

# **International Food Safety Regulation and Processed Food Exports from Developing Countries: The Policy Context, and the Purpose and Scope of the Research Project**

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## 1. Introduction

The impact of food-safety standards on world trade, and the role of the Sanitary and Phytosanitary (SPS) Agreement and the related dispute settlement mechanism of the World Trade Organization (WTO) in averting trade-impeding effects of these standards are at the forefront of the ongoing global trade policy debate. These issues are of particular importance for agricultural-resource rich developing countries as they seek to expand exports of processed food, a product category with immense potential for market penetration in the lucrative developed country markets. Export success of a country in this product area depends crucially on its ability to meet international food-safety standards and to participate effectively in the WTO dispute settlement mechanism in the events of related trade disputes. Many development countries face severe constraints in absorbing best-practice information and mobilising resources for meeting these requirements.

There is a voluminous literature on legal/institutional aspects of SPS issues. However, so far no systematic attempt has been made to examine the problems faced by the governments and exporting firms in developing countries in meeting these challenges. This information gap makes it difficult for developing countries to address their own supply-side problems. It also makes it difficult to conduct the current policy dialogue between developed and developing countries on this important issue in an informed and co-operative manner. Further, even when developed countries are willing to assist developing countries to enhance their capacity to meet food export quality standards, donor assistance can only be made on a rather ad hoc basis, and may not be as productive or effective as they could be. This underscores the importance of a careful, collaborative study on this issue.

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The purpose of this research project (henceforth referred to as the Project) is to fill this knowledge gap. It aims to examine the impact of international food safety regulations on world food trade, particularly on processed food exports of developing countries; to identify the policy, institutional and technical problems faced by processed food exporters in developing countries in meeting these requirements; and to identify appropriate policy measures to address these problems, while recognising the legitimate concerns in importing countries about safety and quality. The core of the study is an in-depth comparative study of the export-oriented processed food industries in India and Thailand, including detailed case studies of the food-supply chain of their processed fish, canned fruit and meat industries. The Thai and Indian experience relating to the issues at hand will be studied in the broader context of the on-going policy debate on the trade impact of food-safety standards and the related reforms under consideration for the next round of trade negotiations under the World Trade organisation.

The outcome of the Project will be a range of detailed recommendations about improvements in procedures for assuring export quality and international standards. These will include policies for adoption by the agencies responsible for quality assurance, as well as management practices to be adopted by the private sector at different stages in the supply chain. The study will also identify key constraints in technical and institutional capacity in each country to provide a better focus for ongoing investments in capacity building by national governments and donors. The quantification of the costs of meeting compliance standards, including issues associated with meeting non-uniform standards imposed by various importing nations, and the time frame and communication pathways used for notification of changes to standards, will make an important contribution to the international discussions on the WTO mechanism for SPS dispute settlement. In particular, firm-level evidence relating to the relative importance of supply side problems and identification of practical measures to address them would serve to dispel the misconception in policy circles that the lop-sided view that SPS standards in developed countries are primarily driven by protectionist forces. This can minimise trade frictions and conflict between exporting and importing countries, and facilitate a consensus approach in future WTO trade negotiations.

The purpose of this paper is to place the research project in the context of the ongoing global policy debate with a view to obtaining feedback from the interested parties in shaping the research strategy and facilitating their participation in the process of project implementation. The paper is structured as follows. Section 2 surveys the emerging trends and patterns of processed food exports and their implications for development policy in agricultural-resource rich developing countries. Section 3 paints a broad-brush picture of the current state of the debate on trade-impeding effects of international food-safety standards and the relation world trade rules. Section 4 presents preliminary results from a study-in-progress on inter-country differences in the incidents of import detentions by the US Food and Drug Administration (USFDA) and the underlying cause of detention. These results aim to inform the discussion on designing appropriate methods and strategies for studying the problems faced by exporting firms in India and Thailand in meeting food-safety standards and designing institutional capabilities to facilitate redressing these problems. A brief survey of the existing literature on the subject is undertaken in Section 5, with a view to placing the present study in context. The research project is discussed in the final section, focusing in turn on its objectives, approach and methodology, and the expected output.

## **2. Trends and Patterns of Processed Food Exports**

The most remarkable development in world merchandise trade over the past three decades has been the rapid increase in the share of manufactured goods in total trade. Based on the conventional definition based on the Standard International Trade Classification (SITC),<sup>1</sup> manufacturing share in total world exports increased from 67 per cent in 1970 to over 80 per cent by the end of the 1990s. This increase has been closely associated with the rapid expansion of manufacturing exports from developing

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<sup>1</sup> According to this definition manufactured exports consist of all commodities belonging to Sections 5 through 8 less items 68 (non-ferrous metal) in the Standard International Trade Classification - SITC). Processed/manufactured food items are classified together with the related primary products.

countries. The developing-country share in world manufacturing exports increased from 6 per cent in 1970 to over a third by the end of 1990s (Table 1). This was accompanied by an increase in manufacturing share in developing-country exports from 27 per cent to over 80 per cent between these two time points.

While this structural change in trade patterns is now well-documented in the literature, a related notable development that has attracted relatively less attention is the significant increase in the share of processed food in total primary exports (total merchandise exports less manufacturing). The share of processed food in primary exports increased from 27 per cent in 1970 to over 35 per cent in 1999. A significant increase in the share of processed food in primary exports is observed both in the case of developing and developed countries. The share of processed food in total merchandise exports has however remained virtually unchanged for the two country groups and in aggregate, reflecting the faster growth of manufacturing exports compared to other commodity categories. The rapid growth of manufacturing, however, needs to be treated carefully because of the high import content of the products involved, the degree of which may have increased over the years because of the on-going process of product fragmentation in international production (Yeats 2001). If the growth rates are estimated in net terms (eg. Gross export – imported input) the relative growth of processed food in world trade would turn out to be much sharper.

Powerful forces on both demand and supply sides have underpinned this far-reaching change in world agricultural trade (Athukorala and Sen 1998, Henderson *et al.* 1996). On the demand side, ‘internationalisation of food habits’ - the increased importance of imported processed items in consumption patterns in developed countries as well as in large sections of the populace in many developing countries - appears to play a key role. Factors such as international migration, the communications revolution and international tourism have contributed to this phenomenon. This significant demand-side impetus seems to have been supported by important supply-side developments such as improvements in food technology, refrigeration facilities and transportation that have made processed food items easily tradable across national boundaries. In sum, the emergence of process foods in world

trade is a structural (rather than a 'passing') phenomenon, which is deeply embodied in the ongoing process of global economic integration.

Not all developing countries have, however, so far shared in the growth of processed food exports in the world economy (Table 2). Among the 37 countries listed in the tables<sup>2</sup>, some countries have performed far better than others in this area. For example, Bangladesh, Bolivia, Chile, Indonesia, Korea, Malaysia and Thailand had annual growth rates close to or exceeding fifteen per cent in 1970-1999.<sup>3</sup> In contrast, Cameroon, the Dominican Republic, Ghana, Nicaragua, Nigeria, Sudan, Senegal, Tanzania and Zambia exhibited annual growth rates of five per cent or less. There is some indication that generally countries belong to the high- and middle-income groups (following the World Bank classification) have performed better compared to countries in the low-income category. Among the low-income countries, Bangladesh is a notable exception, with a growth rate of processed food exports that is more than double that of any other low income developing country.

Disaggregating exports by major category, we find that the growth rate of processed food has been significantly higher than that of agricultural products (excluding processed food), non-agricultural primary products (mostly minerals) and total primary products (Table 2). The growth performance of conventional manufactured goods is generally superior, but there is a significant number of countries which have achieved higher or comparable growth in processed food exports.

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<sup>2</sup> We started extracting data for all developing countries (96) covered in the UN data system. The countries finally chosen for the study (37 in number) are the ones for which data are available in the required form on a consistent basis for the period 1980-1999. Despite data availability, the city states of Hong Kong and Singapore are excluded from the country coverage as, given the nature of the resource endowment, food processing was never an export option available to them. A significant amount of processed food from other neighbouring resource-rich countries is routed through these countries as part of entrepot trade. They also undertake some final stage processing of these items.

<sup>3</sup> Another country which has experienced high growth in processed food exports (16% during 1980-94) in recent years, yet we were not able to include in our country sample for want of required data covering the full study period, is China. For details on China's experience in this regard see Fang (1996).

Data on the commodity composition of processed food exports from all developing countries, Thailand and India are presented in Table 3 through 5. A notable development revealed by the data is the remarkable shift in the commodity composition over time. Export growth in recent years has come mostly from commodities that were relatively less important in the 1970s. The most prominent of the new dynamic items has been processed fish, whose share in total processed food exports from developing countries increased from 6.7 per cent in 1970 to 28.4 per cent in 1994. There has also been an increase in the share of preserved fruit in processed food over time, though not as spectacular as in the case of processed fish. On the other hand, shares of 'traditional' items such as meat products, sugar and molasses, animal feeds, and vegetable oils have either fallen or fluctuated erratically over time.

