



Consumer preferences for sustainable aquaculture products: Evidence from in-depth interviews, think aloud protocols and choice experiments



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ARTICLE INFO

Article history:

Received 25 August 2016

Received in revised form

10 February 2017

Accepted 15 February 2017

Available online 20 February 2017

Keywords:

Aquaculture

Claim

Ethical food

Fish

Label

Mixed methods

ABSTRACT

Fish from aquaculture is becoming more important for human consumption. Sustainable aquaculture procedures were developed as an alternative to overcome the negative environmental impacts of conventional aquaculture procedures and wild fisheries. The objective of this contribution is to determine what consumers expect from sustainable aquaculture and whether they prefer sustainable aquaculture products. A combination of qualitative research methods, with think aloud protocols and in-depth interviews, as well as quantitative methods, using choice experiments and face-to-face interviews, was applied. Data was collected in three different cities of Germany. Results revealed that sustainable aquaculture was associated with natural, traditional, local, and small scale production systems with high animal welfare standards. Overall, participants paid a lot of attention to the declaration of origin; in particular fish products from Germany and Denmark were preferred along with local products. Frequently used sustainability claims for aquaculture products were mostly criticized as being imprecise by the participants of the qualitative study; even though two claims tested in the choice experiments had a significant positive impact on the choice of purchase. Similarly, existing aquaculture-specific labels for certified sustainable aquaculture had an impact on the buying decision, but were not well recognized and even less trusted. Overall, consumers had a positive attitude towards sustainable aquaculture. However, communication measures and labelling schemes should be improved to increase consumer acceptance and make a decisive impact on consumers' buying behavior.

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1. Introduction

Regular consumption of fish is associated with health benefits, especially the consumption of saltwater fish with polyunsaturated fatty acids, iodine and selenium (DGE., 2013). It is therefore recommended to consume one to two servings fish per week (FAO/WHO, 2010; WHO., 2006). However, satisfying the global demand for fish is a challenge given the boundaries of natural resources and fish stocks (Jacquet & Pauly, 2007; Nesheim, Oria, & Yih, 2015). Natural fish stocks have decreased drastically since the increase in worldwide fisheries in the 1950s (Sumaila, Bellmann, & Tipping, 2016). Aquaculture developed as an alternative way to produce fish without decreasing wild fish stocks. Since the 1990s

aquaculture has made a significant contribution to the worlds' fish supply (Sumaila et al., 2016); half of the seafood consumed comes from aquaculture (FAO., 2014; Fry et al., 2016). Nonetheless, the rapid increase of aquaculture production and its industrialization has led to a number of environmental problems (Edwards, 2015; Sumaila et al., 2016) due to eutrophication (Edwards, 2015) and emission of substances like hormones, antibiotics and biocides (Bergleiter & Meisch, 2015).

Sustainable aquaculture procedures were introduced as alternative procedures for seafood production, aiming to reduce negative environmental impacts of wild fisheries and conventional aquaculture procedures (Bergleiter & Meisch, 2015), while providing fish for human consumption (Seves et al., 2016). There are a number of certification schemes by different organizations who defined production standards for sustainable aquaculture. Independent third-party control bodies overlook compliance with the standards. The most prominent examples from Europe are the standards for organic aquaculture by the European Union

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(Commission Regulation (EC) 710/2009) which came into force in 2010, and the standards defined by the Aquaculture Stewardship Council (ASC) which are the counterparts to the standards for wild fisheries by the Marine Stewardship Council (MSC) (MSC, 2011). The ASC was founded in 2010. Since 2012, differentiated criteria for eight different species are available. Criteria for more species are steadily complemented (ASC, 2016). Labels for seafood from certified sustainable aquaculture and wild fisheries aim to promote a sustainable, environmentally sound production, educate consumers and induce a change in purchase behavior (Jacquet & Pauly, 2007). Nowadays, sustainability labels are used widespread in the seafood industry (Jacquet & Pauly, 2007; Madin & Macreadie, 2015; Stoll & Johnson, 2015). Starting with the ‘dolphin safe’ logo on tuna cans in the 1990s, the development of labels for alternatively caught marine fish proliferated. The most widespread and well-known seafood label is the Marine Stewardship Council (MSC) label for sustainable wild fisheries (Jacquet & Pauly, 2007). Labels for seafood from sustainable aquaculture are still relatively new and not as widespread as the MSC label.

Several studies have shown that consumers are interested in sustainability criteria when buying fish (Honkanen & Young, 2015; Honkanen & Ottar Olsen, 2009; Hoogland, Boer, & Boersema, 2007; Verbeke, Vanhonacker, Sioen, van Camp, & Henaauw, 2007). In terms of seafood from aquaculture, these include higher animal welfare standards and the reduction of environmental impacts (Olesen, Alfnes, Røra, & Kolstad, 2010). Nonetheless, consumers’ use of sustainability labels in the context of food choice decision (Grunert, Hieke, & Wills, 2014) and in regard to certified seafood products is still relatively low (Almeida, Altintzoglou, Cabral, & Vaz, 2015). Since it is of environmental and societal concern to foster alternative procedures of aquaculture, it is important to understand and turn consumers’ global concern about sustainability into sustainable food choice behavior (Bergleiter & Meisch, 2015; Grunert et al., 2014). This was the starting point for the present study.

