

Product-country image and crises in the Spanish horticultural sector: Classification and impact on the market

M. Mar Serrano-Arcos^a, Juan Carlos Pérez-Mesa^a, Raquel Sánchez-Fernández^a

ABSTRACT: This research provides a conceptual framework to analyse the concept of ‘crisis’ and its multiple origins in the Spanish horticultural sector, the largest horticultural exporter in Europe. For this purpose, this study provides a typology of crises and a classification according to their nature, reasons, and temporary impact. Consequently, this research reviews and chronologically classifies the harmful campaigns that have originated several of those crises. Additionally, the impact on the perceived product-country image is analysed through an empirical research based on the results of a survey of consumers in several European countries.

KEYWORDS: Consumer, food safety crisis, product-country image, Spanish horticultural exports.

Imagen producto-país y crisis en el sector hortícola español: clasificación e impacto en el mercado

RESUMEN: Esta investigación proporciona un marco conceptual para analizar el concepto “crisis” y sus orígenes en el sector hortícola español, el mayor exportador hortícola de Europa. Para este propósito, este estudio proporciona una tipología de crisis y una clasificación de acuerdo con su naturaleza, motivos e impacto temporal. En consecuencia, esta investigación revisa y clasifica cronológicamente las campañas internacionales perjudiciales que han originado varias de esas crisis. Además, el impacto en la imagen percibida del producto-país se analiza a través de una investigación empírica basada en los resultados de una encuesta dirigida a consumidores finales en varios países europeos.

PALABRAS CLAVE: Consumidor, crisis de inocuidad alimentaria, imagen de producto y país, exportaciones hortofrutícolas españolas.

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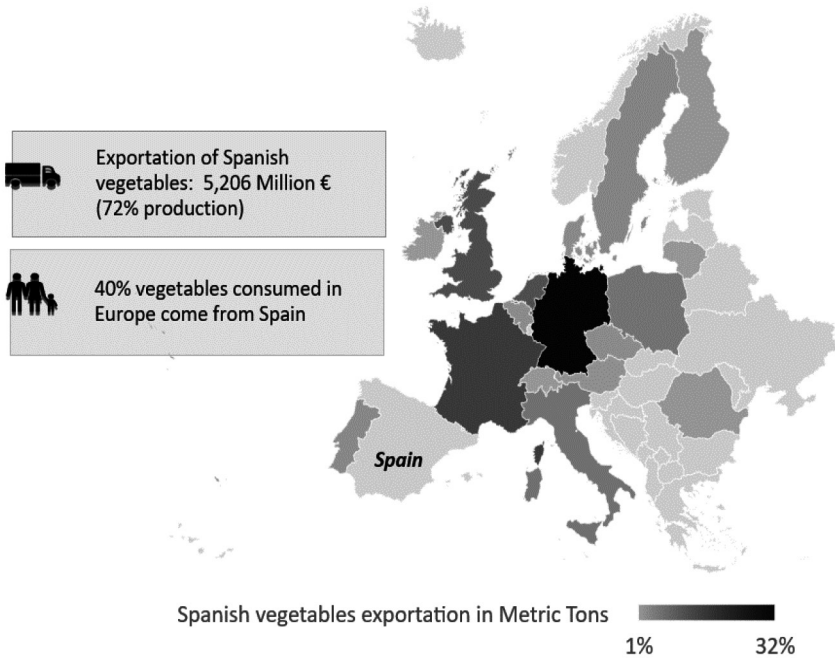
1. Introduction

In the last 50 years, the South of Spain has become a major horticultural supplier within Europe. 40 % of the vegetables consumed in Europe come from Spain. Hence, Spain is considered as the main European producer (5,206 million euros, 72 % of all production), mainly in the European Union market. Figure 1 shows the importance of the Spanish horticultural export sector, representing the percentage of the Spanish vegetables exportation to each European country, where Germany is the main destination market (32 %). Consumers purchase these products, 70 % at least (Pérez-Mesa and Galdeano-Gómez, 2015), in commercial establishments from huge distribution chains (e.g., Aldi, Carrefour, Edeka, Tesco). These retailers demand high production quality standards from their producers including, among other things, environmentally sustainable practices, high product quality technical standards, and socially sustainable strategies. These practices have been strengthened by various factors, including the incidence of food safety crises, potential food risks from chemical use in food production, and related risk communication or the lack thereof (Nguyen *et al.*, 2017).

Nonetheless, many consumers and the mass media ignore the efforts taken so far by producers at origin in order to fulfil the negotiated commitments with their clients, resulting in an asymmetry of information between producers and consumers. Therefore, despite the efforts, the Spanish horticultural sector's image has been affected by recurring crises arising from two main sources. First, the ineffective management of problems common to the Spanish horticultural sector, such as: i) bad social conditions for immigrant workers (Medland, 2016; Pumares and Jolivet, 2014); ii) environmental degradation (Grindlay *et al.*, 2011; Juntti and Downward, 2017); and iii) the excessive use of fertilisers and pesticides, resulting in low-quality production and consumption (Wainwright *et al.*, 2014). Second, the erroneous accusations originating both in Spain and other countries (mainly through mass media) wrongly claiming an outbreak of *Escherichia Coli* identified by Germany as originated in Spanish cucumbers (Haarstad and Littlefield, 2015; Lopes *et al.*, 2013).

