



## Chillies

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## Product description

Chilli (*Capsicum annum L*) is considered one of the commercial spice crops. In daily life, chillies are integral and the essential ingredient in many different cuisines worldwide as it adds pungency, taste, flavour and colour to the dishes. Globally, Indian chilli demand increases for two critical commercial qualities: colour and pungency. This product factsheet focuses primarily on seeds of dried chillies, which export and import data obtained from a harmonised code (HS 090 Spices; fruits of the genus capsicum or pimenta, dried or crushed or ground) nomenclature and production data from FAOSTAT code (0711).

HS code	Description
09042219	Dried Red Chilli
09042211	Chilli powder
09042212	Red chilli seeds
09042190	Dried chilli neither crushed nor ground

## Global Trade – India's Role

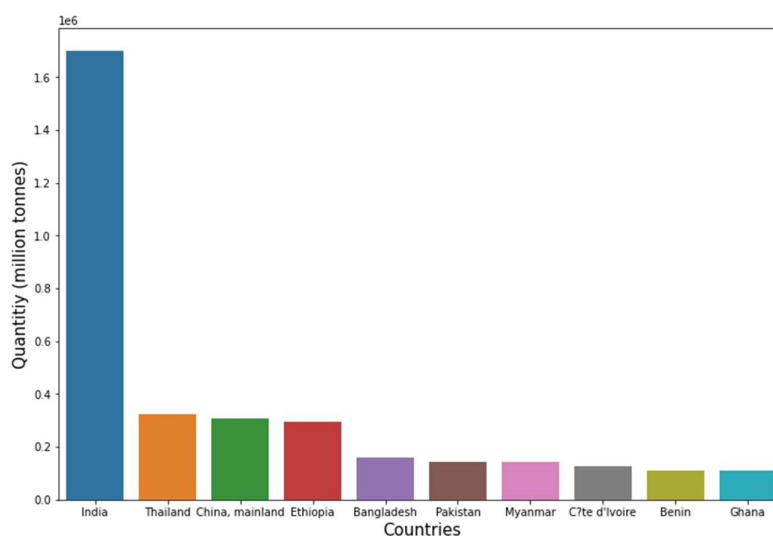


Figure 1. Top ten countries of chillies and pepper (dry) production in 2020 (FAOSTAT, 2021<sup>i</sup>)

- In 2020, India was the world's most significant dried whole chillies and pepper producing country contributing 40.96% of total world production, followed by Thailand (8.18%), China (7.66%), Ethiopia (7.36%) and others (Tridge 2021).
- In 2020, the Indian production of dried chillies was around 1.7 million tonnes (FAOSTAT 2021); 30% of this production is exported, while 70% is consumed domestically.
- China, Thailand, Sri Lanka, USA and Indonesia are the five topmost nations importing the Indian red chillies considerably.

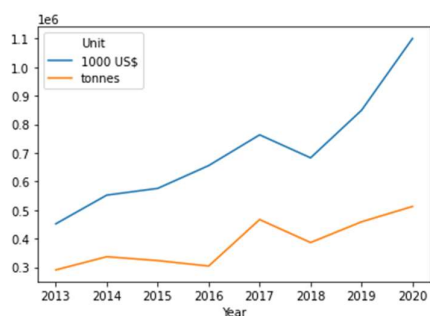


Figure 2. Indian chillies export trend from 2013 to 2020 (FAOSTAT 2021)

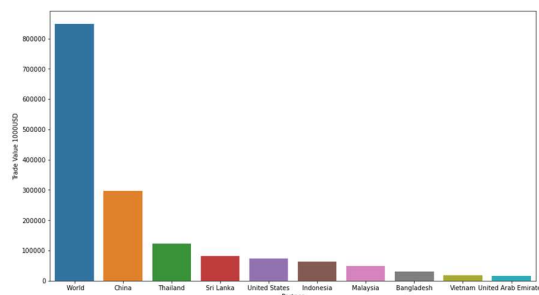


Figure 3. Major chillies importing countries from India in 2019 (WITS 2021<sup>ii</sup>)

