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## Agri-food companies in the social media: a comparison of organic and non-organic firms

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### ABSTRACT

Organic agri-food products in Spain face major commercial problems in the home market as a result of consumers' lack of information about this type of product and difficulties in accessing it, and the considerable price differential between organic products and their conventional equivalents. This study proposes that consideration should be given to social media as a factor for mitigating these commercial problems and improving the competitiveness of organic food companies. Specifically, the aim of this research was to examine the social media penetration and activity of olive oil sector companies and ascertain whether organic and non-organic operators present differences in this respect. To this end, a checklist was used to analyse the social media activity of 663 olive oil companies in total, comprising both organic and non-organic producers. The results reveal statistically significant differences in social media penetration and use by organic and non-organic operators, with the former being more active in these networks. Nevertheless, the social media efforts of organic operators are less effective, owing to the limited demand for their products.

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## Introduction

Society's increasing concern with healthy eating and greater awareness of environmental problems has led to a steady rise in the prominence of organic farming within the primary sector.<sup>1</sup> Worldwide, from the supply perspective, the agricultural surface area registered as organic grew from 11 million to around 51 million hectares between 1999 and 2015, the number of operators linked with it rose from 0.2 to 2.4 million, and the number of countries adopting this production method doubled (Willer & Lernoud, 2017). From the demand perspective, over the same period,

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organic food sales multiplied by five, attaining the value of €75 billion in 2015, and considerable further growth is anticipated (Willer & Lernoud, 2017).

Spain is in a very strong position as regards the factors of production, since its organic production area is the largest in Europe and the fourth largest in the world (Willer & Lernoud, 2017). The home market's consumption of organic products is out of step with its production capacity, however, being only €32.27 per capita per year, equivalent to just 1.51% of total food expenditure (MAPAMA, 2016). This gap between supply and demand has made it necessary to direct Spain's output towards other markets. Consequently, the bulk of sales go to foreign markets, where there is no guarantee that either this level of exports or their profitability can be sustained, as this depends on their being able to hold their ground against increasing competition (MAPAMA, 2016).

The reasons for the commercial shortfall in the organic agri-food sector in Spain are largely the same as those in other national markets. They include the following: the consumer's lack of information about this type of product, the inaccessibility of available supplies, and an excessive price differential between organic products and their conventional equivalents (Moza, Bernal, Medina, & Fernández, 2016; Rousseau & Vranken, 2013; Tsakiridou, Boutsouki, Zotos, & Mattas, 2008). The present study suggests that consideration should be given to technology as a factor for mitigating these commercial problems and improving organic organisations' competitive position in the market. Specifically, it focuses on online social networks (the 'social media') owing to their many organisational advantages, which include their informational and commercial potential (Gil, Kalixto, & Quintero, 2018; Kaplan & Haenlein, 2010; Martin & Van Bavel, 2013). For this reason, online social networks can perform a very significant role for organic operators, helping them to generate clear competitive advantages (Moza *et al.*, 2016). The reasons why online social networks are able to help in this way include their ability to create trust among consumers (Laroche, Habibi & Richard, 2013).

This study centres on the olive oil industry in Spain, both because of its worldwide relevance and because organic operators in this sector share the problems described above with the organic agri-food sector as a whole (Willer & Lernoud, 2017). The aim of this research was to analyse olive oil companies' social media penetration and Facebook and Twitter activity levels, distinguishing between organic and non-organic operators, in order to check whether there were significant differences between the two groups in terms of social media use, user interaction with corporate accounts on these platforms and the efficiency with which these accounts were used.

This article is organised as follows: The theory section that follows this introduction includes the hypotheses proposed. The subsequent section describes the study population and the methods used. The results are then presented, followed by the discussion and conclusions, including the limitations of the study and future lines of research.

## **Theoretical framework**

Transaction cost theory has frequently been used as a basis for analysing and highlighting the potential of information and communication technology (I.C.T.) for businesses, particularly in the commercial context (Powell & Dent-Micallef, 1997). Social

media, as the main example of this phenomenon, bring multiple benefits in terms of corporate performance and reducing the different costs that arise in the course of a transaction, such as information, negotiation and security costs (Salas, 1989). Information costs are brought down by the information potential of online social networks, which facilitate, improve and speed up information exchanges (DiMicco, Millen, Geyer, Dugan, Brownholtz, & Muller, 2008; Hohenthal, Johanson, & Johanson, 2014; Karoui, Duzdert, & Leidner, 2015; Lorenzo, Constantinides, & Alarcón, 2011). Negotiation costs fall because online media can improve customers' access to the organisation and enable them to receive more personalised offers (Alberghini, Cricelli, & Grimaldi, 2014; Bradley & McDonald, 2011; Cerezo, 2008; Karoui *et al.*, 2015; Martin & Van Bavel, 2013; Stephen & Toubia, 2010; Wamba & Carter, 2014). Lastly, warranty costs are minimised because trustworthy, high-quality information and feedback are given to the users (Laroche, Habibi, & Richard, 2013).