Apparently, European end consumers have placed a great deal of importance on the crises that have occurred in the Spanish horticultural sector. However, no previous studies have analysed these critical events in a structured manner. Previous literature has only focused on the implications of consumer's risk perception on food purchase decisions (Böcker and Hanf, 2000; Dosman *et al.*, 2001; Wandel and Fagerli, 2001). Specific studies on horticultural consumers' perceptions are scarce (Kreab, 2015). Following Cheng *et al.* (2016), consumer studies on purchase behaviour and safety concerns are necessary to help the food industry to control product safety and quality. Consequently, the main objective of this study is to determine and classify the origin and characteristics of the negative campaigns responsible for damaging the sector's image, and to determine its impact on the European market through an exploratory approach.

FIGURE 1
Importance of the Spanish horticultural export sector



Source: Original calculations based on data from ICEX (2017) and Eurostat (2017).

The outline of the paper is as follows. After this introduction, the paper starts with a literature review on the country of origin effect and the concept of product-country image. Furthermore, this research provides a conceptual framework to analyse the notion of ‘crisis’. Subsequently, the paper explores the different sources and origins of this phenomenon in order to provide a typology and a classification of crises in this sector, analysing, in particular, the main negative campaigns in the case of the Spanish horticultural sector. This classification is presented chronologically and provides illustrative examples, motives and means of diffusion. The methodology section is presented then, with the rationale for adopting an exploratory approach, and a description of the method and the data collection. Finally, results are discussed, and conclusions are offered for the possible implications to management and the orientation of future research.

2. Literature review and theoretical framework

2.1. Origin and Product-Country Image

The literature suggests consumers' perceptions about imported products and their attributes are affected by the country of origin (Cilingir and Basfirinci, 2014; Roth and Diamantopoulos, 2009; Samiee, 2010), and consumer ethnocentrism (Balabanis and Diamantopoulos, 2004; Chrysochoidis *et al.*, 2007). Country of origin research focuses on studying what consumers feel when they are exposed to country of origin cues, how they form their country images, and how they may use them in their marketplace behaviour (Chattalas *et al.*, 2008). Consumer ethnocentrism is often confused with 'country of origin bias' in spite of both being independent from each other. Thus, consumer ethnocentrism is more a "general tendency" to avoid buying foreign-made products as opposed to a specific country of origin image (Shankarmahesh, 2006). However, consumers can harbour ethnocentric tendencies as a general attitude toward imports and, simultaneously, have an affinity for a specific foreign country, which induces a favourable attitude toward imports from that specific country (Jaffe and Nebenzahl, 2006).

Within the framework of these criteria, the literature recognises that product image is closely linked to how the production country is perceived (Ahmed and d'Astous, 2008). This relationship is essentially based on the fact that consumers often use information from the country of origin to evaluate products in terms of quality, risk or perceived value (Brijs *et al.*, 2011; Hsu *et al.*, 2017; Josiassen *et al.*, 2008). Therefore, a positive image of a product is strengthened by the positive perception or reputation of the exporting country (Laroche *et al.*, 2005; Zhou *et al.*, 2007). Several studies have analysed the impact of country-of-origin image on the consumption of food products (e.g., Barbarossa *et al.*, 2016; Heslop *et al.*, 2008; Williamson *et al.*, 2016), confirming the relationship between reputation and increased consumption. In this way, if consumers do not have enough information to make a qualified judgment, or this information is erroneous, it is possible that a negative image will be generated. In addition, this image will be powerful enough to create a negative perception of the attributes of the product in question (Wongprawmas and Canavari, 2017). This type of situation frequently occurs with agricultural products. For example, in the presence of a food safety crisis, a problem of information asymmetry between the country of origin and the destination markets is created, as consumers are unable to easily understand the facts, which ultimately affects the perceived value of the product (Olynk *et al.*, 2010).

The country of origin effect is rooted in consumers' image of the quality of specific products marketed by firms related to a country of origin (Wang *et al.*, 2012; Carneiro and Faria, 2016). This image has been referred to as product-country image and may be based on actual product experience, but also on information gathered through advertising and other sources of product information, including word-of-mouth (Berger, 2014), articles in the news press (Verbeke and Ward, 2001; Verlegh *et al.*, 2005) and social media (Gaspar *et al.*, 2014). More specifically, negative

publicity has a potential negative effect on the company's image (Ahluwalia *et al.*, 2000). The mass media have a tendency to report about unfavourable news and this is the reason why some companies receive unfavourable press rather than favourable press (Dean, 2004). Furthermore, negative news related to food safety issues has been proven to have a far greater and faster impact on consumer behaviour, than positive news have (Verbeke *et al.*, 2007). In the food industry sector, incidents of negative publicity are widely prevalent in the market, ranging from food safety concerns to resulting negative externalities.

