



# Consumers as co-creators of new product ideas: An application of projective and creative research techniques



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## ABSTRACT

Involving consumers in the process of modification and creation of new food products has been recently identified as a vital factor for new product development. However, little attention has been devoted to consumer-generated product solutions, and instead, researchers continue to view new product development process as a firm-centred activity. This study uses projective and creative research techniques to involve consumers in the process of modification and creation of new aquaculture product ideas. We provide guidelines for the use of these techniques in the new product development process, as well as managerial and practical implications for the future development of new aquaculture products.

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## 1. Introduction

In today's competitive market arena, innovation and ability to generate new or enhanced product ideas is critical to food industries. It is not surprising that understanding consumer's cognitive mechanisms and perceptions, especially during the early stages of new product development and creation of marketing strategies, has been extremely important in food research (Guerrero et al., 2010; Van Kleef, van Trijp, & Luning, 2005; Vidal, Ares, & Giménez, 2013). In addition, recent evidence shows that involving consumers as co-creators of products is positively related to new product development, in relation to increased product creativity, decreased time to market, and reduced development costs (Potts et al., 2008; Von Hippel, 2005). However, little attention has been devoted to consumer-generated product solutions; instead, experts continue to view new product development process as a traditionally firm-centred activity.

Similar to other food sectors, rise in fish demand and aquaculture production, as well as its impact on the markets, has brought forward a pressing need for further insights into possible development of aquaculture products driven by consumer needs (Brunso et al., 2008; Claret et al., 2014). Recent research has investigated aquaculture product consumption (Altintzoglou, Vanhonacker, Verbeke, & Luten, 2011; Hall & Amberg, 2013), consumer perceptions and preferences in terms of

farmed fish versus wild fish (Claret, Guerrero, Gartzia, Garcia-Quiroga, & Ginés, 2016; Stefani, Scarpa, & Cavicchi, 2012), and relevant environmental attributes in marketing of aquaculture products (Verbeke, Vanhonacker, Sioen, Van Camp & De Henaau, 2007; Young, Brugere, & Muir, 1999). In this respect, research shows that aquaculture products have been subjected to particular scrutiny and negative perceptions by consumers (Hall & Amberg, 2013; Verbeke, Sioen, Brunsø, De Henaau & Van Camp, 2007). These negative perceptions are mainly related to a lower expected intrinsic quality and unnaturalness of aquaculture products, reports on health risks associated to consumption of certain farmed fish species, such as salmon, due to the elevated levels of chemical contaminants and insecticides, as well as environmental risks related to pollution from farms (Hall & Amberg, 2013; Schlag & Ystgaard, 2013; Verbeke, Sioen, et al., 2007; Young et al., 1999).

To be able to answer existing challenges and assure consumer acceptance of new aquaculture products it is important not only to study and quantify a number of quality parameters (Brunso, Verbeke, Ottar Olsen, & Fruensgaard Jeppesen, 2009; Olsen, Scholderer, Brunsø, & Verbeke, 2007; Pieniak, Verbeke, Scholderer, Brunsø, & Olsen, 2007), but also to incorporate consumer in early stage of new product development process (Van Kleef et al., 2005). This would involve in-depth examination of consumer needs and involvement in the new product development process, which are essential for designing products that will actually meet consumer demand (O'hern & Rindfleisch, 2010; Van Kleef et al., 2005). The transformation of new aquaculture product ideas into commercially successful end-products comes after an exploration of consumer needs and consumer involvement in the product creation that can guide product development and marketing strategies. Recently, it has been recognized that involving consumer in co-creation represents

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a critical success factor in the new product idea generation (Füller, Hutter, & Faullant, 2011; O'hern & Rindfleisch, 2010). Thus, in order to promote future opportunities for aquaculture industry, besides the importance of understanding consumer perceptions of aquaculture products, it is imperative to be able to generate new or enhanced product ideas that could bring competitive advantages through aquaculture products' differentiation.

In the case of new ideas generation, qualitative research is an appropriate approach to understand how consumers see and perceive new concepts (Berg, Lune, & Lune, 2004), but also to involve consumers as active co-creators of the products they buy and use (O'hern & Rindfleisch, 2010; Potts et al., 2008; Von Hippel, 2005). Qualitative research approaches have had an important and profound impact in the field of food research, yielding meaningful and useful results for a deeper understanding of different food-related phenomena and their dynamics (Roininen, Arvola, & Lähteenmäki, 2006; Van Kleef et al., 2005).

Projective and creative techniques, which are commonly applied in psychology, consumer research, and innovation management (Couger, 1995; Donoghue, 2000; Higgins, 1994; Lilienfeld, Wood, & Garb, 2000), are qualitative methods that could serve as instant and convenient tools in exploring consumer perceptions for new and undefined concepts, such as new aquaculture product ideas. Projective and creative techniques may be less lengthy than many other qualitative approaches, such as personal interviews. Most importantly, by asking individuals to answer structured questions indirectly from the perspective of another person, projective and creative techniques are able to facilitate and capture salient issues and unconscious aspects of individual's viewpoints better than tools that use more direct questioning where subjects are asked to talk about themselves (e.g. personal interviews) (Boddy, 2005; Catterall & Ibbotson, 2000). In this way, indirect questioning allows subjects to describe their own feelings and most salient beliefs, however with the facade of anonymity. Moreover, the most salient beliefs or associations that an individual holds about certain attitude object are the best predictors of the individual's behaviour in relation to that object (Ajzen, 1991). In addition, mimicking other people's behaviour rather than sharing private information facilitates the individual's response and avoids 'impression management' and socially desirable response bias (Ashton-James, Van Baaren, Chartrand, Decety, & Karremans, 2007). Thus, associations that first come to an individual's mind and are elicited by mimicking other people's behaviours are the ones that should be the most relevant for product choice and acceptance (Van Kleef et al., 2005). Subsequently, projective and creative techniques could prove to be convenient tools for exploring and generating new aquaculture products ideas through collaborative new product development activity in which consumers can actively contribute to the design of the new aquaculture product offering.

However, even though projective and creative techniques have been found as useful in the market research as in new product development (Van Kleef et al., 2005), none of the previous consumer studies has ever used a combination of these tools to assess consumer perceptions and involve consumers in modification and creation of new (food/fish) product ideas. When properly applied, creative and projective techniques might bring more credibility to the qualitative research and provide better understanding of cognitive process with higher focus on real-life experience, placed in its appropriate context, aquaculture products in the specific case. In this respect, this paper applies projective and creative techniques to examine what are the factors and product ideas that could be most persuasive in directing consumer acceptance of aquaculture products. Accordingly, the objective of this research is to identify ideas of new aquaculture products through a qualitative study in five largest EU fish markets (i.e. France, Germany, Italy, Spain, and the UK), in order to point directions for future, more market oriented new aquaculture product development.

## 2. Methodology

### 2.1. Theoretical background and conceptual framework

Projective techniques are generally based on the concept of projection, the process in which salient issues and unconscious aspects of an individual can be inferred by prompting individual with ambiguous stimuli so that the individual 'projects' own feelings, beliefs or self-concept to give to a situation some structure (Boddy, 2005; Donoghue, 2000). Based on the answers they elicit, projective techniques are classified into associative, construction, completion, choice (or ordering), and expressive techniques (Lindzey, 1959). Guerrero et al. (2010) and Ares, Giménez, and Gámbaro (2008) have demonstrated that word association techniques allow for the evaluation of conceptual structures, provide better understanding of the consumers' projections and beliefs in relation to different foods (i.e. traditional, conventional, and functional), and give valuable insights for food product positioning, innovation, and new product development. Similarly, the personification association technique was found a powerful tool for obtaining information on brand and product personality through association of stimuli with a person or personality type (Aaker, 1997). Constructive techniques (loosely based on the Thematic Apperception Test (TAT)) have also been found useful in assessing consumer values and beliefs with regards to food products where individuals are compelled to construct a story or an image of an investigated stimulus (Catterall & Ibbotson, 2000; Steinman, 2008; Vidal et al., 2013). Choice or ordering techniques have been convenient for sorting different products/brands, grouping them into different categories according to their similarities and dissimilarities and choosing the best option (Grunert et al., 2001) with important influence on brand development management (Sujan & Bettman, 1989). Completion techniques have been shown to be extremely effective in uncovering consumer perceptions of ready-to-eat foods through completion of the stimulus in a form of drawing or a sentence (Vidal et al., 2013). Finally, expressive techniques are used to integrate stimulus through a role-playing task into a new creation relevant for consumers' food choice and their loyalty to food retailers (Doherty & Nelson, 2010).

Creative techniques have been used for some time now in the innovation management as an internal, firm-based activity (Couger, 1995). There are many definitions of creative problem-solving (Amabile, 1983; Couger, 1990; Higgins, 1996). In general, the underlying principle is that creative problem-solving is an innovation process that involves problem formulation, preparation, idea generation, idea evaluation, and idea selection, where the created idea is something of novelty or value that requires modification or rejection of previously accepted ideas. Thus, the main focus of creative techniques is on idea generation to be able to create a pool of candidate ideas that could be further appraised and implemented (Garfield, Taylor, Dennis, & Satzinger, 2001). Higgins (1996) and Osterwalder and Pigneur (2010) have shown that creative techniques, such as storyboarding, empathy design, and brainstorming, are vital in product creation and design. Storyboarding and empathy design are structured creativity processes grounded on brainstorming that can be easily adapted to the intended context. Many group-based creativity processes, as storyboarding, are based on brainstorming. Brainstorming represents a deliberate thinking process that involves cross stimulation (i.e. getting the ideas moving), suspended judgement (i.e. 'no idea is too ridiculous'), and the formality of the setting (i.e. 'no approach is too foolish') (De Bono, 2010).