So far little was known about consumers’ understanding and acceptance of sustainability labels for aquaculture products. The objectives of this contribution were to explore consumers’ perception of sustainable aquaculture and assess their preferences for sustainably produced aquaculture products. Since findings of preceding studies point to the need for enhanced communication measures regarding sustainability and ethical issues (Verbeke et al., 2007), consumers understanding and acceptance of frequently used labels and claims for sustainably produced aquaculture products were also evaluated. The overall objective was to make recommendations for producers and marketers of sustainable aquaculture products as to how consumer acceptance of sustainable aquaculture products can be increased.

2. Material and methods

The present study used a combination of qualitative and quantitative methods of consumer research to address the comprehensive study objectives. Since little was known about consumers’ understanding and acceptance of sustainability labels for aquaculture products and their perception of sustainable aquaculture, qualitative in-depth interviews combined with think aloud protocols (TAPs) were conducted first. Afterwards, a cross-sectional consumer survey including a choice experiment was carried out to quantify consumer preferences for sustainable aquaculture products. For the qualitative as well as the quantitative part of the study, data was collected in three different cities of Germany; one in the North (Hamburg), one in the South (Stuttgart) and one in the East (Leipzig). Smoked trout filets were selected as test products since trout is the most common fish held in aquaculture in Germany (Statista, 2015).

2.1. Qualitative methods

The qualitative part of the study aimed to explore consumers’ perception of sustainable aquaculture and their understanding and acceptance of claims and labels for fish products from sustainable aquaculture. With regard to the subsequent quantitative study with choice experiments, the qualitative study should provide first insights into the product attributes consumers find relevant when purchasing aquaculture products. The qualitative study was based on TAPs and in-depth interviews. TAPs are an exploratory research method to examine how consumers react to a stimulus, e.g. a product, website or leaflet. The method’s unique feature is that participants are asked to ‘think aloud’, i.e. to concurrently verbalize aloud their thoughts, feelings and associations (Ericsson & Simon, 1993; Willis, 2005). TAPs are well suited to examine how consumers evaluate different products, in this case trout products, in a structured laboratory environment (Reicks et al., 2003).

In the present study, the participants should imagine they wanted to purchase fish. They were presented with six packages of smoked trout; three of which were certified organic and carried a respective organic label. The test products were ‘normal’ products bought in supermarkets, i.e. as such, the packages were not manipulated. The participants were asked to decide which product they preferred and should concurrently think aloud during the decision making process. As suggested by Boren and Ramey (2000) the interviewer gave two standardized comments during the TAP: ‘Please keep on speaking’ when participants fell silent, and ‘hmmm’ (affirmative) to encourage participants to keep on speaking when participants paused. As it is rather uncommon for consumers to think aloud, the session started with an introduction to the methodology and an exercise with cookie packages. Then, the actual fish purchase task proceeded while consumers were thinking aloud. In subsequent in-depth interviews, questions about the production method and perceived sustainability of the offered aquaculture products served to further explore consumers’ understanding and use of additional product information displayed on fish packages. At last, consumers were asked to evaluate frequently used claims¹ and labels¹ for sustainable aquaculture products. The participants were asked what they associate with the following claims: ‘environmental friendly produced’, ‘sustainable aquaculture’, ‘respecting animal welfare’, ‘near-natural aquaculture’, ‘ensuring local employment opportunities’, ‘saves resources’, ‘no use of antibiotics’. Afterwards, the following labels were presented and the participants were asked whether they had seen the label before: EU organic label, German governmental organic label, the label of the organic farmers’ association Naturland, the label of the Aquaculture Stewardship Council (ASC), the label of the World Wide Fund For Nature (WWF), and one company-owned label.

In every city, six consumers were interviewed, resulting in a study population of $N = 18$. Participants were screened according to their consumption of fish (participants had to consume fish or seafood several times a month) and their occupation (people who worked in fish farming, agriculture or the food industry were excluded from participation). Since women are still mainly responsible for food shopping in most German households (Federal Research Institute of Nutrition and Food, 2008), twelve women and six men were recruited. A classification of products found in a store inventory preceding the study, indicated that most organic fish fulfill different criteria for a sustainable production. As such a further quota was used regarding the consumption of organic food:

¹ The most frequently used claims and labels on the German fish-market were derived from an inventory-study, conducted survey in 24 supermarkets and three organic food stores in nine different cities of Germany preceding the survey.

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