legal authority to control producers' marketings and the minimum prices paid to them by processors. It eliminates direct competition between producers. The nature of competition and pricing behaviour in the broiler industry is thus influenced by the operations and policies of the Board. Study of the structure and conduct of the market will reveal the extent and nature of changes undergone in the broiler industry.

In 1970, Hurnanen, et al.,[1] analyzed concentration and vertical integration in the Alberta broiler industry. According to the study, one vertically integrated firm possessed a high degree of market share at different stages of the production process. Apparently the broiler industry was in a bilateral monopoly situation held by the Board and that integrated firm. The study indicated that the practices and policies of these two forces would determine the nature and direction of change in the industry. The main purpose of the present study is to analyse these intra-industry relationships. The comparative-static analysis that is developed will provide a quantitative base to evaluate some of the policies of the Board and their relationship to industry.

Market structure represents those characteristics of the organization of a market which seem to influence strategically the nature of compe-

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[1] R.R. Hurnanen, et al., Op. Cit.

tition and pricing within the market.[1] The following are the common components of market structure which can be attributed to the Alberta broiler industry:

1. Market concentration--number and size distribution of buyers and sellers.
2. Integration--vertical and horizontal.
3. Legal and other institutional constraints in the industry.
4. Conditions of entry and exit of the firms.
5. Product differentiation.
6. Growth rate of market demand.
7. Price elasticity of market demand.

The elements of market structure referred to above are interdependent. A change in one affects the other. Market structure influences market conduct which, in turn, determines market performance. The flow of this causation can also be backwards. The variables of market structure considered in the present study are discussed below.

Market Concentration and Integration

Market concentration represents the number and size distribution of firms in an industry. It is the best known and most often used indicator of market structure. The level of concentration provides a useful parallel with, and partial substitute for, the theoretical categories of monopoly, oligopoly, monopolistic competition, and pure competition.[2]

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[1] Joe S. Bain, Op. Cit., p. 7.

[2] Richard Caves, Op. Cit., p. 15.

Here the term integration represents both vertical and horizontal coordination of business decisions in the broiler industry. A vertically integrated firm can achieve horizontal expansion at different stages of the production process. This expansion can be achieved through internal growth, acquisitions, and contract arrangements.[1]

The horizontal integration achieved by Alberta broiler producers through establishment of the Board has structural and behavioral implications in the industry. Initially the corporate firms considered the monopoly powers of the Board a threat to their existence and growth. A review of the retaliatory acts undertaken by the corporate firms to undermine the monopoly powers of the Board is given below.

One of the objectives of the Board was to prevent the corporate takeover of independent broiler producers. As stated in the tenth annual report of the Board: "One of the objectives to establish the Board was to oppose the vertical integration in broiler production. It was hoped that the proposed board would revert the trend before independent growers were eliminated from the industry."[2] In actual practice, however, vertical integration was fostered in the initial stages of the Board's operation.[3]

The vertically integrated firms initiated moves for horizontal expansion in order to increase market shares and controls at different

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[1] For details on these aspects see: J.T. Hill, "Vertical Integration and the Poultry Meat Industry," Canadian Farm Economics, Vol. 1, No. 7 (August 1966), pp. 8-12; Roy R. Hurnanen, "Vertical Integration and Concentration in the Alberta Broiler Industry," (Unpublished M.Sc. Thesis, Department of Rural Economy, University of Alberta, Edmonton, 1970), pp. 27-31.

[2] Alberta Broiler Growers' Marketing Board (1976), Op. Cit., p. 12.

[3] For a complete account see: R.R. Hurnanen, et al., Op. Cit.

stages of the production process. They acquired a few independent broiler farms and made merger deals to reduce or eliminate competition. In this regard the activities of Lilydale, a cooperative firm (firm A), and Canada Packers Ltd., a corporate firm (firm C), are of special mention. As a result of mergers and takeovers, the processing and hatching operations were reduced to a duopolist market situation. Firm A became the dominant share holder with 79 percent and 81 percent of hatching and processing facilities, respectively. The second largest firms were firm E with a 10 percent share of hatching and firm C with 16 percent of the processing facilities. The composite market shares in different segments of the industry are presented in Table 6.1.

Table 6.1

Composite Market Shares for the Broiler Industry in Alberta, 1968

Firm	Share of Total Output			
	Hatcheries	Production	Feed Manufacturing	Processing
	(Percent)			
A-B	79	37	-	81
D	-	-	40	-
C	-	7	15	16
E	10	-	8	3
3 Independent Hatcheries	11	-	-	-
94 Independent Producers	-	56	-	-
4 Independent Feed Co's.	-	-	37	-
TOTAL	100	100	100	100

Source: Roy R. Hurnanen, "Vertical Integration and Concentration in the Alberta Broiler Industry" (Unpublished M.Sc. Thesis, Department of Rural Economy, University of Alberta, Edmonton, 1970), p.41.

In primary production the market share of firm A was 13.3 percent in 1967. After acquisition of three independent farms and a merger activity with firm B in 1968, firm A's share increased to 44.2 percent. The Board was primarily concerned about the takeover of the independent farms by the integrated firm. Quotas with the integrated firms were therefore frozen. In order to maintain and improve the market share of independent producers, a new quota policy was formulated (Appendix C-1). Through persuasion a commitment was also received from firm A to dispose of 179,000 square feet of independent growers' quota acquired after the formation of the Board. As indicated in the sixth annual report of the Board these two developments were considered positive steps towards achieving reduction of vertical integration in broiler production.[1]

Source of Data

The data for the present analysis were obtained from the mailed questionnaire, the Board's records, and through interviews with the growers, Board officials and government representatives of the poultry division. The mailed questionnaire is given in Appendix A. At the time the questionnaire was mailed, there were 124 active broiler producing units. Ten of these farms, which represented 31 percent of the total authorized quota in broiler production were possessed by two vertically integrated firms. The remaining 69 percent of the quota was shared by 114 independent growers. In total, 62 independent growers responded to the questionnaire. These respondents shared 74 percent of the broilers marketed by independent producers. The remaining 26 percent was assumed to be normally distributed. No response was received from integrated

[1] Alberta Broiler Growers' Marketing Board (1972), Op. Cit., p. 10.

farming units. It was assumed that they buy and sell from their respective vertical establishments. Consultations with Board officials were made to rationalise this gap of data availability.

Comparative Analysis of Structural Changes

The subsequent analysis attempts to estimate the relationship between market regulations and market concentration and integration, other things remaining the same. The application of selected measures of market concentration along with estimates of vertical integration and other supporting statistics will provide a perception of the problem at hand.

A comparative analysis of concentration and vertical integration in the four segments of the industry at different points in time is discussed below.

Primary Production Segment

The analysis of market concentration indicates the actual market rivals of a firm. The establishment of the Board has eliminated competition between producers. The main purpose of this analysis is to find the influence of quota policy and programs of the Board on the market environment of broiler producers. The analysis of market shares and production arrangements of independent and integrated growers will accomplish this purpose.

Table 6.2 indicates the distribution of market shares between independent and integrated producers at different points in time. As shown in the table, total authorized quota in 1967 was 1,926,900 square feet. Of this quota, 63 percent was shared by 89 independent producers and 37 percent by 3 integrated firms. The quota of the integrated firms

Table 6.2

Distribution of Authorized Quota Between Independent and Integrated Firms in Different Years

Particulars	Number/Quantity			Percent of Total		
	Independents	Integrators	Total	Independents	Integrators	Total
Authorized Quota (sq. ft).						
1967	1,217,100	709,800	1,926,[illegible]	[illegible]3.2	36.8	100
1969	1,171,400	928,600	2,[illegible]	[illegible]5.8	44.2	100
1971	1,369,100	940,200	2,309,300	[illegible]9.3	40.7	100
1976*	1,814,470	825,200	2,639,670	68.7	31.3	100
Broiler Growers						
1967	89 (89)	3 (9)	92 (98)	96.7	3.3	100
1969	94 (94)	2 (12)	96 (106)	97.9	2.1	100
1971	102 (102)	2 (12)	104 (114)	98.1	1.9	100
1976	114 (114)	2 (10)	116 (124)	98.3	1.7	100
Quota Change from:						
1967 to 1969	-45,700	218,800	173,000	-3.8	30.8	9.0
1967 to 1971	152,000	230,400	382,400	12.5	32.5	19.8
1967 to 1976	597,370	115,400	712,770	49.1	16.3	37.0

Note: Figures in brackets are number of broiler farms.

* Quota in 1976 does not include 39,300 square feet of suspended quota with five growers. It also does not include 35,000 square feet of roaster chicken quota.

was located at nine different farming units. The total number of broiler producing farms and producers was thus 98 and 92, respectively.[1]

Since the Board's formation, total authorized quota has been increased by 40 percent. All of it, as provided in Board policy, was allotted to new (35 percent) and established (65 percent) independent producers. In 1967, the market share of integrated firms was 37 percent. After acquisitions of independent farms, it increased to 44 percent. From 1967 to 1971 new quota allotments of 382,400 square feet were made to independent producers. This reduced the integrators' market share by 3 percent. Market share with them was still 4 percent above what they had in 1967.

In the fall of 1976, firm A partly fulfilled the commitment it had made to the Board in 1972.[2] Firm A sold 111,000 square feet of its quota back to the independent producers. As a result of quota expansion and sale deals to independent growers, the market share of integrators was reduced to 31 percent. The market share of firm A, which had increased from 13 percent to 44 percent after the acquisitions of 1968, consequently was reduced to 25 percent.[3]

As shown in Table 6.2, percentage market shares of integrated firms in 1967 and 1976 indicates a reduction of 6 percent. In absolute

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[1] In the present analysis the number of growers or firms represents business entities, whereas number of farms is a count of the farming units.

