Understanding Technical Barriers to Agricultural Trade

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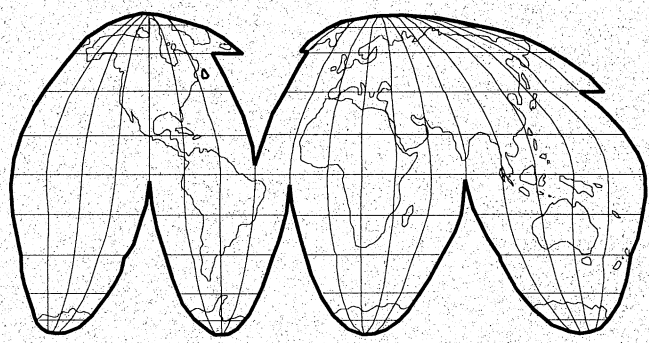

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Technical Measures for Meat and Other Products in Pacific Basin Countries*

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This paper reports the results of a study of meat and fruit (apple) import measures in Pacific Basin countries. The analysis is based on the certification manuals issued by the New Zealand Ministry of Agriculture to veterinarians and other experts involved in export inspection and certification. Each country's requirements are established by bilateral negotiation and/or agreement. Thus the analysis is essentially inward looking as it represents only one country's view of another country's importing requirements, but outward looking as the manuals cover a wide range of country conditions and experiences.

For many years, New Zealand [NZ] meat exporters only had to satisfy the United Kingdom [UK] Imported Food Regulations and only a small staff of inspectors was required. Changes took place in the immediate post-war period when the United States [US] market for beef was opened up. In 1956 and 1957 the US Department of Agriculture [USDA] found hair contamination on boned-out beef imports from NZ. Rejection of some shipments led to an increased level of surveillance by NZ inspection services and a tightening of the standards required. Emphasis was placed on the cleanliness of the product according to existing USDA import standards. In 1980, the NZ program for the control of residues was reviewed by a three-man mission from the USDA. Visits were made to export slaughterhouses to review procedures for tracing animals back to their farm of origin (Ministry of Agriculture and Fisheries 1981). The required standards were met and the Ministry subsequently noted that NZ meat imported into the US had the lowest rejection rate of all meat imported into the US (Ministry of Agriculture and Fisheries 1985).

The accession of Britain to the European Economic Community [EEC] in 1973 also brought NZ meat exports to Europe under the hygiene standards of a new authority - the EEC Intra-Community Veterinary Directive [ICVD]. The European Community [EC] Council Directive on health and veterinary inspection upon importation of bovine animals, swine and fresh meat from third countries [3CVD] was introduced in December 1972, and laid down detailed veterinary requirements for all third countries exporting fresh, chilled and frozen meat, and animals for slaughter to the EEC (*Official Journal of the European Communities* 1972). The requirements for the Directive were based largely on the Federal Republic of Germany's domestic legislation for the slaughter, hygiene and inspection of bovine animals. As a result, the EC meat hygiene standards are more stringent than those required by any other meat importing country and are not necessarily applicable to other countries (Cottrell 1982).

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In responding to the Directive, NZ raised the question of equivalent practices which would reach the same objectives. The following requirements in the Directive could have been met if the equivalence principle had been accepted by both parties (Cottrell 1982):

- replacement of wooden structures in stock yards;
- a maximum deep bone temperature of 7 degrees in boning rooms;
- packing of cuts in separate rooms from cutting rooms;
- self-contained slaughterhouses for sick or suspect animals;
- cutting and inspection of lymph nodes; and
- constant supervision by qualified veterinarians.

The intention of the Directive was that conditions of entry should be no less stringent than those stipulated in the intra-community directive for trade between member states. Arrangements were made for EC inspectors to visit NZ so that a list of establishments which met the requirements could be prepared. Negotiations completed arrangements for changes in technology, post-mortem health inspection techniques and carcass cutting temperatures (Ministry of Agriculture and Fisheries 1985). Considerable investment was required in updated buildings, assembly yards and processing facilities. Estimates are that the programme cost producers $NZ250m for investments over and above the standards required by other meat importing countries (about $NZ5,000 per livestock farmer) (Cottrell 1982). This was due, in part, to the fact that 3CVD was wider in scope than the equivalent USDA standard with emphasis on structures and storage as well as product cleanliness. Currently, NZ is negotiating with the European Union [EU] a bilateral veterinary agreement to standardize and economize on requirements for inspection and certification (Appendix 1). It is important to establish equivalence on production systems which achieve the same objectives and reduce costs of meeting the required standards.

Within the US, Canada, and the EU, there is now a move by governments to move the primary responsibility for the safety of food to processors and to improve the performance of programmes by mandating that all processors design food safety programmes and process foodstuffs in accordance with specified principles. There is also a corresponding trend to move away from a prescriptive set of procedures designed to deliver safe food (command and control procedures) towards performance based standards using pathogens as the indicator of performance. Discussions between the US and NZ, and Canada and NZ, have advanced on the basis that exporters can demonstrate that new systems can perform at least as well, if not better, than traditional programmes. With the EU, similar proposals are being negotiated for equivalence though not yet for processor self-regulating systems (NZ MAF 1995).

