Meeting Food Safety Standards in Export Markets: Issues and Challenges facing Firms Exporting from Developing Countries

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Abstract

Food safety has become a major economic issue of public policy in both developing and developed countries. The nature of this issue differs between food exporting developing countries and food importing developed countries. Using the example of India, we illustrate the difficulties that processed food exporters in developing countries are facing with the variety of food safety standards being set by governments in food importing developed countries. On the basis of the results of a sample survey of firms engaged in exporting processed food products, the characteristics of the firms and the nature and consequences of the difficulties faced were identified. In particular, it was found using a constructed index of the food safety standards that these firms face, together with a gravity model of exports from India to seven developed country markets, that there were substantial potential losses to India from the strictness of the standards set and from the variation in these standards amongst the seven export destinations. It appears that in several instances the standards set exceed those recommended by the Codex Alimentarius Commission. While those standards could be challenged in the WTO, the evidence suggests that, in general, developing countries do not possess the legal or financial resources to mount a case in the Dispute Settlement Body.

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1. Introduction

Food safety has become a major economic issue in public policy. This observation is just as true in food exporting developing countries as it is in food importing developed countries, although the economic nature of the issue is somewhat different. In exporting developing countries, the principal issue is the effect that the stringent food safety standards (FSS) set in the import markets of developed countries have on the ability of firms in developing countries to export to these markets. These effects include: increased costs of production which tend to fall most heavily on the smaller firms, thereby affecting the size distribution of firms and perhaps being inconsistent with development policy; and the lack of sufficient laboratory equipment required to measure minute concentrations of regulated substances. In importing developed countries, the principal issue is consumers' concerns about the safety of food. Well publicised scares such as BSE, outbreaks of food poisoning, suspicions about the presence in foods of chemicals, of veterinary residues, and of genetically modified components, and reports about the dangers of aflatoxins and acrylamides, have all raised awareness about food safety.

There are three principal aspects about food safety and public policy in developed countries. First, the food industry is complex and this raises the issue of trace-back should a food scare occur. Second, the media has an important role to play in providing balanced reporting in order to ensure that consumers' knowledge of the hazard and the risk are kept separate and that perceptions of the risk are accurate.[1] And third, it is difficult for a public agency to know how best to respond to a failure of the system. Should it play down the risks to human health when they are small or should it be seen to be active and over-reacting to the true nature of the risks?[2]

The economic issues of interest to analysts differ between the exporting and importing countries. In the exporting countries, the analysis revolves around how best to maximise the net, domestic, economic benefits from exporting, through the choice of the way in which governments intervene domestically in order to ensure that foreign food standards are met. These foreign standards are generally those set in developed countries because nearly 80 per cent of processed food exports from developing countries go to markets in developed countries, a proportion that is higher than that for manufactured goods (65 per cent) or other primary products (68 per cent) (based on figures from WTO (2004b)).

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[1] A typical headline at the time of a food scare in the United Kingdom was "Food cancer scandal grows as shops clear more shelves" (*The Times*, 2005c).

[2] For a discussion of this issue, see Viscusi (1997) and for a more general assessment, see Pollack (1998).

In the importing countries the analysis involves how best to solve in an open economy the market failure caused by the credence nature of food safety. Any intervention must be consistent with the Articles of the SPS Agreement in the WTO. But SPS Agreement has not been a marked success in achieving its harmonisation and equivalence goals, and many countries impose standards more stringent than those set by the international organisations such as Codex, FAO and WHO. Further, these are frequently revised thereby, magnifying compliance costs for suppliers. There is a widespread perception in several developing countries that many of these standards and methods of enforcement are motivated by protectionist aims rather than the aim of food safety, and are discriminatory against exports from developing countries. Officials from developing countries complain that requests to develop equivalence agreements are often ignored and that many countries do not provide the adequate technical assistance required by the SPS Agreement on a best endeavours basis. But most developing countries have been reluctant to use the Dispute Settlement Body in the WTO even when they feel they have a strong case because of the high financial costs of such action and lack of technical and legal expertise.[3]

A considerable body of literature now exists on several dimensions of food safety and trade. This literature ranges from the theoretical (e.g., Antle (2001), Bureau *et al*. (1998), Krisshoff *et al*. (2002) and WTO (2005) to policy analysis (e.g., Athukorla and Jayasuriya (2003) and OECD (1999)) to empirical (Buzby (2003), Otsuki *et al*. (2001) and Unnevehr (2000)). However, empirical analysis of the impact of food safety standards on exporting firms in developing countries is relatively sparse. Food safety standards in developing countries typically tend to be less stringent than those in developed countries, and enforcement mechanisms are often weaker. Hence firms face different – often widely different – standards in the domestic market, and in different export markets. This influences their decisions on whether to export, and to which markets. Unless balanced by higher expected prices in export markets, an implicit home-market bias is introduced when compliance costs of higher standards are added to other trade costs. Compliance costs also vary across industries and may depend on scale of output, and on access to technology and information. These factors can have important implications for many aspects of the export industry such as firm-size and market structure with potential employment and equity implications.

