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## Food Safety and Communication in Italian Agri-Food Firms

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### Abstract

**Purpose:** Consumers are increasingly interested in food safety and the communication of agri-food companies plays a strategic role in satisfying customers and maintaining companies' competitiveness. However, there is little attention in the literature on communication in agri-food SMEs, especially on issues of health and food safety. The research aims to investigate to what extent Italian Agri-food firms use communication tools to communicate food security and how this activity impacts business performance and customer engagement, from the entrepreneurial perspective.

**Methodology:** Data were collected from 270 Italian firms operating in the agri-food industry from March to May 2022 through an online questionnaire. Descriptive statistics and regression were performed.

**Findings:** The study reveals that Italian Agri-Food firms communicate food safety most frequently through websites, packaging, public relations, personal communication, tv/radio/press/billboards/brochures, and catalogs. Further, the website and instant messaging have a significant impact on the business performance, while the website, public relations, and tv/radio/press/billboards/brochure and catalogs have a significant impact on customer engagement.

**Research limitations/implications:** We collected data from a single European country and the results cannot be generalized. Agri-food firms should invest more intensively in food safety communication, both in traditional and digital tools.

**Originality/Value:** No previous studies have investigated the kinds of communication tools adopted and the intensity of their use, as well as the impact of the communication mix on business performance and customer engagement.

**Keywords:** Food safety, Communication, Digital communication, Agri-Food firms, SMEs

**Paper type:** research paper

### 1. Introduction

In the European Union, Agri-food is one of the most important sectors in terms of economic output and employment (Food Drink Europe, 2020). The European Green Deal and the Farm to Fork (F2F) strategy aim to guide the transition toward a fair, healthy, and respectful food system for people and

the environment. Agri-food is defined as the combination of the primary sector and the food industry (European Commission, 2007). In the past decades the sector had to face many health crises (BSE in 1996 and 2000, foot-and-mouth disease in 2001, avian flu in 2005, cucumber crisis in 2011), patterns of fraud relating to the authenticity of the food (“horsegate” in 2013) and the debate concerning the safety of certain processes (e.g. accusation of GMOs in 2012) which led to a growing distrust of the consumers for the quality of food products (Fontes et al., 2015).

This sector is still facing many other challenges such as globalization, the climate change emergency, and the recent war in Ukraine is receiving growing attention by different stakeholders (governments, NGOs, community, etc.).

The agriculture sector plays a key role in Italy as it represents both a business and a tradition of quality. We are well-known for the quality of raw materials of excellent products, that currently are increasingly supported by innovation, new instruments for traceability, to reconstruct the history of the product and meet consumer needs (Zouaghi and Sanchez, 2016). Italian firms operating in the agri-food sector, are therefore asked to strengthen food strength quality through technological and organizational innovation.

All firms of the agrifood sector must adopt new practices in line with the new requirements of food security regarding nutritional content, absence of pathogens and contaminations, treatment of animals, and reduced impact on the environment. Consequently, a key issue for scholars and entrepreneurs is to understand how to boost innovation in the Agri-food sector (Palazzi et al., 2023; Del Baldo et al., 2023). In order to make food offers increasingly safer for the health of consumers and at the same time competitive in terms of prices and perceived quality. Examples of innovation are irradiation which eliminated some of the microorganisms responsible for the degradation or contamination of the food or certain additives that could enhance the conservation or use as antibacterial and antifungal agents in foodstuffs (Fontes et al., 2015). However, sometimes positive effects are contested, given secondary suspected or proven effects and issues such as ‘naturalness’ and ‘authentic’ food products are today much demanded by the consumers, as well as the origin of production (Fontes et al., 2015).

For Italian firms operating in the agri-food sector, food safety and quality became fundamental assets to strengthen through both technological and process innovation. This industry consisting mainly of SMEs is receiving increasing attention in the entrepreneurial literature (among others, Palazzi and Sentuti, 2021; Del Baldo et al., 2023; Palazzi et al., 2023)).