The US market has developed as the single most important market for NZ beef while the EU remains the most important market for lamb meat. Meat products as a whole formed 17.2 percent of total exports in 1993-94 with a value of $3.2b. Some 57 percent of beef and 70 percent of lamb produced was exported. Principal markets for beef, beside the US, were Canada, Japan, and South Korea. Principal markets for lamb, beside the UK and the EU, were Saudi Arabia and the Pacific area (Table 1). While most beef was sent to the US, imports from NZ were only 1.5 percent of total US production. And in the case of lamb, NZ imports to the whole of the EU represented only 15 percent of total consumption.

Table 1. Principal destinations for meat exports from New Zealand, 1994

Destination	Beef and Veal		Lambmeat	
	tonnes	*%*	*tonnes*	*%*
United States	166,015	54.4	6,646	2.4
Canada	52,172	17.1	7,363	2.7
United Kingdom	360	0.1	69,233	25.3
Rest of EU	488	0.2	72,161	26.3
Japan	16,982	5.6	10,138	3.7
South Korea	23,071	7.6	1,877	0.7
Papua New Guinea	1,895	0.6	22,415	8.2
Saudi Arabia	8	0.0	23,602	8.6
Pacific area	20,450	6.7	34,550	12.6
Other	23,854	7.8	26,185	9.5
Total	305,295	100.0	274,170	100.0

Source: New Zealand Meat and Wool Boards' Economic Service Review, 1995, p.29.

Apples provide another example where importing countries have varying standards of import regulation and requirements. The pests and diseases affecting apples are many and various and each country seeks protocols which prevent the introduction of new organisms. NZ lists 146 recorded organisms which may affect the mature fruit of apple (*Malus sylvestris var. domestica)* and importing countries can make use of this list in setting up their protocols. New Caledonia, Taiwan, and the US have exchanged information on this basis (Table 2). The three-way classification shows whether the organism is actionable under the importing countries' protocols, whether it is non-actionable, or whether the appropriate classification is unknown.

Table 2 shows that there is a relatively high proportion of actionable organisms for New Caledonia and the US, where the presence of an organism domestically may be the reason for the non-actionable categorization. Imports into other countries are guided by a list of default maximum pest limits [MPLs]. Finding one specimen in 600 on inspection means that there is 95 percent confidence that an MPL of 0.5 percent will not be exceeded. For an MPL of 5 percent up to 22 findings of live pests in 600 would be permitted and for 10 percent, 47 findings of live pests at the same confidence level. Each country can have a different requirement for each species; the reason largely being whether or not the particular species is a threat to the domestic economy in some way.

Table 2. Categorization of organisms present in New Zealand domestic apples by foreign governments

Government	Actionable Organisms	Non-Actionable Organisms	Categorization Unknown
	%	%	%
New Caledonia	22.6	52.1	25.3
Taiwan	10.9	61.9	27.2
United States	30.8	58.9	10.3
Average	21.4	57.6	21.0

Source: NZ MAF Regulatory Authority, Wellington, New Zealand.

A disease of the apple tree (though not present in the fruit) is Fire Blight (*Erwinia amylovora*) which is a bacterium found in the EU and NZ but not in Australia and Japan. The establishment of protocols for these countries provides further case material on the introduction of more uniform standards under the World Trade Organization [WTO] Sanitary and Phytosanitary [SPS] Agreement. Apples are exported to the EU (61 percent), the US (15 percent), Asia and Pacific destinations (16 percent), and Russia and the Central and East Europe [CEE] countries (5 percent).

Analyzing the Meat Protocols for Pacific Basin Countries

The purpose of this analysis was to discover whether the technical barriers to trade for meat in Pacific Basin countries were consistent with the objectives of the then GATT Article XX and whether some measures could be implemented in a trade discriminatory way. The following countries' import measures were examined (Petrey and Johnson 1992): Australia, Canada, Fiji, French Polynesia, Hong Kong, Indonesia, Japan, Malaysia, New Caledonia, New Zealand, Papua New Guinea, Philippines, South Korea, Taiwan, Thailand, US, and Western Samoa. Commonalities between countries were sought as well as signs of excessive zeal in drawing up or implementing the measures. The methodology employed follows closely that of Hillman (1978, 1991).

Article XX set out those measures and reasons which may be regarded as general exceptions to the Agreement (GATT 1986, pp.37-38):

> Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures...(b)

necessary to protect human, animal or plant life or health;...and (g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption;...

The GATT Articles, intended principally to free international trade, recognized, in principle, two important conditions: first, the purpose of such measures must be to contribute to a legitimate domestic objective; and, second, equivalent regulations must be applied to domestically produced products and imports (the principle of national treatment). Any restrictions imposed on foreign practices for environmental or health reasons must reflect such a domestic commitment, so that the exceptions cannot be misused as a disguised form of protection (Runge 1990).

