33rd Annual Conference of the
Australian Agricultural Economics Society
Lincoln College, Christchurch, New Zealand, 7-9 February 1989

IMPLICATIONS OF CHANGES IN ACCESS TO JAPANESE BEEF MARKETS FOR NEW ZEALAND TRADE

S SriRamaratnam*

Policy Services, MAFCorp
PO Box 2526
Wellington

Abstract

A static policy simulation model of the world beef market is utilised to study the effects of recently announced changes in access to the Japanese beef market. A subsidy equivalent based assistance or tax reduction to producers and consumers of beef in Japan respectively was simulated under various realistic scenarios. The effects on trade flows, production (short run and long run), consumption (beef and other meat types in Japan), world prices and on producer/consumer welfare and prices were investigated.

The increase in world beef prices was quite small but increases in net beef imports into Japan following substitution of higher tariffs for quotas was significant. Most of this benefit is captured by the US, with Australia and New Zealand gaining very little extra trade. Increases in Japanese beef consumption will be at the expense of mainly pork and also poultry meat consumption. Supply response in major beef exporting countries will be small both in the short and long run.

---

* The views expressed in this paper are those of the author and do not necessarily reflect the official view of the Ministry of Agriculture and Fisheries. The helpful suggestions and comments of colleagues at Policy Services are acknowledged. Errors and ommissions remain the responsibility of the author.

IMPLICATIONS OF CHANGES IN ACCESS TO JAPANESE BEEF MARKET FOR NEW ZEALAND TRADE

I Introduction

The Japanese beef market has been the subject of many studies in the recent past. The nature of production assistance and marketing (Longworth, 1983) and the peculiar rationality of the trade barriers used by Japan (Anderson, 1986) have been addressed. Beef imports into Japan are controlled by a complicated import quota system, the operation and effects of which were examined by the ABARE (1988). In addition, a 25 percent ad valorem tariff has also been levied by Japan on beef imports.

Japan has recently announced it will substantially open up its beef market in stages over the period 1988-1994. It is therefore useful to assess the implications of the proposed changes in Japanese beef import policy for New Zealand and other countries currently exporting beef to Japan and likely to be involved in future trade.

New measures announced by Japan in June 1988 involve the increase of the annual quotas by 60,000 tonnes each year for 3 years up to Japanese Fiscal Year (JFY) 1990, giving a global import quota of 394,000 tonnes. In April 1991 the import quotas are to be abolished and replaced by an ad valorem tariff of 70 percent, reducing to 60 percent in 1992 and 50 percent in 1993. An additional tariff of 25 percent is to be imposed if the imports appear likely to exceed 120 percent of previous year's imports. From JFY 1994, the tariff on beef imports will remain at 50 percent, subject to negotiations in the Uruguay Round and would be the only trade measure affecting beef imports.

This paper first provides some background Japanese beef market information on the levels of production, consumption and trade. The beef prices and the extent of assistance to Japanese beef producers and the tax on consumers due to the Import Policy are then considered. Current level of beef exports from New Zealand and the export destinations of New Zealand beef are also reported.

Next, the overall objective of the paper and certain specific areas of interest are discussed. A theoretical outline of the effects of policy changes is then provided, followed by a brief description of the modelling framework and data considerations, including some of the possible limitations requiring further work.

Two potential scenarios arising from the proposed changes in Japanese beef import policy are analysed and discussed in terms of trade flows, production, consumption levels, changes in prices and producer/consumer welfare. Finally, the main findings of the study are summarized and further work in this area suggested.

II Background

Beef production in Japan (table 1) consists of the native Wagyu beef and beef from dairy cattle, with the latter accounting for about 60 percent in 1985. Beef consumption has gradually expanded as a result of the shift towards more diversified dietary patterns and a rapid increase in per capita income. However, average

percapita consumption of beef has not expanded as much as that for pork or chicken meat (Wahl et al, 1987).

Since the beginning of beef imports into Japan almost 40 years ago, Australia has been the major supplier, while the US share has grown since the mid seventies. New Zealand's market share was about 25 percent in the mid sixties but has declined to under 4 percent at present. The reported preference for US grain-fed beef among Japanese consumers over grass-fed beef has been suggested as the reason for these developments.

Table 1: Japanese Beef Data*

Year	Prodn.	Consn.	Net Imports	Prod. Price	Cons. Price	Percentage PSE	Percentage CSE	Unit PSE	Unit CSE
1979-81	430	610	181	1,485	NA	52	-42	775	-622
1985	555	769	214	1,511	2,233	59	-52	827	-740
1986	559	830	256	1,557	2,330	71	-65	1,028	-954
1987	565	874	309	NA	NA	62	-57	904	-840

* Quantities are in '000'tonnes carcass wt basis for calendar years and prices and unit PSEs are '000' yen per tonne.

Sources: (i) OECD - Meat Balances in OECD Countries (1986); Updating PSE/CSE Analysis, Country notes on Japan (1988).