Various experts agree on the usefulness of the projective and creative techniques in market research and emphasize on the value of the insights they can generate (Griffin & Hauser, 1993; Guerrero et al., 2010; Osterwalder & Pigneur, 2010; Roininen et al., 2006; Vidal et al., 2013). One of the advantages that is often mentioned is their ability to get around participants' conscious defences and gain access to subconscious information (Boddy, 2005). Donoghue (2000) reports that qualitative research can benefit by using tools as projective techniques to

better understand non-communicable, unconscious information, as these techniques actually encourage consumers to express their private beliefs by talking about other people rather than themselves. Storyboarding and empathy design have been quite valuable in new product development and design, as well as for the generation of different business models (for a review see Higgins, 1994; Osterwalder & Pigneur, 2010; Van Kleef et al., 2005), however they have never been applied as creative techniques in a qualitative study or used as tools in consumer creation of new product ideas. The empathy design has been employed in previous studies mainly through the direct observation of product users (i.e. research), through the secondary observation or interpreting and communicating the user data and previous findings (i.e. communication), and through projection of the product designer's own experiences in the user relevant area (i.e. ideation or storyboarding) (for a review see Kouprie & Visser, 2009). The engagement of the empathy design as an 'ideation' or 'experience prototyping' is very similar to projective techniques (Catterall & Ibbotson, 2000), where focus is on the understanding of the user's behavioural and experiential aspects instead of user's characteristics. As empathy aids product designers to create products that fit the user's needs (Kouprie & Visser, 2009; Leonard & Rayport, 1997), it can also help consumers to describe how others (similar to them, but not themselves), might think, feel or behave when considering a new product and what could be product-seeking benefits (Boddy, 2005; Catterall & Ibbotson, 2000).

## 2.2. Participants

Participants' recruitment requires special attention when aiming to create new product ideas (Füller et al., 2011; Potts et al., 2008). Therefore, purposive sampling was used for recruitment based on the participant's expected contribution to the research objective. Participants were screened in five largest EU fish markets (i.e. France, Germany, Italy, Spain, and the UK) for their fish consumption behaviour, level of involvement, domain relevant skills, and subjective knowledge, determined based on a preceding quantitative survey undertaken in the same countries (for more information see Krystallis, Banovic, Guerrero, & Reinders, 2015). This was also done to satisfy basic requirements of the projective and creative techniques, namely that a participant must have domain-relevant skills (i.e. familiarity with the area in question, and practical skills) and be intrinsically motivated to perform within domain in question (Amabile, 1983; Donoghue, 2000). To be recruited participants were required to be consumers and purchasers of fish in general and aquaculture products in particular, to possess cooking and evaluation abilities in relation to fish products (i.e. domain-relevant skills) and to be interested in new fish products (i.e. intrinsic motivation) (see Krystallis et al., 2015). To get better insights in drivers and barriers of new aquaculture products, we have chosen to cover fish users from heavy (i.e. consume aquaculture products once a week or more) to light consumer groups (i.e. consume aquaculture products once a month).<sup>1</sup> We expected to get insight on obstacles regarding new aquaculture products primarily from light users. The final sample consisted of 60 regular wild fish, farmed fish and seafood consumers, equally divided between males (M) and females (F) with average age of 42 years (SD = 8.7) (Table 1). All participants were very interested in fish product category in particular (i.e. consumer involvement) and in new fish products in general (i.e. domain specific innovativeness), and they considered to possess sufficient knowledge to evaluate and prepare fish products (i.e. subjective knowledge). The fish consumption levels vary in five countries, covering light to heavy consumer groups.

<sup>1</sup> We acknowledge that consumers are not always aware of the fish production origin (i.e. wild vs aquaculture fish) and that in our sample knowledge of fish production is to a large extent self-perceived (i.e. subjective). As consumer projections are vital for this study, the participants' belief that they consume aquaculture products once a week or once a month does not obstruct research rationale and fulfilment of the study aims.

## 2.3. Procedure

Ten focus groups consisting of 6 participants each were undertaken across the five study markets (i.e. France, Germany, Italy, Spain, and the UK), two focus groups per country, during the second half of January 2015. Estimated interview time was about 120 minutes. A professional market research agency undertook participants' recruitment and interviews in each country. The interviews were conducted according to a predetermined protocol common to all countries, to centralize the data collection process. All discussion guides were translated from English to every native language by the local agencies. In each country, moderators used the translated discussion guide to ensure consistency and uniformity of the process in all focus groups, which also enabled the comparison of results across focus groups and countries. The discussion guide included three tasks which are depicted in Fig. 1, while the methodology of the each task is explained in more detail below. This procedure provided up to three new product ideas per focus group, leading to 30 product ideas in total (6 in each study country). The interviews were audio/video-recorded, translated back to English and transcribed for subsequent data analysis.

### 2.3.1. Perceptions towards new food product ideas

The focus groups started with participants giving their informed consent and introducing themselves, followed by a group discussion to investigate consumer perceptions towards new food product ideas in general (first task, Fig. 1). For this purpose, participants were asked to give examples of new food products and describe their experiences with them. Answers were discussed in the group (5–10 min).

### 2.3.2. Perceptions towards and modification of new aquaculture product ideas

At a subsequent stage, participants were individually engaged in the projective associative and expressive tasks respectively (at the same location) (Vidal et al., 2013) (second task, Fig. 1). Their individual answers were subsequently discussed in the group (20–25 min), in order to acquire a detailed and substantiated insight about consumer perceptions towards specific intrinsic and extrinsic fish product attributes. Participants were first probed to personify and project human characteristics to fish in order to elicit their thoughts about new product possibilities, attributes, and personality traits (i.e. personification association task) (Aaker, 1997; Boddy, 2005). Subsequently, participants stated all the words that came to their mind in association with the term 'new aquaculture products' (i.e. word association task) (Guerrero et al., 2010; Roininen et al., 2006). Lastly, participants were presented with a set of 6 fish product images shown separately on a white piece of paper (Fig. 2), asked to assume the role of product manager and point out what could be modified in those images in their opinion in order to improve the way new aquaculture products should look (i.e. role playing task) (Doherty & Nelson, 2010).

### 2.3.3. Consumer creation of new aquaculture products ideas

After a short break (10–15 min), participants in every focus group were divided in 3 groups of two people each, in order to get the best results possible through group interaction (Garfield et al., 2001). In this task, participants were engaged in the creation of new ideas for aquaculture products and the creative empathy task with combination of choice projective techniques (third task, Fig. 1) (Amabile, 1983; Higgins, 1994; Osterwalder & Pigneur, 2010; Van Kleef et al., 2005). The focus at this stage was three-fold: (i) facilitate the consumer's ideation process by profiling the typical 'user' of new aquaculture products (i.e. creative techniques, empathy map with brainstorming), (ii) involve consumers in the process of product ideas creation (i.e. creative technique, storyboarding with brainstorming), and (iii) involve consumers in the selection (voting) for the best product ideas (i.e. choice technique). The goal was to elicit new ideas through brainstorming aided by an empathy map that was adapted from a tool developed for creative thinking

**Table 1**  
Background characteristics of the participants.

	Overall	France	Germany	Italy	Spain	UK	F/ $\chi^2$ test	p
Age								
Min.	31	31	31	30	30	30		
Max.	55	54	59	58	59	59		
Mean	41.8	43.8	44.1	44.5	45.6	44.0	0.30	0.877
SD	8.7	7.0	9.2	9.8	9.3	8.6		
<i>Wild fish consumption (%)</i>								
Once a week or more	26.7	–	25.0	33.3	33.3	41.7	24.82	0.002
2–3times a month	48.3	100	58.3	41.7	8.3	33.3		
Once a month	25.0	–	16.7	25.0	58.4	25.0		
<i>Farmed fish consumption (%)</i>								
Once a week or more	40.0	–	8.3	50.0	75.0	66.7	51.06	<0.001
2–3times a month	38.3	100	25.0	8.3	25.0	33.3		
Once a month	21.7	–	66.6	41.7	–	–		
<i>Seafood consumption (%)</i>								
Once a week or more	13.3	–	–	25.0	16.7	25.0	26.65	0.001
2–3times a month	45.0	100	33.3	50.0	25.0	16.7		
Once a month	41.7	–	66.7	25.0	58.3	58.3		
<i>Consumer involvement*</i>								
I am very concerned about what fish products I purchase.	1.92	1.92 <sup>b</sup>	1.58 <sup>b</sup>	2.83 <sup>a</sup>	1.17 <sup>c</sup>	2.08 <sup>b</sup>	6.05	<0.001
I care a lot about what fish products I consume.	1.52	1.75	1.33	1.50	1.50	1.50	0.67	0.616
Generally, choosing the right fish products is important to me.	1.43	1.92 <sup>a</sup>	1.50 <sup>b</sup>	1.33 <sup>b</sup>	1.17 <sup>b</sup>	1.25 <sup>b</sup>	4.66	0.003
<i>Domain specific innovativeness*</i>								
In general, I am among the first in my circle to purchase new fish products.	3.70	4.00	4.17	3.17	4.17	3.00	0.97	0.431
In general, I would consider buying new fish products.	3.23	4.17	2.67	3.75	3.00	2.58	1.46	0.228
In general, I am among the first in my circle to know the latest fish product trends.	3.77	3.92	4.08	3.83	4.08	2.92	0.72	0.582
<i>Subjective knowledge*</i>								
I consider that I know more about fish than the average person.	2.97	3.17	2.25	3.58	3.08	2.75	1.55	0.201
I think that I know more about fish than most of my friends.	2.63	2.75	2.25	3.25	2.50	2.42	1.10	0.365
I have a lot of knowledge about how to prepare fish.	2.50	2.58	2.08	2.50	2.67	2.67	0.65	0.631
I have a lot of knowledge about how to evaluate the quality of fish.	2.25	2.33	1.75	2.58	2.25	2.33	1.09	0.307

\* 7 point Likert scale (1 – strongly agree to 7 – strongly disagree).