2.2. Delimitation of the concept of crisis

A crisis can strike any company at any moment. Regardless of their severity, crises pose a serious threat to companies (Vassilikopoulou *et al.*, 2009). The term 'crisis' is used relatively indiscriminately within various communities of discourse, making it difficult to establish how or when circumstances warrant its application (Bessant, 2007). Hermann (1972; p. 13) asserted that a situation might be deemed as crisis when (i) it poses a threat to important goals, (ii) there is a limited amount of time in which to respond, and (iii) policy makers are taken by surprise. In the food industry sector, the term 'crisis' refers to extreme situations characterised by a variety of circumstances: i) there are serious human health risks which are so complex they cannot be managed using standard methods; ii) the threat expands throughout the entire food chain or a large portion of it; iii) there is a potential impact on different regions or countries; and iv) general public opinion perceives the situation as critical. Food crises are a major source of public concern. As with other health-related crises, they can be characterised by a combination of "*unexpectedness, high levels of threat, an aroused or stressed population, and media looking for breaking news stories*" (Glik, 2007; p. 35). Gaspar *et al.* (2014) defined crisis as "*one or more perceived threatening events that go beyond what is "normal" or expected, demanding non-routine organisational and individual responses*". Therefore, the increasing complexity of products, more stringent product-safety legislation, and more demanding customers, make these crises ever more frequent (Laufer *et al.*, 2009).

In parallel, other types of crisis exist that must be addressed. In this case, their origin does not lie in a particular food risk¹, but rather in the consequences of events or factors that ultimately affect consumer perception more directly. These situations are most commonly related to production and resulting negative externalities (e.g., environmental impact, working conditions or social impact). The origin of these crises (that are not based on food risk or food safety) vary, yet the majority are created by the mass media or through complaints reported by groups (e.g., NGOs or competitors). Finally, crises can also arise which compromise the economic viability of a company or sector, thereby adversely affecting its future economic sustainability.

¹ From an operational point of view, the previous phase of a food crisis is the existence of a 'food alert' that can be detected by various public bodies or private agencies, which generates immediate action by the competent authorities. In the EU, for example, the RASFF tool (Rapid Alert System for Food and Feed) manages alert suspicions and decides whether a product needs to be removed from the market.

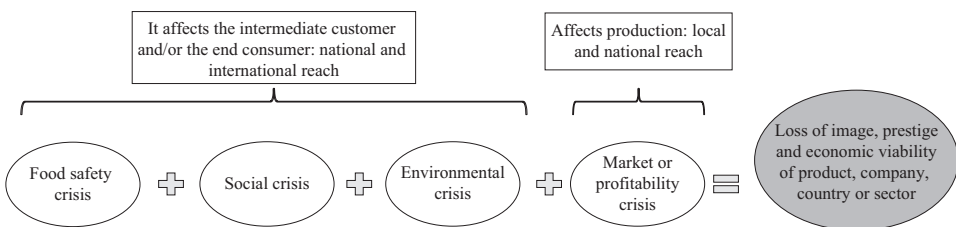
Such crises may be the result of temporary or structural changes (e.g., decreases in prices or demand, increased competition, and overproduction). Therefore, an effective crisis management is key for protecting companies from negative publicity and preserving their image.

In this research, we focus on a restricted concept of ‘image crisis’ that refers to the existence of a severe situation that can negatively affect the perception or image that the intermediate customer, or the end consumer of vegetables, has of the commercial and productive sector in the country of origin. This image is also compounded by negative communication campaigns. Thus, the impact of these critical situations on public opinion is spread by mass media (Andéhn *et al.*, 2016; Costa *et al.*, 2016). In these terms, an image crisis can have serious consequences, for example: the willingness to pay less for a product due to the perception of low quality (Tsakiridou *et al.*, 2009); the decrease in the consumption of products considered ‘foreign’ (Nijssen and Douglas, 2004); or ‘boycotts’ of the product-country (Hoffmann, 2011). The latter is considered to be a type of anti-consumption behaviour and a means of consumer resistance in response to different causes and objectives (Cherrier, 2009; Iyer and Muncy, 2009).

In order to identify the type of crises affecting the Spanish horticultural sector (see Figure 2), we propose the following typology: 1) *food safety crisis*, for example, the possible use of pesticides in the production process or the alleged discovery of harmful bacteria in products; 2) *environmental crisis*, essentially based on the excessive generation of waste; 3) *social crisis*, based for instance on the exploitation of immigrant workers; and 4) *market or profitability crisis*, due to a drop in prices (e.g., as a consequence of a supply excess, or even caused by meteorological factors), demand or increased competition, among other factors. In sum, the common factor among the various crises is the loss of credibility and image of the products, companies, sectors or countries directly or indirectly related to them, effectively threatening their sustainability.

FIGURE 2

First delimitation of the concept of crisis: Typology



Source: Own elaboration.

After defining the product-country image effect, the concept of image crisis and providing a typology of crises, we will examine the case of the Spanish horticultural sector. For this purpose, we propose a classification of the horticultural sector crises based on their origin, nature and scope.

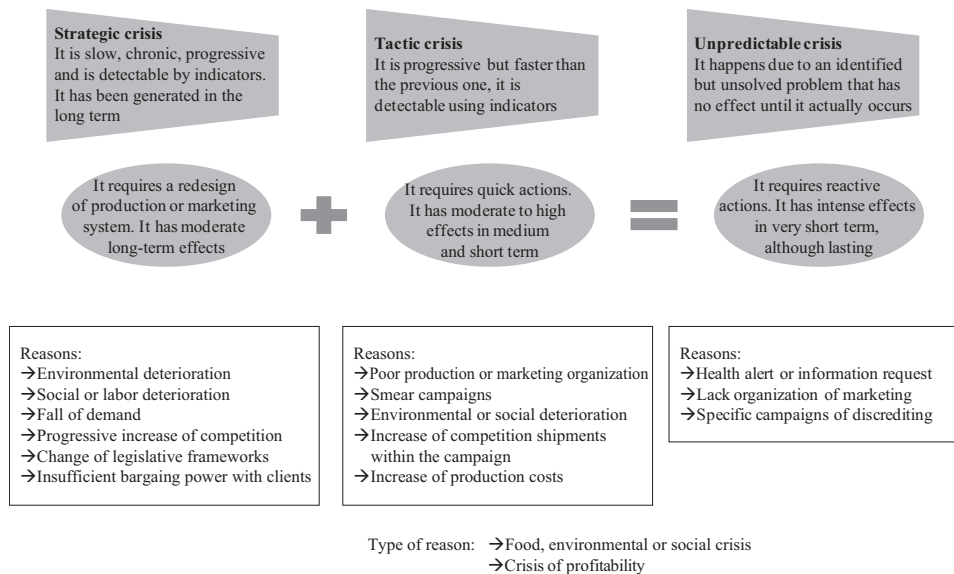
3. Identification and classification of the horticultural sector crises