The new export opportunities in processed food deserve special attention in considering export development policy options for agricultural resource-rich countries for a number of reasons. First, there is evidence that export diversification into this commodity category will bring in significant terms of trade gains. Whether export diversification will lead to terms of trade gains depends on the degree of income and price elasticity of demand for the commodities concerned. The data we have already analyzed relating to overall demand trends seems to suggest that processed food exports are superior to primary products in terms of these criteria. The available estimates of income and price elasticities of demand in food trade further corroborate this view (Islam 1988, Islam and Subramanian 1989, Fang 1996). Preliminary results of our on-going research on agricultural exports from Thailand as part of the present research project also suggest that terms of trade movements of processed fish and fruit exports for the past three decades closely resemble that of traditional manufactured goods.

Second, final stages of food processing appear to be labour-intensive. This is in contrast to in the production process of resource-based products (eg. further processing of resources such as minerals and timber) in which the dominant costs are capital charges and raw material inputs, and the most important factor substitution appears to be towards greater capital intensity to reduce raw material costs (Roemer 1979, Findlay 1985). This implies that the expansion of the

processed food sector can have a strong positive effect on employment generation in the typical labour-surplus developing economy. While further research is needed on this subject, this view finds support from the available factor proportion estimates for manufacturing production in China (Fang 1996) and Malaysia (Athukorala 1998, Chapter 7).

Third, in terms of potential net balance of payments implications (net export earnings) and addition to national income (GNP), processed food appears superior to the 'conventional' manufactured exports. Most conventional manufacturing exports from these countries (such as garments, toys, sport goods, electronics components etc.) are based on simple domestic processing of imported inputs. Process food products naturally have a greater domestic input content and hence a greater domestic value added compared to these products. Finally, the expansion of these exports is a powerful vehicle for linking the rural economy in a positive way with the on-going process of economic globalisation.

### 3. Food-safety Standards and Trade: The State of the Debate

Food-safety standards are the measures of compliance regulations enacted by the government to protect the health and safety of their citizens and the environment in which they live. Following the promulgation of the Sanitary and Phytosanitary (SPS) Agreement in 1994 as part of the outcome of the Uruguay Round of world trade negotiations, these standards are now popularly known as 'SPS measures/standards'. According to the Agreement, SPS measures include,

All relevant laws, decrees, regulations, requirements and procedures including, *inter alia*, end product criteria; processes and product methods; testing, inspection, certification and approval procedures; quarantine treatments including relevant requirements associated with the transportation of animals and plants, or with the materials necessary for their survival during transport; provisions on relevant statistical methods, sampling procedures and methods of risk assessment; and packaging and labelling requirements directly related to food safety' (Annex A (1)).

In theory, establishment of SPS standards (or other technical standards) should facilitate trade by assuring importers that the food they import is of an acceptable



standard. Universally accepted standards should also guide exporters as to the expectations of importers concerning food quality and safety, leading to reduction in trade frictions. Efficiency of production would be increased through standardization as it reduces information asymmetries between buyers and sellers, and promotes product commutability, thereby allowing for increased economies of scale and scope. However, in practice, SPS standards can become a major impediment to trade on both demand and supply sides.

On the demand side, importing countries may deliberately craft SPS measures that impose a cost or other disadvantage on foreign competitors to provide protection for domestic producers. As tariff barriers and other forms of border protection (e.g. quantitative import restrictions (QRs) and voluntary export restraints (VERs) are progressively dismantled as part of the on-going multilateral and unilateral trade liberalisation initiatives, temptation to use SPS standards (and other non-border measures) as protectionist barriers become greater (FAO 1999, Sykes 1995, Sykes and Barret 1997). There is indeed evidence that for agricultural products, and processed food in particular, non-tariff impediments to international trade stem predominantly from SPS regulations relating to trade flows (Dawson 1999, FAO 1999, Henson and Loader 1999, Orden and Roberts 1997, Hooker 1999, Mascus and Wilson 2001).

On the supply side, meeting food safety standards is often far more complicated and costly in the case of processed food than in primary agricultural products (which are affected more by quarantine regulations). The existing food-safety standards have been designed by industrial countries to reflect their technology mix and consumer preferences, which may or may not be appropriate for developing countries. Upgrading existing standards or developing new ones and performing risk assessments is a costly and difficult procedure, and is neither technically feasible nor affordable for most developing countries (Michapoulos 2001, 94). Resource, manpower and institutional constraints are naturally more binding for developing-country exporters compared to their developed-country counterparts. In addition, SPS standards sometimes diverge considerably across importing countries, making meeting standards costly and cumbersome for exporters. Thus, standards can impede trade even when they are imposed on genuine health and safety considerations.

The compliance-related trade impeding effect of SPS standards on developing countries is likely to increase over time because there has been a steady growth in food safety regulations in developed countries as a result of increasing affluence. Greater food safety is a 'normal' economic good, the demand for which rises as income levels rises, and thus greater prosperity tends to be accompanied by increased demand for these kind of policies. Many interests in developed countries see the much lax SPS standards that often prevail in developing countries as a threat to their more stringent standards by precipitating 'a race to bottom'

The SPS Agreement ratified at the Uruguay Round of trade negotiations was designed to minimise the likely trade-impeding impact of SPS regulations, particularly to ensure that they do not become protectionist tools in disguise.<sup>4</sup> The promulgation of the Agreement was prompted by legitimate concern about the possibility that removing trade restrictions on imports of agricultural products has the potential to tempt countries to use SPS standards as a new form of protection. The agreement aims to keep to a minimum the trade effects of government actions aimed at protecting human, animal and plant health. It requires importing countries are required to demonstrate that their SPS measures are based on scientific grounds and are applied equally to domestic and foreign producers. This provision puts the WTO on the side of those exporters who comply with the importing country's SPS measures. The WTO Member countries now have clear grounds for challenging trade-impeding SPS measures through the WTO Dispute Settlement Mechanism (DSM), provided they adhere to SPS standards as stipulated in the Agreement.

However, to benefit from the trade rules of the SPS Agreement, developing countries have to set up an appropriate set of institutions, including setting up 'enquiry points' to enhanced access to their markets. This is excessively costly for many developing countries.<sup>5</sup> Even after making these initial institutional investments, the ability to participate effectively in the WTO dispute settlement process by

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<sup>4</sup> See Appendix 1 for further details on the SPS Agreement.

<sup>5</sup> Reflecting these constraints, the formal compliance for the SPS Agreement has so far been less than 60% of the total developing country membership of the WTO (Michalopoulos 1999).

developing country is constrained by its low level of technical, scientific and legal capacity for mounting or defending a case in the dispute process. The Agreement allows too much latitude in adopting SPS measures, allowing importing countries to impose measures that impede imports, no matter how unlikely or how inconsequential the risk involved. Many of the provisions in the SPS Agreement pose problems in their interpretation and application. For instance, the requirement that Members may adopt more stringent measures if they can base on 'sound science' is a vague provision which assures that there exist a *single objective* and a *correct view* of any scientific issue (Wirth, 1997, p. 827). Thus it has become increasingly difficult to delineate the boundaries between a nation's sovereign rights and its obligations to the international trading community. Given these complexities, benefiting from the DSM requires specialist knowledge in international law which is absent in most developing countries, and employing international lawyers is an extremely costly proposition (Michalopoulos 1999).

The SPS Agreement itself tries to facilitate effective participation of the developing countries in the Agreement by encouraging developed-country members to provide technical assistance (Article 9) and according special and differential treatment these countries (Articles 10). (See Appendix 1 for details.) However, developed countries have not as yet taken any notable initiative to assist developing countries along these lines. International organisations such as the UNCTAD, the ITC and the World Bank have begun to provide technical assistance to developing countries to develop their institutional capacities to meet food-safety standards in compliance with the SPS Agreement. These initiatives are, however, at the formative stage and the total technical and financial support provided remain rather small compared to the actual requirements. Apart from the financial constraint, a major problem faced by these organisations is the paucity of information on various dimensions of the issues at hand.

#### 4. Import Detentions on Food-Safety Grounds in the USA: An Analysis of USFDA Detention Records<sup>6</sup>

Data on detention of import shipments following border inspection in developed countries is a useful source of information for understanding the incidence of SPS requirements (and other technical standards) on foreign trade. At present these data are readily available only for the United State. The U.S. Food and Drug Administration (FDA) makes publicly available some limited, yet useful, information on detention of shipments following its border inspection of shipments (in compliance with the Federal Food, Drug and Cosmetic Act). The information, for each shipment detained, includes the name/address of the exporter, the product and the reason for detention, and is available on a monthly basis (with a time lag of about two weeks) for the given month and the preceding eleven months.<sup>7</sup> This section presents preliminary results from an analysis of detention records for the twelve-month period from May 2001 to April 2002.<sup>8</sup>

Before analysing the tabulations, some brief remarks on the nature and scope of the data are in order. First, the data do not cover all food products imported to the US; meat and poultry products (which accounts for around a fifth of total annual food imports to the country) do not come under the preview of the USFDA compliance tests of the USFDA border inspection. Second, detention by the USFDA does not necessarily result in a complete loss of shipments. Most of the detained shipments eventually enter the US market after further testing and/or following treatment to bring into compliance with US SPS requirements. But the cost of rejection at the border can be considerable, including loss of product value, transport and other costs, and product re-export or destruction. More importantly, regardless of the actual cost involved, detentions provide useful information as to the ability of exporters to meet SPS standards. A careful analysis of detention records can also provide some important directions for research into underlying causes of failure to meet SPS

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<sup>6</sup> This section is based on Athukorala and Kohpaiboon (2002).

