The mental availability of seafood: an Australian consumer study

Abstract
The purpose of this paper is to investigate the mental availability of seafood as a means of understanding differences in seafood consumption levels. This study presents the findings of an online survey of 899 Australian consumers which investigated drivers and barriers to fish consumption in Australia among regular, light and very light fish consumers. Measures of mental availability included knowledge and confidence in selecting, storing and preparing fish, consumption occasions, safety concerns, perceived physical availability, and perceived inconvenience of fish as a meal option. The findings reveal that regular fish consumers perceive greater mental availability of fish as compared to light and very light seafood consumers. Lighter seafood consumers expressed less knowledge and confidence with respect to selecting, storing and preparing fish, more typically serve fish for special occasions rather than on a more regular or everyday basis, perceive fish to be less physically available, and perceive fish as a less convenient meal option than do regular fish consumers. Increasing seafood consumption in Australia will rely on changing consumers’ perceptions, and in particular lighter seafood consumers, in ways that render seafood more mentally accessible to consumers as an everyday meal solution.

Keywords Seafood, fish, mental availability, consumer perceptions, drivers, barriers

Paper type Research paper
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Introduction

Fresh seafood is readily available in Australia and yet, for many consumers, consumption levels remain below recommended levels (Danenberg & Mueller, 2011). Most Australians consume higher levels of meat and poultry as compared with seafood, with seafood not being an important part of the everyday traditional Australian diet. The price of fresh seafood and perceived lack of physical availability has consistently been found to create barriers to seafood consumption (Brunsø, Verbeke, Olsen, & Jeppesen, 2009; Trondsen, Scholderer, Lund & Eggen, 2003; Verbeke & Vackier, 2005). In western countries such as the UK, USA and Australia, fresh seafood and in particular cheaper seafood alternatives including imported products and undervalued species (e.g. sardines) are readily available. However, price and perceived lack of physical availability do not fully explain lower levels of seafood consumption in Australia, nor the ongoing preference for other forms of animal protein including meat and poultry. Moreover, the significant health benefits associated with seafood consumption, which are well understood by Australian consumers, and education campaigns on the nutritional benefits of seafood have not served to mitigate perceived barriers (Olsen, 2004; Pieniak, Verbeke, Scholderer, Brunso & Olsen, 2008; Verbeke et al. 2007). Indeed, other barriers to seafood consumption are evident and are related to factors more associated with tradition and a lack of mental availability. Mental availability is the propensity of a product or brand “to be noticed and/or thought of in buying situations” (Sharp, 2010, p. 191). The focus of this paper is on factors which may serve to reduce the perceived mental availability of seafood, and specifically fish, as a meal option, and how this may vary across consumption segments (regular, light and very light fish consumers).

Factors influencing the mental availability of seafood

Despite acknowledged health and nutritional benefits, a review of the literature reveals a number of factors that influence the mental availability of seafood as a meal option including lack of knowledge and confidence in selecting, storing and serving seafood, concerns about the safety of seafood, limited consumption occasions, perceived lack of availability of fresh fish, and perceived inconvenience of seafood as a meal option. Numerous studies of seafood consumption have revealed that consumers experience difficulty in evaluating, selecting, storing and preparing seafood (Juhl & Poulsen, 2000; Scholderer & Grunert, 2001; Sogn-Grundvåg & Ostli, 2009; Sveinsdóttir, Martinsdottir, Green-Petersen, Hyldig, Schelvis, & Delahunty, 2009). Lack of self-efficacy in managing the consumption process for seafood contributes to lower levels of seafood consumption in Australia (Birch & Lawley, 2012).

Some consumers only eat seafood for special occasions (e.g. dining out, entertaining, religious occasions), while others consume seafood on a more regular basis (Rortveit & Olsen, 2009). For example, Olsen (2004, p. 82) proposed that “extremely fresh seafood is associated with food for special occasions or as a delicacy”. In western countries such as Australia and the United Kingdom, where cooking fresh fish at home is not necessarily part of the traditional diet, seafood consumption may involve eating pre-cooked fish and chips from the fish and chip shop or take-away outlet. For other westerners, seafood consumption may be preserved for entertaining, dining out, special, traditional or religious occasions, such as Easter and Christmas, rather than everyday meals (Birch & Lawley, 2012).