An example of the sanitary and various technical requirements for meat and meat products exported from NZ and imported into the US is shown in Table 3. The table identifies the policy or practice that actually has to be observed by exporters and the reasons lying behind the measures. The schedule is divided into meat and meat products, edible by-products, and inedible by-products. Each is described with specific certification requirements, terms, and import prohibitions noted. There is a heavy emphasis on labeling procedures and approvals. Finally the requirements mention no less than four pieces of relevant US legislation or agencies, viz. the US Meat Inspection Regulations, the US Wholesale Meat Act 1967, the US Food and Drug Administration [FDA], and the USDA.

For other countries, there is a range of additional requirements to those contained in the general NZ official health/veterinary certificate that also must be endorsed. A summary of these additional requirements by country is shown in Table 4. Table 4 shows that importing countries are generally sensitive to pigmeat disease status, to possible contamination of product in trans-shipment, to possible transmission of disease in by-products, and to inspection requirements such as labeling and being able to identify the part against the whole (in case diseased tissue has been removed before export).

The most important feature of Table 4 is the lack of uniformity in the range of measures for meat in the region. Generally speaking, the measures are more comprehensive for countries with well-developed domestic food safety systems and the will to train and recruit the necessary veterinary and inspection services. In some cases, labeling requirements additional to truth-in-labeling appear to be carried to extraordinary lengths. In some cases, large quantities are involved, and in others the trade is minuscule or does not exist.

At the bilateral level, these measures are fully transparent to the participating parties. However, there is the wider question of whether such measures are transparent in relation to the problem they seek to contain? Is the underlying problem a true health for imported products are part of the Uruguay Round [UR] agreement. Without risk or a form of nontariff protection? Suggested rules for the assessment of health risk developments in this

Table 3. Nontariff trade measures for meat imported into the US* from NZ

Commodity	Policy or Practice	Reason for Trade Measure
Meat and meat products	**Import prohibitions:** carcasses or parts of carcasses from which naturally associated tissues such as the peritoneum, pleura, or carcass lymph nodes have been removed, or that have required major rectification to bring them up to standard, e.g., carcasses with deep-seated wounds or bruises or heavily contaminated carcasses;	Public Health (part versus whole) Consumer Aesthetics
	meat derived from: - bodies having tuberculosis in the carcass or viscera; - animals which have reacted to a tuberculosis test; horsemeat; bobby calf veal, except boneless bobby calf veal and bone-in legs; livers with portal lymph nodes missing; edible lungs and lactating udders; pieces of fresh, frozen or cured meat smaller than 50mm cubes, except where recognizable as an anatomical entity; inedible rendered fat, not denatured; any meat or meat product considered adulterated or mis-branded in terms of the US Meat Inspection Regulations.	Public Health/Consumer Aesthetics Public Health/Consumer Aesthetics Public Health Public Health/Truth in Labeling Public Health/Animal Health
	Import restrictions: imports restricted to slaughter and preparation of product from approved establishments; the establishment and its products are to be "at least equal to" requirements of the USA Wholesale Meat Act 1967; imports restricted to product subject to an approved residue testing programme, approved quality sampling programme, and packing materials approved by US Food and Drug Administration.	Public Health/Animal Health
	Labeling restrictions: product, packaging, product containers, must meet label standards ("definitions"), mandatory information, requirements for petfood and other inedible byproducts, label approval procedures, all as specified, e.g., "Labels must be first submitted in the form of a sketch ... labels should be submitted in triplicate ... and approved prior to submission of 4 sample printed labels or 4 colour photos ..."	Truth in Labeling
	Other specific product requirements: restrictions on salt-added boneless beef, use of proteolytic enzymes, mechanically recovered meat, cured meat products, canned meat products, cooked beef, roast beef and cooked corn beef, ground or comminuted meat, chopped steaks, meat patties, meat loaves, pork and smallgoods, all as specified.	Public Health/Truth in Labeling
	Certification requirements: - imported product must meet completion requirements, transit requirements, label approval and residue pre-testing endorsement requirements.	Truth in Labeling

