



FINAL REPORT

The New Zealand Poultry Meat Industry - Competition Issues and Biosecurity Risks

Submitted to:

**Poultry Industry Association of New Zealand
Auckland**

Prepared by:

**James Mellsop
Mike Wilkinson**

Charles River Associates (Asia Pacific) Ltd
Level 27, PWC Tower, Cnr Quay and Albert Sts
PO Box 2107, Auckland, New Zealand
Tel: + 64 9 368 9244 Fax: + 64 9 368 9255

24 May 2005

DISCLAIMER

CRA and its authors make no representation or warranty as to the accuracy or completeness of the material contained in this document and shall have, and accept, no liability for any statements, opinions, information or matters (expressed or implied) arising out of, contained in or derived from this document or any omissions from this document, or any other written or oral communication transmitted or made available to any other party in relation to the subject matter of this document.

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1. BACKGROUND TO REPORT	1
1.2. EXECUTIVE SUMMARY	2
1.2.1. Industry Structure and Size	2
1.2.2. Competition and Industry Outcomes	2
1.2.3. Biosecurity	3
2. INDUSTRY STRUCTURE AND SIZE	4
2.1. AN INTRODUCTION TO THE POULTRY MEAT INDUSTRY	4
2.2. INDUSTRY STRUCTURE	4
2.3. SIZE OF THE INDUSTRY	5
2.3.1. Exports and Imports	6
3. COMPETITION	9
3.1. INTRODUCTION	9
3.2. INVESTMENT, ENTRY AND EXIT	9
3.2.1. History of Entry, Expansion and Exit	11
3.3. COUNTERVAILING POWER	14
3.4. VOLATILITY	15
3.5. PRODUCTION AND FIXED COSTS	16
3.6. EXISTENCE OF A COMPETITIVE FRINGE	16
3.7. CONCLUSIONS	17
4. INDUSTRY OUTCOMES	18
4.1. POULTRY MEAT CONSUMPTION AND PRICES	18
4.2. EFFICIENCY, QUALITY IMPROVEMENTS AND PRODUCT INNOVATION	19
5. BIOSECURITY	22
5.1. NEW ZEALAND POULTRY INDUSTRY AND BIOSECURITY	22
5.2. STUDIES OF OUTBREAKS	23
5.2.1. Australian Study	23
5.2.2. Major Outbreaks in United States	24
5.3. APPLYING ANALYSIS TO NEW ZEALAND	26

6. REFERENCES27

1. INTRODUCTION

1.1. BACKGROUND TO REPORT

The importation of poultry meat into New Zealand is currently subject to strict biosecurity control and quarantine measures. These measures are carried out as part of the Biosecurity Act 1993. Bell Gully (2002) states that the purpose of this Act “is to eradicate and effectively manage unwanted organisms and pests already in the country and to prevent pests and unwanted organisms from entering New Zealand.”

We understand that the Government faces some pressure to consider whether to relax New Zealand’s poultry meat biosecurity and quarantine measures, specifically rolling back the present limitations on poultry imports to New Zealand. Relaxation of these measures would be likely to result in both costs and benefits to New Zealand. The key effects would likely be:

- On the benefit side, an increased competitive threat to New Zealand producers from imported poultry meat, particularly from those countries that enjoy a lower cost base for inputs such as poultry feed; and
- On the cost side, an increased biosecurity risk.

In considering a decision to relax the current poultry meat import requirements, the Government would have to carefully weigh these costs and benefits up.

The Poultry Industry Association of New Zealand (“PIA”) has asked us to carry out three projects:

- Review the economic size of the New Zealand poultry meat industry;
- Analyse the current level of competition in the New Zealand poultry meat industry. The benefits of relaxing import restrictions would be a negative function of the degree of competition already existing; and
- Review existing economic studies of poultry biosecurity risks, and apply these to the New Zealand situation, to the extent that this can be done qualitatively and rigorously.

It is important to note that we have not been asked to carry out a cost benefit analysis of a policy decision to relax poultry import restrictions – such an exercise would require a more comprehensive and detailed analysis (for example, it would require an estimate of the probability of a disease outbreak caused by imports, and a model of the impact of imports on domestic prices and quantities). We accordingly provide no view as to the efficiency of such a policy decision.

1.2. EXECUTIVE SUMMARY

1.2.1. Industry Structure and Size

The poultry meat industry involves the growing of chickens and other birds for meat that is then processed into products for human consumption. In New Zealand, the industry comprises three large companies with a further eight smaller players.

Overall, poultry meat consumption is a significant part of the economy. In the year ended December 2004, poultry meat expenditure totalled \$524 million, representing 38.9% of the combined sheepmeat, beef, poultry and pigmeat consumption and 26.1% of retail meat expenditure.¹

Falling prices,² improving quality and changing consumer preferences have resulted in poultry meat gaining importance as a protein source for consumers. Growth in poultry meat consumption per capita has averaged 6.4% p.a. over the last twelve years with poultry replacing beef and veal as New Zealander's most popular meat in 2000.³

1.2.2. Competition and Industry Outcomes

Outcomes for New Zealand poultry consumers have been improving over time, as evidenced by long terms trends in poultry prices and quantities, efficiency, quality and product innovation. These outcomes are consistent with effective competition in the industry, despite the concentration levels and the import restrictions. Key drivers of these outcomes are likely to be that:

- There do not appear to be any material barriers to expansion;
- The poultry meat processing companies face significant countervailing power held by supermarkets and large purchasers such as KFC;
- The technology of poultry meat processing plants exhibits economies of scale, meaning that volumes are important to unit costs, and therefore provides a strong incentive to compete for sales; and
- Chicken meat competes with other protein sources, such as lamb, beef and pork.

¹ Source: Meat consumption and expenditure data from Meat & Wool New Zealand - Economic Service.

² In relative and real terms.

³ Source: Meat consumption and expenditure data from Meat & Wool New Zealand - Economic Service, Ministry of Agriculture and Forestry, Poultry Industry Association and Pork Industry Board.

Furthermore, changing consumer preferences and the existence of a competitive fringe, the most significant of which is Turks Poultry, act as further constraints on the industry's behaviour.

1.2.3. Biosecurity

The economic studies of poultry disease outbreaks overseas find that the welfare losses are significant, and include:

- Stock losses to producers;
- Clean-up costs; and
- Higher prices to consumers (depending on the role of imports).

These studies include ex post empirical work, and hypothetical modelling. Hafi et al (1994), for example, predict that the welfare loss from a hypothetical outbreak of Exotic Newcastle Disease in New South Wales would amount to A\$29-37 million in the first year, depending on the amount of chicken imported.