In general terms, the Spanish horticultural sector is subject to constant crises, which imply both threats and opportunities, and organisations must know how to take advantage of these situations. Hence, it is necessary to identify and classify the origin of these constant crises in the sector to better understand how to address them.

As detailed in Figure 3, an unfavourable image of the sector is caused by different factors or reasons. These also have different implications for companies and for the sector in terms of time. One notable aspect is that in certain circumstances, a non-predictable crisis might have its origins in a strategic crisis stemming from environmental mismanagement and social deterioration, it may also be caused by a tactical crisis, for example, by not preventing the sale and use of illegal chemical products quickly and effectively.

FIGURE 3

Classification of the horticultural sector crises



Source: Own elaboration.

Table 1 lists several crises the Spanish horticultural sector has undergone in recent years as reported in the mass media, which affected its perceived image both in Spain and other European countries. According to our previous proposal represented in Figure 3, these are classified into three types: strategic, tactical and/or unpredictable crises.

TABLE 1
Classification and examples of crises

Type of crisis	Country	Media	Date	Reason
Strategic	England	The Guardian (Newspaper)	February 2011	The report criticised English supermarkets for selling vegetables from the province of Almería (Spain) because this production area was taking advantage of the economic crisis to 'exploit' irregular immigrants.
	The Netherlands	Omroep NI TV	March 2011	Under the title 'Pact Van de Stille', a report was issued which presented an unfavourable image of illegal immigration in the province of Almería (Spain).
	Germany	FOCUS (Magazine)	January 2015	Spanish-origin tomato was associated with high use of pesticides. They linked the production system to the employment of mostly illegal immigrants.
	England	Channel 4 TV	April 2015	An unfavourable report alleging situations of labour abuse by commercialisation companies on the farms of the provinces Murcia and Almería (Spain).
	Germany	3 SAT TV	January 2016	The report questioned the working conditions of migrant workers in greenhouses, qualifying the production area as a slave sector.
Tactical	Spain	La Sexta TV	April 2015	A TV report by Chef Alberto Chicote on the channel La Sexta made serious accusations regarding the destruction of millions of kilos of fruit monthly and the production systems in El Ejido (Almería, Spain).
	France	Francia 2 TV	February 2016	A news report presented the situation that Andalusian farmers were going through due to price drops, highlighting the misuse of income generated in the past.
	France	Francia 5 TV	April 2016	This news report dealt with the recent evolution of organic farming in the area of Almería. It was addressed from a biased point of view.
Unpredictable	Germany	ZDF TV	May 2011	A report on the outbreak of infections caused by E. coli bacteria in cucumbers, noting that the problem was in the handling process of Spanish companies.
	The Netherlands	Europa Press	May 2016	Article on a batch of tomato from Almería with a prohibited compound (Etefón).
	England	The Grocer (Magazine)	February 2017	A report on the supply problems due to poor farming conditions (cold) in the south of Spain that caused the increase in prices in British stores. The consumer was led to believe Spain did not want to supply the United Kingdom.
	France	YouTube	January 2018	A video about the production of tomato in Almería, which has given as a result a formal complaint carried out by the interprofessional association called HortiEspaña.

Source: Own elaboration.

As shown in Table 1, negative news about the Spanish horticultural sector appear mainly in the main destination markets in Europe (Germany, France, The Netherlands and United Kingdom). Within these countries, there is an increasing production enhanced by proximity, which may overlap in some months with the Spanish production. Spain strives to ensure its inwardly position as one of the largest suppliers. In general terms, it is expected that the foreign consumer is willing to pay a higher price for their domestic products in comparison to foreign products. This fact could be related to an inadequate general perception of the imported product with regard to the local one. Indeed, proximity products are related to sustainable consumption, as these products simplify distribution logistic and, consequently, reduce emissions.

Hereunder, it is important to analyse what were the major crises that substantially affected this sector. In particular, two crises –which were linked to two horticultural products (sweet peppers and cucumbers)– severely jeopardised the future of the sector. A detailed view of how crises actually arise, using some examples, will demonstrate how these two situations led to the development of a more sustainable production system.