Table 3 continued

	Fresh meat: - derived from livestock which have received ante and post mortem veterinary inspection in establishments approved for export into the USA - not adulterated or mis-branded as defined by the regulations governing meat inspection of the US Department of Agriculture - products have been handled in a sanitary manner and otherwise in compliance with requirements at least equal to those of the Wholesale Meat Act 1967 and regulations. - Certificates must be endorsed for "spring lamb" and "yearling mutton" as specified.	Public Health/Animal Health Truth in Labeling
	Meat products: various pork products require specific certificate endorsements.	Truth in Labeling
Byproducts - edible	**Other specific product requirements:** restrictions on bobby calf vells as specified.	Public Health/Truth in Labeling
	Certification: as for fresh meat	Public Health/Truth in Labeling
Byproducts - inedible	**Other specific product requirements:** restrictions on bobby calf vells inedible bovine, ovine and caprine glands, blood products, factal calf serum, lungs, pig hearts, valves for human transplant surgery and inedible tallow, as specified.	Prevent Entry into Edible Food Chain
	Certification: imported products should be certified: - free from foot and mouth disease, rinderpest, vesicular stomatitis, anthrax, swine fever, swine vesicular disease, lumpy skin disease and contagious bovine pleuropneumonia; - after treatment, every precaution has been taken to prevent contamination, prior to dispatch from processing premises; - for lamb caps an Animal Health "Inedible" health certificate is required as above; - various byproducts require specific certificate endorsements.	Animal Health Animal Health/Restrictions on Use

*(incl. US mainland, States of Alaska and Hawaii, Commonwealth of the N Marianas, including Guan and Saipan, American Samoa, Midway and Wake Islands, but excluding the US Trust Territory of the Pacific Islands (Palaus, Oonape, Yap, Truck, and the Marshalls.)

Table 4. Summary of country-specific technical and certification requirements for meat imported into Pacific Rim countries

Country	Certification Accepted from New Zealand	Trans-shipment Restriction	Pigmeat Status	Byproduct Sterilization		Whole or Part	Labeling Specified
				Edible	Inedible		
Australia	NZ	Y	A	Y	Y		
Canada	S	Y	N			Y	Y
Fiji	NZ		N				
Fr Polynesia	S		Trich				
Hong Kong	NZ		St			Y	
Indonesia	S						
Japan	NZ		Trich		Y		Y
Malaysia	NZ		St	Y	Y		Y
New Caledonia	S		St		Y		Y
New Zealand	-	Y		Y		Y	
Papua New Guinea	NZ		St	Y			
Philippines	NZ		St				
South Korea	NZ			Y	Y		Y
Taiwan	NZ				Y	Y	
Thailand	NZ						
Tonga	-		A				
United States	S				Y	Y	Y
W Samoa	NZ		A				

Certification
NZ The New Zealand Official Meat Inspection Certificate, AgM111 is accepted.
S Country specific Official Veterinary and Public Health Certificates are required.

Pigmeat (Restrictions)
A Aujesky's disease
N Imports refused
Trich Trichinosis tested
St Sterilized product

No Requirement Specified:
No entry shown in table
Y = Yes

Source: Petrey and Johnson (1992).

area, Article XX hitherto has provided blanket powers for countries to take such measures as they consider necessary to protect plant, animal and human life and health. It has been virtually impossible to challenge a country's measures as unnecessary as it would be very difficult to argue such a case in terms of this Article.

From the data in Tables 3 and 4 and the data from other countries studied, the following national reasons for sanitary and other technical regulations in the meat trade area can be identified: threats to animal health, threats to public health, need for truth-in-labeling, meeting consumer aesthetics, maintaining of product quality, maintaining security from tampering, meeting customary practice (religious requirements), protection of domestic production, need for market discipline, and prevention of entry into the edible food chain. Within such a broad framework, case-by-case studies are required to identify the original motives for each domestic policy measure and whether it was "justified" in GATT terms.

The Uruguay Round SPS Agreement

The objectives of the SPS Agreement [the Agreement] are to establish internationally a common set of rules and disciplines to guide the adoption, development and enforcement of SPS measures in world trade which minimize their negative effect on trade (GATT 1992). The Agreement encourages the development and adoption of uniform international standards that protect human, animal and plant health on as wide a basis as possible to reduce barriers to international trade. Harmonization of SPS measures will encourage countries to adopt wherever possible standards and guidelines set by international scientific standardizing organizations such as Codex Alimentarius, the Organization International Epizootics, and the International Plant Protection Convention. The goals of the Agreement are to be achieved by greater transparency, openness and clarity, by promotion of greater international harmonization of standards, rules and procedures, and by promotion of an improved consultation and dispute settlement framework.

The lack of uniformity between countries appears to have been the main driving force behind the Agreement. The Cairns Group (a mixture of developed and developing agricultural exporters including Australia and NZ) made major submissions along these lines. "The absence of a consistent multilateral framework and of transparency in agreements between contracting parties has resulted in much of the existing contention about the legitimacy of SPS measures" (GATT 1990). The Agreement sets up such a multilateral framework. The scientific organizations can provide a set of independent benchmarks and still leave countries to adopt measures more stringent than those provided for by international standards provided they can be established with reasonable scientific justification.

A later proposal by the Cairns Group and others was to establish greater consistency in the assessment of risk linked with importation of products. The role of the multilateral framework should be to interpret, clarify or reformulate Article XX and other relevant provisions..... "by recognition of the central role of the concept of the acceptable level of SPS risk based on risk assessment consistent with available multilaterally approved criteria and

definitions and with contracting parties' responsibilities to protect human, animal and plant health and their obligation to allow maximum trade opportunities;...." (GATT 1990).