However, experience suggests that not all businesses have the same ability to make use of the advantages the Internet affords. Rather, a number of studies indicate that adapting to the Internet depends on various factors, which differ according to the industry or the region in which the business operates (Vlachvei, Notta, Diotallevi, & Marchini 2014). In the specific case of agricultural markets, McFarlane, Chembezi, and Befecadu (2003) found that distribution chain characteristics, the scope of the business and the type of product it sells influence the intensity of the electronic commerce ('e-commerce') strategic adoption. For instance, the intrinsic characteristics of certain 'experiential' agricultural products make these particularly suitable for Internet marketing (Stricker, Mueller, & Summer, 2007). Wine purchasing and consumption, for example, are based on an intensive exchange of information referring not only to tangible aspects of the product but also to others such as symbols, tradition, culture, tourism or gastronomy, which can significantly enhance the consumer's value perception (Canavari, Regazzi, & Spadoni, 2002). The proximity of the social media and their interaction with the users make them an ideal communication channel for conveying this information.

Based on these arguments, and bearing in mind the characteristics that define the supply of organic agri-food products, it may be deduced that this sector is in a better situation than conventional agri-food products to benefit from the marketing advantages afforded by the social media (Medina, Bernal, Mozas, Moral & Fernández, 2016; Mozas *et al.*, 2016). For instance, some of their characteristics tend to increase the transaction costs more than their conventional equivalent. These include the consumers' lack of knowledge or misinformation about these products, lack of proximity to supplies and other distribution shortcomings, and an excessive difference in price compared to the conventional equivalents (Hamzaoui & Zahaf, 2008; Padel & Foster, 2005; Roitner, Darnhofer, Somsook, & Vogl, 2008; Rousseau & Vranken, 2013; Tsakiridou *et al.*, 2008). As a result, social media use is particularly attractive for this sector, as it provides companies with a low-cost alternative for improving communication (Gunelius, 2011), enhancing interaction with customers (Lai, Tong, & Lai, 2011) and, in short, better commercial practices (Cheng & Xie, 2008; Fernández, Mozas, Bernal, & Medina, 2016; Wei, Zhang, & Sutanto, 2013).

In addition, since organic agri-food products have the capacity to evoke sensations and convey experiences, they may be considered 'experiential products' (Schmitt,

1999). In the case of olive oil, the considerable proliferation of ‘olive oil tourism’ shows that consumers are increasingly interested in product-related experiences that extend far further than simply buying the physical product (Murgado, 2013).<sup>2</sup> For a number of other consumers, olive oil is part of their ‘green consumption’ shopping basket, seen as less polluting and more environmentally friendly (Calomarde, 2000). Given this background, the proximity and trust conveyed by social media as a communication channel make it possible to share information on the differential attributes of organic products and on experiences of their consumption, adding to their value and differentiating them in increasingly competitive markets. The findings of Haff (2017) point in this direction: After examining the social media strategies of eight of the principal organic food brands in the US, this author concluded that 88.6% of the advertising messages on these media were ‘transformational–emotional’.<sup>3</sup> In view of these arguments, the following hypotheses can be proposed:

H1. Social media presence and activity is greater among organic companies than among non-organic ones.

H1.1. Social media presence is greater among organic companies than among non-organic ones.

H1.2. Social media activity is greater among organic companies than among non-organic ones.

As mentioned in the introduction, organic food consumers show a high degree of ignorance and confusion about these products and their characteristics. This aspect is particularly important since the various models that have attempted to explain the behaviour of these consumers (Chan & Lau, 2000; D’Souza, 2004; Follows & Jobber, 2000; Kalafatis, Pollard, East, & Tsogas, 1999; Laroche, Bergeron, & Barbaro-Forleo, 2001) all emphasise the key role that the consumers’ ‘ecological knowledge’ plays in their purchase intention.<sup>4</sup> The reason is that in order to decide whether to buy the product, consumers require a more profound assessment of the environmental and individual consequences associated with the purchase (Follows & Jobber, 2000).

A scarcity of information has a negative effect on the decision to buy organic products for at least two fundamental reasons: first, because consumers are uninformed about the benefits or risks involved in their consumption (Hilverda, Kuttschreuter & Giebels, 2017), and second, because consumers find it difficult to justify paying the higher price than for conventional equivalents (Chronis, Lu, & Miller, 2015). This situation may lead consumers to experience feelings of confusion and anxiety and a greater need for information to allow them to assess the pros and cons of consuming organic products (Van Dijk, Fischer, & Frewer, 2011).

