



Deliverable Report

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Deliverable Title	Development of the product mock-ups for use in the experimentation with consumers in the five countries investigated		
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Task Title:	Optimization of intrinsic-extrinsic attribute combinations		
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Objective: The general objective of Deliverable 29.5 is to develop the product mock-ups for use in the experimentation with consumers in the five countries investigated (i.e. France, Germany, Italy, Spain and the United Kingdom). This deliverable incorporates the work done in WPs 28 and in Tasks 29.1 and 29.2. In this respect, a number of extrinsic quality attributes (i.e., product labelling elements that function as quality cues, for instance quality certifications, health claims etc.) is incorporated into the physical product prototypes developed in WP7.2 to generate experimental product mock-ups with optimal intrinsic-extrinsic attribute combinations.

Description: Deliverable D29.5 contains the following information: (i) the methodology used for development of mock-ups, and (ii) development of mock-ups for the experiments that include (a) images of the developed product ideas; (b) review of the consumer studies; (c) secondary analysis of the data on newly launched fish products, and (d) the experimental design.



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1. Objective

The general objective of this report was to develop the product mock-ups for use in the experimentation with consumers in the five countries investigated (i.e., Germany, France, United Kingdom, Italy and Spain). This is done drawing on the information obtained from Work Package 28 (reported in the Deliverables 28.1, 28.2, 28.3 and 28.4), as well as Tasks 29.1 and 29.2 (reported in the Deliverables 29.2 and 29.3). In this respect and in this report, a number of extrinsic quality attributes have been incorporated into the physical product prototypes developed in Work Package 7.2 to generate experimental product mock-ups with optimal intrinsic-extrinsic attribute combinations.

2. Methodology

In this sub-task 29.3.1, six products have been selected for the development of the product mock-ups based on Deliverable 29.3 (see **Table 1**). These products have also been approved by other Diversify partners, both researchers and industrial participants, involved in Work Packages 27 to 30. However, only two products will be selected for the experiments in the sub-task 29.3.2, depending on the results from Deliverable 29.4 and additional fine tuning and discussion with our industrial partners.

Table 1. Selected products for the development of product mock-ups.

Fish species	Product ideas and developed product prototypes
Meagre	Idea 6: Fish burgers shaped as fish (H) Idea 4: Ready to eat meal: salad with fish (L)
Pikeperch	Idea 9: Fish spreads/pate (H)
Grey mullet	Idea 2: Thin smoked fillets (M) Idea 33: Ready-made fish fillets in olive oil (M)
Greater Amberjack	Idea 34: Fresh fish steak for grilling in the pan (L)

L: low processing; M: mid processing; H: high processing.

*See deliverables D28.2 and D28.4 to have a detailed description of each product.

In order to develop product mock-ups, select the most important combination of intrinsic-extrinsic product attributes for targeted consumer segments established in Sub-task 29.1.1 (see Deliverable 29.2), and prepare experimental set-ups for subsequent Sub-task 29.3.2, this report follows a four-step approach:

- i) First, pictures have been taken of the developed physical product prototypes in the proper packaging and without any labelling information, in order to resemble as much as possible the final products.
- ii) Subsequently, a literature review of previous consumer studies that involved experimental set-ups with fish products (i.e. Conjoint or Discrete Choice experiments) has been undertaken to cease the most important product attributes and their levels.
- iii) Following, a crosscheck of the findings from the previous studies with existing secondary data on new fish product launches has been undertaken based on datasets from the Mintel¹ Global New Products Database (GNPD).

¹ The Mintel Global New Products Database (GNPD) (<http://www.gnpd.com/>) monitors product innovation and retail success in consumer packaged goods markets worldwide. GNPD offers unrivalled coverage of new product activity for competitor monitoring, category awareness, opportunity identification and inspiration for new product development.



- iv) Finally, based on the above, an experimental design with product attributes and attribute levels has been proposed across developed product ideas.

In this way, the overall efficiency of this report is increased and product mock-ups are developed in a way that will ultimately contribute to the launch of new fish products within Diversify project and ultimately to their placement in the European fish markets.