We have considered ways in which to extrapolate the results of these studies to New Zealand. On the evidence, we consider that the biosecurity factor is a serious issue,⁴ but the results cannot be directly extrapolated to New Zealand, and within the scope and budget of this project we have not attempted the analysis a cost benefit analysis would require.

⁴ Made all the more so by the established examples of transmission of Highly Pathogenic Avian Influenza (HPAI) to humans.

2. INDUSTRY STRUCTURE AND SIZE

2.1. AN INTRODUCTION TO THE POULTRY MEAT INDUSTRY

Today, commercial poultry falls into two categories: egg production and meat production. Although the latter originally stemmed from the former (in that chickens that stopped producing eggs were sold for meat), the two now involve distinct production processes. This section describes the poultry meat production process and characterises the industry structure in New Zealand.

The poultry meat industry involves mainly the growing and processing of chickens, which represented 95% of poultry meat consumed in 2003. The remainder consists of ducks, turkeys and other birds.

Regulations that prohibit the importation of live birds, fresh and frozen poultry, and commercial eggs influence New Zealand's chicken meat production process. Fertile breeding eggs are imported from international livestock breeding companies. The chickens from these eggs (known as great-grandparents) and their initial offspring (grandparents) produce parent birds, which produce the chicken flock for meat consumption (broiler chickens). Incubation and hatching of eggs occurs under strictly controlled conditions in specifically designed hatcheries.

After hatching, broiler chickens are grown for approximately 34-42 days in broiler farms before being processed into a variety of chicken meat products and distributed to food retailers.

Similar, although less well developed, production processes exist for ducks, turkeys and other birds.

2.2. INDUSTRY STRUCTURE

The New Zealand poultry meat industry comprises three major integrated producers:

- Tegel Foods Limited (“Tegel”);
- Inghams Enterprises (NZ) Pty. Limited (“Inghams”); and
- P.H. Van den Brink Limited (“Brinks”);

and a further eight smaller producers.⁵

⁵

Information on these smaller firms is set out in Section 3.6.

Cooper-Blanks (2003) notes:

There is a high level of vertical integration within this industry with the three major suppliers owning and controlling more of the stages of production, from hatcheries and breeding farms to feed mills, processing plants and distribution to the retail outlets.

... Nevertheless the major companies contract out the growing of broiler chickens to contract growers whilst still retaining ownership of the chickens.

These three producers currently account for 97% of the New Zealand market, with the remaining 3% spread among the eight smaller players.^{6 7} Additionally, other firms occupy specific parts of the industry, such as Bromley Park Hatcheries Limited (“Bromley Park”), which provides parent and day old broiler chickens to processors.

Between the three main producers, some product differentiation exists. Brinks mainly focuses on fresh and frozen whole chickens, but also sells fresh and frozen, bone-in and de-boned portions. Tegel and Inghams spend significant amounts on product research and development. ‘Value-enhanced’ and further processed chicken represent significant components of these companies’ sales.

In the remainder of this section we consider the size of the poultry meat industry, before going on to consider the competition in the industry in Section 3.

2.3. SIZE OF THE INDUSTRY

Overall, poultry meat consumption is a significant part of the economy. In the year ended December 2004, poultry meat expenditure totalled \$524 million, representing 38.9% of the combined sheepmeat, beef, poultry and pigmeat consumption and 26.1% of retail meat expenditure.⁸

⁶ We have received information regarding the individual market shares of the three major firms, but for confidentiality reasons we are not able to publish these.

⁷ This level of concentration is similar to the Australian market as described by Hafi et al (1994), where two players controlled 75% of the market, with the remainder spread amongst a competitive fringe.

⁸ Source: Meat consumption and expenditure data from Meat & Wool New Zealand - Economic Service.

Falling prices,⁹ improving quality and changing consumer preferences, which we discuss in Section 4, have resulted in poultry meat gaining importance as a protein source for consumers. Growth in poultry meat consumption per capita has averaged 6.4% p.a. over the last twelve years, outpacing growth in beef and veal, sheep meat and pig meat consumption, with poultry replacing beef and veal as New Zealander's most popular meat in 2000.¹⁰

The three major poultry firms, plus Turks Poultry and Bromley Park, directly employ approximately 3,000 full time equivalent employees.¹¹ Related employment exists in smaller poultry producers, contracted poultry farms and downstream activities (e.g. butcheries, delicatessens). Nationwide, poultry meat farms numbered 200 as at 30 June 2002.¹²

2.3.1. Exports and Imports

Exports

On exports, Cooper-Blanks notes:

The New Zealand export market is still in its infancy and accounts for less than 2% of production. Both poultry and poultry meat products are exported, as well as a small amount of poultry meat, and table eggs to the South East Asia and Pacific Basin regions. Export markets have developed recently as New Zealand producers become more competitive on the international scene. However, local feed costs ... are high in relation to other major producing countries, due to the need to import raw materials, such as soya meal and some grain. This has a significant effect on export price competitiveness.

Figure 1 shows significant growth in exports over the ten years to 2003, largely driven by value-added products reflecting product innovations, and live poultry and fertile eggs, reflecting the high quality of New Zealand's stock. Whole bird exports have been more variable. Cooper-Blanks argues that it is difficult to predict the future of these export markets.

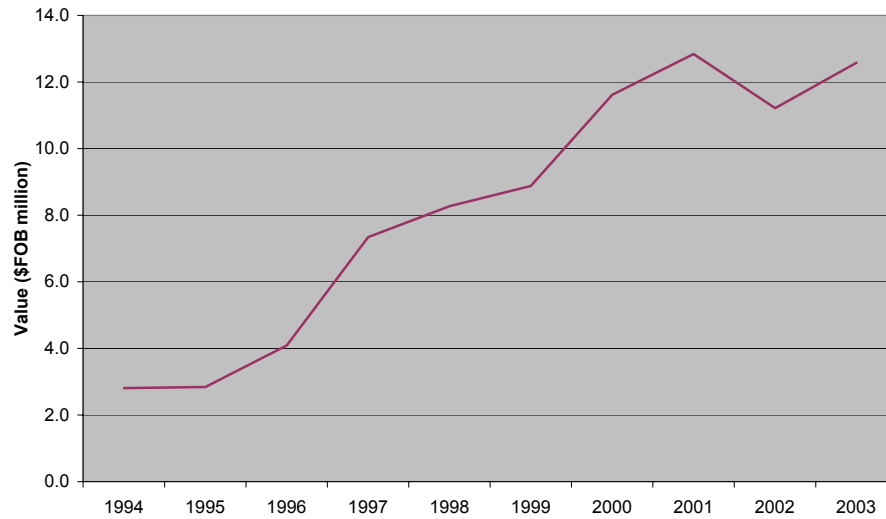
⁹ In relative and real terms.

