

Responsibilities of stakeholders in recalls: a multiple case study in Brazilian food supply chains

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Abstract

Managing food safety and quality to prevent recalls is a responsibility shared by all stakeholders in the supply chain. The objective of this paper is to understand the different roles of stakeholders in the risk management process to deal with recall events in food supply chains (FSCs). For that, we analysed data from 15 semi-structured interviews and secondary documents of Brazilian FSCs. Our contributions are twofold: to understand the specific roles of Brazilian stakeholders and, to identify in which phases of risk management do the stakeholders act to avoid and/or minimize the impacts of food recalls on the supply chain.

Keywords: Food recall, Food supply chain, Stakeholders.

Introduction

Many factors have made food supply chains (FSC) increasingly complex and extensive, with multiple layers of suppliers and customers (Chaudhuri et al, 2016). Examples of those factors are: seasonality of production and consumption, quality variations and perishability of the raw material and the final product (Batalha & Silva, 2007), characteristics related to logistical efficiency due to complexity of interactions and distance, methods of manufacturing and processing, and sustainability (Göbel et al., 2015). All of these make risk management a complex process, in which any fail in it might cause food safety incidents that result in food recalls (Soon et al., 2020).

According to Potter et al. (2012), a product recall is considered by many to be the practice of last instance management to prevent unsafe products from being purchased and consumed by the public. For this reason, in case of any food recall, companies remove their products from the market to avoid problems with consumer health (Bernon et al., 2018). Because of that, organizations need to develop proactive plans to manage risks from different sources. Nakandala et al. (2017) highlight that risk management actions in

FSCs are used to ensure food safety, and that is a shared responsibility of all stakeholders in the supply chain (Aung & Chang, 2014). To achieve effective actions of actors in food safety systems, it is necessary to consider how stakeholders perform and align their roles and responsibilities in the FSC (Erdem et al., 2012).

Studies carried out on recalls and risk management actions in FSC have focused on risk prevention and their impacts on the supply chain (Kumar & Budin, 2006; Roth et al., 2008; Mattevi & Jones, 2016; Nakandala et al., 2017). Also, there are limited studies in the area of FSCs involving the application of stakeholder's theory (Shnayder et al., 2016; Shankar et al., 2018). Thus, very little is known about the roles played by stakeholders during the different phases of risk management in food recall events. This paper, therefore, aims to understand the specific roles of Brazilian stakeholders and, to identify in which phases of risk management do the stakeholders act to avoid and/or minimize the impacts of food recalls on the supply chain. To do so, interviews were carried out with 11 stakeholders involved in recalls events.

In the following sections, the concepts of risk management in FSCs and stakeholder theory is addressed. Subsequently, the applied research method, followed by the results and conclusions of the study.

Literature review

Risk management in the FSC

Risk management can be defined as the identification and management of risks through a coordinated approach among actors of the supply chain, to reduce and avoid the supply chain vulnerability (Jüttner et al., 2003). It involves four cyclical phases (Mitigation, Preparedness, Immediate Response, and Recovery), which operate simultaneously to develop proactive measures (Mitigation and Preparedness) so as to respond to interruptions by containing and controlling potential risks, and reactive measures (Immediate Response) regarding actions in the short and long term after the occurrence of an interruption (Recovery) (Altay & Green, 2006; Scholten et al., 2014). Overall, Mitigation phase involves the understanding by all stakeholders about the possible risks and the appropriate measures applied that will prevent a disruption, while Preparedness means that all stakeholders are prepared to take specific action to respond effectively in case of disruption (Scholten et al., 2014). Immediate Response encompasses activities after the occurrence of a disruption that includes the use of resources to preserve life, property, the environment, social, economic, and political structures (Altay & Green, 2006). Finally, the Recovery phase occurs during and after the conclusion of a recall event in the FSC. In this phase, actions are taken to stabilize and restore normality in supply chain structures (Altay & Green, 2006).

Stakeholder theory

Stakeholder is defined as any group or individual that affects or is affected by the actions of an organization. It can be classified as internal (e.g. shareholders, employees, and direct service providers) or external (e.g. suppliers, consumers, government, media, NGOs, competitors, and local communities) to the firm (Freeman, 1984). This theory aims to understand organizations in a dynamic world by identifying the different needs or interests between stakeholders and establishing appropriate tasks to solve them (Cui et al., 2018). This theory assumes that a successful supply chain depends on the harmonious cooperation of all stakeholders, as well as on shared responsibility and bidirectional relationships (Soundararajan et al., 2019). Lamberg et al. (2008) highlight that stakeholders act through explicit or implicit agreement of mutually recognized rights and obligations to obtain a mutual benefit or avoid any damage. In this sense, Busse et al.