## Import Trends in European Union

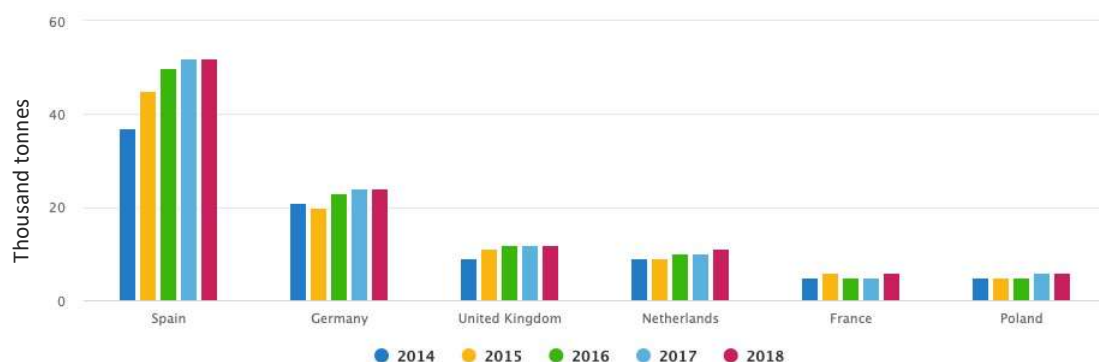


Figure 4. Leading importers of dried chillies in the EU (CBI 2021<sup>iii</sup>)

- Between 2014 and 2018, European imports of dried chillies grew 6% in value and 5% in volume every year, up to a value of €326 million and a quantity of 144 thousand tonnes in 2018.
- Crushed and ground chillies represent 65% of the total imported dried chillies, while the remaining 35% represent whole dried chillies.
- European production of dried chillies is not self-sufficient. Europe produces less than 80 thousand tonnes of dried chillies and other dried paprika, 50% of the imported quantities. The leading producer is Romania, followed by Hungary and Spain. In Romania and Hungary, dried chilli pepper and paprika are traditionally used for cooking meat, vegetable and bean stews. A large share of those products in Hungary and Romania represents dried sweet peppers.
- Spain is by far Europe's largest importer of dried chillies. The Spanish import value was €78 million in total in 2018. Spain's imports increased by 9% annually between 2014 and 2018.

## Import Trends in Germany

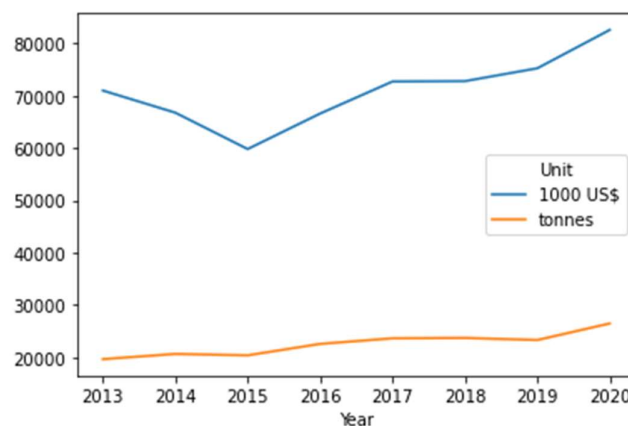
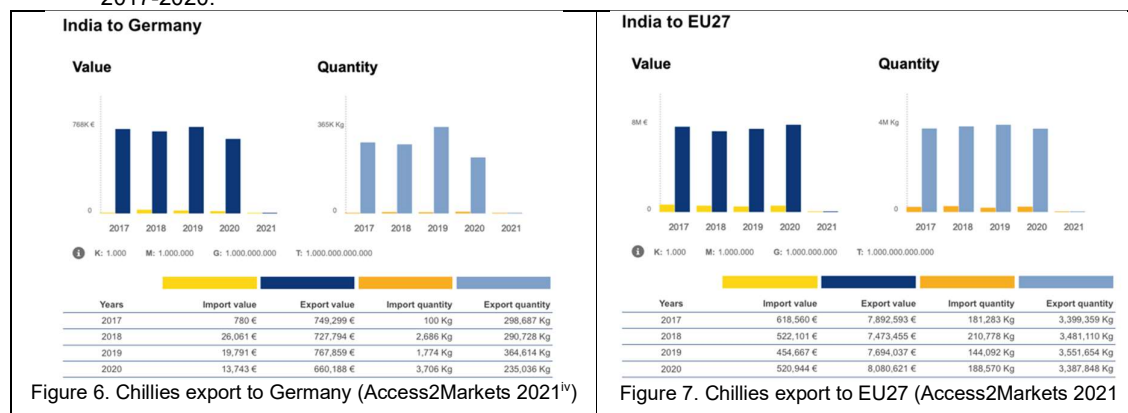