¹⁰ Consumption measured in kilograms per capita. Source: Meat consumption and expenditure data from Meat & Wool New Zealand - Economic Service, Ministry of Agriculture and Forestry, Poultry Industry Association and Pork Industry Board.

¹¹ Source: Company information provided by Tegel, Inghams, Brinks, Bromley Park and Turks Poultry.

¹² Source: 2002 Agricultural Production Census, Statistics New Zealand.

Figure 1: Poultry and Eggs Exports¹³

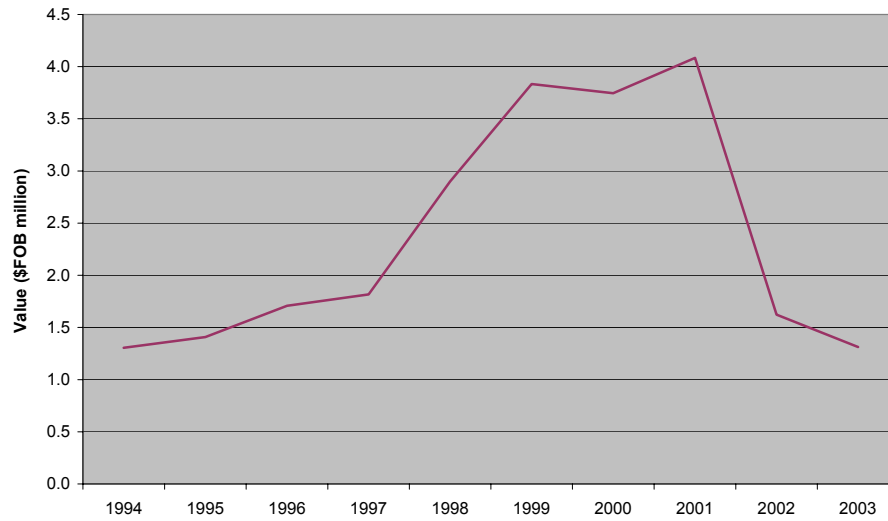


Imports

Although they must be cooked to specific time and temperature parameters to be allowed into New Zealand, some poultry meat products are imported into New Zealand.

¹³ Source: Cooper-Blanks (2003). Includes data for live poultry and fertile eggs from 1997 onwards.

Figure 2: Imports of Poultry Meat Products¹⁴



14 Source: Cooper-Blanks (2003).

3. COMPETITION

3.1. INTRODUCTION

Cooper-Blanks argues that consumers benefit from the oligopolistic and vertically integrated structure of the poultry industry, and that competition among the producers can be fierce. He highlights the significant improvement in quality allowed by the high level of control in a vertically integrated structure and the benefits of economies of scale.

In considering the Australian poultry meat industry, Hafi et al (1994) find it to be contestable despite high market concentration (with 75% of the market spread between two firms), due to:

- Few barriers to entry;
- The existence of a competitive fringe;
- State regulations and trade practice legislation restricting predatory pricing; and
- The existence of countervailing power held by highly competitive supermarkets, fast-food outlets and the food service sector.

This section analyses the nature of competition in the poultry meat industry. We find that, despite the concentrated nature of the industry, the industry is effectively competitive because of the ease of expansion, the significant amount of countervailing power and the competition for sales and market share caused by significant economies of scale.

3.2. INVESTMENT, ENTRY AND EXIT

An important consideration in understanding the level of competition in an industry is the ability of incumbents to expand production or new entrants to start operations and compete with incumbents. We see two prime factors that affect investment: regulation and sunk costs. We have also identified several essential inputs for chicken meat production that a potential entrant would require access to. We also note that imports, which ordinarily would be considered a source of 'entry', are effectively prevented under New Zealand's biosecurity rules.

As with many food businesses, a number of regulatory approvals are required including resource consents and MAF and HACCP/food safety approvals. We note, however, that these same factors characterise the red meat industry, and do not constitute entry barriers in that industry.

Investment in hatcheries, broiler farms and chicken processing facilities may be regarded as sunk since these assets cannot be easily used for other activities. We do note, however, that there is some potential to use processing facilities for processing possums and rabbits, as happens at Exotic Game Meats, and we have received indications that there is an Australasian market for second hand transportable equipment.

As with the red meat industry, exit costs may also exist, for example, costs associated with Resource Management Act related site decontamination.

Access to good quality chickens (and, in earlier production stages, eggs) is obviously critical to the production of chicken meat. Given the high quality of chicken production in New Zealand currently (see Section 4.1), an entrant with only partial access to chickens, or access only to low quality chickens will struggle to compete. Good quality feed is also important.

The industry has, however, developed a number of methods for dealing with these issues. As mentioned in Section 2.2, the major firms use contract growers, who provide land, labour and buildings, custom designed broiler sheds, for the growing stage of production. In order to ensure access to good quality chickens, the major firms retain ownership of the chickens at the broiler farms and provide training and technical expertise to the contract growers.

While Tegel runs and maintains its own hatcheries and imports a breed of fertile eggs known as Ross, an independent hatchery, Bromley Park Hatcheries, supplies the other companies in the market. Bromley Park Hatcheries imports Cobb breed eggs and sells day-old broiler chicks and parents to New Zealand and South Pacific customers. With at least 18 months warning, Bromley Park Hatcheries advises us that it is able to supply new processing entrants.

Tegel and Inghams also own feed milling operations, using imported and domestic ingredients. Other processors are supplied by these operations and from other sources including PCL Feeds, owned by egg producer Mainland Poultry Limited.

Through these methods, the industry is at least partly able to share the risks associated with sunk costs while ensuring access to chickens and eggs during each stage of the production process. For example, chicken production companies reduce the amount of sunk costs they hold, and therefore the amount of risk they have to bear, by using contract growers who invest in sunk assets associated with broiler chicken growing (the broiler sheds).¹⁵ Chicken producers ensure access to good quality chickens and eggs by owning broiler flocks and providing technical expertise to growers. Most companies also attempt to reduce risks by using Bromley Park Hatcheries for parent and broiler chicken supply, thereby avoiding sunk costs associated with hatcheries.¹⁶

A further foundation for entry exists in the form of large customers (see Section 3.3) that could purchase a significant amount of a new entrant's production. By contracting with one or more customers, a new entrant could reduce the risks associated with fully utilising the fixed costs incurred.

