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WHEAT GROWING, FLOUR MILLING AND BREAD BAKING

A case study of a domestic agricultural industry adapting to
overseas competition

Report to the Foundation for Research Science and Technology

Prepared by Dr Michael Pickford

NZ Trade Consortium Working Paper No. 4

1999

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I. INTRODUCTION¹

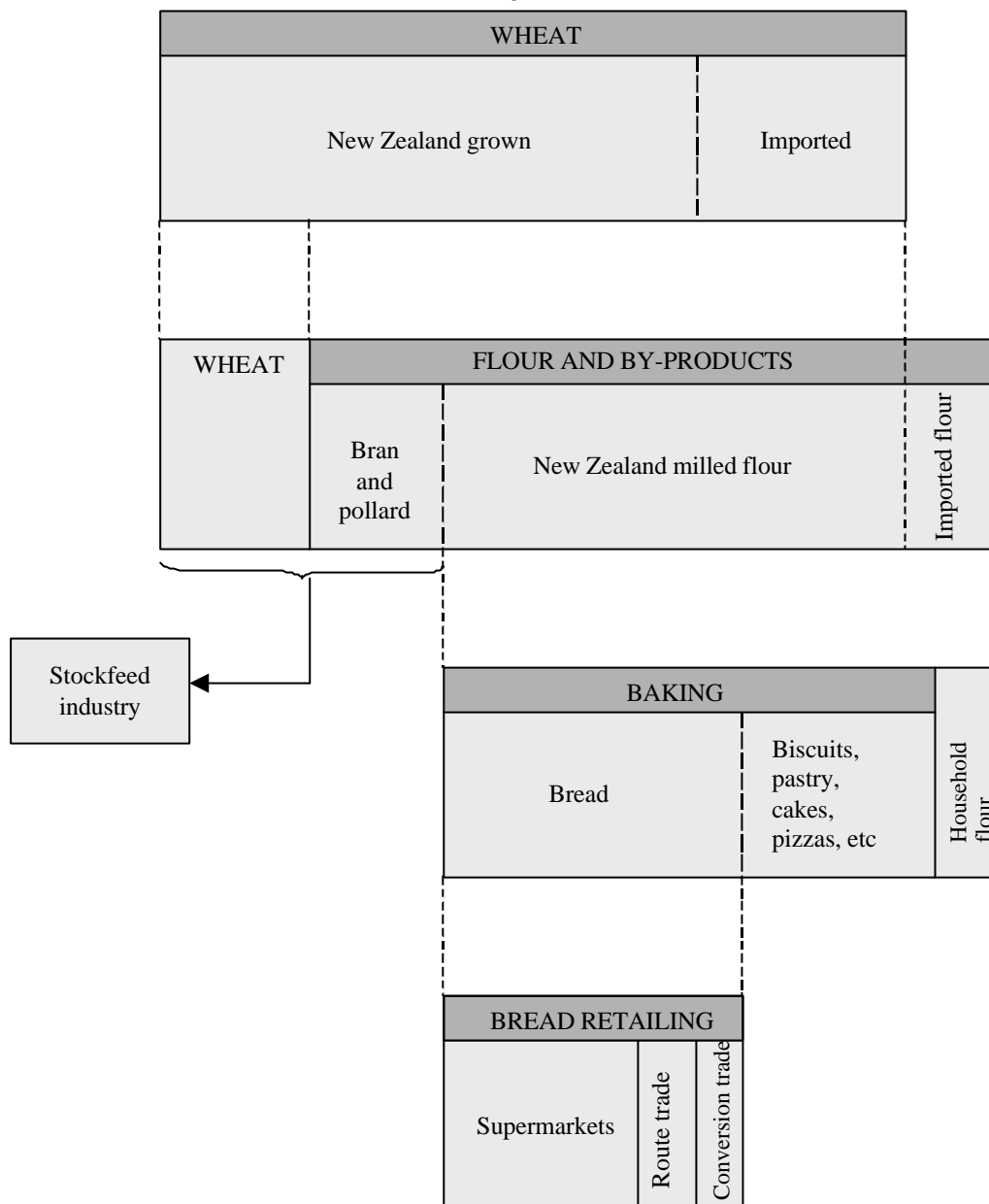
The wheat growing, flour milling and bread baking industries (henceforth, for the sake of brevity, “the industries”) are closely interrelated in various ways. A stylised view of the vertical production (though not the ownership) structure of these industries is shown in Figure 1. In New Zealand most wheat is grown to be milled into flour, with individual farmers usually contracting directly with particular millers for sale of their crop prior to sowing the seed. As the country is not self-sufficient in wheat, the local crop has to be supplemented by substantial imports, mostly from Australia. The bulk of the flour milled (together with a little imported flour from Australia) is used for bread baking, and most bread is now produced in the plant bakeries of the two major producers, which by vertical integration are also the major flour millers. Those same companies are also important producers of other flour-based goods, such as pastry and pies. By-products of flour milling – bran and pollard – are used in the stock feed manufacturing industry.

Apart from these vertical links, all industry participants contribute through a levy system to fund research through the Crop and Food Institute and other bodies on wheat breeding and related matters, a process which over several decades has generated wheat varieties better adapted to local conditions and with improved milling and baking qualities. In addition, during the period of heavy regulation of the New Zealand economy from the 1930s to the 1980s, the wheat, flour and bread industries were the subject of especially stringent regulations which recognised their interdependence.

This essay is concerned primarily with how the regulations impacted on those industries and, more especially, with how they have adapted to operating in free markets following deregulation over the period 1981-87. In section 2 we look at the history and impact of the regulation of the industries. The following section describes the huge changes in their structures triggered by deregulation, culminating in the formation of three (and more recently, two) vertically-integrated and foreign-owned.

¹ The author is Chief Economist at the Commerce Commission, Wellington. The author stresses that the chapter was not written in his official capacity, and any views expressed do not necessarily represent the views of the Commerce Commission. Information used in this chapter has been taken purely from the public domain, and no use has been made of information supplied to the Commission in confidence, or which is otherwise not publicly available. The author acknowledges the assistance from FRST grant number 98-IER-13-6379.

Figure 1: A stylised view of the vertical structure of the wheat, flour milling and bread baking industries



milling and baking companies. Sections 4, 5, and 6 then overview the background demand and supply conditions in the wheat, flour milling, and bread baking industries respectively. Sections 7, 8, and 9 go on to review the market structures, market conduct and market performance of the industries respectively, with the prime focus being on the bread industry, the major end point of the production chain. Finally, in section 10 the conclusions are drawn together.

2. INDUSTRY REGULATION

The wheat, flour and bread baking industries in New Zealand have a long history of regulation. Controls on wheat prices and marketing appeared during the First World War, and continued during the 1920s and 1930s. The aim was to encourage self-sufficiency in wheat, and to protect the economy both from drains of scarce foreign exchange associated with the purchase of imported wheat, and from possible disruptions in supply of a basic foodstuff during wartime. Other motives emerged in the Great Depression of the 1930s. One was to protect the industry against dumping when international wheat prices fell. Also, with the collapse in the prices of other crops, farmers turned to growing more wheat, leading to a much larger crop, and hence to a sharp drop in price, in the 1932/33 season. The drop in demand fuelled by falling incomes also led to outbreaks of “cut-throat” pricing by millers, bakers and grocers which resulted in many bakers being made bankrupt. The introduction of price controls and other measures were seen as a means of restoring order to chaotic markets, and of ensuring that bread was available at a reasonable price.

Once introduced, such measures were continued to guard against dislocations during the Second World War and the post-War period of reconstruction. However, the regulation of the industries persisted in various forms until 1987. This has been attributed to a number of factors: the relative importance of wheat in arable farming; bread being a basic foodstuff, and the consequent need to maintain quality and price stability; and the desire to attain self-sufficiency as a means of conserving overseas exchange (DSIR, 1983, p. 2), the last being the objective of the industry specified in the *Wheat Board Act 1965*. However, the DSIR noted that self-sufficiency had been attained only twice in the preceding 25 years. Borrell and Zwart (1982) suggested that price stability was the objective actually pursued.

Regardless of how well-intentioned initially were the motives for regulation, history indicates that once introduced they become very difficult to abolish. Typically, this appears to be because interest groups – often producers – who benefit from the regulations organise to ensure their continuance, whereas those bear the costs – often taxpayers and consumers - are largely unaware of the costs imposed upon them, and in any case are so numerous and dispersed as to be difficult to organise effectively to press for reform. This results in a situation where the political will to reform is weak, even though market distortions are evident and the net benefit of the existing policy may be negative. In the case of wheat, flour and bread, deregulation was slow to come even though the bakers, anxious to improve the poor and variable quality of the flour with which they were supplied, were strongly in favour of reform (Butterworth, 1997, pp. 22, 135).

2.1 The Wheat Board

While the institutions changed over the long period of regulation – the Wheat Committee replaced the Wheat Purchase Board in 1936, and was itself replaced by the Wheat Board in 1965 – the marketing functions they carried out continued with little change.² Between 1965 and 1st February 1987 the wheat and flour industries were heavily regulated under the New Zealand Wheat Board, the monopoly marketing authority created by the *Wheat Board Act 1965*. It was composed of industry representatives and government officials. Under the Act the Board was responsible for purchasing all wheat of millable quality from farmers, which it accomplished through the agency of grain merchants acting as brokers for the Board, at a price determined by the government's Department of Trade and Industry in collaboration with various groups in the wheat and flour industries.³ The Board also had complete responsibility for transportation and storage, most of which was conducted by farmers, brokers, and transport operators under contract to the Board. It also had the exclusive right to import wheat to make up for shortfalls in local production.

Latterly, wheat prices were set according to a three-year moving average of Australian fob prices (in NZ dollars), payable at the farmer's nearest railway station (meaning the farmer was responsible for transport to the station). This price was standardised for all farmers, regardless of their location, so that those located in close proximity to end-users received the same as those located more remotely. This encouraged wheat to be grown in remote localities where it was probably not viable if actual transport costs were paid. Moreover, the Board also paid the transport costs from the farmer's nearest railway station to either the flour mill of destination or from there to a point 35 miles from the bakers of final destination (as specified by the Board), whichever was the greater. As this rate was paid regardless of the actual distance travelled, and often more direct routes were available which avoided the nearest railway station, transport costs were often higher than necessary or actually paid (Borrell, 1980, p. 37).

The Board also allocated flour quotas to individual flour mills, thereby determining the size, number and location of mills. As the quotas were determined largely on historical grounds – they changed little from 1936 until their abolition in 1987 - they contributed to preserving the historical shape of the milling industry regardless of changing economic conditions. A licence was required to build a new mill, and this could only be granted on public interest grounds. As a consequence, only two new flour mills were built over the 28 year period from the end of the

² The early period of regulation in the industries is briefly reviewed in: Miller (1989, p. 12) and Bushel (1995, pp. 9-11).

³ Lower grade feed wheat could be sold directly to users by farmers.

Second World War until 1973, yet the forces for change were reflected in the fact that over the thirty year period 1936-66 over half of all mills (mainly the older and smaller ones) closed.

The Board purchased all flour from the mills, and resold it to wholesalers and end-users at national prices controlled by the Secretary of Trade and Industry through Orders in Council made under the *Commerce Act 1975*.⁴ The prices paid to mills were calculated on a cost-plus basis which, from 1978, were set to reflect the individual cost structures of the differently sized mills. Pricing was thus designed to keep existing mills solvent rather than to encourage an optimal industry structure. Moreover, prices were often higher than they need have been because mills were denied by the quota system the throughput needed to operate at full capacity (available wheat could be processed by operating five-day weeks). Cost-plus pricing probably also stunted incentives for mills to cut costs and improve efficiency.

The effect of the regulations was to remove all direct competition from the industry. Wheat farmers had a guaranteed market providing wheat quality reached a minimum (quite low) standard, and flour millers could not choose from which source to buy their wheat. The production of flour mills was virtually guaranteed, and quality and variety was limited. Users had no option but to accept the flour offered by the Board. The Board also ensured that all mills operated at a reasonable level of capacity, which meant that given the overall distribution of capacity, about 40,000 tonnes (equivalent to about a quarter of the North Island market) of flour annually was shipped north from the South Island regardless of transport and other costs. This was done primarily to ensure the continued viability of South Island mills. Substantial quantities of wheat were also shipped north to feed the northern mills.

Flour quality was a particular problem. Uniform pricing, with a lack of a differential for quality, meant that farmers had no incentive to plant higher quality but lower yielding cultivars. Moreover, the Board's policy was to mill most of the crop, even when it was not entirely suitable for bread flour. It was not able legally to distinguish different qualities of flour for different end-uses, which ignored the fact that flour is not an homogeneous product, and that use of the appropriate flour is critical for the efficient production of different sorts of flour-based products, such as bread, biscuits, cakes, and pastry. Bakers suffered from flour that was often unsuitable, and whose quality varied frequently. Likewise, the emphasis on ensuring low-priced flour for consumers meant that wheat growing was concentrated in areas where the costs of production was lowest (Southland and Canterbury), regardless of quality and of proximity to markets.