Taking a marketing perspective, consumers are paying increasing attention to food safety which is a “non-negotiable” attribute in the purchase of food products. Consumers in developed countries have become more demanding of food safety, can pay a premium price for safer food, and can boycott

in case of a suspected or proven assumed food outbreak (Fontes et al., 2015). Thus, Agri-food companies are asked to create safe foods and reduce the perceived risks that greatly influence purchasing food products through effective communication activity.

Marketing strategies represent ways of reducing pre-decision risk to reduce the concern for making important purchases or frequent purchases. The most common controllable tactical marketing tool for producing a desirable market response in a target market is the “marketing mix” or McCarthy’s four-Ps framework (product, price, place and promotion). Yeung and Yee (2010) found that the marketing mix elements can reduce perceived food safety risk. In particular, product brand image and quality mark, as well as the product passing government or private testing, (e.g. certifications) and product traceability could be considered as product-related strategies for food safety. It seems that consumers are willing to pay a premium price for food safety. Together with safe and good quality products, the type of stores, atmosphere, and attributes such as cleanliness, feelings of safety, staff service and knowledge, reputation, etc. (Mitchell, 1998) may contribute to signal that the food is safe to consume influencing purchasing decision (Yeung and Yee, 2003). Also promotion - that is advertising, personal selling, sales promotion and public relations may contribute to reducing risks connected to food security. These tools include a non-personal presentation or oral presentation, short-term incentives to encourage the purchase or building good relationships through favourable publicity (Kotler and Keller, 2006). According to marketing literature the more the consumers perceived risk in buying a product, in particular when information is lacking, the greater the propensity to use word of mouth (Pocharski and Jacobson, 2007). As today WOM is mainly online, especially through social media (Tuten and Solomon, 2018), online WOM is very important to reduce food safety. This paper focuses on promotion or communication policy.

Within this context, communication has received little attention by marketing literature. However, it plays a central role to assure consumers and stakeholders and help producers and distributors to capture adequate value.

Focussing on the communication of food safety in Italian Agrifood firms, empirical evidence is still limited and our goal is to investigate how these firms communicate and if the communication activity has an impact on business performance and engagement.

Consumers are increasingly interested in food safety (Baert et al., 2011) and agri-food companies should reduce the gap between perceived risks and assessed risks (Santeramo et al., 2021; Santeramo and Lamonaca, 2015) to preserve competitiveness. Therefore, communication – especially digital communication - plays a strategic role to gain and maintain consumer confidence in the safety of the food products offered and to increase the level of loyalty in order to maintain and reinforce

companies' competitiveness (Sparacino et al., 2020; Marek et al. 2020). However, there is little attention in the marketing literature on communication food safety in agri-food SMEs.

Therefore, the research questions of our study are the following:

- 1) To what extent do agrifood firms use communication tools to communicate food security?
- 2) How does communication on food security through traditional and digital communication tools impact business performance?
- 3) How does communication on food security through traditional and digital communication tools impact customer engagement?

## **2. Theoretical background: communicating food safety in the agri-food sector**

Food safety has been defined as *“the condition of the foodstuffs in all stages of production, processing, and distribution, required to guarantee the protection of consumer's health, also taking into account normal circumstances of use and information available for the foodstuffs concerned”* (Baert et al., 2011). According to Casella (2001), food safety is an inherent part of food quality. From this perspective, food can be considered safe if it is the result of a combination of primary resources, healthy and controlled, with no risk to consumer health.

Consumers are increasingly interested in food safety (Baert et al., 2011; Fontes, 2015) and the challenge for agrifood companies is to reduce the gap between consumers' perceived risks and assessed risks (Santeramo et al., 2021; Santeramo and Lamonaca, 2015) to increase consumers' confidence and preserve competitiveness. To promote a correct perception by consumers of the value of safe food products, market communication plays a very important role. In this phase of rapid technological evolution, digital communication takes on strategic roles to dialogue and involve consumers in value co-creation processes within the experiential customer journey in order to maintain companies' competitiveness in the agri-food sector (Sparacino et al., 2020; Marek et al. 2020). However, while an increasing number of studies are focused on the increased awareness of consumers toward food safety issues (Fontes et al., 2015) there is little attention to the marketing literature on the effective communication of food security in agri-food SMEs. Most of the contributions to consumer behavior toward food safety and this specific aspect of communication are taken from medicine and agriculture scholars.