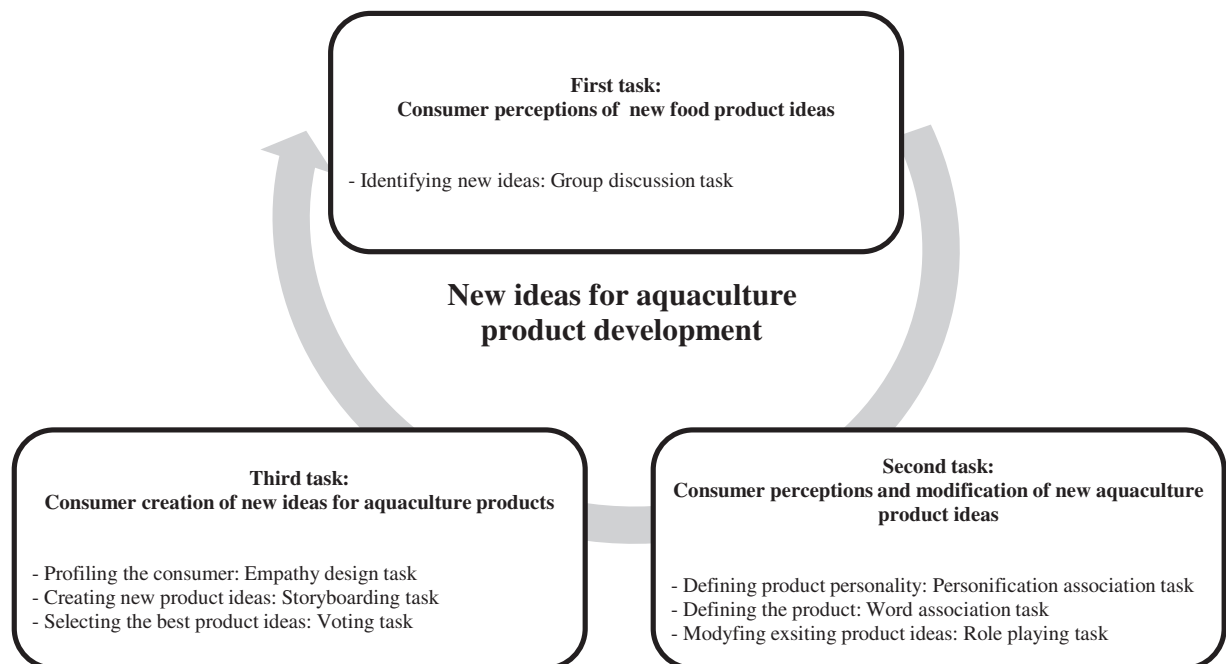
<sup>a</sup> Significantly different at  $p < 0.05$  Tukey's test for multiple comparisons.

<sup>b</sup> Significantly different at  $p < 0.05$  Tukey's test for multiple comparisons.

<sup>c</sup> Significantly different at  $p < 0.05$  Tukey's test for multiple comparisons.

(Osterwalder & Pigneur, 2010), and brainstorming (De Bono, 2010) (Fig. 3). Empathy map allowed participants to empathise with the typical 'user' of a new aquaculture product and explain this person's needs and wants, and main reasoning behind the consumption of these

products. Participants had to construct a story around a 'user', give 'their user' a name and a socio-demographic identity (e.g. occupation, marital status). The map was a printout and used as a poster on the whiteboard. Participants used post-its and markers to write or draw



**Fig. 1.** Research framework.



Fig. 2. Stimuli used for the role-playing task.

their ideas that were placed accordingly on the map. Each group worked separately on their map for about 30 min.

After conveying their thoughts about the typical user, participants focused on the development of new ideas for aquaculture products for this person (i.e. storyboarding task, Fig. 1). Each group had to determine how to satisfy their user needs and come up with its own original product idea, presented on another board or a large piece of paper. At the end of this session, each group presented their product idea(s) (e.g. story, drawing), with individual presentations lasting up to 2 min. After each group's presentation, everyone voted for the best ideas. Each participant had 12 points<sup>2</sup> to award that could all go to one idea or distribute them according to their personal preference. The entire part lasted up to 45 min (20–30 min for ideas' creation and 10–15 min for presentation and voting).

#### 2.4. Data analysis

The audio recordings of the focus groups were translated from their original language (i.e. French, German, Italian, and Spanish) to English

<sup>2</sup> All the points had to be awarded in order to allow comparison across focus groups and countries.

language and transcribed for subsequent analyses. The analysis of results conveyed from the projective techniques was undertaken according to standard content analysis procedures, where unstructured data is transformed into a structured format concerned with data meaning, consequence and context (Berg et al., 2004). The main goal was to describe participants' responses by grouping them into exclusive and exhaustive categories (Hayes & Krippendorff, 2007). By using NVivo 10, transcripts of elicited phrases and words were coded by triangulation. To minimize subjectivity bias in coding, transcripts were coded by the first author of this paper and crosschecked with two other researchers not involved in the project, trained in content analysis. First, by using the raw data, more recurrent themes (or associations) within each task were coded, and subsequently grouped into different categories based on the similarity of their meaning. The classification of the different themes was based on the personal interpretation of the researchers (obtained by consensus), and adapted to identify categories that might contribute to explain the underlying contexts relative to new aquaculture products. Frequencies of mention in each category were obtained by counting the number of participants that used similar themes, where the main basis for our comparison was information obtained from the each task. Only categories mentioned by at least 8% or approximately 5 participants were taken into account.

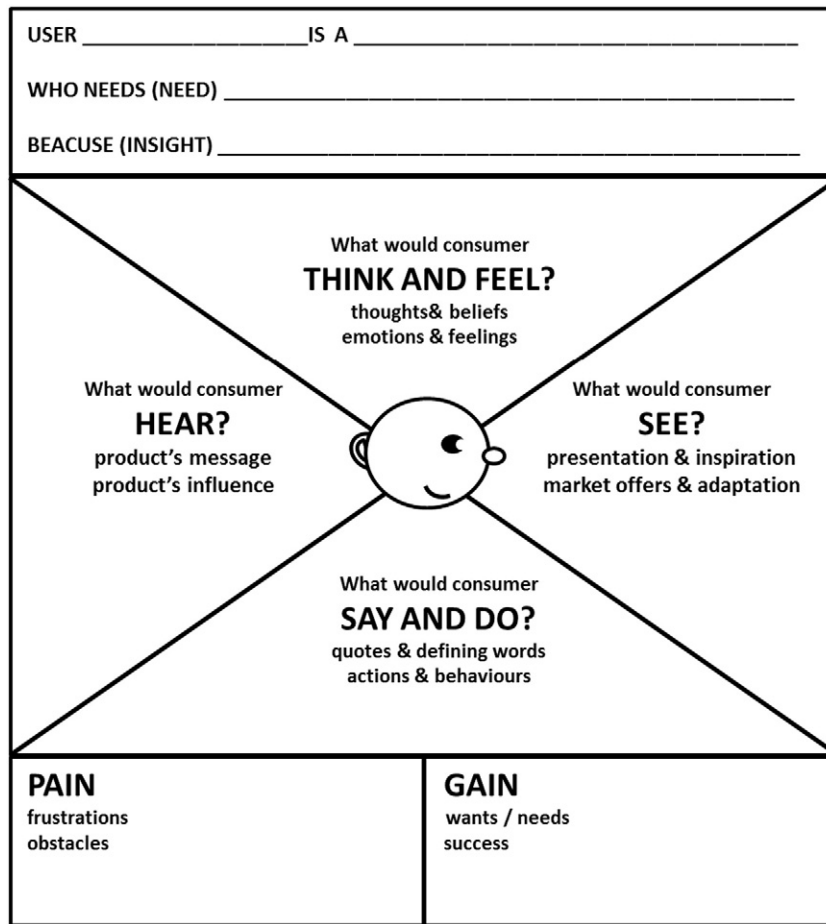


Fig. 3. Map used for the empathy task, adapted from Osterwalder and Pigneur (2010).