December 2006 saw the appearance of an unauthorised active material (*isofenphos-methyl*) in peppers exported to Germany, the United Kingdom and the Netherlands. This discovery led to a health alert and caused multiple European distributors to cease buying products from Spain, which put the sector in serious jeopardy (Pérez-Mesa and Galdeano-Gómez, 2010). The main distribution chains in Europe, starting with German firms (Aldi, Edeka, Lidl and Rewe), began replacing Spanish production, especially that of Almería (main exporting province of Spain), with production from other origins (Israel and the Netherlands). It should be taken into account that the change in strategy of these large retailers had been set in motion by the serious food safety problems that began to appear in Europe in the late 1990s and early 2000s (e.g., the “mad cow” crisis). At that time (1997), “avian crises” also took place. These events of this time period considerably affected the quality regulations with which suppliers had to comply (Washer, 2006). However, contrary to expectations, these events did not change the procedures used in the Spanish horticultural sector, mainly because the entire supply chain was considered to be free of any food safety problems since it was already fulfilling private quality standards (at that time controlled by Eurep Gap, today Global Gap), which involved a 50 % reduction on the maximum limits of chemical residues established by law. The mad-cow disease crisis made large retailers realise that it was necessary to establish more controls² on their horticultural suppliers. In turn, the production sector was convinced of the need to reduce the use of chemical phytosanitary products. This change triggered the massive incorporation of biological pest control³ as of 2007 (Piedra-Muñoz *et al.*, 2016). This technique rapidly expanded, increasing from 2 % use on the cultivated area of peppers in 2006, to 61 % the following year. At present, the geographical area of Alm-

² Audit-based controls were facilitated. Direct control visits, samples to check Maximum Residue Levels (MRLs) and the number of pesticides - in products with origin in Spain- grew steadily.

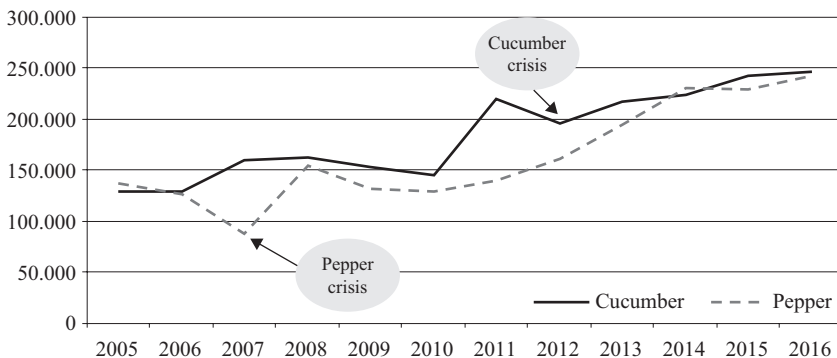
³ Use of auxiliary fauna (insects) to control pests, without the use of chemical control.

ería is the largest user of Integrated Pest Management worldwide, ahead of countries with a longer tradition in this technique, such as the Netherlands.

In May 2011, the largest crisis the Spanish horticultural sector has ever experienced took place. The authorities of the state of Hamburg attributed an infectious outbreak of *E. coli* to cucumbers from Spain, prompting an alert against the consumption of tomatoes, lettuce and cucumbers which quickly affected all horticultural products, not only originating in Spain, but also from more summer export areas (for example, Holland). The large distribution chains cancelled their orders, others were returned, even some that were in route. Although nearly three weeks later the German authorities recognised that the origin of the outbreak was not in Spain, these highly perishable products were no longer marketable. Consumption was so widely affected that prices fell drastically in both the national and export markets. Pérez-Mesa (2011) estimated the direct losses for the Spanish sector at more than 50 million euros. Despite the negative consequences, the sector was able to recompose itself and demonstrate to its customers (the main European distribution chains) that the traceability system implemented by companies worked properly, thereby increasing the degree of customer confidence in the Almería system. Six years after the so-called ‘cucumber crisis’, the state of Hamburg reached an out-of-court settlement whereby it compensated⁴ only two of the Spanish companies that were accused at the time.

Figure 4 illustrates the impact of the two crises mentioned on Spanish sweet pepper and cucumber exports to Germany, which are the two main exported products. For instance, in the case of the pepper crisis, the sales fell down 31 % in Germany within a single year. There was a drop of 11 % in the case of the cucumber crisis. These percentages cannot be considered accidental.

FIGURE 4
Spanish exports to Germany. Tonnes



Source: Original calculations based on data from ICEX (2017).

⁴ The spokesman of the Government of Hamburg estimated the payment to be between 400,000-700,000 euros per company.

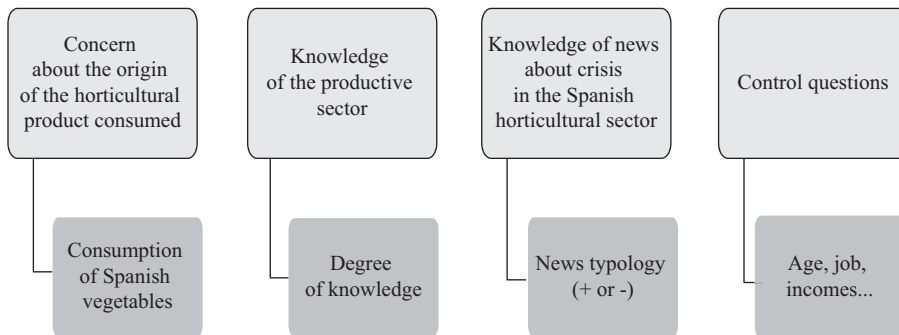
4. Exploratory analysis of crises impact on the market

4.1. Methodology

The conceptualization, classification and review of the main Spanish horticultural sector crises have allowed highlighting the origin of a potential impact on the consumers' perception of this type of products. However, the extent of such potential impacts remains difficult to determine. Therefore, we have conducted an exploratory analysis, as a preliminary attempt to know the impact of those crises on the perceived product-country image, considering the main destination markets in Europe. More specifically, the analysis aims to: 1) explore the consumers' knowledge about the origin of the product; 2) obtain information regarding the level of knowledge that end consumers have of the horticultural production system, as well as to what extent this knowledge affects their consumption and their product-country image; 3) identify the kind of campaigns consumers associate most frequently with the Spanish horticultural sector. Finally, a Logit model is used to explore the impact that the degree of knowledge on the sector and the news about it have on the probability of consumption of Spanish horticultural products.