The GATT secretariat set out some useful observations on risk assessment in 1991 (GATT 1992). They recognized three principal steps in SPS risk management that might give rise to restrictions on trade, inadvertent or otherwise. First, risk assessment involves an evaluation of the likelihood of a pest or disease becoming established or its potential consequences, or, in the case of additives, contaminants and toxins, the potential adverse effects on human or animal health. Second, risk assessment involves determining the acceptable level of risk. That is, meeting societal preferences through "negligible risk" levels for food quality, or through acceptable "tolerance" levels for contaminants. Third, risk assessment involves the selection and application of health and sanitary risk management measures by governments. It is the latter which have the potential to impose unnecessary burdens on imported goods.

In the Agreement itself, risk assessment is defined as "the evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the SPS measures which might be applied, and of the associated potential biological and economic consequences; or the evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins or disease-causing organisms in food, beverages or feedstuffs" (GATT 1994). It now remains for countries to develop suitable procedures and techniques and agree on their applicability. Actual decisions are likely to be taken in the light of all the circumstances surrounding a particular case.

Case Studies of Success and Failure Involving Risk Assessment

The testing of the SPS arrangements must come down to a case-by-case comparison of actual decisions in the bilateral framework. Decision-making is a continuous process in this area and individual cases may take months or years to find resolution. This section of the paper presents a summary analysis of two bilateral agreements for exports from NZ (one successful and one not) and two agreements for imports into NZ (also one successful and one not). They illustrate the important point made by GATT (1992, p.9) that determining an acceptable level of risk requires a judgement that reflects, among other things, a society's values and not just risk assessment itself.

Apples into Australia

In 1990 the Horticultural Policy Council of Australia recommended that it was unsafe to import apples from NZ because of the threat of fire blight bacterial disease. It was not clear how the disease was transmitted (Rodriguez 1993). The disease had been found in NZ in the early 1920s and a prohibition on export of plant material to Australia dates from this time (The EU accepts apples from NZ on the basis that mature healthy fruit are not a vector of fireblight). Negotiations on removing the prohibition commenced in 1986. Preparations involved a testing procedure for the presence of bacteria, isolation of disease free supply

areas, free access to laboratories, and product treatment before export. The Australian quarantine authorities [AQIS] ruled that the draft proposal for NZ imports did not provide sufficient safeguards in 1990. This decision was based on biological conditions, economic analysis of impacts if the disease was introduced, and other risks associated with importation.

Subsequently, the Horticultural Policy Council, a consultative body, submitted the fire blight working group's report to the Minister in Australia. The Council considered that the risk of fire blight establishing itself in Australia via apples from NZ was low, but still concluded that there was some risk and that the draft agreement should not be signed. The Council acknowledged that quarantine must not be used as a barrier to protect domestic industries from foreign competition but still rejected the proposed agreement on the following grounds (Rodriguez 1993): there was no fireblight-free district in NZ; there was a risk from the import of large volumes of the fruit; the disease was one of the most infectious and devastating diseases known to affect plants; once established, the disease would be extremely difficult and costly to eradicate; research indicated that the disease was one of the most erratic and unpredictable diseases of apples and pears; and there were technical inadequacies in the proposed NZ quarantine arrangements.

Apples into Japan

On the June 1, 1993, Japan agreed to grant access for fresh NZ apples. This decision followed twelve years of scientific research and five years of negotiations between the two countries. The discussions included codling moth control to fire blight quarantine, residues issues, and an offer to grant access for Japanese apples into NZ. Japan is free of fire blight bacteria and the codling moth (Rowe 1993).

In June 1988, NZ scientists submitted a codling moth (*Cydia pomonella*) disinfestation programme to the Japanese MAFF based on a considerable period of basic research. The Japanese asked for more test data and then informally notified the NZ authorities that though the technical requirements were met, they could not approve an agreement without approving all other concerns. One concern was fireblight. The Japanese also stated that delays were caused by their consideration of NZ data for cherries and nectarines and of data for apples from Australia, Canada and the US.

In August 1991, NZ MAF submitted to the Japanese MAFF a fire blight certification scheme, based on requirements laid down by the Japanese MAFF. The Japanese accepted these proposals in February 1993 with the exception of the chemical residue issue.

The residue issue arose from the different spraying programmes in the two countries and the fact that some NZ chemicals were not registered in Japan. Japanese producers had complained of higher residue levels on imported apples. In March 1993, the NZ authorities submitted to the Japanese MHW details and lists of chemicals used on NZ apples. The list stipulated which chemicals were banned, relevant pesticide residue standards and NZ monitoring data. In April the NZ MAF told MHW that all apples exported from NZ to Japan would be in compliance with existing or proposed Japanese minimum residue levels [MRLs] or Codex MRLs where Japanese MRLs have not been set or proposed. The apples would

have nil detectable residues where chemicals have no MRLs set in either Codex or Japanese existing or proposed regulations. This proposal was accepted.