3. Development of product mock-ups

3.1 Images of the developed product ideas

The images of all six physical product prototypes have been taken by a professional with high resolution camera with each image having at least 5" x 4" (3750 x 3000 pixels) at 300 dpi on the white background. This is done in order to obtain a sharp reproduction of fish product images for our experiments. Images are further manipulated in GIMP Image Manipulation Program and set on a black background in a 1280 x 1024 pixels resolution where the image was centred and set within the square of 1080 x 700 pixels. In this respect, **Figure 1** shows images before and **Figure 2** after manipulation. Manipulated images of each product idea thus constitute the stimuli for the experiments in the subsequent task 29.3.2.

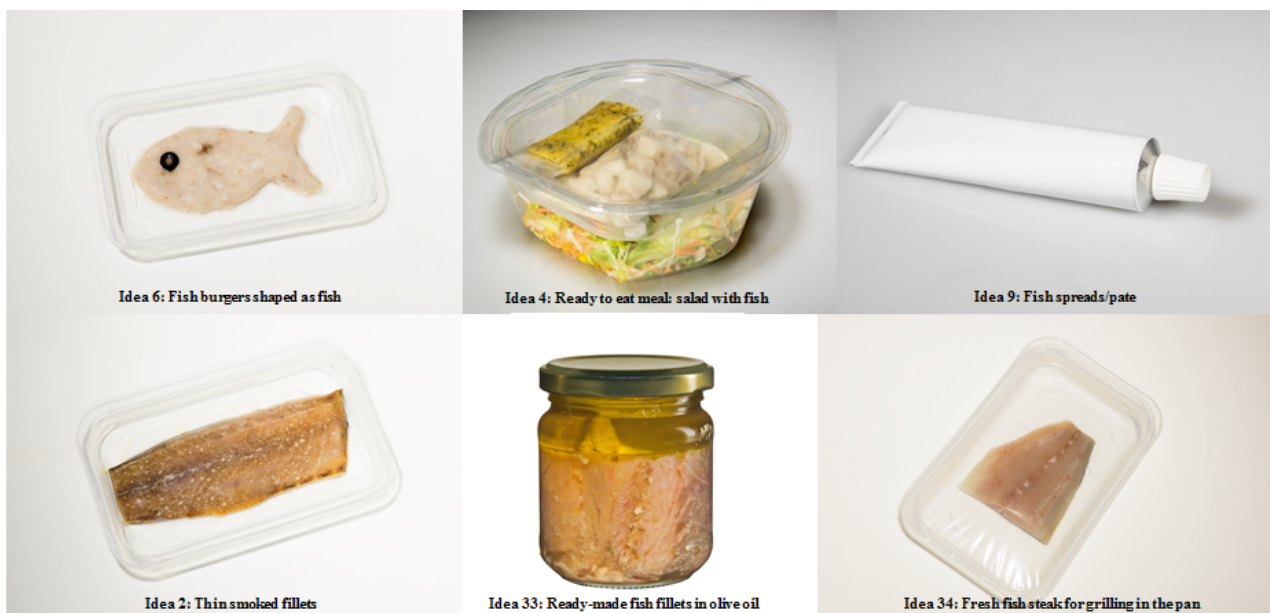


Figure 1. Images of developed product ideas before manipulation.



Figure 2. Images of developed product ideas after manipulation.

3.2 Review of relevant consumer studies

Review of previous literature with regard to fish product experiments may assist in selection of the most important extrinsic product attributes (i.e. product labeling elements). **Table 2** provides key references in relation to fish products and different experimental set-ups. References are mainly related to studies that have applied conjoint or discrete choice experimental designs in a fish context, as subsequent Sub-task 29.3.2 will apply similar designs to ascertain final combination of attributes with highest consumer value perceptions per product. Additionally, **Table 2** presents a condensed description of prior studies underlying operating procedure and including product attributes tested, as well as their levels. In summary, previous research reports show that most important attributes in relation to fish products are:

- country of origin (e.g. domestic vs imported);
- price (attribute levels vary depending on species and countries);
- storage conditions (e.g. fresh vs frozen);
- production method (e.g. wild caught vs farmed);
- organic and natural claims (e.g. organic salmon: yes vs no);
- certification labels (e.g. certified for sustainability vs certified for quality vs uncertified);
- ethical animal claims (e.g. fewer salmon suffer from external injuries: yes vs no), and
- brand (e.g. manufacturer vs retail brand).