(ii) USDA/ERS (1988) - Estimates of Producer and Consumer Subsidy Equivalents.

The extent of protection afforded to the beef producers in Japan can be measured using the Producer Subsidy Equivalent (PSE) concept. This Subsidy Equivalent shows the changes in producer revenue due to government actions. The import quota is the main form of support provided to encourage domestic beef production. This results in higher prices for consumers of beef in Japan and is measured as a negative Consumer Subsidy (i.e tax) Equivalent (CSE).

Table 1 provides recent information on both Percentage and Unit PSEs and CSEs for Japanese beef, along with the prices, levels of production, consumption and net trade (imports) figures. Based a comparison of these measures for other countries and commodities (USDA 1988), Japanese beef producers are considered to be among the most highly protected agricultural sectors in the world.

New Zealand beef export data are presented in table 2. This shows that the North American market comprising the US and Canada accounts for over 85% of total New Zealand beef and veal exports. The North Asian market, consisting mainly of Japan, is a relatively small market at present.

Table 2: Export Markets for New Zealand Beef & Veal

	Markets	1986/87* Weight	1986/87* Percentage	1987/88* Weight	1987/88* Percentage
1	USA	227,000	82.4	205,967	76.2
2	CANADA	11,000	4.0	26,499	9.8
3	NORTH ASIA (Incl. Japan)	16,000	6.0	19,741	7.3
4	PACIFIC	10,000	3.6	5,502	2.0
5	OTHERS	11,000	4.0	12,680	4.7
	TOTAL	275,000	100.0	270,389	100.0

* The export figures are tonnes of Product Weight on a September year ending basis.

Source: New Zealand Meat Producers Board/SONZA, 1988.

In the 1987/88 trade year Japan imported about 9,000 tonnes of beef from New Zealand. This was mainly in the frozen form, with chilled beef accounting for less than 12%. There has been some growth in the North Asian and Canadian trade in 1987/88 compared to 1986/87.

III Objectives of paper

The objectives of this paper are to address the implications of the policy changes in the Japanese beef market within a subsidy equivalent frame work. These policy changes are the increase in the quota during the 1988-1990 period, the subsequent abolishing of quotas in 1991 and the imposition of an (higher) ad valorem tariff after that date. The specific effects to be studied relate to:

(a) changes in world reference prices for beef and other products;

(b) net trade flow changes for beef in New Zealand, Australia and the US (and Japan from 1991);

(c) producer price changes in all these countries and the resulting supply response in the short and long run;

(d) consumer price effects and meat consumption levels and patterns in Japan from 1991; and finally

(e) net welfare changes for those involved in the beef production/consumption activity in the respective countries.

IV Theoretical Effects of Substitution of Tariffs for Quotas

Relative to a free-trade situation, the present Japanese system of import-quotas and producer subsidy for beef raises producer welfare, reduces consumer welfare and accrues some rents to the government from the quota. The overall result is a significant

dead weight welfare loss to the economy from these policies (Anderson, 1986).

When the import quota is replaced with a higher tariff or levies which are less trade distorting and the revenue is used to support the prices to the producers at the previous level, imports will expand. Domestic beef production and producer welfare will be unaffected as the effects of increased quota and direct producer assistance from tariff revenue will offset each other. Consumer welfare will, however, increase considerably due to lower consumer prices and the dead weight welfare loss will be reduced. Direct subsidies to the producers will increase and the changes to government revenue net of these subsidy payments will be dependent on the extent of the drop in consumer prices due to the policy change and the elasticity of demand for beef in Japan.

The more the government of Japan is prepared to reduce its current rents from selling imported beef above the world price, the more revenue is available to finance the difference between domestic producer and consumer prices (Anderson, 1986). Import quotas have ensured that beef prices within Japan are several times higher than import prices with the main object of supporting the incomes of domestic livestock producers.

V Modelling Considerations and Data

The Static World Policy Simulation (SWOPSIM) framework used for analysis was developed by the USDA in 1986. It is similar to the OECD (MTM) trade model (1985) in its economic structure but operates on a micro computer. The models created by the SWOPSIM framework have an economic structure and a policy structure and reside in the respective spreadsheets. Policies are introduced by allowing the world, producer and consumer prices to diverge. The policy coverage of SWOPSIM-generated models is achieved by price linkage equations based on Josling's (1981) Subsidy equivalent Method.

Based on this SWOPSIM framework developed by the USDA, a model (MAFF) was created for use by the Policy Services. It consists of 6 countries (regions) which are treated explicitly and 15 commodities covering meat, dairy products and grains. These 6 countries are the US, Canada, Australia, New Zealand, Japan and the EC, with only the EC (as a whole)[1] unlikely to benefit from the changes in access to the Japanese beef market, due to non-tariff barriers to trade arising from Foot and Mouth disease (FMD). Under the memorandum of understanding between EC/Australia, the EC has agreed not to extend sales of subsidised EC beef to traditional North Asian Markets of Australia. Among the rest of the World (RW) beef exporters, South American countries will also not benefit from Japanese beef market liberalisation due to endemic FMD.