### 3. Results

The results of the focus groups are discussed across the studied countries explaining the categories that have occurred during each of the three focus group tasks. Participant's quotes were used to illustrate how different categories were deliberated during the focus groups by taking into account the background information of the participants (i.e. country of origin).

#### 3.1. Stage 1: perceptions towards new food product ideas – group discussion task

During the group discussion task, participants were very attentive to new products and able to list various foods and superfoods (e.g. vitamin water and protein bread in Germany; fresh cheese mayonnaise and lemon caviar in France; pomelo and puff pastry discs in Italy; spider crab cream soup and vegetable oil spray in Spain; and kale crisps and apples with black currents in the UK). Table 2 shows the most

frequently occurring categories in the group discussion task. Two predominant categories were *preference for innovation* and *convenience in preparation*. Participants mostly discussed the fact that new food products should have something *original, intriguing and innovative* in order to attract the consumer: 'Punjabi rolls, with vegetables and jasmine rice, deep frozen. It sounded intriguing and it delivered its promises' (male, Germany); 'It is not something you would have on a daily basis, it is like giving yourself a treat' (Female, Spain). *Innovation* was also seen as a change in the physical product: 'When it says 'new' it's eye catching and you want to check it out and if it's a variation of the things that you normally eat it is even better, it's a novelty' (Female, France). However, participants pointed out that new food products rarely surprise and that they should be modified to provide *functional benefits in preparation* beyond what is expected from normally consumed day-to-day products: 'Rarely a new product surprises you; it is more about cooking it in a different way, quick and easy' (male, Spain); 'I'm rarely disappointed by a new product, but I notice a difference in cooking times' (Female, Italy).

**Table 2**  
Categories identified in the group discussion task.

Categories	Example	Overall frequency (%) of mention*	Frequency of mention				
			FR	GER	IT	SP	UK
Preference for innovation	Innovativeness, originality, novel products attractiveness, interest in superfoods	20 (33)	4	6	4	3	3
Convenience in preparation	Practical, ready, convenient, easy preparation, recipes, variety, additions for cooking	12 (20)	3	3	1	4	1
Experiences while eating	Enjoyment, experience, taste, sensory quality	8 (13)	1	1	1	4	1
Product presentation	Appearance, presentation, package	7 (12)	1	1	1	2	2
Product healthiness	Healthy, no additives, no carbohydrates	7 (12)	2	1	2	1	1

\* N = 60 participants; 12 participants per country.

### 3.2. Stage 2: perceptions towards, and modification of new, aquaculture product ideas

#### 3.2.1. Defining product personality – personification association task

Categories identified in the personification association task are shown in Table 3. In summary, participants described fish mainly as a *flexible, self-persevering, possessing camouflage ability, sociable* and actively supporting and promoting *environment and healthy lifestyle*. Participants agreed that fish has to be flexible, able to constantly change and adapt to different conditions, and these characteristics should be considered as an essential and symbolic part of the new fish products. Only then, they pointed out, the fish can transform into something completely new: *‘Very flexible and mobile, elegant, physically, but mentally flexible as well’* (Female, Germany); *‘They would go about their business actively and flexibility would be part of their lifestyle’* (Female, UK).

*Self-perseverance* and *camouflage ability* characteristics point in the indirect way to the product-related attributes of new aquaculture products, where products with proper packaging and presentation that give notion of safekeeping would be those products more accepted by the consumer: *‘Intelligent and protected, theoretically safe.’* (Female, France). *‘Able to dress-up in many different ways’* (Female, Spain). On the other hand, this resourcefulness could also be seen as a need for new and different products that could be transformed or combined with other food products in order to make them more agreeable and accepted by the consumers. The main discourse behind the *protagonist* of this story would be concerns in relation to environment and constant obstacles and difficulties that are mainly related to human activity (i.e. *environmental consciousness*): *‘If fish could talk to me, and if I was a fish I would tell the mankind that they hurt me very much. Because they over-exploit me, overfish me.’* (Female, France). In addition, they would be *social* and promote *healthy lifestyle*: *‘We would be good friends.’* (Male, Spain). *‘Promote healthy living, would actively talk about health, fitness and good clean living. It would talk about it actively, as it would be part of its lifestyle.’* (Female, UK).

#### 3.2.2. Defining the product attributes – word association task

Categories identified in the word association task are presented in Table 4. The categories mentioned by the higher number of participants were *fish species, novelty, frozen, packaging* and *fresh*. These results show that when participants thought about new aquaculture products, they mostly thought about production and preservation method. However, some negative associations, such as *‘impacts of fishing, conflict between fish species, environment and consumption’*, *distrust*, and *industrial*, have also been elicited by a lower number of participants.

#### 3.2.3. Modifying existing product ideas – role-playing task

Table 5 presents categories identified in the role-playing task. Generally, ‘fish (back) fillet’ and ‘ready-made fish fillet’ were considered as

most acceptable product ideas that do not need much modification. This can be assigned to the fact that these products were also considered as appetizing and worth trying. Additionally, ‘fish (back) fillet’ was seen as luxury product that would be even more accepted if its packaging is changed: *‘You could improve the packaging and would like the fact that you can see the fish.’* (Female, UK). On the other hand, ‘readymade fillet’ was considered as convenient product that needs additional sauces to appeal more to the consumer: *‘I am thinking salmon is dry, maybe with the sauce it would be better.’* (Male, Italy). ‘Fish hamburgers and sausages’ was the least accepted idea, mostly because of the belief that these products are too industrial, processed, and unhealthy. Interestingly, even though most of the participants had negative perceptions about ‘fish hamburgers and sausages’, they also considered them as appetizing and, if their preparation would change, they could: *‘... encourage fish consumption of children’* (Male, Spain). ‘Carpaccio’ was the only product that has not been discussed in depth, besides the fact that it was considered an appetizing and delicious product. ‘Octopus and seafood salad’ was seen as most unappetizing product among all ideas: *‘To look at it, it looks a little bit strange, a little bit disgusting.’* (Female, Germany). On the other hand, even though ‘snacks’ were considered as too industrial product, they were seen as a very good option in social contexts: *‘You can have these for dinner parties’* (Female, UK). Generally, and in terms of other possible modifications of the presented stimuli, besides changing of packaging, participants believed that improvement of product labels in terms of providing more information on ingredients, product traceability and production would certainly add value to the products. Similarly, preparation recommendations and additional recipes would also help increase the value of these products.

### 3.3. Stage 3: consumer creation of new aquaculture products ideas

#### 3.3.1. Profiling the consumer – empathy task

Table 6 shows the categories identified in the empathy task. Most of the participants’ groups envisaged the typical consumer of new aquaculture products as a ‘single-living’, ‘busy-lifestyle working person’. Irrespective of demographic profile, the main goal of this fictitious consumer would be to pursue *health and well-being* through consumption of aquaculture products and reap the gains of healthy source of proteins with a positive effect on consumer’s or family lifestyle: *‘Antony is a personal trainer who needs fish for health and fitness because he is looking for better, new ideas, which will give him health, vitamins and protein’* (Two Males’ group, UK); *‘Susanne is a working woman with a child and a partner, who wants a healthy and conscious nutrition based on fish to keep herself and her family healthy’* (Two Females’ group, Germany).

Besides *health and well-being*, and the need for *healthy products*, participants also added that ‘their’ typical consumer would think about a product that is *quick and easy to cook* and *tasty*: *‘Happiness can be complete, tasty and easy to cook’* (male and female group, Spain); *‘Feel like*

**Table 3**

Categories identified in the personification association task.

Category	Examples	Overall frequency (%) of mention*	Frequency of mention				
			FR	GER	IT	SP	UK
Personality traits of fish							
Flexibility	Mobile, free, open, playful, active, living-day-by-day, no taboos, love/hate	29 (48)	3	7	9	2	8
Self-perseverance	Intelligent, clever, bright, strong, serious, organized, reserved, balanced, fit, vivacious, slippery	21 (35)	9	7	2	1	2
Camouflage ability	Mysterious, elusive, undistracted, unbothered, elegant, colourful, beautiful	15 (25)	3	5	2	2	3
Environmentally conscious	Environment, pollution, overfishing, overexploitation, overconsumption, leave us alone, mankind hurt me, profiteers	15 (25)	6	0	5	0	4
Sociable	Social, approachable, close to people, advise you, sweet words, liking	13 (22)	1	0	8	0	4
Healthy lifestyle	Healthy living, clean living, healthy lifestyle	11 (18)	0	0	0	3	8
Male	Commander Cristo, Neptune, men from Scandinavian countries, D’Artagnan of the 3 Musketeers, Professor (male), Aquarius star sign (male).	8 (13)	4	1	3	0	0
Female	Woman, feminine, Brigit Bardot, mermaid	5 (8)	2	0	3	0	0

\* N = 60 participants; 12 participants per country.