Table 2. Recent references of methods and product attribute levels for opportunity identification in development of product mock-ups

Reference	Method	Region	Product	Attribute levels
Uchida, Onozaka, Morita, and Managi (2014)	Conjoint analysis	Japan	Salmon fillet	<ul style="list-style-type: none"> - Country of origin: Hokkaido, Alaska, Norway, Chile - Production method: wild-caught, farmed - Ecolabel: labeled, no label - Price (yen per package): Hokkaido, Alaska, Norway: 275, 300, 325, 350, 375, 400 Chile: 200, 225, 250, 275, 300, 325
Grimsrud, Nielsen, Navrud, and Olesen (2013)	Discrete choice analysis	Norway	Salmon	<ul style="list-style-type: none"> - Fewer salmon suffer from deformities: yes, no - Fewer salmon suffer from external injuries: yes, no - Greater resistance to disease, less use of pharmaceuticals, and less trace of pharmaceuticals: yes, no - Greater resistance to lice resulting in less use of chemicals and less infection of wild salmon stocks: yes, no - Extra earmarked tax, NOK per household per year
Claret, et al. (2012)	Conjoint analysis	Spain	Hypothetical Sea Fish	<ul style="list-style-type: none"> - Country of origin: Spain, Morocco, Norway - Production method: wild-caught, farmed - Storage conditions: fresh, frozen - Purchasing price (€/kg): 6, 12, 18
Davidson, Pan, Hu, and Poerwanto (2012)	Conjoint analysis	Hawaii	Salmon, Tuna, Tilapia, Moi	<ul style="list-style-type: none"> - Production method: wild-caught, farmed (salmon, tuna, tilapia); wild-caught, farmed, ocean-based, farm raised-land based (moi) - Storage conditions: fresh, frozen (all) - Country of origin: domestic, import (salmon) - Claims: turtle safe – yes, no (tuna); natural veggie-based feed – yes, no (tilapia) - Price (lb): 4.99, 6.99, 8.99, 10.99 (salmon, moi); 8.99, 14.49, 19.99, 25.49 (tuna); 1.99, 3.99, 5.99 (tilapia)
Olesen, Alfnes, Røra, and Kolstad (2010)	Discrete choice analysis	Norway	Salmon	<ul style="list-style-type: none"> - Organic Salmon: yes, no - Freedom Food Salmon: yes, no - Conventional Salmon: yes, no - Colour: 5 color categories - Price (NOK for 400 gr salmon): 24,30,36,42,48 (36,42,48,54,60 for Organic and Freedom food Salmon)
Ariji (2010)	Conjoint analysis	Japan	Tuna	<ul style="list-style-type: none"> - Production method: wild-caught, farmed, full-cycle farmed - Production location: domestic production, overseas production - Ecofriendly label: with ecofriendly label, without ecofriendly label - Price (yen per piece of sushi): 200, 300, 400, and 500
Jaffry, Pickering, Ghulam, Whitmarsh, and Wattage (2004)	Discrete choice analysis	UK	Different fish products	<ul style="list-style-type: none"> - Product type: fresh and chilled cod fillets, fresh and chilled salmon steaks, tinned tuna, frozen fish fingers, smoked haddock fillets, frozen prawns - Certification label: certified for sustainability, certified for quality, uncertified - Certifier: non-governmental, governmental - Country of origin: UK, foreign, UN-stated - Production method: wild-caught fish, farmed fish - Product specific price: low, medium, high, very high - Brand: retailer's brand, manufacturer's brand

3.3 Analysis of secondary data on newly launched fish products

The secondary analysis of the existing data on newly launched products can additionally assist in the selection and fine tuning of the most important extrinsic product attributes for fish products, as it provides a clear picture of the existing products in the marketplace and what works for consumers (Proctor, 2005; Van Kleef, van Trijp, & Luning, 2005). Therefore, to have a clear picture of the newly launched fish products in the five European countries investigated, an extensive search has been undertaken in Mintel GNDP Database. The search of newly launched fish products has been carried out during June 2016. Additionally, it has been limited to new products launched from 1st of January 2011 to 31st of May 2016. Additionally, the search has also been restricted to the products belonging to the “Fish product category” (existing in Mintel GNDP Database) as well as to the product ideas developed in the DIVERSIFY project (**Table 1**). Therefore, the information on the number of new products launches, prices, certification logos and the claims has been accessed for the last five years and for five countries investigated (*i.e.* France, Germany, Italy, Spain and the United Kingdom).