In considering the Australian poultry meat industry, Hafi et al (1994) argued that the industry was contestable because there were few barriers to entry. To analyse the significance of the various factors in aiding investment, and therefore contestability, in New Zealand we consider the history of entry, expansion and exit.

3.2.1. History of Entry, Expansion and Exit

We firstly consider entry, expansion and exit in the hatching and processing parts of the industry before turning to the broiler farms that are commonly owned by contract growers.

Hatching and Processing Facilities

The tables below set out details of entry, exit, expansion and transactions in the hatching and processing segments of the industry.

Table 1: Recent Hatching/Processing Entry into the Poultry Meat Industry¹⁷

Announcement Date	Company	Investment	Comment
2002	Progressive	Further processing	Receives whole

¹⁵ The existence of contracts, however, between processors and contract growers and the need for processors to maintain their reputation with growers causes the processors to continue to bear some of the risk associated with these sunk costs.

¹⁶ Again, the nature of contracts with Bromley Park, including twelve month commitments and lower prices for higher volumes, prevents processors from avoiding all of the risk associated with hatchery sunk costs.

¹⁷ Sources: Discussions with industry participants.

Announcement Date	Company	Investment	Comment
	Enterprises	facility in Auckland	chickens from suppliers

Table 2: Recent Hatching/Processing Exit from the Poultry Meat Industry¹⁸

Announcement Date	Company	Investment	Comment
2000	Tegel	Closure of Levin hatchery	Shift of operations to Bell Block
1999	Tegel	Closure of Te Horo processing facility	Shift of operations to Bell Block

Table 3: Recent Notable Hatching/Processing Expansion in the Poultry Meat Industry¹⁹

Announcement Date	Company	Investment	Comment
2004	Tegel	New Auckland further processing facility	
2003	Inghams	Expansion of Ngarua hatching/processing facilities and Mt Manganui feed plant	
2003	Tegel	\$8.5 million upgrading Bell Block processing facility	
2002	Tegel	Third Waiwhakaiho hatchery plant	
2002	Brinks	Expansion of Canterbury Chicken	

¹⁸ Sources: Press reports from Nexis Database.

¹⁹ Sources: Press reports from Nexis Database, discussions with industry participants.

Announcement Date	Company	Investment	Comment
2004	Tegel	New Auckland further processing facility	
		plant	
1999	Tegel	\$6.6 million upgrading Bell Block processing facility	Shift of operations from Te Horo

Table 4. Other Recent Notable Transactions in the Poultry Meat Industry²⁰

Announcement Date	Vendor	Purchaser	Investment	Comment
2002	Gladvale Chicken	Brinks	Purchase of Gladvale Chicken processing plants at Underwood and Invercargill	
2002	Prestige Meats	Gladvale Chicken	Purchase of Tau Tau Chicken Underwood processing plant	
2002	Canterbury Chicken	Brinks	Purchase of Canterbury Chicken Rolleston processing plant	

'Recent greenfields' entry has been limited to supermarket chain Progressive Enterprise's investment in a further processing facility in Auckland. While the lack of greenfields entry may be indicative of the significance of fixed and sunk costs, it is also consistent with the industry being competitive and there being no profit opportunity to enter.

There is, however, no apparent impediment to expansion, with the three larger players recently making significant upgrades in capacity.

²⁰ Sources: Press reports from Nexis Database, discussions with industry participants.

Broiler Farms

Entry, exit and expansion appear to occur fairly easily in the broiler farm area of the production process. We have received indications that a broiler shed housing 40,000-45,000 birds costs \$500,000 - \$750,000, financed by the contract grower. Following the closure of Tegel's Te Horo facilities, media reports indicated that up to 24 farms were shut down and the production largely taken over by the Taranaki chicken industry. Compensation was paid to affected growers. In the three years to March 2003, 35 new broiler sheds were built in Taranaki.

Media reports following KFC's decision to award Inghams its chicken supply contract indicated that the expansion of Inghams' Ngarua processing facility would also involve the building of 35 new broiler sheds and the expansion of several chicken farms.

Finally, ProTen Limited, a Fielding based company, built a significant number of broiler sheds in New Zealand before selling them and using the proceeds to expand into Australia. It has also been considering a sharemarket listing.

3.3. COUNTERVAILING POWER

As shown by Table 5, the two supermarket chains (Foodstuffs and Progressive) purchase close to half of the major chicken producers' production.

Table 5. Average Customer Shares for Three Major Firms

	Average Share
Supermarkets	48%
Further Processors	13%
Distributors	12%
Others	26%

Supermarkets are extremely well informed and actively seek to minimise the costs of their supplies on all fronts. They also have significant countervailing power, derived from their size and their options, e.g., in general their ability to facilitate entry or vertically integrate themselves.

In this regard, it is notable that the supermarkets sell chicken under their own house brands, such as Progressive Enterprise's "Signature Range". As noted in Section 3.2.1, Progressive Enterprises has also gone even further by investing in further processing facilities where whole chickens are converted into more processed forms, such as chicken breasts or pieces.

Other major purchasers include KFC, which recently switched suppliers from Tegel to Inghams. KFC is reported to represent 5-10% of the New Zealand poultry meat market. Large purchasers such as KFC are able to create an auction by asking for suppliers' best prices and selecting the supplier with the lowest. Besides KFC and the supermarkets, other large purchasers include further processors, such as Santa Rosa, and takeaway chains, such as Glovers Food Processing (which processes chicken for McDonalds), Subway and Burger King. Australian fast food chain Red Rooster has also recently announced it is entering New Zealand and is procuring chicken from Tegel.

Lastly, it should be remembered that there are alternative protein sources available to end consumers. In supermarkets and restaurant menus, chicken is generally situated alongside lamb, beef and pork creating competition between these products based on price and quality. Evidence of changes in the market shares of each of these protein sources are presented in Figure 3 of Section 4.1.

3.4. VOLATILITY

The presence of volatility makes it more difficult to make a collusive agreement, because suppliers are continually having to respond to changing conditions.

On the demand side, changing consumer preferences and a proliferation of product innovations has created a large amount of volatility for the poultry meat industry. The strong growth in products such as Tegel's chicken rashers and ready-to-roast chicken signifies the importance of meeting customer preferences, creating a race to innovate and making collusion very difficult. Also the fluctuating relative price of other sources of protein (e.g. red meat) to the consumer also constrains the ability to collude.

