



Analysis

Price premium of organic salmon in Danish retail sale

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ABSTRACT

The year 2016 will be pivotal for organic aquaculture producers in EU, because it represents the deadline for implementing the complete organic life cycle in aquaculture production. Depending on the sturdiness of farms already producing, such a shift in the industry may affect production costs of exclusively using organic fry for production. If the profitability of the primary organic aquaculture producers should be maintained, then farmers must be able to correspondingly receive higher prices, transmitted through the value chain from the retail market. This study identifies the price premium for organic salmon in Danish retail sale using consumer panel scanner data from households by applying a random effect hedonic price model that permits unobserved household heterogeneity. A price premium of 20% was identified for organic salmon. The magnitude of this premium is comparable to organic labeled agricultural products and higher than that of eco-labeled capture fishery products, such as the Marine Stewardship Council. This indicates that the organic label also used for agricultural products may be better known and trusted among consumers than the eco-labels on capture fishery products.

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1. Introduction

The year 2016 will be pivotal for the European Union organic aquaculture sector. According to Commission Regulation (EU) No 1364/2013, the full life cycle from the time the fish hatches to when it is slaughtered must be 100% organic from 1st January 2016, if the product is to be recognized and marketed as an organic certified product. Today only grow out stages of aquaculture production need to be organic to achieve this label. The regulation of exclusively using organic fry is expected to challenge the organic aquaculture producers in that the organic rules only allow limited use of antibiotics and requires specially made organic feed. As such, the new regulation will most likely induce higher cost in terms of higher fry mortality, feed costs and management effort.

In light of this transition, the existence of a price premium could incentivize producers and facilitate subsequent conversion of conventional farms into organic farms and maintain already existing organic farms. The necessary conditions for the price premium existence are consumers ability to identify organic goods at retail sale (i.e., through labeling), and the willingness to pay extra price relative to the conventional salmon. Furthermore, the price premium must be transmitted through to all actors in the value chain, i.e. if the organic salmon market is to be maintained, all actors in the chain must gain from it (Asche et al., 2015).

The purpose of this article is to reveal whether a price premium exists for organic farmed salmon products in the Danish retail market. The magnitude of the estimated price premium is discussed in light of the premium attributed to other eco-labels such as in organic agriculture, fisheries (e.g., the Marine Stewardship Council) and aquaculture eco-labels (i.e., organic and the Aquaculture Stewardship Council) found in literature. The workhorse for the study is the hedonic price model.

The study provides an important contribution to the hedonic literature on eco-labels for seafood mainly conducted in the United Kingdom. In contrast to stated preference studies which identifies hypothetical willingness to pay, this study provides evidence of “revealed” organic price premiums; an evidence important for fish farmers and actors in the value chain in an emerging organic aquaculture market. Although this study has direct benefits for producers in Norway,¹ Scotland and the Faroe Islands in the case of salmon, it informs producers about the market potential of substitute products such as organic trout where Denmark is the leading producer.

Environmental friendliness has for the last 2–3 decades been a major part of the food production process and consumer food choice decisions, more recently also being introduced in the seafood sector. Despite the established importance of seafood as a global source of protein, nutrition and other health benefits (Food and Agriculture Organization, 2014; Daviglus et al., 2002; Brunsø et al., 2008), there

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¹ Norway, though not a member, follows the EU rules on organic aquaculture, because the EU market is the most important export market.

has been growing concerns about the environmental impact of the production process (Asche et al., 2015; Roth et al., 2000; Asche and Bjørndal, 2011). The traditional “command and control” fishery and aquaculture management instruments have been recognized as inadequate in their own in terms of addressing these concerns. Thus, market-based incentive regulation such as individual transferable quotas (Anderson, 1994; Turner, 1996; Smith, 2012; Nielsen, 2011, 2012 and Nielsen et al., 2014) and the use of information, such as eco-labeling, have been called upon as an alternative to traditional methods of regulating environmental externalities.

Eco-labeling helps to establish product differentiation by making the credence attribute production method (organic/conventional) visible to the consumer and contributes to mitigating potential inefficiencies resulting from imperfect information (e.g. information asymmetry between producers and consumers) about the environmentally friendly production processes of a good. Because such production processes are typically more costly than conventional standards, producers undertaking these methods need increased earning. Hence, the aim of eco-labeling is to increase profits by attracting environmentally responsible consumers who are willing to pay a price premium to support a costlier production process, while attaining utility.

The most dominant and studied eco-label in the seafood sector is the Marine Stewardship Council (MSC) in the fisheries sector (MSC, 2014, Roheim et al., 2011). The Aquaculture Stewardship Council (ASC), established in 2010, is also emerging for farmed fish (ASC, 2014) but yet to be studied, given that the first certification was only launched in 2012 for tilapia in Indonesia. Following the introduction of EU Regulation 710/2009 in 2010, the EU organic aquaculture eco-label was also introduced. However, there are many other national and private aquaculture labels. To build on consumer confidence, certified organic farmed fish in Denmark are labeled with the well-established and well-known label, a red-Ø (Christensen et al., 2014), which is issued, enforced and controlled by the Danish government.