<sup>7</sup> Data source is (<http://www.fda.gov/oasis>)

<sup>8</sup> Tabulations were made for two one-year periods - April 1999-May 2000 and April 2001-May 2002 – to find that the over served patters of the incidence of detention across countries and the underlying causes of detention are almost identical. The results are therefore reported only for the latter period

standards and relative importance of different causes of detention in explaining inter-country differences in the ability to meet such standards.

Table 6 provides data by trading partner country (exporting country) on total detentions, total value of food exports (excluding meat and paltry products) and export value per detention. The data are presented separately for developed and developing countries (using the US country classification), with the latter countries divided into low-, middle-, and high-income groups (based on the World Bank classification) to facilitate the discussion. The level of rejections for a given country will reflect the overall volume of export, in addition to its ability to meet SPS standards. We therefore use 'export value per detention' (total dollar value of exports divided by the number of detained shipments) as a relative measure (which allows for the volume effect) of inter-country difference in the ability to meet SPS standards. In a comparison among countries, a numerical value of the ratio would suggest a better performance in meeting SPS standards.

The data clearly shows the incidence of detention is greater on developing country imports relative to the trading significance of these countries compared to the developed countries. During the period under study there were 11634 reported cases of import detentions, of which 6329 cases related (54 per cent) related to imports from developing countries even though they accounted for 41 per cent of total food imports to the USA. The distinction become even sharper in terms of the exports per detention estimates reported in the last column of the Table. On average developing country firms experienced a detention for every \$1996 worth of imports to the US. This figure was much higher, over \$ 2600, for developed country firms. When developing countries are grouped by income level, export value per detention is found to be much lower (\$920 thousand) for low-income countries compared to the figure for developing countries as a group (\$1996 thousand). Overall there seems to be a negative relationship between the incidence of detention and per capita income of exporting countries; this would suggest that richer exporting countries tend to have a greater capacity to meet SPS standards.

However, on closer inspection the data reveal a more complex picture. There is a great deal of variability among countries within similar income categories;

income alone is a poor predictor of capacity to meet safety standards and obviously other country-level factors play a major role. For instance, the data show that, despite the smaller export volume, Indian processed food exporters have experienced a far greater incidence of detention (a detention for every \$608 thousand worth of exports) compared to their Thai counterparts (\$5632). It seems that India and other latecomers to this trade may have important policy lessons from the experience of countries like Thailand. Thus, a comparative study of India and Thailand proposed here can shed important light on what measures can be implemented to immediately improve supply side performance.

Table 7 summarises FDA data by reason for detention for three processed food products – fish products, fruit and vegetables – and the sum of these three products for developed countries and developing countries (and also separately for India and Thailand). At the aggregate level, most detentions relating to imports from developing countries are for insanitariness (contamination with insects and rodent filth), followed by microbiological contamination, acidification, and pesticide residue violations. In other words, developing countries seems to face considerable problems in meeting basic food hygiene requirements, let alone requirements for which more sophisticated monitoring and therefore more costly, procedures are required, for example limits on pesticide residues and heavy metals. The distribution of causes of detentions of shipments from Thailand and India seems to mirror the general developing country patterns. As is to be expected, for exporters from developed countries do seem to pass the tests for basic hygiene requirement without any difficulty. Detention of imports from these countries seems to be for easily rectifiable reasons such as deficiency in labelling and provision of inadequate information.

## **5. The Existing Literature**

There is a sizable general literature on the modalities and implementation of food safety standards, the WTO SPS agreement and the related institutional infrastructure.<sup>9</sup>

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<sup>9</sup> See Sykes 1995, Trebilcock and Howse 1999 (Chapter 6), Michalopoulos 2001 (various chapters), Maskus and Wilson 2001 for comprehensive surveys.

But trade effects of food safety standards remain a subject that is sparsely covered, both theoretically and empirically. In particular there is a dearth of studies specifically dealing with issues of food safety – trade issues of developing countries.

A number of recent studies on trade policy issues in developing countries in relation to multilateral trade negotiations have noted the importance of SPS issues and their potential to occupy the centre stage at the next round of WTO negotiations (ESACP 1996, 2000, UNCTAD/Commonwealth Secretariat 1996, FAO 1994 and 1996, Colby 1997, Athukorala 2000, Gulati 1999a & 1999b, Henson and Loader 1999, Poapongsakorn and Santanarasit 2000). But inferences in these studies are based on rather impressionistic evidence. Moreover, several of these studies have tended to place the blame for the trade impeding effects of SPS measures squarely on the demand (importing country) side, without the support of hard empirical evidence, and while ignoring the supply-side factors which seemingly constrain the ability of developing-country exporters to meet such standards.

Perhaps the most in-depth firm-level analysis of the impact of SPS requirements on exports from a developing country is the study by Cato and Don Santos (1998) of shrimp exports from Bangladesh. During the period from August to December in 1997, the European Union banned fishery product imports from Bangladesh because of concerns about hygiene standards in processing facilities. Cato and Don Santos (1998) examine the underlying factors of alleged poor sanitary standards and the economic cost of the ban through a survey of shrimp processing firms. The analysis points to the importance of supply side constraints. From about the late 1970s, the Bangladesh seafood processing industry (with shrimp as by far the largest product line) began to expand rapidly, but the use of new technology, sanitary facilities and processes, and trained manpower did not keep pace with this rapid growth. The estimated cost of the loss of revenue to shrimp processors as a result of the ban was \$14.6 million (35% of export earnings from that commodity in 1996). The study makes a strong case for importing country support to enhance the capabilities of shrimp processing plants to maintain Hazard Analysis Critical Control Point (HACCP) procedures.

Muata and Nyamandi (1998) assess the impact of SPS requirements on agricultural and processed food exports from African countries through a survey of CODEX Alimentarius contact points in these countries. Of the countries that responded, 57% indicated that export products had been rejected within the previous two years because of the failure to comply with health standards in importing countries. Microbiological contamination, spoilage and other forms of contamination were identified as the major courses. The study calls for financial and technical support for improving testing and inspection facilities in exporting countries. Most respondents mentioned that financial constraint limited the effectiveness of these procedures, and that testing and inspection facilities were inadequate.

FAO (1999) examines food quality and safety problems in food exports from developing countries through an analysis of import detentions by the USFDA, the only agency that makes such data public through a monthly import detention list. The analysis is based on a cross-tabulation of USFDA data for the period from June 1996 to June 1997 by major courses of detention and four country groups (Africa, Latin America and the Caribbean, Europe, Asia and Total). The results yield the optimistic inference that 'dealing with these problems is well within the means of most developing countries' (FAO 1999, p5). The majority of detentions of imports from developing countries were related not to very high technical or sophisticated requirements, but to rather more basic issues of product contamination and handling. Thus, food hygiene problems represented by contamination of food with insects and rodent filth were the most common factor. Microbiological contamination comes next, followed by failure to comply with US low acid canned food registration requirement, and improper labelling.

Otsuki *et al.* (2000) undertakes an in-depth analysis of the trade impact of a 1998 EC regulation that raised the maximum permissible level of certain type of aflatoxin (a toxic substance) in foodstuffs and animal feed to a higher level than international standards (required by the Codex Alimentarius). The degree of protection arising from differences between the EU standards and those suggested by the international standards is estimated for 15 European importing countries and 9 African exporting countries between 1989-1998. The results suggest that the EU's choice to have its own aflatoxin standards in place of the international standards,



which would reduce health risk by approximately 1.4 deaths per billion a year, will result in a contraction of African exports by 64 per cent or \$670 million.

The Centre for Food Economics Research at the University of Reading recently conducted a study (during 1998-1999) on the constraints faced by developing countries in meeting food-safety standards in EC markets and in participating effectively in the implementation of the SPS Agreement (Henson and Loader 1999a, Hansen and Loader 1999b, Henson et al, 1999, Henson and Loader 2000). The study adopted a two-pronged approach to collect information; (i) interviews with government officers and country representatives from 99 countries, and (ii) a questionnaire survey of developing-country WTO delegations in Geneva or (in cases where the country is not a WTO member) the Codex Alimentarius Contact point of the country. The findings point to SPS measures as a major factor influencing the ability of developing countries to exploit export opportunities in developed-country markets. Indeed amongst the surveyed countries, SPS measures are considered as the most important impediment to agricultural and food exports to the EU. They identified poor access to compliance resources, including scientific and technical expertise and finance as major constraints, but also found that several other factors were important. These included the incompatibility of SPS requirements and production and/or marketing methods in developing countries, a lack of awareness among officials about SPS requirements and lack of adequate notice of changes to SPS standards.