On the supply side, while much of the chicken production process is shielded from the weather, a traditionally important cause of volatility in food supply, volatility does still exist. Based on information provided by processors, approximately 40-45% on the cost of poultry meat is feed. In New Zealand, 73% of the ingredients for compound feed production are produced domestically, with the remainder imported.²¹

Accordingly, the price of feed is affected by both domestic factors, such as the weather, the attractiveness of other forms of land use such as dairy farming for grain growers and international factors such as the exchange rate and the world commodity market. Over time, because of contracted sources of supply, costs among the competitors are likely to vary thereby limiting incentives and credibility of collusion (there will also be different contracts with demanders).

²¹ New Zealand Feed Manufacturers Association (2002) *Production Statistics – Raw Materials*, provided by PIANZ.

3.5. PRODUCTION AND FIXED COSTS

If a production process has significant fixed costs, then a small increase in output can have a large effect on profitability. Given there are significant fixed costs in the poultry meat industry, in the form of hatcheries, broiler sheds and processing equipment, a firm with excess capacity can significantly improve its profitability by increasing production a small amount.²² This increases the competitive tension in the industry, particularly when combined with the ability to expand production, as discussed above.

HJ Heinz, the owner of Tegel, has recently acknowledged a downturn in the profitability of Tegel's business. This downturn was attributed to "market pricing of chicken", with Tegel Managing Director, Bruce Scott, noting "it's a competitive market and an aggressive supermarket trade out there." However, the company noted "Tegel's volumes will grow on last year even after accounting for the loss of KFC, with the volumes being replaced by other sales."²³ Inghams and Brinks also acknowledged that their profitability had been affected.²⁴

These market conditions are consistent with an industry where fixed costs are important. We are advised by the firms that the increase in the industry's capacity following Inghams' expansion, and Tegel's desire to maintain its volumes, have caused significant decreases in pricing and affected the industry's profitability.

3.6. EXISTENCE OF A COMPETITIVE FRINGE

While the three larger players make up 97% of the industry, a significant competitive fringe does exist. These firms supply niche products such as duck meat, free range and organic chicken meat. These firms also include Turks Poultry, which has recently experienced increases in market share, supplying chicken meat predominantly to the lower North Island. Table 6 sets out details of the 'fringe' firms.

Table 6: 'Fringe' Firms

Company	Main Location	Product Focus
Turks Poultry	Foxton	Produces eggs and poultry meat in North Island
Willows Group	Gisborne	Produces Heuvels organic chicken

²² For example, poultry processors have discussed with us the requirement to maintain sufficient volumes of chicken produced by contract growers, in order to maintain the profitability of the growers.

²³ New Zealand Herald Articles, "Heinz Hints of Tegel Sell Off After Profit Report", 24th November 2004, and "Heinz Sets Off Tegel Sale Talk", 25th November 2004.

²⁴ Dominion Post Article, "Chicken Glut Provides a Bonus for Consumers", 6th December 2004.

Company	Main Location	Product Focus
Croziers	Ashburton	Produces turkey meat
Friis Distributors	Hastings	Produces mainly chicken meat
Easterbrook	Auckland	Produces duck and poussin meat
Canter Valley Farm	Christchurch	Produces duck, pheasant, turkey, quail and poussin meat
Quack A Duck	Cambridge	Produces duck meat
Exotic Game Meats	Whangarei	Produces possum, free range chicken and duck meat

3.7. CONCLUSIONS

Outcomes for New Zealand poultry consumers have been improving over time, as evidenced by long terms trends in poultry prices and quantities, efficiency, quality and product innovation. These outcomes are consistent with effective competition in the industry, despite the concentration levels and the imports restrictions. Key drivers of these outcomes are likely to be that:

- There do not appear to be any significant barriers to expansion;
- The poultry meat processing companies face significant countervailing power held by supermarkets and large purchasers such as KFC;
- The technology of poultry meat processing plants exhibits economies of scale, meaning that volumes are important to profitability, and therefore provides a strong incentive to compete for sales; and
- Chicken meat competes with other protein sources, such as lamb, beef and pork.

Furthermore, changing consumer preferences and the existence of a competitive fringe, in particular Turks Poultry, act as further constraints on the industry's behaviour.

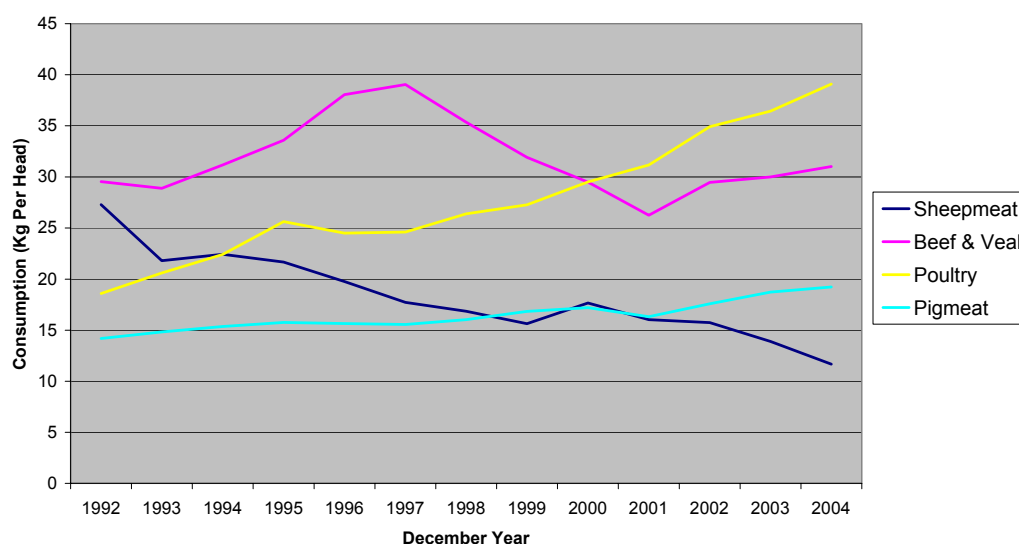
4. INDUSTRY OUTCOMES

We have set out the important aspects of the poultry meat industry and the reasons for believing that it is likely to be competitive. We now turn to evidence of its competitiveness in industry outcomes. The New Zealand poultry meat industry appears to have yielded significant improvements in consumer welfare. This section considers a number of indicators of consumer welfare.

4.1. POULTRY MEAT CONSUMPTION AND PRICES

Poultry meat consumption has increased significantly over the past decade. On the demand-side, this increase in demand is attributed to a growing emphasis on health and an increasingly diverse culture (Cooper-Blanks).