With the use of the collected data, conclusions were drawn about the average prices, the logos and labels mostly used, and the overall product attributes from previous research cross-checked. This is done in order to obtain additional information on the labeling and extrinsic attributes with regards to newly launched fish products on the European marketplace with emphasis on the five countries investigated (*i.e.* France, Germany, Italy, Spain and the United Kingdom) and developed product ideas within Diversify project (**Table 1**). Finally, prices, claims, and logos of the selected products were listed and then summarized to demonstrate overall similarities and differences across countries. Additionally, cross-comparison of the real-life data provided from Mintel GNDP Database with primary data obtained from the DIVERSIFY project (see Deliverable 28.1) allowed for a more effective generation of product mock-ups that can subsequently be tested in sub-task 29.3.2 with consumers from the identified market segments (see Deliverable 29.2 for more information). The secondary data analysis has been undertaken separately for each product idea (see **Table 1**) and presented below.

3.3.1 *Fish burgers shaped as fish*

Product idea - fish burgers shaped as fish is a high processing product that cannot be found on the market in its proposed shape. However, fish burgers are very much present as products on the European marketplace and in the past five years (January 2011 – June 2016) there have been 36 newly launched fish burgers in five countries investigated (see **Figure 3**).

According to Mintel GNDP Database, prices of fish burgers range from 1 to 5 euros per 100 gr of product weight depending on the fish species used for manufacturing of fish burgers across investigated countries (see **Table 3**). Most often used claims are nutritional and health claims (**Table 4**), *i.e.* ‘Omega3’ and ‘improves cardiovascular function’. Use of logos varies across the countries (**Table 5**), but then again is linked to environmental and ethical claims.

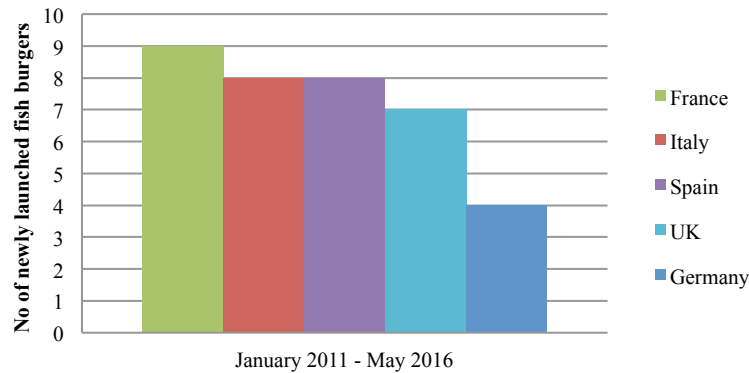


Figure 3. Number of newly launched products similar to fish burgers, Mintel (2016).

Table 3. Prices of newly launched product similar to fish burgers.

Fish species	Price range (average) per country (€/100gr)					Overall
	France	Germany	Italy	Spain	UK*	
Salmon	1.00-3.48 (2.21)	1.38-1.8 (1.59)	1.25-1.33 (1.29)	1.68-2.30 (1.91)	1.27-1.48 (1.38)	
Tuna	-	-	2.50 (2.50)	1.25 (1.25)	-	
Cod	1.15 (1.10)	-	-	1.68 (1.68)	1.40 (1.40)	
Hake	1.15 (1.15)	-	-	-	-	
Pollock	0.97 (0.97)	-	-	-	1.26-1.40 (1.34)	
Unspecified fish	-	-	2.22 (2.22)	-	-	
All fish species	0.97-3.48 (1.76)	1.38-1.80 (1.59)	1.25-2.50 (1.83)	1.25-2.30 (1.73)	1.26-1.48 (1.36)	0.97-3.48 (1.61)

*Conversion rate (1 pound = 1.27 euros) on 10th of May 2016.

Source: Mintel (2016).

**Table 4.** Most often used claims for newly launched products similar to fish burgers.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Ethical & environmental	Responsible sourced			x		x
Nutritional	Omega3		x	x	x	x
	High in protein	x				x
	Reduced fat	x				
	No gluten				x	
	No lactose				x	
	Less salt/ iodine					x
Health	Good for bones					x
	Improves cardiovascular function		x	x	x	
	Brain Function					x
	Improves Immune System					x

Source: Mintel (2016).

