



# Consumer awareness and credibility factors of health claims on innovative meat products in a cross-sectional population study in the Netherlands



C. Strijbos<sup>1</sup>, M. Schluck<sup>1</sup>, J. Bisschop, T. Bui, I. de Jong, M. van Leeuwen, M. von Tottleben, S.G. van Breda<sup>\*</sup>

Department of Toxicogenomics, GROW School for Oncology and Developmental Biology, Maastricht University, P.O. Box 616, 6200 MD, Maastricht, The Netherlands

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## ABSTRACT

Meat consumption-associated cancer risks relating to the preservative nitrate are receiving considerable attention. Consequently, innovative meat products are being developed with no or reduced nitrate levels. For example, phytochemicals are currently under investigation for their potential to replace nitrate in meat. Consumers are becoming more aware of health aspects of consumed foods, a trend which is accompanied by an increase in health claims on food products. However, consumer acceptance of a health claim is dependent on consumer credibility of the claim. In order to produce a health claim, perceived credible by consumers, it should be known which factors influence consumer credibility. This pilot study investigated the extent to which consumers perceive health claims on innovative meat products credible and which factors influence this credibility. By means of a questionnaire distributed amongst 1010 Dutch participants representative of the Dutch population, factors like health claim promoters, media platforms, and the phrasing of the proposed health claim were investigated. Main results are that the majority of consumers indicates meat products with phytochemicals as acceptable. Promotion by a national health foundation is perceived as credible, and health magazines are perceived as a credible media platform. This study found that neither weekly meat consumption, sex, nor age have effect on the consumer credibility of certain health claims, but that educational level does.

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## 1. Introduction

Consumers are becoming increasingly aware of health and safety aspects of food and food products they purchase (Wognum & Bremmers, 2009). Consequently, the number of foods and food products bearing nutrition and health claims to inform consumers of the health benefits of these foods, is vastly increasing (Regulation, 2007). A health claim is any statement made about a relationship between a food product and a desired health status (European Food Safety Authority, 2014b; Williams, 2005). A health claim suggests that health benefits can result from consuming a certain food or one of its components. Producers use these claims to differentiate their product, it forms a basis for competition on nutritional quality (Caswell, Ning, Liu, & Mojduszka, 2003). Health claims can be divided in three different categories: functional claims, risk-reduction claims, and claims referring to children's development (European Food Safety Authority, 2012). Functional

claims can be related to growth, development, functions of the body, slimming or weight control, and can also refer to behavioral and psychological functions (European Food Safety Authority, 2012). Next, risk-reduction claims, as the name implies, refer to foods that reduce the risk for developing a disease (European Food Safety Authority, 2014a). Finally, claims referring to children's development are claims that have severe legislation, due to the fact that people aged younger than 18 years are more sensitive to damage (European Food Safety Authority, 2014b).

Health claims are closely monitored and regulated within the European Union. This regulation is based on the scientific evidence that supports each health claim. The strength of this evidence is assessed by the European Food Safety Authority (EFSA) and based on their recommendation, the European Commission decides whether a specific health claim is approved or not (Grunert et al., 2009).

The use of health claims on food products aims, amongst others, to inform and educate consumers as well as affecting consumer awareness and behavior (Williams, 2005). Consumer awareness refers to knowledge of the consumer about a particular product. This knowledge allows the consumer to make better,

<sup>\*</sup> Corresponding author.

E-mail address: [s.vanbreda@maastrichtuniversity.nl](mailto:s.vanbreda@maastrichtuniversity.nl) (S.G. van Breda).

<sup>1</sup> Both authors contributed equally to this work.

well-informed choices based upon information they find trustworthy (Van Trijp & van der Lans, 2007). Consumer behavior is not only influenced by the information the consumer has about a certain food product, but also by the health image of a food product. For instance, a health claim on a food product with a positive health image is evaluated as more positive by consumers (Siegrist, Stampfli, & Kastenholz, 2008).

As not all food products have a positive health image, like meat products, we are interested in the perceived credibility of health claims on such a product. The perceived credibility of the health claim can lead to consumer trust for in this case the meat product. Consumer trust, defined by Sirdeshmukh et al., are the expectations held by the consumer that the service provider is dependable and can be relied on to deliver on its promises (Sirdeshmukh, Singh, & Sabol, 2002). Consumer trust often leads to consumer acceptance of a product. However, due to conflicting reports in the media about healthy and unhealthy, consumers might be unsure whether to believe a health claim (Naylor, Droms, & Haws, 2009).

