

# **What do Border Rejections tell us about Trade Standards Compliance of Developing Countries?**

## **Analysis of EU and US Data 2002-2008**

UNIDO Working Paper



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## Analysis of EU and US Data 2002-2008

### UNIDO Working Paper

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## Acronyms

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APHIS	Animal and Plant Health and Inspection Service (US)
DG SANCO	Directorate General for Health and Consumers (EC)
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organization
FDA	Food and Drugs Administration (US)
FD&C	Federal Food, Drug and Cosmetic Act (US)
FSIS	Food Safety Inspection Service
GAO	Government Accountability Office (US)
HACCP	Hazard analysis and critical control point
IDS	Institute of Development Studies
IPPC	International Plant Protection Convention
OASIS	Operational and Administrative System for Import Support (US FDA system)
OECD	Organisation for Economic Co-operation and Development
OIE	World Organization for Animal Health
PRA	Pest Risk Assessment
RASFF	Rapid Alert System for Food and Feed (EU)
RRRI	Relative Rejection Rate Indicator
SPS	Sanitary and phytosanitary measures
UNIDO	United Nations Industrial Development Organization
USDA	US Department of Agriculture

## Executive Summary

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UNIDO and IDS launched in 2010 the *Trade Standards Compliance Report* (TSCR), a cooperation to provide developing countries, technical assistance agencies and donors with a policy making support tool. The TSCR enables them to make better informed decisions on where to concentrate their development efforts in the area of trade-related capacity-building, in particular with respect to the compliance with trade standards. A core element of the related research is the analysis of major international markets' border rejections of agri-food products originating from developing countries. The TSCR further estimates related export losses and provides indications where technical assistance is best allocated.

The analysis of border rejections was undertaken for the US and EU markets based on unprecedented access to data granted by the US Food and Drug Administration (FDA) and the European Commission Directorate General for Health and Consumers (DG SANCO). The wealth of innovative analysis and interesting findings, including for specific commodity groups (i.e. fish and fishery products, fruit and vegetables, nuts and seeds, as well as herbs and spices) and across both markets, however, went beyond the scope of the TSCR. UNIDO and IDS therefore decided to separately publish the present working paper to make the full analysis available.

Examining EU and US border rejection data indeed generates a rich set of findings and insights. Most importantly, patterns and trends in border rejections clearly point to the sectors and products where the real compliance challenges lie for developing countries. They also reveal the reasons for missed trade opportunities for developing countries when exporting their products to either the EU or the US or even to both markets.

The paper finds that there are significant differences in the patterns of rejections between the EU and the US, reflecting both patterns of trade and distinct food safety and other requirements as well as associated systems of enforcement. While EU rejections have been dominated by products that contravene restrictions on levels of mycotoxins, in the US non-compliance with labelling and company/process registration requirements has been the prevalent cause of rejections.

The analysis also reveals that the vast majority of border rejections, both of all agri-food products and of particular commodities, are accounted for by a relatively small number of countries. Some countries have high rates of rejection in both the EU and US, and for all or most of the commodities they export, suggesting systemic weaknesses in compliance capacities. This is true, for instance, for India and China. Other countries face significant border rejection rates for exports to particular markets and/or for particular commodities only, suggesting weaknesses in certain value chains or with specific food safety controls. Examples include exports to the EU of nuts from Iran and fish and fishery products from China and Thailand. There are, however, also a number of countries that have had a good compliance performance in both the EU and the US and across most (if not all) of the agri-food commodities they export. Among them are many of the major exporters of agri-food products like Chile, Argentina, Ecuador and South Africa.

While the crude numbers of border rejections are perhaps most headline-grabbing, it is more informative to examine and consider how rates of rejections vary across countries and commodities and over time for particular countries. On the one hand, such patterns and trends serve to highlight where particular countries perform relatively well or badly, compared to competitors and peer groups, in their degree of compliance with regulatory requirements in export markets. This Working Paper presents a summary measure of relative rates of border rejections, the Relative Rejection Rate Indicator (RRRI), which facilitates such comparisons. On the other hand, the rejection analysis undertaken in this paper also gives an indication of how compliance challenges change over time, perhaps as investments are made in particular areas of capacity and/or in response to particular compliance problems.

Overall, border rejections provide a useful rough indicator of key trade standards compliance challenges in the developing world. Future work will aim both to validate the patterns and trends revealed by the rejection data and to explain these patterns and trends. A particular focus of this work will be on relating rejections to the status of compliance capacity of exporting countries. It is envisaged that this further analysis, with in-depth case studies, will allow for compliance performance to be benchmarked across developing countries, thus providing the basis for informed policy decision-making on capacity-building investment at both supply-side and quality infrastructure levels.



# What do Border Rejections tell us about Trade Standards Compliance of Developing Countries?

## Analysis of EU and US Data 2002-2008

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### 1. Introduction

Concerns about the challenges that developing countries face in complying with food safety, quality and other requirements in industrialised country markets, whether laid down by technical regulations or by standards, are well documented (see, for example, World Bank, 2005; Caswell and Bach, 2007). While there is a growing body of evidence that supports such concerns, predominantly this comes from a relatively disparate collection of case studies and econometric analyses. Indeed, existing empirical studies largely fail to provide a consistent basis on which to compare the nature and level of compliance challenges across countries and/or to monitor changes in the compliance challenges faced by particular countries over time. Their utility is to provide evidence that problems exist rather than to guide the setting of priorities for trade capacity-building and/or to support impact assessment of capacity-building investments, which require more broad-based indicators of trade-related compliance performance.

In the search for a consistent set of data to explore patterns of compliance across developing countries and/or trends in compliance by particular countries over time, considerable attention has been given to border rejections of agri-food products in major industrialised country markets (for an example of an application see Ababouch *et al.*, 2005). Given that these records relate to specific and actual instances of non-conformity that result in a consignment being refused entry, intuitively they can be used to identify specific areas where developing countries face problems across export markets, products and areas of compliance. Some analysts have gone further and inferred the value of rejected consignments (see, for example, Jaffee and Henson, 2004; Diaz Rios and Jaffee, 2008). In interpreting these data, however, attention needs to be given to the underlying systems of border inspection and the instances of non-compliance that the data include/exclude. It is all too easy to over-interpret the data.

This report presents a comprehensive analysis of border rejection data for the European Union (EU) and United States (US). This analysis aims to:

- ◆ Derive and assess alternative measures of non-compliance from border rejection data;
- ◆ Identify broad patterns in border rejections across developing countries, food product exports and areas of non-compliance;
- ◆ Identify trends in the compliance performance of developing countries, including broad groups of countries by income and individual countries, over time.

While the analysis has value in and of itself, a more general and important objective is to explore the utility of border rejection data for assessing compliance performance in agri-food product trade and to provide themes that require further analysis.

## 2. Indicators of compliance-related trade problems

In identifying the compliance challenges faced by developing countries in international trade, the challenge is to relate specific weaknesses in compliance capacity to the ability to meet food safety, quality and other requirements in export markets. In practice, we rarely have a complete data set to accomplish this task; for example, assessments of compliance capacity are often undertaken in isolation from analyses of specific trade problems and/or longer-term trends in export flows. As a result, we are almost inevitably forced to ‘piece together’ sometimes disparate evidence and infer inter-relationships that may be somewhat tenuous. That having been said, there is a growing body of data that can conceivably be used to throw some light on the status of compliance capacity in developing countries and the consequences for export performance, if used with care.

**Figure 1. Categories of indicators of SPS capacity building needs**

Type of Assessment	Examples of Indicators
Capacity-based	Benchmarking <i>Ad hoc</i> capacity assessments
Compliance-based	Inspection reports Approved import lists
Trade-based	Import rejections Trade flow trends and disruptions Administrative actions in import markets Reports of trade problems from exporters Exporter and/or importer interviews and surveys <i>Ad hoc</i> problem reports/questionnaires

Henson and Masakure (2009) distinguish between three broad indicators of trade-related compliance performance for agri-food products (Figure 1). Although this taxonomy is defined with sanitary and phytosanitary (SPS) measures as its main focus, it can quite easily be extended to compliance issues more generally, for example those relating to labelling requirements and/or social and environmental standards:

- ◆ *Capacity-based indicators* focus directly on weaknesses in SPS controls, either in the broad areas of food safety, animal health and plant health, or with respect to particular SPS control functions, for example laboratory capacity. Standard capacity assessment instruments have been developed by FAO (FAO, 2006), OIE (OIE, 2008) and the IPPC (FAO, 2005) for this purpose that effectively benchmark national capacity to international norms. This group of indicators does not, however, explicitly relate weaknesses in compliance capacity to trade problems and/or export performance.
- ◆ *Compliance-based indicators* focus on evidence of non-compliance with SPS requirements in export and/or domestic markets. Examples include inspection reports, such as those undertaken to assess the efficacy of veterinary controls in developing countries by the European Commission, and official lists of approved countries and/or exporters maintained by importing countries, such as those maintained by the US Animal and Plant Health and Inspection Service (APHIS) for imports of animal and plant products.

Typically, these indicators are based on a relatively objective assessment of capacity, for example in the form of an audit schedule or pest risk assessment (PRA). The focus of such indicators is on system compliance, whether through the value chain for particular products or official systems of SPS control.

- ◆ *Trade-based indicators* provide *ex post* evidence that trade is impeded due to non-compliance with export market SPS requirements. The focus of such indicators is on the compliance of products. Examples include data on import rejections (for example as is available for the EU and the US), analysis of trade flows, administrative actions in importing countries (for example bans), reports from exporters of import problems, etc. A key challenge with some of these indicators, however, is isolating the impact of SPS compliance issues from other trade impediments.

In principle, many of the compliance- and trade-based indicators in Figure 1 are available for developing countries that already engage in trade with major industrialised countries. However, these data are not always publicly available and even when they are accessible there has been only limited systematic analysis across countries and/or time. While capacity-based indicators exist for many developing countries, predominantly these remain *ad hoc* and, at least until recently, have employed inconsistent methods. The initiatives of FAO, OIE and IPPC in establishing a common framework for such assessments is a major improvement in this regard.

Both the compliance and trade-based indicators in Figure 1 are generally absent for countries that do not have established exports of a particular commodity but may have aspirations to commence export. Thus, for example, rejection data is only created when a product consignment is exported and fails an instance of border inspection. While capacity-based indicators may be available for such cases, it can be difficult to relate these to potential export performance; latent exports can be constrained by a multitude of factors, including weaknesses in transport infrastructure, production inefficiencies and lack of SPS capacity. Thus, care must be taken not to over-attribute latent exports to SPS issues.

Looking across the possible indicators of trade-related compliance performance in Figure 1, rejection data are evidently the most comprehensive of those available at the current time. These data are captured and assembled on a systematic basis by most industrialised countries and are available at a relatively disaggregated level across agri-food products and time. Subject to the limitations and provisos detailed in Section 3 below, these data permit patterns and trends in compliance-related trade problems to be identified across countries and products and through time. Thus, for example, rejection data have been employed in a number of previous studies of food safety compliance in international trade (Allshouse *et al.*, 2003; Ababouch *et al.*, 2005; Buzby *et al.*, 2008; Buzby and Regmi, 2009; Jaud *et al.*, 2009). The analysis presented below uses rejection data for both the EU and the US. In so doing, it aims to establish a series of measures that can be used to monitor the trade-related compliance performance of developing countries over time, both in aggregate and for exports of particular agri-food products, and across export markets.



### 3. Measures of border rejections in the EU and the US

Both the EU and the US have systems for collecting and collating data on rejections of imports of agricultural and food products. Both systems provide data on import consignments that are refused entry because they are judged not to conform to regulatory requirements. A record is provided for each consignment that details the commodity, port of entry where the inspection was undertaken, country of origin, reason for the rejection and date of rejection. Various other data may be recorded, including the name and/or address of the exporter and the volume of the consignment, although these are often not made publicly available for reasons of confidentiality.

The EU's Rapid Alert System for Food and Feed (RASFF) provides a platform for the exchange of information between Member States on measures taken in response to food and feed products that pose an immediate risk to human health, both in the EU internal market and with respect to imports from Third Countries. All EU Member States plus Norway, Liechtenstein and Iceland are members of the RASFF. Members are required to make a notification through the RASFF of:

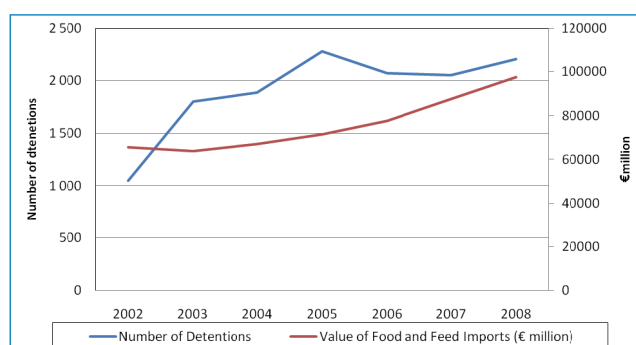
- ◆ Immediate measures aimed at preventing products being placed on the market, forcing the withdrawal of products from the market or the recall of products in order to protect human health;
- ◆ Recommendations or agreements with suppliers of products, whether voluntary or obligatory, laying down conditions on the placing on the market or the use of products that pose a serious risk to human health;
- ◆ Border rejections of product consignments that pose a direct or indirect risk to human health.

The first two of these scenarios relate to so-called 'market notifications': products on the EU's internal market that are found to pose an immediate risk to human health. The third scenario relates to products that are the subject of a border rejection and never enter the EU, but rather are sent back to the country of origin, destroyed or diverted to another destination.

In the analysis below, the major focus is on border rejections since this is the main mechanism through which controls are exerted on imports of food and feed products from Third Countries. However, included in the data are a relatively small number of market notifications. In principle, these instances could be removed from the data so that the focus is entirely on border rejections. In so doing, however, information would be lost on cases of non-compliance. The reference below to 'border rejections' therefore encompasses all forms of notifications to which food and feed imports from Third Countries are subject over the period 2002 to 2008.

In recent years, EU border rejections of food and feed products have increased appreciably, predominantly reflecting growth in the rate of rejections rather than growth in the volume of food and feed imports. Thus, over the period 2002 to 2008, whilst the number of notifications increased by 110 per cent (Figure 2) the volume of food and feed imports expanded by only 49

**Figure 2. Trend in value of EU imports and number of rejections of food and feed products from Third Countries, 2002-2008**



per cent. Predominantly, this reflects an appreciable increase in the number of rejections over the period to 2005, since when the numbers have stabilised. On the basis of the information available, it is not possible to say whether this trend reflects higher rates of border inspection (as no data are available on this) and/or lower rates of compliance.

Table 1 details the number of EU rejections of food and feed product imports by commodity and origin. Over the period 2002 to 2008, nuts, nut products and seeds, fish and fishery products, fruit and vegetables and herbs and spices accounted for 74 per cent of the total rejections, with nuts, nut products and seeds alone accounting for 35 per cent. There were notable trends in the number of notifications over this period, for example increased rejections of nuts, nut products and seeds and food contact materials, and reduced rejections of fish and fishery products, some of which are discussed below.<sup>2</sup>

Of the total rejections of food and feed product imports to the EU over the period 2002 to 2008, lower middle-income and upper middle-income countries accounted for 54 per cent and 27 per cent, respectively. Developing countries as a whole accounted for 89 per cent of rejections. Over this same period, upper middle-income countries accounted for 41 per cent of food and feed imports and lower middle-income countries for 25 per cent. Developing countries as a whole accounted for 72 per cent of food and feed imports. The fact that lower middle-income countries accounted for a significantly greater proportion of rejections than of food and feed imports provides an initial indication that these countries have faced considerable challenges in complying with EU food safety requirements relative to other country income groups. In contrast, upper middle-income countries recorded rejections that were low relative to the level of food and feed imports, suggesting relatively good compliance performance.

The US Food and Drugs Administration (FDA) is responsible for controls on imports of pharmaceuticals, medical devices, cosmetics and food products, with the exception of meat and poultry and meat and poultry products.<sup>3</sup> Data on border rejection

<sup>1</sup> See Regulation (EC) No. 178/2002.

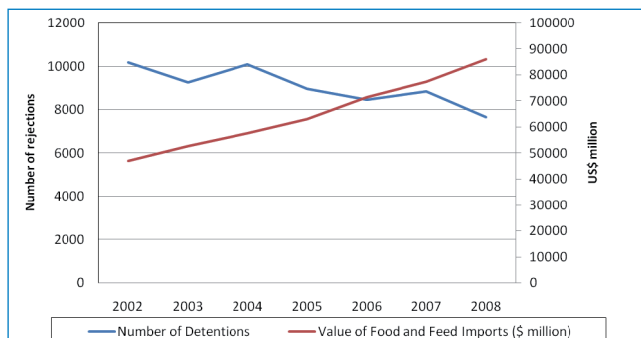
<sup>2</sup> Note that data for commodities with low rates of rejection should be treated with caution. They generally reflect limited and often sporadic incidences of non-conformity within the context of a large overall number of inspections and rejections.

<sup>3</sup> Regulation of meat and poultry and meat and poultry products is the responsibility of the Food Safety Inspection Service (FSIS) of the US Department of Agriculture (USDA).

**Table 1. Number of EU rejections of food and feed products from Third Countries by product, 2002-2008**

Product	Year							Total
	2002	2003	2004	2005	2006	2007	2008	
Nuts and seeds	244	731	777	858	707	619	744	4,680
Fish and fishery products	396	483	372	417	380	344	288	2,680
Fruits and vegetables	110	166	175	244	258	313	353	1,619
Herbs and spices	26	85	159	230	129	113	88	830
Food contact materials	2	12	28	116	109	151	165	583
Cereals and bakery products	3	13	12	27	140	76	114	385
Poultry meat and poultry meat products	112	73	61	39	7	14	22	328
Meat and meat products	37	75	60	71	28	29	20	320
Confectionery	2	19	28	30	34	47	79	239
Dietetic foods, food supplements, fortified foods	8	9	11	24	52	88	41	233
Honey and royal jelly	41	24	18	38	23	24	30	198
Fats and oils	3	2	76	57	8	22	19	187
Soups, broths and sauces	13	31	39	23	30	22	17	175
Feed for food-producing animals	1	0	0	0	12	70	64	147
Non-alcoholic beverages	3	24	15	14	22	33	28	139
Animal nutrition	21	16	11	36	39	0	0	123
Cocoa and cocoa preparations, coffee and tea	15	7	14	8	26	14	29	113
Pet food	0	0	0	0	16	34	47	97
Prepared dishes and snacks	3	5	11	17	14	6	9	65
Other food products/ mixed foods	1	5	4	8	11	9	10	48
Milk and milk products	4	2	8	7	3	4	10	38
Food additives	2	2	0	1	2	6	6	19
Egg and egg products	0	13	1	0	0	1	3	18
Water for human consumption (other than natural mineral water)	0	0	0	5	5	4	4	18
Natural mineral water	1	0	0	4	4	3	5	17
Alcoholic beverages (other than wine)	1	2	1	2	2	2	1	11
Wine	0	0	3	1	4	2	0	10
Feed additives	0	0	0	0	4	2	3	9
Ices and desserts	0	0	1	0	1	0	4	6
<b>Total</b>	<b>1,049</b>	<b>1,799</b>	<b>1,885</b>	<b>2,277</b>	<b>2,070</b>	<b>2,052</b>	<b>2,203</b>	<b>13,335</b>

**Figure 3. Trend in value of US imports and number of rejections of food products, 2002-2008**



Note: Excludes meat and poultry and meat and poultry products.

tions are available through the Operational and Administrative System for Import Support (OASIS), an automated FDA system for processing and making admissibility determinations for shipments of imported products that come under the jurisdiction of the FDA. Prior to 1998, records were kept of all import consignments subject to rejection regardless of whether these were eventually permitted to enter the US. Since that time, only consignments actually refused entry have been recorded, making the data more directly comparable to those of the RASFF (although see below for certain incompatibilities between the OASIS and RASFF data). The basis on which imports are regulated is the Federal Food, Drug and Cosmetic (FD&C) Act that lays down requirements not only for product safety but also for labelling and quality, at least as these relate to adulteration.

Over the period 2002 to 2008, the number of rejections of food products by the FDA declined 17 per cent (Figure 3), while imports increased 63 per cent. This is in stark contrast to the trend in the number of rejections recorded in the EU, as discussed above. Whilst it is not possible to discern whether this reflects changes in the rate of inspection and/or the rate of non-compliance, it should be noted that the US Government Accountability Office (GAO) has raised concerns that, whilst the regulatory responsibilities of the FDA in the area of food safety have increased appreciably over time, its funding and staffing have not expanded commensurately (GAO, 2008). Specifically on seafood imports, the GAO has raised concerns about limitations in inspection resources (GAO, 2004). This suggests that rates of border inspection through the 2000s are unlikely to have kept up with the growth in food imports.

Of the total rejections of food products under the FDA's jurisdiction from 2002 to 2008, fruits, vegetables and fruit and vegetable products and fishery/seafood products accounted for 51 per cent (Table 2). However, rejections of these products declined rapidly over this period, accounting for 53 per cent of rejections in 2002 but only 38 per cent in 2008. At the same time, rejections of spices, flavours and salts increased appreciably, from four per cent of rejections in 2002 to 11 per cent in 2008. Significant increases in rejections were also recorded for chocolate and cocoa products. Note that nuts and edible seeds, the commodity subject to the highest rate of EU border rejections over the period 2002 to 2008, accounted for less than two per cent of US rejections.

Over the period 2002 to 2008, lower middle-income countries accounted for 33 per cent of rejections but only 21 per cent of imports. As with the EU, this presents an initial indication of high rates of non-compliance relative to other country income groups. Upper middle-income countries accounted for around 31 per cent of US border rejections over the period 2002 to 2008, in line with their share of food imports.

In using rejection data, the intention is to throw some light on the compliance performance of developing countries, individually and as income sub-groupings. It is necessary from the outset, however, to reflect on how reliable rejection data is for this purpose and, perhaps more importantly, how patterns and trends in rejections should be interpreted. Broadly, EU and US rejection data should be recognised as an imperfect indicator of the compliance problems faced by developing countries, whilst at the same time representing the best data currently available.<sup>4</sup>

First, it is important to recognise that rejection data tells us nothing about the state of capacity in countries that do not export. These countries may have very weak compliance capacity (and perhaps this is the reason they do not export), or, alternatively, very good compliance capacity while not exporting for other reasons (for example, lack of productive capacity and/or high transport costs). Zero exports could also result from prohibitions on exports due to persistent non-compliance and/or non-approval of food safety control systems in the exporting country.

Second, border inspections cover a small fraction of total food

imports.<sup>5</sup> Further, the RASFF and OASIS data do not record the number of consignments offered for inspection or the number of inspections undertaken. Thus, it is not possible to estimate the share of consignments from any one country or over time that is in non-compliance.

Third, the rate of rejection will reflect the exporting country's compliance capacity relative to the importing market's official requirements, which is of interest here. However it will also be influenced by the efforts and attentions of border officials in the importing country, which may vary in a non-random manner across time, products, exporting firms and/or country of origin according to historical rejection rates, administrative priorities in the importing country, etc. Thus, conceivably, enhancements in compliance performance could be accompanied by (but not related to) increases in levels of rejections.

While the crude rejection data reported above provides a broad picture of patterns and trends across products, exporting countries and destination markets, these data also reflect changes in the volumes of exports over time. Thus, in the analysis below, three measures are presented that aim to provide a more complete picture of patterns and trends in rates of non-conformity:

1. **Aggregate number of rejections:** The simple sum of the annual number of rejections over the period 2002 to 2008. Increases in the number of rejections can reflect both increases in the volume of exports and in the rate of non-compliance.
2. **Unit rejection rate:** The number of rejections per US\$1 million of exports over the period 2002 to 2008. This measure takes account of changes in the volume of exports such that it provides a direct measure of the rate of non-compliance. It is presented as a series of three-year moving averages to smooth out often appreciable year-on-year variations.
3. **Relative rejection rate:** The ratio of country share of total rejections to share of total imports for the entire period 2002 to 2008. This provides a convenient measure of the performance of countries relative to one another over the longer term. Thus, a country whose share of rejections is less/more than its share of imports is defined as a relatively good/bad performer in terms of rates of non-conformity. These data can be presented graphically (using a logarithmic scale) or presented numerically.