Feed grains such as coarse grains and soybeans are included, owing to the importance of livestock-feed grain linkages, especially in

---

[1] There are however, possibilities for Ireland and Denmark to participate in this trade as they are free of FMD.

the northern hemisphere countries. Poultry, pork and sheepmeats are also important, particularly in Japan, in order to study possible substitutability (or complementarity). The dairy products have been included due to the growing importance of bull-beef from the dairy herd in New Zealand beef production.

The SWOPSIM framework is well suited for evaluating the trade, price, and welfare effects of assistance based multi-lateral liberalisation scenarios. It uses the subsidy equivalent approach in reducing assistance levels as opposed to a policy based liberalisation strategy (eg, substitution of tariffs for imports controls). This involves the transformation of assistance from various policies into a monetary equivalent per unit of output.

The framework can be used to study the effects on trade of a single commodity (eg, beef) involving several countries, but is not presently capable of effectively addressing issues of bilateral nature, such as import or production quotas directly. As the SWOPSIM generated models follow the logic of non-spatial price equilibrium, domestic and traded goods are assumed to be perfect substitutes in consumption. This lack of differentiation between grain-fed and grass-fed beef categories and diaphragm and Wagyu beef in Japan is a major limitation. Use of an Armington type model would resolve some of these problems, even though the policy changes would still be addressed within a subsidy equivalent approach.

Armington Models are a subclass of bilateral trade flow models of agriculture developed due to the failure of spatial price equilibrium models to recognise deviations from law of one price and the assumption of perfect homogeneity of products (eg, beef) from different geographic origins (Dixit and Roningen, 1986). Here the consumers are allowed to discriminate among commodities for varietal or quality differences and place of production and these are, in effect, different "products". This is important in the current investigation because elasticities with respect to prices of 'products' of the same kind and cross-price elasticities between the different goods have to be calculated to create the various product demand equations.

While recognising these shortcomings of the Standard SWOPSIM framework, the model is still found useful to evaluate the effects of changes in the Japanese beef market. The effects on trade flows, production, consumption, prices and welfare of producers and consumers in the different countries involved in the Japanese beef trade need to be estimated using a PSE/CSE based assistance reduction approach.

OECD/USDA estimates of PSE and CSE for beef in Japan provide some break down of the components of PSE by the different policy measures or means of assistance delivery. There was however, insufficient details provided (OECD, 1987) on assistance to producers or tax imposed on consumers to determine the effects of import control for beef in Japan. This additional information required some extra effort and estimations. According to estimates by USDA, assistance to beef production through tariff and State Control (ie, mainly Import quota) represented about 85% of total

PSE and the tariff at 25% accounted for less than 20% at 1982-86 levels.

VI Potential Scenarios

It is generally believed that assistance to beef producers in Japan will be maintained through substitution of direct production support in place of market price support provided at present by way of import controls and Ad Valorem tariff. The likely scenarios considered here are:

(i) a reduction in consumer prices for beef in Japan equivalent to the unit PSE changes arising from the substitution of tariffs for import controls in 1991[2] (70%), 1992 (60%) and 1993 (50%) which is the scenario to be implemented by Japan; and

(ii) a reduction in overall unit PSEs for beef producers in Japan proportionate to policy changes from 1991[3], in addition to the reduction in beef prices to Japanese consumers in scenario (i), which is a scenario the beef exporting nations probably expect to see implemented.

The level of production disposition for beef and other commodities ~~Japanese beef markets~~ in 1991 is unknown at this stage for Japan as well as other countries. The results for these scenarios have to be simulated ~~Japanese beef market~~Japanese beef market as percent changes from recent (1985-1987) or past levels (1979-1981) of production incorporated in the existing MAFF model. The level of assistance and prices will also relate to 1985 values used in the existing version. It is thus necessary to emphasize the results from this exercise as only providing some general estimates of the likely consequences of the expected changes in Japanese beef import policy.

The effects of increases in the size of Japanese beef import quota by 60,000 tonnes annually, during 1988-1990, cannot be modelled directly within SWOPSIM in its present form as these features are not operational. However, by calculating the new implicit tariff associated with the additional quota (ABARE, 1988), the consumption and trade effects which follow due to the likely

---

[2] On the basis of USDA (1988) figures for Japanese beef during 1982-86, the substitution of 70% tariff for import control in 1991 represents about 45% reduction in market price support for Japanese beef. This is because the current level of 25% tariff accounted for about 78 billion yen or about 17% of total policy transfer, amounting to 469 billion yen during this period.

[3] USDA PSE breakdown also suggest about 35% reduction in PSE for beef in Japan in 1991 due to the substitution of higher tariffs in place of import controls, at 1982-86 prices and assistance levels. This figure was derived from the fact that import or state control at 305 billion yen was 65% of total policy transfer during this period.

reduction in beef prices in Japan, the effects of liberalisation can be estimated indirectly.