In general, effective communication activity in terms of adequate frequency and quality of information plays a strategic role in competing in the agri-food sector (Fritz e Schiefer, 2008; Duffy *et al.*, 2005; Matopoulos *et al.*, 2007). The literature also stressed the potential of the Internet in the communication of the sector, as the Internet allows the engagement of customers and stakeholders.

For example, Italian-speaking web users in agri-food sector are concentrated on specific product types and on the territory of production and pay attention to quality rather price different from English-speaking web users use most frequently in their conversation word connected to price and communication (Scorrano et al., 2013).

Websites play an important role not only in communicating information about agri-food companies but have the potential to stir emotions, and create involvement and a stable relationship with the consumer (Iaia et al., 2018). The Authors explained that certain Italian regions are famous “brands” thanks in part to the value of their agri-food products (e.g. Champagne, Gorgonzola, Montalcino, etc.).

Among studies on the communication of agri-food firms, especially SMEs, there are no studies on the communications mix adopted. In the marketing literature, studies on integrated communication mix prevail in large companies. Qualitative analyses and pilot studies have been adopted to investigate digital communication and social media while a lack of quantitative studies is observed (Aronica et al., 2021).

A recent study on a representative sample of Italian SMEs (Italiaonline 2021) stressed that investments in digitalization increased by 22% with respect to 2020, 73% of the sample have a website, 50% use social media, and Influencer marketing strongly increased (+50% in terms of investments compared to 2020). Investment in traditional communication (e.g. TV, Radio, press, billboards, fairs, etc.) is still significantly lower than the pre-pandemic values of 2019.

Focusing on the communication of food safety, Santeramo et al (2021) underline the importance of communication to reduce perceived risks of the consumers. Perceived risks are more important than assessed risks as play a central role for customers, and consequently for the supply chain. There is a gap between assessed and perceived risks and people have different perceptions of risks. The analysis of the Authors shows that planning effective communication strategies is very important for efficiently informing consumers on food risks and reducing the above gap.

The risk assessment in agri-food supply chains is of utmost importance for the food industry and for policymakers. A wrong perception of risks may alter the functioning of supply chains; thus, efforts should be devoted to communicating risks in an efficient way to consumers.

Santeramo and Lamonaca (2021) stressed that communication strategies may reduce the gap between assessed and perceived food risks. Producers and marketers in agri-food supply chains should consider innovative strategies to improve the communication of food risks, avoiding losing premium prices for food safety information. Examples are innovative labels conveying. Indeed, food safety in agri-food supply chains is frequently characterized by asymmetric information as producers and marketers tend to be better informed than consumers on the potential risks of foods. Thus, using

innovative strategies to communicate information on food risks may contribute to lowering the divergence between assessed and perceived risks. In this regard, innovative labels, such as traffic light labels and nutri-score labels, or the use of nanotechnologies may be a valid alternative.

Furthermore, technologies such as Agri-Food 4.0, Blockchain, and Internet of Things may be useful tools to inform consumers in real-time, also supporting the supply chain decision-making process (Lezoche et al., 2020) and improving the coordination process that involves farmers, industries, and consumers (Handayati et al., 2015).

Overbay et al. (2017) proposed a literature review about the use of social media in food safety and infectious disease communication. Wu (2015) underlined that risk perception, emotions, social trust and social support affect the use intention of Facebook and that Facebook is a new important vehicle for risk communication.