The fact that rejection data for both the EU and the US are available potentially permits comparison of compliance performance at the country and products levels. However, strictly speaking, the RASFF and OASIS data are not directly comparable in that their coverage is somewhat different across products and the basis on which non-compliance is assessed, notably:

- ◆ The RASFF data provide information on rejections of all food and feed products, while the OASIS data exclude meat and poultry and meat and poultry products. This is not considered a particularly significant issue since rejections of meat and poultry and meat and poultry products only account for five per cent of EU rejections. Further, exports of these

<sup>4</sup> As recognised by Buzby *et al.* (2008) in their analysis of US border rejections over the period 1998 to 2004.

<sup>5</sup> It is estimated that only about one per cent of US food imports were subject to FDA inspection in the 2000 financial year (GAO, 2001).

**Table 2. Number of US rejections of food products by product, 2002-2008**

Product	Year							Total
	2002	2003	2004	2005	2006	2007	2008	
Fruits and vegetables	3,182	2,800	3,397	3,074	2,660	2,721	1,624	19,458
Fish and fishery products	2,205	2,062	2,196	1,860	1,606	1,731	1,290	12,950
Confectionery without chocolate/chewing gum	592	580	499	678	717	596	633	4,295
Spices, flavours and salts	409	381	443	398	490	632	844	3,597
Bakery products/dough/mix/icing	445	402	592	610	495	486	481	3,511
Multi-food dinner/gravy/sauce	414	436	347	300	299	350	428	2,574
Soft drink/water	293	369	315	273	287	334	388	2,259
Cheese/cheese products	350	379	492	244	195	248	201	2,109
Chocolate/cocoa products	202	148	148	153	154	217	545	1,567
Snack food items	123	97	227	191	271	178	190	1,277
Macaroni/noodle products	413	229	129	96	107	86	118	1,178
Dressings/condiments	137	141	125	142	147	246	165	1,103
Milk/butter/dried milk products	254	252	182	115	91	124	77	1,095
Nuts/edible seed	136	158	168	146	204	158	73	1,043
Whole grain/milled grain products/starch	178	86	109	108	151	157	100	889
Beverage bases/concentrates/nectar	115	121	113	119	101	89	55	713
Coffee/tea	98	50	75	76	81	82	111	573
Soup	189	105	75	42	67	43	51	572
Food sweeteners	74	78	63	49	79	73	70	486
Dietary convenience foods/ meal replacements	39	84	59	56	54	46	37	375
Gelatin/rennet/pudding mix/pie filling	99	38	32	50	44	30	56	349
Vegetable oils	43	44	49	42	39	43	26	286
Cereal preparations/breakfast food	32	41	36	28	30	20	17	204
Food additives (human use)	26	51	18	25	25	18	21	184
Baby food products	35	16	33	26	14	24	10	158
Ice cream products	14	34	10	11	14	23	15	121
Colour additive food/drug/cosmetic	10	16	8	4	13	55	10	116
Alcoholic beverages	7	7	63	7	4	19	4	111
Meat, meat products and poultry	21	17	27	15	18	8	4	110
Vegetable protein products	28	4	4	10	4	18	4	72
Filled milk/milk products	8	16	11	2	9	2	9	57
Egg/egg products	2	8	24	2	3	0	9	48
Prepared salad products	4	3	9	9	4	1	3	33
<b>Total</b>	<b>10,177</b>	<b>9,253</b>	<b>10,078</b>	<b>8,961</b>	<b>8,477</b>	<b>8,858</b>	<b>7,669</b>	<b>63,473</b>

products are insignificant for all but a very small number of developing countries.

- ◆ The RASFF data provides data on border rejections that are related predominantly to non-compliance with food safety requirements. Conversely, the OASIS data includes rejections due to non-compliance with a range of quality and labelling requirements.
- ◆ In most cases, the RASFF data record a single reason for the rejection of a particular product consignment, whereas multiple reasons are typically recorded in the OASIS data. Either the OASIS data provide a more complete record of the ar-

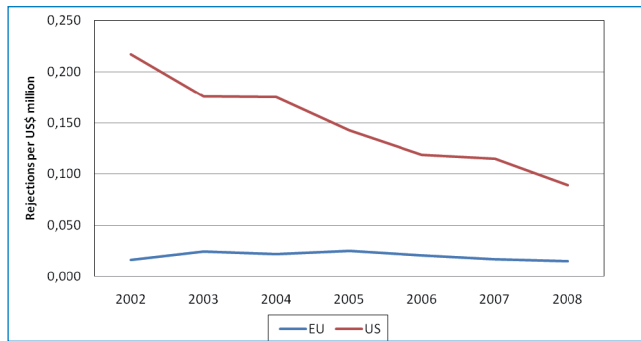
reas in which a particular consignment is in non-conformity, or the definitions of non-conformity are more specific than those of the RASFF.

- ◆ The ways in which commodities are categorised differ between the RASFF and OASIS data. In some cases, however, it is possible to rearrange the data to define broadly comparable commodity groupings and this has been undertaken for the four commodity groups analysed in detail below.
- ◆ The RASFF data include some limited instances of market notifications as well as border rejections. The OASIS data, however, are restricted to border rejections.

**Table 3. Five and ten country concentration ratios for EU and US rejections by product**

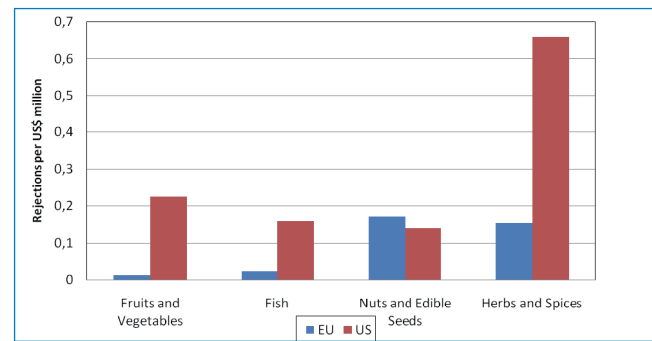
Recipient	Concentration Ratio	Total Food	Fruits and Vegetables	Fish	Nuts and Edible Seeds	Herbs and Spices
EU	CR <sub>5</sub>	51.2	67.5	46.9	78.4	61.0
	CR <sub>10</sub>	69.6	75.9	63.3	90.3	78.8
US	CR <sub>5</sub>	42.8	56.5	46.4	58.1	68.2
	CR <sub>10</sub>	60.3	67.7	66.1	72.5	78.8

**Figure 4. Trend in unit rejection rate for food imports to the EU and the US, 2002-2008**



Note: EU rejection rate converted to US\$ at respective average annual exchange rate.

**Figure 5. Unit rejection rate for selected food commodity imports to the EU and the US, 2002-2008**



Note: EU rejection rate converted at current exchange rate.

While recognising the distinct features of the RASFF and OASIS data, it is possible to discern distinct features of rates of rejection in the EU and the US which need to be recognised in interpreting patterns at the more disaggregated level. First, the overall unit rejection rate, the number of rejections per US\$1 million of imports, was consistently greater in the US than the EU over the period 2002 to 2008 (Figure 4). While the US unit rejection rate declined from 2002 to 2008, from 0.217 to 0.089, it remained five times greater than the EU unit rejection rate in 2008 of 0.015 detentions per US\$1 million of agri-food imports. Second, the unit rejection rate varied significantly across food commodity groups (Figure 5).<sup>6</sup> In the EU, the highest unit rejection rate was for nuts and seeds and herbs and spices, with much lower rates for fruits and vegetables and fish and fishery products. For all commodities, with the one exception of nuts and edible seeds, the unit rejection rate was appreciably higher in the US. By far, herbs and spices had the highest unit rejection rate in the US, whilst nuts and edible seeds had the lowest rate.

In both the EU and the US, a relatively small number of countries accounted for the majority of border rejections over the period 2002 to 2008, both in aggregate and for particular food commodities. Table 3 presents five (CR<sub>5</sub>) and ten (CR<sub>10</sub>) country concentration ratios for the aggregate number of rejections over this period.<sup>7</sup> For example, ten countries accounted for 69 per cent of the total rejections of EU food and feed product imports, and 60 per cent of US rejections. In the case of nuts and edible

seeds, five countries accounted for 78 per cent and 58 per cent of rejections in the EU and the US, respectively. Across all commodities, with the exception of fish and fishery products, five countries accounted for over half of EU or US rejections.

Before proceeding to the more disaggregated analysis, it is important to provide further words of caution about the interpretation of the rejection data, notably as a measure of rates of non-conformity with food safety and other requirements in the EU and the US. At best, rates of rejection provide a crude and partial picture of the compliance difficulties faced by developing countries with agri-food product exports. While the patterns and trends discussed below provide a broad picture of where problems exist and how the scale of problems differs across countries and changes over time, in terms of compliance challenges they evidently represent the 'tip of the iceberg'. Thus, the data in effect provide observations of specific instances where an exporter attempts to gain access to EU or US markets and where these fail due to non-conformity with official requirements that are enforced through border inspection. The data tell us nothing, for example, about exporters that choose not to export because of real or perceived weaknesses in compliance capacity. At the same time, care must be taken not to over-interpret the data. The focus should be on broader patterns and trends rather than the very wide scatter of small numbers of rejections which arguably provide 'noise' rather than indicate concrete compliance concerns.

<sup>6</sup> Here the focus is on four commodity groups that account for a substantive proportion of developing country agri-food exports to the EU and the US, namely: 1) fish and fishery products; 2) fruits and vegetables; 3) nuts and edible seeds; and 4) herbs and spices.

<sup>7</sup> The concentration ratio shows the proportion of rejections accounted for by the five or ten countries with the largest number of rejections.



## 4. Analysis of total rejections

To provide a broad picture of compliance challenges with agri-food exports to the EU and the US, we first focus on total rejections over the period 2002 to 2008. As noted above, these data reflect both the volume of exports from particular countries to the EU/US and the rate of non-compliance. In turn the rate of non-compliance can reflect such factors as the state of compliance capacity in the exporting country, the products exported (for example whether they are high or low risk with respect to food safety) and the regulatory regime in place for these products in the importing country.

In both the EU and the US, a relatively small number of countries accounted for the majority of rejections (Tables 4 and 5). China and India had high levels of rejections in both the EU and the US. Other countries, for example Iran, Turkey and the Dominican Republic, had a large number of rejections in either the EU or US, but not both. It is notable that some industrialised countries also had large numbers of rejections. Thus, the US was in the top five countries by number of rejections in the EU, and the UK and Canada were amongst the six countries with the greatest number of rejections in the US.

Tables 6 and 7 present the unit rejection rates of the largest exporters of agri-food products to the EU and the US, in declining order by value of exports over the period 2002 to 2008. The average across all countries is also presented. In calculating the average throughout this report, only countries with annual exports of US\$1 million or more are included. Scanning the data, it is apparent that numerous very small exporters have incidents of single rejections. Because the exports of these countries are so low, the associated unit rejection rates are often extremely high and tend to distort the data.<sup>8</sup>

In the case of the EU, major agri-food exporters with relatively high unit rejection rates over the period 2006 to 2008 included Iran, Turkey, China, Nigeria, Egypt, India, Thailand, the Philippines, Vietnam and Ghana. Most of these countries had high rejection rates throughout the period 2002 to 2008, suggesting longer-term problems with non-compliance. Notable exceptions, that recorded an appreciable decline in the unit rejection rate over time, included Iran, Vietnam and Thailand. Large exporters with low unit rejection rates included Brazil, Argentina, South Africa and Chile.

Of the largest agri-food exporters to the US, the Dominican Republic recorded the highest unit rejection rate by far throughout the period 2002 to 2008. Other countries with high unit rejection rates included South Korea, India, Taiwan, Japan, United Kingdom, Vietnam, Honduras and the Philippines. Whilst China's unit rejection rate exceeded the all-country average, it performed better than a number of other large agri-food exporters. Developing countries with low unit rejection rates included Chile, Brazil, Colombia, Argentina, Peru and Cote d'Ivoire.

Tables 8 and 9 present unit rejection rates for the EU and the US by income country groups. In the case of the EU, lower middle-income (especially) and low-income countries had the highest

unit rejection rates throughout the period 2002 to 2008. Upper middle-income countries, however, performed appreciably better over this period, with a unit rejection that was consistently below the all-country average. In the case of the US, low, lower middle-income and upper middle-income countries all had unit rejection rates that exceeded the all-country average. High-income non-OECD countries, however, had the highest unit rejection rate throughout the period 2002 to 2008.

To provide a graphical depiction of the relative compliance performance of countries over the period 2002 to 2008, Figures 6 and 7 plot the log share of total rejections against the log share of total agri-food exports for the EU and the US.<sup>9</sup> Countries with exports below US\$1 million per year are excluded. Countries with zero rejections are also excluded. The position of each country reflects their performance relative to one another. The 45° line represents the boundary between relatively 'good' and 'bad' performers in terms of rates of rejections. Countries above the line are relatively bad performers in that their share of rejections exceeds their share of exports. Conversely, good performers are below the line; their share of rejections is less than their share of exports. Given that the positioning of countries along the horizontal axis reflects their share of agri-food exports, a distinction can be made between larger and smaller exporters.

Among large agri-food exporters, relatively poor performers include China, Turkey, India, Thailand, Vietnam and Iran in the case of the EU, and India, Vietnam, Dominican Republic and the Philippines in the case of the US. The share of US rejections of both China and Mexico is approximately in line with their share of exports. Among larger exporters, relatively good performers include Brazil, Argentina, Chile and Ecuador for both the EU and the US. Morocco and Ecuador and South Africa are among the good performing large exporters to the EU, while Guatemala and Colombia are good performing large exporters to the US. Relatively good performers are also observed among smaller agri-food exporters, for example, Tanzania, Paraguay, Mauritius, Malawi and Namibia.

The patterns in rejections across countries and over time displayed above reflect not only the compliance capacities of exporting countries, but also the regulatory foci of the importing countries. Thus, appreciable differences are observed in reasons for rejections between the EU and the US (Tables 10 and 11). As described above, the RASFF data generally only detail a single reason for a rejection, whilst the OASIS data typically cite multiple reasons. Thus, in the case of the OASIS data the frequency count for reasons for rejection significantly exceeds the total number of rejections.

In the case of the EU, the most important reason by far for rejections of food and feed imports over the period 2002 to 2008 is mycotoxins, accounting for 40 per cent of all rejections. This is in stark contrast to the US, where mycotoxins are referenced in less than 0.5 per cent of rejections. Mycotoxins have been a problem, however, for relatively few countries, notably Iran (accounting for 38 per cent of all mycotoxin-related rejections), Turkey, China and the United States. Veterinary drug residues also figure prominently in the EU rejection data, accounting for 10

<sup>8</sup> Unit rejection rates exceeding 1.0, and even 10.0, are not uncommon in such instances.

<sup>9</sup> Country abbreviations are given in the appendix.

**Table 4. Number of EU rejections of food and feed products from Third Countries, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Iran	63	492	491	470	243	130	172	2,061	294.4
China	149	133	158	253	262	354	498	1,807	258.1
Turkey	141	200	180	198	250	294	302	1,565	223.6
India	60	119	110	137	86	111	157	780	111.4
United States	25	53	52	74	231	184	144	763	109.0
Thailand	143	85	45	117	85	92	103	670	95.7
Brazil	102	116	109	124	91	58	61	661	94.4
Vietnam	67	35	56	124	68	44	55	449	64.1
Argentina	11	42	46	57	75	47	58	336	48.0
Indonesia	39	36	70	58	43	25	14	285	40.7
Ghana	1	8	78	59	44	31	23	244	34.9
Egypt	9	40	33	24	30	35	48	219	31.3
Nigeria	1	7	15	30	28	49	25	155	22.1
Hong Kong	2	4	6	31	29	45	25	142	20.3
Bangladesh	11	18	18	25	29	15	22	138	19.7
Ukraine	13	0	6	20	18	40	36	133	19.0
Pakistan	7	12	14	25	19	28	27	132	18.9
Morocco	17	29	9	15	23	22	11	126	18.0
Malaysia	14	34	23	8	13	22	8	122	17.4
Philippines	4	18	6	14	41	13	23	119	17.0
Chile	9	28	20	14	8	18	8	105	15.0
Russia	8	3	10	34	25	15	10	105	15.0
Singapore	5	54	19	1	7	10	5	101	14.4
Tunisia	5	3	11	17	7	16	33	92	13.1
Sri Lanka	6	4	14	5	9	22	23	83	11.9
Australia	2	4	6	25	17	14	12	80	11.4
Taiwan	5	36	13	1	5	5	15	80	11.4
Somalia	13	17	12	11	7	8	7	75	10.7
Lebanon	2	9	9	5	8	19	17	69	9.9
Ecuador	11	14	16	3	5	7	8	64	9.1
South Korea	3	4	16	19	11	3	7	63	9.0
Senegal	4	12	3	8	6	13	10	56	8.0
Israel	4	4	9	9	10	5	14	55	7.9
Other	93	126	202	262	237	258	222	1,400	200.0
<b>Total</b>	<b>1,049</b>	<b>1,799</b>	<b>1,885</b>	<b>2,277</b>	<b>2,070</b>	<b>2,052</b>	<b>2,203</b>	<b>13,335</b>	<b>1,905.0</b>

**Table 5. Number of US rejections of food products, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Mexico	1,804	1,502	1,581	1,735	1,477	1,270	1,066	11,926	1490.7
India	746	725	871	1,026	1,132	1,113	707	7,223	902.9
China	541	667	616	672	664	740	479	5,005	625.6
United Kingdom	377	288	325	245	369	430	1,262	3,767	470.9
Dominican Republic	263	266	535	415	663	512	77	3,121	390.1
Canada	414	543	551	284	246	238	361	3,014	376.7
Vietnam	428	332	478	350	300	378	306	2,939	367.4
Japan	755	241	192	147	285	203	319	2,448	306
Indonesia	138	269	331	214	313	374	250	2,159	269.9
Thailand	280	258	351	307	216	233	212	2,122	265.3
France	461	365	345	223	159	155	113	2,081	260.1
South Korea	297	344	285	205	112	166	287	1,938	242.3
Philippines	203	456	248	214	135	244	168	1,906	238.3
Italy	197	226	252	245	175	287	223	1,834	229.3
Taiwan	244	180	183	210	165	173	272	1,631	203.9
Poland	259	129	121	117	58	59	40	895	111.9
Brazil	125	118	153	118	122	84	61	893	111.6
Pakistan	113	116	106	114	90	129	61	833	104.1
Guatemala	107	91	87	98	109	100	126	821	102.6
Spain	172	93	160	58	78	62	64	785	98.1
Turkey	180	101	84	82	70	83	28	718	89.7
Honduras	38	46	57	76	122	73	134	624	78
Bangladesh	30	22	188	98	50	67	42	568	71
Sri Lanka	84	71	28	32	89	109	29	505	63.1
Colombia	26	47	119	102	54	50	41	502	62.7
China	99	64	33	70	44	51	53	473	59.1
Peru	23	71	45	70	29	75	67	434	54.3
Ecuador	75	26	51	72	59	74	15	425	53.1
Israel	40	52	106	33	19	43	60	403	50.4
Ireland	230	19	68	29	1	4	1	402	50.3
Egypt	49	54	62	48	41	66	28	398	49.7
Syria	32	74	23	45	74	82	14	393	49.1
Lebanon	61	53	67	51	31	45	32	389	48.6
Malaysia	63	26	38	68	35	60	46	384	48
Nicaragua	25	37	77	32	15	65	45	338	42.3
Ghana	56	40	70	55	39	12	17	330	41.3
Netherlands	65	34	58	14	48	36	24	319	39.9
Chile	45	60	45	34	35	43	16	318	39.7
Jamaica	31	38	40	45	35	23	30	277	34.6
South Africa	29	39	55	27	37	11	43	275	34.4
El Salvador	44	56	14	47	25	31	22	273	34.1
Russia	22	44	83	13	31	18	28	273	34.1
Costa Rica	45	36	73	17	33	19	9	265	33.1
Ukraine	17	91	37	32	25	20	10	265	33.1
Other	844	843	786	772	568	748	381	5,648	706.0
<b>Total</b>	<b>10,177</b>	<b>9,253</b>	<b>10,078</b>	<b>8,961</b>	<b>8,477</b>	<b>8,858</b>	<b>7,669</b>	<b>72,541</b>	<b>9,067.6</b>

*Note: Excludes meat and poultry.*



**Table 6. Unit rejection rate for EU food and feed imports from Third Countries, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Brazil	85,254	0.012	0.011	0.010	0.008	0.005
United States	58,836	0.006	0.008	0.015	0.019	0.020
Argentina	49,291	0.006	0.009	0.010	0.009	0.007
China	28,370	0.061	0.058	0.059	0.062	0.064
Norway	23,975	0.002	0.004	0.004	0.003	0.001
Turkey	23,740	0.072	0.065	0.059	0.063	0.067
Switzerland	17,093	0.003	0.003	0.003	0.003	0.002
New Zealand	17,037	0.002	0.002	0.003	0.002	0.002
South Africa	16,810	0.000	0.000	0.000	0.000	0.000
Chile	16,711	0.011	0.011	0.006	0.005	0.004
Indonesia	16,502	0.028	0.028	0.027	0.019	0.011
Thailand	15,512	0.061	0.047	0.043	0.045	0.033
Morocco	14,854	0.012	0.010	0.008	0.009	0.007
Côte d'Ivoire	14,661	0.003	0.003	0.004	0.004	0.004
Canada	14,557	0.002	0.003	0.003	0.004	0.004
India	14,334	0.065	0.074	0.060	0.053	0.043
Ecuador	12,858	0.011	0.008	0.005	0.002	0.003
Colombia	12,432	0.007	0.007	0.003	0.002	0.003
Australia	12,096	0.003	0.007	0.009	0.010	0.008
Malaysia	11,142	0.021	0.017	0.010	0.008	0.007
Vietnam	9,850	0.088	0.078	0.073	0.058	0.026
Costa Rica	9,833	0.000	0.001	0.002	0.003	0.002
Iceland	9,578	0.001	0.001	0.001	0.000	0.000
Ukraine	9,278	0.007	0.010	0.015	0.021	0.017
Israel	8,793	0.006	0.006	0.007	0.006	0.007
Peru	8,507	0.006	0.006	0.004	0.006	0.006
Russia	8,238	0.007	0.017	0.023	0.022	0.012
Kenya	7,480	0.001	0.002	0.002	0.003	0.004
Ghana	7,083	0.031	0.052	0.063	0.044	0.027
Mexico	4,651	0.010	0.012	0.009	0.006	0.003
Tunisia	4,566	0.016	0.017	0.017	0.018	0.021
Philippines	4,167	0.019	0.024	0.036	0.038	0.039
Cameroon	3,814	0.002	0.001	0.001	0.001	0.001
Egypt	3,753	0.081	0.084	0.055	0.046	0.051
Uruguay	3,678	0.011	0.009	0.006	0.008	0.008
Mauritius	3,462	0.002	0.005	0.005	0.006	0.003
Faroe Islands	3,381	0.000	0.000	0.000	0.000	0.000
Nigeria	3,347	0.017	0.036	0.054	0.075	0.069
Croatia	2,944	0.008	0.023	0.026	0.021	0.017
Iran	2,809	0.882	1.231	0.989	0.723	0.432
Papua New Guinea	2,770	0.000	0.001	0.001	0.001	0.001
<b>All Country Average</b>	<b>-</b>	<b>0.021</b>	<b>0.024</b>	<b>0.023</b>	<b>0.021</b>	<b>0.018</b>

Note: EU rejection rate converted to US\$ at respective average annual exchange rate.