VII Results

These results refer to the two scenarios identified in the previous section. Percent changes in world reference price for beef, producer and consumer prices in Japan and the resulting changes in demand, supply and net trade from base 1979-81 average quantities (OECD/MTM, 1985), and 1985 prices and policies are reported. These base values were summarized in table 1 together with the 1985 percentage and unit PSEs and CSEs for beef in Japan. The 1986 and 1987 values were given for comparisor and do not differ greatly from the 1985 values.

Scenario 1

This scenario represented a reduction in the consumer tax equivalent (CTE) or negative consumer Subsidy equivalent (CSE) for 1985 (ie, -740,000 yen/tonne) reported in table 1. This results from the substitution of higher tariffs for import quotas in 1991, and the consequent reduction in beef prices for consumers in Japan. In the absence of a precise breakdown in the OECD updates of PSEs or CSEs for Japanese beef in 1985, a reduction in CTE (or -CSE) of 400,000 yen per tonne (ie about 55%) was considered as a limiting case to evaluate the effects. The substitution of 70% tariff for quotas in 1991 represents a 45% reduction in CSEs (USDA, 1988). Japanese beef PSEs were left unchanged in this scenario assuming continued assistance to beef producers at around the 1985 levels, but through more direct production assistance.

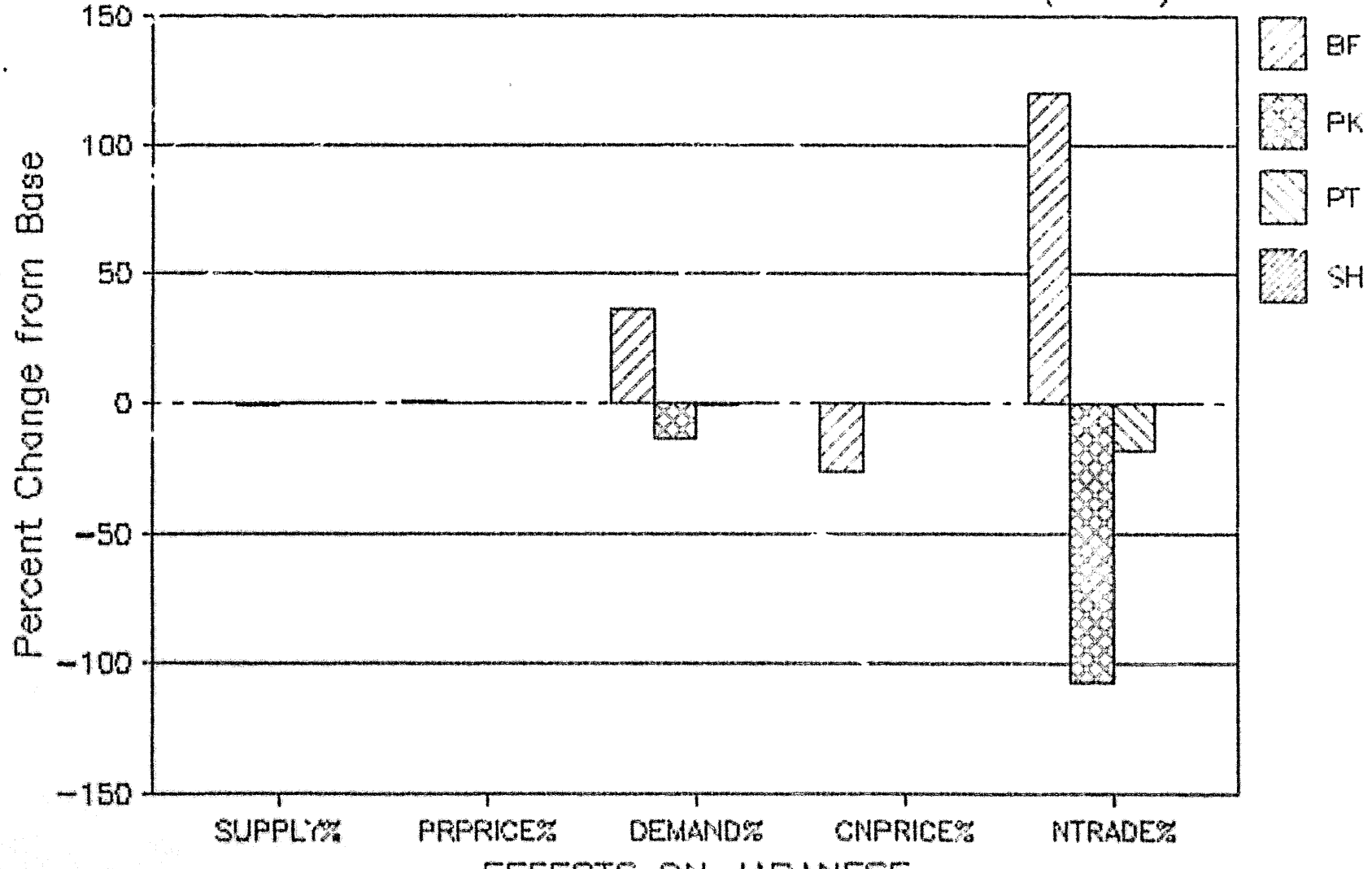
The results of this scenario are reported for beef and other meat products in Japan in figure 1. The World reference price for beef increased by about 2.5%, while there were no appreciable changes in the prices of other commodities. There was no change in producer prices or supply of beef in Japan as PSEs were left unchanged. The consumer prices were reduced by about 25% on 1985 levels and the local demand increased by about 26% on base 1979-81 values. The resulting change in net trade from 1979-81 levels was a 120% increase in net imports in carcase weight basis amounting to about 220,000 tonnes. These are medium term results over 3-5 years.

