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Food Import Refusals in United States of America: A Comparative Study of India and China

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ABSTRACT

The present study was carried out to assess food import refusals in the United States of America from India and China and compare India and China based on the number of refusals and product refusals from 2002–03 to 2019–20. The results of the study show that the maximum numbers of refusals were recorded during the period of 2010–15 in India, and the highest number of refusals was noticed in the year 2015, i.e., 1698. The numbers of imported food refusals were highest in the year 2011 from China, i.e., 1131. The maximum numbers of food product refusals during the period 2002–20 from India were due to food containing Salmonella bacteria, which is poisonous and injurious to health, and also due to the presence of whole or part of filthy substances in food. Maximum numbers of food import refusals from China were noted during the period of 2002–20 due to the presence of whole or part of filthy or decomposed substances in food.

Keywords: Import, Food refusals, Refusal charges, Adulteration, India, China

The global food trade is growing due to improvements in logistics, infrastructure, marketing networks, and customer demand. The World Trade Organisation implements the minimum rules and trade policies in food safety to protect the health of consumers by achieving appropriate levels of protection (ALOP). The products certified in one country should be accepted by other countries without the need for further inspection or testing by the other countries, with equivalence or mutual recognition (Attrey, 2017). The majority of the agricultural and other food refusals were from Mexico, India, and China, and these were mainly for vegetables, spices, and sea foods from 2005 to 2013 (Food and Drug Administration). Around 57 percent of refusals are related to safety issues, packaging integrity and adulteration (Bovay, 2016). India and China are having the same agri-food refusals on exports from the United States (Food and Drug Administration, Kallummal & Gurung, 2014). Various vegetable and vegetable products (20.6 per cent) and fish and seafood products (20.1 per cent) were refused due to pesticide and sanitary hazards under FDA law (Bovay, 2016).

Insect rubbishes were observed in the samples of semolina and canned tomatoes, whereas plastic fragments were found in the grated bread (Tilocca *et al.* 2015). Misbranding is the practise of labelling a product incorrectly, misleadingly, dishonestly, etc. with regard to the content, manufacturer, etc. (Tsimidou & Boskou, 2003). Synthetics of other brands also come under the category of misbranding (Kalra, 2020).

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REVIEW OF LITERATURE

Buzby (2003) stated that food safety regulations and risk awareness fluctuate from country to country. As global food trade expands, US consumers become more reliant on food safety measures used in other countries, and there are more opportunities for U.S. food exports. The various factors in the seafood trade are increasing day by day (Allhouse *et al.* 2004; Ababouch *et al.* 2005). Sanitary and phytosanitary rules play an important role in implementing food safety (Dong *et al.* 2004; Becker, 2008). Kerala is more reliant on the EU and US markets than the rest of the Indian market (Henson *et al.* 2004). The key reasons why the goods were refused were because they were unhealthy, lacked safety, and contained pesticides (Allen *et al.* 2008). Many domestic political issues were associated with the number of import refusals (Baylis *et al.* 2009). Sanitary and phytosanitary measures, along with the technical barrier's agreement in trade, have been used as a powerful non-tariff barrier (Parappurathu *et al.* 2009; Aarthi *et al.* 2012; Jouanjean *et al.* 2012; Kallummal & Gurung, 2014; Anders & Westra, 2011). They investigated the trends and patterns in U.S. import refusals between 2000 and 2010. Food contamination may be planned or unintentional (Zach *et al.* 2012). In most of the incidents, the consumers did not detect the food safety risks (Johnson, 2014). Generally, the FDA is unable to inspect all imported food items (Nguyen *et al.* 2015). Trafialek *et al.* (2016) observed that the risk of metallic foreign bodies was found in different finished products. Various private and public regulatory mechanisms should involve improving the safety of different food materials (Tsimidou *et al.* 2016; Zikankuba *et al.* 2019). The Indian exports were rejected because they were in non-compliance with food safety and health standards (Goyal, 2017). External factors such as change in climate and competition between food and feed are playing an important role in the integrity and authenticity of milk (Montgomery *et al.* 2020). Safety and authenticity are continually monitored by researchers, governing bodies, and industrial people (Montgomery *et al.* 2020). Rajamanickam *et al.* (2020) concluded that exports of Indian shrimp were rejected by the USA due to microbiological factors. Rhodes (2020) explained that import violations increased due to microbial contamination violations.