**Table 7. Unit rejection rate for US food imports, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Canada	84,751	0.049	0.043	0.032	0.021	0.020
Mexico	60,929	0.246	0.212	0.187	0.156	0.120
China	24,846	0.263	0.234	0.194	0.172	0.133
France	20,773	0.162	0.117	0.086	0.056	0.041
Italy	18,569	0.106	0.101	0.086	0.080	0.072
Thailand	17,036	0.147	0.142	0.127	0.099	0.076
Chile	16,437	0.027	0.023	0.017	0.014	0.011
Brazil	14,825	0.096	0.078	0.064	0.044	0.031
Netherlands	14,170	0.028	0.018	0.020	0.015	0.016
United Kingdom	9,996	0.261	0.212	0.219	0.229	0.426
Indonesia	9,921	0.226	0.225	0.206	0.194	0.184
Colombia	9,581	0.057	0.071	0.068	0.046	0.030
India	8,360	0.726	0.767	0.849	0.902	0.767
Ecuador	7,873	0.052	0.047	0.055	0.058	0.040
Costa Rica	7,785	0.055	0.044	0.039	0.019	0.015
Australia	7,676	0.021	0.033	0.037	0.041	0.023
Vietnam	7,616	0.468	0.401	0.376	0.299	0.254
Spain	7,138	0.166	0.110	0.099	0.060	0.058
Germany	7,051	0.064	0.038	0.032	0.019	0.014
Guatemala	6,439	0.128	0.111	0.111	0.106	0.104
Philippines	5,728	0.458	0.432	0.257	0.229	0.187
Argentina	5,676	0.034	0.039	0.046	0.051	0.041
Malaysia	5,329	0.134	0.086	0.076	0.071	0.043
New Zealand	5,180	0.028	0.017	0.013	0.016	0.011
Peru	3,855	0.138	0.156	0.096	0.093	0.072
Japan	3,713	0.902	0.403	0.393	0.376	0.441
Côte d'Ivoire	3,320	0.008	0.005	0.002	0.004	0.004
Ireland	3,201	0.310	0.098	0.082	0.024	0.004
Sweden	3,054	0.029	0.022	0.013	0.008	0.012
Honduras	3,016	0.130	0.151	0.200	0.200	0.223
Austria	2,970	0.043	0.030	0.026	0.014	0.022
Russia	2,934	0.153	0.142	0.119	0.042	0.052
Taiwan	2,256	0.676	0.621	0.589	0.566	0.581
Belgium	2,098	0.092	0.063	0.040	0.025	0.017
Switzerland	2,042	0.076	0.067	0.056	0.086	0.051
South Korea	1,985	1.306	1.099	0.728	0.525	0.567
Dominican Republic	1,952	1.386	1.591	1.962	1.788	1.324
Denmark	1,906	0.049	0.062	0.055	0.153	0.133
Poland	1,762	0.774	0.499	0.397	0.306	0.193
Turkey	1,761	0.687	0.409	0.337	0.285	0.196
El Salvador	1,576	0.359	0.271	0.151	0.140	0.079
Nicaragua	1,512	0.286	0.284	0.222	0.155	0.146
South Africa	1,477	0.218	0.203	0.183	0.105	0.130
All Country Average	-	0.175	0.142	0.119	0.115	0.089

*Note: Excludes meat and poultry*

**Table 8. Unit rejection rate for EU food and feed imports from Third Countries, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Low-income	43,460	0.027	0.033	0.036	0.031	0.021
Lower middle-income	173,365	0.048	0.055	0.049	0.043	0.035
Upper middle-income	276,216	0.015	0.015	0.014	0.013	0.011
High-income OECD	155,652	0.004	0.006	0.009	0.010	0.010
High-income non-OECD	26,408	0.017	0.019	0.013	0.010	0.011
<b>Average</b>	-	<b>0.021</b>	<b>0.024</b>	<b>0.023</b>	<b>0.021</b>	<b>0.018</b>

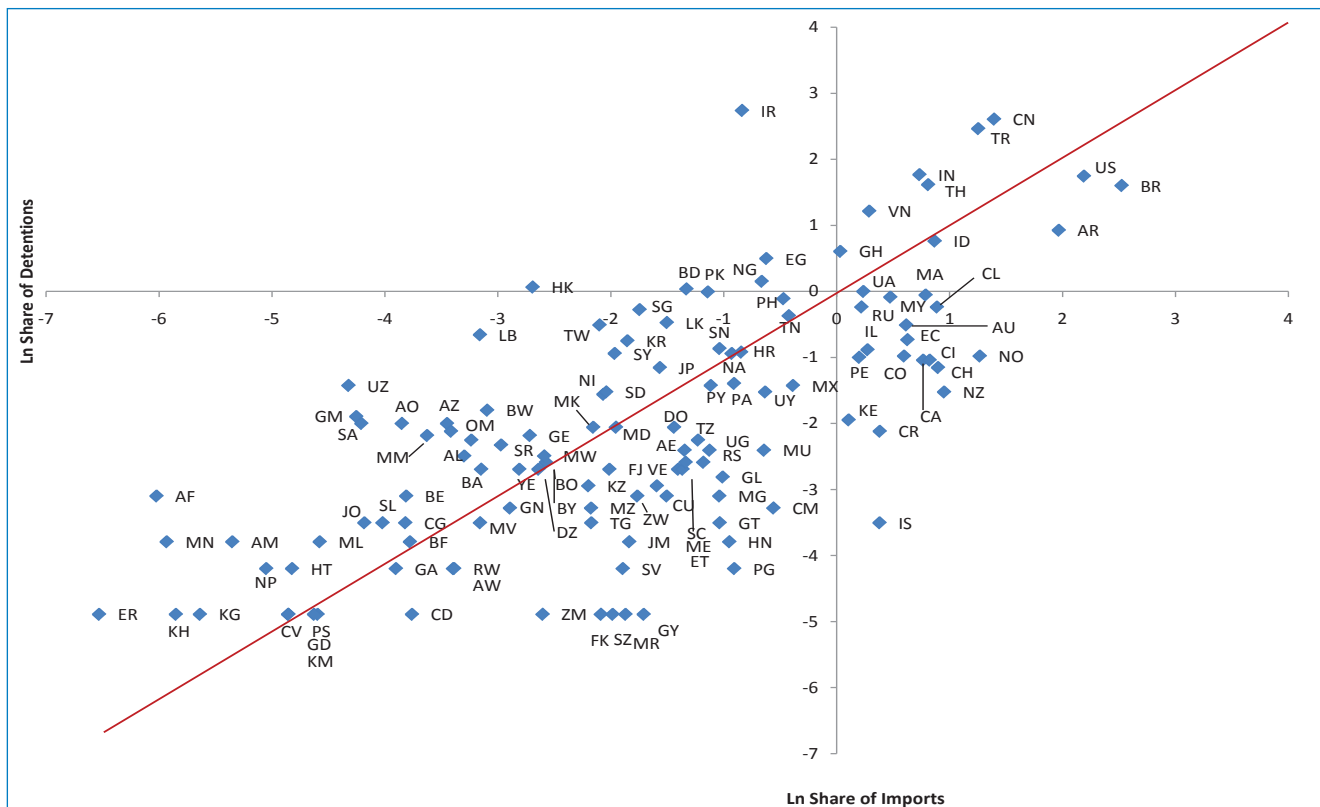
Note: EU rejection rate converted to US\$ at respective average annual exchange rate.

**Table 9. Unit rejection rate for US food imports, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Low-income	13,268	0.382	0.352	0.330	0.257	0.209
Lower middle-income	94,312	0.286	0.271	0.242	0.227	0.188
Upper middle-income	140,041	0.203	0.178	0.159	0.129	0.097
High-income OECD	199,824	0.114	0.084	0.070	0.057	0.062
High-income non-OECD	7,253	0.473	0.438	0.375	0.344	0.331
<b>Average</b>	-	<b>0.175</b>	<b>0.142</b>	<b>0.119</b>	<b>0.115</b>	<b>0.089</b>

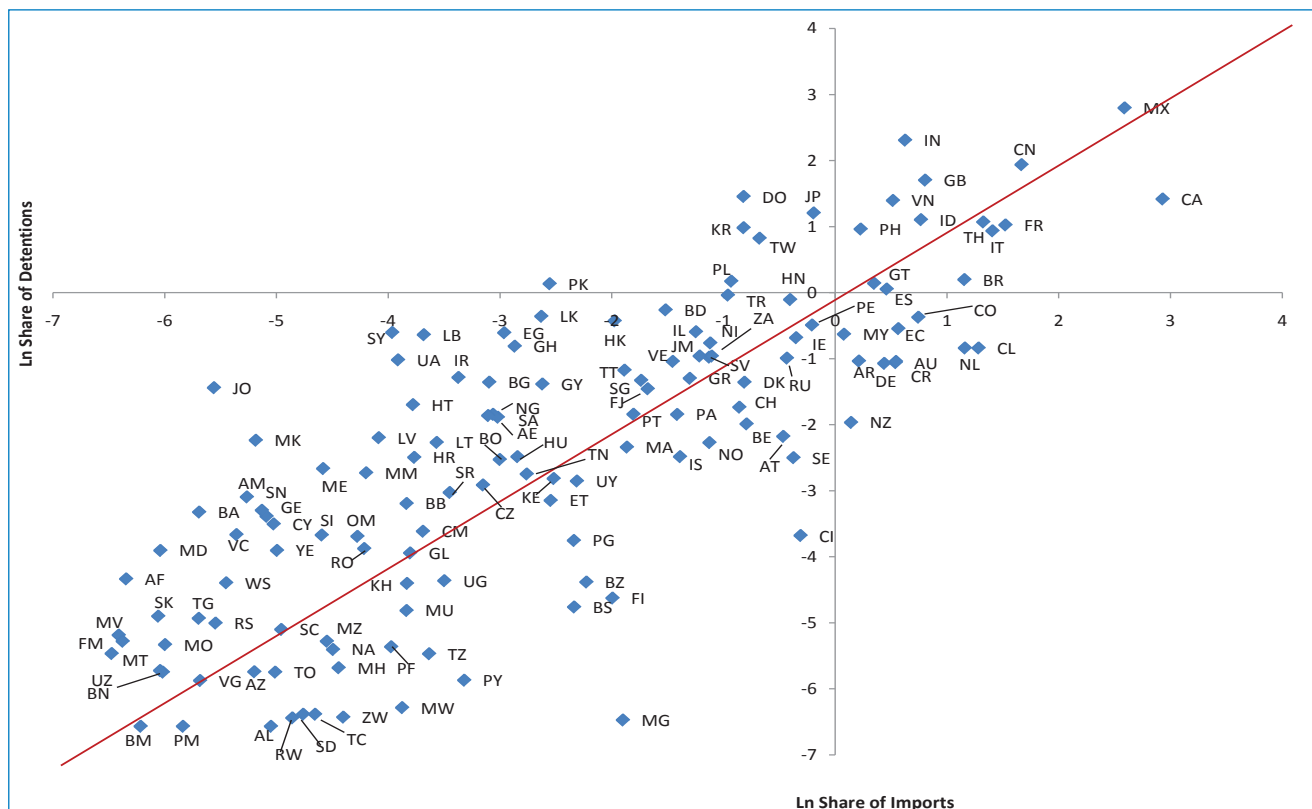
Note: Excludes meat and poultry.

**Figure 6. Share of EU rejections versus share of imports for food and feed products from Third Countries, 2002-2008**



Note: Includes countries with annual exports of food and feed products of US\$1 million or above and with non-zero rejections; converted to US\$ at respective average annual exchange rate.

Figure 7. Share of US rejections versus share of imports for food products, 2002-2008



Note: Includes countries with annual exports of food and feed products of US\$1 million or above and with non-zero rejections. Excludes meat and poultry.

per cent of rejections over the period 2002 to 2008. Conversely, veterinary drug residues are referenced in less than two per cent of US rejections.<sup>10</sup> While pesticide residues are cited in 11 per cent of US rejections, they account for less than five per cent of EU rejections.

The most frequently referenced reason for US rejections of food imports is contravention of labelling requirements, being associated with 58 per cent of all rejections. A further 29 per cent of US rejections reference unregistered process/manufacture; the US requires that manufacturers of certain products (for ex-

ample low-acid canned foods) register their process with the FDA). Broadly, the EU does not enforce labelling requirements through border inspection and rates of non-compliance are not recorded in the RASFF data.

In both the EU and the US data, microbiological contamination is widely cited as a reason for rejection of agri-food products, accounting for around 13 per cent of EU rejections and 12 per cent of US rejections. The OASIS data make frequent reference to the broader concept of unsanitary or 'filthy', which is cited in 25 per cent of rejections.

<sup>10</sup> While this may partly reflect the absence of meat and poultry and meat and poultry products from the US rejection data, it should be noted that the majority of EU rejections for reasons of veterinary drug residues are fish and fishery products. Thus, this difference appears to be more a reflection of the distinct regulatory requirements of the EU and the US.

**Table 10. Reasons for EU rejections of food and feed products from Third Countries, 2002-2008**

Country	<div><div>Mycotoxins</div><div>Microbiological contaminants</div><div>Veterinary drug residues</div><div>Heavy metals</div><div>Unauthorized food additives</div><div>Product composition</div><div>Pesticide residues</div><div>Migration</div><div>Industrial contaminants</div><div>GMO/novel food</div><div>Foreign bodies</div><div>Biotoxins/contaminants</div><div>Radiation</div><div>Organoleptic</div><div>Bad or insufficient controls</div><div>Parasitic infestation</div><div>Labelling</div><div>Packaging</div><div>Other chemical contamination</div><div>Allergens</div><div>Feed additives</div><div>Not determined/other</div><div>Total</div></div>																							
Iran	2,041	1	0	3	9	0	15	0	1	0	4	0	0	0	0	0	2	0	0	0	0	3	2,079	
China	503	89	286	300	139	77	25	229	86	41	45	8	31	26	14	12	20	14	12	3	0	109	2,069	
Turkey	983	95	15	30	177	114	153	19	8	0	47	2	2	8	0	2	11	0	2	4	0	20	1,692	
India	193	148	179	77	48	139	65	9	5	7	7	3	7	18	1	0	3	0	1	2	0	16	928	
United States	340	32	8	18	48	36	5	0	15	206	13	0	43	7	8	4	13	1	7	3	3	26	836	
Thailand	20	233	191	47	78	12	111	13	21	0	7	13	18	3	4	0	0	4	2	1	0	25	803	
Brazil	178	234	78	29	70	4	12	2	1	1	5	3	3	11	16	6	4	19	3	1	13	22	715	
Vietnam	20	147	186	46	26	28	8	1	30	1	3	13	5	5	7	2	0	1	0	1	0	16	546	
Argentina	174	78	27	7	15	1	14	1	1	1	2	1	0	12	8	5	0	0	0	0	2	6	355	
Indonesia	14	36	72	88	4	37	1	1	0	1	1	44	3	4	1	6	0	0	1	1	0	3	318	
Ghana	91	13	0	5	11	101	0	0	8	0	5	0	0	6	6	0	4	4	0	0	0	8	262	
Egypt	130	30	2	1	8	23	41	1	1	0	11	0	0	1	2	0	3	0	0	0	0	5	259	
Hong Kong	4	6	0	57	19	5	0	57	10	4	1	0	4	3	0	0	1	0	2	0	0	6	179	
Nigeria	90	13	0	10	16	18	0	0	1	0	7	0	1	2	2	1	1	0	0	0	0	2	164	
Pakistan	56	10	4	3	19	55	1	0	0	0	3	0	0	6	0	0	1	0	0	1	0	1	160	
Ukraine	8	22	27	7	6	6	9	0	17	0	23	3	4	5	13	0	2	2	0	1	0	4	159	
Bangladesh	9	28	85	2	1	15	2	0	0	0	3	1	0	1	0	0	1	0	0	0	0	0	148	
Morocco	5	44	0	15	17	1	30	1	4	0	1	14	0	4	5	1	2	2	1	0	0	0	147	
Russia	8	7	9	2	9	65	0	1	5	0	0	0	4	2	7	1	0	6	1	0	0	10	137	
Malaysia	6	70	11	2	6	5	1	1	7	0	0	13	0	0	1	0	3	0	0	0	0	3	129	
Philippines	24	5	11	5	19	6	0	0	15	0	0	6	1	1	0	0	1	2	0	0	0	29	125	
Singapore	11	1	1	89	3	1	0	0	2	1	2	0	3	0	0	0	0	0	0	3	0	0	117	
Chile	3	38	16	17	9	3	18	1	1	0	2	1	0	0	2	1	0	1	1	0	0	2	116	
Tunisia	1	31	0	8	24	0	1	0	2	0	16	1	0	4	6	2	4	1	0	0	0	6	107	
Taiwan	0	0	33	13	4	0	9	24	2	0	0	0	1	0	0	2	0	0	0	0	0	14	102	
Other	423	329	86	243	224	233	130	29	49	17	43	89	39	31	56	60	22	10	9	16	1	67	2,206	
Total	5,335	1,740	1,327	1,124	1,009	985	651	390	292	280	251	215	169	160	159	105	98	67	42	37	19	403	14,858	
% rejections	40.0	13.0	10.0	8.4	7.6	7.4	4.9	2.9	2.2	2.1	1.9	1.6	1.3	1.2	1.2	0.8	0.7	0.5	0.3	0.3	0.1	3.0	-	

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

**Table 11. Reasons for US rejections of food products, 2002-2008**

Country	Labelling	Unregistered process/ manufacturer	Filthy/unsanitary	Unauthorized food additives	Microbiological contaminants	Pesticide residues	Veterinary drug residues	Poisonous	Biotxins/contaminant	Product not approved/ no import permit	HACCP	Mycotoxins	Product composition	Foreign bodies	Other chemical contamination	Packaging	Allergens	Adulteration	Quality standards	Inadequate information	Radiation	Total
Mexico	3,328	475	3,476	1,475	1,328	2,109	16	135	5	27	114	91	14	17	10	14	7	1	8	0	0	12,650
India	3,829	1,246	1,722	1,346	1,532	454	16	48	2	28	0	37	15	38	10	4	4	1	1	0	0	10,333
United Kingdom	5,899	1,228	65	833	40	1	0	5	7	5	13	0	16	2	0	0	0	9	0	1	0	8,124
China	1,266	1,236	1,625	931	290	402	582	45	5	12	7	7	9	11	35	9	1	0	1	3	0	6,477
Canada	2,516	356	548	524	124	254	16	26	0	16	27	33	6	5	0	0	0	3	0	5	0	4,459
Japan	1,124	1,726	279	272	76	4	0	12	4	5	58	0	1	1	2	1	1	0	0	0	0	3,566
Vietnam	798	376	866	285	770	16	172	106	99	2	29	22	0	1	8	0	1	0	1	0	0	3,552
Dominican Republic	117	32	170	8	2	2456	0	4	5	15	0	0	1	0	0	2	0	0	0	0	0	2,812
Italy	1037	1268	215	68	63	10	0	11	0	4	6	1	5	1	0	0	0	0	1	0	0	2,690
South Korea	875	1068	181	299	129	13	0	8	0	7	49	0	2	1	1	0	2	0	0	0	0	2,635
Indonesia	335	347	949	82	600	0	120	56	95	6	2	3	13	0	0	1	0	0	0	0	0	2,609
France	725	561	186	83	541	22	0	16	0	371	0	1	0	0	0	1	0	0	0	0	0	2,507
Taiwan	707	693	398	436	153	14	11	10	42	5	1	2	4	13	5	4	1	1	0	0	0	2,500
Thailand	452	557	846	241	250	64	18	7	10	1	11	2	1	1	5	0	2	0	1	0	0	2,469
Philippines	455	662	624	353	210	10	0	26	43	4	0	3	7	1	3	6	0	0	0	0	0	2,407
Pakistan	589	298	98	150	154	15	0	13	0	7	0	3	5	1	0	3	0	0	0	0	0	1,336
Poland	608	513	19	81	1	55	0	0	0	0	13	0	4	0	0	0	0	1	0	0	1	1,296
Brazil	438	364	151	62	135	27	1	21	1	6	1	0	0	0	0	1	1	0	0	0	0	1,209
Turkey	513	358	67	70	66	17	0	7	0	4	0	11	0	0	0	5	0	2	0	0	0	1,120
Guatemala	521	134	37	52	11	306	0	0	0	4	1	4	8	0	0	0	0	2	0	0	0	1080
Spain	339	418	42	43	16	184	0	9	1	0	1	0	3	1	0	1	1	0	1	0	0	1060
Sri Lanka	464	240	89	80	42	2	0	10	5	1	2	0	0	0	1	1	0	0	0	0	0	937
Honduras	437	69	211	14	161	10	0	3	0	11	0	0	0	0	0	0	0	0	0	0	0	916
Other	9,462	4,015	3,034	1,318	1,200	598	95	232	92	69	72	39	118	15	7	20	18	12	16	1	0	20,433
<b>Total</b>	<b>36,834</b>	<b>18,240</b>	<b>15,898</b>	<b>9,106</b>	<b>7,894</b>	<b>7,043</b>	<b>1,047</b>	<b>810</b>	<b>416</b>	<b>610</b>	<b>407</b>	<b>259</b>	<b>232</b>	<b>109</b>	<b>87</b>	<b>73</b>	<b>39</b>	<b>32</b>	<b>30</b>	<b>10</b>	<b>1</b>	<b>99,177</b>
% rejections	58.0	28.7	25.0	14.3	12.4	11.1	1.6	1.3	0.7	1.0	0.6	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

## 5. Analysis by product group

### 5.1 Fish and fishery products

In the following sub-sections, patterns and trends in border rejections for four main food commodity groups are examined. The first of these is fish and fishery products. In both the EU and the US, Vietnam, Indonesia, China, India and Thailand are amongst the countries with the greatest number of rejections of fish and fishery products over the period 2002 to 2008 (Tables 12 and 13), collectively accounting for over 45 per cent of total rejections. In the US, the Philippines also recorded a large number of rejections, accounting for almost six per cent of the total.

Examining unit rejection rates, however, presents a somewhat different picture to the total number of rejections. In the EU, the

largest unit rejection rates for fish and fishery products over the period 2002 to 2008 were recorded by Vietnam, Indonesia, India, Sri Lanka and Malaysia (Table 14). In all of these countries, however, the unit rejection rate declined more rapidly than the all-country average over this period, suggesting appreciable improvements in compliance. However, while China had a relatively low unit rejection rate, this needs to be interpreted with some caution. Over much of the period 2002 to 2008, China faced restrictions on exports of certain fish and fishery products due to persistent non-compliance, for example with controls on veterinary drug residues. Because no exports of these products could take place, clearly rejections were zero. Morocco, Argentina, Ecuador, Chile, Namibia, Seychelles and Senegal all stand out as developing countries with large exports of fish and fishery products but low unit rejection rates.