Despite consumers understanding the many health benefits associated with seafood consumption, some consumers express concerns about the safety of seafood (Fischer & Frewer, 2009; Tuu & Olsen, 2009). Safety issues include possible contaminants, treatment
with hormones or antibiotics, mercury levels and whether seafood has been handled in a hygienic manner (Lobb, Mazoccchi, & Traill, 2007; Sioen et al., 2008; Vanhonacker et al., 2010). While seafood is readily available in both fresh and frozen form at Australian retail outlets, some consumers report a perceived lack of availability of fresh Australian seafood, contributing to lower levels of seafood consumption (Birch, Lawley, & Hamblin, 2012).

Another key barrier to seafood consumption concerns the perceived inconvenience of seafood as a meal option due to the time and effort involved in selecting, preparing and serving fish (Honkanen, Olsen & Verplanken, 2005). Perceived inconvenience is associated with perceptions of how convenient a consumer considers a particular product is to plan, purchase, prepare and serve (Rortveit & Olsen, 2009).

Based on the literature regarding the mental availability of seafood, we hypothesise that in Australia lighter fish consumers are more likely than more regular fish consumers to (H1) perceive a greater lack knowledge and confidence in selecting, storing and preparing fish; (H2) perceive that fish is less suited for everyday meals; (H3) hold greater concerns regarding the safety of fish; (H4) perceive that fish is less readily available at retail outlets; and (H5) consider fish to be a relatively inconvenient meal option.

**Methodology**

A national online survey of 899 Australian fish consumers was conducted in late 2010 to measure drivers and barriers to fish consumption in Australia. Participants were screened for industry affiliation, participation in recent seafood research in the past six months, age (18 years and older), whether they were either the main or joint grocery shopper in the household, and for having consumed fish in the past three months. Participants were classified as being either regular (n=296), light (n = 303) or very light (n=300) fish consumers. Regular fish consumers are those who purchase and eat fish 2-3 times per week to at least once a week. Light fish consumers purchase and eat fish about once per fortnight, while very light fish consumers purchase and eat fish once per month.

Females represented 66% of the sample, and 73% of respondents identified as the main shopper. The majority of the respondents were in the 55 years and older age bracket (34%), with the next largest age bracket being 45-54 years (30%), with respondents under 25 years of age being the smallest age group in this survey (3%). The sample was well educated with the majority being tertiary educated (48%), with the next largest group being technically trained (27.3%), followed by people educated to secondary school level (24%). This skewed age and educational range should be considered when interpreting the findings. However, it is likely that perceived barriers to seafood consumption leading to lack of mental availability will be under rather than over reported due to the skewed sample with Trondsen et al. (2003) finding a negative relationship between educational level and perceptions of barriers to fish consumption. Likewise, older consumers have more positive attitudes toward seafood and experience less difficulty in preparing seafood than their younger counterparts (Verbeke & Vackier, 2005). The respondents represented a range of annual household income categories.

Items for measuring the five dimensions of mental availability were drawn from the seafood literature and adapted for the Australian context of the study (Refer to Table 1). First, we developed a bank of four items to assess the extent to which Australian consumers have the required knowledge and confidence to select, store and prepare fish (Vanhonacker et al., 2010; Verbeke et al., 2007). To measure fish consumption occasions we included four items to measure consumption for special occasions (e.g. dinner parties, religious occasions) and one item to capture more regular everyday fish consumption (Olsen, 2003; Verbeke et al.)
We included three items to measure safety concerns about contaminants, high mercury levels, and hormones or antibiotics (Fischer & Frewer, 2009; Vanhonacker et al., 2010). Three items were used to assess the perceived availability of fish (Scholderer & Grunert, 2001). Finally, to measure perceived inconvenience we included three items concerning time, effort, speed and ease of preparation (Candel 2001; Rortveit & Olsen, 2009). Data was analysed using principal components factor analysis with a varimax rotation. Cronbach’s alpha was used to assess internal reliability and consistency of the multi-item scales. Analysis of variance was conducted to identify differences across fish consumption segments.