Finally, the MAFF request to grant access to NZ for Japanese apples (as a possible *quid pro quo* for their producers) reversed the whole process. Now NZ has to scrutinize the Japanese quarantine arrangements especially with regard to fruit fly and fungus infections. A list of requirements was provided to the MAFF and its provisions accepted. The relevant Japanese laws were amended on May 28, 1993.

Canadian Salmon into New Zealand

Imports of Canadian uncooked salmon were banned in NZ in the early 1980s because of the perceived risk of importation of disease into NZ fish stocks. The Canadian authorities have since sought to regain access to both the NZ and Australian markets on the basis that no other countries restricted the product. The NZ authorities then examined the problem in the light of the probabilities of disease introduction and concluded that the risk was so small that imports should be resumed.

An outline of the approach is instructive: in order for table fish to serve as a vehicle for the introduction of fish disease, material of a headless, gutted, ocean-caught salmon would have to find its way into a NZ river or ocean fishery. In addition:

- the disease must be present in the waters of origin;
- the disease must be present in the particular fish caught (or be picked up in processing);
- the disease causing agent must be present in the imported tissues;
- the diseased flesh must pass inspection and grading procedures;
- the pathogen in the flesh must survive storage and processing and be present in an infectious dose;
- the pathogen must be able to establish infection ether by being swallowed or by being absorbed through the skin of the host fish; and
- scraps of the flesh product must find their way into a susceptible host fish in NZ, or an infectious dose must find its way into contact with a susceptible fish host by some other means.

Taking these factors into consideration, a non-quantitative risk analysis led to the conclusion that of the 23 diseases present in North American salmonids, furunculosis, caused by the bacterium *Aeromonas salmonicida*, was the disease which would be most likely to be carried in the type of commodity under consideration (MacDiarmid 1995). Quantitative risk analysis then established the prevalence, distribution, survival and processing susceptibility of *A. salmonicida* in relation to introduction into NZ waters. For chilled, headless, eviscerated salmon the model estimated that there is a 95 percent probability that there would be fewer than one disease introduction per ten million tonnes imported. The risks associated with other diseases would be cumulative so that any risk posed by one of the other diseases must be added to that posed by furunculosis. To put this analysis in perspective, the entire annual production of ocean-caught Pacific salmon in British Columbia is no more than 100,000 tonnes. The volume of imports annually is expected to be less than 200 tonnes.

Modified Genetic Material into New Zealand

In this case, a NZ company applied to the NZ MAF for permission to import, from Scotland, sheep semen with an introduced human gene which will cause some female offspring to produce a rare antitrypsin used in treating the medical condition congenital emphysema. The manufacture of such a drug treatment could bring considerable income to the country which produced it. The NZ MAF has given a clearance for the import, but another body, in an advisory capacity to the Minister of Environment, recommended against the importation (*The Dominion*, 30 September 1995).

The NZ MAF approval for the importation was made in terms of the relevant legislation. The point in question was whether the imported semen could bring with it the infective agent for the disease scrapie (a disease of sheep absent from NZ but which might have been introduced in an earlier experiment with imported livestock). The approval required very stringent quarantine restrictions as regards origins of the material and operation of facilities within NZ, but with these precautions the Chief Veterinary Officer [CVO] believed the risk was manageable (*The Dominion*, 20 September 1995).

The second group concerned is called the Genetically Modified Organisms Interim Assessment Group [IAG], which is an advisory body to the NZ Minister for Environment. IAG canvassed public opinion, including cultural groups like the Maori, and reached its conclusions on scientific, social and cultural, and economic grounds (*Bay of Plenty Times*, 5 October 1995). IAG accepted the views of the CVO that adherence to the NZ MAF Standard would ensure appropriate protection of NZ livestock from scrapie. They believed that quarantine would be difficult to maintain at the field station level. There was also a risk of tampering with the field security arrangements. The economic benefits were minor because production of the antitrypsin would likely be undertaken overseas. Cultural opposition to the importation was strong especially from Maori groups. In sum, IAG was opposed to the importation, because of the possibility of escape and adverse public opinion.

The Minister for the Environment's decision was not binding on the importing company putting up the proposal as the necessary legislation (the Hazardous Substances and New Organisms Bill) had not yet been passed through Parliament. The importer could therefore act under the NZ MAF authorization and later have it withdrawn when the pending legislation comes into force. The MAF only consider the importation of a disease under their legislation, whereas IAG is charged with considering environmental effects and cultural and social outcomes of genetically modified biological material.

Legislating for Risk

There is now a need for Member countries of the WTO SPS Agreement to sit down and assess what they mean by "acceptable risk." Some observers believe the difficulties of getting uniformity in risk assessment procedures are too great and that the procedures proposed will favor the big battalions. Domestic authorities will need better guidelines to set up and operate risk assessment procedures and training programmes will need considerable enhancement. At the end of the day, of course, political decision makers will be consulted and consensus

views on acceptable risk are likely to prevail. Among other countries, NZ is at the preliminary stage of defining and forming suitable procedures for imported products and materials.

