

Thinking aloud about sustainable aquaculture products: Consumer perceptions and barriers to communication

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Abstract

Sustainable methods of aquaculture have evolved as a response to negative impacts of overfishing of the oceans and problems associated with conventional aquaculture. The additional ethical and environmental quality of products from sustainable aquaculture is mainly communicated to consumers via labels and claims. However, little is known about how consumers evaluate and interpret the different food labels and claims of sustainably produced aquaculture products. Think aloud protocols and in-depth interviews were applied to gain insights on how consumers evaluate sustainable aquaculture products. Sustainable aquaculture production was generally supported and valued by consumers. Overall, organic aquaculture products were evaluated as being more sustainable; however, consumers mentioned additional criteria which sustainable aquaculture products should fulfill, namely clear labeling of the geographic origin and traditional production. Apart from attributes like origin and production methods other topics like skepticism and knowledge about procedures of aquaculture were impacting consumers' opinion of sustainable aquaculture products.

Introduction

The world fish market has grown substantially over the last years. The increased production of fish was accompanied by several environmental problems, foremost overfishing of the oceans. But also aquaculture is associated with a number of risks, e.g. the introduction of allopathic remedies and nutrients into the biotic system, the escape of bred fish into the wild, and poor animal welfare. These negative impacts of conventional aquaculture are critically evaluated by consumers (Lasner and Hamm 2011).

Sustainable methods of aquaculture have evolved as a response to negative impacts of overfishing of the oceans and problems associated with conventional aquaculture. The additional ethical and environmental quality of products from sustainable aquaculture is mainly communicated to consumers via labels, and claims. However, little is known about how consumers evaluate and interpret the different labels and claims of sustainably produced aquaculture products. This paper presents results of think aloud protocols about consumers' fish-buying decision making and in-depth interviews on consumer preferences for different sustainability labels and claims.

Material and methods

Think aloud protocols are a good method to explore product evaluation processes and decision making of consumers. In a structured laboratory environment, processing information is traced through verbalizations concurrent to performing a given task (Reicks *et al.* 2003). In the present study, a typical buying-situation was simulated. The participants were shown six packages of fish (smoked trout), three of which were organically produced, and three came from conventional aquaculture. The participants had the task to decide which product they preferred most and were asked to concurrently think aloud during the decision process. As this procedure is unnatural to consumers, the data collection was divided into four phases. First, an introduction and orientation to the methodology took place (Phase I). Then, the decision-making and product evaluation proceeded, while the consumer was thinking aloud (Phase II). Afterwards, questions about the production methods and perceived sustainability of the offered aquaculture products served to further probe the decisions made and evaluated the production methods and sustainability of the offered aquaculture products (Phase III). Lastly, in-depth interviews were applied to evaluate frequently used claims³ and labels for sustainable aquaculture products (Phase IV). In this phase, the following labels were shown to the

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³ The most frequently used claims and labels on the German fish-market were derived from an inventory-study in 30 different retail shops across Germany.

consumers: EU-Organic-Label, German-Organic-Label, Naturland-Label, ASC-Label, WWF-Label, and one company-owned-Label and the following claims were shown: 'environmental friendly produced', 'sustainable aquaculture', 'respecting animal welfare', 'near-natural aquaculture', 'ensuring local employment opportunities', 'saves resources', 'no use of antibiotics'.

Data collection took place in three different regions of Germany (North, South, East). In every site six consumers were interviewed, resulting in a study population of N=18. Participants had to ensure that they regularly consume fish or seafood before participating. Besides, they had to work outside agriculture or the food industry. Nine consumers should buy organic products (not necessarily fish) regularly, whereas the other nine consumers should not buy organic products frequently. Data was collected by a trained investigator and recorded through an audiotape and a video camera. The obtained data was fully transcribed and analyzed using qualitative content analysis. Data analysis was facilitated using the software MaxQDA®.