FIGURE 5

Summary of survey questions



Source: Own elaboration.

Firstly, a survey was designed to collect information (Figure 5). An online questionnaire was chosen as its advantages (i.e., low cost, high speed and appeal) overcome its limitations (i.e., representativeness) (Duffy *et al.*, 2005). The survey was conducted among end customers in the main consumer countries of Spanish horticultural products (Spain, Germany, France, United Kingdom and the Netherlands). The sampling procedure was performed using the *snowball* technique (Baltar and Brunet, 2012) until a total of 118 respondents were obtained. This sample size was considered sufficient for an initial exploratory study of these characteristics. Previ-

ously, a pre-test was performed on 15 consumers of vegetables. One of the objectives of our study was to know the socio-demographic profile of the horticultural products' consumers. The survey revealed the following demographic and socioeconomic characteristics of the end consumer sample (Table 2).

TABLE 2
Sample characteristics

Age	Occupation	%	Income (euros)	%	Country of origin	%
20-58 years	• Employed workers	42.4				
	• Self-employed workers	9.3				
	Working population	51.7	Less than 600	39.8	Spain	32.0
			Between 600 and 1,200	24.6	United Kingdom	25.0
	• Students	35.6	Between 1,201 and 1,800	22.9	The Netherlands	14.0
	• Homemakers	5.9	Between 1,801 and 2,400	10.2	France	12.0
	• Unemployed	4.2	More than 2,400	2.5	Germany	3.0
	• Retirees	1.7			Others	
	Non-working population	48.3				

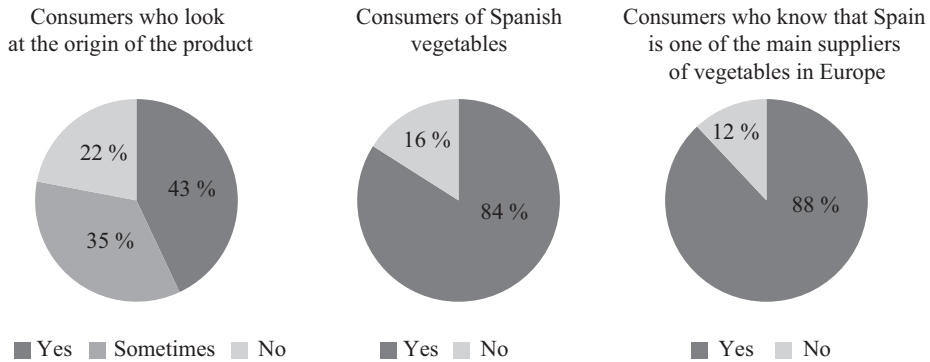
Source: Own elaboration.

5. Results and discussion

Findings show that, in general, consumers' look at the origin of the food they consume (i.e., fruits and vegetables). More specifically, the majority of respondents know that they consume fruit and vegetables originating from Spain. Furthermore, most consumers' know that Spain is one of the main suppliers of European fruits and vegetables (Figure 6).

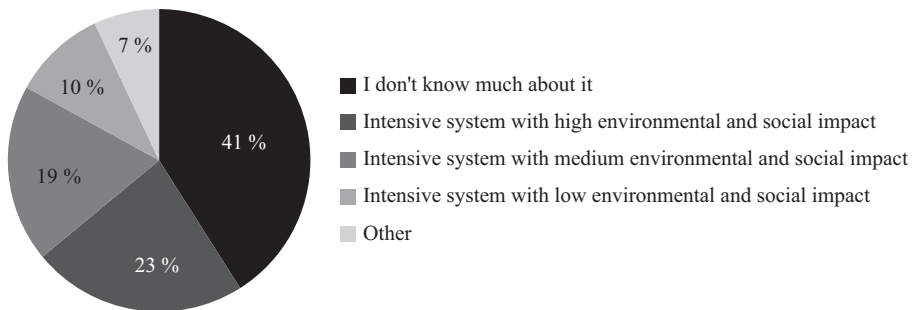
When asked if they had any knowledge on the Spanish horticultural production system, 41 % of the respondents answered that they were not very familiar with it (Figure 7). 23 % of the respondents considered that the Spanish production system was intensive, with a high social and environmental impact. However, it is also observed that nearly half of the consumers had no knowledge about the production system that produced the vegetables they consumed. In spite of most consumers' knew that Spain was one of the main suppliers of European fruit and vegetables, they were not very familiar with the Spanish horticultural production system. Therefore, the lack of consumers' awareness about the production system used could make them more vulnerable to a negative publicity.

FIGURE 6
Knowledge of product origin



Source: Own elaboration.

