Food Control 66 (2016) 158–165

Contents lists available at ScienceDirect

Food Control

journal homepage: www.elsevier.com/locate/foodcont

Stakeholders' perceptions, attitudes and practices towards risk prevention in the food chain

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ARTICLE INFO

Article history:
Received 1 October 2015
Received in revised form
27 January 2016
Accepted 2 February 2016
Available online 11 February 2016

Keywords:
Risk perception
Animal health
Plant health
Food safety
Online survey
Web survey

ABSTRACT

An online survey was conducted to describe stakeholders' perceptions, attitudes and practices towards risk prevention in the food chain and to explore if common features could be extracted from different fields of competency or groups of stakeholders. Out of 80 participants, 60% believed that pathogenic microorganisms were the main hazard to prevent. Twenty-four percent perceived climate change as the main risk factor. Seventy-three percent believed that hazards in the food chain are preventable and they often showed a positive attitude towards risk prevention measures. The opinion of 75% of stakeholders was that prevention measures should be compulsory and under the shared responsibility of both food business operators and competent authority. Seventy-five percent of the respondents had recent experience with particular hazards and declared to have undertaken risk reduction measures. Incentives to implement measures were policy obligation and public health consequences whereas barriers were budgetary reasons and doubts about their effectiveness. However, there was not always a complete agreement between the perceived usefulness of risk prevention measures and their effective implementation, and conversely. No significant difference could be observed in the perceptions, attitudes and practices towards risk prevention between neither groups of stakeholders nor their fields of competency. The results are important for improving the risk communication process because the same issues can be emphasized when promoting risk prevention in the food chain regardless of the type of food sectors and the groups of stakeholders.

1. Introduction

The risk analysis paradigm consists of three distinct parts: risk assessment, risk management and risk communication (Regulation (EC) No 178/2002). Risk management in food safety is broadly separated in two complementary approaches: risk control and risk prevention (Regulation (EC) No 178/2002). In general, control measures are implemented once the hazard has occurred in the food chain, to decrease its adverse effects and/or severity, whereas prevention measures consist in avoiding the hazard occurring in the food chain, tackling problems at source, where possible.

Risk prevention is an integrated approach which is implemented throughout the whole food chain, at each and every production-processing-distribution stage (Regulation (EC) No 178/2002), involving all the stakeholders. Stakeholders are defined as any person, group or organization having an interest in or affected by the policy making (Regulation (EC) No 178/2002). Selection and implementation of risk prevention measures are not necessarily compulsory and can rely on the responsibility of each individual stakeholder. Therefore, the effective risk prevention throughout the food chain requires a strong active partnership between *e.g.* the producers, food business operators, veterinarians, transporters, retailers, consumers and public authorities. Understanding the process by which stakeholders decide to bring forward some preventive measures can help to build such a successful and sustainable commitment towards risk prevention. When considering the process by which stakeholders make decisions about risk prevention, it is especially important to identify the factors which drive

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http://dx.doi.org/10.1016/j.foodcont.2016.02.003
0956-7135/

and motivate their behaviour. In particular, stakeholders' concerns and perceptions can modify their decision-making process, influencing actual exposure indirectly. Effectively, the first-ever expected application of studying behaviour is changing stakeholders' behaviour, *i.e.* their practices. Communication is a valuable tool to promote positive risk prevention practices. Understanding the common and different factors leading the decision-making process between stakeholders may guide improvement to risk communication. Development of a communication approach about risk prevention in the food chain can be conducted either at a global level, or targeted and stakeholder- or field of competency-tailored if significant differences are observed. Identification of the related factors is critical in understanding the decision-making process and needs an integrated multidisciplinary approach, including social sciences (Mills et al., 2011).

The human behavioural science and theory, *i.e.* studying the process from social construction of subjective judgments to rational decision making, is often referred to as social epidemiology when applied on populations. It is well known that many factors influence people's risk perception (Botterill & Mazur, 2004). Consequently, there is likely to be a substantial variation amongst stakeholders with respect to what represents an acceptable/tolerable level of risk. Levels of acceptable/tolerable risk are value-based and affected by many factors. As well as the obvious elements of benefits and costs, these factors also comprise culture and perception of the risk, which are themselves influenced by many further factors. These notably include voluntariness, controllability, delay effect, natural *versus* manmade, familiarity and habituation, benefit and risk-benefit distribution, and the role of the media (Schmidt, 2004). What is considered to be an acceptable/tolerable level of risk will therefore vary depending upon which group of stakeholders is being considered. Thus, risk perception may lead to distortions of risk prevention priorities among the stakeholders (Ilbery, Maye, Ingram, & Little, 2013; Kristensen & Jakobsen, 2011; Simon-Grifé et al., 2013).