**Table 12. Number of EU rejections of fish and fishery products from Third Countries, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Vietnam	61	19	36	90	45	22	31	304	43.4
India	48	46	25	35	35	26	41	256	36.6
Indonesia	37	34	63	48	38	19	7	246	35.1
China	59	23	13	21	24	52	29	221	31.6
Thailand	69	57	12	13	30	16	13	210	30.0
Bangladesh	11	16	13	21	27	6	14	108	15.4
Brazil	5	6	21	26	20	19	4	101	14.4
Malaysia	13	25	21	4	3	15	5	86	12.3
Singapore	4	52	16	0	2	6	1	81	11.6
Morocco	13	24	7	2	11	14	6	77	11.0
Sri Lanka	5	3	10	1	8	16	17	60	8.6
Chile	5	23	13	6	5	5	2	59	8.4
Tunisia	3	1	5	12	4	10	23	58	8.3
Taiwan	2	34	6	0	3	1	1	47	6.7
Senegal	4	8	2	8	6	11	7	46	6.6
Ecuador	9	14	11	3	2	1	6	46	6.6
Australia	0	1	4	17	12	6	0	40	5.7
Norway	1	2	14	11	8	0	2	38	5.4
USA	1	16	2	3	3	5	6	36	5.1
Philippines	0	13	2	3	4	5	5	32	4.6
Turkey	3	4	5	8	1	3	4	28	4.0
Croatia	0	0	6	2	1	4	14	27	3.9
Namibia	6	1	1	5	3	7	4	27	3.9
Panama	6	1	0	2	6	11	1	27	3.9
Argentina	2	9	1	4	4	2	0	22	3.1
South Korea	1	4	6	1	7	0	3	22	3.1
Russian Federation	0	1	8	7	1	1	2	20	2.9
Angola	1	0	0	9	2	6	0	18	2.6
Colombia	0	8	3	1	3	2	0	17	2.4
Cote d'Ivoire	1	1	2	0	3	6	2	15	2.1
Other	26	37	44	54	59	47	38	305	41.4
<b>Total</b>	<b>396</b>	<b>483</b>	<b>372</b>	<b>417</b>	<b>380</b>	<b>344</b>	<b>288</b>	<b>2,680</b>	<b>383</b>

**Table 13. Number of US rejections of fish and fishery products, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Vietnam	256	228	365	285	194	237	229	1,794	256.3
Indonesia	122	230	267	173	213	271	203	1,479	211.3
China	119	132	107	156	282	387	160	1,343	191.9
Philippines	113	142	127	114	57	109	65	727	103.9
Thailand	109	99	114	130	71	78	65	666	95.1
India	154	131	75	86	47	51	12	556	79.4
Mexico	228	98	55	70	41	29	26	547	78.1
Korea, South	60	92	65	66	46	56	105	490	70.0
Japan	90	86	71	50	131	25	36	489	69.9
Taiwan	86	74	75	57	50	69	57	468	66.9
Bangladesh	28	19	186	66	41	35	38	413	59.0
Canada	97	100	60	60	31	14	15	377	53.9
Ecuador	57	17	30	54	43	40	8	249	35.6
Brazil	25	49	46	31	60	18	13	242	34.6
Ireland	212	9	6	4	0	0	1	232	33.1
United Kingdom	36	53	50	7	6	11	38	201	28.7
Malaysia	12	16	16	37	21	43	37	182	26.0
Venezuela	14	20	53	34	5	34	11	171	24.4
Chile	25	28	31	22	20	17	4	147	21.0
Spain	14	10	65	16	29	7	3	144	20.6
Hong Kong	39	9	13	11	23	27	4	126	18.0
Sri Lanka	12	18	5	11	29	18	9	102	14.6
Singapore	13	46	6	10	9	8	9	101	14.4
Ghana	15	22	23	18	9	6	7	100	14.3
Guyana	21	17	26	21	10	3	0	98	14.0
Italy	15	11	22	18	3	16	11	96	13.7
Peru	10	44	10	9	1	14	8	96	13.7
Poland	5	34	25	21	2	0	7	94	13.4
Panama	12	9	40	7	12	3	7	90	12.9
Honduras	4	20	1	33	7	0	4	69	9.9
Other	202	199	161	183	113	105	98	1061	151.6
<b>Total</b>	<b>2,205</b>	<b>2,062</b>	<b>2,196</b>	<b>1,860</b>	<b>1,606</b>	<b>1,731</b>	<b>1,290</b>	<b>12,950</b>	<b>1,850.0</b>

Countries with high US unit rejection rates over the period 2002 to 2008 included South Korea, the Philippines, Taiwan, Guyana, Indonesia, Vietnam, Bangladesh, Japan, Spain and the United Kingdom (Table 15). Among the developing countries with large exports of fish and fishery products, Chile, Thailand, Argentina, Mexico and Panama had unit rejection rates that were appreciably below the all-country average.

Figures 8 and 9 report relative rejection rates for fish and fishery products in the EU and the US, excluding countries with annual exports of less than US\$500,000 and those with zero rejections. For both the EU and the US, Chile and Ecuador are large exporters with good relative compliance performance. Conversely, Vietnam, Indonesia and Bangladesh have relatively poor compliance performance in both the EU and the US. In both the EU and the US, there were relatively minor exporters of fish and fishery

products with particularly poor relative rejection rates, suggesting acute compliance problems. For example, Ghana and Nigeria in the US and The Gambia, Benin, Fiji and Congo in the EU.

It is noteworthy that, while Thailand and China are large under-performing exporters with respect to exports to the EU, they are relatively good performers in the US. Conversely, while Senegal recorded a relatively good compliance performance with (large) exports to the EU over the period 2002 to 2008, it performed relatively poorly with respect to its exports to the US, where it was a comparatively minor exporter. Such comparisons of relative rejection rates for particular commodities, in this case fish and fishery products, indicate export destination-specific compliance issues rather than more systemic weaknesses in compliance capacity.



**Table 14. Unit rejection rate for EU fish and fishery product imports from Third Countries, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Norway	20,754	0.002	0.003	0.004	0.002	0.001
Iceland	8,514	0.000	0.000	0.000	0.000	0.000
China	7,701	0.080	0.027	0.018	0.022	0.021
USA	6,180	0.010	0.011	0.003	0.004	0.004
Morocco	6,057	0.021	0.015	0.008	0.009	0.010
Argentina	4,740	0.006	0.007	0.005	0.005	0.002
Thailand	4,372	0.118	0.064	0.031	0.028	0.025
Ecuador	3,960	0.038	0.027	0.013	0.003	0.003
Vietnam	3,590	0.309	0.169	0.148	0.105	0.039
Chile	3,548	0.041	0.039	0.017	0.009	0.006
India	3,500	0.114	0.085	0.066	0.058	0.053
Russian Federation	3,242	0.007	0.013	0.013	0.007	0.003
Faroe Islands	3,140	0.000	0.000	0.000	0.000	0.000
Canada	3,102	0.005	0.008	0.004	0.003	0.003
Greenland	2,412	0.001	0.001	0.006	0.006	0.006
Namibia	2,029	0.011	0.008	0.011	0.017	0.015
South Africa	2,029	0.005	0.005	0.003	0.003	0.003
Indonesia	1,966	0.189	0.164	0.163	0.115	0.072
Seychelles	1,663	0.007	0.004	0.000	0.005	0.005
Bangladesh	1,590	0.066	0.078	0.090	0.076	0.062
Senegal	1,573	0.020	0.026	0.025	0.037	0.036
Brazil	1,392	0.053	0.074	0.094	0.101	0.074
Turkey	1,296	0.033	0.037	0.028	0.021	0.010
Madagascar	1,256	0.003	0.003	0.002	0.000	0.000
Peru	1,154	0.016	0.015	0.015	0.011	0.006
New Zealand	1,113	0.012	0.020	0.017	0.011	0.009
Colombia	1,103	0.027	0.029	0.016	0.012	0.011
Tanzania	1,096	0.010	0.009	0.010	0.008	0.006
Cote d'Ivoire	1,084	0.008	0.006	0.012	0.020	0.023
Malaysia	1,003	0.150	0.110	0.061	0.043	0.049
Mauritius	960	0.013	0.011	0.009	0.009	0.006
Philippines	912	0.048	0.058	0.029	0.031	0.028
Mauritania	882	0.003	0.000	0.000	0.000	0.000
Tunisia	863	0.029	0.048	0.055	0.063	0.088
Ghana	852	0.006	0.009	0.030	0.034	0.031
Falkland Islands	813	0.000	0.000	0.000	0.000	0.002
Uganda	763	0.010	0.010	0.002	0.002	0.005
South Korea	709	0.038	0.039	0.054	0.032	0.036
Average	-	0.031	0.028	0.023	0.020	0.016

Note: Rejection rate converted to US\$ at respective average annual exchange rate.

Microbiological contamination was a major reason for rejections of fish and fishery products in the EU and the US over the period 2002 to 2008 (Tables 16 and 17), accounting for over 20 per cent of rejections in the EU and being referenced in almost

29 per cent of rejections in the US. The related but more generic category of filthy/unsanitary was referenced in almost 50 per cent of rejections in the US; this category is not employed in the EU. In both the EU and the US, a relatively small proportion of

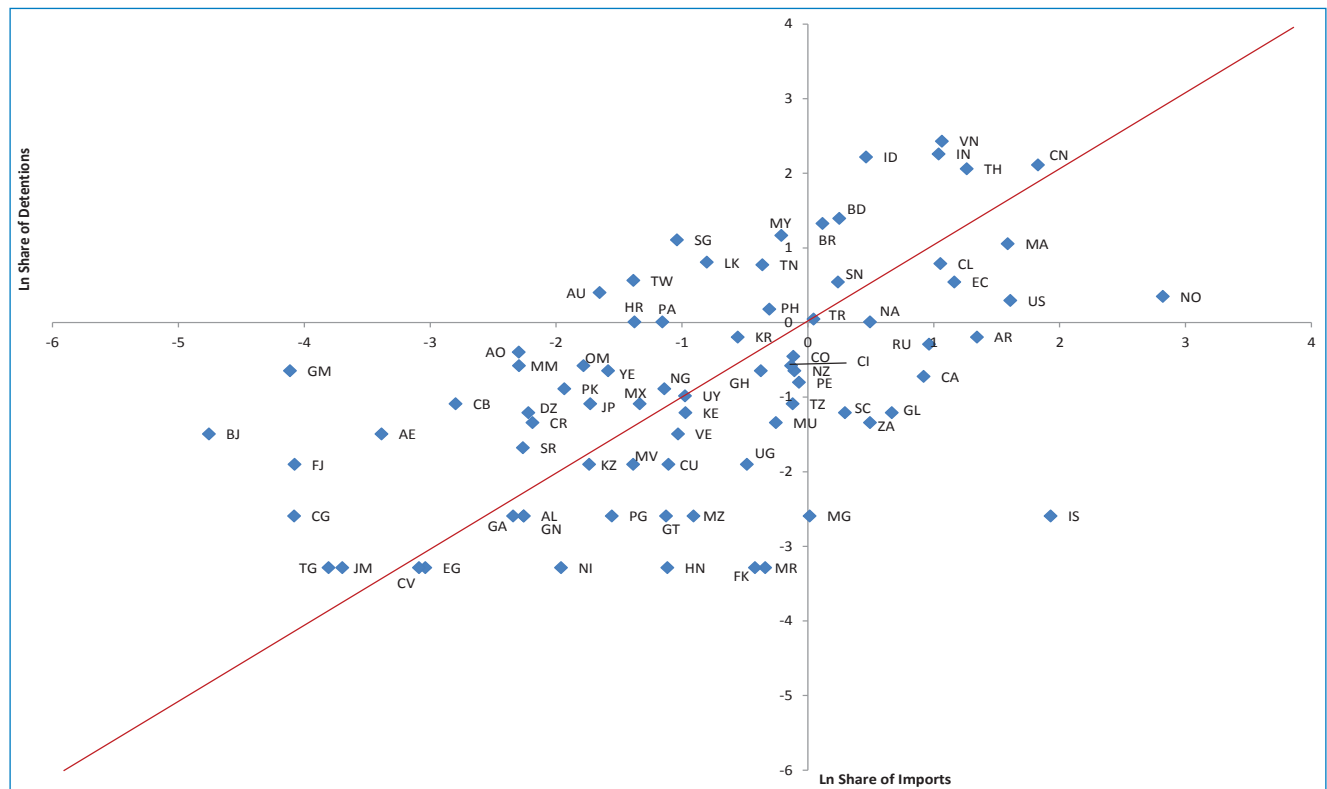
**Table 15. Unit rejection rate for US fish and fishery product imports, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Canada	15,076	0.041	0.034	0.024	0.016	0.009
Thailand	11,188	0.078	0.080	0.070	0.056	0.039
China	10,766	0.113	0.103	0.114	0.149	0.138
Chile	5,554	0.046	0.039	0.032	0.022	0.014
Indonesia	4,974	0.417	0.395	0.309	0.272	0.255
Vietnam	4,643	0.457	0.470	0.466	0.365	0.314
Ecuador	3,642	0.077	0.068	0.081	0.083	0.053
Mexico	3,092	0.328	0.177	0.124	0.102	0.067
India	2,437	0.288	0.234	0.186	0.190	0.132
Russia	2,162	0.022	0.018	0.017	0.011	0.015
Philippines	1,561	0.685	0.611	0.448	0.382	0.304
Japan	1,243	0.592	0.445	0.493	0.364	0.320
Brazil	1,082	0.210	0.241	0.313	0.271	0.240
Honduras	992	0.066	0.127	0.090	0.087	0.025
Bangladesh	975	0.529	0.583	0.579	0.303	0.240
Iceland	945	0.038	0.081	0.072	0.057	0.000
New Zealand	915	0.026	0.013	0.015	0.024	0.019
Taiwan	911	0.613	0.524	0.465	0.469	0.450
Malaysia	899	0.398	0.341	0.166	0.210	0.180
Norway	853	0.074	0.081	0.093	0.063	0.020
Panama	734	0.193	0.174	0.185	0.069	0.072
Venezuela	670	0.255	0.314	0.263	0.261	0.201
Australia	627	0.040	0.035	0.034	0.030	0.027
Argentina	588	0.037	0.050	0.046	0.023	0.033
Nicaragua	564	0.111	0.088	0.026	0.036	0.031
South Korea	507	1.062	1.083	0.860	0.784	0.859
Costa Rica	477	0.157	0.145	0.143	0.121	0.118
Fiji	443	0.095	0.120	0.120	0.193	0.133
Peru	399	0.556	0.467	0.120	0.118	0.095
United Kingdom	395	1.083	0.694	0.424	0.142	0.233
Bahamas	375	0.005	0.012	0.007	0.007	0.012
Trinidad and Tobago	310	0.071	0.196	0.167	0.152	0.005
Singapore	297	0.443	0.439	0.201	0.233	0.237
Spain	281	0.798	0.765	0.878	0.382	0.285
Guyana	269	0.561	0.573	0.528	0.299	0.116
Colombia	268	0.172	0.168	0.094	0.061	0.051
Belize	214	0.007	0.007	0.007	0.000	0.000
South Africa	212	0.084	0.084	0.084	0.044	0.044
Average	-	0.202	0.181	0.158	0.136	0.114

rejections were related to concerns over the efficacy of process controls, whether generically or specifically related to hazard analysis and critical control point (HACCP).

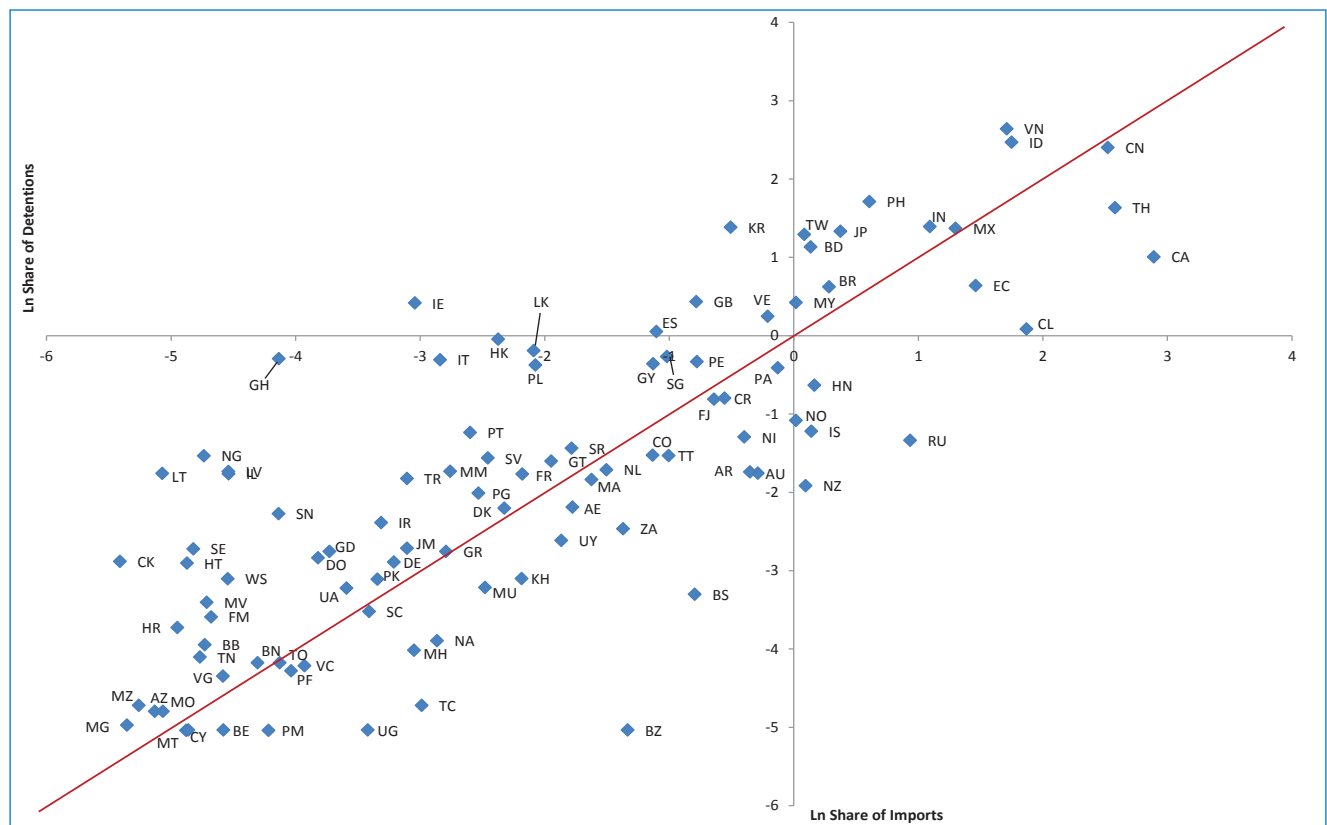
With EU rejections, veterinary drug residues and heavy metals figure prominently, accounting for almost 28 per cent and over 20 per cent of rejections, respectively, while veterinary drug residues were referenced in less than eight per cent of rejections in

Figure 8. *Share of EU rejections versus share of imports for fish and fishery products from third countries, 2002-2008*



Note: Includes countries with annual exports of food and feed products of US\$500,000 or above and with non-zero rejections; converted to US\$ at respective average annual exchange rate.

Figure 9. *Share of US rejections versus share of imports for fish and fishery products, 2002-2008*



Note: Includes countries with annual exports of food and feed products of US\$500,000 or above and with non-zero rejections.

**Table 16. Reasons for EU rejections of fish and fishery products from Third Countries, 2002-2008**

Country	Veterinary drug residues	Microbiological contaminants	Heavy metals	Biotoxins/contaminants	Product composition	Parasitic infestation	Bad or insufficient controls	Industrial contaminants	Organoleptic aspects	Not determined/other	Total
Vietnam	160	103	44	13	21	2	7	1	1	10	362
India	159	63	37	2	0	0	1	0	9	11	282
Indonesia	70	28	87	44	36	5	1	0	2	2	275
China	118	12	14	1	0	11	8	0	2	72	238
Thailand	107	33	41	13	7	0	1	7	1	20	230
Bangladesh	85	27	1	1	0	0	0	0	1	0	115
Brazil	1	12	23	3	1	5	0	0	1	56	102
Malaysia	11	59	1	13	0	0	1	3	0	2	90
Singapore	0	0	88	0	0	0	0	0	0	3	91
Morocco	0	34	14	13	0	1	3	3	1	18	87
Sri Lanka	1	3	14	30	1	10	0	0	0	5	64
Chile	14	30	14	1	1	1	2	0	0	2	65
Tunisia	0	27	5	1	0	1	2	0	3	27	66
Taiwan	33	0	13	0	0	2	0	0	0	0	48
Senegal	0	9	14	2	4	1	3	3	1	11	48
Ecuador	6	14	7	5	1	0	1	0	1	12	47
Australia	0	0	39	0	0	1	0	0	0	0	40
Norway	0	5	0	6	0	21	0	2	1	6	41
USA	0	4	12	0	0	4	4	5	1	10	40
Philippines	11	1	5	6	5	0	0	0	0	8	36
Turkey	0	34	1	2	0	0	0	1	2	0	40
Croatia	0	1	4	3	0	17	5	0	0	2	32
Namibia	0	6	19	0	1	0	2	0	0	0	28
Panama	0	0	16	2	2	0	0	0	0	7	27
Argentina	0	10	5	1	0	2	1	0	3	5	27
South Korea	7	5	3	1	0	0	0	0	0	7	23
Russian Federation	0	2	1	0	0	1	4	0	1	12	21
Angola	0	0	0	1	0	0	0	0	0	17	18
Colombia	0	6	1	1	0	0	0	0	0	10	18
Cote d'Ivoire	0	2	2	2	0	0	0	11	0	3	20
Other	35	69	68	25	16	10	21	22	9	61	336
<b>Total</b>	<b>818</b>	<b>599</b>	<b>593</b>	<b>192</b>	<b>96</b>	<b>95</b>	<b>67</b>	<b>58</b>	<b>40</b>	<b>399</b>	<b>2,957</b>
<b>% rejections</b>	<b>27.7</b>	<b>20.3</b>	<b>20.1</b>	<b>6.5</b>	<b>3.2</b>	<b>3.2</b>	<b>2.3</b>	<b>2.0</b>	<b>1.4</b>	<b>13.5</b>	<b>100.0</b>

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

the US. Veterinary drug residues, however, were a problem for a relatively small number of countries exporting to the EU, notably Vietnam, India, China, Thailand, Bangladesh and Indonesia;

this reflects specific problems with residues of antibiotics in the products of aquaculture, notably shrimp.

**Table 17. Reasons for US rejections of fish and fishery products, 2002-2008**

Country	Filthy/unsanitary	Microbiological contaminants	Labelling	Unregistered process/manufacture	Veterinary drug residues	Poisonous	HACCP	Biotxins/contaminants	Unauthorised food additives	Other	Total
Vietnam	740	688	338	89	170	100	29	99	14	5	2,272
Indonesia	903	572	103	4	120	54	2	95	14	0	1,867
China	471	216	233	79	564	6	7	5	123	17	1,721
Philippines	430	164	119	207	0	20	0	43	2	5	990
Thailand	396	203	104	78	18	5	11	10	2	6	833
India	382	366	32	19	16	2	0	2	2	1	822
Japan	236	76	145	122	0	9	58	4	22	1	673
South Korea	136	128	192	121	0	7	49	0	2	1	636
Mexico	218	183	66	13	12	7	114	2	1	5	621
Bangladesh	292	259	51	0	1	1	0	0	0	0	604
Taiwan	296	124	69	23	10	5	1	42	3	2	575
Canada	162	58	154	71	9	16	25	0	4	5	504
United Kingdom	35	32	96	205	0	0	13	7	8	0	396
Ecuador	115	38	25	36	5	22	18	39	0	1	299
Brazil	131	105	19	19	1	20	1	1	0	1	298
Spain	10	3	81	137	0	8	1	1	2	0	243
Ireland	224	5	2	4	0	0	1	0	0	0	236
Malaysia	101	57	39	13	12	0	0	12	0	0	234
Venezuela	60	94	20	2	18	5	4	0	0	0	203
Sri Lanka	24	16	87	53	0	10	2	5	0	1	198
Italy	19	0	54	95	0	10	5	0	0	0	183
Chile	69	29	31	26	1	13	13	0	0	0	182
Hong Kong	77	8	28	8	32	0	0	0	16	2	171
Guyana	59	21	76	1	0	0	0	1	0	0	158
Poland	5	0	20	112	0	0	13	0	0	0	150
Ghana	81	5	33	14	0	0	6	0	0	0	139
Peru	47	2	26	47	5	5	2	1	0	0	135
Singapore	60	14	6	1	0	32	3	8	0	0	124
Panama	69	35	14	0	0	1	1	2	0	0	122
Other	535	210	356	315	1	92	19	10	8	8	1,554
<b>Total</b>	<b>6,383</b>	<b>3,711</b>	<b>2,619</b>	<b>1,914</b>	<b>995</b>	<b>450</b>	<b>398</b>	<b>389</b>	<b>223</b>	<b>61</b>	<b>17,143</b>
<b>% rejections</b>	<b>49.3</b>	<b>28.7</b>	<b>20.2</b>	<b>14.8</b>	<b>7.7</b>	<b>3.5</b>	<b>3.1</b>	<b>3.0</b>	<b>1.7</b>	<b>0.5</b>	<b>-</b>

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

Labelling and unregistered process/manufacture were referenced in 20 per cent and 15 per cent of US rejections of fish and fishery products over the period 2002 to 2008, respectively. In

general, these determinations were accompanied by other aspects of non-compliance, notably filthy/unsanitary and microbiological contamination.

## 5.2 Fruits and vegetables and fruit and vegetable products

Over the period 2002 to 2008, total EU rejections of fruits and vegetables and fruit and vegetable products were much lower than for fish and fishery products (Table 18). However, while rejections of fish and fishery products declined over this period, rejections of fruits and vegetables increased appreciably, from 110 in 2002 to 351 in 2008. Conversely, fruits and vegetables dominated US of rejections, with an average of almost 2,800 rejections annually (Table 19). Over this period, however, the number of US rejections almost halved, from 3,182 in 2002 to 1,624 in 2008. The rate of decline in rejections for fruits and vegetables was much greater than that for all food commodities.