MATERIALS AND METHODS

The population of the study consisted of all imported food refusals from India and China. Frequencies of the top 20 refusal charges of food imports and the top 10 food import product refusals were considered for the study of research. Secondary data has been used. The secondary data pertaining to import food refusals from India and China were collected from the website of the United States Food and Drug Administration (USFDA) for a period of 18 years, from 2002–2003 to 2019–2020 during 2020–21. The data were analyzed about food refusals, Refusal charges, and Product refusals for the food imports from the two countries, India and China. Trend Analysis has been used to compute the effect of import food refusals with time for a period of 18 years (2002–03 to 2019–20) from India and China. A paired t-test has been used for the comparison of imported food refusals from India and China. The refusal charges imposed on food imports are determined by considering various factors. The major refusal charges were considered for the study of the research. The food imports refused by the United States Food and Drug Administration consist of seafood, cereals, processed foods, etc. A two-sample t-test and trend analysis were conducted using linear and quadratic regression for import food refusals. Data analysis has been done by using the software JMP version 10.0.2 of SAS institute. The functional form of the linear regression model is given below

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_p X_p + \varepsilon$$

Where, Y = dependent variable

X = independent variable

β_o = intercept

β_1 = linear effect on Y

p = number of independent variables

ε = random error

RESULTS AND DISCUSSION

The frequencies of food import refusal products year-wise were found, and the variations in the number of refusals from year to year were observed. The refusals of food imports were due to adulteration present in the food or misbranding of food products. The results of linear trend analysis and interpretation

of p- values, and coefficients were presented. The relationship between the import refusals and time was explained using the results obtained. The p-value for each term tests the null hypothesis that the coefficient is equal to zero (no effect).

Table 1: Linear trend analysis for import food refusals from India and China

Parameter	Estimate (Std. Error)	t-value	p–value	R^2
Intercept	994.17 (156.15)	6.37	<.0001	0.75
Time	17.96 (13.69)	1.31	0.2070	
Quadratic trend analysis for import food refusals from India				
Intercept	1290.42 (95.41)	13.53	<.0001	
Time	17.96 (7.36)	2.44	0.0267	–
$(Time-10)^2$	-9.87 (1.50)	-6.54	<.0001	
Linear trend analysis for import food refusals from China				
Intercept	773.57 (84.52)	9.15	<.0001	0.68
Time	6.12 (7.41)	0.83	0.4200	
Quadratic trend analysis for import food refusals from China				
Intercept	927.82 (56.57)	16.40	<.0001	
Time	6.12 (4.36)	1.40	0.1798	–
$(Time-10)^2$	-5.14 (0.89)	-5.74	<.0001	

Table 1 revealed that the R2 value for this model is 0.75. Quadratic trend analysis shows the curvilinear line at the points of refusal and time. The coefficient was significantly different from zero. The change in import refusals was due to changes over time. The p-value fitted to the line indicates a parabolic curve. The R2 value for this model is 0.68. The p-value for (time-10)2 was less than the 5% level. Hence, it was found significant, and the null hypothesis was rejected. The coefficient was significantly different from zero. The change in import refusals changed with time. As the p-value fitted for the line indicates a parabolic curve, the finding supports the finding of (Zhou *et al.* 2019).

Table 2 shows that the majority of food product refusals were due to adulteration and misbranding. The percentage of food products refused due to adulteration is 59.61 per cent. Food product refusals under misbranding were notices at 40.39 percent.

Table 2: Frequencies of top twenty refusal charges for food imports from India and China