(2017) point out that they act to assist, develop policies, evaluate, monitor, and identify the potential for improvement in a supply chain. Furthermore, a study on risk management and stakeholder theory shows that stakeholder management can be effective in overcoming crises or scandals that can impact the company (Pedrini & Ferri, 2018).

Research methodology

To achieve the aim of this study, field research was conducted through the collection of empirical evidence using semi-structured interviews, secondary and internal documents from stakeholders of Brazilian FSC. With the use of multiple data sources and the triangulation between them, it is possible to increase the reliability of the research and guarantee the validity of the analyses (Näslund et al., 2010). Due to the sanitary restrictions of the Covid-19 pandemic, interviews (Table 1) were conducted online using videoconferencing software (Howlett, 2021). In all, 15 interviews were conducted among different stakeholders (Table 2).

Table 1 - Criteria for interviewee selection

Selection criteria	Description
Which cases?	• Cases of food recalls with high and medium severity to the consumer's health (Class I and II), that is, cases of recalls in which the consumption of the defective product can cause health problems, or even death.
Who?	• Interviewing one individual (at least) from each stakeholder in the FSC that had a food recall event. • Stakeholders who act in the preventive phase and in containing impacts on the FSC in recall events.
Period?	• Food recall campaigns carried out between 2015 and 2020 due to the Collegiate Board Resolution (RDC 24), which regulates food recalls in Brazil, published in 2015 by ANVISA.
Local?	• Stakeholders located in Brazil, as it aims to analyze risk management actions and food recall procedures in the Brazilian context.

Table 2 – Interviewee information

Stakeholder	Description	Position	Professional experience (years)
Industries	Company A (Candy and Snack)	Quality coordinator	11
		Quality manager	18
		Supply chain manager	20
		Marketing manager	14
	Company B (Meat and Sausage)	Quality analyst	6
		Quality analyst	3,5
Producer / Supplier of productive inputs	Company in the poultry sector	Quality supervisor	10
Government	Regulations	Regulation technician	7
	Oversight	Food product inspection coordinator	15
		Food products tax auditor	12
	Consumer protection	Technical consultancy and administrative sanctions coordinator	8
Distributor	Supermarket	Supermarket Owner	22
Service provider	Consultancy	Chief Executive Officer (CEO)	41
	Packaging Specialist	Food packaging specialist	30
Non-governmental organization	Private non-profit organization	President	41

The empirical research involved the participation of 2 companies that have already carried out a food recall process in Brazil. Company A operates in the candies and snacks segment with around 700 employees and carried out a recall process due to the discovery by the quality control of the presence of foreign metallic bodies in the product - voluntary recall. Company B operates in the meat and sausages segment with more than 10,000 employees with a slaughtering capacity of around 600,000 poultry per day. This company carried out a recall due to a government determination because of the excessive presence of pathogens. Table 2 portrays information about the participants in this study.

All interviews were transcribed and uploaded into QDA Miner software for further content analysis, following the approach of Bringer (2006) and Krippendorff (2013). A codebook was created to categorize and code the available data in a mutually exclusive and exhaustive way. This facilitates the identification of relationships and the establishment of connections between the different authors who write about the same constructs (Gibbs, 2009).

Results

After the analysis, we identified 30 risk management actions in recall events which are performed by one or more stakeholders at different stages of risk management (Table 3). It was observed that producers work in the mitigation and immediate response phases with preventive actions, such as vaccination and medication control, sampling and testing, implementing agricultural controls and training of employees. They also collaborate in the identification of risk through traceability, transparency and visibility, defining response time and segregation of non-compliant products.

["Respect grace periods, get to know the raw materials that are being used there to feed the animals, the source of the raw materials, the question of the health of the herds."] - Food products tax auditor

["His role is to work in a way to prevent it. If it happens and he is a supplier, his role is to collaborate in the investigation of the causes and then to block the cause."] - CEO of food safety consultancy

Suppliers of productive inputs can act 1) in the mitigation phase with preventive actions through internal audits and 2) in building transparency and visibility with their customers through communication channels, 3) through quality specifications and certifications and 4) by providing training in good manufacturing practices. In the immediate response phase, they act on traceability and segregation of non-compliant products. The recall events caused by the suppliers can be costly for customers. Therefore, the processing companies pressurize suppliers to adopt traceability and transparency mechanisms in their production processes, as can be seen in the following cote.