[2] This commitment was to sell back to independent category of producers an equivalent amount of quota, (179,000 square feet), the firm had purchased from them after Board's formation. For details see: The Alberta Broiler Growers' Marketing Board (1972), Op. Cit., p. 10.

[3] If broiler production through the permit growing system is considered, firm A's share in actual production is 23 percent. In recent years, on average, 7 percent of the total production is through permits. Firm A volunarily refuses the permits.

terms, however, they still posses 115,400 square feet more than they did in 1967. By considering 74,800 square feet of independent growers' quota not accounted for in the analysis and 24,000 square feet of new quota not availed by the growers in 1976, the ratio of market share between independent and integrated growers becomes 7:3.[1]

Contract Integration in Production--The market shares of integrated firms as shown in Table 6.2 are comprised of owned and leased facilities. This category of vertical integration is called ownership integration. Another form is called contract integration (or contract production). This involves agreements between producer, processor, feed company or hatchery. Contract integration is a market phenomenon developed to serve the mutual interests of the contracting firms. The contract producer is provided a guaranteed market outlet and an assured price for his product. In turn, he is required to buy and sell through the contracting firm. The production contracts are of many types depending upon terms and conditions involved. They range from simple management to full management contracts.

In the Alberta broiler industry, contract integration has been of a limited extent and simple in nature. The records of the Board indicate that at the time of its formation in 1966, 30 percent of the production facilities were under contract growing arrangements, mainly with the processors. The survey conducted in 1968 indicated contract production

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[1] Of the quota, 74,800 square feet belonged to five temporarily suspended broiler growers and another five roaster growers. In 1976, the Board allotted 100,000 square feet of new quota, 24,000 of it was not availed by the producers in 1976. Considering broiler production on permits which are mainly issued to the independent growers, the ultimate market share of integrated firms reduces to 28 percent.

at 13.5 percent.[1] In the first two years of Board operation, contract integration was reduced by 60 percent. In the present survey not a single reporting producer indicated any sort of formal contract.

The supply management program instituted by the Board has provided the lacking services, facilities and economic environment to the industry which were instrumental in eliminating the need for contract integration. In recent years the ownership integration trend has also been reversed. According to a research report, the attitude of the corporate firms toward ownership integration in broiler production has changed. The report states that some of the corporate firms want to get out of direct production and dispose of their quota. This is because they cannot produce birds cheaper than individual farmers. Higher labour costs relative to farmer-run operations seem to offset the financial and economic advantages of coordination.[2]

The above observations seem equally applicable to the integrated firms in the Alberta broiler industry. Firm A had already sold 111,000 square feet of its production facilities to independent producers. In Alberta, ownership integration has been reduced from 37 percent in 1967 to 30 percent in 1976. In Ontario, ownership integration has been relatively low. In 1965, it was 17 percent and 12.5 percent in 1970. Even in the highly integrated U.S. broiler industry, ownership integration is limited. In 1970, ownership integration was 7 percent in comparison to

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1 Roy R. Hurnanen, Op. Cit., p. 30.

2 Ontario Ministry of Agriculture and Food, Corporate Farming and Vertical Integration in Ontario, Research Report (Toronto: OMAF, Economic Branch, October 1972), pp. 35-37.

90 percent contract integration.[1]

Measures of market concentration such as the Four Firm Concentration Ratio and the H-Index were applied.[2] The values of these indices as well as the vertical integration discussed in the preceding section are presented in Table 6.3. These statistics indicate that the upward trend of market concentration and integration observed during the initial years of Board operation has been reversed.

Table 6.3

Indices of Concentration and Integration in Broiler Production

Particulars	1967	1969	1976
Vertical integration			
Ownership Integration (%)	36.8 (3)	44.2 (2)	3[illegible].3 (2)
Contract Integration (%)	30.0 (4)	13.5 (3)	0.0 (0)
Four Firm Concentration Ratio	[illegible]1.2 (3)	40.7 (2)	37.0 (2)
Market Share of Firm A (%)	13.3	[illegible]7.8	24.9
H Index	.08	.15	.07

Note: Figures in brackets indicate number of integrated firms.

The common criticism that marketing boards restrict entry and thereby increase market concentration is not fully applicable to the broiler

[1] U.S. Department of Agriculture, Contract Production and Vertical Integration in Farming, ER 479 (Washington D.C.: USDA, Economic Research Service, April 19[illegible]), p.[illegible].

[2] In the primary production segment, two more concentration measures, a Lorenz Curve and a Gini Coefficient, are also applied. Discussion about them will follow.

production segment of the industry. This becomes evident when comparing the trends of concentration in Alberta and British Columbia. As a result of the negotiable quota policy of the British Columbia Board, the number of individual broiler farms had decreased from 217 in 1963 to 134 in 1969.[1] On the other hand, in Alberta, the non-negotiable quota policy and the Board provision for 35 percent of new quota being allocated to new growers has increased their number from 100 in 1967 to 131 in 1976. However, in total, 42 new growers were added through Board quota allocations during this period.

Before closing the above discussion, a point with respect to operational efficiency and conditions of entry should be made. In Alberta, of the total increase in demand for the product so far, about half has been met by issuing quota to new and established growers. The rest of the demand has been met by expanding the productive capacity of existing facilities through adoption of shorter production cycles and raising density of output. A part of the seasonal increase in demand is supplied by the permit growers. These practices, no doubt, improve the competitive position of the industry by making efficient use of the existing resources. It also provides the small growers with a more viable size of operation. There is a trade-off because such developments involve consideration of barriers to entry, income distribution, and market concentration.

Financing of Chicks and Feed--The practice of buying chicks and feed on credit as indicated by a survey in 1968 is still prevalent. The payments are made after sale of the birds. Financing is mainly provided by the

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[1] S.M.H. Rizvi, "Marketing Boards in Canada--An Evaluation of Their Quota Policies With Special Reference to the British Columbia Industry" (Unpublished Ph.D. Thesis, Department of Rural Economy, University of Alberta, 1974), p. 19[illegible].

hatchery and the feed dealer for their respective sales. According to the present survey, 76 and 80 percent of the reporting producers bought chicks and feed on credit. The corresponding percentages in the survey of 1968 were 61 and 51 percent. This indicates an increased proportion of short term financing by growers. The added security in the industry and certainty of income to producers has probably encouraged lending institutions to advance more credit. In the present survey, 8 percent of the total financing of chicks and 10 percent of feed requirements were provided by the commercial banks.

According to the survey data, 40 percent of producers indicated trade with more than one feed dealer. Parallel trade with more than one hatcheryman or processor were only 6 and 8 percent, respectively. Relatively speaking, changing from one hatchery or processor to another was rare. This is one of the indicators of the fewness of firms and high business concentration in hatching and processing activities. The growers appear to exercise their independence in establishing trade links to buy chicks and feed and to sell their product. However, they usually do not readily break the business ties so established unless another competing firm offers substantially more favorable terms of trade.

Number and Size Distribution of Broiler Producers--The distribution of authorized quota over time was analysed in order to establish the relationship of quota policy and number and size distribution of producing firms. The producers and the Board alike consider 6,000 square feet of production facility a minimum practical size of operation.[1] The reason behind this is that this size of operation provides the grower with a full

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[1]. In the new quota policy formulated in 1976 (Appendix C-2), the Board proposed to raise this minimum level of quota to 12,000 sq. ft.

truckload for market. This is a factor of economic consideration due to f.o.b. plant basis of producer paying prices in Alberta. The Board has kept this point in mind while forming the quota policy. According to the priority list quota has been allotted in batches of 6,000 and 3,000 square feet to new and established growers, respectively. At the end of 1974, two rounds of new quota had been allotted to the growers who were registered at the time of board formation. A third round of new quota allocation was started in 1976. It will literally be completed in 1977 or 1978. A total of 42 new growers have also been added to the list of independent broiler growers during this period. In 1967, there were 18 growers below the minimum size of business operation. In 1971 and 1976 there were only 4 and 2, respectively.

The quota policy of the Board and other economic factors affecting the size of operation has resulted in a change in the number and size distribution of quota holdings. This aspect is analysed by dividing the total authorized quota into five size groups as given in Table 6.4. The first four groups belonged to independent producers and the last represented the integrated producers. The letter designations of S, M, L, XL and XXL are used to represent these size groups. The data in Table 6.4 are used in Figure 6.1 to exhibit distribution of market shares among independent and integrated firms.

Table 6.4 indicates a relative shift in market share from S to M producers in the last ten years. In 1967, 19 and 22 percent of total authorized quota was with S and M producers. In 1976, they possessed 16 and 27 percent, respectively. Since 1967, percent market share with L producers has also increased. In 1967, only one producer belonged to this size group. In 1971 and 1976, their numbers were 9 and 11, respectively.