These results are projected in table 3 as changes in net trade, demand and consumer prices from base 1990 values for Japan, when this particular policy change actually takes effect. The level of net trade in the year 1993, following a 120% increase, would be 2.2 times the level of net imports of beef into Japan in 1990. This will be 1.24 M tonnes, since in the 1990 Calendar year 0.564 M tonnes of beef is expected to be imported on a carcass weight basis. The annual increases in quota by 60,000 tonnes product weight basis for JFY 1988-1990 have been transformed to a carcass weight basis and reported for calendar years in table 3, as this is consistent with the SWOPSIM model data base.

FIGURE 1

Effects of Japanese Beef Market Policy Changes

SCENARIO 1: Reduction in Consumer Taxes (−CSE)



The corresponding production and consumption figures for the period 1985-1993 are reported in table 3. Values for 1985-87 are actuals while the 1988-1990 consumption and 1991-1993 net trade estimates are derived as residuals assuming no stock carryover. They are based on projections on production and consumption levels discussed in the footnote of table 3.

Table 3: Japanese Beef Situation in response to changes in Market Access ('000' tonnes)

Years	Production[1]		Consumption[2]		Net Imports[3]	
	Carcass Wt.	Product Wt.	Carcass Wt.	Product Wt.	Carcass Wt.	Product Wt.
1985	555	394	769	546	214	153
1986	559	397	830	589	256	168
1987	565	401	874	630	309	220
1988	571	403	962	683	395	280
1989	577	405	1,050	745	479	340
1990	583	407	1,137	807	564	400
1991	589	409	1,479	1,050	903	641
1992	595	411	1,620	1,150	1,041	739
1993	601	413	1,832	1,300	1,250	887

1 Production assumed to remain fairly stable with very small increases characteristic of the 1985-87 period.
2 Consumption levels for 1985-87 are actual values, for 1988-1990 are residuals from production and net imports, and for 1991-1993 are estimates by Kerr and Wallace (1988).
3 Net Import increases in 1988,89 and 90 of 60,000 tonnes are on a product weight basis.

Scenario 2

In this scenario, in addition to the reduction in consumer tax equivalent considered in Scenario 1, a 30% reduction in Japanese beef PSEs was also studied. As precise estimates of PSE composition in 1990 are, of course, unavailable, the 1985 level (ie, 827,000 yen/tonne) was used. This level of PSE reduction can also be viewed as a limiting case. The results are provided in figure 2. Unlike scenario 1, producer prices in Japan were found to decline by about 13% with consequent supply decreasing by about 2-3%. Effects on consumer prices and domestic demand for beef in Japan were similar to Scenario 1 and this resulted in about 130% increase in net import trade. The marginal increase in net imports due to the reduction in assistance to Japanese beef producers was therefore only 10%, as the result in Scenario 1 represented a 120% increase in net imports.

This result is not surprising given an elastic demand (price elasticity demand of over -1.0) and an inelastic supply (elasticity of supply of 0.23) for beef in Japan (OECD/MTM, 1985). Results are consistent with observations of other studies of Japanese beef (ABARE, 1988). In figure 3, the Scenario 2 trade flow changes for beef are given for Canada (CN), Australia (AU), New Zealand (NZ), US and the Rest of the World (RW). EC trade in beef was held constant by a corresponding hypothetical reduction in PSE for beef in EC.