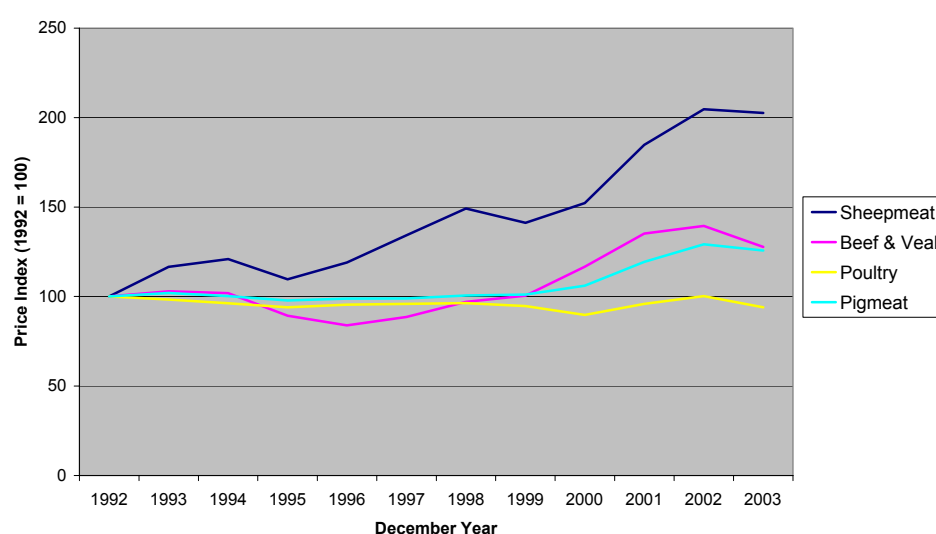
Figure 3: Domestic Meat Consumption Per Head²⁵



²⁵ Source: Meat consumption and expenditure data from Meat & Wool New Zealand - Economic Service, Ministry of Agriculture and Forestry, Poultry Industry Association and Pork Industry Board.

Despite rapid increases in consumption, nominal prices have remained steady and real prices have fallen, indicating that competition has caused increases in supply through efficiency improvements and investment in new facilities to alleviate upwards pressure on prices.²⁶ We note that Figure 4 shows roughly stable nominal poultry prices, implying that real (inflation adjusted) prices are falling. This trend is at odds with price trends for other meat products, although we note that overseas market conditions and exchange rate movements are likely to a greater extent affect these products.

Figure 4: Domestic Nominal Meat Price Indices²⁷



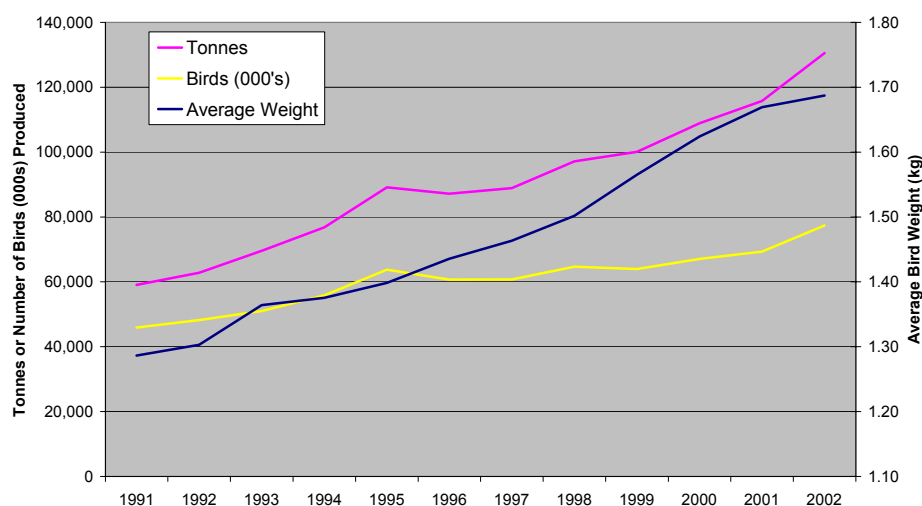
4.2. EFFICIENCY, QUALITY IMPROVEMENTS AND PRODUCT INNOVATION

Efficiency improvements are reflected in chicken production data. While the number of birds produced has been growing steadily, significant improvements in the average weight of birds has greatly increased the total tonnes of chickens being produced.

²⁶ The evidence that we have been provided on feed costs indicates that they have been relatively stable between 1996 and 2003 (we have not seen any data pre-1996). Most other input prices, such as labour, have risen in nominal terms.

²⁷ Source: Meat consumption and expenditure data from Meat & Wool New Zealand - Economic Service, Ministry of Agriculture and Forestry, Poultry Industry Association and Pork Industry Board. Poultry retail prices declined 0.6 per cent in the 12-month period to 31 December 2004.

Figure 5: Broiler Chicken Production²⁸



Quality improvements are also reflected in other evidence from producer firms. Inghams has recorded a drop in positive salmonella tests from around 30% in 1990 to 1-2% today and a reduction in customer complaints from 0.00155 per kilogram in 2000 to 0.00127 in 2003. This trend is supported by evidence provided by the New Zealand Food Safety Authority. Campbell and Gilbert (1995) found 23 of 137 (17%) unfrozen poultry, and 2 from 17 (12%) frozen raw chicken samples to be contaminated with salmonella. The incidence of salmonella is now reported to have dropped to 1.6%.²⁹

Consumer welfare has also been improved by a number of innovations. Based on company information, Tegel recorded significant growth in what it terms “innovative product sales” in FY2004, helped by Ready-to-Roast, Quick Roast and chicken sausages and rashers. Tegel’s chicken rashers product recently won two gold awards, including the best new meat, poultry and delicatessen meat product, at the SIAL d'OR awards in France, as judged by 27 international food journalists and trade press.

According to an article in the Dominion Post, dated 6 December 2004, Inghams is also in an “aggressive mood”, and is pushing ahead with a \$100 million plan to expand its market share and is increasing its value-added products.

²⁸ Source: Poultry Industry Association of New Zealand.

²⁹ Incidence between 2001 and 2003. Source: Quoted by PIA from National Microbiological Database operated by the New Zealand Food Safety Authority.