["(...) You have the issue of compatibility between products and packaging. So, this issue of visibility and transparency in the chain is something that awakened us (...) I am here with a product with a plastic taste in the mouth and I will have to collect all this material. But whose responsibility is this?] - Food packaging specialist

["To guarantee traceability so that the moment we find it here (processing company), we can track their part (suppliers), which was what we used."] - Quality manager

Service providers work in the risk mitigation phase through activities to prevent the occurrence of a recall through training and by specifying guidelines for good manufacturing practices. Also, they assist the supply chain by acting to identify and correct the flaw that originated the risk and in filling the documentation that needs to be completed to governmental agencies to institute a recall procedure.

["Our main focus is on prevention because a recall should not occur. So, what we work on is precisely how you must proceed so that you do not let it happen. And we help the company to prepare the procedure for how it has to act if it happens."] - CEO of food safety consultancy

["It happened (recall)! I think it is collaborating and helping with the best knowledge to clarify, identify the causes and eventually make corrections."] - CEO of food safety consultancy

Table 3 - Risk management actions and phases in which stakeholders act in food recalls

Stakeholders	Actions										
	Producer	Supplier of productive inputs	Service provider	Processing company	Logistic Operator	2 nd processing company	Distributors	Consumers	Media	Government	NGOs
Sampling and test	M	M		M		M					
Suppliers and customers audits	M	M		M		M	M				
Agricultural controls	M										
Allergen control		M		M	M	M					
Storage control	M	M		M	M	M	M	M			
Control of packaging and labeling		M		M		M					
Hygiene control	M	M		M	M	M	M				
Transport control					M						
Vaccination and medication control	M										
Control in commercialization							M				
Hazard Analysis and Critical Control Point				M							
Government inspection/oversight										M	
Government laws										M	
International standards											M
Process planning and control	M	M		M		M					
Recall simulations				P		P	P				
Customer service				IR							
Communication of recall events				IR				IR	IR		
Change in product formulation		Re		Re		Re					
Notification by regulatory bodies										IR	IR
Prohibit and suspend products										IR	
Segregate nonconforming products	IR	IR		IR	IR	IR	IR				
Response time	IR	IR		IR	IR	IR	IR	IR			
Quality certifications	M	M Re	M	M Re	M	M Re					
Food defence				M P IR							
Contractual penalties	M	M		M IR	M	M IR					
Traceability	M P IR	M P IR		M P IR	M P IR	M P IR	M P IR				
Information technology	M IR	M IR		M IR	M IR	M IR	M IR				
Transparency and visibility	M P IR Re	M P IR Re		M P IR Re	M P IR Re	M P IR Re	M P IR Re				
Training of employees	M P Re	M P Re	M P Re	M P Re	M P Re	M P Re	M P Re				

Caption: M = Mitigation; P = Preparedness; IR = Immediate Response; R = Recovery.

The processing company is the stakeholder who acts in the four phases of risk management through good manufacturing practices, recall simulations, communication with the supply chain, and adoption of risk correction measures and in triggering the recall. This stakeholder is normally responsible for the entire management of the recall process (Kumar, 2014). In the excerpts below, the preventive role in managing the recall is highlighted.

["In a need for recall, the more organized the company is in the sense of providing the evidence, it is the best way because if any kind of circumstance happens, you have to have all the records of your production process very well stored there and ready for you to be able to use, so you can compose this dossier."] – Quality coordinator

["The more organized the company is, concerning its documentation based on the whole process, and the more simulations it makes of it, I think that all companies will be much more prepared to deal with the problem if the problem is real if the need for recall for real. So, it is very important to have this flow well designed, to have a crisis management team that are those people who are going to have an impact, who are going to have a reflex, who are going to be able to participate."] – Quality coordinator

Logistics operators work in three phases of risk management - mitigation, preparedness, and immediate response - through actions such as control in the transportation and storage of products, developing traceability systems to identify the distribution locations of the products, in consolidating communication and transparency and visibility mechanisms with chain members and by undertaking non-compliant product segregation measures. In this sense, logistics operators play a vital role in ensuring the safe and efficient movement of food products, requiring the use of transparency, visibility and transportation controls (Robison et al., 2013). This is seen in the following quote.