**Table 4**  
Categories identified in the word association task and example of individual associations.

Category	Examples	Overall frequency (%) of mention*	Frequency of mention				
			FR	GER	IT	SP	UK
Fish species	Salmon, tuna, pangasius, loup de mer, tilapia	36 (60)	6	12	6	5	7
Novelty	Novelty, unique, original, special, crème de la crème, new recipes	35 (58)	12	4	10	3	6
Frozen	Frozen, freezer, chilled	31 (52)	4	9	12	4	2
Packaging	Packaging, compressed package, bag, can, tin, jar, foil, cardboard package	23 (38)	1	8	9	3	2
Fresh	Fresh, freshness, caught close by, fishmonger	22 (37)	3	3	6	4	6
Products	Fillets, Carpaccio, sushi, surimi, fish sticks, fish fingers, fish burgers	22 (37)	1	5	7	8	1
Ready	Ready, readymade, convenient, easy, practical, cooked quickly	20 (33)	4	5	4	4	3
Taste	Taste, flavour, delicious, texture, succulent, good	19 (32)	2	5	5	3	4
Healthy	Healthy, health, organic, natural, good for you	17 (25)	5	2	2	2	4
Preparation (cooking)	Preparation, cooking, baking, frying, boiling	17 (25)	1	3	3	3	5
Environmental impacts of fishing	Overfishing, pollution, deep sea fishing, ugly fish	14 (23)	8	2	1	2	1
Search for information	Search for information, read the ingredients, understand the origin	11 (18)	0	1	7	0	3
Necessity of fish farms	Fish farms became a must, fish ethics, fish welfare, farm wild fish in identical conditions, fish traceability	7 (12)	6	0	0	0	1
Price (cheap)	Price important, low cost, inexpensive, cheap	7 (12)	0	3	4	0	0
Conflict between fish species, environment and consumption	Panga lives in dirty water and consumption is not advisable, Nile perch killed the lake and they exported it to Europe	7 (12)	3	0	0	4	0
Distrust	GMO, chemicals, hormones, genetic mutations, antibiotics	7 (12)	4	1	1	0	1

\* N = 60 participants; 12 participants per country.

sharing a discovery and original taste experience, quick complete meal' (two females group, France); 'All the pleasure with little effort' (two women group, UK). Nevertheless, this did not refrain consumer from always pondering on the impact of fishing on the environment and need for more trustworthy information on aquaculture products.

### 3.3.2. Creating new product ideas – storyboarding task

Although participants created much more ideas, they had to choose the most suitable one for their consumer, thus a final number of 30 product ideas were created across the 30 participants' groups. Table 7 presents short description of some of the created ideas. The general categories occurring across all ideas created can be found in Appendix A.

Most of the participants created product ideas related to fresh fish, but at the same time have some functional dimension in terms of packaging, accompaniments or arrangement (as opposed to frozen and ready-made fish dishes, Appendix A). Following, most ideas had in common the necessity of the product 'to be seen', emphasising transparent and see-through packaging: 'The top of the packaging is transparent; you can see the product, which is, in this case, sword fish.' (male and female group, Spain). Furthermore, participants envisaged that the new

products have to have something more than simple convenience, and be practical and useful in preparation due to the general lack of time, knowledge and skills on behalf of a large part of the typical consumer. Participants were certain that new products that offer more convenience in preparation, proper accompaniments and arrangement with additional preparation suggestions and recipes would be more likely to influence consumer perceptions and choice of these products positively: 'Fish slices. Totally clean, without bones and pre-sliced in a plastic package with a plastic tray, so you can put it in the microwave or oven. Easy-opening system with cooking instructions and easy recipe, 5 min preparation' (male and female group, Spain); 'Fish fillet. Easy and quick to cook, in a tray, for a barbeque, oven or microwave' (male and female group, UK); 'Freshly made dish. Convenient plate, like a snack, covered with transparent plastic' (two males' group, France); 'Fillet with cover of herbs. Different ways to cook, for the oven, ready-to eat' (two females' group, Germany).

Worth mentioning that some of the new created ideas have been previously presented to the participants in the role-playing task, i.e., fish sausages and hamburgers, ready-made fish fillet (see Fig. 2). Even though idea of fish sausages and hamburgers was considered

**Table 5**  
Categories identified in the role-playing task.

Category	Examples	Overall frequency (%) of mention*	Frequency of mention within each stimuli**					
			1	2	3	4	5	6
Change packaging	Transparent, clear, visible, plastic tray, sliding packaging	50 (83)	17	3	0	7	4	19
Acceptable product idea	Good solution, interesting, new, novelty, interesting, surprise, fun	40 (67)	10	10	5	0	9	6
Appetizing	Appetizing, mouth-watering, tasty, delicious, would taste it	37 (62)	6	10	9	6	3	3
Unacceptable product idea	Not good idea, nothing new, do not like it, would not buy it	30 (50)	0	0	13	3	6	8
Unappetizing	Unappetizing, disgusting, would not eat it	28 (47)	0	0	6	5	4	13
Industrial, processed	Too industrial, too processed	21 (35)	0	0	11	0	5	5
Convenience in preparation	Convenient, easy to prepare, fast, quick	20 (33)	2	6	4	0	1	7
Change product arrangement	Change the product, pre-sliced, in cubes, mini products, in shape of fish	19 (32)	0	0	9	0	4	6
Add accompaniments	Add sauces, add marinade, add dips, add spices, add herbs	17 (28)	1	8	2	1	3	2
Improve label information and trust	Change label, more trustworthy information	14 (23)	3	2	0	0	3	6
Social context	Parties, special occasions, barbeque	14 (23)	0	3	3	0	6	2
Add preparation suggestions and recipes	More preparation suggestions, add recipes, add how to cook it	10 (17)	7	1	0	1	0	1
Healthy, natural product	Healthy, unaltered, natural, unprocessed, good for you	10 (17)	3	1	0	0	3	3
Unhealthy product	Unhealthy product	10 (17)	0	0	6	0	2	2
Luxury product	Luxury, delicatessen, top-range	8 (13)	8	0	0	0	0	0
Acceptable for children	For children, for kids	6 (10)	0	0	5	0	1	0
Purchase point	Fishmonger, supermarket, specialty store	5 (8)	2	0	0	3	0	0

\* N = 60 participants; 12 participants per country.

\*\* Stimuli – 1: Fish (back) fillet; 2: Ready-made fish fillet; 3: Fish sausages and hamburgers; 4: Carpaccio; 5: Snacks; and 6: Octopus and seafood salad.



**Table 6**  
Categories identified in the empathy task.

Category	Examples	Overall frequency (%) of mention*	Frequency of mention				
			FR	GER	IT	SP	UK
Health and well-being	Well-being, health, maintain body weight, balanced diet	24 (80)	4	6	3	6	5
Single working consumer	Single working man, single working woman	20 (67)	3	1	5	5	6
Convenience in cooking	Quick, easy, ready, readymade, little preparation, time-saver, versatile	14 (47)	4	2	2	3	3
Healthy, natural	Healthy, natural product, organic, unprocessed or little-processed product, actual fish 100%	13 (42)	3	4	2	2	2
Experiences while eating	New experiences, taste, enjoyment, discover new flavors, appetizing	12 (40)	2	3	2	3	2
Environmental consciousness	Sustainable fishing, responsible farming, overfishing, scarcity of the species, fish caught in a nonviolent way, aquaculture, fish alternatives	11 (37)	3	4	1	1	2
Consumer with the family	Mother with two kids, father with two kids, couple	10 (33)	3	5	1	1	0
Clear label information	Easy to identify product name, label transparency, 'sustainable fishing label', fishing verification, honest information	10 (33)	4	3	2	0	1
Innovative products	Innovative, original, authentic, 'it's not steak it's a fish'	8 (27)	2	2	0	2	2
Affordable price	Affordable price, inexpensive, special offer, acceptable price	8 (27)	2	1	2	1	2
Social context	Surprise people, impress a girl, impress a colleague, impress a client, dinner with family and friends	7 (23)	1	2	2	0	2
Quality	Product quality, good quality, high quality	7 (23)	0	2	2	2	1
Lack of time	Need time, pinched for time, busy	6 (18)	2	1	2	0	1

\* Frequency of mention across 30 groups, i.e. 6 groups per country.

unattractive in the role-playing task, some of the participants actually found this idea important to create more acceptable fish products for children (see Table 7, best voted ideas).

### 3.3.3. Selecting the best product ideas – voting task

Table 7 also presents the summary results from the voting task with the ratings of the best and least voted product ideas per country. Participants on average voted and selected more often product ideas that involve fresh fish and innovations in terms of packaging, accompaniments, such as sauces and marinades, and -most importantly- recipes and cooking suggestions. Subsequently, these ideas were regarded as the most creative ones and those who will be more likely accepted by potential consumers. On the other hand,

ready-made products and frozen fish products ideas were selected less often.