There have been a number of reviews of the implementation of the SPS Agreement and the related WTO dispute settlement mechanism (WTO 1999, 1998, Roberts 1998, Henson and Loader 1999b, Swinbank 1999, Hoekman and Mavroidis 2000). Though there is a consensus that a promising start has been made in bringing in greater transparency and orderly conditions to world food trade, developing countries have not been effective participants because delegates from developing countries had lower scientific and technical know-how compared with those from developed countries. Although the Agreement stipulates that developed countries will provide developing countries with technical support to cope with supply-side constraints to meet SPS standards, so far no concrete attempts have been made in this direction. There are also concerns about the length of time given between the

notification of new SPS measures and their application, and about delays and perceived developed-country bias involved in the standards setting mechanism under the CODEX.

Finger and Schuler (2000) examine financial constraints faced by developing countries in meeting SPS standards. Based on World Bank project experience over the past five years in helping a number of developing countries to build their capabilities in this area, the authors observe that financial resources needed to implement the WTO rules would amount to ‘an entire years development budget’ for most of the developing and transitory economies (Finger and Schular, 2000, p. 511).<sup>10</sup>

## **6. Present Study**

The purpose of this section is to provide an overview on the objectives, methodology and the expected output of our ACIAR-funded project on International Food-Safety Standards and Process Food Exports from developing Countries. Further details on these aspects of the project, and additional information on research collaboration and arrangements for ensuring the involvement of firms and policy makers in the implementation of the project are provided in the Research Proposal which will be available on the project website.

### ***Objectives***

This study aims to examine the policy, institutional and technical problems faced by processed food exporters in developing countries in meeting these requirements, and to identify appropriate policy measures to address them while recognising the legitimate concerns in importing countries about safety and quality through a comparative case study of Thailand and India. The key specific objectives of the study are the following.

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<sup>10</sup> The cost of achieving disease- and pest-free status required for Argentina to export meat, vegetables and fruit is estimated to have been \$82.7million over the period 1991-96. The cost of upgrading hygiene standards in slaughterhouses in Hunagary over 1985-91 is estimated as \$41.2 million.

- To examine the trade impact of SPS standards, distinguishing how the impact relates to the nature of SPS measures themselves and the limited capacity of the governments and exporters in India and Thailand to comply with such measures.
- To identify the technical, institutional and policy constraints faced by governments and exporters in India and Thailand in meeting SPS requirements.
- To identify how developed countries can assist India and Thailand (and other developing countries) with appropriate technical support and expertise to improve domestic technical capacity in this area
- To assess the effectiveness of the SPS Agreement and the related WTO dispute settlement procedure in cushioning exporters of food products against trade inhibiting effects of SPS measures, with emphasis on how institutional and technical constraints can be addressed to facilitate compliance and reduce trade disputes and frictions.
- To prepare a comprehensive inventory of existing SPS standards in the two countries and the actual practices in this regard; to compare them with international standards recognised under the SPS Agreements and specific standards adopted by importing countries, and to make recommendations on ways and means of harmonizing and simplifying these standards.
- To draw general lessons for improving WTO dispute settlement procedures relating to SPS standards

To achieve these objective, the analysis of the study will be carried out focussing on the following hypotheses:

- Processed food exports from developing countries are impeded by inter-country differences of food safety standards in importing countries.

- There is an economically ‘recoverable’ gap between current performance and potential, which is influenced by factors such as information deficiencies (lack of transparency of standards, delays in notification, absence of established standards etc.), and limited access to technology.
- The ability of exporters to comply with SPS standards improves as part of export experience over time, but the government can play a pivotal role in shortening the time involved in this process.
- Involvement of foreign firms (multinational enterprises, MNEs) in export-oriented foods sectors is an effective way of redressing some SPS-related impediments to food trade.
- Food safety standards generate a structural shift in the size distribution of firms in process food industries in developing countries away from small and medium scale firms and towards large-scale firms. **(To be reworded)**

### ***Why Thailand and India?***

Thailand and India have both similarities and differences relating to their involvement in processed food trade and their track record in meeting international food-safety standards to make them an ideal subject for a paired case study of the issues at hand.

Among developing countries, Thailand has been a relatively early entrant to the processed food export trade. Following rapid growth of export for over three decades, it is now the second largest exporter of processed food among developing countries (with a total export value of over US\$ 10 billion after Brazil (US\$12 billion). The share of processed food exports in total agricultural exports in Thailand has more than tripled since the early 1970s to be over 60% at present. Thailand is now by far the leading frozen shrimp exporter accounting for over 30% of total world exports. Exports of frozen poultry and canned food (both fruit and vegetables) have also expanded rapidly over the past two decades. By the late 1990s the processed

food sub-sector accounted for 13% of total domestic manufacturing and 4% of GDP (TDRI, 1999).

In India, food-processing industries accounted for 18% of domestic manufacturing and over 2% of GDP in 1998/99. Benefiting from liberalisation reforms initiated in 1991, this industrial sub-sector has grown faster than most other manufacturing sectors. Although India has a long history of exporting processed foods, these exports have begun to show a notable increase only from the late 1980s, reflecting the impact of controlled trade regime over the four decades prior to this. In 1997/98, the total value of exports was over US\$ 3 billion (40% of total agricultural exports), up from US\$ 0.5 billion (10% of total agricultural exports) in 1980. The Indian processed food sector (like most other product sectors in the economy) remains predominantly domestic market oriented, a legacy of the past inward looking policy regimes (Gulati *et al.* 1994, Srinivasan 2000, Athukorala 1998). India has potential in marine product exports with varied fish resources along a coastline of over 8000 km., 28000km. of rivers, and millions of hectares of reservoirs and brackish water. Poultry production has been increasing at double-digit rates over the past decade, though exports still account for less than 5% of total production. There is good potential for rapid growth of fruits and vegetable exports under the on-going process of agricultural trade liberalisation (Gulati 1999a).

India and Thailand, like a number of other agricultural resource rich developing countries, have experienced significant expansion of processed food exports in recent years. However, problems with meeting sanitary and phytosanitary (SPS) standards are considered a major constraint to achieving the full potential of these dynamic export lines. The potential negative impact of international food safety standards has attracted increased attention among policy circles in both countries (Gulati 1999a and 1999b, Government of India 2000, Poapongsakorn and Santanaprasit 2000). For example, *Economic Survey* 1999-2000 of the Government of India (the major annual policy review of the country) emphasised that, because 'international trade in agricultural products is increasingly being dominated by concerns of quality to safeguard human health, it is very important [for India] that agro-food-processing industry improves its functioning and pays attention to hygiene and manufacturers/processors are made aware of the high international standards for

quality' (Government of India, 2000, p. 145). A recent review of Thailand's experience with the Uruguay Round Agreement has identified SPS issues as the single most important source of the country's international trade conflicts after the signing of the Uruguay Round Agreement in 1994 (Poaponsakorn ad Santanaprasit, 2000). During this period Thailand has been involved in 21 SPS disputes with her trading partners (Australia (4 disputes), European Union (5), Korea (2), Japan (2), Mexico (2), Czech Republic (1), USA(1), New Zealand (1), Brunei(1), Saudi Arabia (1) and Singapore (1) (Table 1, Appendix). The Thai government has set up an interdepartmental committee (with private sector participation) at the Ministry of Foreign Affairs to deal with trade disputes in this area.

The overwhelming share of India's exports of vegetables and fruits are to developing country markets (in particular to the Gulf), and exporters interviewed stated that they shun the more potentially lucrative developed country markets because of their inability to meet their SPS standards. It appears that a major constraint faced by Indian poultry producers in entering export markets in developed countries, is the absence of international food safety standards for this product (CODEX has not yet set SPS standards for poultry products).

Our analysis of the import detention records of USFDA (Section 4) pointed to remarkable differences between the two countries in meeting the US food-safety standards SPS standards. This contrast would provide an ideal setting for studying the supply-side constraints faced by Indian firms in meeting these standards and the factors contributing to the relative Thai success.

