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Consumer response to health and environmental sustainability information regarding seafood consumption

Silke Jacobs[a,b], Isabelle Sioen[b,c], António Marques[d], Wim Verbeke[a,*]

[a] Department of Agricultural Economics, Ghent University, Coupure links 653, 9000 Ghent, Belgium
[b] Department of Public Health, Ghent University, UZ 4K3, De Pintelaan 185, 9000 Ghent, Belgium
[c] Department of Food Safety and Food Quality, Ghent University, Coupure links 653, 9000 Ghent, Belgium
[d] Division of Aquaculture and Upgrading (DivAV), Portuguese Institute for the Sea and Atmosphere (IPMA), Avenida de Brasilia, 1449-006 Lisboa, Portugal

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ABSTRACT

Seafood consumption has an impact on both consumers' health and on the marine environment, making the integration of health and sustainability aspects in information and recommendation messages for consumers highly topical. This study presents the results of a consumer study in terms of the impact of exposure to a message about health and sustainability aspects of seafood on 986 participants from Belgium and Portugal. Possible drivers for behavioural change regarding seafood consumption frequency and sustainable seafood buying frequency are studied following exposure to the message. Initial behaviour emerges as the most important factor triggering a change in the intention to consume seafood twice per week and a change in the intention to buy sustainable seafood. A higher health benefit perception resulted in an increased intention to consume seafood twice per week. Attitude towards the message and the option to optimise consumers' choice of seafood species favouring sustainability were significant determinants of change in the intention to buy sustainable seafood. Different stakeholders may take the results of this communication strategy into account and, consequently, contribute to a seafood supply and related communication that supports public health and the marine environment.

1. Introduction

1.1. Scope and objectives

Regular consumption of seafood is recommended owing to its well-established health benefits. For example, the World Health Organization (2017) recommends 1–2 servings per week and the American Heart Association (2017) recommends at least 2 servings per week. However, health benefits have to be balanced with potential health risks. On one hand, seafood contains nutrients beneficial for human health, such as omega-3 fatty acids, vitamin D, iodine and selenium. On the other hand, seafood may also contain contaminants, such as methyl mercury, PCBs, dioxins and other environmental contaminants of emerging concern such as pharmaceuticals, microplastics and endocrine disruptors. It has been generally advised to consume a seafood meal twice per week, with one including fatty fish species (Mozaffarian and Rimm, 2006; Sioen et al., 2008a,2008b). In addition, seafood consumption recommendations should also guarantee that the advocated behaviour is environmentally sustainable, as a conflict may exist between the advice to increase seafood consumption and the pressure on fish stocks in the wild (Clonan, 2012). In a recent publication of the European Commission prepared by the International Union for Conservation of Nature (Nieto et al., 2015), it is reported that 8.4% of European marine fish species have experienced declining populations, 21.5% are more or less stable and 1.7% are increasing. The trend for 68.4% of the species still remains unknown. The main threats to European marine fish are overfishing, coastal development, energy production, mining and pollution (European Commission, 2015). The latter threat in specific is related with potential adverse impacts on consumers' health when consuming seafood (Domingo, 2016; Van der Meersch et al., 2015; Mostofa et al.,2013).

Most seafood consumption guidance has not taken into account the ecological impacts of seafood choices by consumers (Oken et al., 2012). The general advice to increase seafood consumption has been criticised as conflicting with environmental sustainability goals (Clonan et al., 2012; Jenkins et al., 2009) and nutritional recommendations to increase seafood consumption are only realistic if sufficient fish supplies are available (Oken et al., 2012). Besides the responsibility of policy makers to guarantee long-term availability of seafood through the implementation of appropriate stock management strategies, it is

* Corresponding author.
E-mail addresses: silke.jacobs@ugent.be (S. Jacobs), isabelle.sioen@ugent.be (I. Sioen), amarques@ipma.pt (A. Marques), wim.verbeke@ugent.be (W. Verbeke).

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important to inform consumers so that they can adjust their seafood consumption pattern integrating health and sustainability information. Environmental impacts associated with fish choice are perhaps the least visible to consumers and consequently the most difficult to incorporate into decision making processes (Oken et al., 2012). The development of an optimised communication strategy integrating the domains of health and environmental sustainability is of particular interest because of its potential impact in terms of changing consumers' knowledge, shaping their attitudes and redirecting their food choices and dietary behaviour (McGloin et al., 2009).

Most research performed so far in the field of communication regarding seafood consumption covered risk-benefit communication, and within food risks, most attention has been paid to chemical contaminants (Frewer et al., 2016). Balanced messages referring both to health benefits and health risks were reported to result in an unchanged intention regarding seafood consumption frequency, but concurrently, resulted in a more negative attitude towards seafood consumption (Verbeke et al., 2008). By contrast, when communication only addresses seafood health benefits, it may be perceived as hiding the truth because of a vested interest; when the communication is only focused on seafood health risks, it may limit seafood consumption more than is desirable from a public health perspective (Verbeke et al., 2008). The provision of balanced messages may lead to a more informed decision, and it is desirable because of ethical reasons relating to transparency and honesty (Fischer and Frewer, 2009; Greiner et al., 2010; Verbeke et al., 2008). Since better knowledge may lead to better choices and health outcomes, the necessity of well-designed risk-benefit communication activities including knowledge about the health benefits and risks of seafood has recently been stressed (Engelberth et al., 2013). Furthermore, as a natural resource is affected with these communication activities, it is of utmost interest to integrate information and provide knowledge about the environmental sustainability as part of seafood consumption advices. Advice should cover information to enable consumers to meet their nutritional needs, while protecting fish stocks as this is theoretically possible (Clonan et al., 2012; Nesheim and Nestle, 2014; Oken et al., 2012). Importantly, consumers seem to perceive a match between health and sustainability and to be open to balanced information referring to health risks, health benefits and the environment in food-related communication activities – at least in the context of plant-based diets (Van Loo et al., 2017). Furthermore, they seem to be capable to "trade-off" or meaningfully combine such information to make informed decisions (Cope et al., 2010).