FIGURE 2

Effects of Japanese Beef Market Policy Changes

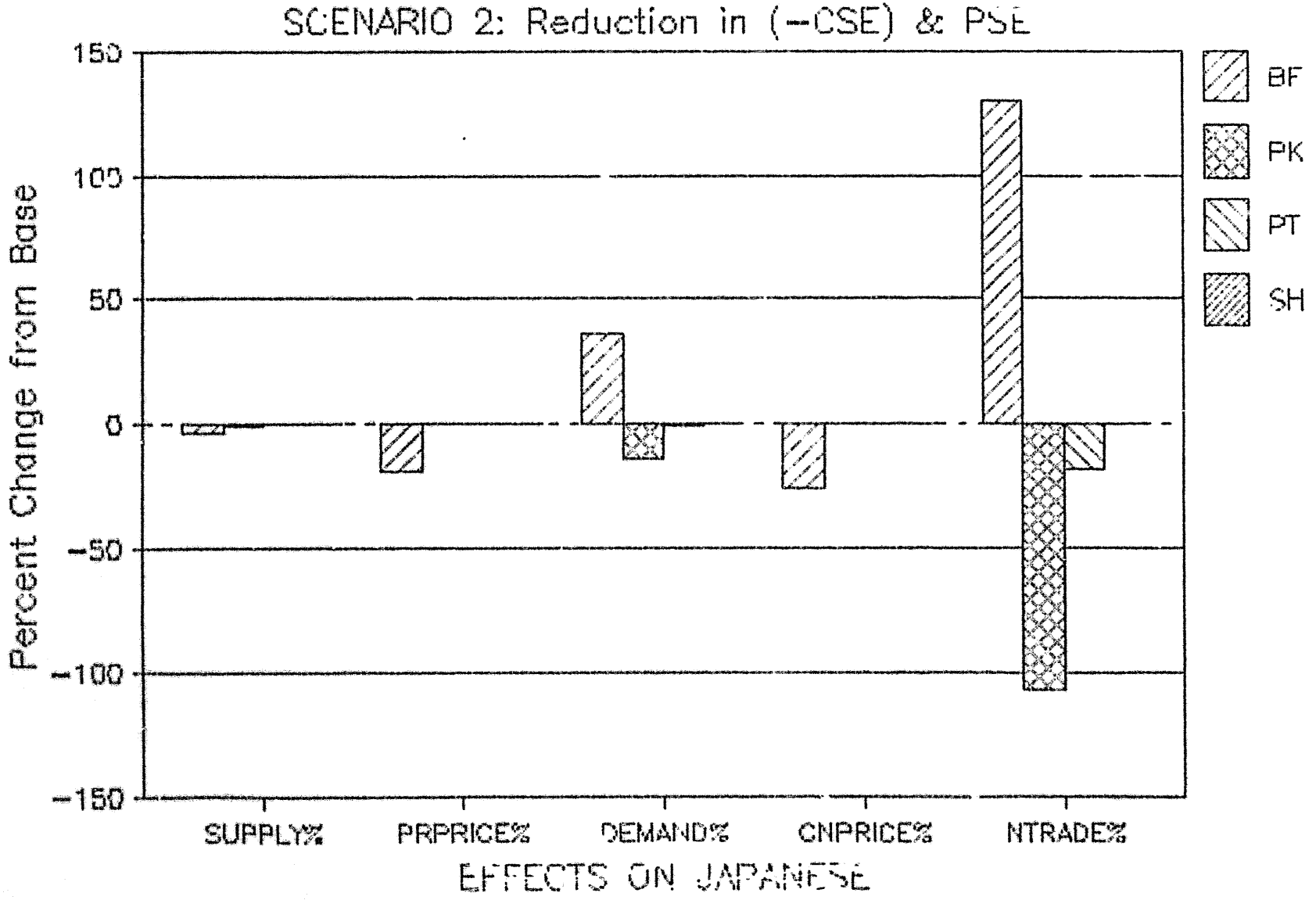
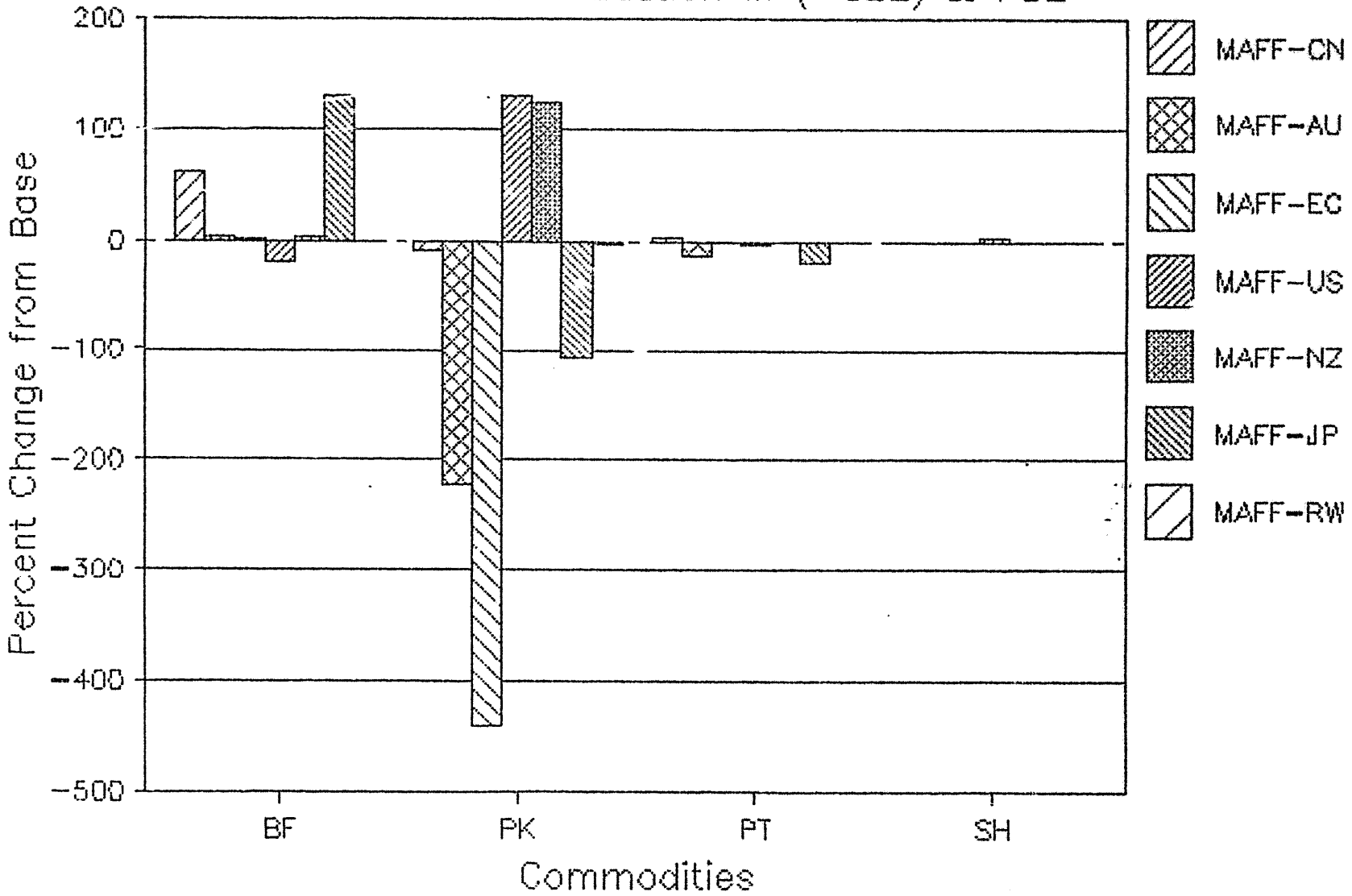