Table 5. Most often used logos for newly launched products similar to fish burgers.

Category	Logo	Countries				
		France	Germany	Italy	Spain	UK
Organic production	EU leaf (Ecocert)	x				
	AB logo	x				
Ethical Animal Sustainability	Dolphin Safe				x	
	Forever Fish					x
	Forever Food					x

Source: Mintel (2016).

3.3.2 Ready to eat meal - salad with fish

Product idea ready to eat meal - salad with fish is a low processing product that cannot be found so easily at the marketplace. According to Mintel GNDP Database in the last five years (January 2011 – June 2016) there have been approximately 50 newly launched fish products similar to ready to eat meal – salad with fish (**Figure 4**). Prices of ready to eat meal - salad with fish vary in newly launched products and across investigated countries from 0.49 to 2.28 euros per 100 gr of weight (**Table 6**). In terms of claims, besides convenience claims, only one nutritional claim was used in UK and related to reduce fat content (**Table 7**). The certified logos are not used in ready to eat meal – salad with fish.

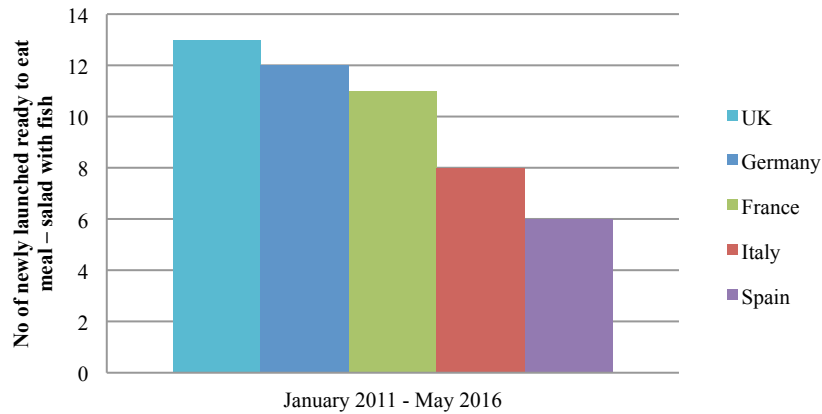


Figure 4. Number of newly launched fish products similar to ready to eat meal – salad with fish, Mintel (2016).

Table 6. Prices of newly launched products similar to ready to eat meal - salad with fish.

Fish species	Price range (average) per country (€/100gr)					Overall
	France	Germany	Italy	Spain	UK*	
Salmon	1.48-1.92 (1.70)	-	-	-	2.28 (2.28)	
Tuna	0.85-1.20 (1.04)	1.00-1.18 (1.06)	-	0.49-1.10 (0.87)	0.66 (0.66)	
<i>All fish species</i>	0.85-1.92 (1.30)	1.00-1.18 (1.06)	-	0.49-1.10 (0.87)	0.66-2.28 (1.47)	0.49-2.28 (1.19)

*Conversion rate (1 pound = 1.27 euros) on 10th of May 2016.

Source: Mintel (2016).

Table 7. Most often used claims for newly launched products similar to ready to eat meal - salad with fish.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Nutritional	Reduced fat					x
Convenience	Easy to use	x	x	x	x	x

Source: Mintel (2016).

3.3.3 Fish spreads/pate

Product idea - fish spreads/pate are common product on the market, according to Mintel GNDP Database. However, there have been only 19 newly launched fish products similar to fish spreads/pates, and mainly in France, Spain, UK, and Italy (**Figure 5**). According to Mintel GNDP Database, prices of fish spreads/pate



range from 0.42 to 3.43 euros per 100 gr of product weight depending on the fish species that have been used for its production across investigated countries (**Table 8**). Most often used claims are ‘ethical and environmental’ and nutritional claims, i.e., ‘responsibly sourced’ and ‘Omega3’ (**Table 9**). Logos used are mainly related to organic production (**Table 10**).