Another recent study (Marek et al. 2020) examined the importance of social media, specifically Facebook, in communicating fresh food. The study's objective is to highlight the importance of social media communication in the agri-food sector, specifically in the sub-sector of local fresh products, and to determine which consumers are most interested in local products from farmers communicated through Facebook. They measured demographic factors (gender and age) and users' interaction with individual posts. Research has shown that women between the ages of 45-64, who follow Facebook mostly from their mobile phones, are most interested in Facebook posts with local fresh products (and information about them).

Sparacino et al. (2020) analyzed the main aspects of the communication of local beekeepers on their websites, and discovered a low differentiation between communication strategies related to honey organoleptic and sensorial characteristics. Claims concerning the gastronomic pairings, quality and certification, links to territory, and organic honey categories were the most widespread current on beekeeping websites, while there was slight information related to health aspects and ethical/social sustainability. As part of the numerous studies in the wine sector, we note, for example, the contributions of Dolan and Goodman (2017), which explores the role of social media in Australian wine sector, Ingrassia et al. (2020) that analyzes the characteristics of the activity of wine influencers and the communication model used via Instagram and the study of Capanna Piscè et al. (2022), dedicated to the study of the value of semantics in Food and Wine Labeling: for the wine consumers.

To summarize, on the one hand, we can find studies that investigate the communication processes in some specific sectors of the agri-food industry, on the other we note that there are few studies on the communication of food safety and there is a wide space to explore how Italian agri-

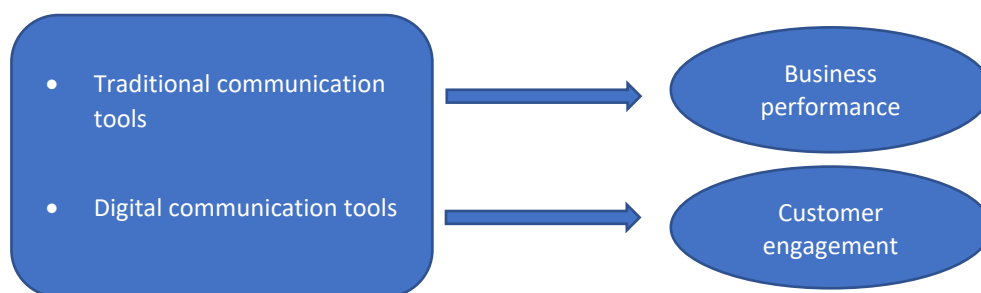
food firms communicate this important aspect of competitiveness. There are gaps both in terms of quantitative research and qualitative research.

## 2.1 Exploring communication in the agrifood firms: a conceptual framework

To fill the gaps in the literature on communicating food safety in agrifood firms, as explained in the previous section, exploratory and quantitative research will be conducted adopting some concepts taken from the marketing communication literature. In particular, the level of usage of traditional and digital communication tools to communicate food safety by Italian agri-food firms and how these tools impact business performance and customer engagement will be investigated (fig.1).

The adoption of communication tools (and activities) is strictly related to the communication capabilities of firms.

Fig. 1 – Research Framework



### 2.1.1 Traditional and digital communication tools

Effective marketing communication is known as an important factor to maintain business success. Communication can be effective in case of maintaining good relationships with business partners, customers, and stakeholders.

We assume that for agri-food SMEs it is important to combine digital and traditional communication to be successful. Among traditional communication tools, advertising consists of paid forms of non-personal presentation and promotion of ideas, goods, or services by any identified sponsor (Kotler and Armstrong, 2010). Advertising can be done through print papers such as newspapers, brochures, magazines, audio media such as radio, and visual media such as billboards and television (Kotler and Armstrong, 2010). Other traditional communication tools include public relations, sponsorships, personal communication, direct marketing, and packaging.

In the agri-food sector digital transformation is altering production, process-manufacturing, the supply chain, distribution, wholesale retailing, and consumption (Anastasiadis et al., 2018). SMEs usually

adopt short-term digital strategies, which do not favor the long-term investments required to enhance investment capacity and business performance with respect to large firms (Zambon et al., 2019). Few studies apply the technological capability concept to food companies and there is limited study of digital capabilities (Lanza and Passarelli, 2014) and digital transformation in SMEs, in particular of agribusinesses. Cannas (2021) investigated digitalization in agro-SMEs with the aim to explore the mechanisms by which they implement digital technology and build dynamic capabilities addressed to reshaping internal and external resources to face rapid changes. There are no studies that explore the adoption of digital communication tools and communication capabilities in the digital era.