Results and discussion

Factor analysis revealed five factors with Eigenvalues greater than 1.0 (Table 1).

<table>
<thead>
<tr>
<th>TABLE 1 Factor Analysis and Reliability Testing</th>
<th>Variance Explained</th>
<th>Factor Loadings</th>
<th>Cronbach alpha coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge and Confidence</strong></td>
<td>22.1%</td>
<td>0.82</td>
<td>0.82</td>
</tr>
<tr>
<td>I do NOT know how to select fish</td>
<td>0.87</td>
<td>0.81</td>
<td>0.79</td>
</tr>
<tr>
<td>I do NOT know much about how to prepare and serve fish</td>
<td>0.81</td>
<td>0.79</td>
<td>0.66</td>
</tr>
<tr>
<td>I do NOT know how long I can keep fish before it needs to be cooked</td>
<td>0.87</td>
<td>0.82</td>
<td>0.86</td>
</tr>
<tr>
<td>Fish is more difficult to assess for freshness and quality as compared to other meats</td>
<td>0.87</td>
<td>0.82</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Consumption Occasions</strong></td>
<td>15.8%</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td>I serve fish on special occasions or for dinner parties</td>
<td>0.83</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td>I serve fish when we have a BBQ with family/and or friends</td>
<td>0.82</td>
<td>0.79</td>
<td>0.71</td>
</tr>
<tr>
<td>I serve fish for traditional or religious occasions (e.g. Xmas)</td>
<td>0.82</td>
<td>0.79</td>
<td>0.71</td>
</tr>
<tr>
<td>I serve fish on a regular occasion each week (e.g. Fridays)</td>
<td>0.82</td>
<td>0.79</td>
<td>0.71</td>
</tr>
<tr>
<td><strong>Safety Concerns</strong></td>
<td>12.0%</td>
<td>0.87</td>
<td>0.87</td>
</tr>
<tr>
<td>I am concerned about possible contaminants in fish</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
</tr>
<tr>
<td>I am concerned about high levels of mercury in fish</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
</tr>
<tr>
<td>I am concerned that the fish may have been treated with hormones and antibiotics</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Physical Availability</strong></td>
<td>9.6%</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td>Fish is more difficult to find at the store where I shop, as compared to meat and poultry</td>
<td>0.89</td>
<td>0.89</td>
<td>0.88</td>
</tr>
<tr>
<td>Fresh quality fish is NOT readily available where I shop</td>
<td>0.89</td>
<td>0.89</td>
<td>0.88</td>
</tr>
<tr>
<td>I would serve more fish if it were more readily available</td>
<td>0.89</td>
<td>0.89</td>
<td>0.88</td>
</tr>
<tr>
<td><strong>Convenience and Expense</strong></td>
<td>4.3%</td>
<td>0.61</td>
<td>0.61</td>
</tr>
<tr>
<td>To me, it takes very little effort to prepare fish for a meal</td>
<td>0.85</td>
<td>0.85</td>
<td>0.61</td>
</tr>
<tr>
<td>I serve fish because it is quick and easy to prepare</td>
<td>0.81</td>
<td>0.81</td>
<td>0.61</td>
</tr>
<tr>
<td>To me, it takes a lot of time to prepare fish for a meal</td>
<td>0.44</td>
<td>0.44</td>
<td>0.61</td>
</tr>
<tr>
<td>I serve fish for everyday meals</td>
<td>0.44</td>
<td>0.44</td>
<td>0.61</td>
</tr>
</tbody>
</table>

(KMO = 0.77, χ² = 6529.5, d.f. = 153, p = 0.00).