### ***Research Method***

Given the novelty of the issues at hand, it is not possible (and can even be counterproductive) to start off with a pre-set methodology /analytical framework. The methodology would be carefully designed in an 'evolving fashion' along the way, carefully tailoring to the unique circumstances of each country. **(Sisira, is this OK?)**

The study will have two components, the first focussing on the national level issues, and the second, on industry level issues, and they will be undertaken in two overlapping stages. In the first stage, a quantitative and qualitative database will be

developed to obtain a concrete and detailed national level overview of the constraints relating to meeting SPS standards. In addition to collation and analysis of the information available on SPS related issues, this component will draw on the experiences and perceptions of the main public-sector and private organisations involved in the promotion and monitoring of processed food trade. Interviews will be conducted with:

- government representatives and advisers involved in trade policy making, and those involved in international trade policy negotiations
- scientific personnel working in the area of food quality
- government agencies responsible for the day to day administration of export quality control
- focus groups involving key industry representatives, including producers, processors and traders/exporters

The second component of the case study will involve a detailed supply-chain study of selected industries, which will also involve a firm-level survey based on a structured questionnaire. These studies will be undertaken through field visits and interviews with producers, processors and traders/exporters, covering production, preliminary processing, transport, storage, final processing and export. The sample of firms will be carefully selected on the basis of a complete list of firms ('sampling frame') prepared from official records. The sample frame will be cross-checked with relevant private-sector bodies and the list of all importing firms available from the web-site of the USFDA. The compilation of the sample frame itself will be an important contribution of the project. Using this sampling frame, a sample of about 200 firms in each country will be selected using an appropriate sample selection procedure with a view to obtaining complete data for at least 50 firms, while ensure reasonable representation of relevant firm characteristics.

The firm-level study will cover the following products based on current importance in exports as well as perceived potential.

- Shrimps (both countries)
- Tuna (both countries)

- Poultry (both countries)
- Pig meat (Thailand)
- Mangoes (India)
- Pineapple (Thailand)
- Mushrooms (India)

These products were chosen in consultation with key officials of relevant public and private sector organisation in the two countries during the project-development trips. The present and potential export significant, and the importance of SPS issues for export performance based on the performance record since the implementation of the SPS agreement in 1995 are the two main criteria used.

The following regions, where one or more of the selected products are concentrated in each country, will be covered in the study.

#### India:

- Andhra Pradesh (shrimp, tuna, poultry and mango)
- Maharashtra (poultry, shrimp, tuna, mango)
- Kerala (shrimp, tuna).

#### Thailand

- Bangkok and surrounding area (shrimp, pig meat, tuna)
- Eastern Thailand (tuna, pig meat, pineapple)
- Southern Thailand (shrimp, pineapple, mango)

The firm level data will be used to understand different levels of performance (the degree of export orientation, level of success in meeting SPS standards) within each industry category, by establishing relationships between performance variables and firm-characteristics (e.g., size, nature of ownership, age of firm, nature of links with importing country firms, technical capacity available to meet standards, quality control methods etc.).



Firm level issues at every stage in the supply chain will be explored in detail, and the production/processing activities will be related to quality control issues. The firm level constraints and problems will then be related to the problems identified at national level. This will provide the basis for empirical estimation of the costs of meeting SPS standards, the constraints faced at each stage in the supply chain, and export losses that are incurred as a result. Inter-industry comparisons will also be undertaken to understand the nature of any common elements that may be at work in influencing export performance.

In-depth case studies will be used to clarify the process of transformation of production units in an essentially unorganised sector to modern units in organised sector, giving due weight to food safety standards. This would involve studying the inflows of capital (technology) as well as technical expertise to achieve higher standards, first to satisfy the emerging domestic processed food markets, and then supply external markets. In addition to detailed descriptive analysis of supply chain issues associated with the processed food trade, three standard methods of economic analysis will be applied to the data collected from the surveys of sample firms:

First, the trade impact of food safety standards will be analysed using key tools of the standard Policy Analysis Matrix (Monke and Pearson 1989). The first step of the analysis is to estimate the 'export tax' equivalent of SPS compliance cost (*TE*) using detailed cost-structure data. *TE* estimates will then be combined with other aspects of the incentive structure impacting on export production at successive stages to estimate the nominal rate of protection (*NRP*) and the effective rate of protection (*ERP*). The aim here is to measure the extent to which costs are raised by the need to comply with food safety standards. These enable marginal cost-benefit ratios to be computed so that the net gains from investments to upgrade quality to meet food safety standards in export markets can be ascertained.

Second, information relating to detentions of shipments to the major importing countries be analysed in the context of the existing formal international and individual importing country SPS standards with a view to detecting possible discrimination involved in the application of SPS standards. Food scientists will play a key role at

this investigation. Feedback from scientists at AQIS will be used as a check on the assessment by the Indian and Thai food scientists.

Third, multiple regression analysis at the firm level will be used to analyse inter-firm differences in the incidence of SPS impediments to exports and costs of such impediments (dependent variables) in terms of carefully selected set of independent variables encompassing firm ownership, firm size, age (business history), type of product, etc.. Particular emphasis will be placed on the role of multinational enterprises (MNEs) participation (through both direct investment and trade links) in Thai process food industries (as against negligible FDI participation in the counterpart Indian industries) in explaining differences between the two countries in meeting SPS standards.

The findings will be analysed/discussed in the context of the available global literature with a view to gaining broader perspectives and enhancing their general applicability and policy relevance.

### ***Expected outputs***

The focus of the project is policy formulation and identification of required measures to enhance quality standards, not new technology generation. The main outputs of this study will be detailed reports and policy briefs on the findings of each project component. The information and recommendations contained in these reports will include recommendations to improve compliance to SPS standards through improved production and processing practices, identification of improved practical procedures for testing and quality control and contribution to international debate on the implementation of the SPS Agreement. Delivery of output will take the form of workshops and policy briefing sessions to ensure collaboration and feedback with public and private sector personnel involved in each partner country. The key reports and the timing of their delivery are outlined below. See Annexes 2 and 3 for a schematic presentation of the expected output and the time-line of project implementation.

Some of the specific information/recommendations arising from the project will include the following:

- *Recommendations to improve compliance to SPS standards through improved production and processing practices:* the firm-specific nature of the investigation and the emphasis placed on the identification of critical points relating to meeting quality standards in the supply chain will allow for detailed, ‘practical’ recommendations to be developed to improve production and processing methods and procedures, and management practices – at every stage (farm to export) in the processed food chain, so that SPS standards can be met.
- *Identification of constraints on the Use of improved practical procedures for testing and quality control:* both the private firms and public sector institutions will be involved in implementing recommendations at this level. Note that at the primary production and storage/processing stages, small farmers and small retail traders/collectors are involved. Hence, private sectors’ activities to enhance better quality control may need to be complemented by direct government action to ensure that low-resource producers have access to needed facilities. It is also important to improve the efficiency of the government agencies responsible for quality assurance, with a view to reducing the administrative costs and unnecessary delays. The findings from the supply chain analysis and from the investigation into the operation of national quality control mechanisms working of the of the study will be of immense value in policy making in these areas.
- *Contribution to international debate on the implementation of the SPS Agreement,* by provision of much needed empirical evidence on costs related to SPS compliance by firms, and institutional and financial constraints faced by developing country governments. This information is particularly important for the international discussion on improving the WTO mechanism for SPS dispute settlement, setting international food-safety standards by the Codex Alimentarius Commission and other related bodies, and for designing projects by international developmental organisations (such as the World Bank and the AUSAID) for capacity building in the area in developing countries.

## **Appendix 1:**

### **The Agreement on Sanitary and Phytosanitary Measures**

The Sanitary and Phytosanitary Agreement, which forms a part of the WTO Agreement signed in 1994, aims to lay a firm foundation for strengthening multilateral discipline in the implementation of food-safety standards (SPS standards) in agricultural trade, with a view to achieving objective of protecting consumers while regulating the use of these standards as means of non-border trade protection. It superceded the original Article XX of the GATT which remained virtually inactive in achieving this objective owing to unclear/restrictive provisions and the lack of an effective institutional framework for implementations.

In order to harmonize sanitary and phytosanitary measures on as wide a basis as possible, the Agreement encourages members to base their measures on international standards, guidelines and recommendations where they exist, most notably the Codex Alimentarius, the International Office of Epizootics (OIE) and the International Plant Protection Convention (IPPC). The Agreement, however, affirms the rights of Members to adopt SPS measures (Article 2). But Members are responsible for ensuring that a measure is applied ‘only to the extent necessary’ to protect human, animal or plant life or health and is based on scientific principles and evidence. Members are however allowed to adopt SPS measures ‘on the basis of available pertinent information’ when ‘relevant scientific evidence is insufficient’, pending a more objective evaluation based on fuller evidence within a reasonable time (Article 5.7). Moreover, it is expected that Members would accept the sanitary and Phytosanitary measures of others as equivalent if the exporting country demonstrates to the importing country that its measures achieve the importing country’s appropriate level of health protection.

Members are required to formulate their SPS measures on ‘international standards, guideline or recommendations’ whenever possible. Setting higher level of standards compared to the existing international standards requires scientific justification. In the absence of international standards, Members are obliged to accept

the SPS measures of other countries as equivalent, if the exporting member demonstrate that it's measure achieve the same purpose.

The Agreement recognises that SPS risk do not correspond to national boundaries, there may be areas within a particular country that has lower risks than others, determined by factors such as geography, ecosystems, epidemiological surveillance, and the effectiveness of SPS controls., including pest- or disease-free areas and areas of low pest or disease prevalence.

In order to achieve transparency in SPS standards adopted by different countries, Members are required to publish and notify the SPS Secretariat of all proposed and implemented SPS measures. This information is relayed via the 'Notification Authority' within each Member government. Moreover, Members are required to establish an "Enquiry Point", which is the direct point of contact for any other Member regarding any question about SPS measures or relevant documents.