FIGURE 7
Knowledge about the Spanish horticultural production system



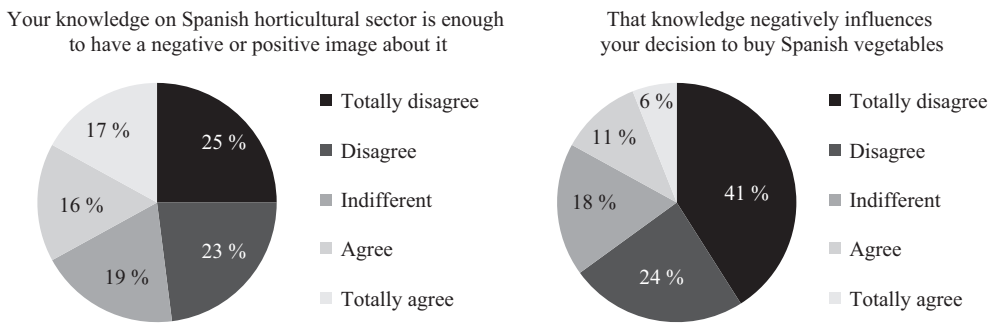
Source: Own elaboration.

To delve further into the previous topic, we conducted an analysis to determine the impact that consumer knowledge has on purchase decision-making. More specifically, consumers were also asked if the fact of knowing this sector influenced or not their own behaviour, their consuming decisions, and if it influenced negative or positively. Being one of the principal producers within the European Union, and after the controversy originated in the mass media due to the ongoing crisis suffered in this sector, we were eager to know the scope of the negative information on the horticultural production systems. Likewise, we wanted to know if consumers had sufficient information about this sector in order to have a positive or negative image.

In the light of the above, the main purpose was to demonstrate that negative news prevail over the positive ones, that is, if consumers associate the Spanish horticultural products to negative news, such as lack of food safety, and social and environmental negative effects. In this sense, 33 % of consumers did not have enough knowledge to have a positive or negative image of the production system. 48 % of the respondents asserted that their knowledge is enough to have a negative or positive image about the Spanish production system. Moreover, 17 % of the respondents said that their knowledge influences in a negative way, 18 % were indifferent and 65 % were positively influenced (Figure 8). Similarly, 39.8 % of those surveyed stated that they would like to receive more information about the production system in use. This aspect could be an indication of a need for knowledge that is unattended by retailers that sell Spanish vegetables.

FIGURE 8

Impact of production system knowledge



Source: Own elaboration.

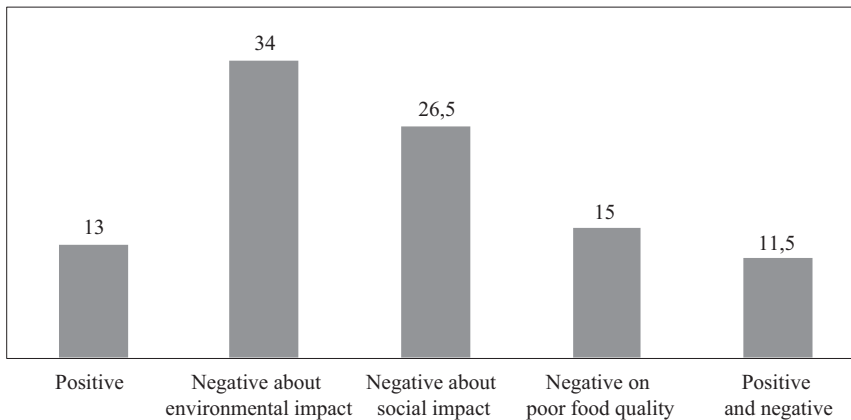
Another item on the survey sought to determine the level of consumer awareness of news related to the Spanish horticultural sector (Figure 9). Respondents were asked if they had read or seen any news about the Spanish horticultural sector and, if so, what kind of news they were. The results of the survey are shown in Figure 5. These percentages could indicate the deterioration of the perception of the sector’s image since the majority of consumers associate Spanish horticultural products with news that had a negative impact.

A Logit model is used to analyse the impact that the degree of knowledge on the sector and the news about it have on the probability of consumption of horticultural products of Spanish origin. In general, consumers’ purchase choices are based both on prior information stored in their memory and on information that they obtain from the external environment (e.g., advertising, internet, sellers, news, etc.) (Degeratu *et al.*, 2000). In the particular context of food consumption, consumers’ preferences and motives underlying choices are influenced by a multitude of interacting factors (Sinesio

et al., 2018), such as the product itself, person-related factors, and the specific context in which the choice is made (Köster, 2009). In particular, consumers evaluate food information conveyed by different media, and this information influences their food purchase choices (Nocella *et al.*, 2014). This approach guarantees the model typology.

FIGURE 9

Type of news about the Spanish horticultural sector (%)



Source: Own elaboration.

For this purpose, the following variables were defined:

- SC = Consumption of Spanish vegetables. Dichotomous dependent variable (Yes = 1; No = 0).
- OK = Knowledge of the origin of the product that is consumed (Yes = 1, otherwise = 0).
- PK = Knowledge of the Spanish horticultural production system. Dichotomous variable (Yes = 1, otherwise = 0).
- NK = Knowledge of negative news about the Spanish horticultural sector (Yes or sufficient = 1, otherwise = 0).
- Net monthly income (internal variable with 5 categories, from “less than 600 euros” to “more than 2,400 euros”), age (continuous variable) and occupation (Working = 1, otherwise = 0).