Figure 5. Chillies and peppers dry import trend in Germany (FAOSTAT 2021)

- After black pepper and ginger, dried chillies and dried sweet peppers are Germany's third-largest imported spice category. In 2020, imports reached 23.4 thousand tonnes.
- German companies mainly import dried chillies and further process them by crushing and packing or using them as ingredients in spice blends and seasoning preparations. A significant share of dried chillies in Germany is used in the meat processing industry, especially for the production of sausages.
- There are almost 90 companies that are members of the German Spice Association. Those companies are primarily engaged in refining spices and producing spice blends, spice preparations and other seasoning ingredients. In 2018, they made up for more than €1.2 billion.

## Exports and Import trends from India to Germany & EU27

- India's export to Europe accounts for only a 2.3% share, there is no significant change in exports from 2017-2020.



## Market Segmentation in Europe

Importers and wholesalers can be general spice importers or specialise in specific roles. Some now exclusively deal with ingredients in the processing industry, while others pack dried chillies for retail chains. Some importers also deal with a broader range of products apart from spices, such as beans or seeds. The European food industry uses ground chillies in significant quantities, especially in meat products such as sausages, salamis or patés. It is also used in spice mixtures, sauces, soups and ready meals. The food processing segment is roughly estimated to account for 60-70% of the usage of dried chillies on the European market<sup>v</sup>. The most significant users within the food processing segment include spice mixture producers, the meat industry and the sauces and seasonings industry. Spice mixture producers specialise in producing spices and herbs for different applications. Those companies are constantly investing in research to develop custom formulations for food processing companies and help launch new attractive tastes. They produce either dried or liquid spice ingredients. Some examples of spice mixtures and ingredients companies are AVO (German producer, part of the European group), Meat Cracks, Kerry Ingredients, Frutaron, Farevelli Group, Food Ingredients Group, Kalsec, EHL Ingredients or Ion Mos.

The retail sector is segmented into supermarkets, independent grocers, and speciality shops, such as health, organic and spice shops. Companies that hold the largest market shares in Europe are Schwartz Gruppe (Lidl and Kaufland brands), Carrefour, Tesco, Aldi, Edeka, Leclerc, Metro Group, Rewe Group, Auchan, Intermarché, and Ahold (Delhaize, Albert Heijn and several other brands). Leading brands in Europe include Schwartz (United Kingdom), TRS (United Kingdom), Fuchs (Germany), Ostmann (Germany), Ducros (Spain, France, Belgium, Portugal), Euroma (Netherlands), Verstegen (Netherlands), Cannamela (Italy), Santa Maria (Scandinavia), and Prymat Group (Poland).

Table 1. Consumer prices of various EU chilli brands	
Brand	Chilli powder, flakes (in €)
Ostmann (100g)	6.26
Uncle spice 50g	15.90
Azafran Bio (100 g)	9.90
TRS whole chillie (50g)	4.99

## EU Regulatory Requirements

Since June 2019, dried chillies and dried sweet peppers from the following countries have been under stricter import control:

- India: According to regulation on special import conditions, 20% of all shipments of dried chillies must be officially tested at the border for the presence of aflatoxins. Additionally, all dried chilli shipments should be accompanied by a health certificate stating that the products have been sampled and analysed for the existence of aflatoxins and have been found compliant with the EU legislation.
- China: 20% of all shipments of dried sweet peppers must be officially tested for the presence of Salmonella
- Sri Lanka: 50% of all shipments of dried chilli and sweet peppers must be officially tested for the presence of aflatoxins.