It is useful to recall the three steps in risk management identified by GATT (1992). They are: evaluating the likelihood of a disease or pest entering a country, or determining the potential adverse effects on health of additives and contaminants: determining the "acceptable level of risk;" and, selection and application of measures that would limit risk to acceptable levels and which are compatible with trade requirements. The first is a question of scientific assessment or evaluation; the second is a question of choice; and the third is a matter of design. In my view, the salmon and Australian apple cases discussed above were primarily cases of risk evaluation. The question of choice also arose in the Australian case and in the NZ modified genetic material case. The question of design is one for policy advisors and legal experts. Understanding how these concepts might work can be illustrated by bringing out the underlying economic principles involved.

Figure 1 shows the normal trade-off between risk and net benefits, the EV line suggesting a positive relationship between greater benefits from the import and use of a product, and the risks to society created by that import. It is clear that "zero" risk means no imports (O), and that "no unreasonable" risk means some threshold level as represented by AB. The latter could be tolerances or MRL's determined by the science agencies. Other things being equal, domestic policy makers should seek measures that push the benefits from imports out to point B. Domestic agencies concerned with licensing or evaluation need to be able to assess economic benefits from a proposed import, to undertake a risk assessment of the possible deleterious effects of the proposed import, and to identify environmental or other effects of the import on human, plant and animal health.

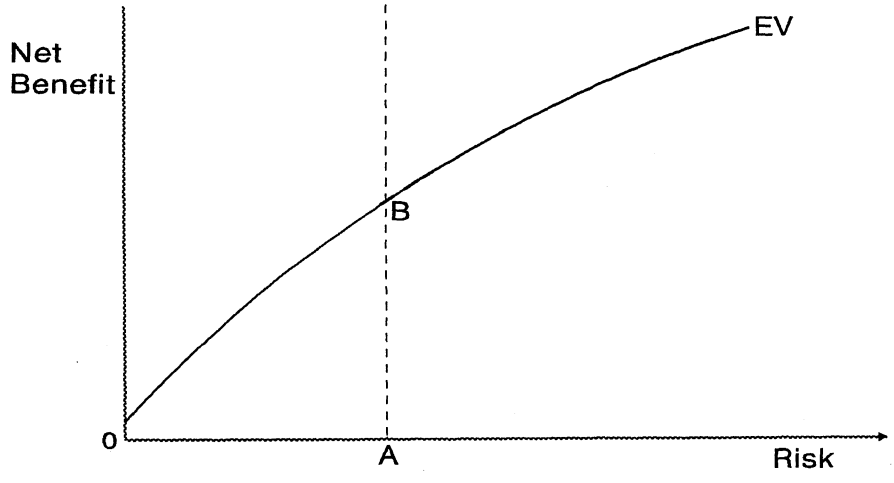

Figure 1. Risk trade-offs.

There is a subsidiary question of whether an assessment agency should be making the decision on national benefit grounds or on quarantine grounds. Legislation could be drafted to emphasize the quarantine requirements and the prospective importer left to make a commercial decision in the light of the constraints imposed. Alternatively, the agency could be required to assess the net national benefit in making the importing and risk amelioration decision, in which case the agency determines the national good on behalf of the proposer. In this case, the agency would want very clear guidelines as to the relevant costs and benefits to be considered. As the domestic requirements are more and more determined by environmental considerations, the balancing of objectives is more likely to be the work of an agency and not something which could be left to commercial decision. For example, how would one interpret the requirement ".. an authority ... may approve an application [for import] if ..... the beneficial effects of a substance outweigh the harmful effects ....?" (draft Hazardous Substances and New Organisms Bill).

Figure 2 shows the case where an agency might impose conditions on the import and use of a product or compound. In an SPS case, these conditions would be related to control measures that reduced the risks to society if the product is imported. Thus risks could be reduced to a level which was acceptable to the importing authority. The lower axis measures the increasing cost of control and the upper axis measures net benefits from the import. Curve MB shows marginal benefits decreasing as amount of control increases and curve MC shows marginal costs of a unit of control rising at the margin.[1] The optimum point of control is where the marginal equality is reached at D. The distance OD represents the cost of reducing a given amount of risk. If the agency was concerned with evaluating practicable alternative methods of managing the risks involved, it would need to develop cost profiles of these methods. If the agency was also committed to evaluating the consequences for trade of each alternative measure (GATT 1992; Article 5, clause 4 of the Agreement 1994), then they would also need to have a thorough knowledge of the Agreement and be able to assess different trade impacts.