⁴ From 1978 ex-mill prices were set individually for each of the 18 mills according to their individual circumstances. This power to control flour prices was transferred to the Commerce Commission under the 1986 Act for a brief period from 1st May 1986 to 1st February 1987 prior to deregulation of the industry. For details, see Commerce Commission (1991).

Overall, industry regulation brought stability to the industries, but at the expense of several drawbacks: it preserved the 1930s pattern of capacities and geographical locations of flour mills regardless of efficiency considerations; it promoted inefficient transport patterns; it prevented the trend towards the vertical integration of flour milling and bread baking evident overseas (because a company's bakers could not source flour from the company's mills); and it lacked incentives to maintain wheat quality (DSIR, 1983, p. 5). A study of the industries in the early 1980s (Borrell, 1980; Borrell and Zwart, 1982) estimated that the 1979 annual marketing costs of about \$20 million could be reduced to about \$13 million by centralising and integrating the milling and transport operations alone. Another consequence of regulation appears to have been excess capacity in flour milling. In 1985 it was estimated that the production tonnage based on quotas in the North Island was 126,436 tonnes, or only 56% of estimated potential capacity of 224,480 tonnes.⁵ Likewise, in the South Island the quota tonnage at 66,410 was only 34% of estimated potential capacity of 194,363 tonnes (Commerce Commission, 1987a, pp. 31, 44).

Following an official review, the government in 1984 announced a timetable for the progressive deregulation of the industries. From 1st February 1985 the Board began to charge each mill the cost of transporting the wheat from the grower, so that wheat costs – which made up about 75% of flour costs – varied between mills. From 1st February 1986 mills were permitted to buy up to half of their wheat requirements directly from growers without the intervention of the Board. This led to a distinction between “contract” wheat, and the “non-contract” wheat supplied by the Board and subsequently through the market. This also had the effect of shifting financing costs from the Board to millers, since previously the Board had paid the mills for their flour up to four weeks before the mills had to pay the Board for the wheat used to produce that flour. Finally, from 1st February 1987 all wheat was to be purchased by mills, the flour quota system was abolished and price control was removed (including from bran and pollard; the price control of bread had ended in 1981). The *Wheat Board Amendment Act 1986* required the Board to cease trading in wheat and flour from that date, and made provision for the Board to be dissolved (Commerce Commission, 1991, pp. 4, 8; *NZ Yearbook*, 1987/88, pp. 439-40).

Imports were also liberalised. From 1987 global licences for the equivalent of 20% of domestic production were introduced for flour (as for the products of other industries). In addition, under ANZCERTA, licence restrictions on flour from Australia were gradually relaxed from 1 January 1983, while Australian flour was exempted duty from 1 January 1986 (Commerce Commission, 1987a, pp. 37-38). This forced the flour industry to start to compete with the Australian industry

⁵ It is not clear how the latter figure was calculated. Plant capacities are notoriously difficult to estimate.

in terms of price and quality to some degree. Small-scale (bagged) imports have been a continuing feature of the New Zealand market.

Thus, over a two-year transition period the industries had to adjust from operating in tightly regulated markets to ones which were almost completely unregulated.

2.2 Bread Price Control

In the 1930s the regulatory control of the industries was completed with the *Board of Trade (Bread-Price) Regulations 1936*, under which bread prices were first regulated (Hunn and Easton, 1985, pp. 113-23; Butterworth 1997, pp. 27-34).⁶ Most bread prices were directly controlled from that time under various regimes until 1981, when the control was lifted. Control was associated with the setting of standard sizes (weights) for loaves, so that competition on product quality as well as price was impaired.

The 1936 controls were aimed at ending the cut-throat pricing of the previous three years, and at ensuring that those employed in the milling and baking industries had a reasonable standard of living. They fixed the price of flour at the level prior to the onset of price cutting; fixed the price of bread of various types in each of the four main, and some smaller, centres, and regulated delivery charges; and imposed on bakers a levy related to flour usage to fund both the Wheat Research Institute and the NZ Master Bakers' Federation. The regulations were tightened in 1943 under wartime conditions, which reduced to six the number of loaf types which could be made, and specified the permitted weights and ingredients.

In December 1953 the control of bread prices was brought under the Pricing Tribunal, which set maximum retail prices based on bakers' profitability at a uniform level country-wide, with the price being supported by a government subsidy until 1967. However, in 1956 "non-standard" breads were removed from price control. When the long-standing subsidy on bread was abruptly removed from "standard" loaves in 1967, their production became relatively unprofitable, leading to a marked swing towards "non-standard" bread, a move helped by the fact that non-standard bread was free of price control. Non-standard bread included the "milk loaf", whose ingredients, because they included 6% milk powder, took it outside the regulations – an illustration of how those who are regulated will seek to evade restrictions imposed by the regulations.⁷ Flour usage by bakers for price controlled bread declined from 90% in 1968 to 46% in the first half of 1971 (Commerce Commission, 1980, p. 13). The uneven application of controls may thus have

⁶ The intention here is to provide something of the flavour of price control rather than a detailed history, which would take a whole book to do justice to the subject. See also: Commerce Commission (1980).

⁷ This often resulted in situations where the regulations were made more detailed and comprehensive to block evasion, thereby further adding to the bureaucratic red tape with which producers had to deal.

contributed to product diversity, at least until controls were reimposed on most bread in 1972. Butterworth (1994, p. 6) also argued that price control kept profit levels too low to encourage investment in the new equipment which had become available in the 1950s, so that equipment which had been installed in the 1930s, and whose economic life was coming to an end, was not replaced, leaving much of the industry technologically backward.

In November 1975 the Secretary of Trade and Industry became the price control authority for goods and services (including bread) covered by the “Positive List” issued under Part IV of the *Commerce Act 1975*, which replaced the *Control of Prices Act 1947*, with the Commerce Commission becoming the appeal authority for pricing decisions of the Secretary. The period of uniform prices came to an end in 1977 when the Secretary became increasingly concerned at the resulting wide range in profitability among bakers, with some earning very high rates and others very low. Thenceforth, prices were controlled on an individual bakery basis, with increases in prices being authorised only on the grounds of increased costs, on application from the baker. This resulted in a narrowing of the range of profitability across bakers, as those with high profits had to absorb cost increases whereas those with low profits could claim price increases. The focus of the controls on overall profitability, rather than types of loaf, encouraged a proliferation in bread types, and opened the door to price competition between bakers in the same area, whereas previously non-price competition seemed to have been the norm. However, in 1980 it was difficult to tell whether the closeness of the prices of different bakers’ prices in different cities reflected adherence to controlled prices or the effects of competition (Commerce Commission, 1980, pp. 20-21).

In 1979 the government, after completing a survey of items on the *Positive List of Controlled Goods and Services 1977*, decided to refer certain items, including bread, to the Commerce Commission for its opinion as to whether a continuation of price control was warranted. A particular concern raised during the Commission’s inquiry was the potential for local bakers in isolated districts to exercise market power. The Commission recommended that bread should be subject to a twelve month period of price surveillance (monitoring), under which bakers would furnish returns in relation to the setting and changing of bread prices, with the provision that the reintroduction of price control should be considered at any time during, or at the expiry of, that period (Commerce Commission, 1980). In the event, the government decided to remove price control in 1981.

3. DEVELOPMENTS AFTER 1987

Although some rationalisation of the industries had occurred in the 1960s and 1970s, the floodgates were opened by the deregulation in 1987.

3.1 Changes in Wheat Growing

The impact of deregulation on the wheat industry was initially dramatic, and accentuated both by falling world wheat prices, which caused domestic prices to fall sharply, and a drought. At the same time, flour users took the opportunity to tighten their flour specifications to the point where they could not be met by millers using domestic wheat alone. Consequently, millers switched to Australian wheat of a more consistent and higher quality, especially compared to North Island production, with imports rising substantially to around 200,000 tonnes a year, equivalent to about two-thirds of the country's bread wheat requirements (Dunbier, 1993). The upshot was a very sharp decline between 1987 and 1989 in both the acreage devoted to wheat and in tonnages, as shown in Table 1.

Since then both acreage and tonnage have been gradually recovering, but more importantly, quality has increased sharply, so that some believe now that there is no need to import wheat to blend with domestic production to raise the quality. This was achieved by a much greater emphasis on wheat meeting set quality standards to be acceptable; premiums being paid for wheat of higher quality; improved growing practices by farmers; and the release of better quality varieties such as Otane. Premiums for quality have encouraged an increase in the growing of special purpose varieties, such as adapted durum wheats for pasta and coloured wheats for multi-grain breads (Dunbier, 1993). Kibbled purple wheat is exported to Australia.⁸ Other trends include the direct contracting in advance by millers with growers for wheat supplies; improved flows of market information back to millers, which in turn convey their requirements to farmers; and variations in wheat prices between regions reflecting differences in production costs, returns on alternative land uses, and the costs of storage and transport.

The statistics also suggest that there has been a reduction in the pre-deregulation tendency for large fluctuations in production from year-to-year. These fluctuations were caused mainly by changes in area of land sown with wheat, and only a small part to fluctuations in yields (86% and 14% respectively). The variations in planting patterns reflected large variations in the prices of other farm products in the context of mixed cropping and sheep raising farms, with the area of wheat sown varying inversely with those other prices (Zwart, 1979, pp. 42, 47). Combined with

⁸ See: "Kibbled Kiwi grain in Australian bread", *The Press*, 8th July 1993, p. 13.

a stable domestic demand for wheat, the fluctuations made self-sufficiency unattainable in most years. Over the period 1959-79, the size of the harvest ranged from 457,000 tonnes in 1969 to 180,000 tonnes in 1975, and imports were nil in only four years (Borrell, 1980, Figure 2.2, p. 13; Table 2.1, p. 17). It is not clear why the fluctuations have reduced. Growers have argued that wheat, being the major crop in Canterbury, tends to set the prices for less preferred alternatives.

3.2 Amalgamation and Rationalisation

The amalgamation and rationalisation of bread baking started before the Second World War, but accelerated from the late 1960s. Flour milling remained locked in a time warp until deregulation in the mid-1980s. From that point pent-up changes accumulated over many years occurred very quickly, with a rash of firm closures, amalgamations, and takeovers, together with new investments and entry. This process led to the emergence in the early 1990s of three major, vertically integrated, and foreign-owned players: Allied Foods, Defiance and Goodman Fielder. While all three companies played important roles, the rationalisation process was to a large degree brought about by the actions of the last.

Allied Foods entered New Zealand in 1951, and by 1963 had acquired 17 bakeries and closed down all but three, two in Auckland and one in Wellington, which were among the largest in the country. In 1978 it became vertically-integrated by acquiring a 50% ownership share in the Auckland Flour Mills, and purchased the other half in 1988, along with 100% of Wellington Flour Mills. In 1991 it established a presence in the South Island by acquiring Norths Bakeries. The purchase included the bakeries in Christchurch, Auckland and Dunedin, but not Wellington, together with the former Archers flour mill at Rangiora. Today it has four flour mills in Auckland, Wellington and Christchurch (two), and four bakeries, one each in the four main centres. The company is owned George Weston Foods, an Australian company with a UK parent.

Defiance Food Industries, owned by an Australian company, Defiance Mills, was the most recent of the big three to begin production in New Zealand. Its entry was probably encouraged by the prospect of deregulation, and the uncertainties this created in the free market for many existing players. In 1986 it opened a sales office in Auckland, and in the following year it purchased the largest privately-owned, and second largest, flour miller, the Christchurch-based Ireland Group. That Group had mills at Mount Maunganui, Christchurch, Oamaru and Dunedin (the Oamaru mill was subsequently closed), a stockfeed plant, and the Stacey and Hawker bakery in Christchurch. The Group was considered vulnerable because of its lack of tied bakery outlets, and its Mount Maunganui mill, the only independent mill in the North Island, was disadvantaged by its relative distance from the major Auckland market, and its vulnerability to selective price

discounting by the combined Goodman Fielder/Wattie (Commerce Commission, 1987a). In the four years 1988-91 it spent \$40 million expanding its operations (Alexander, 1990; Steeman, 1997), including the acquisition of Herbert's Bakery in Hamilton in 1988. It bought North's Wellington bakery in 1992, and built a storage and manufacturing plant in Christchurch to produce flour mixes and similar products. It also built a bakery in Dunedin in 1991 at a cost of \$1 million to take flour from its Dunedin mill after that mill became exposed by losing the contract to supply flour to Goodman Fielder Wattie's Dunedin bakery (Hutching, 1991). In 1992 it purchased the ailing Windmill Bakery in Hastings, but closed it in 1995. Prior to the merger with Quality Bakers in 1997, it three mills in Mount Maunganui, Christchurch and Dunedin, and four bakeries in Hamilton, Wellington, Christchurch and Dunedin.