The Agreement provides for the settlement of disputes between Members regarding the legitimacy of SPS measures that affect trade through the general Dispute Settlement Mechanism (DSM) of the WTO. (The dispute settlement system of the GATT was generally considered to be one of the cornerstones of the multilateral trade order. The Uruguay Round Understanding on Rules and Procedures Governing the Settlement of Disputes has further strengthened the GATT system significantly) The Dispute Settlement Unit (DSU) at the WTO provides an integrated system for WTO Members to base their claims on any of the multilateral trade agreements included in the Annexes to the Agreement establishing the WTO. The DSU emphasizes the importance of consultations in securing dispute resolution, requiring a Member to enter into consultations within 30 days of a request for a consultation from another Member. Where a dispute is not settled through consultation, the DSU requires establishment of a panel, at the latest, at the meeting of the DSB following that at which a request is made, unless the DSB decides by consensus against establishment. The DSU contains a number of provisions taking into account the specific interests of the developing and least-developed countries.

In principle the SPS Agreement should help to facilitate trade from developing to developed countries by improving transparency, promoting harmonization and preventing the imposition of arbitrary SPS standards. Much of this depends, however, on the ability of developing countries to participate effectively in the Agreement. The Agreement itself tries to facilitate effective participation of the developing countries in the Agreement by encouraging developed-country members to provide technical assistance (Article 9) and according special and differential treatment these countries (Articles 10):

Article 9:

*Technical Assistance*

1. Members agree to facilitate the provision of technical assistance to other Members, especially developing country Members, either bilaterally or through the appropriate international organizations. Such assistance may be, *inter alia*, in the areas of processing technologies, research and infrastructure, including in the establishment of national regulatory bodies, and take the form of advice, credits, donations and grants, including for the purpose of seeking technical expertise, training and equipment to allow such countries to adjust to, and comply with, sanitary and phytosanitary measures necessary to achieve the appropriate level of sanitary or phytosanitary protection in their export markets.
2. Where substantial investments are required in order to for an exporting developing country Member to fulfil the sanitary or phytosanitary requirements of an importing Member, the later shall consider providing such technical assistance as will permit the developing country Member to maintain and expand its market access opportunities for the product involved.

Article 10

*Special and Differential Treatment*

1. In the preparation and application of sanitary or phytosanitary measures, Members shall take account of the special needs of developing country Members, and in particular of the least-developed country Members.
2. Where the appropriate level of sanitary and phytosanitary allows scope for the phased introduction of new sanitary or phytosanitary measures, longer time-frame for compliance should be accorded on products of interest to developing country Members so as to maintain opportunities for their exports.
3. With a view to ensuring that developing country Members are able to comply with the provisions of this Agreement, the Committee [that is, The Committee on Sanitary and Phytosanitary Measures at the

WTO, established under Article 12 of the SPS Agreement] is enabled to grant to such countries, upon request, specified, time-limited exceptions in whole or in part from obligations under this Agreement, taking into account their financial, trade and development needs.

4. Members should encourage and facilitate the active participation of developing country Members in the relevant international organizations.

**Appendix 2: Project Implementation Flow Chart**

	2002		2003				2004				2005	
	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2
Survey of literature	X											
Collection and processing of secondary data	X	X										
Drafting the questionnaire	X											
Country advisory committee meeting		X				X				X		
Implementation workshop in Bangkok		X										
Preparation for field work			X									
Preliminary visit to the field and testing the questionnaire			X									
Field survey			X	X	X	X	X					
A working paper on trends and patterns of processed food trade based on world trade data with a focus on the two study countries and their key commodities			X									
Creation of a project website and posting an expanded version of the proposal and the working paper on processed food trade.			X									
Drafting and finalisation of the issue paper (incorporating work in the first 3 quarters) and posting on the web as well as publishing it as an ACIAR working paper.			X	X								
Interviews with the key public and private sector players associated with processed food					X	X						
Commence feeding and processing of data from field work							X					
Analysis of data							X	X	X			
Drafting an interim report based on secondary data and preliminary results from the sample survey, and posting it on the project website.								X				
Interim Workshop in Bangkok								X				
Interim Workshop in India								X				
Filling gaps through field visits and interaction with public and private sector players associated with processed food trade									X			





### Appendix 3: EXPECTED OUTPUTS DURING THE COURSE OF PROJECT

COMPONENTS	SCIENTIFIC OUTPUTS	POTENTIAL APPLICATION
1. Impact of current SPS regulations on processed food exports – national level <ul style="list-style-type: none"> <li>• India</li> <li>• Thailand</li> </ul>	For each country: a report on <ul style="list-style-type: none"> <li>• Structure, composition and growth of PF exports</li> <li>• Nature and incidence of SPS related problems</li> <li>• Review of issues and constraints operating at national level</li> </ul>	<ul style="list-style-type: none"> <li>• Provides an overview of the impact of food safety standards and state of compliance at present.</li> <li>• Feeds into components 3 and 4</li> </ul>
2. Industry case studies in each country: <ul style="list-style-type: none"> <li>• Shrimps (both countries)</li> <li>• Tuna (both countries)</li> <li>• Poultry (both countries)</li> <li>• Pig meat (Thailand)</li> <li>• Mangoes (India)</li> <li>• Pineapple (Thailand)</li> <li>• Mushrooms (India)</li> </ul>	Structure of industries at each stage of supply chain <ul style="list-style-type: none"> <li>• measures currently in use to comply with SPS standards</li> <li>• market incentives and regulatory framework</li> <li>• review of issues and constraints operating at each stage of the supply chain</li> <li>• links between SPS compliance incentives and industry-level factors (eg. ownership, size, age, target markets and nature of market linkages)</li> </ul>	<ul style="list-style-type: none"> <li>• Provides an overview of firm-level factors that influence exports, export competitiveness and problems with SPS compliance</li> <li>• Feeds into components 3 and 4</li> </ul>

3. Country reports (two) based on integration of national and industry level analysis and global considerations
- detailed analysis of constraints and problems
  - specific and concrete recommendations for development of capacity for compliance
  - directly useful for implementing effective measures at firm and industry levels, and for national policies to achieve more effective compliance with SPS regulations
  - improve consumer welfare in both exporting and importing countries
  - useful for targeting donor assistance to the processed food sector
  - national benefits flowing from improved export performance
  - fosters co-operative links between Australian and partner country institutions and key personnel
4. Synthesis volume, based on comparative experiences of both countries, that will serve as a *policy manual*
- Provides broad background, methodology, and overall assessment of the SPS problems in the two countries, placing them in the wider context of global trends and WTO developments.
  - Presents specific implications for the two countries, for global trade negotiations, and specification, evaluation and enforcement of international standards and steps to facilitate dialogue, assistance and co-operation among exporting and importing countries
  - Direct benefits for all developing countries engaged in processed food exports
  - Assist in developing more co-operative and amicable relations between processed food exporting and importing countries
  - Assist WTO and other bodies involved in formulation and implementation of SPS standards.
  - Will help to build synergy between Cairns Group and other large food exporting non-member developing countries, such as India

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**Table 1: World Merchandise Exports, 1970-1999 (selected years)**

		Developed Countries	Developing Countries	Total
<b>(a) Export Value by major category (\$ million)</b>				
(1) Total export	1970	218.9	38.6	257.5
	1980	1208.2	241.8	1450
	1990	2360.5	539.2	2899.7
	1995	3305.6	1054.3	4359.9
	1999	3564	1244.2	4808.2
(2) Manufacturing (SITC 5 through 8 less 68)	1970	160.8	10.5	171.3
	1980	896.6	111.1	1007.7
	1990	1903	380.6	2283.6
	1995	2649.3	819.1	3468.4
	1999	2964	1015.3	3979.3
(3) Primary products (1) – (2)	1970	58.1	28.1	86.2
	1980	311.6	130.7	442.3
	1990	457.5	158.6	616.1
	1995	656.3	235.2	891.5
	1999	600	228.9	828.9
(4) Agriculture products Including food processing (SITC 0+1+2+4-27-28)	1970	37.5	20.9	58.4
	1980	187.4	87.2	274.6
	1990	286.3	108	394.3
	1995	383.5	166.2	549.7
	1999	349.2	156.4	505.6
(5) Processed foods*	1970	16.9	6.7	23.6
	1980	88.2	34.3	122.5
	1990	155.5	51.1	206.6
	1995	220.4	85	305.4
	1999	212.6	81.8	294.4
(6) Non-agricultural primary products (3) – (4)	1970	20.6	7.2	27.8
	1980	124.2	43.5	167.7
	1990	171.2	50.6	221.8
	1995	272.8	69	341.8
	1999	250.8	72.5	323.3

Table 1 Continued

**(b) Selected Indicators of Export Composition (%)**

(7) Share of Manufacturing in total exports	1970	73.5	27.2	66.5
	1980	74.2	45.9	69.5
	1990	80.6	70.6	78.8
	1995	80.1	77.7	79.6
	1999	83.2	81.6	82.8
(8) Share of Processed food in total exports	1970	7.6	11.9	8.5
	1980	7	5.9	6.6
	1990	6.4	7	6.5
	1995	6.5	6.9	6.6
	1999	5.8	5.6	5.8
(9) Share of processed food in primary exports	1970	29.1	23.8	27.4
	1980	28.3	26.2	27.7
	1990	34.0	32.2	33.5
	1995	33.6	36.1	34.3
	1999	35.4	35.7	35.5
(10) Share of processed food in total agricultural products (including Processed food)	1970	45.2	32.3	40.4
	1980	47.1	39.4	44.6
	1990	54.3	47.3	52.4
	1995	57.5	51.2	55.6
	1999	60.9	52.3	58.2

*Note:*

\* Processed food items were identified using a commodity concordance linking Standards International Trade Classification (SITC) and International Standards Industry Classification (ISIC). All 5-digit items in SITC divisions 0: food and beverages and 4: vegetable oils which are included in the ISIC classification system are treated as processed food. For details see Athukorala and Sen (1998).