Refusal Charges	India Frequency (%)	China Frequency (%)
Presence of salmonella in food	5273 (17.68)	459 (2.17)
Presence of filthy substances in food	4812 (16.13)	4178 (19.76)
Nutrition labeling error in food products	3161 (10.59)	1153 (5.45)
Lack of beverage labeling in food products	2570 (8.61)	1035 (4.89)
Unsafe coloradditives in food	2314 (7.75)	1354 (6.40)
Presence of quinalphos in food	1600 (5.36)	553 (2.52)
Inefficient manufacturing of food products	1392 (4.66)	1371 (6.48)
Lack of labeling contents in food products	1283 (4.30)	534 (3.37)
Presence of pesticides in food	929 (3.11)	–
Residual of pesticides in food	928 (3.11)	857 (4.05)
Presence of new drugs in food	883 (2.96)	371 (1.75)
Low acid canned food	799 (2.67)	964 (4.56)
Presence of artificial colors in food	712 (2.38)	–
Usual name for food products	709 (2.37)	362 (1.17)
Violation of FPLA for food products	680 (2.28)	342 (1.61)
Lacks of firm place labeling in food products	437 (1.46)	714 (2.61)
Unsafe food additives	430 (1.44)	1104 (5.22)
False labeling for food products	382 (1.28)	–
Not listed drugs in food products	266 (0.89)	–
Lack of labelingcolor additives in food products	262 (0.87)	–
Total	29822 (100)	–

Figure in parenthesis show per cent.

The findings were inconsistent with those of (Neff *et al*. 2012, Manning & Soon, 2014; Kallummal, 2018; Chawla, 2016). The number of food import refusals recorded under the inefficient manufacturing of food products was 1371, and their percentage was 6.48.

Food products with unsafe color additives cause ill effects and are injurious to health. The presence of salmonella in food products contaminates the food; it is not useful for consumption, and the number of refusal charges was 459. The number of import refusals under the refusal charge of the presence of new drugs in food was 371. The number of import refusals under the refusal charge for usual or common names of food products was recorded at 362. The number of food imports denied under the refusal charge violation of the Fair Packaging Labeling Act for food products was 342.

Table 3: Frequencies of top tenimport food refusal products from India and China

Products	India Frequency (%)	China Frequency (%)
Rice, Basmati, Processed (Packaged)	1591 (20.82)	–
Shrimp and Prawns, Aquaculture harvested Fishery/Seafood	951 (12.44)	197 (6.17)
Other Bakery Products, N.E.C.	935 (12.23)	–
Capsicums (Cayenne Chili, hot peppers), Ground, Cracked (Spice)	932 (12.19)	–
Herbals and Botanicals (Not Teas), N.E.C	854 (11.17)	796 (24.96)
Fried Snack foods, N.E.C.	772 (10.10)	–
Spices and Seasoning, Ground, Cracked, with Salt, N.E.C.	484 (6.33)	–
Tamarind, Dried or Paste	384 (5.02)	–
Plain Cookies, Biscuits and Wafers, N.E.C	377 (4.93)	292 (9.15)
Shrimp and Prawns	360 (4.71)	204 (6.39)
Shrimp and Prawns, Breaded	–	237 (7.43)
Vitamin, Mineral, Proteins, Udsfha, N.E.C.	–	351 (11.00)
Mushrooms and Other Fungi Products, Whole (Button), N.E.C.	–	264 (8.27)
Eel	–	318 (9.97)
Chinese Red Date (Jujubes, *Ziziphus jujuba*), Dried or Paste	–	213 (6.67)
Tilapia, Aquaculture Harvested Fishery/Seafood Products	–	317 (9.4)
Total	**7640 (100)**	**3189 (100)**

Table 3 shows that the seafood products refusals are appeared twice out of ten product refusals on the basis of different dimensions. Shrimps and prawns, aquaculture harvested, other bakery products and capsicum grounded cracked percentage of refusal frequencies are almost same in number. Most of the refusals of rice basmati, processed (packaged) food product were due to the presence of pesticides in food, harmful to the health of human. The food product refusals of Rice basmati processed (packaged) were recorded the highest number as compared to other products.

Comparison of India and China import food refusals

The comparison between India and China has been done by considering the number of import refusals and the number of product refusals from both the countries. This comparison between number of import refusals from India and China has been done for the period of 18 years from 2002-03 to 2019-2020.