["The transportation part is carried out by (Second company) as well as by third parties. So, we have an annual monitoring qualification process, including third-party warehouses, temperature reports, photos, documentary, and on-site audits at the plant. So, to monitor the performance of these providers and the policy issue, you know, of how they are being treated. Because, like it or not, if the carrier fails, the company still responds."] - Quality analyst of Company B

The stakeholder 2nd processing company, those that purchase products from the processing companies (focal company) for a second processing and / or packaging, plays a role in the mitigation and immediate response phase with actions of audits, sampling and testing on receipt of products, specifications requirements and quality certification of the supplier company, transparency, and visibility, traceability, communication, and segregation of non-compliant.

["We sell to EmpresaX, which is an, Mechanically Separated Meat (MSM), which is used to make sausages and everything. So, they come to our plant, evaluate, score "that part there you have to improve because we identified (...)" they have their specification. So, they send us the specification of their products."] – Quality supervisor

Distributors operate in three phases of risk management- mitigation, preparedness, and immediate response- in control actions in storage, traceability, marketing control, traceability, and segregation of non-conforming products. Large players may require recall simulations from companies to verify the effectiveness of product tracking and possible points of vulnerability.

[...] it will depend for example on the storage of that product, if it is storing correctly as the producer or manufacturer indicated for him, (...) if he received this traceability of the product if it knows who produced it, who consumed it if it is a trustworthy company if it is a company that follows all good manufacturing practices. Because it will sell, right, it will pass the final part to the consumer. So, some problem can cause direct responsibility for him."] – Regulation technician

Consumers act in the immediate response by acting responsibly and consciously, paying attention to the recall campaigns, and returning the product as soon as possible.

["Ideally, he should promote the return of that product, repair or replace it so that we can have control and be sure that that risk has been eliminated. What is very common in recall campaigns for low value-added products? The consumer throws it in the trash."] – Technical consultancy and administrative sanctions coordinator

NGOs work in the mitigation and immediate response phase through the development of international standards in food safety, training of companies, and global notifications of recall cases. NGOs include intergovernmental organizations, such as the World Trade Organization (WTO), Codex Alimentarius Commission (CAC), and those that are private non-profit organizations, such as the Global Food Safety Initiative (GFSI), act on a global stage to establish guidelines for categorizing food risk and improving food safety, strengthening food inspection systems in countries. The following two passages indicate the role of this stakeholder.

["They have a fundamental role in the sense that they establish the marketing parameters there to have an equivalent trade. (...) So, in this sense of providing security in the commercialization, in the production of food, giving unique parameters that will be followed there, I understand that the participation of these entities is fundamental."] – Food products tax auditor

["It is the informational, guidance and mapping role. As you said at the beginning, it is a delicate subject (...). But that is why these international bodies have this role of always being" attentive, not letting past issues fall into oblivion so that they do not repeat themselves."] – Food packaging specialist

The role of the media is focused on the immediate response with the dissemination of information regarding the recall and advertising campaigns to collect non-compliant products.

[In the process of recall, the media is provoked, that is, "how so?" When the company is going to recall food, it has to send an alert message for analysis by ANVISA, this alert message will be linked in the media, so the company will pay for a website, for radio, for TV, to publishing that alert message."] – Regulation technician

The Government stakeholder can act in the mitigation and immediate response phases through the establishment of laws and standards that guarantee the safety of food products, inspections in the supply chain, prohibition and suspension of sales of non-conforming products, and communications of events of recall for society and other government agencies. Government and regulatory agencies have a role in facilitating preventive food safety through voluntary and regulatory mechanisms (Manning et al., 2005) in determining legislation and standards for food businesses to operate in the interests of interests the public (Dani & Deep, 2010) and establish import and export requirements (Dagg et al., 2006). In the following passage, a government tax auditor responsible for inspecting the food chain comments on the government's role in a food recall process.