Knowledge and confidence. More than half of the respondents (51.1%) agreed that fish is more difficult to assess for freshness and quality as compared to other meats. Light (µ = 3.44) and very light (µ = 3.47) fish consumers agreed more strongly that fish is more difficult to assess for freshness and quality as compared to other meats than did regular (µ = 3.20) fish consumers (F(2,896) = 4.7, p = 0.01). One-third of the respondents (33.9%) agreed that they do not know much about how to prepare and serve fish. Light (µ = 2.97) and very light (µ = 3.12) fish consumers agreed more strongly that they do not know much about how to prepare and serve fish than did regular (µ = 2.68) fish consumers (F(2,896) = 9.6, p = 0.00). Almost
one-third of respondents (29.3%) agreed that they do not know how to select fish. Light ($\mu = 2.89$) and very light ($\mu = 3.01$) fish consumers agreed that they do not know how to select fish than did regular ($\mu = 2.59$) fish consumers ($F(2,896) = 10.5$, $p = 0.00$). Just less than onequarter of respondents (23.1%) agreed that they do not know how long they can keep fish before it needs to be cooked. Light ($\mu = 2.81$) and very light ($\mu = 2.81$) fish consumers agreed that they do not know how long they can keep fish before it needs to be cooked than did regular ($\mu = 2.54$) fish consumers ($F(2,896) = 5.3$, $p = 0.01$). The findings reveal that on all four items designed to measure lack of knowledge and confidence to select, store and prepare fish, lighter fish consumers expressed a significantly lower level of knowledge and confidence than did more regular fish consumers, and thus H1 is supported.

**Consumption occasions.** Over half of the respondents (51.3%) agree that they serve fish on special occasions or for dinner parties. Fewer respondents (40.6%) agreed that they serve fish for traditional or religious occasions (e.g. Xmas). There was no significant difference across consumption segments in terms of serving fish for special occasions and dinner parties or for traditional or religious occasions. Almost half of the respondents (48.3%) agreed that they serve fish on a regular occasion each week (e.g. Fridays). Light ($\mu = 3.32$) and very light ($\mu = 3.18$) fish consumers were less likely to agree that they serve fish on a regular occasion each week than regular ($\mu = 3.90$) fish consumers ($F(2,896) = 27.2$, $p = 0.00$). Just less than half of the respondents (46.7%) agreed that they serve fish when they have a BBQ with family/and or friends. Light ($\mu = 3.27$) and very light ($\mu = 3.29$) fish consumers were less likely to agree that they serve fish when they have a BBQ with family/and or friends than regular ($\mu = 3.60$) fish consumers ($F(2,896) = 6.1$, $p = 0.01$). The findings reveal that lighter fish consumers are less likely to serve fish on a regular occasion each week or when having a BBQ with family and friends than regular fish consumers; however they are equally likely to serve fish for special occasions, dinner parties, traditional and religious occasions. Lighter consumers are more likely to perceive fish to be a meal option for special occasions than for more regular consumption occasions. Therefore, H2 is supported.

**Safety concerns.** Australian consumers are concerned about the safety of consuming seafood. Almost three-quarters of the respondents (70.2%) agreed that they are concerned about high levels of mercury in fish. Over two-thirds (68.0%) are concerned about possible contaminants in fish, and just over half of the respondents (55.2%) are concerned that the fish may have been treated with hormones and antibiotics. However, interestingly there were no significant differences across consumption segments with respect to concerns about fish safety, and thus H3 is not supported.

**Physical availability.** Over half of the respondents (57.1%) agreed that they would serve more fish if it were more readily available. However, lighter fish consumers were no more likely to agree than regular fish consumers with this statement. Just less than half (45.8%) agreed that fish is more difficult to find at the store where they shop, as compared to meat and poultry. Light ($\mu = 3.36$) and very light ($\mu = 3.31$) fish consumers were more likely to agree that fish is more difficult to find at the store where they shop, as compared to meat and poultry than regular ($\mu = 3.10$) fish consumers ($F(2,896) = 3.3$, $p = 0.04$). Just less than one-third (32.4%) agreed that fresh quality fish is not readily available where they shop. Light ($\mu = 2.99$) and very light ($\mu = 3.12$) fish consumers were more likely to agree that fresh quality fish is not readily available where they shop than regular ($\mu = 2.78$) fish consumers ($F(2,896) = 5.6$, $p = 0.01$). Therefore, it appears that lighter fish consumers perceived less availability of fish than more regular fish consumers, and thus H4 is also supported.