Table 6.4

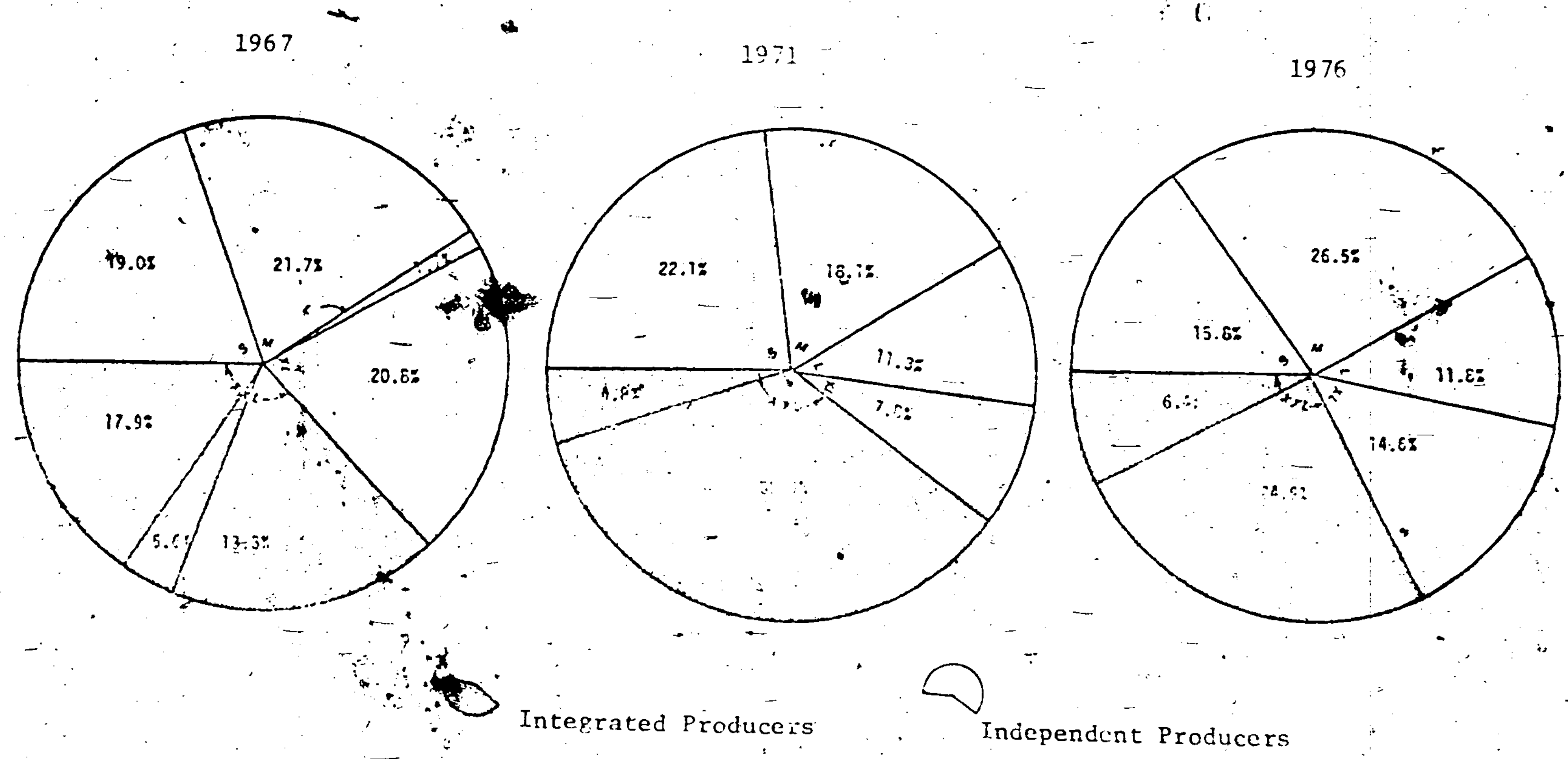
Distribution of Market Share Among Independent and Integrated Producers

Authorized Quota Square Feet	Size Group	1967 % Share	1967 % Producers	1971 % Share	1971 % Producers	1976 % Share	1976 % Producers
Independent Firms:							
Up to 12,000	S	19.0 (54)	58.7	22.1 (65)	62.5	15.8 (53)	45.6
12,001 - 24,000	M	21.7 (27)	29.3	18.1 (25)	24.1	26.5 (43)	37.0
24,001 - 36,000	L	1.7 (1)	1.1	11.3 (9)	8.6	11.8 (11)	6.1
36,001 - 84,000	XL	20.8 (7)	7.7	7.8 (3)	3.0	14.6 (7)	3.5
SUBTOTAL		63.2 (89)	96.8	59.3 (102)	98.0	68.7 (114)	98.2
Integrated Firms:							
Quota With Firm C*	XXL	5.6 (3)	1.1	4.8 (2)	1.0	6.4 (3)	0.9
Quota With Firm A	XXL	13.3 (2)	1.1				
Quota With Firm B	XXL	17.9 (4)	1.1	35.9 (10)	1.0	24.9 (7)	0.9
SUBTOTAL		36.8 (9)	3.3	40.7 (12)	2.0	31.3 (10)	1.8
TOTAL		100.0 (98)	100.0	100.0 (114)	100.0	100.0 (124)	100.0

Note: Figures in brackets represent the number of broiler farms.
* In 1967 this quota was in possession of firm F.

Figure 6.1

Percentage Market Share in Production With Independent and Integrated Firms in Selected Years



The holdings in M and L size groups provide an efficient and economical size of operation. The quota policy of the Board thus seems to have been instrumental in achieving producer concentration towards these size groups. The M and L producers held 23 precent of quota in 1967 and 38 percent in 1976. The number of producers in possession of this quota was 28 in 1967 and 54 in 1976. The new quota policy proposed by the Board would further encourage concentration of producers in this size range. The reduction in market share of XL producers in 1971 was due to the take over of four farms from this category by firm A in 1968.

The producers in XL and XXL size groups (Table 6.4) are few in number and possess a high proportion of the market share. In 1967, they were 12 producers in these groups and possessed 60 percent of the total authorized quota. In 1976, their market share was 58 percent.

Most growers in the S and M size groups are critical of this wide inequality in size distribution. They have labelled the XL producers "Quota Barons". The production interests of XXL integrated firms are not appreciated as well. The independent producers consider primary production the basic right and function of independent family farms.

The current marketing board quota concept was mainly developed to solve marketing and income problems of growers falling in the first three size categories. However, XL and XXL size holders also derive benefits from the high product prices in the regulated marketing system.

In this segment o the industry, another summary measure of market concentration and inequality of firm size is applied. This measure is known as a Lorenz Curve. For this purpose S, M and L size groups are further subdivided into 6,000 square foot size intervals. The XL size group, which ranges from 36,001 to 84,000 square feet of quota is classified into

4 subclasses at 12,000 square foot intervals. This has been done to get more plots on the graph and to minimize the aggregation bias. In this way total authorized quota in 1967, 1971 and 1976 was subdivided into 13, 12 and 12 size groups, respectively. Cumulative percentages of the number of producers and the amount of authorized quota for these size groups were calculated. The data so generated are presented in Appendix D. The data are plotted in Figure 6.2 which provides three Lorenz Curves, one for each of the years considered. As shown in the figure these Lorenz Curves cross one another at certain points depending upon the firm size distribution pattern. Thus a look at the Lorenz Curve does not tell us with certainty whether concentration has decreased or increased from one period to the other. The Gini Coefficient which meausres the deviation between the Lorenz Curve actually observed and the curve of perfect equality was thus applied.[1] The perfect equality curve is the diagonal line shown in the figure and is possible only if all the firms are of equal size. As mentioned elsewhere, the Gini Coefficient is a less precise summary measure than the H-Index. In the present case, it is simply being used to make quantitative assessment of the relative position of the different Lorenz Curves. The calculated values of the Gini Coefficient are .11, .11, and .10 respectively. It shows that market concentration was the same in 1967 and and 1971 then was relatively reduced in 1976. The comparative values of the H-Index were .08, .14 and .07. The latter device is superior because it has depicted the increase in concentration and inequality which ocurred because of acquisition and merger activities in 1968-69. Both the techniques, however, indicated that as a result of the Board's policy

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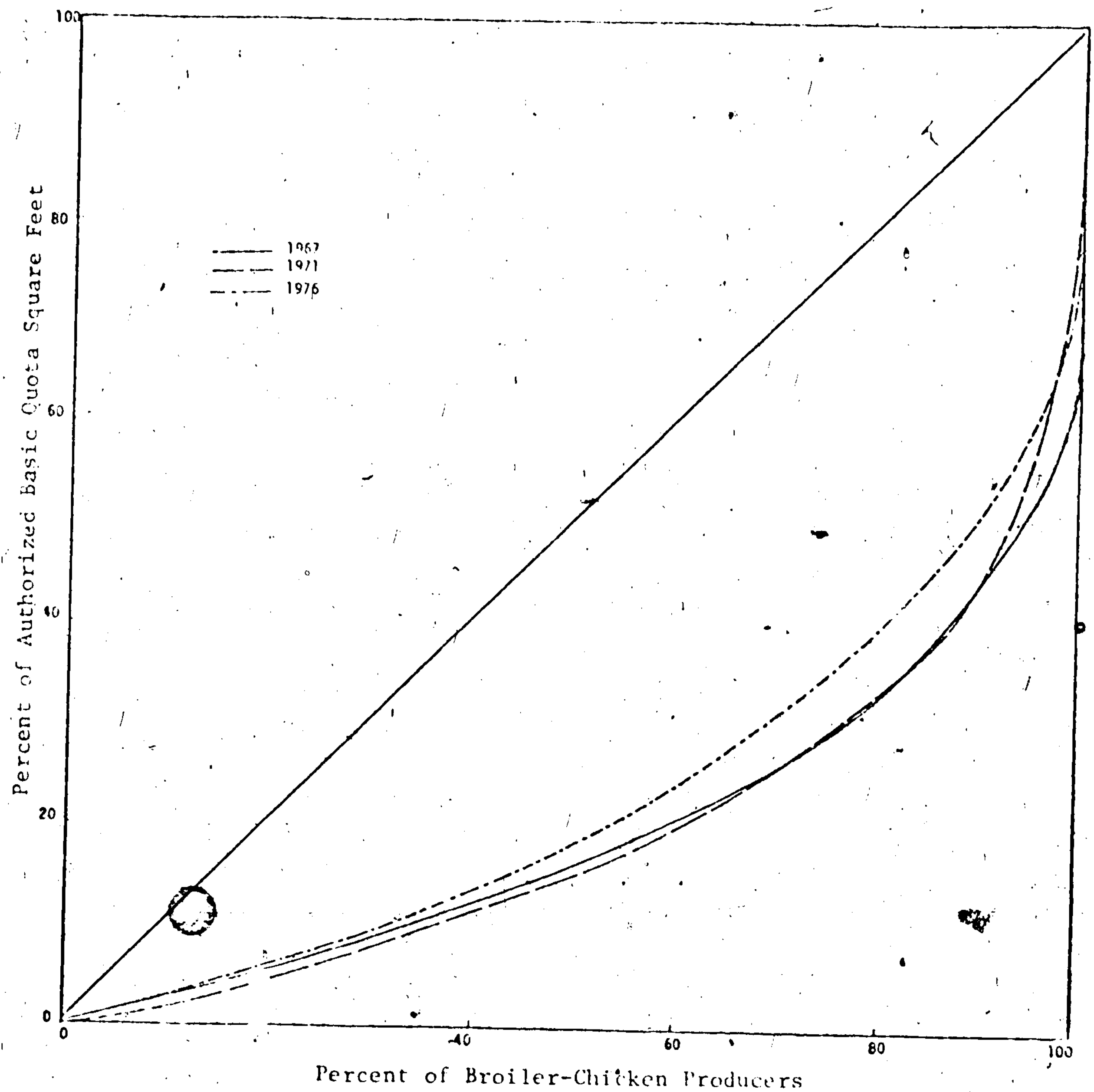
[1] For details on the method of calculating the Gini Coefficient see Appendix F.