Table 4: Comparison of India and China based on number of import refusals

Import refusals from China	Import refusals from India	Mean Difference (Std. error)	t-value (p-value)
834.84	1173.84	-339 (51.54)	-6.57 (<.0001)
China products refused	**India products refused**	**Mean Difference (Std. error)**	**t-value (p-value)**
359.63	341.84	17.78 (10.30)	1.72 (0.1015)

Table 4 shows that the number of import refusals from India and China was 834.84 and 1173.84, respectively. The mean difference for India and China import refusals was -339 (51.54) and the calculated t-value for India and China import refusals was 6.57 with a p-value is <.0001. The calculated t-value was greater than the statistical t-value. Therefore, the null hypothesis was rejected, and there was a significant difference between the number of import refusals from India and China. The number of products refused from India and China was 359.63 and 341.84 respectively. The mean difference between China's and India's product refusals was 17.78. The calculated t- value for India and China product refusals was 1.72, with a p-value of 0.1015. The calculated t-value was less than the statistical

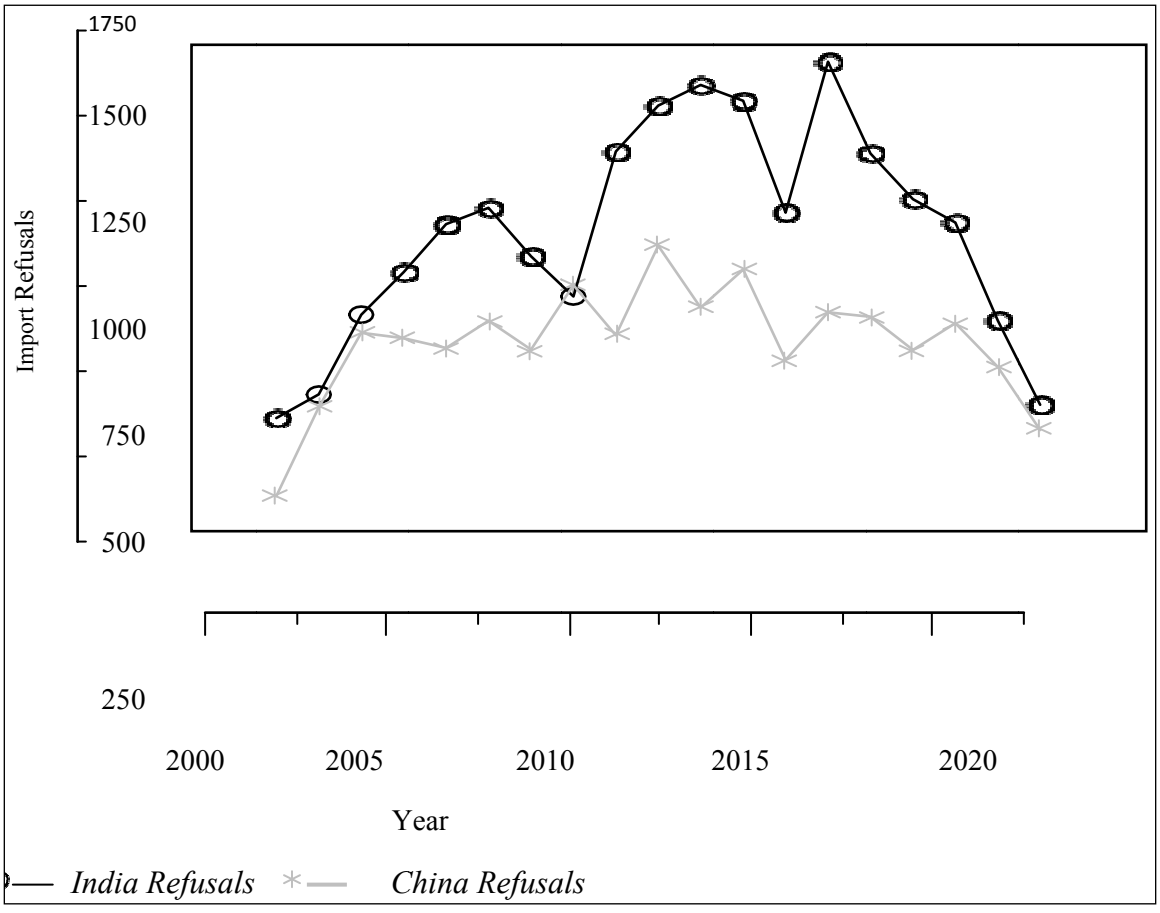

Fig. 1: Year wise import refusals from India and China

t-value. Therefore, the null hypothesis was accepted, and no significant difference was found between the number of product refusals from India and China.