**Convenience.** In general respondents did not consider fish to be an inconvenient meal to prepare. Over three-quarters (78.3%) agreed that they serve fish for everyday meals. However, very light ($\mu = 3.86$) fish consumers were less likely to agree that they serve fish for everyday meals than regular ($\mu = 4.40$) or light (4.22) fish consumers ($F(2,896) = 19.3$, $p = 0.0$). The majority of respondents (81.6%) agreed that it takes very little effort for them to prepare fish for a meal. Light ($\mu = 4.31$) and very light ($\mu = 4.12$) fish consumers were less
likely to agree that it takes very little effort for them to prepare fish for a meal than regular (µ = 4.61) fish consumers (F(2,896) = 18.9, p = 0.00). Over three quarters of the respondents (79.4%) agreed they serve fish because it is quick and easy to prepare. Light (µ = 4.16) and very light (µ = 4.08) fish consumers were less likely to agree that they serve fish because it is quick and easy to prepare than regular (µ = 4.40) fish consumers (F(2,896) = 7.8, p = 0.00). However, one quarter of the respondents (25.0%) agreed it takes them a lot of time to prepare fish for a meal. Light (µ = 2.78) and very light (µ = 2.99) fish consumers were more likely to agree that it takes them a lot of time to prepare fish for a meal than regular (µ = 2.56) fish consumers (F(2,896) = 9.7, p = 0.00). Therefore, very light fish consumers are less likely to serve fish for everyday meals and lighter fish consumers consider fish to be a less convenient meal option than do regular fish consumers, and thus H5 is also supported.

Implications and conclusions
While overcoming the physical lack of availability of fresh seafood through more intensive distribution strategies and better placement in retail outlets can be more readily addressed, reducing the lack of mental availability of seafood is more challenging and requires more sophisticated marketing strategies aimed at changing the way in which consumers, and in particular lighter seafood consumers, view seafood as a viable meal option. In line with the literature, the findings reveal that lack of knowledge and confidence in selecting, storing and preparing fish presents a major mental barrier to fish consumption. Therefore, encouraging fish consumption in countries where seafood consumption is not necessarily a key part of the traditional diet will rely upon educating consumers in how to evaluate the quality of seafood at the point of sale, how to effectively store seafood including how long fish can be kept before consumption and information on suitability for freezing, and how to easily and quickly prepare tasty dishes from seafood. Information on packaging and labels as well as simple recipes at the point of sale will assist to address this lack of knowledge and confidence, as will information provided in relevant media channels.

Seafood is perceived by many Australian consumers to be most suited for special occasions rather than for everyday meals. While Australians have positive attitudes toward seafood in terms of taste and health benefits, many Australian consumers prefer other types of meat and poultry to seafood and others simply are not in the habit of eating seafood on a more regular basis. Increasing consumption of seafood across a variety of consumption occasions and getting Australian consumers to eat seafood on a more everyday basis will rely upon reminding them to include seafood in their weekly menus and providing simple everyday seafood meal solutions. While many Australian consumers are concerned about the safety of seafood, these concerns do not explain variations in seafood consumption levels. However, to increase overall seafood consumption, the Australian seafood industry does need to address general concerns about possible contaminants, mercury levels, and the presence of hormones and antibiotics.

While fresh seafood is readily available in retail outlets, some Australian consumers perceived a lack of availability of fresh Australian seafood. Therefore, the Australian seafood industry needs to ensure availability in popular outlets including both supermarkets and fishmongers, and to communicate that availability with clear labeling at the point of sale. While the majority of Australian consumers do not perceive fish to be an inconvenient meal option, possibly due to the prevalence of canned seafood and frozen fish fillets, lighter fish consumers are more likely to do so. Therefore, developing and positioning seafood products that are simple meal solutions and illustrating and communicating seafood as being easy to prepare, and versatile or suitable for as many dishes and situations as possible will serve to increase consumption among lighter seafood segments (Rortveit and Olsen, 2009).
References


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