In view of the above, it is important to point out that the Internet is currently one of the main sources used to search for food information (Jacob, Mathiasen, & Powell, 2010; Kuttschreuter, Rutsaert, Hilverda, Regan, Barnett, & Verbeke, 2014; Redmond & Griffith, 2006; Tian & Robinson, 2008). Among the various tools the Internet offers, social media provide consumers with platforms where they can acquire trustworthy information and thereby mitigate the knowledge barrier (lack of knowledge) they face when acquiring organic foods (Chronis *et al.*, 2015). Indeed, some authors have argued that because of the more personal character of the information exchange

and its indirect, word-of-mouth-based communication mode, social media are more believable tools than others for supplying 'green information' (Hung, Yiyan, & Tse, 2011). In the food sector, Holt (2016) has suggested a relationship between the spread of social media use and the appearance of a cultural movement organised around the resurgence of pre-industrial foods. Unlike other means of communication such as the press or the television, the interactivity of social media allows instant feedback by organic product consumers on aspects such as lifestyle, environmental preferences and other sustainable behaviours (Kahle & Valette, 2012). Therefore, the following hypothesis can be proposed:

H2. Social media activity levels are higher among the customers of organic companies than among those of non-organic ones.

Social media offer a convincing channel of communication for providing information on the characteristics of products or services and influencing the decisions of a large number of individuals with minimal effort (Subramani & Rajagopalan, 2003). However, the mere presence or penetration of companies on social media is not enough to take full advantage of these tools. It is also necessary to be minimally active and invest resources in this social media activity to ensure its effective implementation (Biloš & Kelić, 2012). These technologies present positive network externalities that increase their attractiveness as the number of users rises (Kaplan & Haenlein, 2010). Consequently, the size of the social medium is a variable that increases its usefulness and value (Calvo & Zenou, 2005; Torrent, 2015). However, it is acknowledged that the dissemination and usefulness of these new technologies may not be optimal, owing to inefficiencies due to informational factors (Bandiera & Rasul, 2006). The benefits of network externality increase when users are well informed and are knowledgeable about the subject under discussion (Subramani & Rajagopalan, 2003).

As mentioned in the introduction, in the case of organic products, particularly olive oil, demand is very low compared to supply levels (Mozas *et al.*, 2016). The organisations that offer this type of product encounter little demand in the home market, which is generally the target of their social media marketing efforts. In this way, organic organisations address a smaller public and one that is unfamiliar with the characteristics and properties of their products. Factors such as these are not favourable for reaping benefits from the network externality effect that occurs on these platforms (Muller & Peres, 2017). Medina *et al.* (2016) also observed shortcomings in organic olive oil organisations' use of online social networks (Fernández, Mozas, Bernal, & Medina, 2016). Based on these arguments, the following hypothesis can be proposed:

H3. The efficiency achieved by the social media activity of organic companies is lower than that of non-organic ones.

## Materials and methods

The study population comprised olive oil mills and factories situated in the largest production region in the world: Andalusia. The government bodies responsible for

agri-food industries possess a database of these companies that can be accessed online (the Andalusian regional government's SIG INDUSTRIA). In order to identify the organisations that operate in the organic farming sector, the regional authorities responsible for overseeing this activity were contacted. They too have a register of the corresponding operators. The population was 951 organisations that produce and market olive oil. Of these, 150 were certified organic producers, and 801 were conventional producers. All organic producers were considered, and a simple random sample of 513 conventional producers was also drawn from the population.<sup>5</sup>

To collect the data, a checklist of indicators of the olive oil companies' social media use and activity was prepared. The main statistics of the organisations' Facebook and Twitter accounts were obtained, as these are the two most popular and most widely used social media among businesses in Spain (ONTSI, 2015). Specialist web tools – LikeAlyzer for Facebook and Twitonomy for Twitter – were also used to analyse the use of these platforms. The metrics that were obtained essentially correspond to variables that reflect the organisations' activity on these social media (posts and tweets) and variables that capture interactions with consumers (likes, followers, engagement rate, people talking about this or P.T.A.T., retweets received and replies).

As regards the methods used, a number of statistical tests were employed in addition to data envelopment analysis (D.E.A.), for which this study employed the classic Banker–Charnes–Cooper (B.C.C.) model, which includes variable returns to scale, adopting an output-oriented approach that maximises outputs (Charnes *et al.*, 2013). This method was used for organisations with active accounts on both social networks (Facebook and Twitter). The main statistics on the activity (posts, photos and video) and following (likes and followers) of each of the olive oil companies' social media accounts were used as inputs and outputs for the model.

D.E.A. is a deterministic non-parametric method for measuring the efficiency of different homogeneous decision-making units (D.M.U.). Although the D.E.A. has been linked to production, it is also used for assessing the actions of organisations, based on best practice in terms of productivity and performance (Cook, Tone, & Zhu, 2014; Zhu, 2015). As an analytical instrument, this method is superior to the traditional approach based on a simple calculation of indicators, as it facilitates multi-dimensional treatment of the input side while assessing output performance systematically and comparatively. Its main advantage lies in its flexibility, as it can be applied to an infinity of scenarios and situations (Charnes, Cooper, Lewin, & Seiford, 2013), especially when precise information on the input costs and output value is lacking (Samoilenko, 2014). To mitigate the weakness of this D.E.A. method, namely its high sensitivity to extreme values (Banker & Gifford, 1988), the super-efficiency technique was employed to detect and eliminate outliers. To this end, observations with a value greater than double the score marking the total efficiency threshold were discarded (Martínez & Pérez, 2014).