The Fig. 1 presents the year wise refusals of food imports from India and China. The number of refusals from India are more as compared to the China that is shown in the graph. Majority of the refusals from China lies between 750 to 1000 in number from the year 2002-20. The number of refusals from China were touched 1000 in one to two years. The comparison of India and China based on number of refusals from the year 2002-20 as per the graph notices that there is raise and fall of refusals. The Fig. 1 indicates that fluctuations of no.of refusals for India and China from 2002-20 are more. From 2002-10 the refusals raise at a particular period and falls from the time 2010. The refusals are more from the time period of 2010-2015 for both the countries. It was at peak in 2015 for India. Frequencies of top 10 food products were taken to reasons for their refusals and the type of products are present. In the year 2015, the number of refusals from India is greater in number i.e. 1698 and in China; a greater number of refusals are noticed in 2011.

CONCLUSION

The results present that in India under the refusal charge presence of salmonella in food greater numbers of product refusals are noticed and it is imposed for the refusal of products due to contamination of food by salmonella. In China under the refusal charge presence of filthy substances in food, a greater number of refusals are noticed and it is due to presence of extraneous material or decomposed substance present in food. Most number of food product refusals causes is due to adulteration and misbranding. In general, shrimps and prawns food refusals from China are majorly due to unsafe additives and presence of drugs. The results of comparison of India and China based on

the number of refusals states there is significant difference between number of refusals from India and China. The p -value for import refusals is less than 1%. For product refusals the p-value is greater than 5% there was no significant difference between the product refusals from India and China.

REFERENCES

Allen, A.J., Myles, A.E., Shaik, S. and Yeboah, O.A. 2008. An analysis of trends in food import refusals in the United States. *Journal of Food Distribution Res.*, **39**(1): 5-10.

Allshouse, J., Buzby, J., Harvey, D. and Zorn, D. 2004. Seafood safety and trade. United States department of agriculture economic research service, seafood safety and trade. *Agri Info Bulletin Number,* 789-7: 1-2.

Anders, M.S. and Westra, S. 2011. A review of FDA imports refusals US seafood trade 2000 – 2010. *AAEA and NAREA. Joint annual meeting Pennsylvania*, pp. 1-20.

Attrey, D.P. 2017. Food safety in international food trade - imports and exports. *Int Food Safety in the 21st Century*. Academic Press, 455-68: 10-27.

Baylis, K., Martens A. and Nogueira, L. 2009. What drives import refusals? *American Journal of Agricultural Economics,* **91**: 1477-83.

Becker, G.S. 2008. US food and agricultural imports: Safeguards and selected issues. *Congressional Res Service,* Library of Congress, pp. 1-49

Bovay, J. 2016. FDA Refusals of imported food products by country and category, 2005-2013. *Economic Information Bulletin Number* 151.*USDA Economic Research Service*, pp. 1-28.

Buzby, J.C. and Regmi, A. 2009. FDA refusals of food imports by exporting country group. *Agriculture and Applied Economics Association,* **24**(2): 11-15.

Chawal, S. 2016. Supply chain issues in Indian spices export to USA. *International Journal of Modern Science Engineering and Technology,* **3**(2): 6-12.

Dong, F. and Jensen, H.H. 2004. The challenge of conforming to sanitary and phytosanitary measures for China's agricultural exports. MATRIC Working Papers 04-MWP 8:2-18ard.iastate.edu/products/publications/pdf/04mwp8.pdf

FDA. 2013. The federal food and drugs act (1906) (accessed 25.04.2021).

FDA, US food and drug administration. 2016. FDA's Participation in Codex. (Online) www.fda.gov/food/internationalinteragencycoordination/internationalcooperation/ucm106250.htm (accessed 25.04.2021).

Goyal, T.M., Mukherjee, A. and Kapoor, A. 2017. Indian council for research on international economic relations. *India's Exports of Food Products: Food Safety Related Issues and Way Forward,* **345**: 1-41.

Henson, S., Saqib, M. and Rajasenan, D. 2004. Impact of sanitary measures on exports of fishery products from India: the case of Kerala. *Agriculture and Rural Development Discussion Paper,* **17**: 1-60.

Johnson R. 2014. Food fraud and economically motivated adulteration of food and food ingredients. *Congressional Res. Service,* pp. 1-40.

Jouanjean, A.M., Maur, J.C. and Shepherd, B. 2012. Reputation matter spillover effects in the enforcement of US SPS measures. *Policy Res Working Paper 302/2011*. The World Bank, pp. 5935.