Among digital communication tools, social media deserves special attention. Social media are considered platforms on which people build networks and share information sentiments, interests, and/or values (Kaplan and Haenlein 2010). According to the Authors, among platforms, there are social networking sites (e.g., Facebook), microblogging sites (e.g., Twitter), and content communities (e.g., YouTube). Social media have radically transformed the way firms and customers interact and influence each as “actions” online (such as likes comments, etc.) influence others’ choices and consumption behaviors (Chen et al. 2011). Further, social media allows firms to better manage relationships with customers, thanks for example to the opportunity to conduct customer analysis, market research, collect ideas, etc. to improve marketing outcomes (Gnitz, 2019).

Li et al., (2022,) have proposed the following definition of social media marketing: as an organization’s integrated pattern of activities that, based on a careful assessment of customers’ motivations for brand-related social media use and the undertaking of deliberate engagement initiatives, transform social media connectedness (networks) and interactions (influences) into valuable strategic means to achieve desirable marketing outcomes.

To communicate in a digital context, firms must develop a digital strategy and use a digital communication mix consisting of different tools starting from the corporate website, blog, e-mail, social media, instant messaging, and influencer and chatbot (Tuten and Solomon, 2018). According to the Authors, it is important to pay to be visible online, in particular on Google through paid search engine ads and social networks and social media through paid social media ads.

### ***2.1.2 The impact of communication on business performance and on customer engagement***

The literature on marketing communication underlines the relationship between communication and business performance and between communication engagement. The role of marketing in explaining business performance has always been of interest in the marketing discipline literature. Indeed, marketing contributes to create and sustain competitive advantage. The Dynamic Capabilities theory, interpreted as an extension of the RBV theory suggests that resources and



capabilities interact in determining firm performance outcomes (Henderson and Cockburn, 1996; Teece et al., 1997). Taking a marketing perspective “marketing resources may be defined as the assets available to marketers and others within the organization that – when transformed by the firm’s marketing capabilities – can create valuable outputs (Morgan, 2011, p.104). Based on the strategic management literature, the Author has conceptualized marketing resources and capabilities typologies and among them, marketing communication management with customers and prospects is considered a key marketing capability associated with customer value delivery (e.g. McKee et al., 1992). Communication capabilities are built on important activities in marketing such as advertising, social media participation, public relations, sponsorship, and corporate image management (e.g. Asker, 1996, 2008). In order to possess and develop strong marketing communication capabilities, firms must be able to communicate their new products’ benefits and availability and reduce the cognitive dissonance reinforcing the purchase decision. The marketing literature has stressed that the aim of advertising is to increase sales performance (David et al., 1988).

Hence, communication activities and capabilities impact business performance. In this study, we explore how the adoption of traditional and digital communication tools to communicate food safety impacts business performance and customer engagement. In relation to this topic, one must take into account the different psychological factors that influence public perceptions of risk, and how individuals between and within different countries and groups respond to, and process, information about food and nutrition (Frewer, 2001)

Customer engagement has become a very important concept, especially with the emergence of social media (Gligor et al., 2019b; Hinson et al., 2019; Bozkurt et al., 2021). It is considered an important condition to reach superior brand performance (Barger et al., 2016; Oviedo-García et al., 2014).

Different definitions of customer engagement have been proposed in the literature (Oviedo-García et al., 2014; Vohra and Bhardwaj, 2019). For example, according to Blasco-Arcas et al.’s (2016) it is an interactive concept related to an individual’s connection with a brand and the empowerment that results from the interaction with the brand. Firms can benefit from customer engagement in tangible ways such as higher revenues, market share, profits, and intangible ways such as feedback or new ideas that help product/service development (Pansari and Kumar, 2017).

