



Food-related hazards in China: Consumers' perceptions of risk and trust in information sources



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ABSTRACT

This paper identifies segments of Chinese consumers based on their perception of personal risk, how worried they are and their subjective knowledge about seven possible food-related hazards: additives, residues, counterfeit, inferior, genetically modified, deteriorated and nutritionally imbalanced food. Data were collected through a consumer survey conducted in Beijing (534 participants) and in Baoding (437 participants). Three clusters were identified: worried and knowledgeable consumers (60.1%), worried and ignorant consumers (21.7%) and moderately worried consumers (18.2%). The first two groups reported a high level of worry and high perception of personal risk about food-related hazards in China. The two hazards they were most worried about were counterfeit food and inferior quality food. Television, internet and personal communication were the three information channels most frequently used by participants to obtain information about food safety. Worried and ignorant consumers reported less frequent use of magazines, books and brochures compared with other consumers. Medical doctors, personal experience and research institutes were the three most trusted information sources for the first two groups of consumers. Moderately worried consumers only placed high levels of trust in medical doctors and themselves. Consumers' perceptions about the knowledge, honesty and concern of different information sources significantly and positively affected their trust in those sources. The study concludes by making recommendations as to how to improve communications with the different identified consumer segments and identifies future research required to expand its validity.

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1. Introduction

Consumers' perceptions of food-related risks and their trust in information about food risks are potential determinants of their food-related behavior (Rosati & Saba, 2004; Verbeke, Frewer, Scholderer, & De Brabander, 2007). An increased frequency of food scares in China in recent years has increased Chinese consumers' worries about food safety and reduced their confidence in the quality of food (Liu, Pieniak, & Verbeke, 2013), which has resulted in a drop in demand for certain food products. For instance, one month after the occurrence of the melamine milk crisis, the consumption of domestic milk powder in China dropped to half the level before the crisis (Chen, Zhou, & Yin, 2009). A better understanding of Chinese consumers' perceptions of food-related risks and their trust in information sources would help improve effective

communication about food hazards to Chinese consumers in China and thereby rebuild their confidence in food safety.

Slovic's psychometric paradigm (1987) proposes that the risk perceptions of lay people are related to psychological factors, such as perceived catastrophic potential, fear or whether exposure to the hazard is voluntary. Risk perception can be measured by worry (Rosati & Saba, 2004), which can be defined as an "unpleasant state of mind with thoughts about uncertain and unpleasant events" (Sjöberg, 1998). Worry is characterized as a "feeling of anxiety, tension and apprehension; moderate awareness of somatic cues and concerns over the future rather than the past or present situation" (Borkovec, Robinson, Pruzinsky, & Depree, 1983: 9). Research on the relationship between worry and perceived risk showed that these concepts were moderately (Rosati & Saba, 2004; Siegrist, Cvetkovich, & Roth, 2000) to highly (Griffin & Dunwoody, 2002; Rundmo, 2002) related.

A number of studies have shown that trust strongly influences risk perception (e.g. Eiser, Miles, & Frewer, 2002; Groothuis & Miller,

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1997; Siegrist et al., 2000). Trust is often conceptualized as a multidimensional construct. For example, Frewer, Howard, Hedderley, and Shepherd (1996) indicated that trust is based on perceived accuracy, knowledge and concern with public welfare. Peter, Covello, and McCallum (1997) proposed knowledge, expertise, openness, honesty, concern and care as the dimensions of trust. Studies into the relationship between food risk perception and trust in information sources have largely focused on the role of mass media and the provision of food safety information (Frewer et al., 1996; Liu, Huang, & Brown, 1998; Lobb, Mazzocchi, & Traill, 2007; Rosati & Saba, 2004).

Risk perception also depends on the information sources that consumers use, which can include the mass media (Combs & Slovic, 1979; Kjærnes, 2006), friends and personal experience. Information seeking and information use are typical components of consumers' risk and uncertainty reduction strategies in food-related decision-making (Danelon & Salay, 2012; Van Wezemael et al., 2010). Word of mouth information is often used in high risk situations or by people who have high perceptions of risk (Mittra, Reiss, & Capella, 1999; Yeung & Yee, 2003). More recently Rutsaert, Regan, et al. (2013) have explored what they view as the strong potential of new online information sources, such as social media, as tools for communicating information about food risks and benefits.

Studies have shown that people with different socio-demographic characteristics perceive food risks in different ways. Lin (1995) found that female, older, more educated, non-working, main meal planners were more likely to treat food safety as a very important issue. Kjærnes (2006) reported that women paid more attention to food safety issues than men because they take more responsibility for buying and preparing food. Young people were found to be less concerned about food safety than older people (Miles et al., 2004) and according to Zorba and Kaptan (2011), knowledge of food safety issues increases with age. These studies confirm that, in order to be effective, risk communication strategies should be tailored to target particular sub-groups of the public (Verbeke, 2005).