In the case of the EU, Turkey alone accounted for over 45 per cent of total rejections of fruit and vegetables over the period 2002 to 2008 (Table 18). Other countries with significant numbers of rejections included China and Thailand. Most other countries had low levels of rejections. Mexico and the Dominican Republic accounted for a large share of fruit and vegetable rejections in the US, representing almost 25 per cent and 13 per cent of the total, respectively. A number of other countries had appreciable numbers of rejections, including China, India and Italy.

Aside from Turkey and China, most large exporters of fruits and vegetables to the EU had very low unit rejection rates over the period 2002 to 2008 (Table 20). Among these countries were a number of developing nations including Brazil, South Africa, Costa Rica, Morocco, Ecuador, Chile, Argentina and Colombia. While some middle-range exporters of fruits and vegetables, including Thailand, India, Tunisia, Ghana, Egypt and Iran, had relatively high unit rejection rates, a number of developing countries in this second tier had good compliance performance. These included Kenya, Panama and Cote d'Ivoire.

Amongst significant exporters of fruits and vegetables to the US, the Dominican Republic, Italy and India had very high unit rejection rates, exceeding one rejection per US\$1 million of exports (Table 21). While China had a unit rejection rate that exceeded the all-country average, this was much lower than the aforementioned countries. Further, the all-country average was elevated appreciably by the small number of countries with extremely high unit rejection rates. Chile and Costa Rica stand out as developing countries with very low unit rejection rates for fruit and vegetables exports to the US.

**Table 18. Number of EU rejections of fruit and vegetables and fruit and vegetable products from Third Countries, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Turkey	64	90	75	97	117	116	167	726	108.1
China	8	15	27	17	26	32	38	163	25.2
Thailand	3	2	12	29	24	25	36	131	25.6
India	1	17	3	8	1	5	8	43	9.4
Egypt	3	3	3	1	3	12	8	33	7.8
Chile	0	4	5	5	3	11	4	32	5.8
Iran	0	0	3	13	6	2	7	31	4.4
Uzbekistan	3	3	5	5	3	1	6	26	4.4
United States	1	0	1	4	18	2	0	26	4.0
Tunisia	0	0	3	3	3	6	8	23	3.0
Vietnam	3	0	6	6	2	2	1	20	2.8
Japan	0	1	1	6	3	8	1	20	2.3
Nigeria	3	3	0	5	4	4	1	20	3.0
Argentina	3	3	2	1	3	2	5	19	5.0
Brazil	1	2	1	3	0	10	0	17	4.6
Ghana	0	3	2	2	0	6	4	17	2.7
South Korea	1	0	5	5	1	1	3	16	2.7
Morocco	1	2	2	3	3	4	1	16	3.2
Dominican Republic	0	0	0	2	4	4	4	14	2.9
Lebanon	0	1	0	2	0	7	1	11	1.6
Pakistan	0	0	1	3	2	4	1	11	1.7
Kenya	0	0	0	2	5	2	1	10	1.3
Other	15	16	17	18	25	42	46	179	25.6
<b>Total</b>	<b>110</b>	<b>165</b>	<b>174</b>	<b>240</b>	<b>256</b>	<b>308</b>	<b>351</b>	<b>1,604</b>	<b>229.1</b>

**Table 19. Number of US rejections of fruit and vegetables, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Mexico	880	517	978	954	631	583	256	4,799	685.6
Dominican Republic	251	242	464	391	646	496	58	2,548	364.0
China	210	307	325	308	219	203	155	1,727	246.7
India	191	105	175	163	178	183	116	1,111	158.7
Italy	89	103	98	166	106	186	67	815	116.4
Canada	59	70	96	39	48	40	172	524	74.9
Thailand	75	67	113	59	45	64	57	480	68.6
Japan	135	61	53	46	38	51	39	423	60.4
Guatemala	70	56	54	58	43	50	58	389	55.6
Spain	133	60	72	23	22	24	32	366	52.3
Poland	103	73	42	37	41	37	15	348	49.7
Turkey	105	53	39	48	49	41	12	347	49.6
United Kingdom	77	51	36	57	36	10	55	322	46.0
South Korea	40	125	36	18	14	20	45	298	42.6
Taiwan	36	32	49	42	53	50	31	293	41.9
Philippines	26	85	42	34	26	31	36	280	40.0
Vietnam	51	29	40	21	24	34	22	221	31.6
Syria	25	59	16	30	37	46	6	219	31.3
Pakistan	33	37	45	34	20	37	12	218	31.1
Egypt	32	21	34	22	15	59	24	207	29.6
Brazil	35	21	39	31	20	15	13	174	24.9
France	39	29	22	28	21	22	3	164	23.4
Peru	10	13	22	28	14	36	31	154	22.0
Colombia	11	17	55	31	11	12	15	152	21.7
Lebanon	41	11	31	15	12	13	18	141	20.1
Iran	19	25	24	9	20	22	10	129	18.4
Bulgaria	12	35	23	18	13	18	4	123	17.6
Argentina	16	5	18	16	16	35	9	115	16.4
Jamaica	13	11	20	35	15	14	5	113	16.1
Hong Kong	27	24	4	30	3	10	9	107	15.3
Greece	47	23	11	13	1	8	3	106	15.1
Honduras	3	6	10	4	13	5	64	105	15.0
Israel	17	15	25	10	6	17	13	103	14.7
Chile	16	25	13	10	12	15	11	102	14.6
Costa Rica	32	17	19	11	12	5	1	97	13.9
Sri Lanka	19	25	5	3	12	25	5	94	13.4
Netherlands	13	17	26	5	6	15	6	88	12.6
Trinidad and Tobago	11	48	7	1	4	5	9	85	12.1
Ecuador	11	9	18	16	7	8	2	71	10.1
Other	169	271	198	210	151	176	125	1,300	185.7
<b>Total</b>	<b>3,182</b>	<b>2,800</b>	<b>3,397</b>	<b>3,074</b>	<b>2,660</b>	<b>2,721</b>	<b>1,624</b>	<b>19,458</b>	<b>2,779.7</b>

**Table 20. Unit rejection rate for EU fruit and vegetables and fruit and vegetable products imports from Third Countries, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Turkey	10,661	0.066	0.065	0.063	0.066	0.072
Brazil	10,520	0.001	0.002	0.001	0.003	0.002
South Africa	9,683	0.001	0.001	0.001	0.001	0.000
China	8,630	0.020	0.021	0.022	0.018	0.019
Costa Rica	8,270	0.000	0.000	0.000	0.001	0.001
Morocco	7,213	0.002	0.003	0.003	0.003	0.002
Ecuador	6,924	0.001	0.000	0.000	0.000	0.001
Chile	6,708	0.004	0.006	0.005	0.006	0.005
Argentina	5,588	0.005	0.003	0.003	0.002	0.003
Colombia	5,459	0.000	0.000	0.001	0.002	0.003
USA	5,038	0.006	0.007	0.007	0.005	0.004
Israel	5,037	0.002	0.001	0.000	0.000	0.002
Thailand	4,007	0.010	0.031	0.047	0.053	0.044
New Zealand	3,592	0.000	0.000	0.000	0.000	0.000
Peru	2,896	0.002	0.002	0.002	0.001	0.002
Egypt	2,567	0.015	0.009	0.007	0.010	0.014
Canada	2,312	0.000	0.000	0.000	0.000	0.001
Kenya	2,279	0.000	0.002	0.007	0.009	0.007
Panama	2,065	0.003	0.003	0.000	0.000	0.001
Cote d'Ivoire	1,973	0.003	0.003	0.003	0.002	0.005
Cameroon	1,612	0.002	0.000	0.000	0.000	0.000
India	1,538	0.050	0.060	0.020	0.020	0.015
Mexico	1,314	0.005	0.000	0.000	0.000	0.000
Serbia	1,042	0.000	0.000	0.001	0.003	0.003
Dominican Republic	919	0.000	0.005	0.014	0.021	0.022
Switzerland	787	0.000	0.000	0.000	0.000	0.000
Tunisia	780	0.010	0.020	0.029	0.032	0.038
Ukraine	749	0.005	0.006	0.008	0.016	0.013
Ghana	745	0.018	0.025	0.014	0.022	0.023
Serbia and Montenegro	643	0.002	0.002	0.000	0.000	0.000
Uruguay	568	0.005	0.005	0.004	0.004	0.014
Russian Federation	560	0.012	0.008	0.007	0.012	0.008
Indonesia	548	0.004	0.008	0.012	0.008	0.004
Australia	534	0.000	0.000	0.013	0.013	0.013
Iran	522	0.013	0.086	0.111	0.105	0.056
<b>Average</b>	<b>-</b>	<b>0.010</b>	<b>0.012</b>	<b>0.012</b>	<b>0.013</b>	<b>0.013</b>

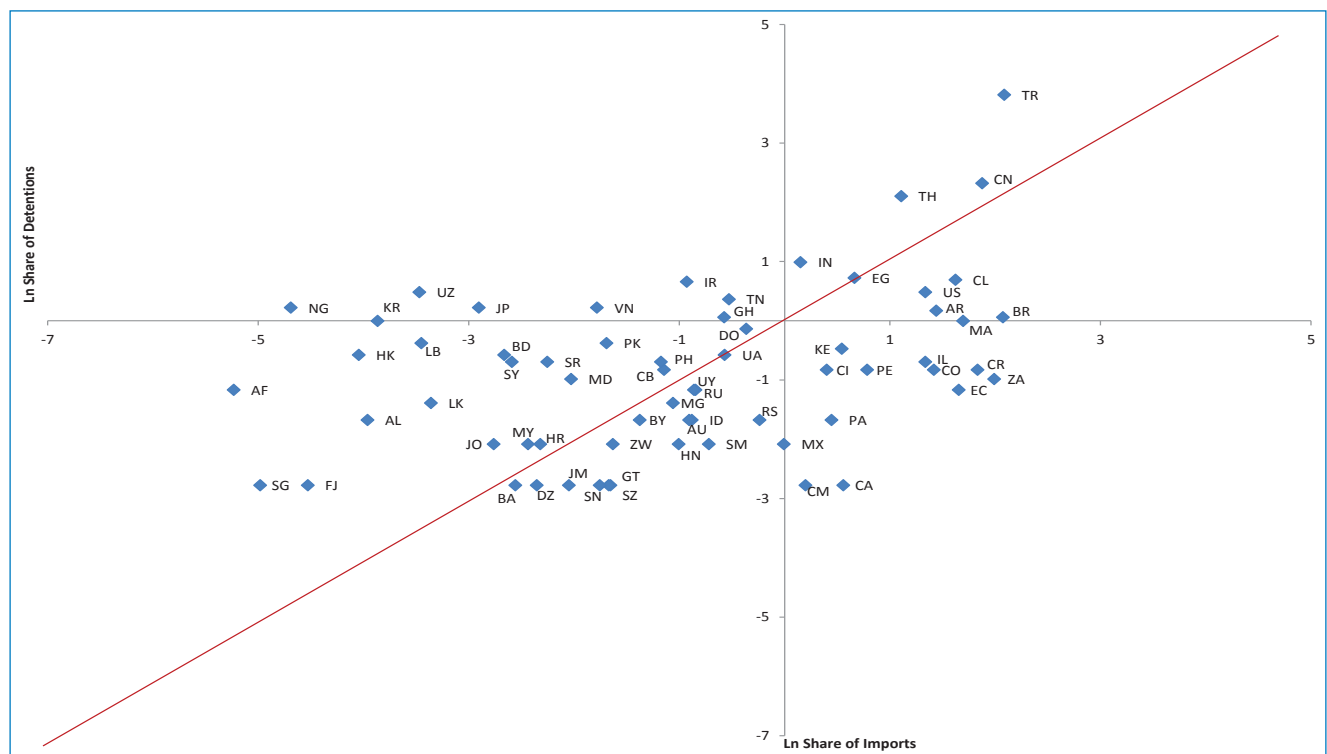
Note: Rejection rate converted to US\$ at respective average annual exchange rate.



**Table 21. Unit rejection rate for US fruit and vegetable imports, 2002-2008**

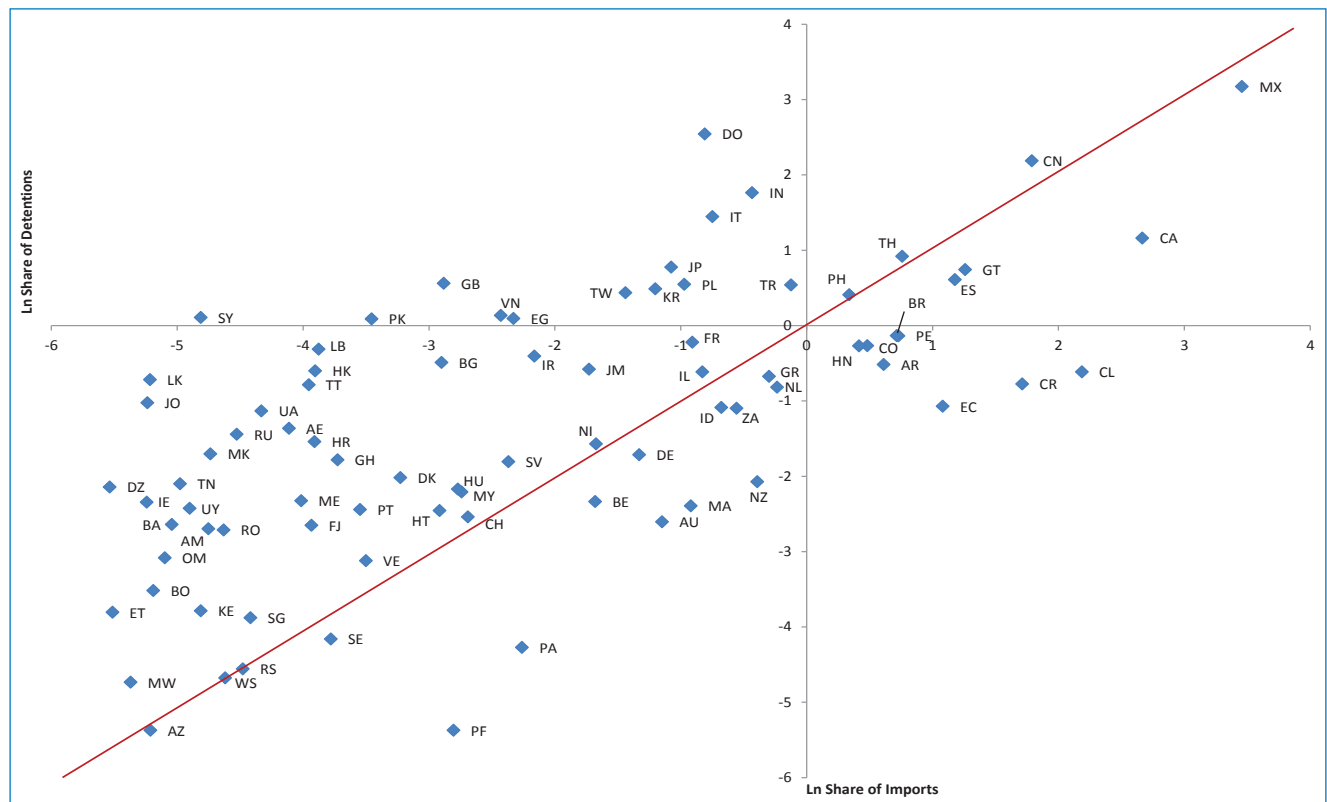
Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
Mexico	29,726	0.245	0.214	0.207	0.156	0.098
Canada	13,323	0.047	0.039	0.033	0.021	0.037
Chile	8,294	0.020	0.016	0.010	0.009	0.009
China	5,931	0.614	0.542	0.403	0.277	0.167
Costa Rica	5,115	0.038	0.025	0.021	0.012	0.007
Guatemala	3,246	0.152	0.134	0.119	0.107	0.094
Spain	2,906	0.222	0.122	0.094	0.054	0.062
Ecuador	2,680	0.037	0.041	0.038	0.027	0.013
Peru	2,022	0.086	0.097	0.083	0.077	0.064
Thailand	1,993	0.372	0.306	0.257	0.184	0.162
Brazil	1,986	0.195	0.154	0.144	0.075	0.042
Argentina	1,764	0.079	0.066	0.075	0.072	0.059
Colombia	1,462	0.147	0.175	0.161	0.083	0.057
Honduras	1,380	0.034	0.035	0.047	0.038	0.121
Philippines	1,265	0.294	0.299	0.186	0.165	0.164
Turkey	852	0.911	0.512	0.404	0.347	0.209
Greece	681	0.320	0.188	0.092	0.069	0.033
Netherlands	667	0.157	0.143	0.121	0.118	0.133
New Zealand	611	0.071	0.090	0.044	0.038	0.005
India	610	2.414	2.024	2.114	1.870	1.464
South Africa	513	0.101	0.113	0.141	0.100	0.129
Indonesia	458	0.064	0.049	0.049	0.110	0.183
Italy	437	1.885	2.324	2.208	2.338	1.631
Dominican Republic	402	5.937	6.685	8.858	8.645	6.649
Israel	377	0.289	0.253	0.224	0.238	0.281
France	370	0.676	0.522	0.446	0.418	0.273
Morocco	369	0.054	0.047	0.042	0.017	0.038
Poland	326	1.281	1.013	1.027	1.009	0.804
Japan	309	2.039	1.286	1.082	1.003	0.891
Australia	289	0.036	0.036	0.105	0.069	0.077
Korea, South	280	2.307	2.062	0.647	0.381	0.528
Germany	225	0.106	0.197	0.218	0.292	0.185
Taiwan	215	1.395	1.419	1.604	1.566	1.388
Belize	200	0.000	0.000	0.000	0.000	0.000
Nicaragua	181	0.316	0.293	0.263	0.135	0.163
Belgium	171	0.225	0.110	0.064	0.051	0.050
Jamaica	162	0.709	1.016	1.062	0.915	0.466
Iran	122	9.540	6.787	2.686	0.631	0.586
Average	-	0.297	0.264	0.238	0.196	0.147

**Figure 10. Share of EU rejections versus share of imports for fruit and vegetables and fruit and vegetable products from Third Countries, 2002-2008**



Note: Includes countries with annual exports of food and feed products of US\$500,000 or above and with non-zero rejections; converted to US\$ at respective average annual exchange rate.

**Figure 11. Share of US rejections versus share of imports for fruit and vegetables, 2002-2008**



Note: Includes countries with annual exports of food and feed products of US\$500,000 or above and with non-zero rejections.

Figures 10 and 11 report the relative rejection rates of fruit and vegetable exporting countries to the EU and the US over the period 2002 to 2008. For both the EU and the US, Chile, Brazil, Argentina, Ecuador, Morocco, Mexico, Guatemala, Colombia and Peru (among others) stand out as having low relative rejection rates, and thus are good compliance performers. Turkey, India, Iran and Vietnam, for example, underperform in both the EU and the US, in that they account for a greater proportion of rejections than their share of fruits and vegetable imports. China's performance in both markets is marginal, being positioned just above the 45° line. Thailand has a high relative rejection rate for fruit and vegetable exports to the EU, but performs better with exports to the US, being positioned almost on the diagonal.

In both the EU and the US, pesticide residues were a major cause of rejections of fruits and vegetables over the period 2002 to 2008, accounting for 27 per cent of rejections in the EU and being referenced in 33 per cent of US rejections (Tables 22 and 23). In the EU, mycotoxins and unauthorised food additives were also frequent causes of rejections, accounting for 24 per cent and 17 per cent of the total, respectively. The most frequently referenced non-conformity in US rejections of fruits and vegetables was unregistered process/manufacture, being cited in over 42 per cent of rejections. Labelling was cited in almost 30 per cent of rejections and filthy/unsanitary in almost 24 per cent.

**Table 22. Reasons for EU rejections of fruit and vegetables and fruit and vegetable products from Third Countries, 2002-2008**

Country	Pesticide residues	Mycotoxins	Unauthorised food additives	Microbiological contaminants	Product composition	Foreign bodies	Heavy metals	Organoleptic aspects	GMO/novel food	Labelling	Not determined/other	Total
Turkey	146	375	173	12	8	40	0	6	0	5	14	779
China	7	3	45	35	37	8	22	6	2	4	16	185
Thailand	95	0	36	38	0	1	3	2	0	0	1	176
India	39	3	2	2	8	1	1	0	0	0	1	57
Egypt	31	1	0	2	1	3	0	1	0	0	2	41
Chile	16	1	8	3	0	2	3	0	0	0	0	33
Iran	8	14	8	0	0	2	2	0	0	0	1	35
Uzbekistan	0	19	0	2	5	0	0	0	0	0	0	26
USA	3	3	1	3	1	1	3	0	10	0	1	26
Tunisia	1	1	0	2	0	16	3	1	0	1	4	29
Vietnam	3	0	1	25	0	0	0	1	0	0	0	30
Japan	0	0	2	0	16	0	7	0	0	0	0	25
Nigeria	0	9	0	1	0	3	7	1	0	1	0	22
Argentina	12	0	6	2	0	0	0	2	0	0	2	24
Brazil	10	1	4	0	0	0	0	2	1	0	1	19
Ghana	0	1	0	5	0	4	1	5	0	1	5	22
South Korea	0	0	0	0	16	0	0	0	0	0	0	16
Morocco	12	1	0	0	1	0	1	0	0	0	1	16
Dominican Republic	15	0	1	0	0	0	0	0	0	0	0	16
Lebanon	12	0	0	1	2	0	0	0	0	0	0	15
Pakistan	1	0	1	1	6	1	2	0	0	0	0	12
Kenya	8	0	0	0	0	0	6	0	0	0	0	14
Other	79	9	27	28	16	7	13	11	2	2	21	215
<b>Total</b>	<b>498</b>	<b>441</b>	<b>315</b>	<b>162</b>	<b>117</b>	<b>89</b>	<b>74</b>	<b>38</b>	<b>15</b>	<b>14</b>	<b>70</b>	<b>1,833</b>
<b>% rejections</b>	<b>27.2</b>	<b>24.1</b>	<b>17.2</b>	<b>8.8</b>	<b>6.4</b>	<b>4.9</b>	<b>4.0</b>	<b>2.1</b>	<b>0.8</b>	<b>0.8</b>	<b>3.8</b>	<b>100.0</b>

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

**Table 23. Reasons for US rejections of fruit and vegetables, 2002-2008**

Country	Unregistered process/manufacture	Pesticide residues	Labelling	Filthy/unsanitary	Unauthorised food additives	Microbiological contaminants	Product composition	Poisonous	Other	Total
Mexico	272	2045	302	2017	174	320	0	5	13	5,148
China	683	346	441	720	521	14	5	16	27	2,773
Dominican Republic	15	2455	44	58	2	1	1	2	2	2,580
India	647	194	649	268	97	19	8	0	2	1,884
Italy	923	9	252	120	6	1	0	0	2	1,313
Canada	122	249	316	62	36	6	5	2	16	814
Japan	409	3	152	11	139	0	0	0	2	716
Taiwan	166	11	211	51	263	0	2	1	4	709
United Kingdom	322	1	279	4	40	1	0	0	0	647
Thailand	224	48	91	180	72	9	1	2	4	631
Turkey	314	15	129	50	19	0	0	7	8	542
Poland	330	54	81	10	19	0	3	0	1	498
Spain	206	182	78	16	5	0	3	0	2	492
Egypt	160	28	223	27	11	6	27	0	0	482
South Korea	295	11	134	19	4	0	2	1	3	469
Guatemala	73	294	75	8	5	0	5	0	0	460
Syria	166	2	205	51	12	2	0	0	4	442
Pakistan	154	3	108	64	35	1	3	0	3	371
Philippines	176	9	32	94	36	19	1	2	2	371
Vietnam	164	14	87	47	29	5	0	1	3	350
Brazil	195	27	68	7	3	0	0	0	0	300
Lebanon	75	1	138	28	30	0	20	0	6	298
Colombia	172	36	42	27	2	0	0	0	1	280
France	131	21	63	17	14	1	0	2	2	251
Iran	76	21	83	57	1	1	1	0	2	242
Peru	107	58	44	6	5	5	0	0	0	225
Sri Lanka	90	0	100	27	8	0	0	0	0	225
Honduras	35	10	29	92	0	48	0	0	0	214
Greece	103	4	81	10	4	0	0	0	6	208
Other	1,434	387	1,260	470	182	59	51	42	30	3,915
<b>Total</b>	<b>8,239</b>	<b>6,538</b>	<b>5,797</b>	<b>4,618</b>	<b>1,774</b>	<b>518</b>	<b>138</b>	<b>83</b>	<b>145</b>	<b>27,850</b>
<b>% rejections</b>	<b>42.1</b>	<b>33.4</b>	<b>29.7</b>	<b>23.6</b>	<b>9.1</b>	<b>2.6</b>	<b>0.7</b>	<b>0.4</b>	<b>0.7</b>	<b>-</b>

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

### 5.3 Nuts and seeds and nut and seed products

Nuts and seeds and nut and seed products for human consumption (rather than oil extraction) were subject to the greatest number of rejections of all food and feed product imports to the EU over the period 2002 to 2008, with an average of 669 annually. Of the 4,680 rejections over this period, Iran alone accounted for 43 per cent (Table 24). Other countries with large numbers of rejections included Turkey, China and the US. These four countries accounted for 75 per cent of total EU rejections of

nuts and seeds. The US, in stark contrast, had itself relatively few rejections of nuts and seeds, totalling only 1,043 over the period 2002 to 2008 (Table 25). India, Mexico and China alone accounted for 46 per cent of US nuts and seeds rejections.