The ability of brands to interact with customers is also linked with increased customer satisfaction (Barve, 2011). Furthermore, perceived brand interactivity (Gligor et al., 2019b) and satisfaction with the brand (Pansari and Kumar, 2017) positively impact customer engagement.

The use of digital communication and social media as well as their relationship with business performance and engagement are less investigated in small companies because of structural limits

These topics seem to be even less investigated in the agri-food sector characterized mainly by small firms.

### 3. Methodology

#### 3.1 Sample and questionnaire design

The present study aims to answer the research questions by means of empirical analysis. A self-administered questionnaire was developed to measure:

- The entrepreneurs' perception of the frequency of communication tools used to communicate food safety;
- The impact of food safety communication on business performance, in respondents' view;
- The impact of food safety communication on customer engagement, in respondents' view.

In particular, the population of Italian companies working in the agri-food industry (our universe) was extracted from the Atoka database, including firms from Agriculture, Manufacturing, and Fishing sectors. A total of 4614 companies were identified. The survey ran from March to May 2022, and a total of 270 participated. The interviews involved the entrepreneurs of agri-food firms and took place in the period March-April 2022.

The questionnaire consisted of three sections. The first section consists of firms' characteristics: size, revenue, and certification. The second part examines the level of frequency of traditional and digital communication tools used by firms to communicate food security. In particular, a total of 15 communication tools were chosen, of which six were for traditional communication and nine for digital communication. In this section, we provide the following definition of food safety:

*“the condition of the foodstuffs in all stages of production, processing, and distribution, required to guarantee the protection of consumer's health, also taking into account normal circumstances of use and information available for the foodstuffs concerned”* (Baert et al., 2011). Notably, the communication tools were taken from the marketing literature, in particular from traditional communication (Kotler and Armstrong, 2010) and digital communication (Tuten and Solomon, 2018). The third part of the questionnaire includes two questions about the impact of these tools on business performance and on customer engagement. The definition of business performance was built on (Pansari and Kumar, 2017) and the definition of customer engagement was adapted from Blasco-Arcas et al. (2016).

Except for the socio-demographic information of firms, all questions were measured using a 7-point Likert scale; in particular questions of section (2) were measured using the level of use from 1=little

or not used at all 7=very used, while questions of section (3) were measured using the level of strength/intensity of the impact where 1=very low and 7=very high.

### 3.2 Data analysis

The data were processed using Statistical Package for Social Sciences (SPSS) version 25.0 for Windows. A regression analysis was implemented to understand the impact of communication tools on business performance and on engagement, from the entrepreneurial perspective.

## 4. Findings

Statistics described in Table 1 summarize the characteristics of the sample. The sample is composed of 270 Italian firms operating in the agri-food industry. The businesses that took part in the study are mainly small firms (60%), followed by medium (30%). The remaining are large (7%) and micro (3%) firms. Most of the firms have revenues between 10 and 49.9 million euros (31%), are non-certified (62%), limited liability companies (57%), and are located in the North of Italy (44%).

Table 1- Sample descriptive statistics

Variable	Description	N	N (%)
SIZE	Micro (<9 employees)	7	3 %
	Small (10-49)	165	60 %
	Medium (50-249)	80	30 %
	Large (>250)	18	7 %
REVENUE	>1 millions	5	2 %
	1-4.9 millions	74	27 %
	5-9.9 millions	56	21 %
	10-49.9 millions	84	31 %
	<50 millions	51	19 %
CERTIFICATION	Non-certified companies	168	62 %
	Certified companies	102	38 %
LEGAL FORM	Limited liability company	153	57 %
	Joint stock company	73	27 %
	Cooperative company	44	16 %
LOCALIZATION	Northern Italy	118	44 %
	Central Italy	108	40 %
	South Italy	44	16 %

(Source: our elaboration)

The communication activity is mainly targeted to the commercial intermediates (mean 5.44) and the final customer (mean 4.88).