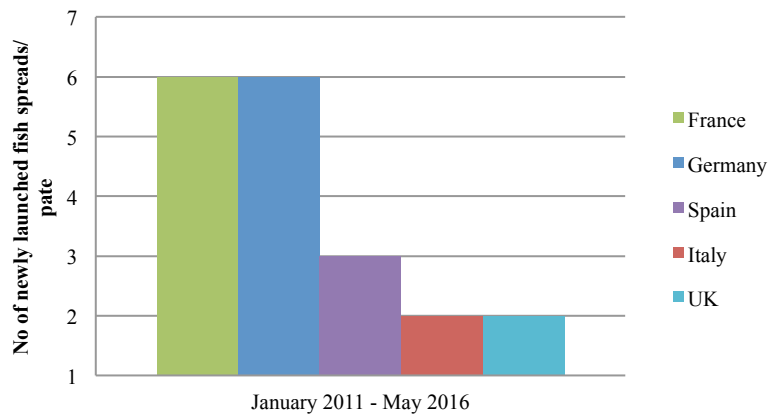


Figure 5: Number of newly launched fish spreads/pate, Mintel (2016).

Table 8. Prices of newly launched products similar to fish spreads/pate.

Fish species	Price range (average) per country (€/100gr)					Overall
	France	Germany	Italy	Spain	UK*	
Salmon	3.43 (3.43)	2-4.17 (3.09)	-	1.54 (1.54)	0.76-1.34 (1.10)	
Trout	5.00 (5.00)	-	-	-	-	
Tuna	1.6-1.66 (1.63)	1.26-3.47 (2.30)	1.19 (1.19)	1.73-2 (1.87)	-	
Cod	0.70 (0.70)	-	-	-	-	
Cod Liver	-	-	-	1.89 (1.89)	-	
Anchovy	2.00 (2.00)	1.00-3.18 (2.09)	-	-	-	
Mackerel	-	2.08 (2.08)	-	-	-	
Sardine	-	-	-	-	0.76 (0.76)	
Unspecified fish	-	-	-	-	0.42- 0.51 (0.47)	
All species	0.70-5.00 (2.40)	1.00- 4.17 (2.42)	1.19 (1.19)	1.54-2.00 (1.79)	0.42-1.38 (0.83)	0.42-5.00 (1.85)

*Conversion rate (1 pound = 1.27 euros) on 10th of May 2016.

Source: Mintel (2016).



Table 9. Most often used claims for newly launched products similar to fish spreads/pate.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Ethical & environmental	Responsible sourced		x	x	x	
Nutritional	Omega3	x		x		x
	High in protein	x				x
	No gluten				x	
Health	Improves cardiovascular function			x		

Source: Mintel (2016).

Table 10. Most often used logos for newly launched products similar to fish spreads/pate.

Category	Logo	Countries				
		France	Germany	Italy	Spain	UK
Organic production	EU leaf (Ecocert)	x	x			
	AB logo	x	x			
Ethical Animal	Dolphin Safe		x		x	
Sustainability	Friends of sea			x		
	MSC - Marine Stewardship Council		x			

Source: Mintel (2016).

3.3.4 Thin smoked fillets

Product idea – thin smoked fillets are medium processed product. There has been only 16 newly launched fish products similar to thin smoked fillets in the last five years on the European market, and mainly in France (**Figure 6**). According to Mintel GNDP Database, prices of thin smoked fillets have quite a wide range from 0.88 to 10 euros per 100 g of product weight depending mainly on the fish species (**Table 11**). Most often used claims are ‘ethical and environmental’ and nutritional claims, i.e., ‘responsibly sourced’ and ‘Omega 3’ (**Table 12**). Logos used are mainly related to organic production (**Table 13**).

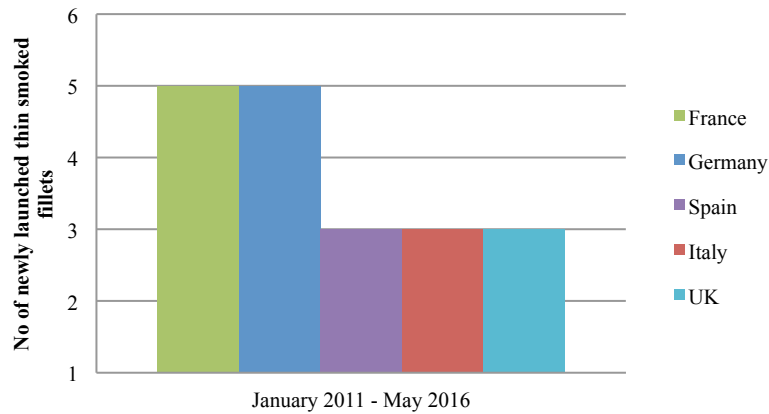


Figure 6. Number of newly launched products similar to thin smoked fillets, Mintel (2016).