## 4. Discussion

### 4.1. Comparison of the results obtained by the projective and creative techniques

The combination of projective and creative techniques allowed the incorporation of the voice of the consumer and facilitated the design of consumer-relevant new aquaculture product ideas across the largest five European aquaculture markets (i.e., France, Germany, Italy, Spain, and the UK). In fact, Spain, France, the UK and Italy are main aquaculture producing countries, respectively (both in value and volume), followed

**Table 7**  
Short description of the new ideas for aquaculture products from the storyboarding task.

Country	Best voted ideas	Ratings* (Max.)	Least voted ideas	Ratings (Min.)	Mean	SD
France	Fresh fish Carpaccio that can be used as starter for a hot meal or as sandwich filling. This Carpaccio is seasoned with ginger and chili and presented as scales of the fish. The product is produced environmentally sustainable. The packaging is a plate that looks like a round box with the compartments and transparent wheel on the top that you can turn to reach different sections.	38	Fresh fish fillet sliced reflecting freshness and luxury. Product is packed in a tray with the sauces on the side in the separate compartment and transparent lid. Product message: 'Fish in all versions'.	20	26.0	6.2
Germany	Fresh fish fillet covered with herbs and spices in the transparent packaging. Different fillet size in the packaging conveying the product message through images and voice: 'For him – Fish for the triathletes'; 'For her – vacation in Provence'.	27	White fish fillet deep frozen in the transparent packaging with additional information and suggestions on product serving and preparation. Product message: 'Informed and enlightened'.	19	24.0	3.2
Italy	Fresh fish steak for grilling in the pan. Transparent packaging with a label that guarantees the origin of the product and communicates its quality, signs and references to tradition and respect for the environment.	33	Steamed fish fillets stored in the glass jar and seasoned with herb, making it more palatable and tasty. Jar made from recycled material.	16	24.0	5.4
Spain	Fish sausages and fish hamburgers. The main advantage of this product is that the product has no bones. The seasoning is very mild and therefore this product is therefore suitable for children. The product is produced environmentally sustainable.	30	Ready-made fish tartar with additional soy sauce for cold serving. Packaging is the golden tray that reflects the colours and physical appearance of the product and that could also be used for serving. Package contains information how the product was made.	18	24.0	4.6
UK	Fresh fish fillet with different 'healthy' seasoning and marinades separately packed that consumer can choose and vary depending on the occasion. This product is sold with recommendation for the appropriate vegetables and wine to accompany the dish. Product message: 'Not two same dishes in a row'; 'You have it ready for you, healthy but still have the hectic lifestyle.'	33	Frozen back fish fillet visually appealing with transparent packaging and accompanying marinades and serving suggestions on the package. Product message through the image: 'Person morphing into a fish' and voice: 'Streamed and healthy living'	12	22.5	8.5

\* Each idea could be rated from 0 to 72.

by Germany where aquaculture industry is currently expanding (Eurostat, 2016). Even though past studies on food research and innovation management have recognized the usefulness of projective (Ares et al., 2008; Guerrero et al., 2010; Roininen et al., 2006) and creative techniques (Couger, 1995; Osterwalder & Pigneur, 2010; Van Kleef et al., 2005); no study up to now has ever used these techniques in combination for the new product development process. In this respect, the application of projective and creative techniques to early stages of new product development process in this study greatly contributed to the generation of more spontaneous and affective consumer answers in relation to aquaculture products, useful market insights, and above all to the creation of new product ideas. (Boddy, 2005; Donoghue, 2000) (Roininen et al., 2006) (Amabile, 1983; Lilienfeld et al., 2000) (Garfield et al., 2001; Higgins, 1996) Besides usefulness of using these qualitative techniques in combination, they individually bring different appraisals of the investigated subject, i.e. new aquaculture products in our case, in contrast to similar consumer studies (Schlag & Ystgaard, 2013; Verbeke, Sioen, et al., 2007).

The projective personification task, compared to other techniques usually applied in new product development, such as conjoint analysis, allowed for the identification of a set of human characteristics (i.e. personality traits) associated to fish as well as indications on how these may influence consumer preference. This was related to the core of the task, where the focus was on the personality of the fish and not the consumer itself, which enabled consumers to express their own individual self and more abstract needs through the usage of fish as a stimulus. Thus, the main advantage of this approach is that brought forward insights on the main personality traits of the fish that can be used as drivers of consumer perceptions and guidelines for positioning of aquaculture products. Uncovered product associations (i.e. product attributes) allow for the further application of current findings to describe a new aquaculture product, as the closer the congruence between attributes describing consumer's own self and a product, the greater the preference for and acceptance of this product (Aaker, 1997). However, the main disadvantage of this method is that obtained categories and traits are often too abstract and have too many degrees of freedom for their unequivocal conversion into product design (Van Kleef et al., 2005). Nevertheless, other techniques used in the new product development as for example conjoint analysis permit product designers to understand how different attributes are interrelated and linked to physical product, but cannot reveal more abstract consequences, consumer needs and values that actually drive consumer behaviour intentions (Ajzen, 1991). The personification association task gives these more abstract consumer needs that are appropriate for marketing purposes (i.e. communication strategy).

Most of the categories considered in the expressive role-playing task were previously elicited in the word association task. Thus, the word association task provided much wider information, as participants were allowed to freely associate aquaculture products to any words or phrases. However, it did not provide relation between product attributes and their consequences. The role-playing task, in turn, allowed for a more in-depth understanding of these different attributes (associations) that combined with the product images, uncovered a number of negative product characteristics that should be altered. Therefore, the main advantage of role-playing method over word association task is that allowed participants to focus on product modification and combine or incorporate stimuli into some kind of novel production, rather on what the product represents and its values. This suggests further that participants, by playing the role of the product manager, projected more of their inner feelings and thoughts on the product compared to the word association task, which could be more useful in circumstances when information about product attributes is sufficient (Guerrero et al., 2010; Roininen et al., 2006). The use of real product images as stimuli in role-playing task further allowed for directing consumer attention to specific stimuli that are of research interest and the more actionable information acquisition for new product development (Altintzoglou et al.,

2010). Creative techniques when compared to the projective techniques, allowed for combination and optimisation of existing product ideas, as well as generation of new product ideas. The grouping of participants into teams and the use of brainstorming further enabled the idea generation process, where the ideas from other participants triggered a participant's own cognitive activity (De Bono, 2010; Garfield et al., 2001). In addition, the use of participants that had domain-relevant skills and task motivation (i.e. necessary components of creativity, as well as vital characteristics for the recruitment of the sample, such as involvement and innovativeness, see Methodology) (Amabile, 1983) allowed for the easier identification and harnessing of new product ideas. Another advantage of creative method is its structured nature when compared to the projective techniques or other methods used in new product development as category appraisal. In this respect, empathy design task allowed for the identification of what really drives the elicitation of consumer needs in relation to a product, that is, what are the motives underlying product use (Higgins, 1996; Osterwalder & Pigneur, 2010). Therefore, the creative empathy task with brainstorming compared to other techniques used in new product development enabled the uncovering of the benefits consumers are looking for in aquaculture products, pointing to those hidden or latent cues that can be used for product improvement. However, one of the drawbacks is that responses elicited by the empathy map task are simpler, restricted and more time-consuming than projective methods or category appraisal technique (Van Kleef et al., 2005).

The structured nature of empathy map, combined with brainstorming, allowed for the better identification of the underlying issues and operational solutions with regards to aquaculture products. Specifically, it created a pool of candidate ideas for further evaluation in the subsequent storyboarding task and, ultimately, product idea implementation. Storyboarding brought participants the advantage of looking back on ideas and facilitated the association of diverse ideas, where the more novel ideas resulted in the activation of the set of development rules producing more novel product ideas. Moreover, the contribution of other participants in the groups affected both the subset of chosen product ideas and the final product ideas produced. Based on previous results, it seems that this creative methodology could have a profound impact on the new product development process, as it lies outside the boundary of traditional new product development view (Füller et al., 2011; Potts et al., 2008; Von Hippel, 2005). Therefore, creative research techniques could contribute to the emergence of a novel methodology that look beyond traditional approaches that can harness the ideas of real consumers and used them as co-creators. Finally, the main advantage of joining together projective and creative techniques in focus groups (all together in the same session) is to allow for building a scenario where projections are driven simultaneously in an individual manner (i.e. classic projective techniques) and as a result of the interaction of the participants (in the focus groups). This, as shown in this study, has indeed resulted in more creative, spontaneous, and different ideas than conventional focus group interviewing would bring forward.

#### 4.2. European consumers' perceptions and creation of new aquaculture product ideas

The current results show that the most important dimensions of fish personality are *flexibility*, *self-perseverance*, and *camouflage ability*, besides *environmental consciousness*, *sociability*, and *healthy lifestyle*. These characteristics are central drivers of consumer preferences and common denominators to market new aquaculture products across Europe. These traits can be further tracked to the created product ideas. Specifically, the dimension of *flexibility* is very much linked to the *convenience* and *functionality* aspects that consumers also found as essential product attributes. Thus, an aquaculture product that is flexible or has the ability to be "*dressed up in different manners*" and possesses the capacity to be prepared faster and easier would be the product that could surprise positively and fulfil consumer needs better.

This result suggests that *flexibility in preparation* could be a base for the formation of more specific beliefs and perceptions towards products from aquaculture. Subsequently, *flexibility* should be considered as an indispensable characteristic of a new aquaculture product in terms of its ability to change and “adapt” to different cooking possibilities and situations. Previous studies on consumer perceptions towards farmed fish have also found *convenience in cooking* as an important factor influencing consumer choice behaviour (Brunso et al., 2009; Olsen et al., 2007).

The *self-perseverance* dimension very much relates to the product *packaging*, found in this study as an important extrinsic attribute for both new and modified aquaculture products. Specifically, transparent packaging and ability to see the product are those characteristics that the consumer would more likely seek after. These results further point that packaging and package features should be always considered in combination with new product development, as certain features such as transparency make an appeal to consumer preferences and can be one of the important instances for aquaculture product differentiation. Even though consumer behaviour research has demonstrated that product packaging is a salient cue that has strong impact on consumers' decision-making processes and choice (e.g. Wedel & Pieters, 2012), little research has been done with regards to packaging of fish products (Brunso et al., 2009). Results from this study show that packaging of aquaculture products merits further investigation, as consumers' projections and preferences were mostly driven by product packages.