Table 2 shows the frequency of adoption of the main communication tools to communicate food security by the sample firms. The communication tools have been measured through a 7-point Likert scale distinguishing between traditional and digital tools. The results show that the scale is reliable (Cronbach's  $\alpha > 0.90$ ).

The main traditional communication tools used by firms are public relations (mean 4.69) and personal communication (mean 4.59) followed by packaging (mean 4.71), while the main digital communication tools are website (mean 5.09), social networks (mean 3.97) and e-mail (3.49). The use of the most innovative digital tools such as chatbots, blogs, and the use of influencers, which could enrich the potential of web marketing, is scarce

Table 2 – Communication tools used by agri-food firms

Kind of communication	Communication tool	Min	Max	Mean	Std.Dev.
<b>Traditional communication</b>	TV/radio/press/billboards/brochures and catalogs	1	7	4,00	1,841
	Packaging	1	7	4,71	1,774
	Direct marketing	1	7	2,52	1,732
	Public relations (events, trades, etc.)	1	7	4,69	1,810
	Sponsorships	1	7	3,75	1,852
	Personal communication	1	7	4,59	1,857
<b>Digital communication</b>	Website	1	7	5,09	1,668
	Blog	1	7	3,28	2,008
	Paid search engine ads	1	7	2,83	1,901
	Paid social media ads	1	7	2,85	1,914
	Instant messaging	1	7	2,49	1,788
	E-mail	1	7	3,49	2,005
	Chatbot	1	7	1,96	1,438
	Influencer	1	7	2,18	1,641
	Social Network	1	7	3,97	2,119

(Source: our elaboration)

In order to understand the impact of communication tools on business performance, from the entrepreneurial perspective, we conducted a regression analysis.

To select variables characterized by a greater predictive power, we perform the multicollinearity analysis through the VIF method – variance inflation factor (Montgomery and Peck, 1992).

Therefore, according to the literature (Judge et al., 1987) we deleted all variables that have a value greater than 3. Notably, we deleted paid advertising on search engines and on social media.

The result of the regression analysis shows that the website and instant messaging are the only communication tools that have a significant impact on performance ( $P < 0.10$ ) (Table 3).

Table 3 – Regression analysis of business performance

Communication tool	B	S.E.	Wald	gl	Sign.	Exp(B)
TV/radio/press/billboards/brochures and catalogs	,112	,126	,792	1	,373	1,119
Packaging	,041	,120	,114	1	,736	1,041
Direct marketing	,059	,147	,162	1	,688	1,061
Public relations (events, trades, etc.)	,087	,122	,507	1	,477	1,091
Sponsorships	,123	,119	1,067	1	,302	1,130
Personal communication	-,031	,116	,070	1	,792	,970
Website	,238	,127	3,525	1	,060	1,269
Blog	-,027	,136	,040	1	,841	,973
Instant messaging	-,366	,157	5,466	1	,019	,694
e-mail	,112	,116	,934	1	,334	1,119
Chatbot	,269	,235	1,308	1	,253	1,308
Influencer	,276	,203	1,839	1	,175	1,317
Social Network	,003	,127	,001	1	,979	1,003
Constant	-1,391	,650	4,577	1	,032	,249

(Source: our elaboration)

The result of the regression analysis shows that the website (sig.= 0,060) and instant messaging (Sig.=0,019) are the only communication tools that have a significant impact on the business performance of agri-food firms ( $P < 0,10$ ) (Table 3).