Only few studies on stakeholders' opinions to food safety are available (Sargeant et al., 2007; Van Boxstael et al., 2013; van Kleef et al., 2006), and they are mainly focused on risk control measures or policy (Sargeant et al., 2007; van Kleef et al., 2006). Studies on attitudes towards risk prevention have mainly concerned the adoption of biosecurity practices by farmers in animal productions (Barnes, Moxey, Ahmadi, & Borthwick, 2015; Brennan & Christley, 2013; Gunn, Heffernan, Hall, McLeod, & Hovi, 2008; Racicot, Venne, Durivage, & Vaillancourt, 2012; Simon-Grifé et al., 2013), whereas, to date, studies on attitudes towards risk prevention in plant production have received less attention (Ilbery et al., 2013; Maye, Ilbery, & Little, 2012). However, to the authors' knowledge, a survey on how risk prevention practices and their effectiveness are perceived by various stakeholders of the food chain in different fields of competency is lacking. Therefore, a specific survey was conducted to describe stakeholders' perceptions, attitudes and practices towards risk prevention in the food chain and to explore if common features could be extracted from different fields of competency or stakeholder groups in order to improve a future communication approach about risk prevention in the food chain.

2. Materials and methods

2.1. Study design and sampling

An online cross-sectional study was set up to investigate the similarities and differences between the perceptions, attitudes and practices of stakeholders towards risk prevention in different fields of competency in the food chain, *e.g.* food safety, animal health, plant health, public health and environment.

The study population consisted of different national and European stakeholders (as regards to the level of responsibilities) of the food chain who were invited to register to a national symposium organized by the Scientific Committee of the Belgian Federal Agency for the Safety of the Food Chain (FASFC) in 2014 on "Improving the safety of the food chain through risk prevention in plant and animal production" (Scientific Committee of the Belgian Federal Agency for the Safety of the Food Chain, 2014).

The survey was distributed in two ways. First, invitations requesting participation in the proposed online questionnaire was sent electronically to about 805 stakeholders at different national and European levels. Most of them were known professional contact points and had been involved in professional activities in the food chain. More than 200 of them had expressed an interest in risk prevention by their registration for the national symposium on risk prevention in the food chain. Second, the questionnaire was distributed through snowball sampling strategy, where the first wave of respondents distributed the questionnaire link to others via e-mail. This enabled to reach more people from a same stakeholder group within a same field of competency.

2.2. Data collection

Responses of the stakeholders were collected using an online anonymous questionnaire, created, hosted and shared using Google Drive™ (available upon request). Time required to respond to the questionnaire was approximately 10–15 min.

The questionnaire was divided into 4 sections: (1) personal information of the respondent (6 questions of which 2 were open-ended); (2) perceived main hazard and related risk factor in the food chain (3 questions, 2 open-ended); (3) attitudes towards risk prevention measures, *i.e.* 22 measures in the field of food safety, 25 in animal health and 16 in plant health, Appendix A (26, 29 and 20 questions, respectively, 1 open-ended); (4) measures implemented to prevent risk of the main hazard occurring or spreading (6 questions, 1 open-ended). In total, the questionnaire contained 44 questions (14% open-ended and 86% closed) if respondent pertained to the field of animal health, 41 questions (15% open-ended and 85% closed) for food safety and 35 questions (17% open-ended and 83% closed) for plant health. No answer to the questionnaire was mandatory.

Questions for quantification of attitude towards risk prevention measures and the measures implemented were designed according to existing scientific literature, guidelines issued by the European legislation and usual, mandatory or common risk prevention measures. Respondents were asked to indicate how much they believe the proposed measures were useful or useless. Answers were measured on five-point Likert scales from *"not useful at all"* to *"extremely useful"* (28 questions for animal health, 25 questions for food safety and 19 questions for plant health). These enabled to differentiate not only between important and unimportant measures but also between positively and negatively rated measures. Respondents were classified as having a positive attitude if they believed the measure to be rather useful or a negative attitude if they considered the measure rather useless.

The questionnaire was reviewed by subject experts in the field of the food chain, including members of the Scientific Committee of the FASFC. A draft of the questionnaire was pre-tested to evaluate the interpretation of the questions, length of the questionnaire and easiness of the online system. Pre-testing was done with by 8 persons belonging to different groups of stakeholders and with different fields of competency.

The initial invitation to participate to the survey was sent on 15th October 2014. The survey was open for responses until 5th December 2014. Reminder e-mails were sent on 23rd October 2014