The purpose in this paper is to draw on results from a recent study of processed food exporting firms in India to illustrate some of these issues and challenges facing firms in developing countries which export food products to developed countries.

[3] See Athukorala and Jayasuriya (2003) for a discussion of this issue.

2. Domestic and International Processes and Problems

India produces a wide variety of food and agricultural products, being the world's second largest food producer. Though exports have been relatively small in the past, Indian firms have begun actively to pursue export opportunities in processed food following the shift to an outward oriented development strategy since the early 1990s. Exports have been growing at around 7 per cent per annum since 1990. India's high value processed food exports are currently around $3000 million, and account for about 40 per cent of total agricultural exports, and 5 to 6 per cent of total merchandise exports. Seafood is the major processed food accounting for around per cent 40 per cent. Poultry, eggs, vegetables and other horticultural crops have also emerged as important exports in recent years. However, despite the seemingly large potential, Indian exporters face major challenges in developing exports, arising from both external and internal factors. Difficulties in meeting food quality standards in export markets are perceived to be an important factor currently constraining Indian export growth.

As is common in developing countries, there is wide gap between the food quality standards that Indian firms need to meet in domestic markets and those they have to meet in attempting to access foreign markets. In the past domestic standards for processed foods have been primarily aimed at avoiding food adulteration and the enforcement of regulations has been often weak. However, the expansion of the Indian middle class is generating both market and political pressures for higher food quality and stricter enforcement. As a consequence regulatory standards are being raised and enforcement is becoming more stringent.[4] Important regulatory changes are also facilitating changes in the Indian processed food sector, as policy reforms since the 1990s relax previous restrictions that had limited firm size, entry of foreign firms, and inter-firm links such as contract farming and vertical integration. Firms operating in this sector are responding to the challenges of meeting higher standards in foreign markets in this fluid and dynamic environment of policy and institutional change.

3. Indian Exporters of Processed Food: Survey Responses

A sample survey of 71 food processing firms in India exporting shrimp, mango pulp, poultry and mushrooms was conducted in 2004/5 (for details, see Mehta *et al*. (2005).[5] The sample was

[4] One immediate consequence is that Indian firms now face a confusing mix of laws relevant to the food processing standards with responsibility shared by six Ministries. The Ministry of Commerce has overall responsibility for the formulation of food safety measures, the Ministry of Food Processing Industries has responsibility for implementing food safety standards as defined in domestic legislation, the Agriculture Produce Export Development Authority and the Marine Product Development Authority implement policies on product standards, and the Export Inspection Council deals with SPS compliance through three types of export inspection and certification schemes.

[5] This survey is part of a broader collaborative study between the Research and Information Systems (RIS), Delhi, India, Thammasat University, Bangkok, the Division of Economics of the Research School of Asian and Pacific Studies, Australian National University and the Asian Economics Centre, University of

selected to ensure that key exporting firms were included. Analysis of the characteristics of firms showed that:

- very few firms were solely export traders – approximately half the firms were involved in both manufacturing and export, while the other half was involved in processing and exporting;
- most firms were relatively small scale (less than 200 employees) and had no foreign affiliation;
- generally, most exporting firms tended to be relatively specialised exporters: the modal firm obtained 75-100% of its sales revenue from exports; and
- on average compliance costs for FSS were around 5% of sales revenue, but for some firms was as high as 10-15%.

The export markets varied with the product. For example, shrimps were exported to a large number of countries (USA, Canada, Japan, the UK, France, Germany, Other EU, Australia and others), whereas mushrooms were exported only to the USA and Germany. Firms were asked to rank markets by the perceived 'trade restrictiveness' of food safety standards, taking into account the level and stringency of standards as well as their experience with the enforcement methods and compliance costs. The degree of such perceived trade restrictiveness of the food safety standards in the major export markets varied by market (and by commodity). For most products EU countries, Australia and USA were ranked by firms as extremely restrictive, while Canada and Japan were considered moderately restrictive. The UK was seen as moderately restrictive in some products (e.g. mushrooms) but extremely restrictive in others (e.g. poultry).