FIGURE 3

Trade Flow Changes: Japanese Beef Access

SCENARIO 2: Reduction in (−CSE) & PSE



The results suggest that an increase in net Japanese beef imports of 130% or 230,000 tonnes would originate from increases in net exports from Canada (11,000 tonnes), Australia (26,000 tonnes), New Zealand (12,800 tonnes), and the US (180,000 tonnes). The Rest of the World and the EC were modelled so as not to benefit from this additional trade owing to FMD. These are results from base 1979-81 net trade levels and represent a 60% increase in Canadian beef exports, 3% on Australian, 3.7% on New Zealand, and 20% on the US beef exports.

From the point of view of beef exporting countries, one of the important effects of the changes in Japanese beef import policy is the resulting supply response and net trade in the long run. Short run trade responses are shown to be minimal, as there is limited short run supply response. In table 4, the long run supply response following the liberalization of beef imports is reported for the US, Australia and New Zealand.

Table 4: Supply Response in Beef Exporting Countries
(tonnes carcass weight basis)

Country	Base Prodn.[1]	Percent Change in Prod. Prices	Percent Change in Supply	Final Prodn.
USA	10,589,000	1.32	0.86	10,680,000
Australia	1,510,000	2.28	0.72	1,521,000
New Zealand	562,000	2.44	2.25	575,000

[1] Base production levels are 1987/1988 values, used as proxies for the level of production in 1990.

Based on the supply elasticities for beef (OECD/MTM, 1985) used in the model for the US (0.69), Australia (0.34), and New Zealand (1.05), and the changes in producer prices reported in table 4 resulting from Scenario 2 within SWOPSIM, the supply response for beef in all three countries was very small. In the case of New Zealand the resulting increase in supply was only about 13,000 tonnes.

Other results generated under Scenario 2 are the effects on the level and composition of meat consumption in Japan following the substitution of higher tariffs for the quota in 199_. The changes in Japanese consumption levels of beef, pork, poultry and sheepmeat are shown in table 5.

These results suggest a clear evidence of substitution of beef for pork and, to a limited extent, poultry meat. This is a partial evaluation which ignores seperate developments in the pork and poultry industries and their import trade. Further the assumption of zero cross price elasticity of demand between beef and sheep meat in Japan adopted in the OECD/MTM Model and used here is also unrealistic. The implications of the extent of substitution within the red meat types is significant from the point of view of Japanese consumption and the consequent effects on overall meat trade from New Zealand.