In the case of meat products, the meat-associated cancer risks have received considerable attention in the last few decades. Notably, the use of nitrite as a preservative in most processed meat products is controversial and there are numerous indications that the formed metabolites, especially nitrosamines and nitrosamides, can have carcinogenic properties (Chao et al., 2005; Honikel, 2008). New meat processing technologies are being developed (Arihara, 2006) in which for instance phytochemicals are added, which are non-nutritive chemical compounds that occur naturally in plants (Fernández-Ginés, Fernández-López, Sayas-Barberá, & Pérez-Alvarez, 2005). These phytochemicals can either replace the nitrite in meat but more probably will counterbalance the negative effects of nitrite on health, if added to processed meat products which still contain some nitrite. A study by Frewer et al. showed that skepticism amongst consumers exists, with regards to new meat processing technologies (Frewer et al., 2011). Factors such as unpredictable effects, uncontrolled use and ethical concerns can lead to the rejection of such new technologies. However, the perceptions of unnaturalness alone are unlikely to induce the rejection of such a new technology (Frewer et al., 2011). In order to prevent the previously mentioned skepticism, health claims could be used to offer the consumer insight into the relationship between the product and claimed benefits.

The preference of the consumer for specific claims should be taken into account when deciding the type of claim to be used. In multiple studies it was shown that physiological health claims are rated as more attractive than psychological health claims (Siegrist et al., 2008; van Kleef, van Trijp, & Luning, 2005). Furthermore, according to a study on consumer appeal of nutrition and health claims, performed by Verbeke et al., mentioning a disease risk in a health claim can negatively impact the consumers' perception of a product bearing a risk-reduction claim (Verbeke, Scholderer, & Lähteenmäki, 2009). The primary reason is that such claims remind consumers of the food-related risks. This reminder reduces the hedonic value of the product even though the product with the claim itself in fact reduces this risk. Furthermore, extensive approval procedures for using a risk-reduction claim might not be contributory as consumers have a much more critical attitude towards products with a risk-reduction claim (Verbeke et al., 2009). Therefore, it might not profit producers to invest in such health claims. Apart from this possible negative effect of a health claim, Roe et al. found that the presence of a health claim on a food package is associated with a higher rating of the product on health attributes that are not mentioned in the claim (Roe, Levy, & Derby, 1999; Van Trijp & van der Lans, 2007). Therefore, products with a health claim are perceived healthier on various aspects, not just regarding the aspects mentioned in the claim (Roe et al., 1999;

Williams, 2005). When a product contains a health claim, consumers view the product as healthier and are more likely to purchase it (Roe et al., 1999). It also seemed that consumers overall prefer short wording of claims instead of long and complex claims (Williams, 2005). The wording that is chosen to express a claim may vary between countries (Van Trijp & van der Lans, 2007). Van Trijp et al. found that content claims are on average perceived most credible, whereas claims on the product not mentioning ingredients, are the least credible (Van Trijp & van der Lans, 2007). Additionally, they found that it is necessary to mention the ingredient added to the product to increase the credibility of the health claim. Furthermore, it appeared that mentioning plant sterols in a health claim does not lower its credibility. Perceived credibility of a health claim is not related to the strength of the promise made in the claim, but messages are more believable when repeated by trusted and multiple sources (Urala, Arvola, & Lähteenmäki, 2003). However, it is unclear which sources are perceived as trustworthy. Furthermore, a lot of functional foods that develop from scientific opportunity meet poor market acceptance and the development of effective health claims seems rather difficult (van Kleef et al., 2005).

Although consuming functional foods has a potential benefit, not much is known about the consumer perceptions of health claims for functional foods and their response to the different types of claims (Naylor et al., 2009; Williams, 2005). Additionally, the perceived credibility of a functional food appeared to be an important factor for the intention to purchase such a product (van Kleef et al., 2005). Therefore, consumer credibility of a health claim on a functional food is important for the intention to purchase the product. A pilot study has been carried out to elaborate on this consumer credibility and on factors influencing this credibility. The aim of this pilot study is to determine to which extent consumers perceive certain health claims on meat products in which nitrite has been (partially) replaced by phytochemicals credible. Additionally, this pilot study tries to establish which factors influence how credible people perceive health claims on these innovative meat products and if the health claims influence the consumer acceptability of these meat products.

## 2. Methods

### 2.1. Sampling

A consumer sample of 1010 Dutch subjects was recruited via an internet panel by a commercial market research agency, Research Now. This agency made sure that age, sex and living region distribution were representative for distribution of these variables in the Netherlands. Concerning the focus of the study on the credibility of health claims on a new meat product, vegetarians were excluded from the analysis. In the analysis, 504 men and 506 women were included. Subjects were paid by Research Now according to the time effort put into filling in the questionnaire. Subjects were divided amongst different age groups (Appendices B, Table B.1). The average age of the subjects was  $36.9 \pm 1.6$  years. The subjects were equally divided amongst the twelve different provinces of the Netherlands depending on the population number of the specific province (Appendices B, Table B.2). In order to get an indication of the educational level of the participants, the highest educational level of each participant was determined (Appendices B, Table B.3).

### 2.2. Questionnaire

The questionnaire started with general questions about the respondents, education level options given in the questionnaire can be compared to the following international education levels:

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