Quality Bakers (QB), the fore-runner of Goodman Fielder, started in 1968 as a co-operative between eight of the larger and more progressive local bakeries operating in the central region of New Zealand.⁹ There seems to have been a number of factors behind its formation. Firstly, there was the stimulus provided by the perceived threat posed by Westons, which was much larger than any other milling and baking company, of industry domination by a foreign-owned company, especially in the event of deregulation. Secondly, a larger grouping would be able to take advantage of the opportunities for the mass advertising of bread introduced by the spread of television in the late 1960s, and by the increasing production of sliced, wrapped bread, and the associated scope for product promotion by means of branding and packaging (the single brand name "Home Style" from one of the original members was adopted initially). Thirdly, such a grouping would have the ability to take advantage of the bulk purchase of inputs. Fourthly, one basis for the selection of members was that no two operated in the same town, so that they were not natural competitors in the spatially disintegrated markets then obtaining. This was reinforced by geographic market-sharing arrangements, under which each was assigned non-overlapping territories to which it had exclusive rights, thereby eliminating actual or potential future competition between them. Those areas had to be amended as new members were admitted subsequently. The group had expanded to 18 by the end of 1972. Finally, an important motivating force was the personal ambition of Pat Goodman, who had started in the family baking business in Nelson and had begun rationalisation of bakeries in that region. He recognised that the milling and baking industries were ripe for reform, and desired a vehicle through which they could be rationalised, standardised, and vertically integrated, with bread baking as the leading force.

⁹ The material on Quality Bakers in this chapter relies heavily upon the excellent company history by Butterworth (1997).

QB was originally a management and service company owned by its members to finance common purposes - such as common advertising and brand promotion, hygiene testing, loaf evaluations, inter-firm comparisons and research - from contributions raised on a flour levy. At the same time the group purchased some smaller bakeries as a group investment, and individual members were active in mergers and takeovers in their own areas. However, Goodman realised both that the QB group was too loosely organised to form an effective unit for his purposes, and that there was little hope of getting the independently-minded members to agree to unite to become a public company. Instead, he decided to use an old-established company – A. S. Paterson & Co. (ASP) – with which he had associations, and which was one of the three largest flour millers in the country, as the vehicle to buy out individual members as they became available, with the owner becoming manager. In 1973 five sold out to form ASP's new bakery division, with several others following over the next few years, although simultaneously they all remained within QB. However, the two companies had very different cultures, and Alex Paterson (the head of ASP) and Goodman fell out. The latter organised a boardroom coup in 1976 which overthrew Paterson, and in 1979 ASP was renamed Goodman Group, with the bakeries established in their own division as New Zealand Bakeries (NZB).

In the next few years NZB grew rapidly, buying out QB members and making outside takeovers, nine in all by 1982. In that year all but five of the remaining QB independents sold out to Goodman Group, and in 1983 the bakery group was renamed Quality Bakers New Zealand. The five independents remained with QB, but as franchisees licensed to use QB trademarks and recipes rather than as members; their number fell to three by 1985 through the withdrawal of Yarrows, and the merger of two Gisborne firms. The three current franchisees are Walter Findlay of Gisborne, Northern Bakeries of Whangarei, and Freshbake Wairarapa of Masterton.

3.3 Merger Activity

After 1983 the very large cashflow produced by QB was used to finance the Goodman Group's acquisitions. One of those acquisitions was indirectly to assist the expansion of both Allied and Defiance, the company's two major competitors.

In 1986 the Commerce Commission consented to the merger of Fielder Gillespie Davis and Goodman Group, which brought together a significant Australian flour miller, bread baker and gelatine maker with the second largest New Zealand miller, which also had a substantial cross-shareholding in the largest New Zealand miller, Wattie Group Mills (Commerce Commission, 1986). The new group was known as Goodman Fielder.

The relationship with Watties had come about in 1980 when Goodmans had entered into a relationship with Cropper-NRM, a subsidiary of Wattie Industries, and the largest flour milling company in the upper North Island. This added to the linkage between the baking and flour

industries, and led to significant cross-shareholdings between the two companies. They also jointly owned a large Auckland bakery. In 1987 Goodman Fielder applied to the Commerce Commission to take-over Wattie Industries, the largest food company in New Zealand producing a wide range of canned, frozen, snack and convenience products. At that time the two companies owned or controlled over 60% of the flour quota and 31 of the 67 main bread bakeries, together with Fermentation Industries, a major bread yeast producer. The Commission blocked the proposal on the grounds that the merged entity would gain a dominant position in several markets, including those in flour milling and bread, and that the public benefit likely to flow from the merger did not outweigh the detriments from the loss of competition (Commerce Commission, 1987a).

After appeals to the High Court and Court of Appeal, the Commission subsequently gave clearance to the merger subject to certain divestitures being completed within six months, viz., the 50% of Auckland Flour Mills owned by Goodman Fielder (the other 50% being owned by Allied Foods), all of Goodman Fielder's Wellington Flour Mills, 25% of Fermentation Industries, and two bakeries (Commerce Commission, 1987b). The new group was called Goodman Fielder Wattie. The divestitures created opportunities for Defiance to enter the market by buying Wellington Flour Mills, and for Allied to expand by acquiring the 50% it did not own in Auckland Flour Mills. At the time the merger was considered crucial to the company's plans for expansion into export markets. However, Pat Goodman later publicly admitted that the merger was probably a mistake (Butterworth, 1997, p. 194 and footnote 17), because in his view Wattie was a creation of protection which was subsequently exposed when protection was stripped away. In 1992 Wattie was sold to Heinz, and the group name reverted to Goodman Fielder.

In 1990 QB acquired Klissers, a 30 year old family bakers in Auckland producing the popular Vogel's and Reizenstein's "health-style" breads using the natural fermentation process. About two-thirds of its production was supplied in Auckland (Commerce Commission, 1990). By this means, QB was able to extend its bread range into the "health" and "heavy" segment of the market at a time when there was an increasing demand for such breads.

In 1997 Goodman Fielder Ltd sought to acquire the New Zealand flour milling and bread baking interests of Defiance. The latter had achieved quite good profits in the 1992/93 year, but subsequent severe price competition and the impact of expansion costs led to large losses in the following two years, and a return to low profits in 1995/96 (Steeman, 1997). Again the Commission turned down the application on market dominance grounds (Commerce Commission, 1997). Subsequently, it accepted a revised proposal which involved Goodman Fielder divesting its flour mill in Christchurch to Allied, thereby establishing the latter as a major force in flour milling in the South Island (the former Archers mill at Rangiora it owned being old

and relatively small). This merger, which resulted in the emergence of two major, vertically integrated industry players, effectively ended the prospects for any significant further amalgamations because of dominance prohibitions under the *Commerce Act*.

4. WHEAT GROWING

Early wheat growing in New Zealand made use of foreign varieties, but these were not well adapted to local conditions, and produced flour which did not make good bread. Even in the 1930s wheat and flour had to be imported from Australia and Canada to blend with local wheat to improve the quality (not to make up any shortfall in production). Wheat breeding started in 1910 at the Canterbury Agricultural College (Lincoln) which led ultimately to the development of a cross in 1923 which, with further development, was released in 1935 as the famous “Cross 7”, the first New Zealand-bred wheat. It quickly became the industry leading variety, and held that position for 20 years. Subsequently, further varieties were released every few years by the research programme funded jointly by the industry and the government, now under the aegis of the New Zealand Institute for Crop and Food Research. The aim was to produce high yielding, high quality wheats, resistant to disease, having good agronomic characteristics, adapted to the conditions in the different wheat growing areas of the country, and having improved milling and baking qualities. A major success was the variety “Otane” released in 1984, which within three years comprised 80% of the entire crop, and which has been held responsible for 20% of the improvement in the baking quality of local wheat over the period 1984-89. More generally, it has been claimed that without the past efforts of the New Zealand wheat breeders, there would not be a milling industry in the country today (DSIR, 1983, pp. 18-21; Bushak, 1995, pp. 25-29). Industry funding is now provided by levies on the membership of each of the United Wheat Growers Association and the New Zealand Flour Millers Association, and government support is supplied indirectly through the Foundation for Research, Science and Technology.

While there are fluctuations from year-to-year in wheat yields, and variations between farms in any given year, the long-term trend has been for a gradual improvement. Between 1931 and 1981, for example, average wheat yields roughly doubled from 2.05 to 4.01 tonnes per hectare. Half of this increase is attributed to improved wheat varieties, and the balance to better farmer education, the application of agronomic research and extension, increased use of fertiliser, pesticides and herbicides, and improvements to machinery (DSIR, 1983, p. 8, 22). A simple least squares time series regression of average annual yield over the years 1981/82-1995/96 produced an equation which suggested that over the period the average yield per hectare was increasing at about eight-hundredths of a tonne per year, and that over the period as a whole yields increased by about 30%.

Wheat is the most important arable crop after barley in New Zealand, with about a fifth of the arable land being devoted to it.¹⁰ Most wheat in New Zealand is grown for milling into flour for human consumption, predominantly for bread. About 60% of the flour is used for bread, 8% for biscuits and the balance for cakes, pizzas, pastry and a range of other items. A significant proportion of the wheat (about 20%) which does not meet milling standards, together with the bran and pollard by-products of milling (often called “offal”), are used for poultry and stock feed manufacture. Local production is supplemented with the import of milling wheat, mainly from Australia, into the North Island.

The major wheat growing area is Canterbury, which contributes about 70% of total production. Another 15% is grown in other parts of the South Island – Marlborough, Otago and Southland – with the remainder coming from small areas in the southern part of the North Island – Manawatu, Wairarapa and Hawkes Bay. This represents a significant change from pre-deregulation years when, in 1981 for example, the South Island contributed 92.2% of the national crop, with Canterbury growing 56.0% and Southland 23.1% (DSIR, 1983, p. 11). Production data for selected years, in terms of land area sown and yields, are shown in Table 1.

There are no farms in New Zealand which grow only wheat, as are found in the major wheat exporting countries, and the average farm size is relatively small. Most wheat in New Zealand is grown as part of a four crop rotation of grass, wheat, barley or oats, and peas. Both autumn and spring wheats are planted, with the former sown in May/early June and harvested in late January/early February (earlier in the north, later in the south), and the latter sown in August and harvested at about the same time as autumn wheat.

Table 1: NZ Wheat Production: Selected years

Year (to June)	Area Sown (hectares)			Yields (tonnes)			Yield per hectare
	N Island	S Island	Total	N Island	S Island	Total	
1981/82	6,042	65,464	71,506	26,574	265,478	292,052	4.08
1985/86	11,817	79,718	91,535	48,404	331,310	379,714	4.15
1990/91	5,225	32,302	37,527	26,376	154,314	180,690	4.81
1995/96	7,157	43,450	50,607	37,628	239,386	277,014	5.47

Source: NZ Official Yearbook, various years

Spring wheats give lower yields but higher protein contents suitable for bread. Current wheat yields in New Zealand of around five tonnes per hectare (see Table 1) are quite high by international standards, and well above those of the major exporting countries such as Australia

¹⁰ See section on arable farming in *New Zealand Official Yearbooks*, various years.

and the United States. Farmers have been quick to take up new varieties of wheat as they have been developed, especially since industry deregulation in 1987, and the contract growing of particular varieties has been introduced. This reflects the post-deregulation concern with wheat quality and its consistency, with quality standards being set by millers, and farmers being encouraged by premium payments, and even required contractually, to meet certain standards (Bushak, 1995, pp. 3-4, 7).

While New Zealand wheat yields are quite high by international standards, quality is variable both between individual farms, and from region to region and year to year. This reflects the use of a variety of cultivars having different qualities, and the impact of different regions and growing conditions. Because most wheat is used for milling, and most of that for bread, there is relatively limited opportunity to skim off lower quality wheats for other purposes. In contrast, in Australia and the prairies of North America the variations in climate and soils is minimal over very wide areas, allowing extensive farming to produce large quantities of wheat at a reasonably uniform quality (DSIR, 1983, pp. 22, 24).

Over 90 per cent of domestic wheat is supplied by contract to individual mills, either directly or through brokers (Commerce Commission, 1997, p. 4). Mills announce contracts and fixed prices prior to the crop being sown in late March to early May, and growers must decide whether or not to accept. Domestic wheat prices reflect the Australian Standard White (ASW) price, which in turn tracks international prices. Contract prices tend to be based on expectations about what prices will be at harvest time. United Wheatgrowers, a farmers group, watches developments, assesses prices, lobbies milling companies and advises farmers. As part of negotiating tactics, growers may hold off on signing contracts if they believe the offered price is too low. Likewise, millers could hold off reaching agreement until after farmers have been forced to sow, although that could expose them to a shortfall in the local crop. Farmers argue that there are relatively few alternative crops to which they can turn, and those tend to be riskier or less profitable than wheat. Those farmers who expect wheat prices to rise above the levels that millers are contracting for may choose the riskier course of not entering into a contract, hoping to sell at a better price on the spot market once their crop is harvested.