Figure 6.2

Lorenz Curves Depicting Market Concentration
In Broiler Production in Selected Years



of allocating quota from the smallest to the largest quota holder, the gap in firm size inequality was narrowed. The Lorenz Curve representing 1976 data exhibits this change in the firm size distribution pattern.

Distribution of Quota Among Independent Growers--The foregoing classification of quota holdings into different size groups is predetermined and arbitrary. The size intervals to develop S, M, L and XL categories were held constant over time.

It has been suggested that the minimum operational unit of 6,000 birds per cycle should be shifted upward to 12,000 birds per cycle.[1] The basis of classification developed below (see Table 6.5) keeps changing with changes in the distribution pattern of holdings over time. To develop four size groups as before, the individual quota holdings of independent growers were arranged in ascending order and cumulative totals of their authorized quota was divided into four equal parts. In this way each size group possessed 25 percent of the market share.

Table 6.5

Size Interval in Square Feet Using Constant Size and Constant Share Methods of Classification

Size Group	Size Interval			
	Constant Size Classification*	Constant Share Classification		
		1967	1971	1976
	(square feet)			
S	up to 12,000	up to 9,000	up to 10,000	up to 12,500
M	12,001 - 24,000	9,001 - 15,600	10,001 - 17,000	12,501 - 18,500
L	24,001 - 36,000	15,601 - 25,000	17,001 - 27,000	18,501 - 31,500
XL	over 36,000	over 25,000	over 27,000	over 31,500

* This remains the same for the three points in time considered in this study.

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1 This point was discussed by the broiler producers at their annual meeting in November 1976. A new quota policy has been proposed to the Council for approval (Appendix C-2).

The size groups developed by using both methods of classification are given in Table 6.5. In the constant share classification, an upward shift in the limits of different size groups is a reflection of new quota allocations to independent growers over the years. Since Board formation, total authorized quota of independent and integrated firms has been increased by 40 percent.

The average holding size, number and percent of producers in each size group using both methods of classification are given in Appendix E. This analysis makes it possible to study the concentration pattern of holdings from two different perspectives.

In both the classifications the average holding size of S producers has increased over years. According to constant share classification, average holding size in all four groups had increased by 1976 in comparison to 1967. This is because two rounds of quota were completed during this period. Two of the holdings of XL group were also sold back to independent producers by the integrated firm.

The class interval of 6,000 square feet was used to show more details about the size distribution pattern of independent growers. The analysis is given in Table 6.6.

Hatchery Segment

In its first year of operation the Alberta Broiler Growers' Marketing Board issued business licenses to 18 hatcheries. The hatcheries were, however, licensed without any consideration of the quality of equipment, service reliability or capacity to meet the commercial needs of the industry. All this was done to minimize criticism from growers and the allied industry while shifting from an open market to a regulated market system.

Table 6.6

Distribution of Authorized Quota Among Independent Producers In Different Years.

Size Group		Authorized Quota Square Feet			Number of Producers		
Square Feet	Class	1967	1971	1976	1967	1971	1976
up to 6,000	S_1	99,500	152,600	142,900	22	26	24
		(8.1)	(11.1)	(7.9)	(24.7)	(25.5)	(21.1)
6,001 - 12,000	S_2	265,100	357,100	273,960	32	39	29
		(21.8)	(26.1)	(15.1)	(36.0)	(38.3)	(25.4)
12,001 - 18,000	M_1	281,900	240,500	419,110	20	16	29
		(23.2)	(17.6)	(23.1)	(22.[illegible])	(15.7)	(25.4)
18,001 - 24,000	M_2	136,800	177,500	283,500	7	9	14
		(11.2)	(13.0)	(15.6)	(7.9)	(8.8)	(12.3)
24,001 - 30,000	L_1	- 0 -	139,900	179,300	-0-	5	7
		(0.0)	(9.6)	(9.9)	(0.0)	(4.9)	(6.1)
30,001 - 36,000	L_2	32,700	129,800	132,400	1	4	4
		(2.7)	(9.5)	(7.3)	(1.1)	(3.9)	(3.5)
over 36,000	XL	401,100	179,700	383,300	7	3	7
		(33.0)	(13.1)	(21.1)	(7.9)	(2.9)	(6.1)
TOTAL		1,217,100	1,369,100	1,814,470	89	102	114
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Note: Figures in brackets are percentages.

Actual experience over that year, however, showed that there were only eight commercial hatcheries. The remaining served the needs of the unregulated small farm flocks. Thereafter these hatcheries were not registered.

Table 6.7 indicates the concentration in hatcheries in 1967, 1969 and 1976. In 1967, firm A had the highest market share with its two hatcheries in Lethbridge and Edmonton. In 1969, this firm bought out the second and third largest hatcheries in Calgary. As a result, 79 percent of the hatching business was under direct control of firm A. The high market share and the pure monopoly in the Calgary market area was considered a matter for consideration by the Board and producers alike.

Since then the market share of firm A has stayed the same. However, a few changes in the firms which shared the remaining 20 percent of the market are noticeable. In 1970, firm C, previously integrated in production, processing and feed manufacturing, also started a hatching operation in broiler chicks through purchase of a private hatchery in Edmonton. The same firm also purchased a turkey poult hatchery in Wetaskiwin. Later, the firm modernized and enlarged this hatchery in order to achieve an efficient size of operation for hatching both poults and chicks. The hatchery operation in Edmonton was subsequently transferred to Wetaskiwin.

As a result of entry and subsequent improvements in the hatching operation by firm C, two independent hatcheries in the Edmonton market area lost their commercial status in the hatching business.

These hatcheries represented as firm P and firm W in Table 6.7, used to supply 10 percent of the provincial market demand in broiler chicks.[1]

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[1] The existence of firm W has not been indicated in the previous study. Board records show commercial hatching in this hatchery for a number of years. Presently it serves noncommercial needs for chicks and poults.

Table 6.7

Concentration and Integration in Hatcheries

Particulars	Percent Market Share 1967	1969	1976
Integrated Hatcheries			
Firm A	36	79	78.4
Firm B*	22		
Firm E	10	10	10.7
Firm C	-	-	9.5
Independent Hatcheries			
Firm S*	20	-	-
Firm P	6	6	-
Firm Q	5	5	0.6
Firm R	1	1	0.8

* Hatcheries B and S were acquired by Firm A in 1968.

Source: Columns 1 and 2: R.R. Hurnanen, "Vertical Integration and Concentration in the Alberta Broiler Industry (Unpublished M.Sc. Thesis, Department of Rural Economy, University of Alberta, Edmonton, 1970), pp. 33-34.

The share of another independent hatchery Q in Calgary had declined from 5 percent in 1968 to less than 1 percent in 1976. In actual practice the firm is not operating its own hatchery. It simply buys the chicks from firm A's hatchery in Calgary and sells to its customers on a commission basis.

All this concludes that vertical integration in hatching facilities has been fostered. The independent hatcheries have either been completely eliminated or reduced to noncommercial status. In 1976, independent hatcheries possessed [illegible]1.4 percent share in comparison to 12 percent in 1969 and 33 percent in 1967.

Corporate firm C, with its modern and high capacity hatchery, has provided direct and conscious competitive rivalry to dominating firm A. This development no doubt has increased vertical integration but terms of trade to independent producers in the Edmonton area have presumably become favourable.

Consequently, in Edmonton and Lethbridge a duopolist market situation between vertically integrated firms prevails. In the Calgary market area, where 40 percent of the total demand for chicks in the province originates, firm A has been the sole monopolist since take over of two hatcheries in 1968. Later on, firm A modernized and expanded the hatching facilities of these acquired firms. Now one of the hatcheries specializes in broiler chicks and the other in turkey poults. The merger activity and improvements and alterations in the operational set up has provided the Calgary market growers with equally efficient and competitive service. Being a cooperative, firm A involves producer interests. However, producers prefer to have at least one alternative for comparative purposes, like their counterparts in the other two market areas (Edmonton and Lethbridge).

The Four Firm Concentration Ratio, the H-Index and the market share of the integrated firms are given in Table 6.8. The statistics indicate that since 1969 market concentration has been stable. Vertical integration, however, has been further increased.

Processing Segment

The processing phase has been instrumental in shaping the economic environment of the Alberta broiler industry before and after the formation of the Board. Both vertical and horizontal integration were primarily

Table 6.8

Indices of Concentration and Integration in Hatcheries

Particulars	1967	1968	1976
Four Firm Concentration Ratio	89.0	99.0	99.4
H-Index	.20	.64	.64
Percent Share With Integrated Firms	68.0	89.0	98.6

motivated and [illegible] by the processing firms.[1] Because of the cause and effect relationship this segment reveals the highest concentration, vertical integration and market power in the industry. Table 6.9 presents the extent of concentration and integration in different years.