*Source:*

Compiled from UN trade data (Series D) tapes held in the International Economic Data Base of the Australian National University.

Table 2 : Processed food exports and growth rate of export by category

	Processed food				Annual compound growth (1980-99)			
	1980 Mil \$	%	1999 Mil \$	%	Processed food	Primary products	Agricultural products	Manufac- turing
<b>Low-income countries</b>								
Burundi	1	0.0	1	0.0	2.7	2.6	2.6	5.2
Bangladesh	46	0.2	350	0.6	15.1	0.3	6.7	11.7
Cameroon	104	0.5	184	0.3	7.0	7.0	5.1	5.8
Ghana	82	0.4	138	0.3	4.9	2.4	2.5	6.5
Honduras	91	0.5	125	0.2	8.8	3.4	4.4	9.4
India	768	3.9	2376	4.4	8.4	6.5	7.3	11.3
Ivory Coast	413	2.1	645	1.2	9.2	7.1	7.2	8.5
Kenya	86	0.4	215	0.4	8.8	6.5	6.8	9.2
Madagascar	41	0.2	27	0.1	0.7	-0.7	-0.7	5.0
Nicaragua	68	0.3	179	0.3	6.4	2.6	3.8	4.6
Nigeria	134	0.7	21	0.0	-4.3	10.4	-5.1	0.3
Pakistan	102	0.5	305	0.6	6.9	3.1	3.7	9.4
Sri Lanka	23	0.1	142	0.3	6.5	3.9	3.9	17.7
Sudan	99	0.5	117	0.2	5.6	1.9	0.7	6.4
Senegal	192	1.0	44	0.1	-2.4	4.7	-1.2	3.2
Tanzania	34	0.2	164	0.3	7.3	2.4	3.5	5.7
Zambia	23	0.1	17	0.0	4.6	10.8	8.6	-2.4
<b>Middle-income countries</b>								
Bolivia	59	0.3	220	0.4	19.5	4.5	13.1	7.4
Colombia	310	1.6	805	1.5	9.6	8.5	5.9	12.9
Costa Rica	96	0.5	516	1.0	11.2	7.5	8.2	15.5
Dominican Republic	365	1.8	435	0.8	4.1	4.6	4.0	12.3
El Salvador	55	0.3	217	0.4	8.3	2.9	3.9	7.8
Guatemala	168	0.8	480	0.9	9.2	6.5	6.9	8.5
Indonesia	723	3.6	3947	7.3	14.6	10.1	9.0	21.6
Peru	357	1.8	1017	1.9	3.1	5.4	3.8	5.1
Philippines	1631	8.2	1650	3.1	5.2	4.3	4.4	15.7
Thailand	826	4.2	6611	12.3	17.0	9.6	10.9	20.9
Tunisia	51	0.3	239	0.4	8.7	7.0	8.3	15.7
Turkey	418	2.1	2072	3.8	10.0	7.1	7.6	17.6
<b>High-income countries</b>								
Argentina	1345	6.8	5890	10.9	11.3	7.0	7.1	11.8
Brazil	5450	27.5	7873	14.6	10.0	6.4	7.1	13.4
Chile	459	2.3	2973	5.5	16.2	11.8	14.8	7.8
Korea	1133	5.7	2245	4.2	12.6	14.8	12.1	19.1
Mexico	955	4.8	3751	7.0	9.3	12.4	9.2	18.5

Malaysia	1564	7.9	6036	11.2	12.7	7.6	7.5	17.4
Taiwan	1425	7.2	1475	2.7	7.8	9.9	7.8	16.5
Uruguay	135	0.7	434	0.8	12.1	5.8	6.9	10.7
Total Sample Countries	19834	100.0	53940	100.0	9.7	7.9	7.2	15.1
All developing countries	34347		81828		8.7			

Source : Compiled from UN trade (Series D) data held in the International Economic Data Base of the Australian National University



**Table 3: Composition of processed food exports from developing countries  
(percentage shares)**

	1970	1980	1990	1995	1999
Processed meat products	18.5	11.0	12.9	11.7	9.8
Diary products	0.4	0.5	1.0	1.1	1.6
Processed fish products	8.9	15.5	29.4	30.0	30.1
Flour and cereals	1.2	1.5	2.3	3.4	3.9
Preserved fruits	4.5	4.4	8.2	5.7	6.8
Preserved vegetables	2.7	3.9	5.2	4.7	4.8
Sugar and molasses	31.5	32.2	11.4	10.2	9.1
Coffee extracts, cocoa, and chocolates	3.0	5.0	3.0	3.0	3.0
Preserved animal feeds	13.7	10.3	11.6	8.6	7.9
Margarine and food preparations	0.8	1.3	1.9	2.8	4.0
Beverages, alcoholic and non-alcoholic	4.0	1.8	3.0	3.9	5.3
Tobacco products	6.2	5.4	8.0	7.8	8.1
Animal oils	1.1	0.3	0.1	0.2	0.1
Vegetable oils	9.8	6.6	10.0	14.5	13.6
Total (million \$)	63618	31595	47364	78925	75691

Source : Compiled from UN trade (Series D) data held in the International Economic Data Base of the Australian National University

**Table 4: Composition of processed food exports from India (percentage shares)**

	1970	1980	1990	1995	1999
Processed meat products	2.4	10.0	0.1	0.2	0.1
Diary products	0.1	0.2	0.1	0.3	0.5
Processed fish products	22.4	33.5	45.7	40.7	49.6
Flour and cereals	1.9	1.4	1.1	5.2	1.4
Preserved fruits	1.0	2.1	2.2	1.8	2.8
Preserved vegetables	1.1	1.7	2.3	2.8	3.1
Sugar and molasses	1.1	1.8	1.6	3.5	3.0
Coffee extracts, cocoa, and chocolates	41.1	22.7	29.3	28.7	16.5
Preserved animal feeds	1.6	1.4	0.8	0.9	1.6
Margarine and food preparations	0.0	0.1	0.6	0.5	0.5
Beverages, alcoholic and non-alcoholic	23.6	23.6	12.7	5.4	9.9
Animal oils	3.7	1.5	3.5	9.9	11.0
Vegetable oils	0.0	0.0	0.0	0.1	0.0
Total export value of processed food (million \$)	184	722	1146	2458	2358

Source : Compiled from UN trade (Series D) data held in the International Economic Data Base of the Australian National University

**Table 5 Composition of processed food exports from Thailand (percentage shares)**

	1970	1980	1990	1995	1999
Processed meat products	7.5	0.9	0.3	1.9	4.1
Diary products	0.1	1.0	0.3	0.4	0.5
Processed fish products	29.3	39.3	57.5	58.8	59.9
Flour and cereals	12.0	3.6	2.0	2.4	3.0
Preserved fruits	4.9	11.6	10.3	7.5	9.5
Preserved vegetables	20.7	9.3	4.5	4.4	3.4
Sugar and molasses	12.4	21.4	19.1	16.8	9.0
Coffee extracts, cocoa, and chocolates	0.0	0.0	0.1	0.2	0.4
Preserved animal feeds	10.7	10.1	3.6	3.0	3.7
Margarine and food preparations	0.9	1.1	1.8	3.1	4.3
Beverages, alcoholic and non-alcoholic	0.3	0.1	0.4	1.1	1.4
Tobacco products	17.8	8.7	1.8	0.8	0.9
Animal oils	0.0	0.0	0.0	0.0	0.0
Vegetable oils	1.1	1.4	0.1	0.3	0.9
Total export value of processed food (million \$)	54	766	3928	7562	6835

Source : Compiled from UN trade (Series D) data held in the International Economic Data Base of the Australian National University

**Table 6 : Import Detentions by the US Food and Drugs Administration: Number of Detentions, Total Value of Food Imports\* and Import Value per Detention, May 2001-April 2002**