The smaller millers tend to hold off from making price offers until they see the prices being arrived at by the major buyer, Goodman Fielder. This might appear to allow the latter some monopsony power.¹¹ However, the potential for such power is likely to be nullified by the probable highly inelastic demand for the domestic crop, especially given the substantially higher cost of imported wheat (10-30% more) (Commerce Commission, 1997, p. 23).

¹¹ Using standard textbook analysis, a monopsonist facing an upward-sloping domestic supply curve and a horizontal import supply curve would buy less domestic wheat than would be demanded in a competitive market.

After the crop is harvested, the farmer sends a sample of the grain to the miller for testing against the quality standard specified in the contract. Deliveries are then tested to ensure that they are comparable to the advance sample. Given the seasonal nature of the wheat harvest, and the steady nature of demand for flour, considerable (and costly) storage facilities are required, particularly for wheat. Harvested wheat is held in small steel storage silos on the farm until required by the miller. Beyond a certain period a rental is paid by the miller, reflecting the cost of storage, and the fact that in a perfect market the price should vary through the year (all else being the same) as storage costs are incurred. On-farm storage means that economies of scale in storage are lost (Borrell, 1980, p. 42). Mills hold small buffer stocks of wheat, and inventories of flour for delivery.

Around 250,000 tonnes of wheat are grown annually in New Zealand, of which 190,000-200,000 tonnes are of milling grade, the rest being used mainly for feed. As there is an annual requirement for about 340,000 tonnes of milling grade wheat year – to produce about 260,000 tonnes of flour¹² - any shortfall must be imported, mainly from Australia. Figures for 1996 are given in Table 2. In 1996 New Zealand milling wheat averaged about \$290 per tonne, feed wheat about \$260, and imported wheat of all types about \$365 (cif) (Commerce Commission, 1997, p. 4). Hence imported standard wheat can only compete with South Island wheat in the North Island.

Table 2: Sources of milling wheat in New Zealand, 1996

Wheat Source	North Island milled		South Island milled	
	tonnes	percent	tonnes	percent
North Island	11,818	6.1	0	0
South Island	39,741	20.4	140,417	97
Imports	142,734	73.5	4,373	3
Total	194,293	100.0	144,790	100

Source: Commerce Commission (1997, Table 4, p22)

¹² The connection between wheat input and flour output is the “extraction rate”. One tonne of wheat in New Zealand yields 0.80 tonne of flour, giving an “extraction rate” of 80%, the balance being bran and pollard. Consequently, the production of a tonne of flour requires 1.25 tonnes of wheat.

5. FLOUR MILLING

5.1 Demand and Supply

The primary purpose of the wheat and flour industry is to meet the relatively inelastic demand for flour of approximately 260,000 tonnes per year, a demand which is distributed geographically according to population density. A paradox is that the bulk of the New Zealand population lives in the North Island, but the bulk of the wheat is grown in the South Island or is imported. This entails the transporting of considerable volumes of bulky products having a high weight to value ratio – wheat and flour – over substantial distances. Wheat is cheaper to transport than flour because of the hygiene requirements of the latter, but that advantage is partially off-set by the reduction in bulk with flour compared to wheat. There seems to be no marked trend to locate milling capacity either close to the supplies of wheat or to the demand for flour, with capacity being fairly evenly split between the two Islands, although production is somewhat larger in the North Island. Millers in Canterbury can compete for flour buyers in Auckland. The transporting of considerable volumes north in New Zealand is not counterbalanced by comparable flows of other products in a southwards direction, so that wheat and flour has to carry the costs of movements in both directions (Borrell and Zwart, 1982, p. 7).

North Island flour mills must seek a substantial proportion of their wheat supplies from outside of the Island. Because of the cost of transporting Australian wheat across the Tasman Sea,¹³ it cannot compete with wheat grown and used in the South Island, but it can compete with South Island wheat in the North Island, especially in Auckland. Hence, flour millers in the upper North Island use largely imported wheat, in the lower North Island a mixture of domestic and imported wheat, and in the South Island mainly domestic wheat.

A breakdown of estimated flour supply in 1996 is shown in Table 3. Nearly 72% is accounted for by the North Island. Until the late-1960s nearly all flour was delivered to business users in sacks, in which it was prone to deterioration, pest attack and losses, and which was inconvenient for large-scale users. The bulk delivery of flour in stainless steel tankers, with the flour being discharged pneumatically into hygienic sealed silos, arrived relatively late in New Zealand. This was probably because of government restrictions on road delivery where rail was an alternative, together with the role of the Wheat Board in the distribution of flour, which was often done in

¹³ The shipping cost of Australian wheat is estimated at \$50-55 per tonne to the destination port. In addition, such wheat has to be purchased from the Australian Wheat Board, a monopoly exporter, which adds on margins and costs which are said to add significantly to the price. This contributes to North Island wheat prices being higher than South Island prices. See Commerce Commission (1997, p. 11).

small lots. In 1968 only 8% of bakery flour was delivered in bulk, but this had increased to 61% by 1973 (Butterworth, 1997, pp. 79-80).

Table 3: Estimated flour consumption, 1996

Flour category	Quantity		
	North Island	South Island	Total
Industrial bulk	123,000	46,000	169,000
Industrial bagged (20-40kgs)	46,000	21,000	67,000
Retail bagged (0.5-5 kgs)	18,500	7,500	26,000
Total	187,500	74,500	262,000

Source: Commerce Commission (1997, Table 2, p6)

Industrial bulk flour is supplied to large users, such as plant bakeries, biscuit, cake and pastry manufacturers, and makes up about two-thirds (64%) of the flour demand. Industrial bagged flour is supplied to wholesalers for on-sale to small bakeries and similar users, or direct to the same users. Retail bagged is sold through supermarkets and other retail outlets for household use. Limited quantities of industrial bagged flour are imported – about 5,500 tonnes annually, some of it speciality types – mainly into the Auckland region (Commerce Commission, 1997, p. 6).

The breakdown in flour use has not changed much in recent years. For example, in 1979 the breakdown was as follows: bread bakers, 57%; biscuits, 7%; high ratio flour (cakes), 1%; self-raising flour, 1%; and other (e.g., household, pastry-makers, starch and gluten manufacture, ice cream cones, and pasta), 34% (NZ Flour Millers Association, 1979, p. 83). In 1986 the comparable figures were 59.8, 8.4, 1.3, 1.7 and 29.4% respectively (Miller, 1989, p. 14, quoting the Wheat Board Annual Report).

5.2 Flour Milling

The purpose of the milling process is to break up the grains of wheat into flour (which comes from the centre of the grain, or endosperm), bran (the skin of the wheat), and pollard (the dusty material created during the grinding process).¹⁴ Wholemeal flour is a blend of flour, bran and pollard in the proportions in which they occur in the grain. Some meals also extract the wheat germ (the growing point of the seed). The aim of the miller is to extract the maximum proportion of flour from the grain with the least possible contamination by bran, pollard and germ, the first two because they discolour the flour, and the last because it reduces the keeping quality. Flour comprises a mixture of fine granules of starch and protein. The latter, when wetted, causes the stickiness and elasticity of dough which is unique amongst the grains to wheat

¹⁴ This section draws heavily on New Zealand Flour Millers Association (1979).

(and rye). The finer granules can be separated out during the milling process to give different grades of flour: a fine particle flour rich in protein; a medium particle flour low in protein; and a coarse flour similar to the original.

The protein content of wheat grains varies from about 7% to 17% depending upon wheat variety, soil, climate and weather. Wheat with a high protein content – “hard” wheats – produce flour suited to bread making, whereas wheats having low protein contents – “soft” wheats – are more suited for biscuits and cakes. Pasta and cracker biscuits are made from very high protein durum wheat. New Zealand varieties of wheats are of an intermediate type, with some hard and others soft.

Mills typically have small laboratories in which samples of wheat from farms are tested for milling quality (e.g., moisture, impurities), and suitability for use in baking (e.g., protein content, sprout damage). Prior to milling the wheat has to be cleaned of impurities by screening using a sequence of different machines to remove different types of impurity; and conditioned, a process whereby moisture is added or subtracted as necessary to ensure uniformity in the grain, and to prepare it for the separation of the endosperm from the bran layers.

The milling of wheat essentially involves scraping out and grinding the inner part of the wheat grain, and sorting the particles by sieving into grades by size and degree of purity, a process which is repeated several times with the objective of obtaining the maximum amount of high quality flour and the minimum quantity of bran. Flour is produced at many points in the milling process, and the different streams have slightly differing compositions which are used to produce different types of flours, which are then conveyed to the packing system. The whole process is highly automated, with automatic controls directing the wheat through the various weighing, cleaning, milling and packaging stages, and with the machinery being connected by various types of conveying and elevating equipment. Mills make extensive use of gravity, with the sequence of machines positioned so that as far as possible stocks in the course of being processed fall from one to another through pipes or chutes. Mill buildings were traditionally tall structures, strongly built to withstanding vibrations from machinery. The more sophisticated the milling equipment used, the greater the range of flours which can be produced. Bulk flour is stored in bins which are tall and thin to prevent the “bridging” of the stored flour under pressure, with flour being discharged at the base by gravity. Deliveries are made by 20 tonne road tanker for short distances, with flour being pumped into silos, or by special “pod” which can be moved by rail or truck.

6. BREAD BAKING

6.1 Demand and Supply

The *a priori* expectation is that the demand for wheat products, generally being basic food items, would be price and income inelastic. Such information as exists for New Zealand is rather dated and anecdotal. Industry participants at a price control inquiry in 1980 all agreed that “reducing prices of bread had no marked effect on sales” (Commerce Commission, 1980, p. 28). A 1975 British econometric study found that “bread and cereals” had a price elasticity of -0.22 ,¹⁵ which was well inside the inelastic demand range. The same study also found a negative income elasticity of -0.50 , suggesting an inferior good, a result which closely mirrored the figure of -0.36 in a 1953 US study.¹⁶

Although now rather dated, a consumer survey of 405 randomly selected Christchurch households in 1978 reached the conclusion that “major influences” on the aggregate demand for bread were population, household composition, income and price (Brodie and Mellon, 1978). It found that while per capita consumption had declined by 21.9% over the preceding two decades from 73.0 kgs. in 1955 to 57.0 kgs. in 1977, total consumption had increased by 16.0% because of the steady growth in the population.¹⁷ This might suggest that as this was a period of steadily rising incomes, bread was an inferior good. The decline may also have reflected the mistakenly-held view, sometimes promoted by nutritionists at that time, that bread, because of its starchy nature, was “fattening”.

Household composition also appeared to be a significant determinant of bread consumption, which was highest in those with 1-2 occupants and no children, although the presence of children did partially offset the lower bread consumption of larger households. A comparison between per capita consumption and the average real price of bread and real wages suggested that the demand for bread might be characterised by a low price elasticity and a negative income elasticity, the former consistent with bread being a “necessity” good, and the latter suggesting that bread was an

¹⁵ Angus Deaton, “The Measurement of Income and Price Elasticities”, *European Economic Review*, vol. 6, 1975, quoted by: D. Begg, S. Fischer and R. Dornbusch, *Economics* (2nd edition), London: McGraw-Hill, 1987, Table 4.3, p. 73 and Table 4.11, p. 84.

¹⁶ Quoted by: Dominick Salvatore, *Managerial Economics in a Global Economy* (2nd edition), New York: McGraw-Hill, 1993, Table 3.4, p. 97

¹⁷ Over the period 1930-43 annual per capita consumption was 88.1 kgs. (Hunn and Easton, 1985, p. 113). Per capita consumption was 54 kgs. in the 1990s, which was high by the standards of Australia and the United Kingdom at 44 kgs, and the United States at 37 kgs. (Butterworth, 1997, p. 208).

inferior good. While consistent with expectations, this must remain speculative in the absence of formal econometric testing.

Other features of demand which emerged from the survey was the importance of “freshness” in influencing the choice of type of bread – a factor which might help to explain the subsequent emergence of, and strong growth in, “hot bread shops”;¹⁸ and the fact that a third of households had varied the type of bread they bought in the previous 1-2 years, indicating the changeability in the market. The dominant change was towards wholemeal bread (although white bread retained by far the largest share). In contrast, a similar Christchurch household survey on meat consumption had found that only 17% of households were buying different types of meat compared to a year previously.

Consumer tastes are also an important determinant of the demand for bread. The 1980s saw a marked switch in demand away from white loaves to brown, wholemeal and fancy breads, and the emergence of “hot bread shops” as independent operators and within supermarkets. In the period 1985-90 health/grain bread sales increased from 37 to 56% of the market (Butterworth, 1997, p. 208). This trend contributed to the growth of Klissers with its popular Vogels and Reizenstein varieties. By 1990 hot bread shops were estimated to account for 10% of all bread sales, the growth reflecting a world-wide trend (Commerce Commission, 1990, pp. 2-3). There was also an increase in the wrapping and slicing of bread (polythene-packed bread became popular in 1968, introduced by Klissers), and the widespread use of home freezers has encouraged bulk buying of bread. Today average per capita consumption is about 1.4 loaves per week, which is relatively high by international standards (Booker, 1995), but aggregate demand is changing little, a factor contributing to strong competition as a small number of large bakers suffering from over-capacity strive for market share.