["I understand that it goes through regulation, so having clear rules concerning these procedures, not only recall but also production, which we are talking about here to prevent this from happening. Well standardize the issue of how to inspect this, how to actually check what is happening, also standardize about punishments in case of non-compliance with the legislation, non-compliance with the rules, non-compliance with norms, non-recalling or commercialization aware of products that are at risk, in this sense of punishment. And also, this intercommunication between the different government agencies in a sense for each one to play their role appropriately and to complete themselves in that sense, so you have to have this intercommunication as well."] – Food products tax auditor

It stands out that 3 actions had the highest mentions among the interviewees: communication, traceability and transparency, and visibility. Communication is an important mechanism to communicate all affected stakeholders during any recall (Kumar et al., 2015), and is an important element that makes it possible to identify and react more quickly to a rupture (Blackhurst et al., 2011).

Discussion

It was possible to identify in the processing companies participating in this study, a harmonious relationship with other the supply chain members during the recall process. This fact may be linked to the commitments made through contracts and the establishment of long-term partnerships with the partners involved in the recall. The benefits of investing in stakeholder relationships before the crisis have profound implications for organizations in crisis. First, stakeholders are interested in the organization's success and can represent a support network during crises. Second, stakeholders are often negatively affected by the crisis, if stakeholder relationships are not strong. These groups can withdraw their support during a crisis, thereby prolonging the effects of a crisis or intensifying the threat associated with the event. However, there were moments of conflict between the two processing companies with government agencies. These conflicts included the main complaint of companies about the lack of transparency in the rules on how to proceed with the recall procedure and they also complain about the communication system with government agencies. In this sense, exploring the relationship between manufacturing companies and the government through the development of better communication channels can help companies to carry out more effective recalls.

According to stakeholder theory, communication allows those involved in the recall to understand the obligations and activities to be performed in the recall management process (Cui et al., 2017). The involvement of stakeholders in the corporate decisions is considered an ethical requirement and a strategic resource, which helps to provide competitive organizational advantages (Miles, 2012).

The actions of traceability, transparency and visibility also stood out. Traceability is an effective action to ensure food safety and quality and reduces the costs associated with recalls (Qian et al., 2018), in addition to being a mandatory requirement in Brazilian FSC (ANVISA, 2015). Transparency and visibility is an action for the bidirectional sharing of information among chain members to track food security vulnerabilities, adverse events and manage product recalls (Ringsber, 2014). In this sense, stakeholder theory assumes that the success of a supply chain depends heavily on harmonious cooperation from its stakeholders (Cui et al., 2018). Our findings thus corroborate thus follow from stakeholder theory in which information sharing may be used to successfully share needs, obligations, and information to perform their operations (Soundararajan et al., 2019).

In this way, the most common actions are related to the exchange of information between FSCs members, which is an important mechanism to reduce the information asymmetry between the stakeholders (Wieland & Wallenburg, 2013). Therefore, the close cooperation between the stakeholders through effective communication and an aligned vision can be important strategies to manage risks in a holistic way in the supply chain (Botha & Badenhorst-Weiss, 2019).

Conclusion

This research helps us in determining the role and responsibilities of different stakeholders in the Brazilian FSC. We also identify the phases of risk management in which different stakeholders are involved in a food recall management process. Our results can be explained using stakeholder theory and thus we contribute to the ongoing literature on food recall management by applying stakeholder theory. Defining these responsibilities is an important step towards implementing food safety systems, traceability systems, determining regulations and mechanisms for preventing, controlling, and responding to recall events in food supply chains (Le Valle & Charlebois, 2015). Another contribution of this paper is a structure that covers the roles, responsibilities, and

actions before (to avoid), during (to deal with), and after (to recover, learn and adapt) and Table 3 explored this by relating risk management actions to stakeholders, identifying which phases of the management of a recall they act.

In addition, the identification and categorization of stakeholders in crisis management may assist managers in decision-making, influencing the growth and survival of the company.

This study has some limitations. First, the study involved processing companies from two different food sectors and it is necessary to analyse other food industries. This is important as different production processes in FSCs which can bring other situations or challenges. Second, the study has a regional limitation (Brazil) and, different countries may adopt different practices to the studied context and different stakeholders may be involved, such as local communities. Third, the study focused on the bidirectional relationship of a processing company (focal firm) with the other stakeholders of FSC; however, the research does not analyse the relationship among other stakeholders, such as distributors with government agencies.

As future research avenues, we can explore the following opportunities: focus on similar supply chains, such as automotive, pharmaceuticals, toys, and electronics; analyse behavioural interaction and compliance among stakeholders in recall events; conduct research on different countries so as to build a global model.

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