Country/Country Group	Import Detention		Total imports		Exports per detention
	No of Cases	%	Million \$	%	\$ '000
<b>1. All countries</b>	11634	100.0	30486	100.00	2620
2. Developed countries	5305	45.60	17856	58.57	3366
Australia	80	0.69	550	1.80	6878
Austria	22	0.19	127	0.42	5767
Belgium	110	0.95	145	0.48	1317
Canada	939	8.07	7143	23.43	7607
Denmark	29	0.25	134	0.44	4633
Finland	8	0.07	35	0.11	4314
France	1035	8.90	1922	6.30	1857
Germany	492	4.23	607	1.99	1235
Greece	93	0.80	147	0.48	1576
Iceland	14	0.12	180	0.59	12892
Ireland	80	0.69	314	1.03	3930
Italy	446	3.83	1587	5.20	3558
Japan	551	4.74	418	1.37	758
Netherlands	143	1.23	1290	4.23	9022
New Zealand	16	0.14	390	1.28	24398
Norway	43	0.37	149	0.49	3476
Portugal	17	0.15	72	0.24	4228
Russia	31	0.27	291	0.96	9399
Spain	253	2.17	629	2.06	2487
Sweden	45	0.39	357	1.17	7926
Switzerland	98	0.84	95	0.31	967
United Kingdom	760	6.53	1273	4.18	1675
<b>3. Developing Countries</b>	6329	54.40	12630	41.43	1996
<b>3.1 Low income countries</b>	1199	10.31	1103	3.62	920
Bangladesh	34	0.29	101	0.33	2983
Ghana.	23	0.20	51	0.17	2225
Honduras	11	0.09	257	0.84	23352
India	769	6.61	467	1.53	608
Kenya	3	0.03	18	0.06	5913
Nicaragua	31	0.27	149	0.49	4807
Nigeria	74	0.64	11	0.04	153
Pakistan	217	1.87	31	0.10	145
Senegal	10	0.09	4	0.01	448
Sri Lanka	27	0.23	12	0.04	442

<b>3.2 Middle income countries</b>					
	1927	16.56	5390	17.68	2797
Bolivia	8	0.07	6	0.02	691
Colombia	166	1.43	493	1.62	2970
Costa Rica	45	0.39	274	0.90	6094
Dominican Republic	611	5.25	414	1.36	678
El Salvador	16	0.14	99	0.33	6207
Guatemala	84	0.72	281	0.92	3350
Indonesia	263	2.26	853	2.80	3244
Peru	49	0.42	114	0.38	2335
Philippines	232	1.99	610	2.00	2630
Thailand	355	3.05	1999	6.56	5632
Tunisia	20	0.17	6	0.02	322
Turkey	78	0.67	239	0.78	3059
<b>3.3 High Income Countries</b>					
	3203	27.53	6138	20.13	1916
Argentina	52	0.45	412	1.35	7923
Brazil	214	1.84	903	2.96	4220
Chile	55	0.47	837	2.74	15213
Korea, Republic Of (South)	439	3.77	207	0.68	471
Malaysia	95	0.82	243	0.80	2555
Mexico	1950	16.76	3186	10.45	1634
Taiwan, Republic Of					
China.	395	3.40	303	1.00	768
Uruguay	3		47	0.15	15506

#### Notes

\* Excluding meat and paltry products.

\*\* Developed and developing country grouping is based on the UN Standard Country Classification System. Developing Countries are classified by the level of income using the World Bank classification system.

Source : Compiled using data for import detention from US Food and Drugs Administration, OASIS Website (<http://www.fda.gov/oasis>) and data for Export to US from US International trade commissions, USITC Website ([dataweb.usitc.gov](http://dataweb.usitc.gov))

**Table 7: Detention of Import of by the USFDA: Percentage Distribution of Shipments of Fish Products, Fruit and Vegetable Detained During May 2001 – April 2002 (%)**

Product/cause of detention	All countries	Developed countries	Developing countries	India	Thailand
<i>Processed Fish</i>					
Unsafe additive	0.4	0.9	0.3	0.0	1.6
Poisonous & deleterious	8.7	17.2	7.4	0.2	1.5
Contamination	29.9	2.8	33.8	36.3	28.4
Insanitariness	32.3	20.7	34.0	57.5	47.3
Acidification	5.5	14.9	4.1	0.9	2.7
Under-processed	0.3	0.9	0.2	0.0	0.1
Inadequate information	10.4	28.6	7.7	0.9	9.0
Deficiency labeling	12.2	13.4	12.0	4.1	9.5
Others	0.4	0.7	0.4	0.2	0.0
Total	100.0	100	100	100	100
(number)	6366	808	5558	579	677
<i>Fruit</i>					
Unsafe additive	7.5	1.0	8.3	2.9	8.2
Poisonous & deleterious	2.5	0.8	2.7	1.0	0.0
Contamination	0.7	0.2	0.7	0.0	0.0
Insanitariness	12.1	7.4	12.7	52.0	27.9
Acidification	23.5	24.9	23.4	6.9	14.8
Under-processed	7.6	0.4	8.5	0.0	0.8
Inadequate information	4.9	41.8	0.2	8.8	36.1
Deficiency labeling	13.9	14.7	13.8	24.5	4.9
Others	27.4	8.8	29.8	3.9	7.4
	100	100	100	100	100
	2239	256	1983	32	184
<i>Vegetables</i>					
Unsafe additive	0.4	0.1	0.5	6.3	1.8
Poisonous & deleterious	29.5	0.2	38.9	0.0	0.0
Contamination	0.4	0.0	0.5	0.0	3.5
Insanitariness	18.1	7.0	21.6	0.0	0.0
Acidification	14.7	30.7	9.5	34.4	12.3
Under-processed	0.3	0.2	0.3	6.3	1.8
Inadequate information	23.2	42.0	17.3	46.9	77.2
Deficiency labeling	8.6	12.7	7.3	3.1	3.5
Others	4.9	7.4	4.2	3.1	0.0
	100.00	100	100	100	100
	2543	616	1927	32	57

Table 7 Continued

<b>Total</b> (of the 3 products)					
Unsafe additive	1.8	0.6	2.0	0.5	3.0
Poisonous & deleterious	12.2	8.5	12.8	0.2	1.1
Contamination	17.3	1.4	20.1	34.4	21.1
Insanitariness	25.0	13.6	27.0	57.2	40.4
Acidification	11.2	22.2	9.3	3.0	5.7
Under-processed	1.8	0.5	2.0	0.3	0.4
Inadequate information	12.2	35.5	8.1	3.7	18.7
Deficiency labelling	11.7	13.3	11.4	5.4	8.2
Others	6.9	4.4	7.3	0.5	1.5
	100	100	100	100	100
	11148	1680	9467	611.00	918

Source : Compiled using data from US Food and Drugs Administration, OASIS Website  
(<http://www.fda.gov/oasis>)

**Table 8: Thailand: SPS Problems with Trading Partners, 1995-1999**

Product	Trading Partner	Problem
1. Chicken/poultry	Czech Republic	Import ban on grounds of excessive level of cyanide
	Australia	Require high temperature treatment and long processing period to control IBD virus
	Korea	Import ban claiming discovery of listeria
	Singapore	Farm and slaughter houses must be certified by the Singapore authorities
	European Union (Denmark)	Exporting firms must stick to an examination procedure for salmonella bacteria stipulated by Denmark
2. Canned tuna	Saudi Arabia	Import ban, claiming genetically modified ingredients
3. Meat of swine	Japan	Thai firms can export only boiled frozen meat of swine (not chilled meat) because of alleged foot and mouth disease
4. Orchid	European Union	Shipments have been destroyed/returned on discovery of thrips palmi
	Mexico	Import ban after discovery of thrips palmi
5. Pameo	European Union (Italy)	Import ban on grounds of containing some insects detrimental to orange plantations in Italy
6. Canned pineapples	European Union (Finland and Spain)	Introduced measures to check for contamination with tin
7. Fresh fruits and vegetables	USA	Allows imports of only selected products such as durians, preserved tamarind and mushroom, because of disease and insect problems
	Australia	Prohibition of fruit and vegetable imports claiming disease and insect problems
	New Zealand	Strict quarantine measures applied to imports of pomalo, mangos teen, mango, rambutan and longan
	Japan	Allows imports of only selected products, because of disease and insect problems
	Brunei Darussalam	Prohibition on imports of eight fresh vegetables - Roselle, French beans, celery, onion, spring, green peas, cucumber, Chinese mustard and tomato - claiming contamination of several chemical residues.
	Korea	Allows imports of only selected products because of disease and insect problems
	8. Durian	Australia
9. Longan	Singapore	Permit importation only if the product passes the Singaporean standards relating to sulphur dioxide remnants



10. Vegetables, dehydrated	Australia	Shipments returned because of high insecticide remnants
11. Rice	Mexico	Import ban, claiming contamination with fungi <i>tilletia barclayana</i>
12. Corn	European Union (Spain and Sweden)	Import ban on finding of <i>Shigella Sonnei</i>

*Source:* Poapongsakorn and Santanaprasit (2000) and *Bangkok Post*, 12 May 2000 (for item2).

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