Table 5: Changes in Japanese Meat Consumption
(tonnes Carcass Weight basis)

Meat Type	Base Consn.[1]	Percent Change in Cons. Prices	Consumption	Proj. Consn.
1 Beef	1,137,000	-37.6	60.1	1,819,000
2 Pork	1,805,000	-0.6	-20.6	1,433,000
3 Poultry	1,515,000	-0.04	-1.9	1,486,200
4 Sheepmeat	160,000	-0.07	-0.02	160,000

[1] Base Consumption level for beef relates to 1990 reported in table 3, derived following the increases in the quota by 180,000 tonnes (product weight basis) over the 1988-1990 period. This is equivalent to about 252,000 tonnes carcass weight, the units of measurement in SWOPSIM. Consumption of other meat types are actual 1986 values considered to be static up to 1990, given the anticipated expansion in beef consumption.

Overall, the effects of Japanese beef market liberalisation was to benefit the Japanese Consumers by increasing their welfare to the value of 1.17 billion US$, while reducing producer surplus by about 0.48 billion US$ resulting in a net gain of 0.69 billion US$. Total welfare gains in Australia and New Zealand were about 15 million and 5 million US$ respectively, while the welfare losses in the US and Canada were about 35 million and 1.2 million US$. The latter was due to the loss of consumer surplus not offset by the gains in producer surplus.

VIII Implications for New Zealand

There is only about a 2.5% increase in world beef prices and about a 4% increase in New Zealand beef trade following the changes in Japanese beef import policy and market access. But this represents about 13,000 tonnes of additional trade, mainly to Japan, where current New Zealand exports is only about 9,000 tonnes. To achieve this almost 150% increase in exports over the next few years, there is a need for a concentrated marketing effort. Moreover, Scenario 2 involving a reduction in the level of assistance to Japanese beef producers, in addition to the reduction in consumer prices following changes in the form of assistance in Scenario 1, did not result in much extra beef trade into Japan. This clearly demonstrates the major benefits arising from the reduction in consumer prices for beef in Japan (scenario 1) which is less politically sensitive in Japan than the reduction in producer assistance (Scenario 2).

Results indicate major trade benefits of improved access to the Japanese beef market being captured by the countries producing grain-fed beef such as the US, Canada even though it results in net welfare losses for the overall beef production and consumption activities together. While some of the results from the existing model (MAFF) discussed here are of considerable interest, more pertinent information on the prospects of New Zealand beef trade with Japan as well as other countries following this policy change can be obtained only by setting up an Armington type model referred

to in this paper. Additional data needs and extra work required in modelling to construct this model are not insurmountable and would be well worthwhile.

IX References

ABARE (1988) "Japanese Beef policies: Implications for Trade, Prices and Market Shares", Occasional Paper 102 by F Teal, A Dickson, D Porter and D Whitford, AGPS, Canberra, Australia.

Anderson K. (1986) "The Peculiar Rationality of Beef Import Quotas in Japan and Korea", in the Political Economy of Agricultural Protection, ed K Anderson and Y Hayami, Allan and Unwin Australia Pty Ltd, Sydney, Australia.

Dixit P. H. and Roningen V. O. (1986), "Modelling Bilateral Trade Flows with the Static Wold Policy Simulation (SWOPSIM) Modelling Framework" ERS Staff Report No. AGE5861124, USDA, Washington DC.

Longworth J. W. (1983) "Beef in Japan: Politics, Production, Marketing and Trade", University of Queensland Press, St Lucia, Queensland, Australia.

Jarratt I. S. (1987) "Some Aspects of Price: Quality Relationships in the Japanese Beef and Feed Grains Markets", PECC Livestock and Feed Grains Workshop, Napier, New Zealand, October.

Kerr A. and R. D. Wallace (1988) "Increasing beef Access to the Japanese Market: Implications for New Zealand", Internal Working Paper, Policy Services, MAFCorp, Wellington.

OECD/MTM (1985), "Model Specification and Data", DAA/1925 - TD/85.26, OECD, Paris.

OECD (1987) "Up-Dating of PSE/CSE Analysis: Country Note on Japan", AGR/TC(WP(87)8, Secretariat, Paris.

USDA (1986) "A Static World Policy Simulation (SWOPSIM) Modelling framework", ERS Staff Report No AGE 5860625 by V. O. Roningen, Washington DC.

USDA (1988), "Estimates of Producer and Consumer Subsidy Equivalents; Government Intervention in Agriculture, 1982-86", ERS Staff report No. AGES 880127, April 1988, Washington DC.

Wahl T. I., Hayes D. J. and Williams G. W. (1987) "Japanese Beef Policy and GATT Negotiations: An Analysis of Reducing Assistance to Beef Producers", Staff Paper No 176, Department of Economics and the Meat Export Research Centre, Iowa State University, Ames, Iowa, October.

Wahl T. I., Williams G. W and Hayes D. J. (1988) "The 1988 Japanese Beef Market Access Agreement: A Forecast Simulation Analysis" International Association of Agricultural Economists Meeting, Buenos Aires, Argentina, August.