## Results

An initial approach to determining social media penetration in the olive oil sector observed that 66% of the organic olive oil companies had active accounts with these

**Table 1.** Mean values of social media activity variables and comparison by type of operator.

SOCIAL NETWORK	VARIABLE	ORGANIC	CONVENTIONAL	SIG <sup>7</sup>
FACEBOOK	Posts	495.35	263.10	0.002
TWITTER	Posts	596.78	280.62	0.023

platforms, compared to 38.01% of the conventional olive oil companies. Taken together, 44.34% of the olive oil organisations had active social media accounts, while the difference between organic and conventional operators was 28%. The difference in social media penetration between the two types of organisation was even greater in the two most popular social networks, Facebook and Twitter.

With the aid of Pearson's chi-squared test,<sup>6</sup> considering the nominal variables 'social media presence' and 'type of operator' (organic and not organic), the evidence was sufficient to reject the null hypothesis that organic and conventional operators make similar use of social media, for a p-value <0.001. Consequently, it may be stated that the observed differences between the two groups can hardly be explained by chance, and that organic companies have a greater social media presence than non-organic companies do.

The following analysis examined whether organic and non-organic organisations presented significant differences in their level of activity on these platforms, in the same way as for social media presence. The criterion was the number of posts made by the companies under study on the two main online social networks, Facebook and Twitter. The mean for each variable indicated that the organic olive oil companies were more active on these platforms (Table 1). Upon applying the Mann-Whitney U test, also known as the Mann-Whitney-Wilcoxon test, the null hypothesis of no statistically significant differences in the distribution of posts between the two groups was rejected (Table 1).

These two tests supported hypothesis 1, namely that organic and non-organic olive oil companies show significant differences in their levels of social media presence (H.1.1.) and activity (H.1.2.), with organic companies showing a greater use of these media.

As mentioned in the introduction, consumers' lack of knowledge is one of the main obstacles to consumption of organic products, so more intense use of the social media as information and communication channels could be expected among organic product consumers than among those who do not consume organic products. To test this hypothesis, a number of variables concerning customer interaction with the social media accounts of the olive oil companies were examined. This analysis showed clear differences in mean interaction rates between the customers of organic companies and those of non-organic companies (Table 2), with the former engaging in greater interaction. The Mann-Whitney U test also confirmed that these differences were statistically significant (significance level 0.05) for the variables *Likes*, *P.T.A.T.*, *followers*, *retweets received*, and *replies* (Table 2).

The greater level of interaction among organic company customers than among non-organic ones could be offset by the limited volume of demand for organic products, so there is no guarantee that the organic companies will be more successful in their social media marketing efforts. Consequently, the social media efficiency of the olive oil organisations was studied through the D.E.A. Facebook and Twitter, the two



**Table 2.** Mean values of social media interaction variables and comparison by type of operator.

SOCIAL NETWORK	VARIABLE	ORGANIC	CONVENTIONAL	SIG <sup>5</sup>
FACEBOOK	Likes	3923.76	495.40	0.006
	Engagement rate <sup>8</sup>	113.95	16.17	0.098
	P.T.A.T. <sup>9</sup>	198.55	30.47	0.028
TWITTER	Followers	737.04	434.13	0.040
	Retweets received <sup>10</sup>	217.87	99.25	0.010
	Replies <sup>11</sup>	92.39	25.66	0.025

**Table 3.** Mean value of the variables included in the D.E.A.

SOCIAL NETWORK	INPUTS	OUTPUTS
FACEBOOK	Posts	2900.70
	Photos and videos	
TWITTER	Posts	791.74
	Photos and videos	

**Table 4.** D.E.A. results and comparison by operator type.

D.E.A. RESULTS	ORGANIC	CONVENTIONAL	TOTAL
Efficient organisations as percentage of total	23.53%	46.88%	34.85%
Mean efficiency*	46.44%	52.11%	48.68%
SIG <sup>12</sup> : 0.046			

\*Mean efficiency score of inefficient organisations.

social networking platforms most used by these organisations, were analysed together so that the synergies of using both tools could be included in the analysis. The proposed model and mean values for each of these variables are shown in Table 3.

The businesses studied were considered to comply with the D.E.A. method's assumption of homogeneity, as they all belonged to the olive oil sector and had active accounts on both Facebook and Twitter. In addition, outliers were removed using the Banker and Gifford's (1988) approach, which uses super-efficiency scores to reject values that exceed a particular predefined threshold and correspond to atypical observations (Banker & Chang, 2006). In this case, the threshold was set at 2. The resulting efficiency levels are shown in Table 4. Similarly, by applying the Mann-Whitney statistic, a non-parametric test that is recommended for efficiency comparisons in the D.E.A. (Banker, Zheng, & Natarajan, 2010), evidence was obtained to reject the null hypothesis of no significant differences between the two types of organisation.

These findings showed that the efficiency frontier was 34.85% of the olive oil companies, of which 62% were non-organic. By type, 46.88% of the non-organic companies could be considered totally efficient according to the efficiency model considered, whereas only 23.53% of the organic companies attained the efficiency frontier. The mean efficiency values for the inefficient organisations differed by around 6% between the two groups, as they were 46.44% for organic firms and 52.11% for conventional oil companies. The efficiency scores, which distinguish each operator, are shown in graph form in Figure 1.