Kallummal, M. and Gurung, H.M. 2014. India's agricultural exports and United States sanitary and other regulatory measures: Special Focus on Exports in Spices and Vegetable Products from Maharashtra and Gujarat. Agricultural_Exports_and_ United_States_Sanitary_and_other_Regulatory-Measures_.

Kallummal, M., Mendiratta, D. and Sangita, S. 2018. US import refusals of agricultural products and their impact on the participation of Indian firms. *Journal of Political Economy,* **7**(1): 78-104.

Karla, N. 2020.Misbranded food under food safety and standards act 2006. *The Lex Warrior: Online Law,* pp. 5-17.

Montgomery, H., Haughey, S.A. and Elliott, C.T. 2020. Recent food safety and fraud issues within the dairy supply chain. *Global Food Security,* **26**: 100447.

Murali, K., Disha, M. and Seema, S. 2018.US import refusals of agricultural products and their impact on the participation of Indian firms. *Agrarian South J. of Political Economy,* **7**(1)*:* 78-104.

Neff, R.A., Hartle, J.C., Laestadius, L.L., Dolan, K., Rosenthal, A.C. and Nachman, K.E. 2012. A comparative study of allowable pesticide residue levels on produce in the United States. *Globalization and Health,* **2**: 1-14.

Nguyen, L., Nelson, R.G. and Wilson, N.L. 2015. Triggering factors for US import refusals the challenge of conforming to sanitary and phytosanitary measures for China's agricultural exports. *SAEA Conference Paper*, pp. 1-15.

Parappurathu, S., Kumar, B.G., Joshi, P.K. and Datta, K.K. 2009. Export of India's fish and fishery products: analyzing the changing pattern/composition and underlying causes. *Indian Journal of Agriculture Economics,* **64**(4): 541-56.

Rajamanickam, G., Ravisankar, T., Patil, P.K., Avunje, S., Vinoth, S., Sairam, C.V. and Vijayan, K.K. 2020. Trends, causes, and indices of import rejections in international shrimp trade with special reference to India a 15-year longitudinal analysis. *Aquaculture International,* **28**(2): 1341- 69.

Rhodes, M.T. 2020. How do import refusals for pathogen violations respond to a recession? *World Nutrition,* **11**: 75-85.

Tilocca, M.G., Caneglias, E., Vodret, B., Mancuso, M.R., Zimmardi, A., Manno, C. and Schiavo, M.R. 2015.

Analysis of foreign matter in foodstuffs using the light filth test. *Italian Journal of Food Safety,* **4**(3): 4504.

Trafialek, J., Kaczmarek, S. and Kolanowski, W. 2016. The risk analysis of metallic foreign bodies in food products. *Journal of Food Quality,* **39**: 398-407.

Tsimidou, M. and Boskou, D. 2003.Adulteration of foods | History and occurrence detection.*In Encyclopedia of Food Sciences and Nutrition,* pp. 42-47.

US FDA. 2008. FDA advises consumers to avoid toothpaste from china containing harmful chemical (accessed 25.04.2021).

Zach, L., Doyle, M.E., Bier, V. and Czuprynski, C. 2012. Systems and governance in food import safety: A U.S. perspective. *Food Control,* **27**(1): 153-62.

Zhou, J., Wang, Y. and Mao, R. 2019. Dynamic and spillover effects of USA import refusals on China's agricultural trade: Evidence from monthly data. *Agriculture Economics,* **65**(9): 424-34.

Zikankuba, V.L., Mwanyika, G., Ntwenya, J.E. and James, A. 2019. Pesticides regulations and their malpractice implications on food and environment safety. *Cogent Food and Agriculture,* **5**(1): 1601544.

Annexure

Annexure - I: Year wise Import Refusals of Food Products from India

Year	Total refusals (India)	Total refusals (China)
2002	599	359
2003	672	633
2004	918	863
2005	1049	846
2006	1197	816
2007	1247	900
2008	1098	811
2009	974	1010
2010	1421	855
2011	1563	1131
2012	1626	940
2013	1577	1058
2014	1233	779
2015	1698	926
2016	1415	912
2017	1274	810
2018	1202	892
2019	900	758
2020	640	563

Source: USFDA.