Of the largest exporters of nuts and seeds to the EU, Iran and China had the highest unit rejection rates over the period 2002 to 2008 (Table 26). While Turkey had large numbers of rejections over this period, the magnitude of its exports meant that its unit rejection rate was much lower than other large exporters.

**Table 24. Number of EU rejections of nuts and seeds from Third Countries, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
Iran	63	491	485	457	233	127	162	2,018	288.3
Turkey	71	66	45	66	108	148	110	614	87.7
China	19	45	60	86	72	85	180	547	78.1
USA	8	18	33	46	67	89	75	336	48.0
Argentina	5	24	27	22	45	21	31	175	25.0
Brazil	49	21	13	36	25	7	17	168	24.0
Egypt	6	26	16	15	19	14	30	126	18.0
India	0	1	32	24	9	18	29	113	16.1
Nigeria	0	4	2	15	15	24	18	78	11.1
Ghana	1	4	12	15	23	5	8	68	9.7
South Africa	12	12	0	7	6	4	4	45	6.4
Lebanon	2	3	5	1	5	10	9	35	5.0
Sudan	0	0	13	4	10	2	0	29	4.1
Nicaragua	0	1	9	1	0	9	7	27	3.9
Paraguay	0	2	1	6	5	2	9	25	3.6
Philippines	1	0	0	4	6	5	9	25	3.6
Syria	0	0	6	6	1	5	6	24	3.4
Israel	0	1	3	4	8	1	2	19	2.7
Azerbaijan	0	0	0	11	5	0	1	17	2.4
Australia	0	0	0	1	0	5	9	15	2.1
Vietnam	0	0	0	0	8	4	3	15	2.1
Pakistan	0	2	0	6	0	4	1	13	1.9
Ukraine	0	0	3	3	5	1	1	13	1.9
Singapore	0	0	1	1	5	3	2	12	1.7
Thailand	1	1	2	0	3	4	1	12	1.7
Malawi	0	0	0	4	3	2	1	10	1.4
Other	6	9	9	17	21	20	19	101	14.4
<b>Total</b>	<b>244</b>	<b>731</b>	<b>777</b>	<b>858</b>	<b>707</b>	<b>619</b>	<b>744</b>	<b>4,680</b>	<b>668.6</b>

**Table 25. Number of US rejections of nuts and seeds, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
India	8	35	41	29	56	24	11	204	29.1
Mexico	8	13	10	28	55	31	13	158	22.6
China	38	16	20	20	17	4	6	121	17.3
Canada	10	11	8	8	7	11	10	65	9.3
Vietnam	10	12	8	1	10	14	3	58	8.3
Philippines	3	11	9	9	0	1	10	43	6.1
Lebanon	5	9	3	10	9	3	0	39	5.6
Pakistan	7	3	14	1	0	0	1	26	3.7
Taiwan	2	5	3	1	2	5	4	22	3.1
Japan	9	1	0	1	0	7	2	20	2.9
Italy	2	3	7	1	1	4	1	19	2.7
Ghana	6	0	4	0	2	1	0	13	1.9
Guatemala	3	0	4	0	1	3	2	13	1.9
Indonesia	0	1	0	6	1	3	2	13	1.9
Syria	0	0	0	0	2	11	0	13	1.9
Turkey	2	4	3	0	2	2	0	13	1.9
Colombia	0	1	3	0	2	6	0	12	1.7
Egypt	1	3	0	5	1	1	0	11	1.6
Iran	1	2	2	0	3	3	0	11	1.6
Haiti	0	0	2	2	4	2	0	10	1.4
Spain	1	0	2	1	4	0	2	10	1.4
Thailand	2	1	1	2	1	3	0	10	1.4
Other	18	27	24	21	24	19	6	139	19.9
<b>Total</b>	<b>136</b>	<b>158</b>	<b>168</b>	<b>146</b>	<b>204</b>	<b>158</b>	<b>73</b>	<b>1,043</b>	<b>149.0</b>

Amongst smaller exporters, Brazil, Egypt, Nicaragua, Ghana and Thailand had high unit rejection rates. Of major exporters to the US, India and Mexico had the highest unit rejection rates (Table 27). Vietnam and (especially) Brazil had relatively low unit rejection rates.

Figures 12 and 13 present the relative rejection rates for nut and seed imports to the EU and the US over the period 2002 to 2008. In the EU, Iran, Brazil, Egypt, Ghana and Nigeria were clear under-performers, accounting for a much higher share of rejections than their share of imports. In stark contrast, Brazil was one of the best performers amongst large exporters of nuts and seeds to the US. Countries with relatively good performance in nut and seed exports to the EU included the US, Turkey, Argen-

tina, India, Vietnam and Chile. Iran and Nigeria had high relative rejection rates for nut and seed exports to the US, but were small exporters.

Of the total EU rejections of nuts and seeds over the period 2002 to 2008, 94 per cent were due to mycotoxins (Table 28), totalling 4,502. Iran alone accounted for almost 45 per cent of these rejections. In contrast, mycotoxins were only referenced in 142 US rejections of nuts and seeds over the same period (Table 29). The EU's official controls on mycotoxins, and especially aflatoxins, and their impact on developing country exports of nuts and other food commodities have been widely discussed in the literature (see for example Diaz Rios and Jaffee, 2008; Otsuki *et al.*, 2001; Otsuki and Wilson, 2001).

**Table 26. Unit rejection rate for EU nuts and seeds imports from Third Countries, 2002-2008**

Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
USA	8,809	0.020	0.026	0.034	0.045	0.051
Turkey	7,180	0.103	0.074	0.060	0.085	0.097
China	1,855	0.188	0.264	0.291	0.300	0.338
Argentina	1,479	0.150	0.173	0.173	0.129	0.111
India	1,457	0.056	0.088	0.099	0.072	0.077
Iran	1,340	1.795	2.426	1.901	1.375	0.899
Vietnam	847	0.000	0.000	0.023	0.031	0.035
Brazil	350	1.101	0.538	0.415	0.363	0.273
Chile	320	0.023	0.023	0.023	0.000	0.000
Philippines	295	0.012	0.031	0.081	0.114	0.125
Bolivia	264	0.037	0.049	0.020	0.027	0.027
Australia	257	0.000	0.008	0.008	0.043	0.098
Georgia	220	0.000	0.000	0.032	0.044	0.044
Indonesia	210	0.000	0.023	0.023	0.023	0.025
Moldova	204	0.000	0.000	0.010	0.018	0.027
South Africa	196	0.311	0.236	0.141	0.188	0.168
Ukraine	176	0.058	0.087	0.145	0.099	0.079
Azerbaijan	173	0.000	0.055	0.105	0.105	0.082
Sri Lanka	130	0.000	0.021	0.021	0.021	0.000
Israel	109	0.100	0.192	0.350	0.297	0.233
Egypt	94	1.975	1.921	1.154	1.029	1.193
Nicaragua	78	0.373	0.398	0.350	0.316	0.392
Pakistan	57	0.065	0.398	0.333	0.553	0.246
Morocco	53	0.000	0.030	0.107	0.107	0.077
Cote d'Ivoire	48	0.122	0.122	0.101	0.053	0.053
Norway	36	0.000	0.000	0.000	0.036	0.036
Thailand	31	0.432	0.307	0.416	0.435	0.481
Ghana	30	1.355	1.586	4.142	4.084	4.132
<b>Average</b>	<b>-</b>	<b>0.213</b>	<b>0.238</b>	<b>0.191</b>	<b>0.160</b>	<b>0.146</b>

*Note: Rejection rate converted to US\$ at respective average annual exchange rate.*

**Table 27. Unit rejection rate for US nuts and seeds imports, 2002-2008**

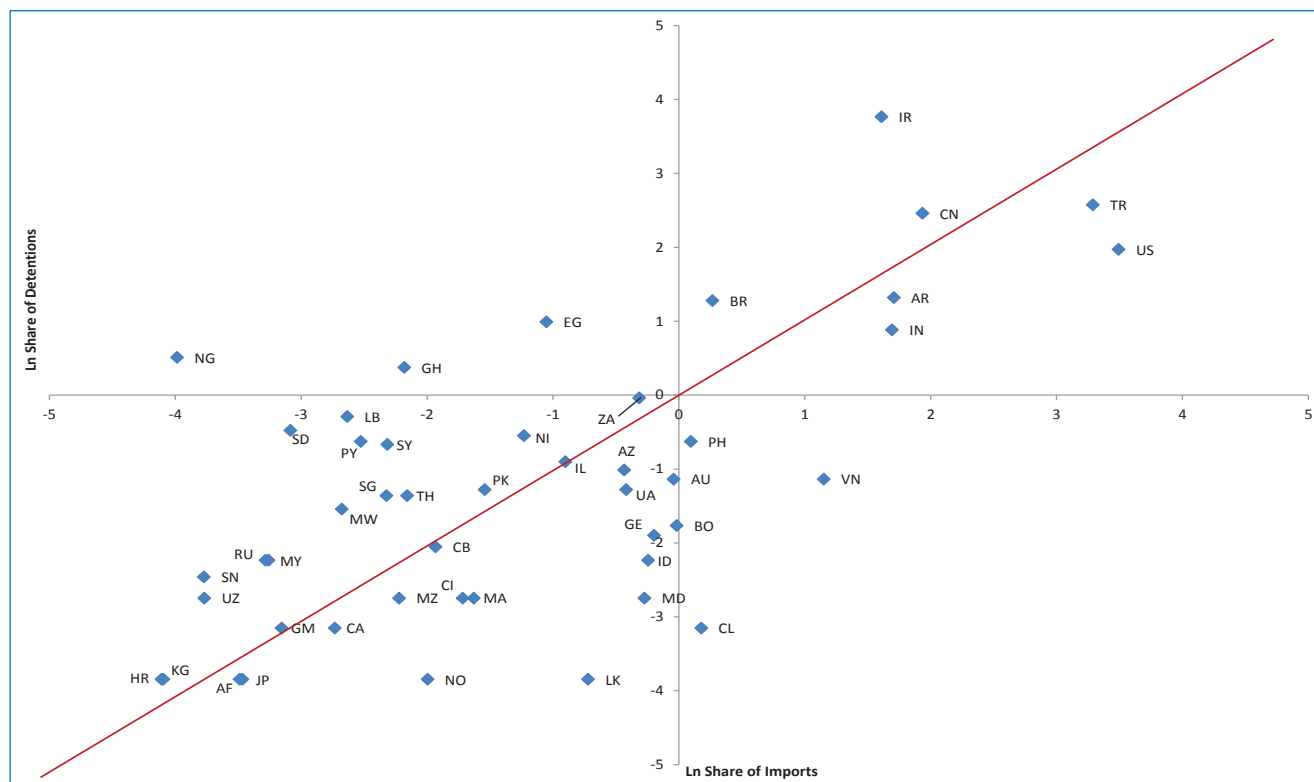
Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
India	1,649	0.121	0.144	0.170	0.157	0.136
Vietnam	1,257	0.101	0.056	0.035	0.039	0.041
Mexico	1,016	0.102	0.128	0.189	0.228	0.186
Brazil	994	0.014	0.012	0.015	0.008	0.002
China	606	0.515	0.276	0.221	0.142	0.080
Philippines	302	0.207	0.253	0.157	0.080	0.065
Canada	298	0.271	0.252	0.192	0.200	0.187
Turkey	262	0.107	0.075	0.044	0.031	0.031
Thailand	207	0.088	0.049	0.039	0.058	0.039
Australia	134	0.000	0.000	0.000	0.000	0.000
Bolivia	123	0.000	0.000	0.000	0.032	0.032
Argentina	109	0.000	0.000	0.153	0.153	0.153
South Africa	108	0.000	0.000	0.000	0.000	0.000
Italy	97	0.498	0.415	0.309	0.119	0.124
Dominican Republic	91	0.000	0.000	0.000	0.050	0.050
Spain	75	0.203	0.143	0.220	0.120	0.119
Peru	65	0.000	0.070	0.070	0.098	0.028
Guatemala	60	0.430	0.126	0.156	0.131	0.191
Lebanon	60	1.107	1.022	0.827	0.770	0.442
Kenya	54	0.000	0.000	0.000	0.000	0.000
Israel	53	0.071	0.071	0.071	0.075	0.095
Indonesia	46	0.147	0.399	0.300	0.390	0.192
Tanzania	35	0.000	0.000	0.000	0.000	0.000
Cote d'Ivoire	34	0.000	0.000	0.000	0.000	0.000
<b>Average</b>	<b>-</b>	<b>0.173</b>	<b>0.152</b>	<b>0.145</b>	<b>0.136</b>	<b>0.113</b>

The most frequent reasons for non-compliance cited in US rejections of nuts and seeds were labelling, referenced in 57 per cent of rejections, unregistered process/manufacturer and microbiological contaminants. The latter of these reasons was

referenced in 168 rejections, accounting for 16 per cent of the total. Microbiological contaminants was the second most frequent reason for rejections of nuts and seeds in the EU over the period 2002 to 2008, accounting for 117 rejections.

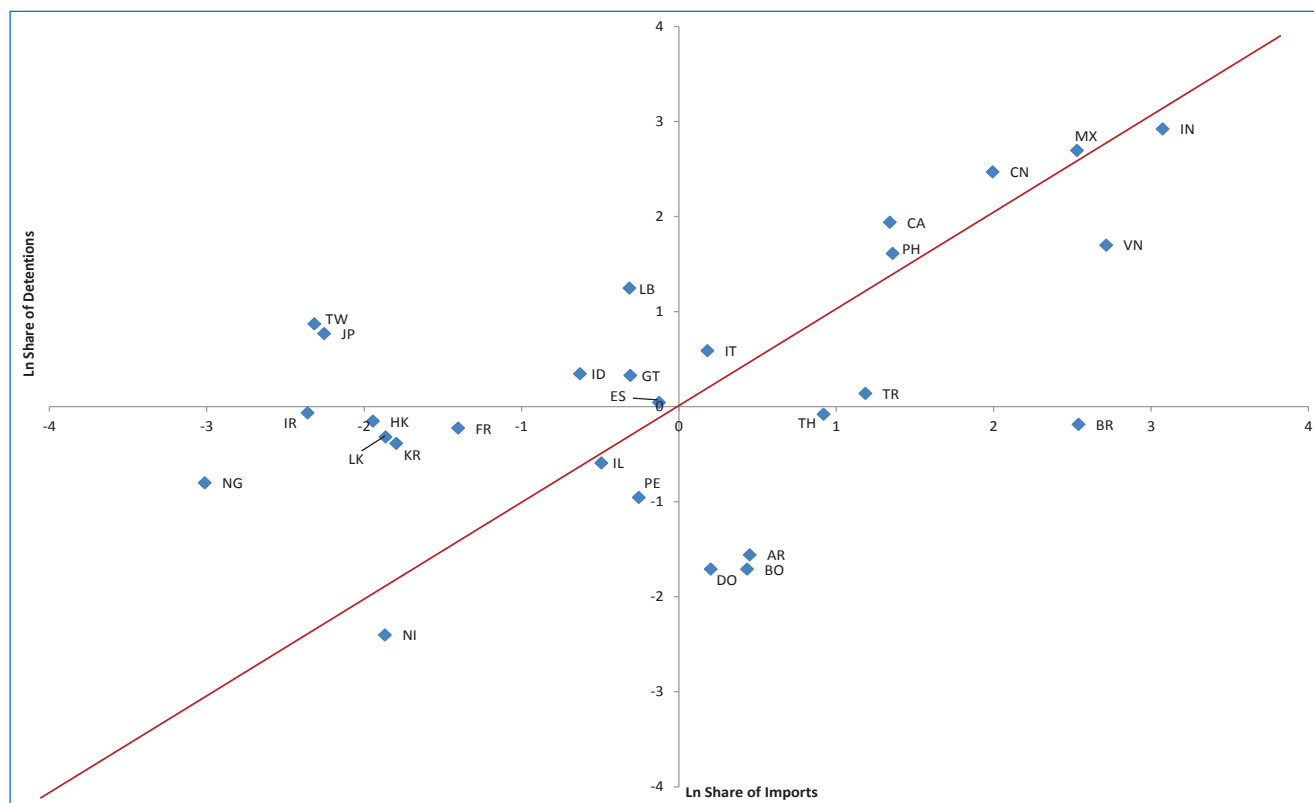


**Figure 12. Share of EU rejections versus share of imports for nuts and seeds products from Third Countries, 2002-2008**



Note: Includes countries with annual exports of food and feed products of US\$500,000 or above and with non-zero rejections; converted to US\$ at respective average annual exchange rate.

**Figure 13. Share of US rejections versus share of imports for nuts and seeds, 2002-2008**



Note: Includes countries with annual exports of US\$500,000 or above and with non-zero rejections.

**Table 28. Reasons for EU rejections of nuts and seeds from Third Countries, 2002-2008**

Country	<i>Mycotoxins</i>	<i>Microbiological contaminants</i>	<i>Foreign bodies</i>	<i>Organoleptic aspects</i>	<i>Not determined/ other</i>	<i>Total</i>
Iran	2,020	1	2	0	4	2,027
Turkey	590	12	4	0	13	619
China	495	19	20	5	27	566
USA	333	6	9	5	4	357
Argentina	172	1	0	1	3	177
Brazil	165	0	0	0	3	168
Egypt	122	1	0	0	4	127
India	68	48	2	7	0	125
Nigeria	74	2	2	0	0	78
Ghana	68	1	0	0	0	69
South Africa	46	0	0	0	0	46
Lebanon	31	2	0	0	2	35
Sudan	29	0	0	0	0	29
Nicaragua	27	0	0	0	1	28
Paraguay	25	0	0	0	0	25
Philippines	23	1	0	0	1	25
Syria	19	5	0	0	0	24
Israel	19	0	0	0	0	19
Azerbaijan	17	0	0	0	0	17
Australia	14	0	0	0	1	15
Vietnam	16	0	0	0	0	16
Pakistan	11	3	0	0	0	14
Ukraine	0	1	8	2	7	18
Singapore	10	0	2	0	0	12
Thailand	12	0	0	0	0	12
Malawi	10	0	0	0	0	10
Other	86	14	1	4	14	119
<b>Total</b>	<b>4,502</b>	<b>117</b>	<b>50</b>	<b>24</b>	<b>84</b>	<b>4,777</b>
<b>% rejections</b>	<b>94.2</b>	<b>2.4</b>	<b>1.0</b>	<b>0.5</b>	<b>1.8</b>	<b>100.0</b>

**Table 29. Reasons for US rejections of nuts and seeds, 2002-2008**

Country	Labelling	Unregistered process/manufacturere	Microbiological contaminants	Unauthorised food additives	Mycotoxins	Filthy/unsanitary	Pesticide residues	Poisonous	Other	Total
India	50	0	40	26	32	12	71	25	0	256
Mexico	82	0	42	13	43	37	3	0	2	222
China	30	38	7	49	6	13	12	3	1	159
Canada	74	0	1	7	18	5	1	2	0	108
Vietnam	33	3	7	29	8	3	0	4	1	88
Philippines	6	48	1	9	0	2	0	1	1	68
Lebanon	4	1	39	0	1	2	0	0	0	47
Japan	13	26	0	0	0	0	0	0	0	39
Taiwan	14	11	0	10	0	1	1	2	0	39
Italy	19	9	0	5	1	2	0	0	0	36
Pakistan	17	0	0	1	3	2	0	13	0	36
Egypt	21	2	4	0	0	2	0	0	0	29
Turkey	16	1	0	1	6	1	0	0	0	25
Iran	15	0	1	1	5	2	0	0	0	24
France	10	11	0	0	0	0	0	0	0	21
Guatemala	12	3	2	0	2	1	0	0	0	20
Haiti	17	0	2	0	0	1	0	0	0	20
Indonesia	6	4	1	2	3	0	0	2	0	18
Colombia	8	0	0	0	9	0	0	0	0	17
Ghana	9	0	1	0	2	4	1	0	0	17
Syria	5	0	12	0	0	0	0	0	0	17
Brazil	7	8	0	0	0	1	0	0	0	16
Hong Kong	12	0	0	2	0	0	0	0	1	15
Spain	1	12	0	0	0	1	0	0	1	15
Sri Lanka	9	3	0	0	0	3	0	0	0	15
Nigeria	9	0	1	0	0	4	0	0	0	14
United Kingdom	5	5	0	2	0	0	0	0	0	12
Other	94	27	7	5	8	17	0	4	0	162
<b>Total</b>	<b>598</b>	<b>212</b>	<b>168</b>	<b>162</b>	<b>147</b>	<b>116</b>	<b>89</b>	<b>56</b>	<b>7</b>	<b>1,555</b>
<b>% rejections</b>	<b>57.3</b>	<b>20.3</b>	<b>16.1</b>	<b>15.5</b>	<b>14.1</b>	<b>11.1</b>	<b>8.5</b>	<b>5.4</b>	<b>0.7</b>	<b>-</b>

## 5.4 Herbs and spices

In both the EU and the US, India had the greatest number of rejections of herbs and spices (Tables 30 and 31), accounting for 24 per cent and 39 per cent of herb and spice rejections, respectively. Other countries with high numbers of rejections of herbs and spices included Thailand and Turkey in the EU and Mexico, Pakistan, Indonesia, China and Vietnam in the US. Note that herbs and spices as a commodity group includes a great diversity of products. Thus, the patterns of rejections across countries very much reflects the types of herb and spice exported and their associated compliance challenges.<sup>11</sup>

Of the countries with appreciable exports of herbs and spices to the EU from 2002 to 2008, Thailand stands out as having by far the highest unit rejection rate (Table 32) at more than one rejection per US\$1 million of exports in some periods. Other exporters with high rejection rates included India, Turkey, Morocco, Egypt and Sri Lanka. Countries with very low unit rejection

rates included Madagascar, Israel, Brazil, Iran, Kenya, Chile and Guatemala; some of these countries recorded no rejections over the period 2002 to 2008.

The unit rejection rate for herbs and spices in the US over the period 2002 to 2008 was much higher than for any other of the commodities analysed in this report (Table 33). Indeed, a number of countries, including India, Mexico, Sri Lanka, Canada Thailand and Guatemala, had unit rejection rates above one. Mexico, for example, had almost three rejections per US\$1 million of exports over the period 2006 to 2008. Countries with low rejection rates included Madagascar, Brazil, Peru, Germany, Israel, Chile, France and Uganda.

In terms of relative rejection rates, China, Vietnam, Peru, Brazil and Chile are among the developing countries that had a good compliance performance with herb and spice exports to both the EU and the US over the period 2002 to 2008 (Figures 14 and 15), while in both the EU and the US, India, Pakistan and Thailand were relatively poor performers, accounting for a greater proportion of rejections of herbs and spices than their share of imports. In the EU, other notable bad compliance performers included Turkey, Thailand, Egypt and Ghana.