The above results indicate that the organic olive oil companies' social media marketing efforts were less efficient than those of the non-organic companies, confirming hypothesis H3. The lower volume of demand for organic products means that organic olive oil companies need to make a greater effort on social media to attract and retain customers through these networks.

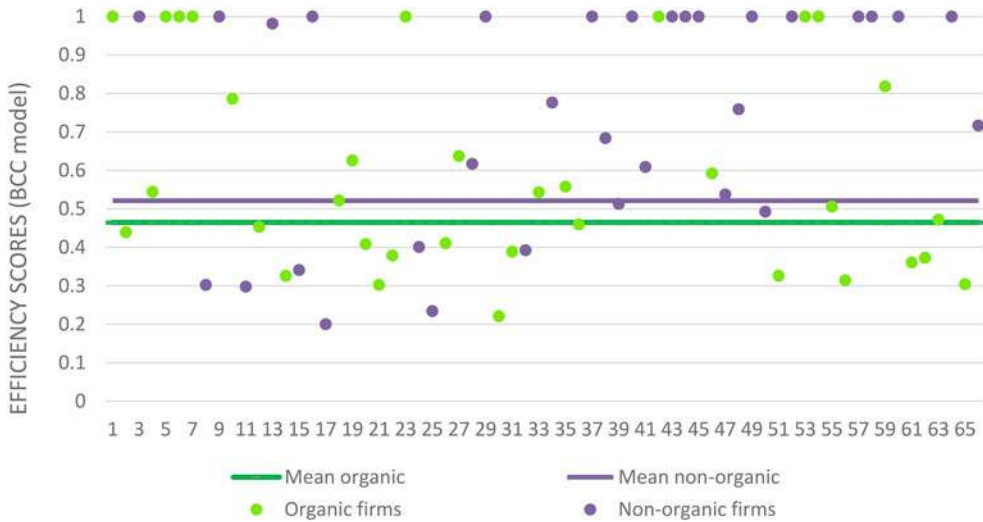


Figure 1. Efficiency scores chart.

## Discussion and conclusion

Organic agri-food products in Spain face major commercial problems in the home market as a result of consumers' lack of information and difficulties in accessing this type of product, and the considerable price differential between organic products and their conventional equivalents. These problems have been documented in studies by Rousseau and Vranken (2013) and Mozas *et al.* (2016). The present study shows that consideration should be given to social media as a factor for mitigating these commercial problems and improving the competitiveness of organic food companies. The capacity of social media to do so owes primarily to their ability to generate feelings of trust among consumers (Laroche *et al.*, 2013). Specifically, the aim of this research was to examine the social media penetration and activity of olive oil companies and ascertain whether organic and non-organic producers present differences in this respect.

This study reveals a clear difference in social media penetration and use between organic and non-organic olive oil producers, in favour of the former. Organic olive oil companies presented greater activity on these media, as observed through posts on the two main social networking sites used by businesses in Spain: Facebook and Twitter. This finding can be explained by the commercial problems facing the organic food sector, which include consumers' lack of information and a lack of proximity to supplies (Rousseau & Vranken, 2013; Tsakiridou *et al.*, 2008), and by the advantages of online social networks in offering an efficient, low-cost communication medium (Gunelius, 2011) and in improving interactions with customers (Fernández *et al.*, 2016; Lai *et al.*, 2011). It was also observed that the organic companies had a greater following among users, which could be explained by the lack of information and confusion consumers face in the traditional market and by the experiential nature of these products. The demand for information is not limited to the physical product but also extends to other aspects related to quality, healthiness and respect for the environment during the production process. Nevertheless, it was the non-organic companies that achieved better results with less effort on these media, as predicted by previous studies of the organic

olive oil sector (Fernández et al., 2016; Medina et al., 2016). Alternatively, this finding could be explained by the network effect, as conventional organisations currently address a far broader demand than that addressed by organic organisations.

These findings may help to make organic agri-food sector companies more aware of the potential of social media for addressing the commercial problems they face and their more favourable position to make use of this potential, given the specific characteristics of their market. At the same time, these findings should spur both public and private bodies to take timely steps to prevent the olive oil sector from lagging behind others in its use of social media for commercial purposes. Because of the importance and topicality of the organic sector and because society is becoming steadily more technological, this line of research should be explored in greater depth. As regards proposals for future developments, it could be interesting to investigate other sectors or quantify the financial impact of these tools on the organisational activity of agri-food companies.

One of the main limitations of this study is that it was confined to olive oil companies. Another limitation is that it focused on Spain. While this country is in an outstanding position as a major olive oil producer, it could be interesting to compare the situation in Spain with that in other producer countries.