Many factors affect consumers' seafood choices. These range from demographic (e.g. age, gender, children) (Olsen, 2003; Verbeke and Vackier, 2005; Murray et al., 2017), regional (e.g. coastal vs. inland location) (Verbeke and Vackier, 2005; Thong et al., 2017) and social (e.g. social norms) (Verbeke and Vackier, 2005) characteristics, over traditions and habits (Pieniak et al., 2008a, 2008b; Olsen et al., 2013; Almeida et al., 2015a, 2015b), marketing, communication and information provisioning (Verbeke et al., 2008; Hallstein and Villas-Boas, 2013), to a wide range of food-, health-, and environment-related personal attitudes, perceived barriers and motives (e.g. Altintzoglou and Heide, 2016; Christenson et al., 2017; Thong et al., 2017). Among the latter are health and sustainability motives, i.e. the focal themes of the present study. Research performed in the UK with the goal to explore consumers' attitude towards purchasing fish revealed that the majority of the participants bought fish for health reasons and that only a minority of them sought for buying sustainable fish (Clonan et al., 2012). In a similar vein, Murray et al. (2017) showed that sensory attributes, price, provenance or origin, and health benefits were far more important than the sustainability of species in influencing seafood consumer choices in British Columbia, Canada. Meanwhile, the study by Hallstein and Villas-Boas (2013) showed that an advisory for sustainable seafood choice through the use of a traffic light system – without simultaneously stressing the nutritional or health benefits of seafood consumption – led to a significant decline in overall seafood sales, which was especially resulting from a strong decline in the sales of the yellow-labelled (i.e. "proceed with caution") category. The latter results underscore the necessity to develop integrated messages referring to both health and environmental sustainability. Moreover, a recent review addressing the implementation of multiple impacts (i.e. health, environmental and economic impacts) of fish consumption in consumer advices in US populations and groups with similar consumption patterns, highlighted that there is a lack of information integrating not only health risks and benefits but also ecological impacts (Oken et al., 2012). Finally, Almeida et al. (2015a, 2015b) stressed that, although for a country such as Portugal (with one of the highest per capita seafood consumptions of the world) dietary recommendations to increase seafood consumption may not be applicable, more sustainable seafood consumption should be advocated.

To our knowledge, no research has been performed yet on the impact of integrated communication activities for consumers referring to health risks, health benefits and environmental sustainability. Consequently, the purpose of this study is to determine the impact of such an integrated message on consumers' intentions. In particular, this study aims to assess whether an integrated message reiterating the current general advice to consume seafood twice per week, results in an intended seafood consumption pattern in favour of health and environmental sustainability.

1.2. Conceptual framework

To the purpose of this research, a framework presented in Fig. 1 is developed based on Verbeke (2008). The framework is based on two streams of research relevant to the field of communication and consumer behaviour, namely classical transmission models of communication or information theory and basic consumer psychology and behaviour models. Specific determinants influence the processing of the exposed message and this information processing may change consumers' knowledge, shape consumers' attitudes and redirect decision making regarding food choices (Griffin et al., 1999; Verbeke, 2008). In this research, the selected determinants that may act as catalysts to information processing are 'attitude towards the message', 'initial behaviour', 'initial beliefs' and 'individual characteristics'. The communication effect variables are 'impact on beliefs' in association with the final effect variable 'change in behavioural intention', which involves two dependent variables: (1) change in intention (difference between after and before exposure) to consume seafood twice per week, and (2) change in intention (difference between after and before exposure) to buy sustainable seafood.

1.2.1. Attitude towards the message

One of the important factors to ensure effectiveness of fish consumption advisories, is trust and belief in the provided information (Frewer et al., 2016, 1997; Griffin et al., 1999; Jardine, 2003; Verbeke, 2008; Verbeke et al., 2008). This is directly related with trust in the message source and with 'attitude towards the message' as presented in the framework.

1.2.2. Initial behaviour

'Initial behaviour' regarding seafood consumption frequency and regarding sustainable seafood buying frequency may be reflected in the attitude towards seafood consumption and the attitude towards buying sustainable seafood (Ajzen, 1991; van Dijk et al., 2011). van Dijk et al. (2012) reported that initial attitudes may influence the effect of balanced information on post-information attitudes and consequently on behaviour. Due to considering initial behaviour regarding seafood consumption frequency and regarding sustainable seafood buying frequency, it is possible to verify whether intentions change according to the recommendations in the exposed message with regards to consumers' initial behaviour.