<sup>11</sup> For example, there are potentially a range of food safety issues associated with chilli powder, including microbiological contamination and adulteration with artificial colour. Conversely, there are few concerns with vanilla.

**Table 30. Number of EU rejections of herb and spices from Third Countries, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
India	10	35	39	47	24	27	19	201	38.9
Thailand	4	1	2	58	15	21	24	125	21.4
Turkey	1	21	42	16	10	8	6	104	12.4
Pakistan	2	6	10	16	5	3	2	44	5.9
Egypt	0	6	14	5	3	4	2	34	4.1
China	2	1	8	7	6	6	3	33	5.1
Russian Federation	0	0	0	17	13	0	1	31	3.4
Vietnam	0	1	2	7	7	6	4	27	3.8
Ghana	0	0	4	4	9	0	4	21	2.6
Morocco	2	1	0	6	7	2	3	21	3.0
Brazil	0	0	4	4	3	0	3	14	1.8
Indonesia	2	1	2	4	2	1	2	14	2.7
Ukraine	0	0	0	6	4	1	2	13	1.4
Peru	0	1	0	1	0	10	0	12	3.1
Sri Lanka	0	0	3	3	1	2	2	11	1.4
Syria	1	0	4	1	0	3	1	10	1.1
Lebanon	0	2	2	2	2	1	0	9	1.1
Other	2	10	24	30	20	18	13	16.7	117.0
<b>Total</b>	<b>26</b>	<b>86</b>	<b>160</b>	<b>234</b>	<b>131</b>	<b>113</b>	<b>91</b>	<b>841</b>	<b>120.1</b>

**Table 31. Number of US rejections of herbs and spices, 2002-2008**

Country	Year							Total	Annual Average
	2002	2003	2004	2005	2006	2007	2008		
India	125	149	173	181	202	282	252	1,364	194.9
Mexico	17	18	27	20	15	43	420	560	80.0
Pakistan	25	18	13	22	45	45	23	191	27.3
Indonesia	3	10	23	14	63	39	5	157	22.4
China	12	26	10	11	8	20	10	97	13.9
Vietnam	11	6	22	11	18	20	4	92	13.1
United Kingdom	33	4	5	9	13	4	8	76	10.9
Turkey	9	17	27	6	5	7	1	72	10.3
Canada	7	6	13	7	6	9	17	65	9.3
Thailand	5	4	7	17	17	9	6	65	9.3
Sri Lanka	11	4	1	8	10	25	5	64	9.1
Japan	32	2	11	0	0	1	0	46	6.6
Brazil	4	8	7	7	1	5	7	39	5.6
Egypt	4	11	1	9	5	3	1	34	4.9
Peru	0	1	5	17	4	0	7	34	4.9
Guatemala	1	1	4	3	7	14	3	33	4.7
Poland	27	2	2	0	1	0	0	32	4.6
Italy	3	2	10	3	2	3	4	27	3.9
Spain	0	8	4	2	3	2	7	26	3.7
Syria	1	1	3	8	6	3	4	26	3.7
Jamaica	3	4	3	1	3	6	5	25	3.6
Ecuador	0	0	0	0	1	21	0	22	3.1
Philippines	1	4	3	2	2	9	1	22	3.1
Taiwan	3	5	1	3	2	1	5	20	2.9
Other	48	50	50	24	38	46	48	286	40.9
<b>Total</b>	<b>385</b>	<b>361</b>	<b>425</b>	<b>385</b>	<b>477</b>	<b>617</b>	<b>825</b>	<b>3,475</b>	<b>496</b>

The main reason for EU rejections of herbs and spices over the period 2002 to 2008 was unauthorised food additives, accounting for almost 44 per cent of the total (Table 34). This pattern reflects on-going problems with adulteration of spices such as chilli powder with artificial dyes, for example Sudan I.<sup>12</sup> In the US, artificial food additives were only referenced in five per cent of rejections (Table 35). Microbiological contamination was a

significant cause of rejections of herbs and spices in both the US and EU, being referenced in almost 58 per cent of US rejections and 24 per cent of EU rejections. In the US, the more generic category filthy/unsanitary was referenced in 16 per cent of rejections. Other frequent reasons for rejections included mycotoxins in the EU and labelling and unregistered process/manufacture in the US.

<sup>12</sup> Under Decision 2003/460/EC, all hot chilli and hot chilli products imported to the EU were required to be tested for Sudan I. Under Decision 2004/92/EC, this requirement was extended to Sudan II, III and IV.

**Table 32. Unit rejection rate for EU herb and spice imports from Third Countries, 2002-2008**

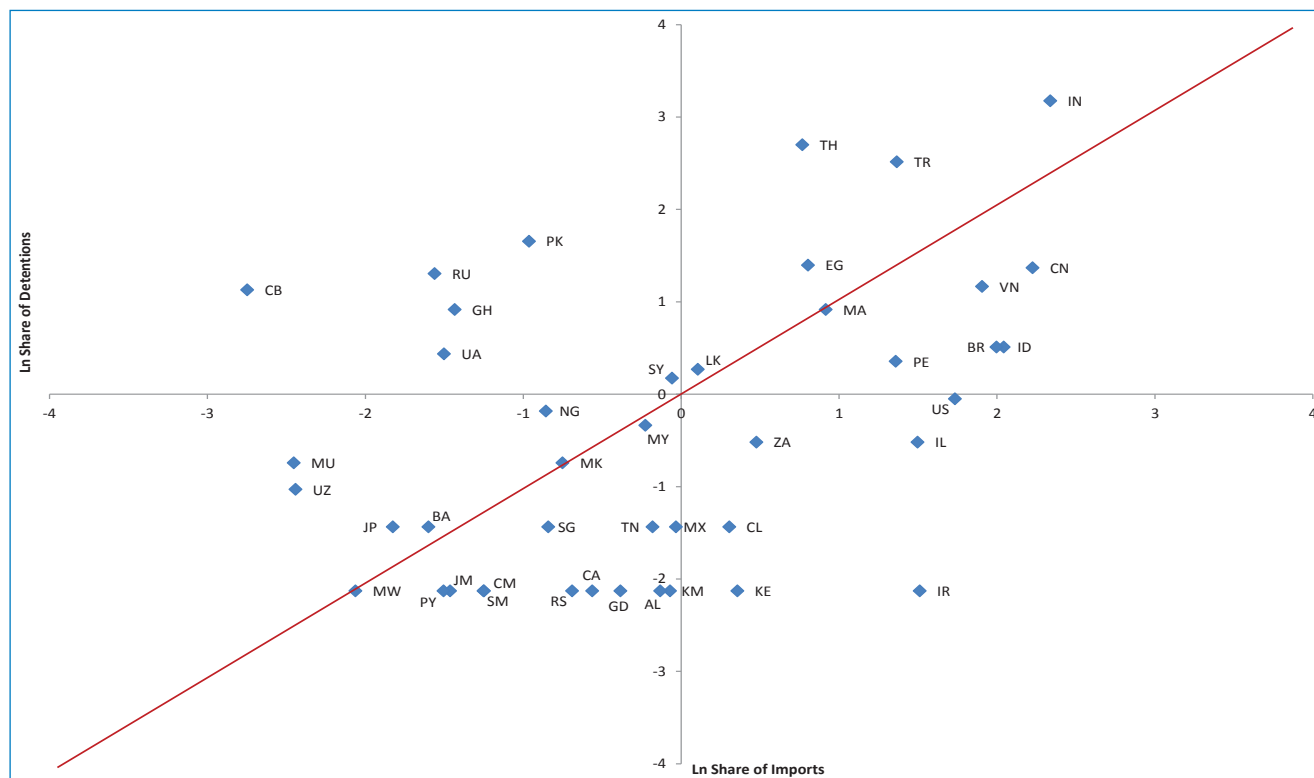
Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
India	621	0.444	0.603	0.505	0.382	0.208
China	555	0.066	0.081	0.101	0.077	0.052
Indonesia	463	0.024	0.042	0.050	0.044	0.026
Brazil	442	0.027	0.049	0.066	0.039	0.029
Vietnam	403	0.026	0.076	0.099	0.108	0.072
United States	340	0.008	0.015	0.027	0.034	0.039
Madagascar	304	0.000	0.000	0.000	0.000	0.000
Iran	272	0.012	0.012	0.012	0.000	0.000
Israel	268	0.012	0.020	0.016	0.023	0.021
Turkey	235	0.750	0.907	0.729	0.330	0.201
Peru	233	0.021	0.028	0.007	0.088	0.081
Morocco	150	0.064	0.124	0.201	0.228	0.156
Egypt	134	0.402	0.500	0.408	0.204	0.128
Thailand	129	0.159	1.153	1.401	1.717	0.934
South Africa	97	0.085	0.109	0.043	0.024	0.000
Kenya	86	0.000	0.000	0.000	0.000	0.014
Chile	81	0.040	0.040	0.000	0.000	0.018
Sri Lanka	67	0.154	0.287	0.322	0.217	0.130
Guatemala	61	0.000	0.000	0.000	0.000	0.000
Mexico	58	0.000	0.045	0.045	0.089	0.043
Syria	57	0.240	0.234	0.234	0.135	0.149
Comoros	56	0.000	0.000	0.082	0.082	0.082
Albania	53	0.000	0.051	0.051	0.051	0.000
Tunisia	50	0.062	0.129	0.129	0.066	0.000
Malaysia	48	0.089	0.231	0.142	0.185	0.043
Grenada	41	0.000	0.000	0.134	0.134	0.134
Zimbabwe	39	0.000	0.000	0.000	0.000	0.000
Croatia	39	0.000	0.000	0.000	0.000	0.000
Papua New Guinea	37	0.000	0.000	0.000	0.000	0.000
Australia	36	0.000	0.000	0.000	0.000	0.000
Canada	34	0.000	0.000	0.000	0.000	0.060
Serbia	30	0.000	0.000	0.000	0.030	0.030
Macedonia	28	0.000	0.000	0.300	0.300	0.300
Singapore	26	0.183	0.083	0.083	0.000	0.000
Nigeria	25	0.119	0.194	0.406	0.510	0.435
Pakistan	23	2.605	4.025	3.618	2.528	0.816
Argentina	22	0.000	0.000	0.000	0.000	0.000
<b>Average</b>	<b>-</b>	<b>0.121</b>	<b>0.211</b>	<b>0.226</b>	<b>0.194</b>	<b>0.115</b>

Note: Rejection rate converted to US\$ at respective average annual exchange rate.

**Table 33. Unit rejection rate for US herb and spice imports, 2002-2008**

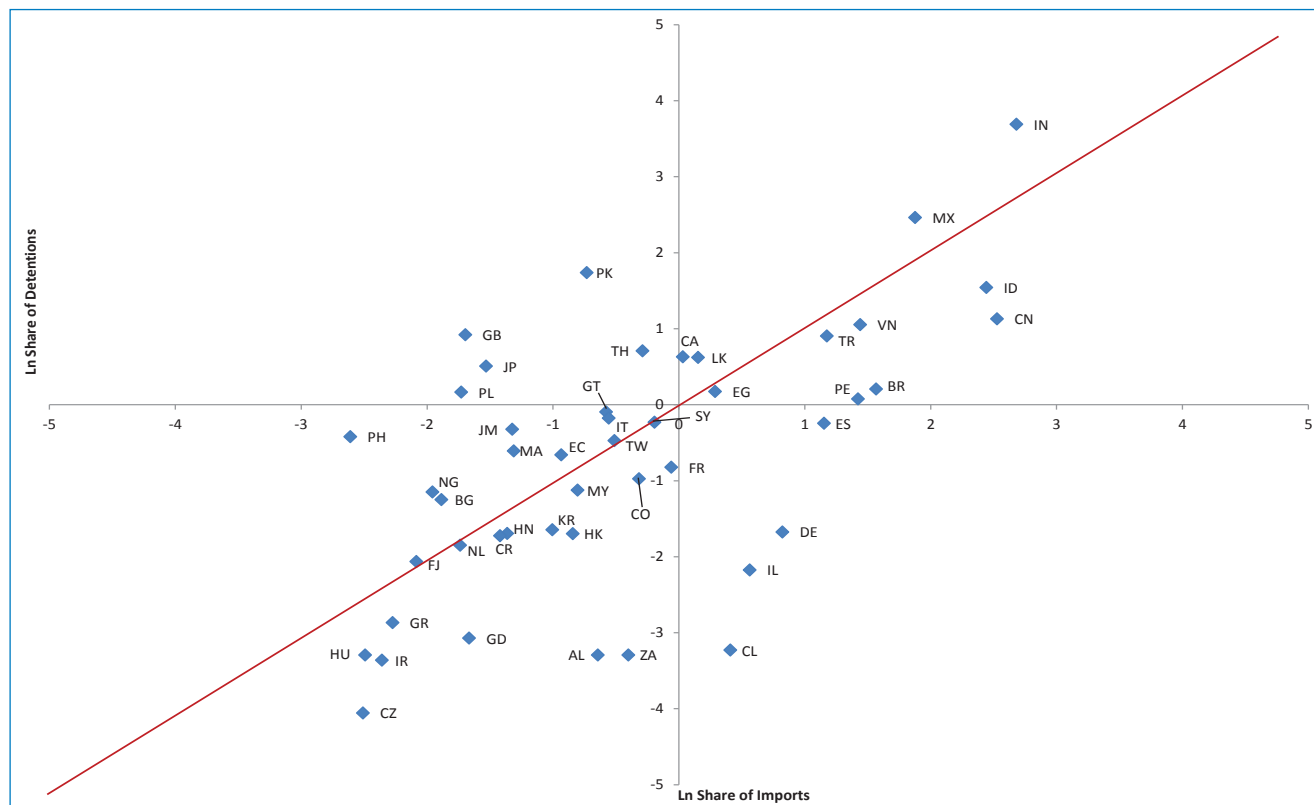
Country	Value of Exports 2002-08 (US\$ million)	Moving Average				
		2002-04	2003-05	2004-06	2005-07	2006-08
India	779	1.892	2.109	2.134	1.971	1.666
China	651	0.215	0.192	0.106	0.131	0.117
Indonesia	608	0.144	0.223	0.550	0.587	0.508
Madagascar	560	0.000	0.000	0.000	0.000	0.000
Mexico	334	0.526	0.524	0.464	0.488	2.888
Brazil	245	0.205	0.228	0.145	0.114	0.118
Peru	221	0.129	0.285	0.280	0.188	0.069
Vietnam	220	0.544	0.462	0.527	0.499	0.413
Turkey	171	0.949	0.891	0.660	0.246	0.154
Spain	165	0.191	0.223	0.144	0.103	0.137
Germany	118	0.107	0.052	0.015	0.000	0.000
Israel	92	0.065	0.065	0.029	0.016	0.036
Chile	75	0.027	0.027	0.000	0.000	0.000
Egypt	69	0.654	0.879	0.568	0.619	0.267
Sri Lanka	61	0.729	0.656	0.780	1.475	1.214
Canada	53	1.109	1.078	1.133	1.083	1.374
France	48	0.519	0.269	0.036	0.000	0.053
Uganda	47	0.000	0.000	0.000	0.000	0.000
Syria	41	0.313	0.564	0.838	0.798	0.997
Thailand	39	1.054	1.843	2.735	2.824	1.915
Colombia	38	0.521	0.203	0.346	0.195	0.329
South Africa	34	0.118	0.000	0.000	0.000	0.000
Taiwan	31	0.855	0.760	0.460	0.423	0.494
Guatemala	30	0.508	0.793	1.580	2.313	2.099
Comoros	29	0.000	0.000	0.000	0.000	0.000
Italy	28	1.306	1.616	1.607	1.030	1.008
Albania	27	0.119	0.000	0.000	0.000	0.000
<b>Average</b>	-	<b>0.554</b>	<b>0.561</b>	<b>0.645</b>	<b>0.698</b>	<b>0.773</b>

Figure 14. *Share of EU rejections versus share of imports for herbs and spices from Third Countries, 2002-2008*



Note: Includes countries with annual exports of food and feed products of US\$500,000 or above and with non-zero rejections; converted to US\$ at respective average annual exchange rate.

Figure 15. *Share of US rejections versus share of imports for herbs and spices, 2002-2008*



Note: Includes countries with annual exports of US\$500,000 or above and with non-zero rejections.



**Table 34. Reasons for EU rejections of herbs and spices from Third Countries, 2002-2008**

Country	Unauthorised food additives	Microbiological contaminants	Mycotoxins	Pesticide residues	Unauthorised food additives	Foreign bodies	Total
India	116	19	93	18	2	8	256
Thailand	6	127	5	16	0	4	158
Turkey	101	29	10	3	0	3	146
Pakistan	44	3	16	0	0	1	64
Egypt	22	23	1	10	2	1	59
China	21	5	4	0	0	14	44
Russia	53	0	0	0	0	0	53
Vietnam	12	19	1	0	1	1	34
Ghana	5	0	14	0	0	4	23
Morocco	0	8	1	18	1	3	31
Brazil	0	7	5	2	1	2	17
Indonesia	0	3	9	0	1	3	16
Ukraine	2	1	1	4	10	1	19
Peru	3	0	10	0	0	0	13
Sri Lanka	4	3	3	1	0	0	11
Syria	12	0	1	0	0	1	14
Lebanon	12	0	1	0	0	0	13
Other	76	23	25	6	2	17	149
<b>Total</b>	<b>489</b>	<b>270</b>	<b>200</b>	<b>78</b>	<b>20</b>	<b>63</b>	<b>1,120</b>
<b>% rejections</b>	<b>43.7</b>	<b>24.1</b>	<b>17.9</b>	<b>7.0</b>	<b>1.8</b>	<b>5.6</b>	<b>100</b>

Note: The reason the count exceeds the number of rejections is because any one rejection can have multiple reasons.

Table 35. Reasons for US rejections of herbs and spice imports, 2002-2008

Country	Microbiological contaminants	Labelling	Filthy/unsanitary	Unregistered process/manufacture	Unauthorised food additives	Pesticide residues	Other	Total
India	953	320	320	60	100	86	43	1,882
Mexico	433	82	70	2	19	10	7	623
Indonesia	26	38	6	183	7	0	0	260
Pakistan	150	34	9	33	6	0	0	232
United Kingdom	2	134	1	11	22	0	0	170
China	29	35	30	6	0	16	3	119
Vietnam	67	31	4	4	4	2	0	112
Canada	26	52	10	5	7	0	1	101
Sri Lanka	26	29	18	17	0	0	0	90
Japan	0	45	0	37	5	0	1	88
Turkey	65	14	3	3	0	0	0	85
Thailand	38	7	12	6	5	4	0	72
Poland	0	54	1	7	0	0	0	62
Guatemala	1	39	2	5	0	12	0	59
Brazil	27	13	3	10	0	0	1	54
Syria	14	23	3	7	0	0	0	47
Peru	5	11	4	0	2	21	0	43
Italy	1	13	0	28	1	0	0	43
Egypt	26	7	4	0	0	2	0	39
Spain	10	5	3	13	1	1	0	33
Philippines	1	2	8	20	1	1	0	33
Jamaica	5	3	3	15	0	0	5	31
Jordan	5	17	5	2	1	0	0	30
Other	99	211	34	47	11	14	13	429
<b>Total</b>	<b>2,009</b>	<b>1,219</b>	<b>553</b>	<b>521</b>	<b>192</b>	<b>169</b>	<b>74</b>	<b>4,737</b>
<b>% Rejections</b>	<b>57.8</b>	<b>35.1</b>	<b>15.9</b>	<b>15.0</b>	<b>5.5</b>	<b>4.9</b>	<b>2.1</b>	<b>-</b>

## 6. Comparative analysis of rejections in EU and US markets

The analysis of the RASFF and OASIS data has produced a large volume of results which, as a whole, provides an indication of the compliance performance of substantive exporters of agri-food products to the EU and the US. In describing the data, an attempt has been made to highlight key patterns and trends, and especially countries that appear to have relatively poor or relatively good compliance performance. Looking at the results as a whole, the following general observations can be made:

- ◆ There are significant differences in the patterns of rejections between the EU and the US, reflecting the composition of trade and distinct food safety and other requirements and associated systems of enforcement. For example, EU rejections were dominated by products that contravene restrictions on levels of mycotoxins. In the US, non-compliance with labelling and company/process registration requirements was a frequent cause of rejections.
- ◆ A large proportion of rejections, both in total and across the four focal commodities, are attributable to a relatively small number of countries. In the EU, Iran, China, Turkey, India and Thailand were developing countries with consistently large numbers of rejections. Mexico, India, China, Dominican Republic, Vietnam, Indonesia and Thailand were amongst the countries with large numbers of US rejections.
- ◆ In order to examine the compliance performance of developing countries, attention must focus on the unit and relative rejection rates. For example, Mexico had a large number of US rejections predominantly because of the magnitude of its agri-food exports. Its unit rejection rate, while above the all-country average, was much lower than for a number of other large developing country exporters. India, Vietnam and the Philippines, for example, had high rejection rates in the EU and the US. Other countries performed relatively well in one market, but less well in the other. For example, China had the highest unit rejection rate of major agri-food exporters to the EU but exhibited a much better performance with exports to the US.
- ◆ For some countries, high levels of rejections are observed across a number of food commodities. For example, India had a high relative rejection rate – it accounted for a greater proportion of rejections than its share of imports – in both the EU and the US for all foods, fish and fishery products, fruits and vegetables and herbs and spices. For these countries, compliance with export market food safety and related requirements appears to be a systemic problem. The poor compliance performance of other countries was restricted to particular commodities, suggesting localised capacity problems. For example, Iran had the largest number of EU rejections of any country, but this was almost entirely down to high levels of rejections for nuts and seeds.
- ◆ A number of countries, many of which are major exporters of agri-food products, demonstrated good compliance performance in both the EU and the US and across most (if not all) of the agri-food commodities they exported. Examples

include Chile, Argentina, Ecuador and South Africa. Presumably, these countries have relatively well-developed compliance capacity in general.

- ◆ Numerous (indeed the majority of) countries had sporadic rejections. Care needs to be taken in interpreting these. Very large rejections in particular provide an indication of acute compliance problems. Examining these rejections in the context of trade flows in subsequent years shows the degree to which the country had been able to ‘recover’. The more general scattering of large numbers of low levels of rejections, however, should be regarded as ‘noise’ and not a reliable indicator of compliance capacity.
- ◆ It is very easy to get lost in the myriad of data and the various measures that have been presented above. At the same time, the performance of particular countries, over time and across product exports and/or export markets, is of key interest. While the plots of relative compliance rates provide useful information in this regard, close groupings of countries can make them difficult to read, and each plot only provides information on a particular product and export market. Thus, below, a summary measure of compliance performance across products and export markets is developed; this is termed the Relative Rejection Rate Indicator (RRRI). At the current time, the results should be viewed very much as ‘work in progress’ and interpreted with some caution.

The RRRI provides a summary of the compliance performance of each country relative to the average rejection rate for particular products in specific markets. In this way, the RRRI aims to maximise the comparability of the rejection data between the EU and the US and across products. Thus, using the RRRI it is possible to see whether a country performs relatively well/badly overall and to identify areas of particularly good and/or poor performance. In turn, it is possible to identify countries where general compliance capacity is weak or particular products and/or export markets where compliance is an issue. This is important information for the allocation and design of technical assistance aimed at trade capacity-building. The RRRI focuses on the period 2002 to 2008 in order to identify longer-term compliance issues and to minimise the ‘noise’ created by the large scatter of small numbers of rejections across exporters and products.

The RRRI for each country-product-export market combination and for total food exports by country and export market is derived as follows:

1. The ratio of the proportion of rejections to the appropriation of imports is calculated, in the same manner as the relative rejection rate described above.
2. For countries with positive rejections, the ratio derived in 1 above is converted into natural logarithms in order to generate a normal distribution. Countries with zero rejections are labelled ‘none’.
3. The natural logarithms are divided into three equal groups to create a tercile distribution. Countries in the highest tercile are labelled ‘high’, middle tercile are labelled ‘medium’ and bottom tercile are labelled ‘low’.