Innovations are likely to continue to occur with Tegel and Inghams spending significant amounts of money on product research and development – slightly above the average for food, beverage and tobacco firms with 50 full-time equivalent employees or more of \$1.1 million annually.^{30 31}

³⁰ Based on statistical data in Statistics New Zealand (2003) *Research and Development in New Zealand 2002*, available: http://www.stats.govt.nz/domino/external/web/prod_serv.nsf/htmldocs/Research+and+Development+in+New+Zealand+2002. The 58 firms in this sample had an average number of FTEs of 544 (Source: correspondence with Statistics New Zealand).

³¹ We have been provided with confidential research and development expenditure data.

5. BIOSECURITY

5.1. NEW ZEALAND POULTRY INDUSTRY AND BIOSECURITY

New Zealand's poultry industry is an exception to most poultry industries, which have significant problems with periodic disease outbreaks. Two of the most lethal, contagious poultry diseases that periodically infect various poultry flocks around the world are Highly Pathogenic Avian Influenza (HPAI) and Exotic Newcastle Disease (END).³² As of today, there are no records that outbreaks of either HPAI³³ or END³⁴ disease have ever taken place in New Zealand.

In the last 35 years, there have been numerous serious cases of both END and HPAI in several countries, with a significant number of them occurring in the United States. Several other countries try to control the threat of poultry disease by banning foreign imports. For example, US poultry exports are frequently (and in fact, currently) banned in many countries both during and after domestic outbreaks of END or HPAI. By doing this, nations hope to prevent the disease from spreading to their own domestic poultry industries.³⁵

In order to investigate the potential costs resulting from a relaxation of import controls, we have conducted a broad search of literature related to poultry outbreaks and identified four studies that provide relevant information. We discuss the four relevant studies below and seek to apply the results of the studies to New Zealand.³⁶

³² Clark (2003).

³³ New Zealand Ministry of Health website, *Avian Influenza A (Bird Flu) (H5N1)* available at: <http://www.moh.govt.nz/birdflu> (accessed 23 November, 2004).

³⁴ Birds n Ways: Guide to Parrots & Exotic Pet Birds 2003, *Exotic Newcastle Disease Transmission, Prevention, Biosecurity*. Available at <http://www.birdsnways.com/newcastle/endhist.htm> (accessed 23 November, 2004).

³⁵ Leuck, D., Haley, M., and Harvey, D. (2004).

³⁶ We simply report these studies here – we make no comment on the appropriateness of their methodology.

5.2. STUDIES OF OUTBREAKS

5.2.1. Australian Study

By far the most rigorous study we have found on the biosecurity issues relevant to the New Zealand poultry industry is that of Hafi et al (1994). In order to predict the social welfare outcomes of a hypothetical poultry disease outbreak, Hafi et al (1994) used a detailed econometric model of Australian broadacre agriculture developed by ABARE.³⁷

The study specifies a hypothetical END outbreak that affects all the chicken meat farms in the outer Sydney and Hunter Valley area. This is an especially productive poultry region of New South Wales, which accounted for approximately 39% of total Australian poultry meat production. The study also considers the benefits resulting from allowing imports.

The Effects of an Outbreak

The study finds that an outbreak in the industry with no imports allowed would result in a 15% reduction in total Australian broiler population, and total welfare losses in the first year of the outbreak of approximately A\$54 million, comprising a consumer loss of A\$109 million due to higher poultry prices and a net producer gain of A\$55 million (with unaffected producers gaining from higher prices). The total welfare losses represent 4% of the total annual chicken meat production in Australia in 1992-93 of A\$1,350 million. Additionally, the outbreak is estimated to cause a total welfare loss in the first year of the outbreak of A\$15 million in the Australian egg industry.

Of greater relevance to our current analysis, however, is the finding that with chicken meat imports allowed the costs of an outbreak are different.³⁸ Prices are assumed to be unaffected because imports are assumed to increase to match the loss in production. In this case, welfare losses, which accordingly are simply decreases in producer surplus, from the outbreak with a 15% reduction in broiler population are expected to amount to A\$29-37 million in the first year, depending on the amount of chicken imported.

³⁷ The model produces conservative estimates of the costs of the outbreak because it does not assess costs outside of the domestic meat industry (and vertically integrated upstream industries), including, for example, the impact on wild and pet bird populations.

³⁸ The welfare effects for the egg industry are assumed to remain unchanged.

The Effects of Imports

Hafi et al argue that the benefits of lower prices from imports depend on the amount of imports that enter the country. Citing evidence from Japan, they argue that up to 20% of Australia's domestic consumption (100,000 tonnes) could be replaced by imports. They also consider smaller amounts of imports (down to 1% or 5,000 tonnes). In the short run, they find net gains (the change in consumer surplus less the reduction in producer surplus and assuming no disease outbreak) ranging from A\$0.05 million a year for 5,000 tonnes to A\$16 million a year for 100,000 tonnes. In the longer run, as chicken producers lower production, they find net gains of A\$0.02 – 9.9 million per annum.

Imports and Probability of an Outbreak

Hafi et al (1994) note that the expected values of the cost of a disease outbreak will be affected by the probability of an outbreak. In assessing the desirability of imports, it is important to compare the benefits of imports with the expected costs of disease. They find, however, that information on the probability is very limited. Hafi et al do not draw a conclusion on the net benefits or costs of relaxing import restrictions into Australia, because of the difficulty of estimating the probability of a disease outbreak.

Hafi et al (1994) do, however, estimate the critical probability of an outbreak occurring that would cause the expected costs to just offset the total surplus gain from import quantities. They find that this critical probability of an outbreak is very low (0.0005) if imports make up approximately 1% of current chicken consumption, 0.038 if imports make up approximately 8% of consumption and 0.335 if imports make up 20% of consumption.

5.2.2. Major Outbreaks in United States

There are numerous examples of HPAI (and also Low Pathogenic Avian Influenza (“LPAI”)) and END outbreaks in the United States. Although less rigorous than the work of Hafi et al, we have chosen two specific examples to illustrate the effects of poultry disease because of the availability of information. These two cases illustrate the type and extent of damage a disease outbreak can have on a poultry industry. The first example is a 1971 outbreak of END in California and the second example is a 1983 outbreak of HPAI in Pennsylvania. We also summarize a paper that provides information on a series of LPAI outbreaks. Although these cases took place relatively long ago, HPAI, LPAI and END are far from being completely eradicated and there continue to be outbreaks of these diseases in the United States today.³⁹ That said, there might be reasons to believe that responses to outbreaks may have become more effective (through experience) since these outbreaks occurred.