Further, the dimension *camouflage ability* could be seen in connection to product accompaniments and arrangement, as well as preparation suggestions and recipes. This is further related to the need that new aquaculture products should be easily transformed, combined or refashioned with other food products in order to be more agreeable and accepted by consumers. Furthermore, previous studies on seafood and fish have shown that accompaniments with serving and cooking suggestions have an important impact on consumer seafood choice and fish consumption (Leek, Maddock, & Foxall, 2000; Mueller Loose, Peschel, & Grebitus, 2012).

*Environmental consciousness* was another important dimension of aquaculture products, not only as a personality trait, but also as a growing need for eco-friendly aquaculture. Fish farms were considered as vital for the future of fish consumption. This possibility is seen only if aquaculture fish species are ethically treated in terms of its growing and catching techniques, as fish was seen as the “protagonist” that needs protection and (fish) welfare. This further suggests that aquaculture products with environmental friendly claims would be more likely to be accepted by consumers, as previous research has shown that consumers are willing to pay more for environmentally friendly products (Laroche, Bergeron, & Barbaro-Forleo, 2001). Previous studies have also reported that products from aquaculture could be seen as optimal from an environmental point of view, as their production requires lower input of energy and involves perseverance of wild fish resources (Thurstan & Roberts, 2014; Verbeke, Sioen, et al., 2007; Welch et al., 2002; Young et al., 1999).

Finally, *healthy lifestyle* is another worth considering factor that could contribute to higher aquaculture product acceptance. Besides being part of fish personality, results also show that the typical target consumer of new aquaculture products would be a person very much concerned with their *health* and *well-being*. Not only would their main expected motive fulfilment be keeping themselves and their family healthy, but also to fulfil their personal values of well-being and self-respect. This could be further traced to natural, unprocessed or minimally processed products, specifically the perceived absence of industrially processed fish, where health-giving properties would be a sign of a good aquaculture practice. More knowledge on these aspects would be crucial for the development of proper health claims that could transfer this perception into new aquaculture products, as inability to emphasize the “good sides” of aquaculture production might affect the probability

of future purchases of these products (Brunso et al., 2008; Pieniak, Vanhonacker, & Verbeke, 2013).

## 5. Conclusion

Findings of this study indicate that there are few managerially meaningful differences across the studied countries in terms of most important drivers for new aquaculture products, as well as with regards to created product ideas. Our findings show that minimal variances in main drivers and created ideas for aquaculture products are independent of the country (as defined using particular sample of consumers), and are likely to be driven by more individual factors, as consumer beliefs and perceptions. This is in line with previous studies which show that differences across cultures have minimal or no impact on certain consumer behaviour, such as consumer cognitive processes, information seeking patterns, and levels of involvement with product (Altintzoglou et al., 2011; Krystallis et al., 2015). Thus, the created product ideas appear to be common in existence and relative importance for the fish target market.

The main conclusion for aquaculture marketers is that product development in terms of (i) product flexibility/convenience, (ii) packaging, (iii) accompaniments and preparation suggestions, and linked to (iv) environmental and health claims, should be the focus when marketing new aquaculture products. There will be little point to convince consumers to purchase a product that is not flexible during preparation, in proper packaging, with appropriate arrangement and accompaniments, and that does not convey a healthy and environmental claim. As noted in earlier research (e.g., Brunso et al., 2008; Claret et al., 2016; Verbeke et al., 2008), a number of factors have to be met in order to increase success and create competitive advantage in the market for new aquaculture products.

On the other hand, marketers should consider involving consumers more in the co-creation of new aquaculture product ideas. As observed in this study, consumers are likely to ignore the product if it is not relevant for addressing a specific consumption problem, for instance flexibility, and if the product is not better than those consumers are currently using. Thus, campaigns that would solely promote existing and traditional products are inevitable to fail, as the underperformance of these products is what makes consumer switch to other products: “There are hundreds ready-to-eat beef products, but there are few fish-based ones.” In this way, not only would marketers ‘sit on the sofa’, but would be able to ‘climb a mountain’ and ensure a great way to develop products that matter to their consumers. Finally, projective and particularly creative techniques should be considered ideal in the first stages of new product development, as confirmed by this study, since these techniques provide a valuable pool of new ideas where the ‘voice of the consumer’ is loudly heard.

The limitation of this study is the small number of participants that has been used for each method resulting in inability to generalize our findings across the investigated markets. Therefore, future studies on new aquaculture/food products should preferably recruit a larger sample, combining projective and creative techniques with the use of quantitative approaches. For example, a comparison of participants' projections could be made against their fish consumption (e.g., via scanner or panel data) to understand to what extent one is predictive of the other. Another limitation is that we have recruited consumers based on their wild and aquaculture fish consumption behaviour combined, not just on aquaculture fish. As consumers are not always aware of the fish production origin (i.e. wild vs aquaculture fish) and provided that this knowledge is often self-perceived (i.e. subjective) this can possibly result in overstated wild or aquaculture fish consumption (as in our study). Therefore, incorporation of the both subjective and objective measures of fish origin knowledge could solve this issue.

This study gives good insight about benefits and drawbacks of projective and creative techniques when used for the generation of new product ideas. Projective techniques were found as a fast way to assess

information about new products. However, when word association method was used, it was not possible to get more insights into links between product attributes and consequences. Role-playing method, in turn, provided more information on attribute-consequence relation. Creative techniques when compared to projective techniques were more time-consuming, but provided more important insights and ideas for the generation and development of new products. We hope that our study brings more clarification on projective and creative techniques and can help researchers and product developers in their application.

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### Appendix A. Categories identified in the storyboarding task in relation to the created product ideas.

Category	Examples	Overall frequency (%) of mention*	Frequency of mention				
			FR	GER	IT	SP	UK
Transparent packaging	Transparent package, clear packaging, cardboard pack with transparent section, packaging can be cardboard with the window that you can see the product, glass jar	26 (87)	5	5	5	6	5
Convenience in preparation	Convenience in cooking, different ways to cook, easy, quick, ready to eat, easy to prepare, readymade	21 (73)	5	6	1	6	3
Accompaniments	Sauces, marinades, vegetables, potatoes, herbs, olive-oil, cheese	18 (60)	5	5	1	4	3
Arrangement	Fillet, pre-sliced, in cubes, little dices, medallions, shape of fish, whole piece, clean-no-bones	14 (47)	4	2	3	5	0
Preparation suggestions and recipes	Preparation suggestions, preparation mode, recipes, instructions for additional serving methods and for cooking	14 (47)	6	2	1	3	2
Healthy Innovative	Healthy, pure, natural	12 (40)	3	5	0	3	1
	Innovative product, original, unique, new, surprise, out of ordinary, magic	12 (40)	4	1	0	4	3
Purchase point and availability	Supermarket, fish market, fishmonger, retail shop, must be available	12 (40)	0	4	2	5	1
Fresh	Fresh, freshness, fresh fish at all times	11 (37)	2	3	4	1	1
Affordable price	Affordable price, reasonable price	11 (37)	2	5	1	2	1
Sensory experience and enjoyment	Taste, tasty, pleasure in one bite, smells, delicious, flavors, first class enjoyment	10 (33)	4	2	2	2	0
Fish species	Salmon, swordfish, tuna, bass, cod, marlin, loup de mer	9 (30)	2	0	1	5	1
Frozen	Frozen, deep-frozen, chilled	8 (27)	2	4	2	0	0

### Appendix A. (continued)

Category	Examples	Overall frequency (%) of mention*	Frequency of mention				
			FR	GER	IT	SP	UK
Information	Information about the product such as origin, sustainability, labels, quality controlling, manufacturing and origin of the products, ingredients	8 (27)	3	3	2	0	0
For family and friends	For whole family, satisfy everyone at the table, to share with friends, for parties	7 (23)	2	1	1	0	3
Quality	Quality, high-quality, best-quality, top-range	6 (20)	1	1	1	1	2

\*Frequency of mention across 30 groups, i.e. 6 groups per country.