As shown in the table, before the merger of firm A and B, three major integrated firms were in possession of 94 percent of the processing business. After the merger in 1968, competition in the province was virtually reduced to a duopoly situation. Since then no change has occurred in the processing market structure. In the Calgary and Lethbridge market areas, firm A holds pure monopoly.[2] In 1976, the Calgary and Lethbridge plants processed 45 percent of the total broiler production in the province. Therefore competitive market conditions exist in only 55 percent of the

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[1] However, there is one exception in that feed manufacturing firm D achieved vertical integration through taking over 50 percent interest in firm B.

[2] After the merger with firm A, processing firm B has retained its identity under the trade name of Pinecrest. Fifty percent of firm B's processing interests are owned by firm D. Through its ownership of the remaining 50 percent, firm A presumably influences processing, sales and pricing decisions of the firm. Retention of the trade name is mainly to make use of the earned goodwill and distributive links.

Table 6.9

Concentration and Integration in Processing

Particulars	Percent Market Share		
	1967	1971	1976
Integrated Firms			
Firm A*	34.0		
Firm B	43.0	75.9	79.2
Firm C	17.0	19.4	18.1
Firm E	3.0	2.7	-
Independent Firms M & V**	3.0	2.3	2.7

* In 1967, processing facilities were owned by an integrated firm (firm F).

** The independent firm, V, started a smallscale processing operation in 1972. In 1976, this firm had only 0.[illegible] percent of the market share.

Source: Column 1: R. R. Hurnanen, M. H. Hawkins and T.W. Manning, Vertical Integration and Concentraion in the Alberta Broiler Industry, Research Bulletin 8 (Edmonton: Department of Rural Economy, University of Alberta, August 1970), p. 13.
Column 2: J. Copeland and M. H. Hawkins, Orderly Marketing in the Alberta Broiler Chicken Industry, Applied Research Bulletin 18, (Edmonton: Department of Rural Economy, University of Alberta, Fall, 1976), p. 7.

Table 6.10

Indices of Market Concentration and Integration in Processing

Particulars	1967	1968	1971	1976
Four Firm Concentration Ratio	97	100	100	99.4
H-Index	.33	.62	.62	.66
Percent Market Share with Integrated Firms	97	97	97.7	97.3

processing business. The measures of market concentration and integration exhibit the results as shown in Table 6.10.

Broiler Feed Manufacturing Segment

Concentration and vertical integration in the broiler feed manufacturing segment is presented in Table 6.11. Because of the oligopolistic interdependence of feed manufacturing firms, competitive rivalry exists between them. This is the most competitive segment of the broiler producers' factor product markets. It seems [illegible] complete elimination of contract integration and reduction of ownership integration has contributed to furthering the competition in the broiler feed industry. An inverse relationship of vertical integration in production and competition among the feed suppliers is observable from changes in their market shares over time. The Four Firm Concentration Ratio in 1967 was 90 percent and in 1976 it was 77 percent.

The total market share of integrated firms in the broiler feed business has declined over the years. At the [illegible] of an unregulated broiler market, the contract growers were under an obligation to buy feed from the parent firm. This practice used to put the independent feed suppliers at a disadvantage. In recent years the situation has changed. Two of the independent firms have gained 35 percent of the market in ten years of Board operation.

On the other hand, integrated firm D, a leader in 1967-68, has lost 50 percent of its market share. Another firm, F, one time an important factor in the broiler industry, has been out of poultry feed manufacturing since 19[illegible].[1] In 1967, this firm held 25 percent of the feed busi-

[1]Firm F sold its growing and processing facilities to firm C in October, 1968.

Table 6.11

Concentration and Integration in Broiler Feed Manufacturing

Particulars	Percent Market Share 1967	1968	1976
Integrated Firms			
Firm C	17	15	22.0
Firm D	41	40	20.6
Firm E	7	8	3.1
Firm F	25	20	-
Firm V*	-	-	4.1
Firm N	-	-	4.7
Independent Firms			
Firm U	2	10	24.3
Firm O*	-	-	13.2
Firm G	2	[illegible]	0.7
Firm H	[illegible]	2	0.8
Others	2	1	6.5
TOTAL	100	100	100.0

* These firms were in the broiler feed business in 1967 and 1968. They held minor shares of the market and were thus accounted for under the heading 'others' as shown in the table.

Source: Columns 1 and 2: R.R. Hurnanen, M.H. Hawkins and T.W. Manning, Vertical Integration and Concentration in the Alberta Broiler Industry, Research Bulletin 8 (Edmonton: Department of Rural Economy, University of Alberta, August 1970), p. 12.

ness; a year later this was reduced to 20 percent.

In recent years a new integrated firm has entered the broiler feed business. In 1976, the market share of the firm was 4.7 percent. The market share of the firm is likely to increase after overcoming the initial operational and distributional cost disadvantages. The following table implicitly indicates that as a result of the growing competitive position of independent producers, competition between feed dealers has also increased.

Table 6.12

Indices of Market Concentration and Integration in Feed Manufacturing

Particulars	1967	1968	1976
Four Firm Concentration Ratio	90	85	77
H-Index	.27	.24	.18
Percent Market Share with Integrated Firms	90	83	55

CHAPTER VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

With respect to market concentration and vertical integration in the Alberta broiler industry, Hurnanen, et al.,[1] derived the following conclusions in their 1970 study:

1. A very high concentration at the processing and hatching stages.
2. A high degree of market power exhibited by one firm through its integrated structure.
3. A producer marketing board that is slowly losing its bargaining power through processor acquisitions of growing facilities.

In light of the above conclusions and considering similar factors which have prevailed in the industry, a review of the present situation, as a comparative static analysis, can be made.

The present analysis indicated the following results. Market concentration in processing and hatching facilities has not changed materially. A high degree of vertical integration in hatching has, however, been further increased by entry of firm C, the second largest firm in the broiler industry.

The rapid expansion in size of operation which the integrated firms achieved through mergers and acquisitions in 1968 has not been repeated in any segment of the industry. The market power so achieved has, however, been maintained and improved through internal growth, especially in processing and hatching facilities.

Integrated firm A, a cooperative, is still the industry leader. In processing as well as hatching operations, it represents 80 percent of

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[1] R.R. Hurnanen, et al., Op. Cit., p. 25.

the market share. In production, its market share has, however, declined from 37 percent in 1969 to 25 percent in 1976.[1] Half of this 12 percent reduction in the market share of firm A is the direct result of quota policies of the Board and the remaining half is due to a change in the firm's attitude towards broiler production.[2] As observed in the base study, processors' direct control on production was 44 percent in 1969. This was reduced to 30 percent by 1976. The present market situation thus indicates that the Board has adequately regained its lost bargaining power in production. The Board has also succeeded in narrowing the inequality gap in size distribution, between independent producers. This has been achieved through planned entry of new growers and priority basis of quota allocations from the smallest to the largest size holders.

In feed procurement, reduction in vertical integration and stability in market conditions have improved the bargaining position of the growers. This is due to the improved competitive position of the independent firms in comparison to the integrated firms.

A comparative picture of the market concentration and vertical integration of the four segments at different points in time is presented in Table 7.1. The values of the index measures indicate that Board opera-

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[1] As explained elsewhere, in the case of primary production market share stands for the share in the basic authorized quota. In actual production, firm A's share was 23 percent instead of 25 percent. This is because in recent years, on average, 7 percent of the total broiler production in the province come from permit growers. The permits for raising broilers are mainly issued to the independent growers. Firm A voluntarily does not avail of the permits.

[2] Firm A made a commitment to sell 180,000 square feet of the basic quota it bought from independent producers after the formation of the Board. Sixty-two percent of the quota so acquired was sold to independent growers in the late fall of 1976.

Table 7.1

Extent of Vertical Integration and Concentration in Different Segments of the Industry

Particulars	Percent of Market Share			
	1967	1969	1971	1976
Vertical Integration:				
Production: Ownership Integration	36.[illegible] (3)	44.2 (2)	40.7 (2)	31.3 (2)
Contract Integration	30.0 (4)	13.5 (3)	n.i.*	0.0 ([illegible])
TOTAL	68.8	57.7	40.7	31.3
Hatcheries	68.0 (3)	89.0 (2)	n.i.	98.6 (3)
Processing	97.0 (4)	n.i.	97.7 (3)	97.3 (2)
Feed Manufacturing	90.0 (5)	83.0 (5)	n.i.	54.5 (5)
Four Firm Concentration Ratio:				
Production	41.2	50.7	46.7	37.0
Hatcheries	89.0	99.0	n.i.	99.4
Processing	97.0	100.0	100.0	99.6
Feed Manufacturing	90.0	85.0	n.i.	77.0
H-Index				
Production	.08	.15	.14	.07
Hatcheries	.20	.64	n.i.	.64
Processing	.33	.62	.62	.66
Feed Manufacturing	.2[illegible]	.24	n.i.	.18

Note: Figures in brackets are number of integrated firms.

* n.i. represents, no information.

tions reduced concentration and integration in production and feed manufacturing. In processing and hatching operations concentration and integration remained [illegible]. Market concentration and integration in these segments have been relatively high in Albert[illegible] are not peculiar to the Canadian poultry industry. In 1961 there were 205 processing establishments in Canada, their number was reduced to 95 by 1974. The same is true in the case of hatcheries.[1]

The following are the main reasons for the high market concentration. In the Province of Alberta, the cooperative character of the dominating firm (A), economies of scale and limited market area are the major factors attributable to the high market concentration in these segments. As oligopoly theory predicts, vertical structure of the firms, in presence of the above factors, seems to pose a formidable barrier to entry of new firms.