Recently a body of literature has emerged that explores Chinese consumers' risk perceptions (Hu & Hua, 2008; Ma & Zhao, 2009; Zhao, Tang, & Li, 2012; Zhou, 2005), how they search for information (Cha, 2009; Han & Yuan, 2008; Hu, Qi, & Hua, 2007; Zhang & Liu, 2010; Zhou, Huo, & Peng, 2004) and the trust they place in information sources (Hu et al., 2007) related to food safety. However, only a few of these studies used a segmentation approach to exploring Chinese consumers' food safety perceptions. Chen (2012) segmented Taiwanese consumers into three groups: pessimistic, neutral and optimistic about food safety, based on their trust in the actors and institutions involved in the food supply chain. Zhang, Huang, Qiu, and Huang (2010) segmented urban Chinese into four groups based on their perceptions and attitudes toward genetically modified (GM) foods (food safety oriented, nutritional technology oriented, GM skeptical and non-food GM supporters). There is a need for further research to understand Chinese consumers' risk perception patterns (and possible differences within these) in order to develop more effective and targeted communication strategies for Chinese consumers.

The primary objective of this study is to identify different segments of Chinese consumers, based on their personal risk perceptions, their degree of worry and their knowledge about food-related hazards. Its second objective is to investigate whether the identified segments differ in terms of their use of information channels about food-related hazards and their trust in information sources. The third objective is to investigate the determinants of trust in information sources. In conclusion this study presents a number of recommendations as to how to communicate more effectively with the identified consumer segments.

2. Materials and methods

2.1. Data collection

Quantitative data were collected through a survey conducted during March 2012 in Beijing and Baoding, a medium-sized city close to Beijing. The survey in Beijing was performed at supermarkets, shopping malls, residences and parks in urban areas. Participants were selected using convenience sampling. Because Beijing has a large transient population we screened out subjects who had lived in the city for less than one year. Participants' consent to use their personal data for scientific purposes was requested prior to starting the survey. Participants received a small cash incentive. The same questionnaire was distributed to households by about 700 students in a middle school in Baoding city. Here a self-selection sampling method was used: the students took the questionnaire home and asked their parents to fill it in and return it.

The questionnaire was constructed to measure consumers' perceptions of the risk of food-related hazards, the frequency with which they used different information channels and their trust in information sources (following on a study by Rosati and Saba (2004)). The master questionnaire was drafted in English, translated into Chinese and pre-tested with a sample of 20 Chinese adults through a pilot study.

This study explored a number of food-related hazards including: food containing additives, food containing pesticides or veterinary drug residues, counterfeit food, inferior food, GM food, deteriorated food and nutritionally imbalanced food. Counterfeit food describes food which uses a brand or label of a recognized food manufacturer or quality grade without authorization or imitates its appearance, but is of far lower quality than the authentic version (Xie, 2009). Inferior food describes sub-standard food products, usually made using low-quality (or even prohibited) ingredients or in unhygienic conditions. Deteriorated food is food which has significantly deteriorated because of spoilage caused by for example bacteria or mold. Nutritionally imbalanced food is food with excessive amounts of some nutritional component, e.g. excessively fat, sugar or salt, compared to equivalent products. These seven food hazards were derived from previous studies by Zhou et al. (2004), Wang (2005) and Xie, Shen, and Li (2010) and cover the major existing and/or potential hazards in the food market in China.

2.2. Segmentation analysis

Segmentation analysis has successfully been applied in food marketing and health psychology research in order to better understand behavioral patterns and to select the appropriate target groups for public health promotion campaigns and communication (Pieniak, Verbeke, & Scholderer, 2010; Verbeke, Perez-Cueto, de Barcellos, Krystallis, & Grunert, 2010). For example, Kornelis, De Jonge, Frewer, and Dagevos (2007) used a segmentation analysis to explore food safety information-acquisition patterns, identifying five consumer segments, each of which relied on different sources of information about food safety. Kennedy, Worosz, Todd, and Lapinski (2008) identified five consumer segments (confident, independent, trusting, cautious and apprehensive) with different attitudes towards food safety. More recently, Rutsaert, Pieniak, Regan, McConnon, and Verbeke (2013) used a segmentation approach to determine consumer interest in using social media to obtain information about the risks of pesticide residues on vegetables.

In this study, segmentation analysis has been performed to identify segments of Chinese consumers based on worry, risk perception and knowledge. Worry, perceived personal risk and subjective knowledge about potential food risks were measured using a scale devised by Rosati and Saba (2004). Participants were

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