The most common requirements regarding contaminants in dried chillies are related to pesticide residues, mycotoxins, heavy metals, microbiological organisms and food additives.

Ash content	- maximum 7%
Moisture	- The maximum moisture content for crushed and ground dried chillies is set to 11%. The maximum moisture content for whole chillies varies depending on the commercial type of chillies from 9% (for De árbol chillies) to 13.5% (for Guajillo and Pasilla chillies)
Mesh or particle size	- The size of the individual flakes or powder particles is used to describe the physical appearance of dried crushed or ground chillies. The actual size of the powder or flakes is measured by micrometre or mesh count. The mesh count is the number of threads in each centimetre. Larger mesh size indicates smaller particles, while smaller mesh indicates a larger sized particle in the final product. The most common mesh of crushed flakes is between 5 and 8
Odour and flavour	- High-quality chilli powder should have ASTA unite value higher than 120. - The hotness (pungency) of dried chillies is an important trade factor. The pungency level is expressed in Scoville heat units (SHU) and ranging from 900-3000 for mild chillies (such as ancho) to >100000 for extra hot chillies (such as habanero).
Labelling requirements	exporting and importing countries may require include the bar, producer and/or packager code, as well as any extra information that can be used in order to trace the product back to its origin. - Name of product, e.g. 'dried whole chilli peppers' - Net weight in metric system - Shelf life of the product - Lot identification number - Country of origin and name and address of the manufacturer, packer, distributor or importer - Lot identification and the name and address of the manufacturer, packer, distributor or importer may be replaced by an identification mark.
Food safety certification	Many EU buyers require implementing a (HACCP-based) food safety management system. - Certification. International Featured Standards <sup>1</sup> (IFS) - British Retail Consortium Global Standards <sup>2</sup> (BRCGS) - Food Safety System Certification <sup>3</sup> (FSSC 22000)

## EU requirements for Organic Chillies

According to the European legislation, to market dried chillies as organic in Europe, they must be grown using organic production methods. An accredited certifier must audit growing and processing facilities before you may put the European Union's organic logo on your products, as well as the logo of the standard holder, for example, Soil Association in the United Kingdom and Naturland in Germany. Importing organic products into Europe is only possible with an electronic inspection certificate (e-COI). Each batch of organic products imported into the European Union has to be accompanied by an electronic inspection certificate as defined in Annex V of the Regulation restricting the imports of organic products from third countries. This electronic inspection certificate must be generated via the Trade Control and Expert System (TRACES).

## Sustainability Certification

Two most commonly used sustainability certification schemes are Fair Trade and Rainforest Alliance. Fair Trade international has developed a specific standard for herbs, herbal teas and spices for small-scale producer organisations. According to this standard, a premium price of 15% over and above the negotiated price between producer and seller must be established. To improve sustainable production and sourcing of spices, mainly European companies and organisations formed the Sustainable Spice Initiative in 2012. The primary objective of this initiative is to strive for fully sustainable spice production and trade in the sector.