The policies and needs of the Board in a regulated market system have also encouraged concentration in these segments. The Alberta Board believes that the established distributive links and the patented product of the big firms are conducive factors for market expansion. The export potential of the industry has been in the range of 12 to 14 percent throughout the years of Board operation. In the case of administered prices a correct assessment of the market demand at short intervals of time is normally required for making adjustments in supply. The Board considers the few big firms to be in a better position to assess their market re-

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[1] For details see: J.T. Hill, "Structure and Concentration in the Canadian Poultry Meat Industry," Canadian Farm Economics, Vol. 1, No. 2 (June 1966), pp. 5-1[illegible]; Statistics Canada, Op. Cit., p.4.

quirements and to keep inventory stocks within manageable limits.

For purposes of policing placements and marketings by individual producers, the fewness of firms is also considered an easier, efficient and accurate alternative for generating weekly market planning data. The above need for market information along with other business tactics of the firms to reduce competition seem to have contributed towards high market concentration.

The growers are interested in obtaining the maximum product prices that can be supported by the market and the cost conditions. The concentrated processor segment, which has interests in production as well, is considered conducive to counteracting the relatively high market power of retailers.

Market Concentration and Firms' Behaviour

The licencing and other regulatory powers of the Board are likely to get competitive and efficient service even from a highly concentrated market structure. A purely structural static model which ignores the conduct of oligopolistic firms is incapable of predicting true market behaviour. Economic theory and empirical evidence, however, show that a high market share with few firms, as in the present industry, can lead to tacit collusion and entry barriers. The stability of firm A's market share is indicative of this behaviour. This, as economic theory predicts, indicates lack of competitive rivalry and existence of above normal profits.

According to Shepherd,[1] the security and relatively high profits

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[1] Willard G. Shepherd, Market Power and Economic Welfare: An Introduction (New York: Random House Inc., 1970), p. 51.

gained by monopoly position may permit and encourage the firm to slacken or develop other forms of inefficiency in the usual business sense. Co-operative firms, with their immunity from the Anti-Combines Act, are prone to this kind of slackness. In this regard, the previous study stated that "at present levels of concentration in hatching and processing facilities, little improvement in operational efficiency can be expected from high concentration. Additional control over the local industry by firm A would invite deterioration of exchange efficiency."[1]

The following reasons can be cited regarding the Alberta broiler growers' non-support of the proposed National Chicken Marketing Agency. The Alberta Board, so far as operational efficiency and business approach to meet local demand are concerned, can be highly rated in Canada. Some of the natural and economic factors are, however, in favour of the industry. The Province of Alberta held 5.4 percent of the Canadian market in 1968 and 6.2 percent in 1974. A faster growth rate in market demand is mainly caused by impersonal market forces such as growth in population and per capita disposable income. Keeping in view the cost structure, chicken prices in the Alberta market are competitive with the rest of Canada. The cost reductions resulting from full capacity operations are, however, not passed on because of monopoly powers in price setting. The following three main factors contribute towards economic rent to broiler growers from their business operations.

1. Operational efficiency through full capacity use of the existing facilities.

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[1] R.R. Hurnanen, et. al., Op. Cit., p. 1.

2. Monopoly powers in price setting and supply adjustments.

3. Natural and economic factors of comparative advantage.[1]

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[1] The freight rate on inbound goods is relatively higher than that on outbound. In Alberta population and per capita disposable income are growing faster than in the rest of Canada. There are comparative locational advantages to Alberta wholesalers to supply the product in adjoining parts of B.C., the Yukon and Northwest Territories. These factors are major considerations for broiler producers who feel they may lose or will not be able to fully benefit from them after joining the national marketing plan.

Recommendations

With respect to the structural variables considered in the study, market developments in the production and feed manufacturing segments have been constructive. In the case of the processing and hatching segments, however, the duopoly and triopoly market situation with asymmetry and stability in the market shares of the firms involve implications of long term market growth and resource allocation. Recommendations for consideration by the Board are therefore made concerning these segments.

In both segments, high market concentration has been maintained by internal expansion. The maintenance and expansion of market shares using internal growth strategy is considered a desirable form of market development. This is because it maintains and improves competition and efficiency. In the highly concentrated segments the implications are, however, conjectural. Since the inception of the Board, the volume of broiler business has almost doubled. This increase has been primarily absorbed by the highly concentrated firms. In particular, firm A has maintained its 80 percent market share in processing and hatching operations. This matter should be reviewed by the Board.

The Board presently needs to think about the future direction of the industry. In the Calgary and Lethbridge market areas, where growers literally have no alternative, patronization of a cooperative is a matter of compulsion rather than economic choice. The Board thus needs to outline a program to encourage entry of new processing and hatching firms in these market areas. Keeping in mind the vertical structure of firm A and its possession of four-fifths of the total market share, the successful introduction of a new firm will not be an easy task. The Board, however, will have to take the initiative sooner or later in the best interests of the industry. The Board, with the support of the Alberta Agricultural Products Marketing Council, can make use of its market regulatory power to encourage entry of new firms.

Orderly planning in this direction would provide the Board with greater equality in bargaining power in the coming years. Economic theory and empirical evidence suggests that high business concentration and implied monopoly power can prove detrimental at any time. In this regard, a previous study states that company officials and policies change over time, and these changes may be either beneficial or detrimental to the industry. The possession of a large degree of market power may tempt someone, sooner or later, to use that power for a particular advantage.[1]

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[1] Hurnanen, et al., Op. Cit., p. 16.

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APPENDIX A

QUESTIONNAIRE TO BROILER GROWERS IN ALBERTA

(Note: Information will be treated confidentially for research purposes only).

Name ________________ Postal Address ________________

Market area you are in: Edmonton ____ Calgary ____ Lethbridge ____

How long have you been a broiler grower? __________ (Number of years)

Do you grow broilers on a seasonal ___ or year round ___ operation?

What percentage of your total net income is derived from broiler production? _____%

Total square feet of authorized quota in your possession ______1975 ________1976.

A. You entered the regulated broiler marketing system by:

(i) Quota allotment by your Board: Year 19__ Authorized quota __________sq. ft.

(ii) Purchase of facilities: Year 19__ Authorized quota __________sq. ft.

(iii) Leasing of facilities: Year 19__ Authorized quota __________sq. ft.

(iv) Some combination of above three: TOTAL QUOTA __________sq. ft.

B. Some Information about other segments of the broiler industry you deal with:

Industry Segment*	Information pertaining to: Yr. of first quota		1975		1976	
	Source	%	Source	%	Source	%
Name of your usual hatchery(s) I						
II						
Financing of chicks by:						
Hatchery						
Bank						
Self (cash)						
Name of usual processor (s) I						
II						
Your usual feed dealer(s) (Trade name and address) I						
II						
Financing of feed by:						
Feed dealer						
Bank						
Self (Cash)						

* If you have indicated more than one source of chicks, feed and financing, please indicate the percentage obtained from each source.

C. More information about your experiences in the broiler industry:

Have you ever been a contract grower? Yes ___ No ___

If yes, which years? 19 ___ to 19 ___

With whom? ___

Have you ever refused quota offered to you? Yes ___ No ___

If yes, give reasons for not using the opportunity. ___

___

D. Financing of broiler barns and equipment:

(i) Initial facilities ___ sq.ft. Year of Construction 19 ___.

Financing provided by: Feed dealer ___ Bank ___ F.C.C. ___

Any other ___.

Interest rate ___ Repayment schedule, etc. ___

(ii) Additions or renovations (if any) Year 19 ___

Financing provided by:

Feed dealer ___ Bank ___ F.C.C. ___ Other ___

Interest rate ___ Repayment schedule, etc. ___

E. Also indicate your opinion about the following aspects:

(1) Prefer replacement cycle: 9 weeks ___ 10 weeks ___ Combination ___

(2) Performance of your Board: Poor ___ Fair ___ Good ___ Excellent ___

(3) Proposed national agency: In favor ___ Not in Favor ___ Undecided ___

Will accept whatever Board decides ___

NOTE: PLEASE RETURN THE QUESTIONNAIRE AS SOON AS POSSIBLE

THANKS FOR YOUR ASSISTANCE

G.S. KHERA, Research Assistant
Department of Rural Economy
University of Alberta
Edmonton, Alberta

APPENDIX B[1]

BOARD REGULATIONS FOR EFFECTIVE SUPPLY MANAGEMENT IN THE BROILER INDUSTRY

Appendix B-1

1. Basic Quota Control

a) Basic Quota Allocation:[2]

8 (2) Where the Board considers that the general marketing conditions warrant that a further marketing quota should be established, the Board shall consider all applications received and may consider the following:

The existing or proposed production facilities of the applicant.

(3) Where further marketing quota is established, it shall be allocated in the following manner:

65% shall be offered as increases to applicants who hold existing quotas.

35% shall be offered to new applicants providing always that no new single applicant shall receive an initial quota in excess of 6,000 broilers per production cycle when the quota is established at 100%.

b) Quota transfers:

11 (1) No registered producer may transfer all or any part of a marketing quota.

(2) No remuneration shall be paid or received by any person in consideration of the alloting or the fixing of a marketing quota, and no

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[1] Extracts from Province of Alberta, "Alberta Regulations, 354/72," The Alberta Gazette, Vol. 68, No. 23 (December 15, 1972), pp. 1125-1136.

[2] See: Appendices C-1 and C-2 for more details on quota policies of the Board.

marketing quota may either directly or indirectly be bought, sold or leased.

(3) Notwithstanding anything contained in these regulations, where a registered producer intends to sell, lease or otherwise assign any production facilities in respect of which a marketing quota has been allotted herein, and the purchaser, lessee or assignee wishes to engage in the marketing of the regulated product, the Board may cancel the marketing quota of the registered producer so selling, leasing or otherwise assigning and may at their discretion allot to the person so acquiring the premises a marketing quota in respect of those premises.