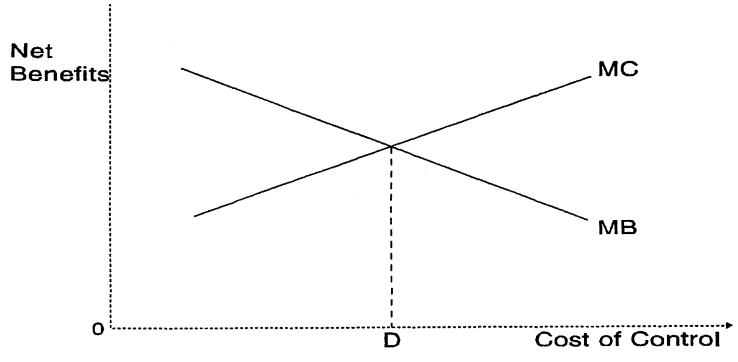

Figure 2. Managing risk.

[1]Normal practice is for the cost of compliance to be transferred to the foreign supplier. A movement toward the optimum could be achieved by the two countries agreeing on a mutually beneficial arrangement.

It would appear that legislation in this area needs to include:

- clear definitions of the benefits to be gained by an import;
- clear guidelines for identifying the degree of risk on introduction;
- clear provisions for the identification of the relevant cost and benefits;
- clear guidelines for identifying management strategies for risk control; and
- clear provisions for understanding the international implications of each import and control strategy.

Conclusions

The case studies analyzed demonstrate that different countries have different understandings of acceptable risk, and that risks associated with the introduction of a product can be identified and measured. They show that countries can develop risk containment (quarantine) programs that satisfy the requirements of other countries. Meeting these requirements involves extra costs for exporters including field hygiene programs, testing products, and inspection and certification services.

The discussion shows that the evaluation, choice and design of legislation for import protocols is important. Legislation will need to provide for evaluation of risk, identification of costs and benefits, identification of risk management strategies, and implications of different strategies for trade. Such legislation should recognize the principle of transparency and be based on scientific principles.

The SPS Agreement has started the process of harmonization and transparency for standards for food and related products that have the potential to harm human, plant and animal health. Gigantic steps have been taken to introduce uniformity between countries for such technical requirements. Part of such a uniform approach must be a greater degree of harmonization of risk assessment procedures and agreement on acceptable risk. It may be that countries may never be able to agree absolutely on acceptable risk but the presence of the Agreement can help countries move toward more common ground with the decisions made more transparent.

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Appendix 1. Current Meat Import Requirements for the European Community

Commodity	Policy or Practice
Fresh meat	**Prohibitions:** meat from boars or cryptorchid pigs; from animals to which prohibited substances have been administered; containing residues of hormonal substances; residues of antibiotics, pesticides or other substances; meat treated with ultraviolet radiation; meat from animals with tuberculosis or *trichinae*; animals slaughtered too young; parts with traumatic lesions; (blood/whole); minced meat; pieces less than 100 grams; and heads of cattle. **Restrictions:** only meat prepared or stored in approved establishments; only meat prepared in accordance with 3CVD; products must meet specifications of individual importing country include head meats, pieces less than 100g, game, game meat, minced meat, or mechanically deboned meat.
Fresh meat and meat products	**Personnel:** persons who are a possible source of contamination shall be prohibited from working and subject to provision of a medical certificate. **Listing:** all premises shall be listed with the appropriate authorities.
Fresh meat	Categories of fresh meat permitted entry: beef, sheep, goats, horses and bobby calves; part carcasses according to country; from approved cutting premises; head meats, etc. as per country requirements; raw materials for pharmaceutical processing; and unprocessed pig bristles.
Meat products	**Processing requirements:** appropriate temperatures for cutting and further processing; warm boning and hot boning where appropriate; secure detaining facilities; premises listed for each member state; meet provisions of EC Meat Products Directive, e.g., requirements with regard to process control, supervision, contamination of materials, construction of rooms, vermin control, working areas, instruments and equipment, cleanliness of staff, separate storage of raw materials, and animal parts not permitted as specified.
Fresh meat and meat products	**Inspection:** *ante mortem* and *post mortem* inspection for all animals slaughtered; specific requirements as to bovines; veterinary inspection of packhouses and cold stores. **Branding:** use of approved ink; number of brands per carcass or part thereof; offal as specified; containers as specified; consumer packs as specified; requirements as to packaging, carcasses and cartons; seals and cleanliness. **Labeling:** product must be clearly dated or coded with date of slaughter; labelling of foodstuffs as specified; appropriate terminology; aurability and use-by dates. **Storage and transport:** meet minimum storage temperatures; isolate different products; meet minimum transport temperatures. **Specific products:** requirements with regard to pieces less than 100g; edible bovine lungs and tracheas; edible blood and blood products; sliced bovine livers; game meat, game, inedible byproducts including high risk material, pig bristles, casings, and materials for pharmaceutical processing. **Certification:** appropriate certificate for country of destination for fresh meat and for meat products as specified.

Source: Overseas Requirements and Certification, MAF Regulatory Authority, Wellington.