<sup>1</sup> <https://www.ifs-certification.com/index.php/en/>

<sup>2</sup> <https://www.brcgs.com>

<sup>3</sup> <https://www.fssc22000.com/?lang=en>

## Chilli Production in India

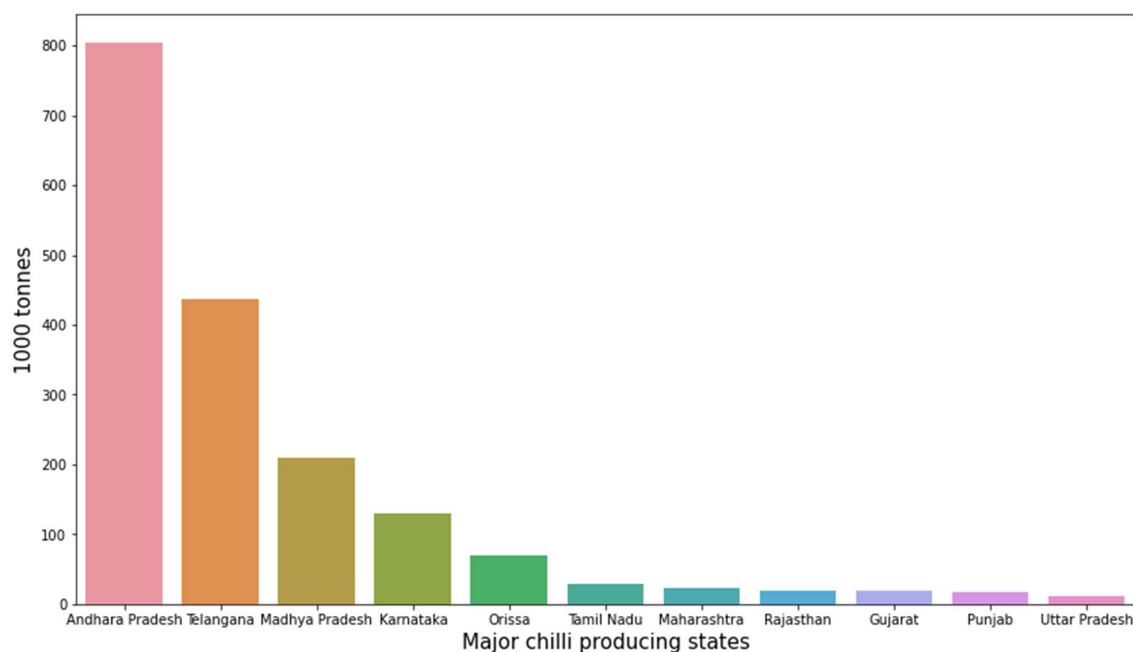


Figure 8 Major chilli producing states in 2019-2020<sup>vi</sup>

- In 2019-2020, the chilli production in India was 1.8 4 million tonnes, cultivated on 0.62 million hectares. The average yield was 2954 kilograms per hectare.
- In 2019-20 Telangana was India's most significant chilli producing state, contributing more than 43% of the total output, followed by Andhra Pradesh (23.69%), Madhya Pradesh (11.33%), Karnataka (7.2%) and others.
- Many dried chilli varieties are grown in India, usually characterised by a higher pungency than Chinese chillies. The most demanded variety by European buyers is Guntur Sannam S4 (also known as S-334), with a pungency level of 18,000–22,000 Scoville Units. Other varieties include Dhani, Byadagi, Hindpur, Jwala, Kanthari White and Kashmir chilli.
- About 65% of the chillies produced in India are traded from six significant markets: Guntur in Andhra Pradesh, Warangal and Khammam in Telangana, Raichur and Bellary in Karnataka, and Jalgaon in Maharashtra.
- Chillies can be grown both as Kharif and Rabi crops. In addition, they are also planted at other times. Sowing months are May to June for the Kharif crops and September to October for Rabi crops.
- Figures 9 & 10 summarise the market rate for 100 kg market price at APMC market price at Warangal.

Date	Arrivals (q)	Minimum Price (Rs/q)	Maximum Price (Rs/q)	Modal Price (Rs/q)
1	4,095	10,500	13,500	12,000
3	3,946	10,000	13,100	11,500
7	3,279	10,000	14,000	12,000
8	2,211	10,000	14,025	12,000
11	3,056	10,500	13,400	11,900
14	817	9,000	14,000	11,500
15	2,479	10,000	13,600	12,500
17	1,244	9,500	13,600	11,500
18	913	9,500	14,300	11,900
21	790	9,000	14,000	12,000
22	494	11,000	13,300	12,000
24	697	11,500	13,500	12,500
25	595	9,500	13,300	11,400
28	421	9,500	12,500	11,500
29	402	10,500	13,200	11,800
30	319	10,000	12,600	11,000

Figure 9. Arrivals and prices of chilli at Warangal Market in June 2021 (PJ TSAU 2021<sup>vii</sup>)