Changing tastes make for a relatively volatile market. In the late 1980s research which showed that oat bran consumption was linked to reduced blood cholesterol levels led to a move towards oat bran bread. At least six different bakers launched loaves containing oat fibres over a two month period in 1988. In addition to the growing association between bread and health, about the same time bread began to lose the stigma of being fattening as consumers’ nutritional awareness grew (South, 1989; Syme, 1993). By 1990 the demand for oat bran bread was waning. A new middle ground between white bread on the one hand and “grainy” bread on the other had been identified (Lawler, 1990). The demand for healthy eating is thought to have contributed to the steep fall in the share of white bread from about 75% of the entire market in 1981 to under 50% in 1991. To cater for this trend, Quality Bakers introduced new varieties in the early 1990s,

¹⁸ 80.7% of respondents ranked freshness as “very important”, far higher than the other characteristics of “whether it is wrapped”, “crust”, “shape” and “price”.

in common with other bakers (Holdom, 1991). Children are said to be the major consumers of white bread.

Plant bakers have three main groups of customers: the supermarket chains, the route trade, and the conversion trade. Supermarkets are very important because of the volumes of bread they sell, especially by each chain nationwide. About 70% of bread today is estimated to be sold through supermarkets (Commerce Commission, 1997, p. 8), up from 50% in 1990 (Commerce Commission, 1990, p. 9). Bread is the largest category monitored by the Nielsen survey of supermarket key accounts, with sales of over \$208 million in 1994. The bread category is broken into three groups: white bread, 47.4%; non-white bread, 49.8%; and specialty breads, 2.7% (Baker, 1993). Nielsen data for 1994/95 shows that sales of in-store bakeries were \$112 million, which compared to supermarket sales of packaged plant bread, buns and rolls of \$228 million. Supermarkets have probably also gained ground over the route trade with the increasing concentration of the population in urban areas, and their longer opening hours.

The route trade covers sales to numerous, smaller outlets such as dairies and petrol stations, where demand is based partly on convenience and emergency top-ups. Demand here is not price sensitive, and such outlets have no bargaining power. Also included are institutions like hospitals and prisons, which purchase requirements through fixed quantity tenders for given periods. The conversion trade is very small, and covers bread supplies to caterers, lunch bars and the like.

The emergence of hot bread shops began in the late 1970s, helped subsequently by the relaxation of shop trading hours, especially at weekends. Their emergence is said to reflect the reaction of consumer demand away from the packaged bread produced by plant bakeries, noted for its convenience and good keeping qualities, to the fresh crusty loaf purchased for immediate consumption. It may also have been helped by the arrival of new immigrants, and by the propensity of New Zealanders to travel abroad where they discover new types of bread (Bushuk, 1995, p. 21). Such operations were made possible by the development of compact and efficient dough-making equipment, provers and ovens combined with the use of pre-mixes (where only water has to be added) or frozen dough. Defiance Milling in Australia was the first to develop pre-mixed products.¹⁹

6.2 Bread Baking

The basic ingredients of bread are flour, water, salt and yeast, but to improve other characteristics – quality, flavour or texture – other ingredients may be added, such as fat, milk powder and

¹⁹ “New facility for formulated flour blends and pre-mixes”, *Food Technology*, vol. 27(5), May 1992, pp. 35-36.

sugar, together with various flour treatment and dough conditioning agents.²⁰ The mixing of the flour and water, and its kneading and stretching, causes the flour protein to change into gluten, producing a strong, stretchy dough. The mixture ferments as the yeast feeds on sugar present in the dough, making bubbles of carbon dioxide gas which are trapped in the dough, causing it to “rise”. The “strength” of the flour (protein content) is critical to good bread making – too “weak” or too “strong” and the bubbles will either burst or not swell.

The traditional approach to bread baking – called “bulk (or natural) fermentation” - involves preparing the dough in a special mixer, and then allowing it to rise for several hours in a warm room. The dough is then cut into loaf-sized pieces in the divider, moulded into baking tins, and put through a “proving” machine where it is allowed to rise, and then baked for 30-40 minutes. After baking the loaves are tipped from the tins and cooled, before being machine sliced and wrapped. Bulk fermentation produces an open-textured type of bread.

Most bread today is made by the “mechanical dough development” (MDD) process introduced into New Zealand in 1965, which produces a finer textured bread with better keeping properties. This process involves a short period (only three or four minutes) of intensive mixing instead of several hours of fermentation. The dough is then divided, proved and baked in much the usual way. The advantage to bakers is the savings in space and time compared to the traditional method, making it a much lower cost technique, albeit that it involves much greater precision in the proportions of ingredients and yeast activity, and requires consistent, high flour quality. Its use initially was associated with the use of flour “improvers” – ascorbic acid (Vitamin C) and potassium bromate – to strengthen weak New Zealand flours and improve bread crumb quality.

As the MDD process could produce dough much more quickly, in more batches and in much greater quantities than the traditional method, pressure was put on the organisation of the production process in various ways (Butterworth, 1997, pp. 87-91). It added to the pressure for larger, plant bakeries; required greater oven capacity, which in turn added to the capital cost of bakeries because ovens are the most expensive items of equipment; required precision metering of processes, which encouraged automation; put pressure on the Wheat Board to improve flour quality; and required the use of faster acting, good quality yeasts. Today about 80% of bread is produced using the MDD process (Bushuk, 1995, p. 20).

The move to plant baking of bread was initially motivated by cost reduction, but today the focus is on meeting consumer expectations for bread of a consistently high quality. The plant baking of bread is now a completely automated process, with the materials and final product being

²⁰ See: New Zealand Flour Millers Association (1979); “What’s Happened to Our Bread?”, *Consumer*, May 1989, pp. 14-16; Nordmark (1997). Food regulations specify the flour contents for bread labelled as “wholemeal”, “wholegrain” or “brown”, limit the amounts and types of additives in bread, and require date and ingredient labelling of packaged bread.

untouched by human hand. Often the machines are adjusted as to ingredient weighing, temperature control, quality sensors and timing by computers and logical programmable controllers (Gould, 1990).

7. MARKET STRUCTURE

The key features of market structure considered here, which have an important bearing on market conduct, are vertical integration, economies of scale, seller concentration, production capacity, and entry and exit conditions.

7.1 Vertical Integration

In 1986 about 68% of the flour quota was owned by Wattie and Goodman mills, and those operations had ties with 27 bakeries which together accounted for about 60% of the bread flour usage, as shown in Table 4. The major millers/bakers were thus already substantially vertically integrated prior to deregulation, especially Goodmans, although the controls nullified its effects by preventing bakers sourcing flour from within the same company. Impending deregulation had encouraged smaller bakeries to take stakes in independent flour millers, apparently to secure assured access to flour supplies in a market where the bulk was likely to be tied up within the large integrated companies. For example, Klissers acquired a small shareholding in Canterbury Roller Milling Co (now Canterbury Flour Mills), while Norths Bakery in Christchurch took a 10% shareholding in Temuka Milling Company, and received regulatory consent to acquire up to 26% in Archers (Commerce Commission, 1986, Annex, p. 15).

The vulnerability of independent flour millers to loss of market share through vertical integration is indicated by the experiences of Canterbury Flour Mills. In 1990 it lost a major client when Klissers was taken over by Goodman Fielder Wattie, which then diverted its flour demand to within the group. Then in 1991 the company came under pressure again when its contract to supply North's Dunedin bakery was threatened by Allied's acquisition of Norths (Hutching, 1991). The company's market position was later secured when it was acquired by Rivermill Bakery of Huntly, an independent plant bakery whose position was also potentially threatened by having to source flour from the large, vertically-integrated chains with which it competed.

The changes in the structure of the flour and bread industries since deregulation are encapsulated in Tables 4 and 5, the latter showing the situation in 1997 prior to the merger of Goodman Fielder and Defiance. While individual market shares have become confidential since deregulation, the "big three" millers – Goodman Fielder, Defiance and Allied – operated mills in both Islands, owned 10 of the 15 mills and all of the largest ones, and produced the bulk of the output.²¹

²¹ The three biggest flour millers plus Canterbury Flour and South Canterbury Mills together accounted for about 98% of the milling wheat acquired in 1996 (CC, 1997, p. 21), and hence it can be inferred that they were responsible for the same proportion of the flour output.

Table 4 : Vertical integration and market shares in flour milling and bread baking, 1986

Company	Flour milling		Breading baking	
	Share (%)	No. of mills	Share (%)	No. of bakeries
Goodman Group	29.7	3.5	48	24.5 ¹
Wattie	38.9	3.5	9	1.5
Ireland	19.4	4.0	8	3.0
Allied		0.5	15	2.0
Other millers	12	6.0		
Norths			5	4.0
Klissers			8	1.0
Others bakers			7	(many)
Totals	100	17.5	100	36.5

Notes: (1) Plus 4 independent franchisees.

(2) Other mills are mainly small or very small. Fractions in numbers indicate partial ownership.

Source: Source: Commerce Commission (1986)

They also owned 22 of the 24 plant bakeries, showing the further development of vertical integration over the previous ten years. Of the two other plant bakeries, Rivermill owned Canterbury Flour, and Yarrows at Manaia was not integrated. Rivermill supplies bread in the upper north Island, and Yarrows in the lower North Island. The four non-integrated millers were largely privately-owned operations in the southern half of the South Island producing very small outputs.

Table 5: Vertical integration in flour milling and bread baking, 1997

Company	No. of mills	No. of bakeries
Goodman Fielder	4	14 ¹
Defiance	3	4
Allied	3	4
Rivermill/Canterbury Flour	1	1
South Canterbury Mills	1	0
Milligans	1	0
Harroways	1	0
South Flour	1	0
Yarrows	0	1
Other bakers	0	(many)
Totals	15	24

Notes: (1) Plus three independent franchisees

Source: Commerce Commission (1997, pp. 5,8)

Various reasons were given by Goodman Fielder/Wattie in their 1987 merger application for vertical integration between milling and baking (Commerce Commission, 1987a, p. 34), although it is questionable as to how well they stand up to scrutiny. Firstly, vertical integration was said to ensure continuity and consistency of supply of flour to bakeries, which is important given the perishable product and the fickle market. However, it is difficult to see why a bakery's requirements cannot be conveyed to flour millers, and their requirements be met, with low transaction costs through a market-based contract. There are significant cake and pastry manufacturers, such as Earnest Adams, which have very particular flour requirements, and yet which rely entirely on outside flour supplies. Yarrows also buys in all of its flour requirements. In addition, "tied" bakeries are not able to shop around for the best deal, and may be penalised if the group's mills are inefficient, while the demand for the mills' flour will be affected by the success of the group's bakery business. This mutual interdependence may explain why the two activities are grouped by Goodman Fielder into one division.²²

Secondly, the integrated group was said to benefit from the full utilisation of production facilities. This is contradicted by the substantial excess milling (and baking) capacity, which is a feature of both the industry at large and of individual groups, and has not been eliminated by integration. Moreover, even the integrated millers make a significant amount of sales outside the group. Thirdly, integration allows the mill to contract for wheat and develop flour blends to suit the known requirement of the associated bakeries. However, if a particular flour blend were critical to a bakery's operations, and could be got only from one mill, the bakery would effectively be tied to that miller even if it were under separate ownership. The critical factor for bread baking is the consistency and high quality of the flour, not the identity of the supplier.

Finally – and probably the most plausible reason for integration - was that it provides a guaranteed demand for the output of the tied mills. This is important given the excess capacity in milling, the sensitivity of unit costs to throughput,²³ and the resulting vulnerability of mills which lose market share. Further, as integration spreads, remaining independent millers, foreclosed from a substantial part of the market, have to compete for a shrinking "non-tied" demand for flour against integrated rivals, an unstable situation which is likely to induce them to vertically integrate (Scherer and Ross, 1990, p. 110). The same trend towards vertical integration and exclusive

²² However, the company recently announced that in Australia its milling and baking unit was to be split into separate units. See: "Goodman Fielder rejigs business structure", *Dominion*, 8th February 1999.

²³ Being a relatively capital-intensive process, flour milling is prone to economies of increased utilisation in the short-run. As throughput is raised, the operation's fixed costs are able to be spread more thinly, causing unit costs of the flour output to fall.

purchase and supply within the group was the norm in Australia and Britain. The British firm Spillers said that its “bakeries had been purchased in order to protect its outlets for flour.” (Commerce Commission, 1987a, p. 35).