(4) If a quota is allotted it may be the same as, or greater, or smaller, than the quota previously issued in respect of those premises.

(5) An application under subsection (3) of this section shall be made prior to the completion of the sale, lease or assignment of the premises, but if approved, the new quota shall not take effect and the old quota shall not be cancelled until the completion of the transaction and the filing of such proof of the completion of the transaction as the Board may require.

(6) Where a marketing quota has been issued in the name of a limited company, the Board may revoke the quota if there is a change in the beneficial ownership of all or any part of the shares in that company.

Appendix B-2

2. Marketing Quota Control

10 (1) Notwithstanding the provisions of section 9, the Board may vary the marketing quota from time to time as warranted by a change in the marketing conditions, and thereby lower or increase the limit on the number

of birds in each approved building that may be marketed by a registered producer through the regular marketing channels.

(2) Any changes in the marketing quotas made by the Board pursuant to this section may be stated in terms of a percentage of the authorized number of square feet in the [illegible] approved buildings from any placement made after a specified date unless otherwise authorized in writing by the Board prior to the placement of chicks.

(7) No registered producer may alter his authorized replacement cycle as established from time to time by the Board without obtaining prior written approval from the Board.

(8) A registered producer shall give the Board four (4) weeks written notice before discontinuing the production of the regulated product pursuant to his authorized replacement cycle.

(10) No registered producer shall market broilers except as are produced in the authorized growing premises in respect of which his marketing quota was allotted unless otherwise authorized in writing by the Board.

(12) In addition to any other grounds set forth herein, the Board may cancel or vary a marketing quota where the registered producer to whom it was allotted;

(a) has failed to observe, perform or carry out the provisions of the Act, these Regulations, any lawful order of the Council or the Board.

13 (1) No person shall be entitled to market, process, pack or store, cause or permit to be marketed, processed, packed or stored any of the regulated product for consumption or resale within the Province of Alberta except pursuant to a marketing quota, permit or exemption granted by the Board.

14 (1) Every processor who receives, processes and markets the regulated product shall comply with directions given from time to time by the Board.

a) Data Requirements - weekly reports

14 (2) Every licensed processor shall prepare a statement at the end of each week showing the name, address and registration number of each registered producer from whom he received the regulated product, the number of broilers received, the number of pounds liveweight of the regulated product paid for, the price paid therefor and the amount of service charge deducted for the account of the Board for each registered product.

(3) The statement referred to in subsection (3) of this section and the monies so collected shall be forwarded in time to reach the Board office not later than Wednesday of the week next succeeding.

16 (1) Every licensed hatcheryman shall prepare a statement at the end of each week showing the name, address and registration number, if allotted, of each person to whom he has placed, sold or delivered the regulated product, the number of broilers paid for, the number of spares delivered free, and the date on which each individual shipment or delivery was made to each person, and this statement shall be forwarded in time to reach the Board office not later than Wednesday of the week next succeeding.

(3) Every licensed processor and every licensed wholesaler shall prepare a statement at the end of each week showing in pounds the amount of broilers imported from outside the Province, the amount of broiler exported to points outside the province of Alberta, and the amount of the regulated product held by him in inventory regardless of where the said inventory is held within the Province of Alberta, and this statement

shall be mailed in time to reach the Board office not later than Wednesday of the week next succeeding.

Appendix B-3

3. Issue Licenses and Raise Funds

a) Issue Licenses:

2 (1) No producer shall be issued a marketing quota or a marketing permit without first having been registered with the Board for the current year.

(2) Any producer shall apply to be registered with the Board upon receiving a request to do so by the Board.

3 (3) No Licence may be issued to a producer unless the producer is a registered producer.

4 (1) A separate licence shall be obtained for each premise, building, or place of storage operated, provided that in the case of a registered producer, one licence only shall be required for each business unit.

(2) Every licence issued by the Board shall expire on the 31st day of December of the year issued.

(3) Where any person operates in more than one capacity as registered producer, processor, trucker, warehouser, wholesaler, or hatcheryman, he shall apply to the Board for a licence for each such capacity and shall comply with all requirements of the Board that apply to his operation in each such capacity.

(4) No licence issued by the Board may be transformed.

6 (2) The Board may suspend, revoke or refuse to renew a licence for failure to observe, perform or carry out the provisions of the Act, the regulations, the Plan or any lawful order or direction of the Council or the Board.

7. No person may commence or continue to engage in the marketing or processing of broilers in the Province of Alberta, including a producer, processor, trucker, warehouser, wholesaler, or hatcheryman unless that person is the holder of the appropriate licence issued by the Board.

b) Raise Funds

5 (1) Each registered producer shall pay to the Board a service charge of one-fifth of one cent per pound of liveweight broilers marketed.

3 (4) No licence fee shall be payable to the Board by a processor, trucker, warehouser, wholesaler or hatcheryman.

APPENDIX C

QUOTA ALLOCATION POLICIES OF THE BOARD

Appendix C-1

Quota Allocation Policy of 1972[1]

No new quotas were allocated for first marketing in 1972. New quotas had been allocated in the previous three years. In view of the slow sales growth and interprovincial marketing situation in effect in 1971, the Board decided not to allocate new quotas for first marketing in 1972. The decision to allocate and notification to growers is done the year before quotas are allocated.

Market conditions improved in 1972, therefore the Board decided to increase the quota by about 8% in 1973. Offerings have been made to 13 potential new growers and to about half of the existing registered growers for a new or increased quota allocation to come into effect sometime in 1973. The exact date of the new allocation will be set according to market conditions.

The Board reviewed its quota allocation policy at the request of the Alberta Agricultural Products Marketing Council. Following the reivew the Board decided to revise the policy.

Many hours in and out of Board meetings by all Board members were expended in developing what is hoped is a fair quota allocation policy. The 1973 new quota allocation will be made according to the following policy as approved by the Alberta Agricultural Products Marketing Council.

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[1] Extracts from The Alberta Broiler Growers' Marketing Board, The Sixth Annual Report (Edmonton: ABGMB, November 19, 1972), pp. 9-10.

Marketing quotas will be offered according to the policy that follows but before quota is issued one square foot of suitable growing space per unit must be available in the case of broiler chicken and one-half square foot for roaster chicken. Growers will be given a reasonable period of time to construct this space before a quota offering is withdrawn. The length of time will depend upon the time of year, the circumstances of the individual and the need for the product.

Growers will be offered either broiler chicken or roaster chick n quota but not both at the same time. Some growers who have a broiler chicken quota will be offered a roaster chicken quota, however, the Board will attempt as much as is practical to keep production facilities for the two classes of chicken separate for disease control considerations.

Initial roaster chicken quotas will be allocated on a regional basis, according to the estimated demand for product in the three market centres of Lethbridge, Calgary and Edmonton. No regional considerations will be taken into account in offering broiler chicken quota.

Initial offerings of roaster chicken quota will be made to growers who have marketed roaster chicken under permit to the Board on a regular basis for the past three years. Initial offerings to these growers will be based on the historic production of these growers.

All other new quota offerings will be made to two classes of growers as market conditions warrant in the following manner:

A. Quota Allocation to New Growers

At least 35% of the total of each allocation (broilers plus roasters) to be offered to new growers as follows:

(1) In lots of 6,000 square feet:

This will allow the marketing of 6,000 broiler chickens or 4,000 roasting chickens per cycle when the marketing quota is set at 100%.

(ii) In order of application received in the Board Office beginning at the commencement of Board operations. In the case of roaster chicken quota, location will also be taken into account. As the time of offering or within a reasonable time thereafter (at the discretion of the Board), the successful applicant must:[1]

(a) own the farmland and facilities where he will raise the regualted product, or else have a long term lease agreement for the buildings in which the birds will be raised.

(b) have facilities entirely separate from any other facilities used to raise the regulated product by any other registered grower.

(c) derive his major net income from farming or satisfy the Board that he will eventually derive his major net income from farming.

B. Quota Allocation to Existing Growers

Priority rating for the balance of each quota to existing quota holders:

in lots of 3,000 square feet offered in the following order:

(i) Growers with quota allocations continuously since 1966 presently less than 10,000 square feet in order from smallest present quota under 10,000 (16 growers).

(ii) Growers who accepted their first quota in 1969 (7 growers).

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[1] If a potential new grower is unable to satisfy these requirements, the Board in its discretion will either remove his name from the list of applicants or leave it on with no change in numerical position for future consideration.

(iii) Growers at more than 10,000 square feet and less than 15,000 square feet in order from smallest present quota (21 growers).

(iv) Growers who accepted their first quota in 1970 (7 growers).

(v) Growers at more than 15,000 square feet and less than 20,000 square feet in order from smallest present quota (13 growers).

(vi) Growers who accepted their first quota in 1971 (7 growers).

(vii) Remaining growers in order from smallest to largest except those who are owned in whole or in part or effectively controlled by a company or individual that has been allocated more than 3% of the total of all outstanding quota at the time quota is offered (14 growers).

C. General Rules

(i) Each time quota increases are offered, present quota holders have not taken advantage of a previous offer will be given the opportunity to take up these previous allocation offers. Notwithstanding this, no grower will be allowed to accept more than two offerings at any one time.

(ii) The total amount of quota offered will depend upon anticipated market demands and will be at the discretion of the Board.

(iii) In the event of any change in ownership or lease agreement, the quota affected automatically reverts to the Board. The Board in its discretion may or may not reallocate the quota to the present or the new owner or lessee.

(iv) Marketings from new quota allocations are to commence at a time the Board considers is warranted by market conditions.

As well as increasing the broiler quota base, the Board is embarking on a regulated roaster chicken (birds over 5 and 1/2 lbs. liveweight) program. Roaster chicken marketing quotas will also be allocated according to the new policy.