Date	Arrivals (q)	Minimum Price (Rs/q)	Maximum Price (Rs/q)	Modal Price (Rs/q)
1	34	10,000	14,200	12,000
4	74	9,500	14,500	12,000
5	77	9,500	14,500	12,000
7	67	10,500	14,500	12,000
8	50	10,500	14,500	12,000
11	89	10,500	14,500	12,000
12	73	10,500	14,500	12,000
20	78	10,500	14,500	12,000
21	49	10,500	14,500	12,000
22	48	11,000	15,000	13,000
25	182	10,800	14,800	12,800
26	57	11,000	15,000	13,000
27	95	9,000	14,600	12,800
28	81	10,500	14,500	12,500
29	62	9,500	14,800	12,500

Figure 10. Arrivals and prices of chilli at Warangal Market in October 2021 (PJ TSAU 2021)



### What are significant constraints in chilli production?

Challenges faced by chilli growers in production and marketing in significant chilli producing states of Andhra Pradesh and Telangana. Both states contribute more than 65% of chilli production in India (Shekar 2019<sup>viii</sup>, Naik 2019<sup>x</sup>).

Telangana					
Technological Constraints	Frequency	%	Marketing Constraints	Frequency	%
Total dependence on private hybrids	61	50.84	Irregular & delay in payment by intermediaries	53	44.17
Non-availability of quality seed	65	54.17	Lack of market information & Intelligence	87	72.50
Lack of knowledge on post harvest operations	21	17.50	Heavy price fluctuation for the produce	90	75.00
Lack of knowledge on micro nutrient deficiencies	50	41.67	No support price for chilli from govt	42	35.00
Heavy use of non-recommended bio-pesticides	36	30.00	Heavy commission charges	71	59.17
Indiscriminate use of the pesticides	42	35.00	Low remunerative price at peak time	35	29.17
High cost of the hybrid seed	76	63.34	Infrastructure Constraints	Frequency	%
Indiscriminate heavy application of complex fertilizers	56	46.67	Lack of drying space	71	59.17
Socio Economic Constraints	Frequency	%	Lack of storage facilities	86	71.67
Uncertainty in market prices	44	36.67	Absence of grading and processing	45	37.50
Scarcity of labour & intensive requirement of labour at picking	71	59.17	High transport costs	50	41.67
High cost of inputs	53	44.17	Supply constraints	Frequency	%
High cost of labour or wages	87	72.50	Non availability of quality inputs	75	62.50
Biotic Constraints	Frequency	%	Irregular supply of fertilizers	49	40.84
Spurious seed	84	70.00	Inadequate finance	54	45.00
Development of resistance in pests against the insecticides	64	53.34	Andhra Pradesh		
Increased incidence of pests and diseases	90	75.00	Constraints	Frequency	Percentage
Abiotic Constraints	Frequency	%	(A) Economic problems		
Drought	55	45.84	(i) Lack of money to purchase useful agricultural material	69	61.60
Heavy rains followed by dry spells	87	72.50	(ii) High cost of seed, fertilizers, insecticides and implements	93	83.03
Sudden and unexpected/ unseasonal rains during winter season spoiling the quality of the fruit	71	59.17	(iii) High labour charges	102	91.07
Strong winds/ gales	35	29.17	(iv) Lack of loan facilities	75	66.96
Institutional Constraints	Frequency	%	(B) Marketing problems		
Lack of quality control and inspection	57	47.50	(i) Knowledge about actual rate of chilli	58	51.78
Dominance of private input agencies	77	64.17	(ii) Regular market in nearest area	12	10.71
Lack of market information on prices and arrivals	66	55.00	(iii) Non-availability of seeds, pesticides and fertilizer in time	8	7.14
Lack of regulated markets	95	79.17	(iv) Low price of chilli in the market	112	100.00
			(C) Technical problems		
			(i) Lack of information about improved varieties of chilli	82	73.21
			(ii) Knowledge about seed treatment	89	89.46
			(iii) Lack of training regarding recommended chilli production technology	112	100.00
			(iv) Lack of knowledge about insects pest and diseases	90	80.35
			(D) Situational problems		
			(i) Non-availability of agricultural input materials in village	92	82.14
			(ii) Remoteness of Market	57	50.89
			(iii) Electricity problem	112	100.00
			(iv) Lack of transport facility	55	49.10
			(E) Extension problems		
			(i) Unavailability of agriculture related information in local language	81	72.32
			(ii) Irregular visit of agriculture officers	68	60.71