Table 36 reports the RRRI for each country with substantive exports of total food and/or any of the four focal commodities. Where cells are empty, there were zero exports over the period 2002 to 2008. Improving performance is indicated by the progression from none, through low and medium to high. Electing some countries as illustration:

- ◆ **Brazil** had a low relative rejection rate for all food exports to the EU and the US over the period 2002 to 2008. However, it had high and medium rejection rates for fish and fishery products for exports to the EU and the US, respectively. Brazil's rejection rate for nuts and seeds is classed as medium. In both the EU and the US, Brazil had a low rejection rate for fruits and vegetables and herbs and spices.
- ◆ **Chile** had a relative rejection rate classed as low or none for all food commodity exports to the EU and the US, with the one exception of fish and fishery product exports to the EU, which is classed as medium. As can be seen in Figure 8, Chile is positioned just below the 45° line for fish and fishery product exports to the EU over the period 2002 to 2008.

- ◆ The relative rejection rate for all food exports from **China** is classified as high with respect to the EU and medium with respect to the US. For the four food commodities included in the analysis, China's relative rejection rate was low in the US and medium for the EU. Presumably, China performed less well with respect to exports of specific agri-food products not covered by this analysis.
- ◆ **Iran** had a high relative rejection rate for fruit and vegetable and nut and seed exports to the EU, but a low rejection rate for herb and spice exports. Its relative rejection rate for fruit and vegetable and nut and seed exports to the US, conversely, was medium.

While reiterating that caution needs to be taken in interpreting the values of the RRRI, and in particular remembering that these values reflect the nature and quality of the underlying data, they do provide a convenient summary of patterns of compliance performance of countries across export products and markets. In so doing, the RRRI provides a very broad initial indicator of both the degree to which countries struggle with compliance and the specific areas where problems are most acute.

**Table 36. Relative rejection rate for imports to the EU and the US by country, 2002-2008**

Country	European Union					United States				
	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices
Afghanistan	High	None	High	Low	None	High		High	None	None
Albania	High	Medium	High	None	Low	Low		None		Low
Algeria	Medium	Medium	Medium	None	None	High		High		
Angola	High	High	None	None	None					
Antigua and Barbuda	None	None	None	None	None	None	None	None		
Argentina	Low	Low	Low	Low	None	Low	Low	Low	Low	Medium
Armenia	High	None	None	None	None	High	None	Medium	Medium	None
Aruba	Medium			None		High	High			None
Australia	Low	High	Medium	Low	None	Low	Low	Low	None	None
Austria	n/a	n/a	n/a	n/a	n/a	Low	None	None	None	None
Azerbaijan	High	None	None	Low	None	Low	Medium	Low	None	None
Bahamas	None	None	None		None	Low	Low	None		None
Bahrain	None	None	None	None	None	Medium	None			
Bangladesh	High	High	High	High	High	Medium	Medium	High	High	High
Barbados	None	None	None		None	Medium	Medium	High		
Belarus	Medium	None	Medium	None	None	High	High	High	None	
Belgium	n/a	n/a	n/a	n/a	n/a	Low	Low	Low	None	None
Belize	None	None	None			Low	Low	None		None
Benin	Medium	High	None	None	None	High		High	High	
Bermuda	None	None	None		None	Low	None			
Bhutan	None	None	None		None	None		None	None	None
Bolivia	Medium	None	None	Low	None	Medium		Medium	Low	None

Country	European Union					United States				
	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices
Bosnia and Herzegovina	Medium	None	Medium	None	Medium	High	None	Medium	None	None
Botswana	High	None	None		None	None		None		
Brazil	Low	High	Low	Medium	Low	Low	Medium	Low	Low	Low
Brunei Darussalam	None	None	None	None		Medium	Medium			
Bulgaria	n/a	n/a	n/a	n/a	n/a	High	None	Medium	Medium	Medium
Burkina Faso	Medium	None	None	High	None	High	None	High	None	None
Burundi	None	None	None	None	None	None				
Cambodia	High	None	None	None	High	Low	Low	None	Medium	None
Cameroon	Low	None	Low	None	Low	Medium	None	High	None	High
Canada	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium
Cape Verde	Medium	Medium		None		High	High			
Cayman Islands	None	None	None		None	None	None	None	None	
Central African Republic	None		None		None	None				
Chad	None	None	None			None				
Chile	Low	Medium	Low	Low	Low	Low	Low	Low	None	Low
Hong Kong	High	None	High	High	None	High	High	High	Medium	Low
China	High	Medium	Medium	Medium	Medium	Medium	Low	Low	Low	Low
Colombia	Low	Medium	Low	None	None	Low	Low	Low	High	Low
Comoros	Medium		None	None	Low	None				None
Congo Brazzaville	Medium	High	High	None	None	None	None			None
DRC	Low	None	None	None	None	None	None			
Cook Islands	None	None	None			High	High	None		
Costa Rica	Low	Medium	Low	None	None	Low	Low	Low	None	Low
Croatia	Medium	High	Medium	Medium	None	Medium	High	Medium	None	None
Cuba	Low	Low	None	None	None					
Cyprus	n/a	n/a	n/a	n/a	n/a	High	Low	High	None	None
Czech Republic	n/a	n/a	n/a	n/a	n/a	Medium	None	High		Low
Denmark	n/a	n/a	n/a	n/a	n/a	Low	Medium	Medium	None	None
Djibouti	None	None	None		None	Medium	High	None		
Dominica	None	None	None	None	None	High	High	Medium		None
Dominican Republic	Medium	None	Medium	None	None	High	Medium	High	Low	High
Ecuador	Low	Low	Low	Medium	None	Low	Low	Low	None	Medium
Egypt	High	Medium	Medium	High	Medium	High	High	Medium	High	Medium
El Salvador	Low	None	None	None	None	Medium	Medium	Low	High	High
Equatorial Guinea	None		None		None	High				
Eritrea	High	None	None	None	High	None	None	None		
Estonia	n/a	n/a	n/a	n/a	n/a	None	None	None		None
Ethiopia	Low	None	None	High	High	Low		Medium	None	High

Country	European Union					United States				
	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices
Fiji	Medium	High	High	None	None	Medium	Low	Medium	None	Medium
Finland	n/a	n/a	n/a	n/a	n/a	Low	None	None		None
France	n/a	n/a	n/a	n/a	n/a	Low	Medium	Medium	Medium	Low
Gabon	Medium	Medium	None	None	None	None	None			None
Gambia	High	High	None	Medium	None	High	High	High	High	
Georgia	High	None	None	Low	None	High	None	Medium	None	High
Germany	n/a	n/a	n/a	n/a	n/a	Low	Medium	Low	None	Low
Ghana	Medium	Medium	Medium	High	High	High	High	Medium	High	High
Greece	n/a	n/a	n/a	n/a	n/a	Medium	Medium	Low	Medium	Low
Greenland	Low	Low	None		None	Medium	None	None		
Grenada	Medium	High	None		Low	None	Medium	High		Low
Guadeloupe	n/a	n/a	n/a	n/a	n/a	Medium		High		
Guatemala	Low	Low	Low	None	None	Medium	Medium	Low	Low	Medium
Guinea	Medium	Low	None	Medium	None	High	High	None	None	High
Guinea-Bissau	None	None	None	None		None			None	
Guyana	Low	None	None	None		Medium	Medium	Medium	None	High
Haiti	Medium	None	None	None	None	High	High	Low		High
Honduras	Low	Low	Medium	None	None	Medium	Low	Low	Medium	Medium
Hungary	n/a	n/a	n/a	n/a	n/a	Medium	None	Low	None	Low
Iceland	Low	Low	None	None	None	Low	Low	High		None
India	High	High	Medium	Low	Medium	High	Medium	Medium	Low	Medium
Indonesia	Medium	High	Low	Low	Low	Medium	Medium	Low	Medium	Low
Iran	High	None	High	High	Low	High	Medium	Medium	Medium	Low
Iraq	None	None	None	None		None		None	None	
Ireland	n/a	n/a	n/a	n/a	n/a	Low	High	Medium	None	None
Israel	Low	None	Low	Medium	Low	Medium	High	Low	Low	Low
Italy	n/a	n/a	n/a	n/a	n/a	Low	High	Medium	Low	Medium
Cote d'Ivoire	Low	Medium	Low	Low	None	Low	High	High	None	None
Jamaica	Low	Medium	Low	None	Low	Medium	Medium	Medium	None	Medium
Japan	Medium	Medium	High	Low	None	High	Medium	Medium	High	High
Jordan	High	None	Medium	None	High	High	High	High	High	High
Kazakhstan	Medium	Medium	High	None	None	None	None			
Kenya	Low	Medium	Low	None	Low	Low	None	Medium	None	Medium
Kiribati	None	None	None	None	None	None	None			
North Korea	High	High	High							
South Korea	High	None	None	None	None	High	High	Medium	Medium	Low
Kosovo	High		None	None	None					
Kuwait	High	None	None	High		High		High		High
Kyrgyzstan	Medium		None	Medium	None	None	None	None	None	None
Lao	None	None	None	None	None	None	None	None	None	None

Country	European Union					United States				
	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices
Latvia	n/a	n/a	n/a	n/a	n/a	High	High	High		None
Lebanon	High	None	High	High	High	High		High	Medium	High
Lesotho	None	None	None	None						
Liberia	None	None	None			High	High		High	
Libya	None	None	None	None		None		None		
Liechtenstein	None	None	None		None	None				
Lithuania	n/a	n/a	n/a	n/a	n/a	Medium	High	High		None
Luxembourg	n/a	n/a	n/a	n/a	n/a	None				
Macao	High	None	None	None	None	Medium	Medium	High	None	High
Macedonia	Medium	None	None	None	Medium	High		Medium	High	Medium
Madagascar	Low	Low	Medium	None	None	Low	Medium	None	None	None
Malawi	Medium	None	None	Medium	Medium	Low	None	Low	None	None
Malaysia	Medium	High	Medium	Medium	Medium	Low	Medium	Low	Medium	Low
Maldives	Medium	Medium		None	None	Medium	High			
Mali	Medium	None	None	High	None	High		None		
Malta	n/a	n/a	n/a	n/a	n/a	Medium	Low	None		
Martinique	n/a	n/a	n/a	n/a	n/a	High	None			
Mauritania	Low	Low	None	None	None	High	None	High		
Mauritius	Low	Low	None	None	High	Low	Low	None	None	None
Mexico	Low	Medium	Low	None	Low	Medium	Medium	Low	Low	Medium
Moldova	Medium	None	High	Low	None	High		High	None	
Monaco	High					High	None	High	High	
Mongolia	High	None	None	None	None	None				
Montenegro	None	None	None		None	None		None		
Morocco	Medium	Medium	Low	Low	Medium	Low	Low	Low		Medium
Mozambique	Low	Low	None	Low	None	Low	Medium	High	None	
Myanmar	High	High	None	None	None	High	Medium	High		
Namibia	Medium	Low	None	None	None	Low	Low			None
Nepal	Medium	None	None		None	High		None		None
Netherlands	n/a	n/a	n/a	n/a	n/a	Low	Low	Low	Medium	Medium
New Zealand	Low	Low	None	None	None	Low	Low	Low	None	High
Nicaragua	Medium	Low	None	Medium	None	Medium	Low	Low	Low	Medium
Niger	None	None	None	None	None	High	High			
Nigeria	High	Medium	High	High	Medium	Medium	High	High	Medium	Medium
Niue	None		None			None	None			
Norway	Low	Low	None	Low	Medium	Low	Low	High	None	None
Oman	High	High	None	None		Medium	None	Medium	None	
Pakistan	High	Medium	High	Medium	High	High	Medium	High	High	High
Palestinian Territory	Medium		None	None	None					
Panama	Medium	High	Low	None	None	Low	Low	Low	None	Medium

Country	European Union					United States				
	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices
Papua New Guinea	Low	Low	None	None	None	Low	Medium	None	None	None
Paraguay	Medium	None	None	Medium	Medium	Low	None	None		None
Peru	Low	Low	Low	None	Low	Low	Medium	Low	Low	Low
Philippines	Medium	None	Medium	Low	None	Medium	Medium	Low	Low	High
Poland	n/a	n/a	n/a	n/a	n/a	Medium	High	Medium	None	High
Portugal	n/a	n/a	n/a	n/a	n/a	Medium	High	Medium	None	None
Puerto Rico	High					n/a	n/a	n/a	n/a	n/a
Qatar	None	None	None	None		None				
Romania	n/a	n/a	n/a	n/a	n/a	Medium	None	Medium	None	None
Russia	Medium	Low	Medium	Medium	High	Low	Low	Medium	High	Medium
Rwanda	Low		None	High	None	Low				
Samoa	None		None		None	Medium	High	Low		None
San Marino	High	None	None	High						
São Tomé and Príncipe	None	None	None			High	None			
Saudi Arabia	High	None	None	High	None	Medium	None	High	High	None
Senegal	Medium	Medium	Medium	Medium	None	High	High	High	High	High
Serbia	Low	High	Low	High	Medium	Medium	None	Low		None
Serbia and Montenegro	Low	High	Low	None	Low	High	None	Medium	None	High
Seychelles	Low	None	None		None	Medium	Low			
Sierra Leone	High	None	None	High	High	High	High	Medium		None
Singapore	High	High	High	Medium	Medium	Medium	Medium	Low	None	None
Slovakia	n/a	n/a	n/a	n/a	n/a	Medium		High		None
Slovenia	n/a	n/a	n/a	n/a	n/a	Medium	High	Medium	None	None
Somalia	None	None	None		None	High	None	None		None
South Africa	Low	Low	Low	Medium	Low	Medium	Low	Low	None	Low
Spain	n/a	n/a	n/a	n/a	n/a	Low	Medium	Low	Low	Low
Sri Lanka	High	High	High	Low	Medium	High	High	High	Medium	Medium
St Kitts and Nevis	None	None	None	None	None	High	High			
St Lucia	None	None	None	None	None	High	None	Medium		None
St Vincent and the Grenadines	None	None	None	None	None	High	Low	Medium		
Sudan	Medium	None	None	High	None	Low				None
Suriname	Medium	Medium	High	None	None	Medium	Medium	None		None
Swaziland	Low	None	Medium			None		None		None
Sweden	n/a	n/a	n/a	n/a	n/a	Low	High	Low	None	None
Switzerland	Low	None	None	None	None	Low	High	Low	Medium	None
Syria	High	None	High	Medium	Medium	High	None	High	High	Medium
Taiwan	High	High	None	None	None	High	Medium	Medium	High	Medium
Tajikistan	None		None	None	None	None		None		



Country	European Union					United States				
	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices	Total	Fish and Fishery Products	Fruit and Vegetables	Nuts and Seeds	Herbs and Spices
Tanzania	Medium	Low	None	None	Medium	Low	None	Medium	None	None
Thailand	High	Medium	High	Medium	High	Medium	Low	Low	Low	Medium
Togo	Medium	None	None	High	None	Medium	High	High		None
Tonga	High	None	None	None	High	Low	Low	None		None
Trinidad and Tobago	None	None	None	None	None	Medium	Low	High	None	Medium
Tunisia	Medium	High	Medium	None	Low	Medium	Medium	Medium	High	None
Turkey	High	Medium	High	Low	High	Medium	High	Low	Low	
Turkmenistan	None	None	None		None	None				
Uganda	Low	Low	None	High	None	Low	Low	High		None
Ukraine	Medium	None	Medium	Low	High	High	Medium	High	Medium	Low
United Arab Emirates	Low	High	None	Medium	High	Medium	Low	Medium	None	High
United Kingdom	n/a	n/a	n/a	n/a	n/a	Medium	Medium	High	Medium	
USA	Medium	Low	Low	Low	Low	n/a	n/a	n/a	n/a	n/a
Uruguay	Low	Medium	Medium	None	None	Low	Low	Medium	None	None
Uzbekistan	High		High	Medium	None	Medium		Medium	None	None
Vanuatu	None	None	None		High	None	None	None		None
Venezuela	Low	Low	None	None	Medium	Medium	Medium	Low	None	None
Vietnam	High	High	High	Low	Medium	Medium	Medium	Medium	Low	Low
Yemen	High	Medium	None	None	None	Medium	High			
Zambia	Low	None	None	High	None	None	None	None	None	None
Zimbabwe	Low	None	Medium	High	None	Low		None		None

## 7. Further analysis

The analysis presented above represents just the starting point in what UNIDO aims to be on-going analysis and reporting of compliance performance as indicated by rejection data. In moving forward, it is anticipated that there will be two threads to the analysis. First, further work on border rejection data, in particular extending the analysis to:

- ◆ Go beyond the EU and the US and include other export markets, notably Japan, Canada and Australia. This will enable a more complete picture of the compliance performance of developing countries and its variation across markets.
- ◆ Extend the analysis beyond the four focal commodities explored here to other agri-food commodities that are of significance to substantive sub-sets of developing countries.

It is likely that, in extending and developing the analysis of rejection data, the focus will be on countries with substantive rejections. Rejection data are seen as providing a rather blunt indicator of substantive deficiencies in compliance capacity.

A second thread of this further work aims both to validate the patterns and trends revealed by the rejection data and to explain these patterns and trends. A particular focus of this work will be on relating rejections to the status of compliance capacity of exporting countries. It is envisaged that a series of in-depth case studies will be undertaken with countries according to the portfolio of values of the RRRI. Thus, the cases might include both countries with very specific compliance problems (confined to certain export products or a certain export market) and countries with more systemic weaknesses in compliance.

## 8. References

- Ababouch, L., Gandini, G. and Ryder, J. (2005). *Causes of Rejections and Rejections in International Fish Trade*. FAO Fisheries Technical Paper 473. Food and Agriculture Organisation, Rome.
- Allshouse, J., Buzby, J., Harvey, D. and Zorn, D. (2008). Food Safety and Seafood Imports. In: Buzby, J.C. (ed). *International Trade and Food Safety: Economic Theory and Case Studies*. Agricultural Economic Report 828. Economic Research Service, United States Department of Agriculture, Washington DC.
- Buzby, J.C. and Regmi, A. (2009). FDA Refusals of Food Imports by Exporting Country Group. *Choices*, 24 (2), 11-15.
- Buzby, J.C., Unnevehr, L.J. and Roberts, R. (2008). *Food Safety and Imports: An Analysis of FDA Food-Related Import Refusal Reports*. Economic Information Bulletin 39, Economic Research Service, United States Department of Agriculture, Washington DC.
- Caswell, J.A. and Bach, C.F. (2007). Food Safety Standards in Rich and Poor Countries. In: Sando, P., Pinstrip-Andersen, P. and Sanda, P.E. (eds). *Ethics, Hunger and Globalisation: In Search of Appropriate Policies*. P281-304. Springer, Dordrecht.
- Diaz Rios, L.B. and Jaffee, S. (2008). *Barrier, Catalyst or Distraction? Standards, Competitiveness and Africa's Groundnut Exports to Europe*. Agriculture and Rural Development Discussion Papers 39. World Bank, Washington DC.
- FAO (2005). *Phytosanitary Capacity Evaluation (PCE) Tool*, Rome: Food and Agriculture Organisation.
- FAO (2006). *Strengthening National Food Control Systems: Guidelines to Assess Capacity Building Needs*, Rome: Food and Agriculture Organisation.
- GAO (2001). *Food Safety and Security: Fundamental Changes Needed to Ensure Safe Food*. GAO-02-47T. United States General Accounting Office, Washington DC.
- GAO (2004). *Food Safety: FDA's Imported Seafood Safety Program Shows Some Progress, but Further Improvements are Necessary*. GAO-04-246. United States General Accounting Office, Washington DC.
- GAO (2008). *Federal Oversight of Food Safety: FDA's Food Protection Plan Proposes Positive First Steps, but Capacity is Critical*. GAO-08-435T. United States General Accounting Office, Washington DC.
- Henson, S.J. and Masakure, O. (2009). *Guidelines on the Use of Economic Analysis to Inform SPS-related Decision-Making*. Standards and Trade Development Facility, World Trade Organisation, Geneva.
- Jaffee, S. and Henson, S.J. (2004). *Standards and Agro-Exports from Developing Countries: Rebalancing the Debate*. Policy Research Working Paper 3348, World Bank, Washington DC.
- Jaud, M., Cadot, O. and Eisenmann, A.S. (2009). *Do Food Scares Explain Supplier Concentration? An Analysis of EU Agri-Food Imports*. Working Paper 2009-28, Paris School of Economics, Paris.
- OIE (2008) *OIE Tool for the Evaluation of Performance of Veterinary Services (OIE PVS Tool)*, Paris: World Organisation for Animal Health.
- Otsuki, T. and Wilson, J.S. (2001). What price Precaution? European Harmonisation of Aflatoxin Regulations and African Groundnut Exports. *European Review of Agricultural Economics*, 28 (3), 263-284.
- Otsuki, T., Wilson, J.S. and Sewadeh, M. (2001). Saving Two in a Billion: Quantifying the Trade Effect of European Standards on African Exports. *Food Policy*, 26 (5), 495-514.
- World Bank (2005). *Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports*, Poverty Reduction and Economic Management Trade Unit Report 31207, World Bank, Washington DC.

## Appendix 1: Country abbreviations

Name	Abbreviation	Name	Abbreviation	Name	Abbreviation
Afghanistan	AF	Guyana	GY	Papua New Guinea	PG
Albania	AL	Haiti	HT	Paraguay	PY
Argentina	AR	Honduras	HN	Peru	PE
Armenia	AM	Hong Kong	HK	Philippines	PH
Australia	AU	Hungary	HU	Poland	PL
Austria	AT	Iceland	IS	Portugal	PT
Azerbaijan	AZ	India	IN	Romania	RO
Bahamas	BS	Indonesia	ID	Russian Federation	RU
Bangladesh	BD	Iran, Republic of	IR	Rwanda	RW
Barbados	BB	Ireland	IE	Samoa	WS
Belgium	BE	Israel	IL	Saudi Arabia	SA
Belize	BZ	Italy	IT	Senegal	SN
Bermuda	BM	Jamaica	JM	Serbia	RS
Bolivia, Plurinational State of	BO	Japan	JP	Seychelles	SC
Bosnia and Herzegovina	BA	Jordan	JO	Singapore	SG
Brazil	BR	Kenya	KE	Slovakia	SK
Brunei Darussalam	BN	Korea, Republic of	KR	Slovenia	SI
Bulgaria	BG	Latvia	LV	South Africa	ZA
British Virgin Islands	VG	Lebanon	LB	Spain	ES
Cambodia	KH	Lithuania	LT	Sri Lanka	LK
Cameroon	CM	Macau	MO	Saint Pierre and Miquelon	PM
Canada	CA	Macedonia, the former Yugoslav Republic of	MK	Saint Vincent and the Grenadines	VC
Chile	CL	Madagascar	MG	Sudan	SD
China	CN	Malaysia	MY	Suriname	SR
Colombia	CO	Malawi	MW	Sweden	SE
Costa Rica	CR	Maldives	MV	Switzerland	CH
Côte d'Ivoire	CI	Malta	MT	Syrian Arab Republic	SY
Croatia	HR	Marshall Islands	MH	Taiwan	TW
Cyprus	CY	Mauritius	MU	Tanzania, United Republic of	TZ
Czech Republic	CZ	Mexico	MX	Turks and Caicos Islands	TC
Denmark	DK	Micronesia, Federated States of	FM	Thailand	TH
Dominican Republic	DO	Moldova, Republic of	MD	Togo	TG
Ecuador	EC	Montenegro	ME	Tonga	TO
Egypt	EG	Morocco	MA	Trinidad and Tobago	TT
El Salvador	SV	Mozambique	MZ	Tunisia	TN
Ethiopia	ET	Myanmar	MM	Turkey	TR
Fiji	FJ	Namibia	NA	United Arab Emirates	AE
Finland	FI	Netherlands	NL	Uganda	UG
France	FR	New Zealand	NZ	Ukraine	UA
French Polynesia	PF	Nicaragua	NI	United Kingdom	GB
Georgia	GE	Nigeria	NG	Uruguay	UY
Germany	DE	Norway	NO	Uzbekistan	UZ
Ghana	GH	Oman	OM	Venezuela, Bolivarian Republic of	VE
Greece	GR	Pakistan	PK	Vietnam	VN
Greenland	GL	Panama	PA	Yemen	YE
Guatemala	GT			Zimbabwe	ZW









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