7.2 Economies of Scale

There appear to be economies of scale in both flour milling and bread baking, in that as the production capacity of the mill or bakery is scaled up, the unit cost at the point of optimal capacity utilisation falls. As a general rule, the cost of production equipment, buildings, trucks and the like rises less than proportionately with scale; are likely to be more power-efficient; and usually require few, if any, additional workers or salaried staff to operate them. Against these production scale economies have to be set the likely greater unit transport costs both of assembling a greater quantity of raw materials for processing, and of distributing the finished product over a wider area. For example, a larger mill requires greater quantities of wheat for processing, and produces more flour, bran and pollard to be distributed, and so the optimal size of mill, and its location, depends on the trade-off between economies of scale in production and rising unit costs of transport. Rising input supply costs would eventually offset following processing costs, causing the overall average cost to turn upwards (Scherer and Ross, 1990, pp. 97-141).

While scale economies are likely in principle, the empirical evidence in support is sketchy. With regard to flour milling, Borrell and Zwart (1982, pp. 15, 50, 53-55) were told by millers that economies arose in both labour and capital. They used accounting costs and output data for a variety of differently-sized mills sourced from the New Zealand Flour Millers Association to estimate by ordinary least squares regression a notional average cost curve of the form: $Y = \alpha X^\beta$, where Y represented processing cost per tonne (excluding the cost of the wheat input), X denoted tonnage of wheat processed, α and β were constants, and Y and X were measured in logarithmic form.²⁴ This equation cannot incorporate diseconomies of large scale (i.e., it is monotonically declining), but the authors noted that some flour mills in the US had annual outputs of 600,000 tonnes, which was six times the capacity of New Zealand’s largest mill and the equivalent of three times domestic flour demand, implying that scale economies were unlikely to be exhausted in the local setting. The authors recognised that the fitted equation could be distorted by variations between mills in terms of location, age of plant, product differentiation and accounting conventions. Moreover, the overall structure of costs was probably distorted by regulation; for example, all mills were operating with varying degrees of excess capacity, and had

²⁴ The equation was as follows: $Y = 145X^{-0.18578}$ with both parameters being “highly significant” and $R^2 = 0.89$.

probably been deterred from rationalising and modernising equipment. Bearing in mind these caveats, rough estimates can be made of the unit processing costs of a range of plant sizes as of 1979. These show unit costs falling from about \$30 for a mill with a capacity of 5,000 tonnes per year, to \$22 for one of 25,000 tonnes, \$19 for 50,000 tonnes, and \$17 for 100,000 tonnes. Given the likely “fuzziness” of real life (as opposed to textbook) cost curves, it would appear that scale economies are largely dissipated beyond about 50,000 tonnes. However, only one mill had a capacity above that figure, suggesting that the fitted equation would be sensitive to the position of that extreme data point.²⁵

There also appear to be scale economies in plant bread baking. In 1990 it was claimed that bakery sizes ranged from 37,000 to 500,000 unit sales per week, with the average being in the range 100,000 to 130,000 per week (Alexander, 1990, p. 11). One likely indicator of economies is the increasing size of new plants. The QB bakery which opened in East Tamaki in 1989, and which replaced two existing QB bakeries, can produce 8,000 loaves an hour. It cost \$27 million to build, and was the largest in the Southern Hemisphere, although recently it has been dwarfed by QB Australia’s new plant in Sydney (Butterworth, 1997, p. 198).

Some numerical evidence on scale economies in baking – unfortunately lacking references to sources – is found in the Trade Practices Tribunal (1976, p. 17,256). The “estimates of indices of production costs” for bakeries of different types and sizes are shown in Table 6.²⁶ These estimates suggest that while all three types of bakery enjoy significant scale economies, the plant bakery has a substantial cost advantage over hot bread shops and family bakeries. However, that advantage is likely to be reduced when delivery costs are taken into account.

Large group bakeries also appear to enjoy scale economies in relation to merchandising, marketing and brand promotion, particularly in the context where supermarkets are the major retailers. They have the ability both to meet the preference of supermarket chains for nationwide (or regional) supply contracts for bread, and to supply individual supermarkets as often as three times a day. In the process they merchandise their products – they restock shelves, an important function because bread moves fast – which, being a labour-intensive process, is something that small bakeries cannot do.

²⁵ In 1976 the Australian Trade Practices Tribunal considered that there were significant scale economies up to at least seven tonnes per hour of capacity. Assuming double-shift working, this would equate to around 40,000 tonnes per year capacity. See: Trade Practices Tribunal (1976, p. 17,249).

²⁶ The estimated loaves-equivalent production and number of people supplied are calculated on the basis used in the decision that a loaf weighed one-and-a-half pounds and consumption was one-and-a-half loaves per person per week.

Table 6 : Production cost indices for bread bakeries, Australia 1976

Type of bakery	Index	Loaves/month	People supplied
Hot bread shop			
10 tonnes / month	110	15,000	2,500
15 tonnes / month	100	22,500	3,750
Family bakery			
5 tonnes / month	112	7,500	1,250
15 tonnes / month	98	22,500	3,750
Plant bakery			
50 tonnes / month	86	75,000	12,500
100 tonnes / month	71	150,000	25,000
200 tonnes / month	67	300,000	50,000
500 tonnes / month	60	750,000	125,000

Source: Trade Practices Tribunal

The proliferation of bread varieties as bakers cater to diverse consumer tastes, and attempt to gain a competitive advantage in the largely static market, has heightened the need for frequent in-store marketing campaigns to maintain market share and make efficient use of shelf space. This has led to an increase in advertising budgets – to over \$2 million in 1988 – which then was a significant change for a product traditionally regarded as a commodity item (South, 1989). At the same time, to avoid both confusing customers with the variety of breads available, and dissipating scale economies, there was some rationalisation of types, most notably by Quality Bakers, which in a five year period in the late 1980s reduced the number of its varieties nationwide from 300 to under 50 (Holdom, 1991).

7.3 Seller Concentration

The process of industry amalgamations and rationalisation described earlier has resulted in a great reduction in the number of significant players, and a concomitant increase in seller concentration, in both the flour milling and bread baking industries, to the point where market power might be a potential problem. In flour milling the number of mills declined from 65 in central Canterbury alone in 1933, to 21 in the whole country in 1980 (14 in the South Island and 7 in the North Island), and to 15 by 1997 (10 and 5). Many of the South Island mills are small, at least in terms of production (as opposed to capacity). Since the takeover of Defiance by Goodman Fielder in 1997, the latter and Allied have together accounted for most of the output, with the only significant independent on a national scale being Canterbury Flour. The industry is thus highly concentrated.

The reduction in the number of bakeries has been an even more striking feature of the bread baking industry, as shown in Table 7. Between 1940 and 1972 the number fell from 730 to a low

point of less than 80, despite an overall increase in total bread consumption. After that the declining trend was reversed with the advent of in-store bakeries and hot bread shops, with 23 new firms entered during the 1970s (Commerce Commission, 1980, pp. 9, 24). Those 23 are included in the 104 bakeries listed for 1980, indicating that the number of standard bakeries was still falling. Of the 104, 31 were grouped into three firms - NZ Bakeries Ltd., Allied Foods Ltd. and Quality Bakers (Commerce Commission, 1980, p. 10).

Table 7: Number of bakeries in New Zealand, selected years

Year	Number of bakeries
1940	730
1950	480
1960	290
1970	c.90
1980	104

Source: NZ Flour Millers Association (1970, p.83); Hunn and Easton (1985, p.114-5; and Commerce Commission (1980, p.8).

The declining trend indicates a shift from bread made by handicraft methods in small bakeries operated by one or two people, to almost fully automated factories or plant bakeries which produce large quantities of output in controlled batches. At one time each provincial town and village had its own bakery. After the Second World War improvements to the road network and to vehicle transport, together with the greater urban concentration of the population, opened the way for the introduction of larger, plant bakeries. At the same time, the small independents were hurt by improved road transport, which removed their natural protection in local markets, and the increasing concentration of bread sales in supermarkets, which have demanded national purchasing and supply arrangements, including bread brands being available on a national basis. Many closed or were taken over by their larger competitors. By 1967, while 82 out of the 132 bakeries used less than 1,000 tons of flour a year, 18 city bakeries used more than 2,000 tons, and the three largest – Denhards in Wellington, and Stormonts and Findlays in Auckland – used more than 7,000 tons (Butterworth, 1997, pp. 18-19).

The plant bakeries could take advantage of economies of scale when fully utilised, but centralisation of production could only proceed with improvements in transport of the highly perishable product. Horse-drawn vans could deliver over only a small area, limiting the size of the enterprise. Westons pioneered the use of large, purpose-built, motorised bread vans, which allowed bulk delivery from a centralised site over entire provinces. The large sides of vans also provided a means of brand promotion. The ending of the 150 km. road transport limit in 1983, which had hindered spatial competition, also helped, as did improvements in baking and

packaging techniques which retarded staling (Butterworth, 1994, p. 4). In 1990 the Commission noted that bread was being transported over a greater distance on a regular basis than was the case in 1987, and determined that the North Island could be split into two geographic markets – the “upper” and “lower” halves (Commerce Commission, 1990, p. 5).

By the late 1980s almost all new supermarkets were being built with in-store bakeries, and those already built were having bakeries added. In 1990 about 30% of North Island supermarkets had their own in-store bakeries (Commerce Commission, 1990, p. 6). In 1997 Goodman Fielder estimated that 242 out of a total of 338 supermarket outlets had in store bakeries, and that there were about 411 hot bread shops nation-wide (Commerce Commission, 1997, p. 8). The reason is not so much the profits from so doing, but rather to contribute to the supermarket’s image with consumers, especially for providing fresh produce, and to act as a competitive threat to outside suppliers.

As shown in Table 8, bread sales through supermarkets in 1995 given by Booker (1995) were dominated by Goodman Fielder, with an estimated market share of over 50%, and eight of the top-ten bread varieties. Its Nature’s Fresh white sliced bread is the country’s largest selling brand. The next largest was Allied, with a 30% share and the remaining two top-ten brands. The third of the major companies was Defiance, which only achieved a national presence in 1993. The rest of the market is made up of independents – mainly Rivermill and Yarrows. Rivermill makes some supermarket sales but does not chase it because selling through supermarkets is regarded as too tough. It sells bread throughout the northern half of the North Island, concentrating on the route trade. Yarrows claim to have half of the market in Taranaki.

It should be remembered that supermarket house-brands are often baked by the plant bakers, and so it is questionable as to whether those sales should be attributed to the plant bakers, as Booker appears to have done, or to the supermarkets. From a production viewpoint housebrand contracts assist the bakers by keeping up throughput, and as such are strongly contested for, but from a demand perspective they carry the supermarket’s own brand and are used as an instrument of countervailing power (see below).

The bread sold through supermarket in-store bakeries and hot bread shops was considered by the Commerce Commission (1997, pp. 17-19) to fall into a “specialty bread market” which was separate from the “packaged bread market”. Manufacturers and bakery specialists are said to agree that the products of in-store bakeries do not compete with packaged bread; rather, consumers buy both to satisfy different needs (South, 1989). Ben Bartelink, the Foodstuffs (Auckland) bakery specialist, reportedly said that 80% of in-store bakery sales are impulse purchases induced by the fresh-baked aroma, attractive presentation and the warm product. They also provide specialised and innovative products in small batches, which avoids wastage and keeps the product consistently fresh, and can vary the product range frequently within the context of a

limited number of lines. Others have seen in-store bakeries as extending the bread category rather than taking away from tradition bread. Its limited shelf life means that it is purchased for immediate consumption, and thus cannot replace the convenience of less perishable, sliced, packaged bread (Lawler, 1990; Baker, 1993; McCarthy, 1994).

Table 8 : Plant bakers, major brands and market (supermarket) shares, 1995

Parent	NZ Subsidiary	Leading Brands	Market share
Goodman Fielder	Quality Bakers	Homestyle Molenberg Reizensteins Vogels Country Fresh McGregors Nature s Fresh	50% - 55%
George Weston Foods	Allied Foods	Tip Top Jumbo Laurensons Norths Burgen	About 30%
Defiance Mills	Country Fare	Country Fare	About 10%
Independents	Yarrows River Mill	Yarrows River Mill	5-10%

Source: adapted from Booker (1995)

The bread baking industry in 1995 had a high degree of seller concentration, which was in 1997 was increased with the acquisition of Defiance by Goodman Fielder.