Results

Most interviewed consumers were interested in manifold attributes of the aquaculture products, before a decision was made (see table 1). The attribute commented on most often was *Origin*. Consumers wanted to know where the products came from (geographically) and in which company the fish was produced. Most consumers preferred a local or at least German geographic *Origin* of the aquaculture product, since they had trust in the German Veterinary and Food Administration scheme. In addition, short distance of transport was seen as a desirable attribute. However, most of the participants were not able to quickly find the origin of the aquaculture products on the packages. They emphasized that transparent and easily accessible information on product origin was crucial to them. Some consumers also focused on the producing company with regards to product *Origin*. Consumers preferred the origin from smallholder enterprises or from old-established enterprises. Regarding the *Production methods* consumers stated that they were not receiving a lot of information on the product packages. It became clear that some consumers lacked knowledge on aquaculture production in general. They were not able to state which production processes they would prefer. Others, by contrast, were interested in information about feeds, animal welfare, the usage of chemicals, and GMO-free production. *Organic* production of aquaculture products seemed to be very important for some consumers, especially with respect to the sustainability of aquaculture production. Even though most consumers could not specify the criteria for organic production, they associated it with sustainable production. The optical *Appearance of the product packaging* was also very important to consumers. Most consumers preferred a blue packaging, which reminded them of the 'sea', 'lakes', 'ponds', and 'freshness'. Pictures showing a natural environment in which the fish was produced were favored. However, the consumers also stated that pictures should be realistic and not misleading. *Product Processing* was mentioned frequently, though this mainly involved the type of smoking applied. It became obvious that there was a lack of information about the different smoking methods. *Branding and Certification* were other important product attributes, which helped consumers to gain orientation and to evaluate the product quality quickly. However, several consumers made clear that they only trusted those brands and certificates which are independently certified.

Table 1: Most important attributes and number of coded units

Most important attributes	Number of coded units
<i>Origin</i>	98
<i>Production methods</i>	92
thereof <i>Organic</i>	46
<i>Product processing</i>	71
<i>Branding/Certificates</i>	43
<i>Taste</i>	30
<i>Other Product details (e.g. nutrient value)</i>	60

During the data collection it became clear that other topics were also relevant to the decision process. Many of the consumers expressed mistrust towards product labeling, and referred to food scandals and related publications in the media. Most consumers argued that communication and labeling are often not transparent and misleading. Consumers stated further that communication claims are often 'imprecise' or 'meaningless'. Consumers did not know what the claims meant, which disclosed a *Knowledge gap* between consumers and producers regarding the product qualities.

With respect to product sustainability, the majority of consumers evaluated the organic products as sustainable aquaculture products. Sustainable aquaculture products were associated with a production close to 'natural breeding', with 'low environmental damages', it should 'not be a product of mass production', and be of 'local origin'. When asked to evaluate the sustainability of the products, the organic labels were the most recognized and trusted sources of information.

Most sustainability claims, which were discussed in the in-depth interviews, were seen as being imprecise, even though consumers generally had a positive attitude towards ethical and sustainability claims. The claim 'environmental friendly produced', for example, raised the question of criteria and metrics used to measure an environmental friendly production. The same critique arose for the claims 'sustainable aquaculture', 'ensuring local employment opportunities', and 'saves resources'. Even though consumers generally evaluated the terms positively, they were asking for background criteria. The claim 'respecting animal welfare' unveiled doubts towards the feasibility of an animal friendly aquaculture production. Some consumers could not imagine an animal friendly aquaculture production for economic, technical or logistical reasons. The message 'near-natural aquaculture' was rejected due to a lack of knowledge about the definition of 'near-natural'. In addition, consumers favored a natural upbringing of the fish, but not a near-natural upbringing. The expression 'no antibiotics' was favored by some. Others, however, were shocked and did not like to associate the topic 'antibiotics' with foods. The message could even lead to avoiding the consumption of fish in general. Overall, consumers demanded more detailed information and transparency along the whole production chain.

The German-Organic-Label was the most recognized label, followed by the WWF-Label, the Naturland-Label, the EU-Label and the company-owned label. The ASC-Label was unknown by all of the participants.

Conclusion

In order to communicate the value of sustainable aquaculture products the knowledge gap between consumers and producers about the production processes needs to be bridged. Consumers prefer local aquaculture production and a clear labeling of the product origin. Communication should therefore include information about the origin of the aquaculture product and, at best, the whole production chain. All information on product packages should be easily accessible to consumers. Claims about sustainability should be precise and certification schemes must be trustworthy.

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