## Notes

1. In this study, organic products and producers were defined as those that complied with the European Union legislation on organic food production and that had obtained the corresponding organic certification.
2. Olive oil tourism is based on a model of concentric circles that represent different experiential components, including visiting an oil mill, tasting olive oils, buying olive oil, visiting olive oil collections (oleotecas) and specialist shops, visiting museums, attending olive- and olive-oil-related fairs and festivals, sampling the local cuisine, taking trips to see landscapes and olive groves, and staying at places associated with the product (Murgado, 2013).
3. Whereas 'informational' advertising provides information or data on the objective properties of the product, 'transformational-emotional' advertising is characterised by providing information on subjective aspects related to the product, such as user characteristics or images, cultural attributes, feelings, emotions or sensations (Bigné, 2003).
4. Ecological knowledge refers to the amount of knowledge of environmental topics that an individual has (Chan & Lau, 2000).
5. For informational purposes, for the population of non-organic organisations, the sampling error was 2.73 ( $p = q = 0.5$  and  $K = 2$ ).
6. Non-parametric methods were used to test the study hypotheses, as the different study variables did not meet the requirements for assuming normal distribution.
7. Mann-Whitney U test evaluating the following null and alternative hypotheses:  
H0: assumes equal variances; H1: assumes different variances
8. *Engagement rate*. The result of dividing the P.T.A.T. by the number of likes. This ratio reveals the interaction between users and the Facebook account based on the size of the user community. The higher the ratio, the greater the impact of the company's posts on the users.
9. *P.T.A.T. (people talking about this)*. Indicates the level of user interaction with a Facebook account, combining variables such as likes, comments, shares, etc. The higher the ratio, the greater the social influence.
10. *Retweets received*. Content that the organisation has posted on its Twitter profile and other users have shared through their own accounts.

11. Replies. Company tweets replying to user tweets. Indicates the level of interaction with other users.
12. Mann–Whitney U test evaluating the following null and alternative hypotheses:  
H0: assumes equal variances; H1: assumes different variances

## References

- Alberghini, E., Cricelli, L., & Grimaldi, M. (2014). A methodology to manage and monitor social media inside a company: a case study. *Journal of Knowledge Management*, 18(2), 255–277.
- Bandiera, O., & Rasul, I. (2006). Social networks and technology adoption in northern Mozambique. *The Economic Journal*, 116(514), 869–902.
- Banker, R. D., & Chang, H. (2006). The super-efficiency procedure for outlier identification, not for ranking efficient units. *European Journal of Operational Research*, 175(2), 1311–1320.
- Banker, R. D., & Gifford, J. L. (1988). *A relative efficiency model for the evaluation of public health nurse productivity*. Mellon & University Mimeo, Carnegie.
- Banker, R. D., Zheng, Z., & Natarajan, R. (2010). DEA-based hypothesis tests for comparing two groups of decision making units. *European Journal of Operational Research*, 206(1), 231–238.
- Bigné, E. (2003). *Promoción comercial: un enfoque integrado*. Ed. Esic: Madrid
- Biloš, A., & Kelić, I. (2012). Marketing aspects of social networks. *Economic research-Ekonomska Istraživanja*, 25(S2), 155–174.
- Bradley, A. J., & McDonald, M. P. (2011). *The social organization: How to use social media to tap the collective genius of your customers and employees*. Harvard Business Press: Boston, Massachusetts.
- Calomarde, J. V. (2000). *Marketing ecológico*. Ed. Pirámide & Esic Editorial: Madrid.
- Calvo, A., & Zenou, Y. (2005). Job matching, social network and word-of-mouth communication. *Journal of Urban Economics*, 57(3), 500–522.
- Canavari, M., Regazzi, D., & Spadoni, R. (2002). *Origin Labels on the World Wide Web*. Working paper, Università di Bologna, Dipartimento di Economia e Ingegneria Agrarie, Italy.
- Cerezo, J. M. (2008). Hacia un nuevo paradigma: la era de la información fragmentada. *Telos: Cuadernos de Comunicación e Innovación*, 76, 91–98.
- Chan, R., & Lau, L. (2000). Antecedents of green purchases: a survey in China. *Journal of Consumer Marketing*, 20(49), 338–357.
- Charnes, A., Cooper, W. W., Lewin, A. Y., & Seiford, L. M. (2013). *Data envelopment analysis: Theory, methodology, and applications*. New York, US: Springer Science & Business Media.
- Chen, Y., & Xie, J. (2008). Online consumer review: Word-of-mouth as a new element of marketing communication mix. *Management Science*, 54(3), 477–791.
- Chronis, E., Lu, Q., & Miller, R. (2015). Social media, customer relationship management, and consumers' organic food purchase behavior. In A. Khanlari (Ed.), *Strategic customer relationship management in the age of social media* (pp. 198–215). Hershey, PA: IGI Global.
- Cook, W. D., Tone, K., & Zhu, J. (2014). Data envelopment analysis: Prior to choosing a model. *Omega*, 44, 1–4.
- D'souza, C. (2004). Ecolabel programmes: a stakeholder (consumer) perspective. *Corporate Communications: An International Journal*, 9(3), 179–188.
- Dimicco, J., Millen, D. R., Geyer, W., Dugan, C., Brownholtz, B., & Muller, M. (2008). Motivations for social networking at work. In: *Proceedings of the 2008 ACM conference on Computer supported cooperative work* (pp. 711–720). California, US: ACM.
- Fernández, D., Mozas, A., Bernal, E., & Medina, M. J. (2016). Use and efficiency of social media. An analysis from the social economy. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, 88, 5–27.