Exporting firms were aware of the need to meet standards and HACCP was used across all four commodities and was the most commonly used standard. Testing was done both inside and outside. Testing and other compliance costs – usually expenses incurred on equipment – were typically reported to be around 5 per cent of total costs, although this figure rose to 10-15 per cent in some cases. Only a few firms (e.g. less than 10 per cent in the case of shrimp exporters) indicated that they had consignments rejected in export destinations. This was probably an underestimate because firms appeared reluctant to admit to having consignments rejected. More commonly, they indicated that they would not attempt to export to markets where there was a reasonably high probability of not being able to meet standards.

The reasons for the difficulty in meeting standards ranged widely, and included 'low raw material quality and availability', high cost of laboratories, testing and certification and financial

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Melbourne, with financial support from the Australian Centre for International Agricultural Research (ACIAR). This research project investigates the impact of SPS and FSS regulations on processed food exporters from India and Thailand (see http://rspas.anu.edu.au/economics/aciar/output.php).

constraints, and issues with waste disposal facilities and antibiotics. Interestingly, firms were less concerned about tariffs and SPS regulations (generally considered to be 'moderately restrictive') than about non-tariff barriers such as product standards, import licensing requirements and 'redundant' import checks. Firms felt that importing firms are a better source of information about food safety measures in their respective countries than are government departments and industry associations in India.

About half the firms felt that they were being 'discriminated against' in at least one of these markets, though proportions varied by product and country. The reasons for this perception varied. They were generally related to a sense that inspection procedures were unduly harsh and inconsistent, and motivated by a desire to find reasons to prevent market entry.

4. Quantitative Impact on Exports

There are few reported studies of the quantitative impact of FSS on exports.[6] This is understandable given the difficulties in quantifying a range of different types of regulatory standards and restrictions. While recognising the difficulties and limitations of such exercises, it is useful to obtain at least some (admittedly crude) quantitative assessment of the impact of FSS on exports. Mehta *et al.* (2005) estimated the following gravity model to estimate the effect of FSS measures in specific importing countries on Indian firms' processed food exports.

$$\ln EXP_{ijt} = \alpha + \beta_1 \ln GDP_t + \beta_2 \ln IMP_{ijt} + \beta_3 DIS_j + \beta_4 \ln POPI_t + \beta_5 \ln POP_{jt} + \beta_6 SPS_{ijt} + \varepsilon_{ijt} \quad (1)$$

where: $\ln EXP_{ijt}$ is the log of exports of the i^{th} processed food product to the j^{th} importing country at time *t*; $\ln GDP_t$ is the log GDP of India; $\ln IMP_{ijt}$ is the log of imports of the i^{th} processed food product by the j^{th} importing country at time *t*; DIS_j is the distance between India and importing country *j*; $\ln POPI_t$ is the log of the population of India at time *t*; $\ln POP_{jt}$ is the log of the population of importing country *j* at time *t*; and SPS_{ijt} is the value of the SPS index for the i^{th} processed food product in the j^{th} importing country at time *t*; α is the intercept term; the βs are the slope parameters for the explanatory variables; and ε is the error term. This is a panel model with four products (*i*), seven importing regions (*j*) and four time periods (*t*).

The only non-standard variable in equation (1) is the SPS index. It is defined as

$$SPS_{ijt} = \left(\sum W (SPSNN_{ijt} / Codex_{i,2000}) / \sum W \right) \times 100 \quad (2)$$

where: SPS_{ijt} is the index of food safety for processed food product *i* by country *j* at time *t*; *i* represents shrimp, mango pulp, poultry and mushrooms; *j* represents the USA, Japan, Australia,

[6] See, Donovan, Caswell and Salay (2001); Otsuki, Wilson and Sewadeh (2001); Wilson, Otsuki and Majumdar,(2001)

France, Germany, the Netherlands and the UK; and *t* represents the years 2000 to 2003 inclusive. $SPSNN_{ijt}$ is the value of the parameters (M_k) of the food safety standard of the i^{th} food product in country *j* at time *t*. $Codex_{i,2000}$ is the value of the corresponding parameters contained in $SPSNN_{ijt}$ for the i^{th} product but defined by Codex in the year 2000. M_k is a vector of 62 parameters or coefficients representing standards for six groups – microbial hazards, pesticides, antibiotics, PCBs, toxic elements or chemical elements or inorganic compounds, and other parameters. For each of the four products, a weight was calculated, and within each group further weights were calculated using the number of parameters present. The ratio of the weighted actual parameters to the corresponding weighted Codex parameters gave a measure of the restrictiveness faced by each product, by destination and by time period. These calculations form the basis of equation (2). Of course, any composite index of this type is subject to serious limitations and several alternative specifications were tried to investigate the sensitivity of the results to alternative indices. The basic results remained relatively robust.