7.4 Production Capacity

All flour mills have consistently operated at below full capacity. In 1986 excess capacity in flour milling was estimated nationally at 36%, being 19% in the north Island and 50% in the South Island (Commerce Commission, 1986, Annex, p. 11). In 1997 total production of flour was about 260,000 tonnes, or only 60% of potential capacity of 437,000 tonnes, showing that excess capacity problems in the industry remained. Most mills were operating at well below maximum capacity (Commerce Commission, 1997, p. 5).²⁷

Published information on flour mill capacities are hard to come by in the post-Wheat Board era. However, an authoritative estimate in 1990 put the range in flour mills sizes from 1.5 to 11 tonnes per hour, with the average being 4.5 (Alexander, 1990, pp. 10-11). The co-existence of

²⁷ Total potential capacity was estimated on the assumption of 3 shift/6 day/50 weeks per year working, thought by Commission staff to be "optimistic". It was considered very unlikely that the small South Island mills could produce to this estimated full capacity.

small and large mills is a puzzle given the scale economies in milling, which would lead to the expectation that large, efficient mills would tend to drive out small, inefficient ones. The persistence of small mills, albeit often with very small outputs, may reflect a mixture of spatial protection, private ownership (often by farmers), niche market operation, and the use of fully depreciated equipment with low labour-intensity. All of the small mills operate south of Christchurch where local markets are small, and where parochialism may be a factor in their support. Also, milling equipment is noted for its longevity (New Zealand Flour Millers Association, 1979, p. 60). In 1987 Canterbury Flour Mills' milling equipment was said to be a century old, although well-maintained and updated (Birss, 1987). Hence the pattern at a particular time of mills of different sizes, with their mixtures of older and more modern equipment, is a legacy of their historical development. Labour requirements at mills are relatively low, because the process is capital-intensive. For example, Allied's Wellington mill – which is one of the larger ones – employs just 19 staff.²⁸

The baking industry also suffers from substantial excess capacity (Butterworth, 1997, p. 207). In 1990 all major plant bakeries had the capacity to expand production by at least 30%, with the exception of Allied's Auckland plant, which was working a two-shift operation (Commerce Commission, 1990b, p. 8). QB has been held responsible in some quarters because of its large number of bakeries – 14 in all, plus the three franchisees – several of them based in relatively small provincial towns.²⁹ From a production perspective this could reflect an inadequate response to the need for rationalisation to gain scale economies, perhaps stemming from its co-operative origins; from a marketing perspective, QB has seen decentralised production as a marketing advantage, based on the slogan that its bread is “baked near you”.

7.5 Entry and Exit Conditions

In 1987 it was estimated that over \$10 million would be required to build a major flour mill operation (Commerce Commission, 1987a, pp. 40-41), a not inconsiderable sum, and probably one that could be doubled today. While the issue was not raised, it seems likely that a significant proportion of such an investment would be sunk, i.e., non-recoverable upon exit, knowledge of which would discourage entry in the first place. In addition, the considerable excess capacity in the industry at the time, and the prospect of rationalisation with deregulation, together with problems of securing access to outlets and withstanding competition from established players, made new entry “highly unlikely” in the Commission's estimation. At the time of the Fielder

²⁸ “Raising flour to new heights”, *The Dominion*, 10th June 1997.

²⁹ QB in 1997 had bakeries in Whangarei, Auckland, Hamilton, Rotorua, Tauranga, Whakatane, Napier, New Plymouth, Palmerston North, Wanganui, Wellington, Nelson, Christchurch, Timaru, Dunedin and Invercargill. The franchisees were in Whangarei, Gisborne and Masterton.

Gillespie Davis/Goodman Group merger in 1986, with deregulation gathering pace, flour imports from Australia were seen as a potential competitive constraint on the domestic industry. Although the extent of such imports was difficult to assess at that point, four Australian flour milling companies were known to have exported small quantities of flour to New Zealand under ANZCERTA (Commerce Commission, 1986, Annex, pp. 14-15).

The same arguments apply today. The main source of competition – as yet potential rather than actual – comes from imports of flour from Australia. In 1997 the Commission found that transport costs of flour to the North Island from either the South Island or Australia were roughly comparable, with per tonne transport costs of about \$60 Christchurch/Wellington and \$80 Christchurch/Auckland, compared to Australia with a figure of \$50-55. Hence flour prices are higher in the North Island than in the South, the differential reflecting transport costs (Commerce Commission, 1997, p. 15). Bulk flour has not regularly been imported into the North Island (and is not feasible in the South), even though it is technically feasible to do so by a variety of means: in one tonne bags, by specially lined container, or in pods similar to those used for rail transport. In addition, bulk flour import would involve extra handling and storage costs, and increase the risk of disruptions to production through supply delays, which would be critical to a plant baker. Imports would also be susceptible to exchange rate fluctuations. Consequently, in recent years imports have been limited to small quantities of bagged flour (Commerce Commission, 1997, pp. 26-27). The by-product also has to be disposed of, although – surprisingly, given its low value bulky nature - bran and pollard is shipped in quantity from the South to the North Islands.

It is clear that the cost of small-scale entry into the bread industry is modest. Hot bread shops represent a re-emergence of the traditional bakery business, where the owner-baker bakes bread in the rear of the premises and sells the bread in the retail outlet at the front. In 1990 it was estimated that the capital cost of establishing a hot bread shop or in-store bakery was between \$150,000 and \$500,000, with the latter being close to a plant bakery-type operation (Commerce Commission, 1990, p. 8). Cheaper second-hand equipment is also available internationally. Moreover, entry would be easier still if hot bread were, indeed, in a different market from plant bread, and so therefore not facing direct competition from that quarter. Perhaps the main limitations on entry are the limited size of the very local markets normally served by such ventures, and the potential fickleness of consumer tastes.

A major plant bakery was estimated to involve capital costs of \$10-20 million in 1990, with a medium-sized plant costing \$2-5 million. However, to survive, a new operation would have to supply supermarkets, and that in turn would require a nationwide (or at least a North Island-wide) presence, possibly involving bakeries in two different centres. Market share would have to be wrestled from well-established incumbents owned by major overseas food companies with entrenched brands, who would respond competitively given the threat to their positions and their

excess capacity. The entrant would also have to secure supplies of flour, which might – in the context of vertical integration among the major players - entail also having to build a flour mill, again in an industry suffering from excess capacity. To be efficient the mill might have to be larger than required to supply the tied bakeries, so that other outlets for the “surplus” flour would have to be sought. When all of these factors are considered, new entry by a plant baker on a scale sufficient to challenge the two incumbents seems very unlikely.

8. MARKET CONDUCT

The three key areas of market conduct in the milling and baking industries covered below – aside from mergers and amalgamations, which have already been discussed – are pricing, the countervailing power of supermarkets, and product differentiation and promotion.

8.1 Pricing

Each baker has to keep a wary eye on the market behaviour of its rivals, especially as regards pricing and promotional activity. Intense competition emerged between bakery companies in the 1990s, especially in the South Island. This reflected both the new aggressive attitude adopted by the supermarket chains (see below), and the restructuring and acquisitions in the baking industry in the 1980s as each group sought nation-wide coverage in order to be able to supply the supermarkets, albeit at the expense of excess capacity. In addition, in the early 1990s Defiance began an aggressive expansion under a new general manager, John Wright, with new capacity being purchased, use of a generic brand, and strong discounting. This approach led to significant losses for the company, and Wright was replaced by John McCabe in 1993, who ended the price discounting in favour of a greater reliance on branding.

The excess capacity was greatest in the South Island where the smaller market was less able to support three major bakers. Allegations arose of agreements between them to reduce competition similar to those in Australia between Goodman and Defiance over flour (Booker, 1995). In 1996 the Commerce Commission took Quality Bakers and Country Fare to court alleging price fixing in the South Island bread market.³⁰ Its investigation found that two senior company representatives, at the September 1993 annual general meeting of the Bakers Association, discussed the high levels of discounting in the South Island and the policies they had previously independently developed to control it. They then sent instructions to their South Island management stating their respective policies, listing maximum discounts and stating that the policy was to be strictly adhered to. This amounted to price-fixing, in that they had reached an understanding effectively to limit the discounts they would offer to their supermarket and other customers. When, a short time later, the two companies became aware that the Commission was investigating the understanding, the policy was abandoned. Following the Commission's investigation, the two companies consented to an agreed statement of fact being presented to the Court, in which they admitted reaching an understanding in breach of the

³⁰ See: *Commerce Commission v Country Fare Bakeries Limited and Quality Bakers New Zealand Limited*, Christchurch High Court, Hansen J., 17th October 1996; and Commerce Commission, "Media Release: \$300,000 penalty for bread price fixing", Wellington: Commerce Commission, 17th October 1996.

Commerce Act, and to having a judgement entered against them with penalties of \$150,000 against each company. In private the companies believed that the case had arisen, at least in part, through the behaviour of the supermarkets.

8.2 Countervailing Power of Supermarkets

In the early 1990s the supermarket chains took a new approach to bread marketing which was aimed at increasing their market share by using bread promotions from the plant bakers, pushing their housebrand bread and adding to their in-store bakeries. This was possibly a result of the greater foreign ownership of supermarkets, the increased emphasis placed on centralised buying, and the adoption of bar coding in the 1980s, which allowed supermarkets to monitor their sales, and to get fast feedback on the impact of discounts and specials, and thereby to control their operations more effectively. All three developments put pressure on the plant bakers. Bread supply contracts became the outcome of negotiations between supermarket chains and baking companies at very high levels in both companies (Butterworth, 1997, p. 188).

Bread is the largest single seller in supermarkets, and hence an important drawcard for getting customers into the store. Most bread produced by plant bakers is sold through supermarkets. Supermarket chains have been able to use their buying power to squeeze concessions from their bread suppliers, in terms of wholesale pricing and discounts, special offers and other concessions. A standard condition is that all bread is supplied on a “sale or return” basis, meaning that the bakers bear the cost of unsold bread. The bakers also undertake the “merchandising” – the refilling of the bread racks on a daily basis – and even supply the racks. Supermarkets thus hardly have to lift a finger to sell their biggest – and perishable – product line, and have no stockholding or warehousing costs. As they are not able to do this with other fresh products such as vegetables, it reveals the intensely competitive, oligopolistic structure of the bread baking industry in the early to mid-1990s. The rapid turnover generates good cashflows prior to the payment of accounts, reducing working capital requirements.

Supermarkets have an important impact on competition between bakers through the criteria they use for determining which bread they stock. Factors typically included are: the cost and quality of the bread; the ability to offer sufficient quantity and product range; the promotional support; and the promotional incentives offered. Smaller bakers have found access to supermarket shelves very difficult because of their inability to match discounts offered by larger bakers, and by an inability to supply the whole chain.

Similar comments apply to supermarket housebrand bread, which emerged in the late 1980s. These brands have gained significant market shares, so that housebrand contracts (usually of six months duration) are keenly fought over by the major bakers, even though this gives the supermarkets the ability to drop prices and create extra leverage over the bakers’ own brands.

Moreover, the larger in-store bakeries are able to supply packaged white bread in direct competition with independent plant bakeries. Supermarkets use this ability to help lever discounts from those suppliers. At least one chain as a matter of policy prices its packaged bread well below that of outside suppliers, and consequently its bread outsells that of the large plant bakers. The supermarkets recognise that market share is important for their suppliers, especially in a stagnant bread market, and competition for prime shelf price is intense. Supermarkets also use bread as loss leaders in their rivalry with other supermarket chains, and expect good deals with suppliers for that purpose (Booker, 1995).

The specialising of bread by manufacturers and supermarkets is a double-edged sword, however. While it may draw customers into stores, it poses problems for bread production in that customers tend to buy in bulk for that week and freeze it, meaning reduced sales in the following week. This leads to peaks and troughs both in production, and for supermarkets in their customer base (Baker, 1993). It also suggests that brand loyalty is weak, at least at the bottom end of the market – the white and nearly white (wholemeal) – whereas specialising on grain bread is uncommon.

Overall, because supermarkets are able to switch between suppliers at little cost, can use the leverage gained from the popularity of their housebrands, and can expand packaged bread from their own stores, they appear to have considerable countervailing power. The major plant bakers have attempted to counteract this buying power through sophisticated brand management techniques. One approach is to appeal directly to consumers over the heads of the supermarkets by differentiating and promoting certain brands to develop strong loyalty. This attempts to make the demands for those brands relatively price inelastic, and thus comparatively insensitive to price cuts on other brands. At the same time, supermarkets are forced to stock the heavily promoted brands or risk losing the patronage of customers, and to focus their efforts to squeeze price discounts or other concessions from suppliers on non-premium brands.

8.3 Product Differentiation and Promotion

Wheat, flour and bread are all differentiated products. With regard to flour, the variety of types available has grown from fewer than six at the large mills prior to deregulation in 1987 to as many as 60 today, which vary according to such characteristics as protein content, colour and moisture retention. Sophisticated, large scale, modern equipment is needed to produce such a range. Although buyers may themselves be technically sophisticated, they often value technical support in the choice of product they use. Standard flours are sold largely on the basis of price. Product promotion is not a significant activity on the part of millers.

The bread market is one where products change regularly in response to changing consumer tastes, and as different bakers seek to gain an edge over rivals in a stagnant market by coming up with a more favoured product. The market is quite volatile. Market surveys are used to elicit customer tastes as the first step in developing new products (Gould, 1990). Differentiation is facilitated by the huge number of bread recipes either available, or which can be developed. In competition terms, product promotion is seen as an alternative to the more damaging price competition. The latter led to an average fall in the price of supermarket white bread by 7.2 cents over the period from August 1992 to August 1993. This price discounting encouraged the three majors to increase their marketing activity in an attempt to shift the focus from price (Syme, 1993).