- Follows, S., & Jobber, D. (2000). Environmentally responsible purchase behaviour: a test of a consumer model. *European Journal of Marketing*, 34(5/6), 723–746.
- Gil, I. S., Kalixto, P. A., & Quintero, J. D. G. (2018). Capital social y redes sociales: analisis del Tercer Sector en contextos rurales. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, (86), 123–154.
- Gunelius, S. (2011). *30 minutes social media marketing: step by step techniques to spread the words about your business*. McGraw-Hill: USA.
- Haff, J. (2017). *Social Media Marketing Strategies in the Organic Food Industry*. Senior Theses and Capstone Projects 81, Dominican University of California, San Rafael, California. <http://scholar.dominican.edu/senior-theses/81>
- Hamzaoui, L., & Zahaf, M. (2008). Decision making process of community organic food consumers: an exploratory study. *Journal of Consumer Marketing*, 25(2), 95–104.
- Hilverda, F., Kutttschreuter, M., & Giebels, E. (2017). Social media mediated interaction with peers, experts and anonymous authors: Conversation partner and message framing effects on risk perception and sense-making of organic food. *Food Quality and Preference*, 56(A ), 107–118.
- Hohenthal, J., Johanson, J., & Johanson, M. (2014). Network knowledge and business-relationship value in the foreign market. *International Business Review*, 23(1), 4–19.
- Holt, D. (2016). Branding in the Age of Social Media. *Harvard Business Review*, 94(3), 40–50.
- Hung, K., Yiyang, S., & Tse, D. (2011). Interpersonal Trust and Platform Credibility in a Chinese Multibrand Online Community. *Journal of Advertising*, 40(3), 99–112.
- Jacob, C., Mathiasen, L., & Powell, D. (2010). Designing effective messages for microbial food safety hazards. *Food Control*, 21(1), 1–6.
- Kahle, R., & Valette, F. (2012). *Marketplace Lifestyles in an Age of Social Media: Theory and Method*. Armonk, NY: M.E. Sharpe.
- Kalafatis, S. P., Pollard, M., East, R., & Tsogas, M. H. (1999). Green marketing and Ajzen's Theory of Planned Behaviour: A cross-market examination. *Journal of Consumer Marketing*, 16(5), 441–460.
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), 59–68.
- Karoui, M., Duzdert, A., & Leidner, D. E. (2015). Strategies and symbolism in the adoption of organizational social networking systems. *The Journal of Strategic Information Systems*, 24(1), 15–32.
- Kutttschreuter, M., Rutsaert, P., Hilverda, F., Regan, Á., Barnett, J., & Verbeke, W. (2014). Seeking information about food-related risks: The contribution of social media. *Food Quality and Preference*, 37, 10–18.
- Lai, I. K. W., Tong, V., & Lai, D. (2011). Trust factors influencing the adoption of Internet-based interorganizational systems. *Electronic Commerce Research and Applications*, 10(1), 85–93.
- Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing*, 18(6), 503–520.
- Laroche, M., Habibi, M. R., & Richard, M. O. (2013). To be or not to be in social media: How brand loyalty is affected by social media. *International Journal of Information Management*, 33(1), 76–82.
- Lorenzo, C., Constantinides, E., & Alarcón, M. D. C. (2011). Consumer adoption of social networking sites: implications for theory and practice. *Journal of Research in Interactive Marketing*, 5(2/3), 170–188.
- MAPAMA (Ministerio de Agricultura, Pesca, Alimentación y Medio Ambiente). (2016). *Caracterización del sector de la producción ecológica española en términos de valor y mercado, referida al año 2015*. Subdirección General de Calidad Diferenciada y Agricultura Ecológica, Gobierno de España.
- Martin, A., & Van Bavel, R. (2013). *Assessing the benefits of social networks for organizations*. Publications Office. European Commission, Luxembourg.