APPENDIX C-2

THE PROPOSED QUOTA ALLOCATION POLICY OF 1976[1]

A. Round Three[2]

1. Continue the third round of quota increases with an offering of 3,000 square feet to each grower in order as listed on the Board's priority list. The first offering will be to the grower with priority listing number 22. Nos. 1-22 have received offers for an increase in 1976.
2. Growers with a credit outstanding will be given the opportunity to use that credit only when they are offered a quota increase. The maximum increase allowable will be 6,000 square feet including credit and new offering. Offerings not accepted will be issued as a credit for possible use the next time the grower is offered a quota increase.
3. No grower will be offered a quota increase if he currently has allocated a total of 3% or more of the outstanding quota.
4. No new growers will be offered quotas in round three.

B. Round Four

1. Priority listing to be reworked to a strictly numerical order beginning with the smallest quota holder and ending with the largest quota holder that has less than 3% of the outstanding quota. In the case of identical allocation, ratings will be adjusted with

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[1] This policy is subject to approval by the Alberta Agricultural Products Marketing Council. Source: The Alberta Broiler Growers Marketing Board, The Tenth Annual Report (Edmonton: ABGMB, November, 1976), p. 9.

[2] The growers who were alloted quota at the time of Board formation in 1966 have received two rounds of quota offers up to 1974.

preference to the grower who placed chicks under quota for the first time on the earliest date.

2. After all growers have had the opportunity to expand to 12,000 square feet, 35% of the total of each quota allocation will be offered to new quota applicants from the Board's application list. Ground rules for eligibility to be decided prior to the next offering to new applications.

3. New growers will be offered quotas of 6,000 square feet plus a special credit of 6,000 square feet. The new grower will be given the opportunity to make use of the special credit each time there is a general quota increase. When the new growers reach 12,000 square feet they will be considered as existing growers and placed in numerical order on the Board's priority list for quota increases. All growers that now have quotas should then have had the opportunity to have an allocation of at least 15,000 square feet.

APPENDIX D

CUMULATIVE PERCENTAGE OF PRODUCERS AND AUTHORIZED BASIC QUOTA FOR DIFFERENT SIZE GROUPS

Quota Square Feet	1967 % of Quota	1967 % of Producers	1971 % of Quota	1971 % of Producers	1976 % of Quota	1976 % of Producers
Independents						
up to 6,000	5.2	23.9	6.6	25.0	5.4	20.6
up to 12,000	19.0	58.7	22.1	62.5	15.8	45.6
up to 18,000	33.6	80.4	32.5	77.9	31.6	70.6
up to 24,000	40.7	88.0	40.2	86.6	42.3	82.6
up to 30,000	40.7	88.0	45.9	91.4	49.1	88.6
up to 38,000	42.4	89.1	51.5	95.2	54.1	92.1
up to 48,000	46.7	91.3	53.6	96.1	58.8	94.7
up to 60,000	54.9	94.6	55.9	97.0	63.0	96.4
up to 72,000	54.9	94.6	55.9	97.0	65.7	97.3
up to 84,000	63.2	96.8	59.3	98.0	68.7	98.2
Integrators						
up to Firm C	68.8	97.9	64.1	99.0	75.1	99.1
up to Firm A	82.1	99.0	100.0	100.0	100.0	100.0
up to Firm B	100.0	100.0				

APPENDIX E

AVERAGE QUOTA HOLDING, PERCENT MARKET SHARE AND PERCENT OF INDEPENDENT PRODUCERS IN DIFFERENT SIZE GROUPS

Size Group	Constant Size Classification 1967	1971	1976	Constant Share Classification 1967	1971	1976
	Average Quota Holding Square Feet					
S	6,750	7,840	7,860	6,000	7,040	8,140
M	15,500	16,700	16,350	12,200	12,140	15,640
L	32,700	29,000	28,300	21,740	20,700	23,900
XL	57,300	59,900	54,760	43,740	35,400	45,400
AV	13,680	13,400	15,900	13,680	13,400	15,900
	Number of Producers					
S	54 (30.0)	65 (37.2)	53 (23.0)	43 (25)	50 (25)	56 (25)
M	27 (34.4)	25 (30.5)	43 (38.7)	25 (25)	29 (25)	29 (25)
L	1 (2.7)	9 (19.1)	11 (17.2)	14 (25)	16 (25)	19 (25)
XL	7 (32.9)	3 (13.2)	7 (21.1)	7 (25)	7 (25)	10 (25)
TOTAL	89 (100)	102 (100)	114 (100)	89 (100)	102 (100)	114 (100)

Note: Figures in brackets are percent of market share held by producers in each size group.

APPENDIX F[1]

ESTIMATION OF GINI COEFFICIENT USING LINEAR APPROXIMATION METHOD

The Gini Coefficient is the ratio of the area between the Lorenz Curve actually observed and the diagonal line (area C in Figure F.1) to the triangular area beneath of diagonal (area C + N in Figure F.1).

$$\therefore \text{Gini Coefficient} = \frac{C}{C+N}, \quad \text{where } C + N = 5000$$

$$= 1 - \frac{N}{5000}$$

The Gini Coefficient can be calculated by estimating area N. The mathematical derivation of N in our example will be equal to:

$$\sum_{i=1}^{m} \frac{1}{2} (P_{i+1} - P_i) \quad (Q_{i+1} + Q_i)$$

where: P_i is the cumulative percentage of broiler producers in the lowest quota size group.

Q_i is the cumulative percentage of the quota in possession of the lowest quota size group of broiler producers.

m is the total number of size groups, and

$P_1 = Q_1 = 0$.

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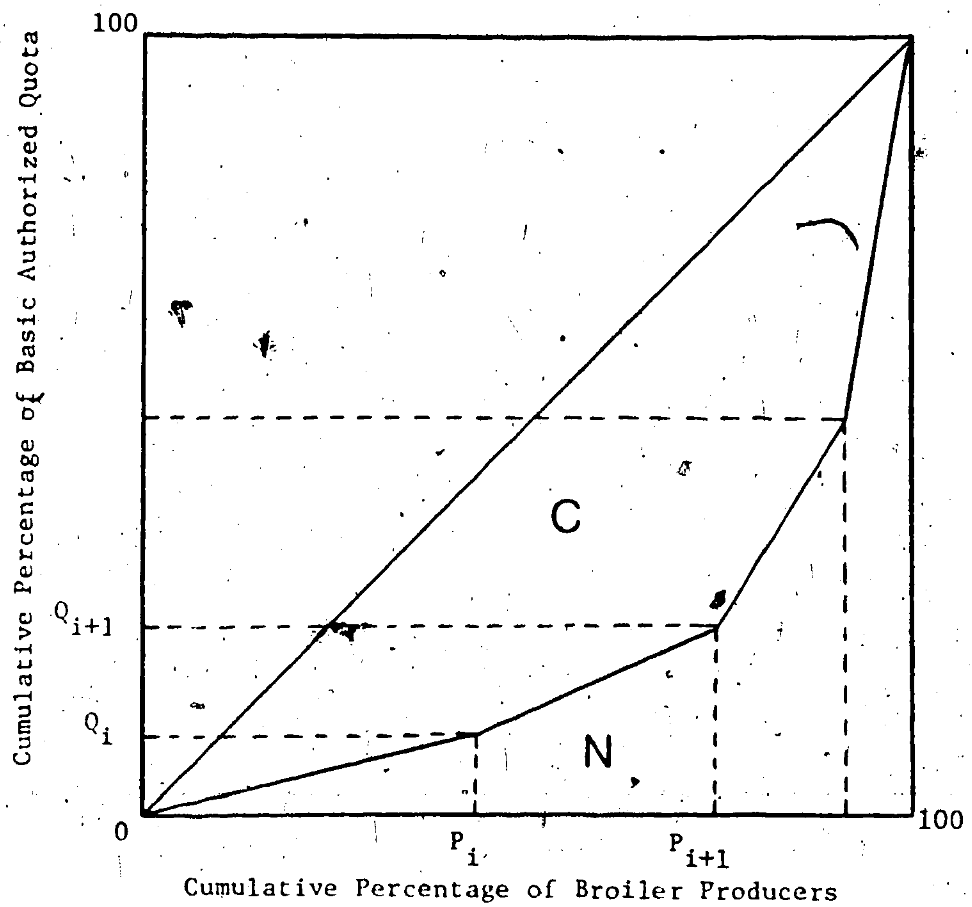
1 The contents given in this Appendix are mainly derived from: Augustine, Y. Bobe, "Income Distribution in Malawi." (Unpublished M.SC. thesis, Department of Rural Economy, University of Alberta, Edmonton, 1976).

Figure F.1

LINEAR APPROXIMATION OF THE GINI COEFFICIENT



The area of N can thus be calculated by estimating the area of m trapeziums. Area of a trapezium = $\frac{1}{2}$ (distance between parallel sides of trapezium) (sum of the parallel sides of trapezium).

In our example, the distance between the parallel sides of the trapezium will be equal to the difference between the percentage of broiler producers in two adjacent size groups. In notation form, that can be indicated as:

$$P_{i+1} - P_i$$

The sum of the parallel sides will be equal to the total of the percentages of quota in two adjacent size groups. In notation form that means:

$$Q_{i+1} + Q_i$$

$$N = \sum_{i=1}^{m} \frac{1}{2} (P_{i+1} - P_i)(Q_{i+1} + Q_i), \text{ and the Gini Coefficient}$$

$$= 1 - \frac{\sum_{i=1}^{m} (P_{i+1} - P_i)(Q_{i+1} + Q_i)}{5000}$$

The use of actual 1976 data from Appendix D will enable a better understanding of the above method.

$$N = \frac{1}{2} \; (20.6 - 0)(5.4 + 0) + (45.6 - 20.6)(15.8 + 5.4) +$$

$$\ldots\ldots\ldots + (100.0 - 99.1)(100.0 + 75.1)$$

By substituting the calculated value of N in the formula of the Gini Coefficient, its value can be estimated.