Equation (1) was estimated using three approaches – the standard regression model, the fixed effects model and the random effects model. The authors found that the standard regression model provided the best fit. Their initial principal finding was the significant and negative coefficient on the SPS variable. Having established this result, they then investigated whether this effect differed across the importing countries. They found that there were significant and negative effects for Australia, Germany, the Netherlands and the UK; that there were non-significant but negative effects for France and Japan; and non-significant but positive effect for the US.

This finding led the authors to investigate the trade effects of differing standards across countries on Indian exports by processed food product. They did so by calculating the average elasticities across the four food products for each destination. These elasticities varied by destination, ranging from –0.58 for imports by Japan to –2.78 for imports by the Netherlands. Generally, it was found that, in absolute value, the elasticities were larger for Australia, the Netherlands, Germany and the US and lower for France and Japan. The differences in these elasticities suggest that the food safety standards of the seven importing countries vary with respect to their 'trade restrictiveness'. If the standards were identical, the true parameter values of the elasticities would be identical but in this sample of countries they were not. The implication is that additional costs are incurred by firms exporting to these countries because of the variation in their standards.

The authors estimated the export loss for Indian firms by food product and destination. The distribution of lost export sales was such that the UK accounted for the highest losses at 33 per cent and the US the least at 1 per cent (calculated from Mehta *et al*. (2005, Table 6.20)). They

concluded that India had lost 18 per cent of her export sales because of the dispersion of food safety standards across the seven countries when compared with the exports that would have been achieved had these countries adhered instead to the corresponding Codex standards. While these figures should be used at best only as indicative of rough orders of magnitude, given the limitations of the SPS index and other measures, nevertheless they are important in that they highlight the potentially significant export losses due to SPS regulations and their dispersion across countries.

5. Conclusions

The desire of developed countries to have high food safety standards, and differing country-specific standards, appear to have a deleterious effect on exports from developing countries. In itself this does not imply that such standards cannot be justified on grounds of consumer safety or that they are WTO-illegal. However, they do highlight the cost imposed on developing countries by such standards and the need to ensure that such regulatory barriers are not misused to achieve protectionist objectives.

Compliance with new and more stringent standards is costly, and typically requires investments in costly equipment; this imparts an undesirable capital-bias into the food processing export sectors of developing countries. The survey data also reveal that compliance costs are a greater burden on smaller firms, and firms have an incentive to source raw materials from larger suppliers than small producers. In some cases, but certainly not in all cases, government action may be able to provide adequate facilities for testing and monitoring. Developing countries lacking large financial resources and legal and technical expertise find it difficult to use the WTO Dispute Settlement mechanisms even when faced with a *prima facie* case of violation of the SPS Agreement.

But in any case, firms in developing countries certainly need to develop independent strategies to cope with the challenge of ever more stringent and changing FSS in developed country markets. Thus standards are changing not only at the entry point into these markets (at the border through government mandated SPS standards) but perhaps even more importantly, among consumers, and among retail chains ('Super Market' chains) which both respond to (and sometimes fashion) consumer preferences. The implications for developing country exporters is clear: the consumers and importing firms in developed country markets will demand increasingly more stringent quality standards, irrespective of what governments do. Further, the importers, unconstrained by any WTO Agreements as to what standards they can demand from their suppliers, are free to ask for standards that best meet their market objectives. Thus, even if governments refrain from raising the SPS bar higher at the border – thus allowing market entry –

it will be those firms that can best meet desired market demand which will penetrate the markets and expand market shares.

In responding to these challenges, developing country exporters can draw important lessons from the relatively successful processed food exporting countries such as Thailand. In Thailand, as shown by Nidhiprabha and Chutisiriwong (2005), firms have evolved strategies tailored to the particular circumstances of different industries in order to cope with these challenges. Links with foreign firms (often based in importing developed countries) assist exporters by facilitating information and technology transfers as well as acting as important lobby groups against protectionist interests within the importing country. The analyses of the Indian survey data has also revealed that firms with foreign affiliation tend to display a relatively better performance than their counterparts without foreign affiliation.[7] Hence a good case can be made for the proposition that involvement of foreign firms in the export-oriented food sector is an effective way to redress some of the SPS-related impediments to the food trade. Vertical integration may help to achieve quality standards efficiently in industries where monitoring of raw material quality and processing is difficult. In some cases contract farming may offer a solution.

In the long run the trend towards higher food safety standards will be beneficial to both developing and developed countries only if mechanisms are developed to ensure that international trade in processed food is regulated appropriately to meet genuine food safety concerns but is not constrained on spurious grounds.

[7] Because of the relatively small number of firms with such foreign affiliation in the sample (only 8 out of 71), this finding must be treated as tentative at this stage.

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