Most studies rely on stated preference methods to establish willingness to pay for eco-labeling in the seafood market (e.g., Olesen et al., 2010). Those relying on actual market data (i.e., revealed preference methods) are limited, but evidence provided in the fishery sector includes the existence of an approximately 13% price premium for salmon (Asche et al., 2015) and cod and haddock (Sogn et al., 2014), a 10% premium for chilled haddock (Sogn-Grundvåg et al., 2013) and a 14% premium for frozen Alaska pollock (Roheim et al., 2011) in the UK market for MSC-labeled fish. A mean price difference of 10% is estimated for MSC Baltic cod in Sweden (Blomquist et al., 2015). For organic salmon, an approximately 25% price premium is found in the UK (Asche et al., 2015). Price premia of 24% and 38% for organic fresh and smoked salmon respectively, have been identified in Norway (Aarset et al., 2000). On eco-labeled agricultural products, there is evidence of price premiums ranging from 15–60% in the UK and Danish markets for various products (Wier et al., 2008 and Baltzer, 2004). Generally, organic price premiums for agricultural products appear to be larger than the range of 10–14% identified for fishery eco-labels.

Using consumer panel data, this study establishes that there is a price premium of approximately 20% for organic salmon. The magnitude of the premium might indicate that consumers value organic farmed fish as in the same range as agricultural products, rather than in the same range as fishery products. The magnitude might also indicate that the Danish organic Ø-label is better-established and more accepted among Danish consumers than the MSC-label. The higher cost of producing organic fish has to be compensated by a higher willingness to pay from consumers. Hence, the high price premium of organic salmon on 20% is good news for producers, provided the price premium is transmitted from consumers, through the value chain to primary producers.

The article is organized as follows. The next section introduces the Danish seafood market, followed by a description of data used for the analysis. The theoretical model and the empirical specification are

then discussed. Next the empirical results are presented. Finally, Section 7 presents the conclusion.

2. The Danish Seafood Market

Denmark is the eighth largest exporter of fish and fishery products in the world (FAO, 2014) with about 80% of Danish exports staying in the EU. It is a major importer of raw materials used for further processing and then re-exported. In 2013, export of fish and fishery products was DKK 21.5 billion, where import formed DKK 15.5 billion. Most imports originate from the countries surrounding the western part of the North Atlantic Ocean with Norway being the largest. Hence, Denmark is an intermediate market in the seafood value chain, with substantial seafood processing but also with important primary fishery and aquaculture sectors. Seafood processing and wholesale in Denmark is mainly made for the EU market, implying that the Danish home market becomes a residual market that is only supplied with a small fraction of what is produced in Denmark (Nielsen, 2005).

The Danish aquaculture sector has a well-established tradition of fish production that dates back more than a century (Hessel, 1993). Aquaculture production concentrates on rainbow trout, farmed freshwater. Blue mussels, sea trout, charrs and pike perch are produced in modest quantities, with several marine fish and mussel farms. The total annual production is approximately 43,000 tons, of which 90% is rainbow trout (Statistic Denmark, 2014). The EU is the most important market with Germany being the largest destination market (Nielsen et al., 2011, 2012). In 2014, Denmark became the largest producer of organic trout, passing France with a production volume of 1080 tons. Organic mussel farms produce approximately 400 tons per annum.

Production of salmon is modest and no organic salmon is produced locally. Norway and the Faroe Islands are the most important fresh salmon markets serving the Danish import demand. The import of salmon is fairly evenly divided into fish that are re-exported with little or no processing and fish that are used for processing, and mostly re-exported in processed form. As a result, Denmark is the second largest exporter of salmon in Europe after Norway (Asche and Bjørndal, 2011). According to Statistic Denmark, more than 80% of the volume of salmon imports into Denmark is farmed fresh or chilled Atlantic salmon. The local market for fish consumption is limited due to its small population; however, the per capita consumption of 24 kg/year/per capita is relatively high.

Domestic supply outlets include supermarket chains, independent fish-mongers/specialized stores, online retailing, restaurants and catering services. Supermarket outlets command the largest share, accounting for 85% of the total domestic supply. According to Brunso et al. (2008), the most frequently consumed fish species and their shares of consumption are herrings (22%), tuna (19%), mackerel (17%), salmon (11%) and plaice (10%). Canned, marinated and fresh filleted fish are the three most frequent product categories. The total domestic fish consumption in 2008 was approximately 127,000 tons. Salmon was estimated to be the most consumed fish in terms of value in Denmark followed by cod with respective values of DKK 1.2 billion and DKK 940 million. The value shares of salmon were 44% for fresh salmon, 39% for smoked salmon and 17% for frozen salmon (Anon, 2011).

Danish consumers have a long tradition for buying organic food products. The country continues to rank second in terms of per capita organic food consumption (DKK 1223/person) and first in terms of organic market share (8%) in the retail market worldwide (Willer and Lernoud, 2015). The most important organic fish species produced in Denmark, trout, hit the retail market in 2005 (Larsen, 2014). Domestically produced organic fish are labeled with the Danish red-Ø-label, which is well known and accepted among consumers. MSC and ASC eco-labels can also be found on retail shelves. The consumption of fish among Danes is motivated by health benefits, availability, convenience, taste, traditions and in contrast, high prices deter consumers from purchasing (Nielsen, 2000). The frequency of fish consumption of elderly people is at least twice that of young people (Olsen, 2004). On

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