Table 4 – Regression analysis of customer engagement

	B	S.E.	Wald	gl	Sign.	Exp(B)
TV/radio/press/billboards/brochures and catalogs	0,324	0,197	2,713	1	0,100	1,383
Packaging	-0,082	0,179	0,210	1	0,647	0,921
Direct marketing	-0,192	0,224	0,736	1	0,391	0,825
Public relations	0,414	0,194	4,569	1	0,033	1,513
Sponsorships	-0,024	0,165	0,022	1	0,883	0,976
Personal communication	0,174	0,165	1,114	1	0,291	1,191
Website	0,431	0,194	4,929	1	0,026	1,539
Blog	-0,318	0,235	1,829	1	0,176	0,728
Instant messaging	-0,283	0,238	1,421	1	0,233	0,753
e-mail	0,155	0,181	0,734	1	0,392	1,167
Chatbot	0,308	0,436	0,499	1	0,480	1,361
Influencer	0,649	0,472	1,894	1	0,169	1,914
Social Network	-0,047	0,203	0,053	1	0,819	0,955
Constant	-2,287	0,918	6,208	1	0,013	0,102

(Source: our elaboration)

The result of the regression analysis shows that the website (sig.= 0,026), public relations (Sig.=0,033) TV/radio/press/billboards/brochures, and catalogs (Sig.=0,100) are the communication tools that have a significant impact on the customer engagement of agri-food firms ( $P < 0,10$ ) (Table 3).

To sum up, (Table 5) the website is the communication tool that has a positive and significant impact both on business performance and on customer engagement of the agri-food firms.

Table 5 - Impact of communication tools on customer engagement and business performance

<b>Variable Y</b>	<b>Communication tool (variable X)</b>
Business performance	Website
	Instant messaging
Customer engagement	tv/radio/press/billboard/brochures and catalogs
	Website
	public relations

(source: our elaboration)

## 5. Discussion and conclusions

The empirical research conducted on a representative sample of Italian Agri-food firms allowed us to answer the three research questions. As there is little research on communication food security our exploratory and quantitative investigation contributes to filling the gaps in the literature starting from the identification of the main communications adopted and the level of adoption of such tools (first research question). The descriptive statistics of this study reveal that these small firms use both traditional and digital communication mix. Packaging, public relations, and personal communication are considered by the entrepreneur as the most frequently adopted tools to communicate food security. The fact that packaging is the most important way to communicate food security is consistent with the agriculture literature stressing the importance of innovative labels to reduce gaps between assessed and perceived risks (Santeramo et al., 2021; Santeramo and Lamonaca, 2015). The most frequently used digital tools are websites, social networks, and e-mails. This result is in line with the increasing contributions focused on the role of websites in the agri-food sector, especially in SMEs (Iaia et al., 2018; Sparacino et al., 2020). Social networks are becoming a very popular communication tool also among agri-food SMEs, as stressed in the literature (study (Marek et al. 2020)). Further, this finding is in line with the increasing investment in digital communication

but the still important presence of traditional means, identified in previous studies of Italian SMEs (Italianonline 2022).

We also investigated through regression analysis how this communication mix impacts business performance (second research question) and customer engagement (third research question).

The study shows that, in the perception of entrepreneurs, websites and instant messaging significantly impact business performance while Tv/radio, website, and public relations impact customer engagement. It seems that digital communication, especially corporate websites, plays a key role even from the perspective of these small firms, thus emphasizing a good level of awareness of these important firms in the Italian economy about digital transformation in communication. As engagement in modern society is an important factor of competitiveness with implications on customer satisfaction and performance, also Tv/radio, website, and public relations are important communication tools that deserve special attention.

This study has produced some preliminary managerial implications. First, entrepreneurs and managers are recommended to invest in an integrated communication mix, both traditional and digital, especially in those tools that significantly impact engagement and performance.

Second, the corporate website is the “king” in a digital context in general and specifically in the agri-food context to communicate properly food security.

Another implication for policymakers can be derived. As consumers require proper information and adequate communication of food security and the majority of agri-food firms are SMEs government should support communication investment.

The originality of the study consists in the empirical investigation of a poorly investigated aspect of agrifood firms, that is communication, and specifically the traditional and digital communications tools adopted to communicate food safety.

The study presents some limits connected to its exploratory nature. The survey was conducted in one country (in Italy) and only some aspects of communication activity have been investigated (tools and impact on performance and engagement). Future research should include qualitative research to investigate in depth the content strategy adopted and the specific informative and emotional content as well as communication techniques (e.g. storytelling) adopted.

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