Quality Bakers and Allied Foods have accommodated this diversity by having a number of key brands representing the main bread types, and then offering variations within each brand. For example, "Natures Fresh" and "Country Split" are two of Quality Bakers' major brands of white packaged bread, whereas Burgen is Allied Foods' "heavy health" brand bread. In 1990 the General Manager of Tip Top Bakeries, Rob Chemaly, reportedly said (Lawler, 1990):

You can't sit back and feel that you have the market covered. It's an ongoing process of development and change which you have to be prepared for.

Experience suggests that the introduction of new lines often takes sales away from an established line. Hence, to avoid a confusing proliferation of brands, the poorly selling lines have periodically to be weeded out. A range of brands is required, each appealing to a particular market segment. The use of polythene bags for packaging provides an ideal medium for branding the product, and for conveying other information to buyers. The importance of branding and brand protection is reflected by the number of costly "passing off" disputes between bakers in the late 1980s, where it was claimed that particular brands were being mimicked by similarities in packaging in an attempt to mislead customers (Commerce Commission, 1990, p. 9). For example, in the period 1985-88 Klissers took a court case against QB over one of the latter's packaging designs, whose checked pattern was said to resemble that of Klissers. The allegation was rejected by the courts.

Various forms of promotion were a feature of bread marketing in 1993, with free giveaways, offers and competitions. Perhaps the most ambitious was Country Fare's offer of one dollar off each Clear Communication toll call, which was seen as giving customers a saving without cutting the price of the product. At the lower end of the market heavy price discounting was still continuing, and believed to have contributed to the upsurge in sales of white packaged bread and to slower growth in housebrands (McCarthy, 1994).

Following a year of marketing research, in 1997 QB decided to draw each of its brand names such as Vogels, Nature's Fresh and Molenburg, which had hitherto operated largely independently, under the new umbrella brand of "Quality Bakers", thereby lifting the profile of the company and

identifying it with each of those brands.³¹ The overall aim was to improve consumers' perceptions of the quality of the product, and thus to reduce reliance on price as being the main selling point, and to halt price discounting, particularly of white bread, which was causing its sales to grow at the expense of higher margin varieties. Strong brands, which differentiate the product from those of rivals, are considered to create buyer loyalty, which in turn allows wider margins and the company to be more resistant to price cutting pressures. The launch was accompanied with a \$5 million television campaign from August 1997 to July 1998, and a repackaging of all brands. These were based on the recognition that mothers are the prime purchasers and children the main consumers of bread.

This approach might be questioned on two grounds, however. Firstly, consumers seem familiar with, and buy bread on the basis of, brand name. Knowing the associated company name would not seem likely to sway the consumer's choice. In any case, the decision of the supermarket to stock a given brand might act as a certification of quality in the buyer's eyes, and frequent purchase allows buyers to test competing varieties. Secondly, given the duopoly nature of the industry, QB's advertising campaign was bound to meet a response from Allied, which became evident early in 1999.

³¹ "Quality Bakers promises to put more dough into the bread market", *Retail Today*, August 1997, pp. 37-39.

9. MARKET PERFORMANCE

The performance of the industries will be assessed in terms of profitability, productive efficiency, product quality and service, and dynamic efficiency.

9.1 Profitability

It is difficult to assess industry profitability because the larger companies are diversified, and it is impossible to get information on the profitability of their milling and baking businesses from their consolidated accounts, while the smaller companies tend to be privately owned. The New Zealand industry has been claimed to be more profitable than the Australian, but the latter has experienced very low profits because of severe competition triggered by great excess capacity. In New Zealand during the early 1990s it would appear that intense competition between the small number of firms for access to supermarket shelves, and the growing willingness of the supermarket chains to exercise their countervailing buying power, led to a situation where bakers earned small margins on bread, while the supermarkets enjoyed large profit margins (Lawler, 1990). The price fixing in the South Island in 1993 admitted to by QB and Defiance was symptomatic of this pricing pressure, as were the losses made by the latter in the same period, which ultimately led to it being acquired by QB.

More recently it would appear that price competition has become less severe. This may reflect the elimination of Defiance as an aggressive competitor; the consequent reduction in the number of major, vertically-integrated players to two; Allied being a less aggressive competitor, especially now it is over-shadowed by the much larger Goodman Fielder; and the increased emphasis on non-price forms of competition, particularly branding. Analysts have commented that QB is reasonably profitable.

9.1.1 Productive Efficiency

Productive efficiency – the production of a given output at lowest cost - needs to be judged against what is technically possible. It is difficult to do this without access to company data, and without making comparisons between companies and plants. There can be little doubt that a number of factors - deregulation and the emergence of competition, plant upgradings and new investments, and industry rationalisation and relocations - have had a salutary impact upon productive efficiency in the milling and baking industries. The equipment in many flour mills was upgraded, and additional equipment was added to enable them to cater for the increasing demand for specialist flours. Increased storage capacity in which mills could hold stocks of the different products to meet customer demand was also required.

However, despite these advances both industries clearly suffer from substantial excess capacity. In milling this might reflect on the one hand the apparent reluctance of smaller operators to exit,

in part because of the sunk and depreciated nature of the investment in the plants, and on the other the possibility that unit costs may be lower from operating larger plants with excess capacity. In bread baking, excess capacity seems to have arisen in substantial part because of QB's policy of maintaining a number of relatively small provincial bakeries, and through its building of an excessively large plant in Auckland (said to be large enough to supply the entire local market).

9.1.2 Product Quality and Service

The abolition of price controls on bread in 1981, and of the regulation of the wheat, flour and bread industries in 1987, with their deadening effect on product quality, opened the way to improvements in quality and quality control. Wheat farmers were encouraged to grow higher quality but lower yielding varieties of wheat by premiums for quality; flourmills developed contracting mechanisms to ensure that they were supplied with the wheat grades required, and upgraded to improve the consistency, quality and variety of flours produced; and there was an explosion in the variety of bread types available as plant bakers competed against the new hot bread shops in a static market to gain market share. Klissers pioneered "heavy" health bread in New Zealand, using its adherence to the tradition "natural" process as a selling point.

Bakers also came under pressure from McDonalds and KFC, which are large users of bread rolls and buns, to meet their exacting quality standards. This caused them in turn to pressure the flour industry and the Wheat Research Institute with the result that the Institute and some milling companies have achieved, or are moving towards, ISO-9002 accreditation. The Champion Flourmills in Auckland was the first New Zealand flour mill to achieve ISO 9002 compliance in 1992, reflecting the spread of Quality Assurance programmes through the flour and bread industries.

More generally, Quality Bakers has wholeheartedly adopted a Total Quality Management (TQM) approach to its operations. This is more than just quality control – the reactive process of inspecting finished products for faults prior to distribution – but rather the pro-active approach to product quality in which an organised, self-scrutinising environment is created such that faults do not occur. Plant baking is well suited to TQM because the product is relatively standardised, and wastage either in the form of "cripples" – damaged and unsaleable loaves – or from returned unsold product because of over-ordering, is relatively easy to prevent but impossible to correct (Butterworth, 1994).

9.1.3 Dynamic Efficiency

As mentioned earlier, the industries have been able to draw on two principle sources of ideals and inventions: the research conducted from 1928 by a central body – formerly the Wheat Research

Institute, now the Institute for Crop and Food Research³² – funded by industry levies on wheat (through United Wheatgrowers) and flour (through the NZ Flour Millers Association), and by the government through the Foundation for Research, Science and Technology; and the access by the vertically-integrated flour milling and baking companies to industry knowledge and research available from their large overseas parents. In addition, the companies have contributed numerous improvements themselves.

The research institutes have made significant contributions in the areas of wheat breeding, wheat growing, flour milling and bread baking. Advances in the first two were mentioned earlier. In respect of milling, the Institute in the late 1940s developed, and subsequently transferred to industry use, a method for increasing the flour extraction rate from wheat from 73 to 80%. This improvement occurred without significant loss of quality, but with added nutritional quality, and remains in wide use today (Bushak, 1995, pp. 30-33).

In bread baking, a particular concern is the suitability of different wheat samples and varieties for baking purposes. The most significant advance was the development of a bake test which reflected commercial baking processes yet allowed the testing of thousands of wheat samples. Further developments occurred during the late 1960s to accommodate the use of the mechanical dough development (MDD) process imported from England to New Zealand styles of bread and flour. By 1982 the Institute had developed equipment and procedures for a fully automated bake test for MDD, with test results being converted into a numerical “bake score” now used as an industry standard (Bushak, 1995, pp. 33-34). When first introduced, at a time when wheat quality was relatively low, it significantly improved overall bread quality.

More recently, research has focused on how different farming practices affect wheat quality, how carbohydrates influence bread crumb quality, how different anti-staling agents work, a method (with an eye particularly on exports) for preventing tiny black flecks from appearing in unbaked frozen pastry, a replacement for potassium bromate as an oxidation agent in dough, and a new dough probe which pinpoints when the dough has been mixed to the optimal extent (Syme, 1993).

The baking industry has made numerous strides to improve its efficiency. The mid-1970s saw an answer to a central industry problem – the disposal of unsold or returned bread, which was either dumped or fed to pigs. A large-scale machine was developed to process such bread into breadcrumbs for food coatings, an important advance in light of the subsequent expansion of takeaway and prepared foods, and the lifting of the Return-of-Bread Regulations in 1984. The late 1970s saw early experiments with frozen dough to meet the emerging demand from hot bread shops by various parties, with Yarrows being the first to solve the technical problems. The

³² The WRI was incorporated into the DSIR Crop Research Division (Lincoln) in 1988, which (augmented by MAF

production of frozen dough has become a large part of Yarrow's business. The 1970s saw the development of computerised accountancy and production control programmes for the industry. At this time the baking industry was highly mechanised, but not automated. All processes were controlled by skilled bakery staff because of the variable quality of flour, which affected every stage in production from dough mixing to bread slicing. Automation centred on the development of "intelligent" sensors which were first applied to adjusting the water/flour mix into the mixer, and were subsequently extended to other major items of equipment. The most modern bakery, built in Auckland in 1987, is fully automated and runs virtually without human intervention.

and DSIR Plant Protection) then became the Institute in 1992.

10. CONCLUSIONS

Price and other controls on flour and bread were introduced in the mid-1930s as a response to the Depression, both to preserve the domestic market for local wheat growers and to ensure that bread consumers had access to supplies of reasonably priced bread. The controls were subsequently continued in the unusual circumstances of the Second World War and its aftermath, but were not removed subsequently, probably for a number of reasons: pressures from political interest groups (i.e., farmers, millers and bread consumers, but not bakers) for their retention; the acceleration in the rate of inflation in the 1970s (price controls and price freezes were seen as a means of stemming inflation in those days); a fear that the removal of controls might lead to excessive price increases by less “responsible” elements in the baking and retailing industries; and the belief that bread markets were local and often supplied by single suppliers, so that consumers needed to be protected from potential monopoly pricing, a problem thought to be exacerbated by the sharp fall in numbers of bakeries over the period. However, the monopoly problem, insofar as it existed, was partly a creation of the controls themselves (including those on road transport), which had served to slow the trend towards centralisation in production and the broadening of the market. During the 1980s the revolution in economic management of the economy swept away notions that price control was an effective weapon against inflation, and undercut interest group opposition to reform. In wheat and flour milling, as in several other industries, regulatory protection was abolished almost overnight in the mid- and latter part of the 1980s (for example, see Pickford and Bollard, 1998).

The flour and bread industries have variously been compared to both the meat and brewing industries. In all three, static or declining demand for the product has led to expansion-minded firms struggling to gain market share ascendancy. As in meat, the flour and bread industries have had to overcome a legacy of regulation and price control, which resulted in over-capacity, and stifled market-led adjustments, innovation and efficiency. As in beer, competition between companies for market share and the nature of the product has led to brand proliferation, perhaps beyond the point of economic efficiency, and certainly to the detriment of profitability. At the same time, supermarkets – the major retailers of bread – have skilfully used their countervailing power effectively to squeeze price discounts and marketing concessions from their bread suppliers. The bread companies have met these pressures by merging to reduce excess capacity, limit competition (short of acquiring a dominant position in breach of the *Commerce Act*) and increase their bargaining power with supermarket customers; and by focusing advertising and promotion on an appeal directly to consumers over the heads of supermarkets by bringing

disparate brands which they had developed or acquired under a single, banner brand with strong market presence.

The slow growth of the bread market and the stabilisation of market shares has meant that the major companies have been forced to turn to diversification and to overseas markets in search of growth opportunities. Relying on their strengths in flour-based products, they have diversified into producing pies, pizza bases, ice cream cones, cakes, pikelets, garlic bread and pita bread. They have also exported frozen pies, croissants and dough.

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