### References

- Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research*, 347–356.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Altintzoglou, T., Birch Hansen, K., Valsdottir, T., Øyvind Odland, J., Martinsdóttir, E., Brunso, K., & Luten, J. (2010). Translating barriers into potential improvements: The case of new healthy seafood product development. *Journal of Consumer Marketing*, 27, 224–235.
- Altintzoglou, T., Vanhonacker, F., Verbeke, W., & Luten, J. (2011). Association of health involvement and attitudes towards eating fish on farmed and wild fish consumption in Belgium, Norway and Spain. *Aquaculture International*, 19, 475–488.
- Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, 45, 357.
- Ares, G., Giménez, A., & Gámbaro, A. (2008). Understanding consumers' perception of conventional and functional yogurts using word association and hard ladderling. *Food Quality and Preference*, 19, 636–643.
- Ashton-James, C., Van Baaren, R. B., Chartrand, T. L., Decety, J., & Karremans, J. (2007). Mimicry and me: The impact of mimicry on self-construal. *Social Cognition*, 25, 518–535.
- Berg, B. L., Lune, H., & Lune, H. (2004). *Qualitative research methods for the social sciences*. Vol. 5. Boston, MA: Pearson.
- Boddy, C. (2005). Projective techniques in market research: Valueless subjectivity or insightful reality. *International Journal of Market Research*, 47, 239–254.
- Brunso, K., Hansen, K., Scholderer, J., Honkanen, P., Olsen, S., Verbeke, W., & Børresen, T. (2008). Consumer attitudes and seafood consumption in Europe. *Improving Seafood Products for the Consumer*, 16–39.
- Brunso, K., Verbeke, W., Ottar Olsen, S., & Fruensgaard Jeppesen, L. (2009). Motives, barriers and quality evaluation in fish consumption situations: Exploring and comparing heavy and light users in Spain and Belgium. *British Food Journal*, 111, 699–716.
- Catterall, M., & Ibbotson, P. (2000). Using projective techniques in education research. *British Educational Research Journal*, 26, 245–256.
- Claret, A., Guerrero, L., Ginés, R., Grau, A., Hernández, M. D., Aguirre, E., ... Rodríguez-Rodríguez, C. (2014). Consumer beliefs regarding farmed versus wild fish. *Appetite*, 79, 25–31.
- Claret, A., Guerrero, L., Gartzia, I., Garcia-Quiroga, M., & Ginés, R. (2016). Does information affect consumer liking of farmed and wild fish? *Aquaculture*, 454, 157–162.
- Couger, J. D. (1990). Ensuring creative approaches in information system design. *Managerial and Decision Economics*, 11, 281–295.
- Couger, J. D. (1995). Creative Problem Solving and Opportunity Finding. *Decision making in operations management series* (95th Edition). Boyd & Fraser Pub Co.
- De Bono, E. (2010). *Lateral thinking: a textbook of creativity*. Penguin UK, 105–116.
- Doherty, S., & Nelson, R. (2010). Using projective techniques to tap into consumers' feelings, perceptions and attitudes... getting an honest opinion. *International Journal of Consumer Studies*, 34, 400–404.
- Donoghue, S. (2000). Projective techniques in consumer research. *Journal of Family Ecology and Consumer Sciences/Tydskrif vir Gesinsekologie en Verbruikerswetenskappe*, 28.
- Eurostat (2016). *Main aquaculture producing EU countries*. Vol. 2016, European Commission.
- Füller, J., Hutter, K., & Faullant, R. (2011). Why co-creation experience matters? Creative experience and its impact on the quantity and quality of creative contributions. *R&D Management*, 41, 259–273.
- Garfield, M. J., Taylor, N. J., Dennis, A. R., & Satzinger, J. W. (2001). Research report: Modifying paradigms—Individual differences, creativity techniques, and exposure to ideas in group idea generation. *Information Systems Research*, 12, 322–333.
- Griffin, A., & Hauser, J. R. (1993). The voice of the customer. *Marketing Science*, 12, 1–27.
- Grunert, K. G., Lähteenmäki, L., Asger Nielsen, N., Poulsen, J. B., Ueland, O., & Åström, A. (2001). Consumer perceptions of food products involving genetic modification—Results from a qualitative study in four Nordic countries. *Food Quality and Preference*, 12, 527–542.

- Guerrero, L., Claret, A., Verbeke, W., Enderli, G., Zakowska-Biemans, S., Vanhonacker, F., ... Hersleth, M. (2010). Perception of traditional food products in six European regions using free word association. *Food Quality and Preference*, 21, 225–233.
- Hall, T. E., & Amberg, S. M. (2013). Factors influencing consumption of farmed seafood products in the Pacific northwest. *Appetite*, 66, 1–9.
- Hayes, A. F., & Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures*, 1, 77–89.
- Higgins, J. M. (1994). *101 creative problem solving techniques: The handbook of new ideas for business*. New Management Publishing Company.
- Higgins, J. M. (1996). Innovate or evaporate: Creative techniques for strategists. *Long range planning*. Vol. 29. (pp. 370–380).
- Koupric, M., & Visser, F. S. (2009). A framework for empathy in design: Stepping into and out of the user's life. *Journal of Engineering Design*, 20, 437–448.
- Krystallis, A., Banovic, M., Guerrero, L., & Reinders, M. (2015). *Perceived consumer value towards new farmed fish species: A psychographic segmentation in top-five EU markets*. In EAAE-AAEA Joint Seminar - Consumer Behavior in a Changing World: Food, Culture, Society/Italy: Naples.
- Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing*, 18, 503–520.
- Leek, S., Maddock, S., & Foxall, G. (2000). Situational determinants of fish consumption. *British Food Journal*, 102, 18–39.
- Leonard, D., & Rayport, J. F. (1997). Spark innovation through empathic design. *Harvard Business Review*, 75, 102–115.
- Lilienfeld, S. O., Wood, J. M., & Garb, H. N. (2000). The scientific status of projective techniques. *Psychological Science in the Public Interest*, 1, 27–66.
- Lindzey, G. (1959). On the classification of projective techniques. *Psychological Bulletin*, 56, 158.
- Mueller Loose, S., Peschel, A., & Grebitus, C. (2012). Influence of convenience on healthy food choice: The case of seafood. In *2012 annual meeting, august 12–14, 2012*. Seattle, Washington: Agricultural and Applied Economics Association.
- O'herm, M., & Rindfleisch, A. (2010). Customer co-creation. In N. K. (Ed.), *Review of marketing research, review of marketing research*. 6. (pp. 84–106).
- Olsen, S. O., Scholderer, J., Brunsø, K., & Verbeke, W. (2007). Exploring the relationship between convenience and fish consumption: A cross-cultural study. *Appetite*, 49, 84–91.
- Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.
- Pieniak, Z., Verbeke, W., Scholderer, J., Brunsø, K., & Olsen, S. O. (2007). European consumers' use of and trust in information sources about fish. *Food Quality and Preference*, 18, 1050–1063.
- Pieniak, Z., Vanhonacker, F., & Verbeke, W. (2013). Consumer knowledge and use of information about fish and aquaculture. *Food Policy*, 40, 25–30.
- Potts, J., Hartley, J., Banks, J., Burgess, J., Cobcroft, R., Cunningham, S., & Montgomery, L. (2008). Consumer co-creation and situated creativity. *Industry and Innovation*, 15, 459–474.
- Roininen, K., Arvola, A., & Lähteenmäki, L. (2006). Exploring consumers' perceptions of local food with two different qualitative techniques: Laddering and word association. *Food Quality and Preference*, 17, 20–30.
- Schlag, K. A., & Ystgaard, K. (2013). Europeans and aquaculture: Perceived differences between wild and farmed fish. *British Food Journal*, 115, 209–222.
- Stefani, G., Scarpa, R., & Cavicchi, A. (2012). Exploring consumer's preferences for farmed sea bream. *Aquaculture International*, 20, 673–691.
- Steinman, R. B. (2008). Projective techniques in consumer research. *Northeastern association of business, economics, and technology proceedings* (pp. 253–261).
- Sujan, M., & Bettman, J. R. (1989). The effects of brand positioning strategies on consumers' brand and category perceptions: Some insights from schema research. *Journal of Marketing Research*, 454–467.
- Thurstan, R. H., & Roberts, C. M. (2014). The past and future of fish consumption: Can supplies meet healthy eating recommendations? *Marine Pollution Bulletin*, 89, 5–11.
- Van Kleef, E., van Trijp, H. C., & Luning, P. (2005). Consumer research in the early stages of new product development: A critical review of methods and techniques. *Food Quality and Preference*, 16, 181–201.
- Verbeke, W., Sioen, I., Brunsø, K., De Henauw, S., & Van Camp, J. (2007a). Consumer perception versus scientific evidence of farmed and wild fish: Exploratory insights from Belgium. *Aquaculture International*, 15, 121–136.
- Verbeke, W., Vanhonacker, F., Sioen, I., Van Camp, J., & De Henauw, S. (2007b). Perceived importance of sustainability and ethics related to fish: A consumer behavior perspective. *AMBIO: A Journal of the Human Environment*, 36, 580–585.
- Verbeke, W., Pieniak, Z., Brunsø, K., Scholderer, J., Olsen, S., & Børresen, T. (2008). Evaluating consumer information needs in the purchase of seafood products. *Improving Seafood Products for the Consumer*, 63–84.
- Vidal, L., Ares, G., & Giménez, A. (2013). Projective techniques to uncover consumer perception: Application of three methodologies to ready-to-eat salads. *Food Quality and Preference*, 28, 1–7.
- Von Hippel, E. (2005). Democratizing innovation: The evolving phenomenon of user innovation. *Journal für Betriebswirtschaft*, 55, 63–78.
- Wedel, M., & Pieters, R. (2012). *Visual marketing: From attention to action*. Psychology Press.
- Welch, A., Lund, E., Amiano, P., Dorronsoro, M., Brustad, M., Kumle, M., ... Jansson, J. (2002). Variability of fish consumption within the 10 European countries participating in the European investigation into cancer and nutrition (EPIC) study. *Public Health Nutrition*, 5, 1273–1285.
- Young, J. A., Brugere, C., & Muir, J. F. (1999). Green grow the fishes-oh? Environmental attributes in marketing aquaculture products. *Aquaculture Economics and Management*, 3, 7–17.