### Comparative Challenges in Chilli Exports from India

India is the world's largest producer, consumer and exporter of chillies globally. However, European authorities increased control for aflatoxins' presence, Europe is not seen as a priority market for Indian dried chilli exporters. Instead, the Indian export of dried chillies focuses on South-East Asian countries (nearly 60% export share) with Vietnam as the leading export destination, the United States (10% export share) and China (9% share). Export to Europe accounts for only a 2.3% export share, with the UK as the leading target market (CBI 2021).

Table 2. Number of border rejection notifications on Indian Chillies imports from 2020-to 2021(RASFF Window 2021)<sup>x</sup>

reference	category	type	subject	date	notifying_country	classification	risk_decision
2020.0649	herbs and spices	food	Aflatoxins in chillies from India	10-02-2020 14:01:22	Italy	border rejection notification	serious
2020.1021	herbs and spices	food	Aflatoxins in dried red chillies from India	03-03-2020 16:06:18	United Kingdom	border rejection notification	serious
2020.2260	herbs and spices	food	Ochratoxin-A in Indian crushed chillies	02-06-2020 13:23:03	Netherlands	border rejection notification	serious
2020.5238	herbs and spices	food	Superación del límite máximo de aflatoxinas //...	24-11-2020 15:54:48	Spain	border rejection notification	serious
2020.5372	herbs and spices	food	Aflatoxin in chilli powder from India	27-11-2020 12:38:03	United Kingdom	border rejection notification	serious
2021.1769	herbs and spices	food	Ochratoxin A in red chilli powder origin India	08-04-2021 17:42:06	Switzerland	information notification for attention	serious
2021.1844	herbs and spices	food	Aflatoxinas B1 en cayena molida esterilizada ...	14-04-2021 10:02:33	Spain	border rejection notification	serious
2020.0594	herbs and spices	food	missing analatical report for chilli powder fr...	06-02-2020 14:14:25	United Kingdom	border rejection notification	not serious
2020.0665	herbs and spices	food	Absence of health certificate in chilli powder...	11-02-2020 10:46:12	United Kingdom	border rejection notification	not serious
2020.4150	herbs and spices	food	Absence of Official certificate for chilli pep...	08-10-2020 14:02:54	Slovenia	border rejection notification	not serious
2021.6644	herbs and spices	food	absence of common health entry document for ch...	06-12-2021 07:54:17	Malta	border rejection notification	not serious

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- <sup>i</sup> [https://www.fao.org/faostat/en/#rankings/countries\\_by\\_commodity\\_exports](https://www.fao.org/faostat/en/#rankings/countries_by_commodity_exports)
  - <sup>ii</sup> <https://wits.worldbank.org/WITS/WITS/Restricted/Login.aspx>
  - <sup>iii</sup> <https://www.cbi.eu/market-information/spices-herbs/dried-chillies/market-potential>
  - <sup>iv</sup> <https://trade.ec.europa.eu/access-to-markets/en/home>
  - <sup>v</sup> <https://www.cbi.eu/market-information/spices-herbs/dried-chillies/market-entry>
  - <sup>vi</sup> <http://www.indianspices.com/>
  - <sup>vii</sup> <https://www.pjtsau.edu.in/files/AgriMkt/2021/July/chilli-July-2021.pdf>
  - <sup>viii</sup> <https://www.ijcmas.com/8-4-2019/D.%20Vinod%20Naik,%20et%20al.pdf>
  - <sup>ix</sup> <https://www.phytojournal.com/archives/2019/vol8issue5/PartAM/8-5-285-437.pdf>
  - <sup>x</sup> <https://webgate.ec.europa.eu/rasff-window/screen/search>