- Martínez, M., & Pérez, W. S. (2014). Efficiency analysis of information technology and online social networks management: An integrated DEA-model assessment. *Information & Management*, 51(6), 712–725.
- McFarlane, D., Chembezi, D., & Befecadu, J. (2003). *Internet adoption and use of e-commerce strategies by agribusiness firms in Alabama*. Presented at The Southern Agricultural Economics Association Annual Meeting, Mobile, AL, 1–5 February.
- Medina, M. J., Bernal, E., Mozas, A., Moral, E., & Fernández, D. (2016). Efficiency of organic farming companies that operate in an online environment. *Custos e Agronegocio*, 11(4), 264–289.
- Mozas, A., Bernal, E., Medina, M. J., & Fernández, D. (2016). Factors for success in online social networks: An fsQCA approach. *Journal of Business Research*, 69(11), 5261–5264. doi: [10.1016/j.jbusres.2016.04.122](https://doi.org/10.1016/j.jbusres.2016.04.122)
- Muller, E., & Peres, R. (2017). The Effect of Social Networks Structure on Innovation Performance: A Review and Directions for Research. *International Journal of Research in Marketing*, 1 Jun 2018. doi: [10.1016/j.ijresmar.2018.05.003](https://doi.org/10.1016/j.ijresmar.2018.05.003)
- Murgado, E. (2013). Turning food into a gastronomic experience: olive oil tourism. In: N. Arcas, N. Arroyo, J. Caballero, R. Andria, M. Fernández, R. Fernández, & M. Garrido (Eds.), *Present and future of the Mediterranean olive sector* (pp. 97–109). Zaragoza: CIHEAM/IOC.
- ONTSI (Observatorio Nacional de las Telecomunicaciones y de la Sociedad de la Información). (2015). *Desarrollo empresarial y redes sociales. El caso de las microempresas españolas*. Ministerio de Industria Energía y Turismo, Gobierno de España.
- Padel, S., & Foster, C. (2005). Exploring the gap between attitudes and behaviour: Understanding why consumers buy or do not buy organic. *Food. British Food Journal*, 107(8), 606–625.
- Powell, T. C., & Dent-Micallef, A. (1997). Information technology as competitive advantage: the roles of human, business and technology resources. *Strategic Management Journal*, 18(5), 375–405.
- Redmond, E. C., & Griffith, C. J. (2006). Assessment of consumer food safety education provided by local authorities in the UK. *British Food Journal*, 108(9), 732–752.
- Roitner, B., Darnhofer, I., Somsook, S., & Vogl, C. R. (2008). Perceptions of organic foods in Bangkok, Thailand. *Food Policy*, 33, 112–121.
- Rousseau, S., & Vranken, L. (2013). Green market expansion by reducing information asymmetries: Evidence for labeled organic food products. *Food Policy*, 40, 31–43.
- Salas, V. (1989). La empresa en la economía industrial. *Investigaciones Económicas (Segunda época)*, suplemento, 7–41.
- Samoilenko, S. (2014). Overview on Data Envelopment Analysis. In K. Osei-Bryson, & O. Ngwenyama (Eds.), *Advances in Research Methods for Information Systems Research* (pp. 139–150). New York, US: Springer US.
- Schmitt, B. (1999). *Experiential Marketing. How to get customers to sense, feel, think act, and relate to your company and brands*. The Free Press: New York.
- Stephen, A. T., & Toubia, O. (2010). Deriving value from social commerce networks. *Journal of Marketing Research*, 47(2), 215–228.
- Stricker, S., Mueller, R. A. E., & Sumner, D. A. (2007). Marketing Wine on the Web. *Choices Magazine*, 22(1). Available at [http://www.choicesmagazine.org/2007\\_1/foodchains/2007\\_1\\_06.htm](http://www.choicesmagazine.org/2007_1/foodchains/2007_1_06.htm).
- Subramani, M. R., & Rajagopalan, B. (2003). Knowledge-sharing and influence in online social networks via viral marketing. *Communications of the Acm*, 46(12), 300–307.
- Tian, Y., & Robinson, J. D. (2008). Media use and health information seeking: An empirical test of complementarity theory. *Health Communication*, 23(2), 184–190.
- Torrent, J. (2015). Knowledge products and network externalities: implications for the business strategy. *Journal of the Knowledge Economy*, 6(1), 138–156.

- Tsakiridou, E., Boutsouki, C., Zotos, Y., & Mattas, K. (2008). Attitudes and behavior toward organic products: an explanatory study. *International Journal of Retail & Distribution Management*, 36(2), 158–175.
- Van Dijk, H., Fischer, A. R., & Frewer, L. J. (2011). Consumer responses to integrated risk-benefit information associated with the consumption of food. *Risk Analysis*, 31(3), 429–439.
- Vlachvei, A., Notta, O., Diotallevi, F., & Marchini, A. (2014). Web marketing strategies in Agro Food SMES – Evidence from Greek and Italian wine SMES. In: Z. Andreopoulou, V. Samathrakakis, S. Louca, & M. Vlachopoulou (Eds.), *E-Innovation for Sustainable Development of Rural Resources During Global Economic Crisis*, (pp. 199–220). Hershey, PA: IGI Global.
- Wamba, S. F., & Carter, L. (2014). Social Media Tools Adoption and Use by SMEs: An Empirical Study. *Journal of Organizational and End User Computing*, 26(2), 1–17.
- Wei, C., Zhang, C., & Sutanto, J. (2013). The influence of user interaction and participation in social on the consumption intention of niche products. *Information & Management*, 50, 661–672.
- Willer, H., & Lernoud, J. (2017). *The world of organic agriculture*. Research Institute of Organic Agriculture (FiBL) & International Federation of Organic Agriculture Movements (IFOAM), Bonn.
- Zhu, J. (2015). DEA Based Benchmarking Models. In J. Zhu (Ed.), *Data Envelopment Analysis* (pp. 291–308). Boston, MA: Springer US. Retrieved from <https://doi.org/10.1007/978-1-4899-7553-9>