The estimation of the Logit model (Table 3) confirmed the results mentioned above and identifies important nuances: Spanish origin does not seem to have a negative image among consumers despite the successive crises the country has endured.

This is supported by the significance of the OK variable: Spanish products are purchased when their origin is known. In addition, some consumers of Spanish vegetables are informed about the production system used, a detail that is derived from the significance of the PK variable. Non-consumers are those who have knowledge of negative news about the sector (significant NK). With respect to the control variables, only that which corresponds to the non-working population (student, unemployed and / or retired) accurately characterises the consumer; however, it is noteworthy that lower income groups are those with the highest purchases (albeit with a $p = 12\%$ for all countries). This fact may indicate the consideration of Spanish products as commodities outside of the Premium standards. Similar results are obtained by running the estimation on split samples by country of residence (Spain and others), revealing a very homogeneous consumer.

TABLE 3

Results of the Logit model. Dependent = Consumption of Spanish vegetables (SC)

Variable	Total	Spain	Other countries
Constant	-4.061**	1.101*	-1.561**
Origin Knowledge (OK)	1.235*	2.265**	0.988*
Production Knowledge (PK)	2.114**	1.589**	1.972**
Negative news Knowledge (NK)	-1.682*	0.933*	-1.901**
Age	0.077	0.052	0.021
Income	-0.811	0.013	0.211
Job	-1.247*	0.977	-1.001
R ² Nagelkerke	0.39	0.32	0.36
Classification success (%)	87	76	81

Note: * = $p < 10\%$; ** = $p < 5\%$; *** = $p < 1\%$.

Source: Own elaboration.

Summing up, most consumers know that they buy vegetables from Spain; however, 41 % of them would have no knowledge about the production system in use. The most popular types of horticultural news that would reach consumers are those focused on the environment and social impact, as well as those that emphasise poor food quality. The results also reflect that negative news could have a measurable and significant impact on the consumption of vegetables. In contrast, having knowledge about the production system could have been proved to positively influence. It must be noted that the survey conducted should be viewed as a preliminary market analysis that will have to be improved to confirm the generalisation of the results.

6. Conclusions

The Spanish horticultural sector has been subject to constant image crises. Mistakes committed by the sector in the past and a failure to address identified problems have had negative consequences on the image of the sector, a fact made evident by the release of negative news in the national and foreign media. However, as the present work has shown, some of the crises have their origins in a previous negative conception or, in some cases, in a lack of knowledge on the part of consumers regarding the efforts made by the Spanish horticultural production and marketing sector in their attempt to improve quality and safety throughout the supply chain.

Most of the image crises existing in the sector can be classified as strategic in the sense that they have emerged slowly, chronically and progressively. This type of crisis is easily detectable by generic indicators such as number of inspections and labour complaints, presence of illegal immigrants, percentage of non-recycled waste, and reduction of aquifer levels. It is essential for the sector to identify these indicators and monitor them, as well as transfer this knowledge to the end consumer, as much of the negative news they receive is unfounded. In the case of the existence of a real and justified problem, the difficulty of addressing it lies in the fact that solutions require a redesign of the production or commercial system, which implies long-term measures that transcend the horticultural sector and require the action of the public administration. The search for solutions individually, that is, at the company level, is unfeasible.

Frequently, the lack of a marketing strategy has been due to the widespread opinion in the sector that initiating promotional campaigns directed at the end consumer is useless. The sector has always considered its end customer to be the large European distributors, and that they are responsible for informing the consumer of the efforts made by suppliers to increase the quality and safety of their products (Pérez-Mesa and Galdeano-Gómez, 2015). This belief has been proven to be false. In recent years, the scarce response by the sector has been coordinated through company associations and federations, as well as through grower associations. In 2017, the creation of the interprofessional association⁵ representing the greenhouse vegetables sector – HortiEspaña – created a wealth of opportunities for collaboration among organisations with common interests in the supply chain, for example, to finance information campaigns that change consumer perception.

In sum, it can be seen that there is a need to take action, which must be coordinated from the origin, in order to reach consumers and restore the prestige of the production system. Initiatives in this line would eliminate the asymmetry of information between production and consumption areas. These proactive information campaigns must give priority to measures implemented for the purpose of increasing social and environmental sustainability, and, in the latter case, to emphasise the use of new pro-

⁵ In Spain, an interprofessional association is an organisation recognised by law, comprised of representative organisations responsible for the production and, where appropriate, the agri-food marketing and distribution of the sector or products included in the agri-food system. To be recognised as such, it must have a minimum representation of 51 % in each and every one of the branches of the above activities. An interprofessional association has regulatory capacity, which can be extended to the entire sector.

duction systems that feature biological control. As for consumer perception of poor social conditions, this is a complicated issue to solve, as it is the product of a combination of more general problems, which are actually exogenous to the sector itself.

Several limitations of the present study should be mentioned. First, the empirical study carried out is exploratory and has analysed a limited sample of consumers. Thus, our findings cannot be generalised, but we can obtain valuable ideas that can serve as a basis for further extended and thorough analysis. Second, the crisis classification provided does not reflect the strategies and actions needed to address each of them individually. For this reason, future research should be carried out to proactively analyse, and ultimately identify, the main indicators that allow those crises to be detected and determine which strategies should be implemented to anticipate or combat them. These indicators and actions should concentrate, fundamentally, on predictable crises, that is, those identified in our study as strategic and tactical.

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