39 Campell, C. (2003).

The studies identify several types of costs associated with disease outbreaks. Costs include:

- Losses sustained by farmers due to lost poultry stock as a result of either natural death by disease or elimination of infected stock;
- Clean up costs are associated with eradicating infected stock, quarantining at risk stock, and various other measures taken to control and eliminate a disease outbreak;
- Losses sustained by businesses in related industries (feed, transport, etc); and
- Consumer costs resulting from increases in the price paid for poultry products and/or their substitutes as a result of the outbreak.⁴⁰

In 1971, California experienced a major outbreak of END in some commercial poultry flocks in the southern portion of the state. According to Clark (2002), an estimated 12 million birds were destroyed. Clark estimates that eradication costs totalled US\$56 million. The outbreak caused a 30% increase in retail egg prices, which is likely to have had a significant impact on consumer welfare.⁴¹

In 1983, a major outbreak of HPAI occurred in several commercial poultry flocks in Pennsylvania, which took two years to control. Clark estimates that 17 million birds had to be destroyed with expenses totalling US\$63 million. The World Health Organisation (2004a) cites an estimate that indirect costs totalled more than US\$250 million. Clark notes that the consumer costs associated with this outbreak include US\$349 million, which is the increased amount consumers had to pay for their protein foods from November 1983 to April 1984 as a result of poultry shortages due to the outbreak.

As Halvorson et al (2003) note, LPAI can also involve significant costs, even though it is not as lethal a poultry disease. LPAI has appeared over 100 times in the past 25 years in the United States alone. The costs associated with these outbreaks can vary greatly, depending on numerous factors, including the size of the outbreak and type of control methods used:

...the range in costs for LPAI and its control is from \$4,000 per flock in the Italy 2001 outbreak where vaccination and controlled marketing were employed to \$760,000 per flock in the Virginia 2002 outbreak where destruction was the primary control method.⁴²

⁴⁰ The World Health Organisation (2004b) also notes the transmission of HPAI to humans, such as 18 cases from a recent outbreak in Hong Kong (6 of which were fatal).

⁴¹ 'Highly Pathogenic Avian Influenza' APHIS Factsheet, from USDA website, 2004. Available at http://www.aphis.usda.gov/vs/birdbiosecurity/Downloads/PDF/fs_ahavianflu.pdf.

⁴² All costs listed in this paragraph are in 2002 US dollars.

In the outbreaks considered by Halvorson et al, costs ranged from US\$1.3 –149 million.^{43 44}

5.3. APPLYING ANALYSIS TO NEW ZEALAND

It is very difficult to infer what implications the studies discussed above have for New Zealand. The benefits of imports will be affected by the change in poultry prices and quantities for New Zealand consumers. The cost of imports for producers (assuming no disease outbreaks) will depend on their ability to profitably produce at the new market prices. Furthermore, the expected cost of a disease outbreak will be affected by:

- The likelihood of imports causing an outbreak in domestic poultry, New Zealand birdlife and/or humans;⁴⁵
- The infectiousness of the disease, the concentration of New Zealand wildlife, chickens and poultry farms and the biosecurity measures practiced by hatcheries, farms and officials, which all affect the spread of an outbreak and the costs of control; and
- The resulting impact on poultry prices (including eggs), the poultry meat and egg industry and related industries.

We have accordingly come to the view that the prospect of disease is a serious issue. Within the scope and budget of this project, however, it would not be possible to conduct an informative cost benefit analysis on relaxing import controls or informatively extrapolate these results to New Zealand.

43 All costs listed in this paragraph are in 2002 US dollars.

44 Most of the outbreaks considered involved turkeys rather than chickens.

45 HPAI occasionally infects humans, generally through occupational exposure, but the World Health Organisation (2004b) highlights some risk that HPAI could combine with a human influenza virus to form a virus capable of human-to-human transmission. If a human influenza pandemic resulted it would “invariably cause great loss of life, social disruption, and economic costs.”

6. REFERENCES

Bell Gully (2002), *Biosecurity Law in New Zealand*, available: http://www.bellgully.com/publications/forest_2002_09_bio.htm

Campell, K. W. and Gilbert, S. A. (1995) *Poultry Quality Assessment*, Report prepared for the Public Health Commission and the Ministry of Health, Wellington, New Zealand, as quoted in Institute of Environmental Science & Research Limited (2002) *Risk Profile: Salmonella (Non Typhoid) in Poultry (Whole and Pieces)*, Prepared for New Zealand Food Safety Authority

Clark, F.D. (2002) "A Short History of the Cleanup Costs Associated with Major Disease Outbreaks in the U.S.", *Avian Advice*, vol. 4, no. 4, pp. 12, available at http://www.uark.edu/depts/posc/avian_advice_4.4.pdf

Clark, D. (2003) "Exotic Poultry Diseases—an Update", *Avian Advice*, vol. 5, no. 3, pp. 10-11. Available at http://www.uark.edu/depts/posc/avian_advice_5.3.pdf

Cooper-Blanks, Bob (2003) *The New Zealand Poultry Meat Industry: An Education and Industry Resource*, Enterprise New Zealand Trust, republished version of 1999 edition.

Hafi, A., R. Reynolds, and M. Oliver (1994) *Economic Impact of Newcastle Disease on the Australian Poultry Industry*, ABARE Research Report 94.7, Canberra

Halvorson, D.; Capua, I.; Cardona, C.; Frame, D.; Karunakaran, D.; Marangon, S.; Ortali, G.; Roepke, D.; and Woo-Ming, B. (2003) 'The Economics of Avian Influenza Control', presented at the Western Poultry Disease Conference, March 2003.

Leuck, D., Haley, M., and Harvey, D. (2004) "U.S. 2003 and 2004 Livestock and Poultry Trade Influenced by Animal Disease and Trade Restrictions", *Electronic Outlook Report from the Economic Research Service*, July, available at <http://www.ers.usda.gov/publications/LDP/JUL04/LDPM12001/LDPM120-01.pdf>

Statistics New Zealand (2003) *Research and Development in New Zealand 2002*, available: http://www.stats.govt.nz/domino/external/web/prod_serv.nsf/htmldocs/Research+and+Development+in+New+Zealand+2002

World Health Organization (2004a) *Avian influenza A (H5N1) - Update 31: Situation (Poultry) in Asia: Need for a Long-Term Response, Comparison with Previous Outbreaks*, Communicable Disease Surveillance & Response, available at http://www.who.int/csr/don/2004_03_02/en/

World Health Organization (2004b) *Avian Influenza and Human Health: Report by the Secretariat*, available at http://www.who.int/gb/ebwha/pdf_files/EB114/B114_6-en.pdf