Table 11. Prices of of newly launched products similar to thin smoked fillets.

Fish species	Price range (average) per country (€/100gr)					Overall
	France	Germany	Italy	Spain	UK*	
Salmon	2.60-9.50 (5.03)	1.60-5.38 (3.25)	3.58-10.00 (6.36)	2.15-7.50 (4.58)	2.03-2.12 (2.08)	
Tuna	-	-	4.50 (4.50)	-	-	
Trout	-	1.92 – 4.00 (2.96)	-	-	-	
Organic Trout	2.76 (2.76)	-	-	-	-	
Mackerel	1.33 (1.33)	-	-	-	2.22 (2.22)	
Herrin	0.88 (0.88)	1.25 (1.25)	-	-	-	
Swordfish	-	-	3.00 (3.00)	-	-	
All species	0.88-9.50 (3.76)	1.25-5.38 (2.88)	3.00 – 10.00 (5.31)	2.15-7.50 (4.77)	2.03-2.22 (2.08)	0.88-10 (3.76)

*Conversion rate (1 pound = 1.27 euros) on 10th of May 2016.

Source: Mintel (2016).



Table 12. Most often used claims for newly launched products similar to thin smoked fillets.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Ethical & environmental	Responsible sourced	x	x	x	x	x
	Ethical animal (fish welfare)	x				
Nutritional	Omega3	x	x	x	x	x
	High in protein	x			x	
	No gluten		x		x	
	Reduced fat	x		x		
	Less salt/iodine				x	
	Vitamin/Mineral fortified	x				
Health	Improves cardiovascular function	x			x	
Natural	No GMO fed	x		x		
	No hormones			x		

Source: Mintel (2016).

Table 13. Most often used logos for newly launched products similar to thin smoked fillets.

Category	Logo	Countries				
		France	Germany	Italy	Spain	UK
Organic production	EU leaf (Ecocert)	x			x	
	AB logo	x				
	AGRIconfiance logo	x				
Sustainability	Responsibly farmed					x
	ASC - Aquaculture Stewardship Council		x		x	
	MSC - Marine Stewardship Council	x	x			
	Forever fish					x
Multiple certifications	Certicofiance	x				

Source: Mintel (2016).

3.3.5 Ready-made fish fillets in olive oil

Ready-made fish fillets in olive oil are very common product in Italy where in the last five years 132 similar products have been launched (**Figure 7**). According to Mintel GNDP Database prices of newly launched products similar to fish fillets in olive oil vary from 1.00 to 6.50 euros (**Table 14**). Most often used claims and logos are mainly related to ethical and environmental claims and logos (**Tables 15 and 16**).

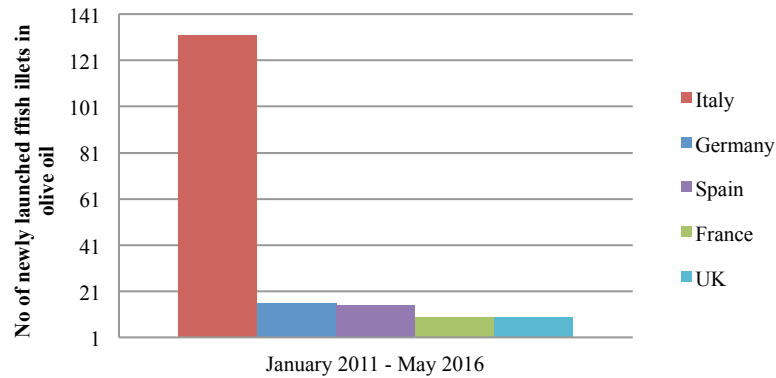


Figure 7. Number of newly launched products similar to ready-made fish fillets in olive oil, Mintel (2016).

Table 14. Prices of newly launched products similar to fish fillets in olive oil.

Fish species	Price range (average) per country (€/100gr)					Overall
	France	Germany	Italy	Spain	UK*	
Tuna	1.96- 4.00 (3.00)	1.57 - 2.77 (1.91)	1.00-4.3 (2.28)	1.56 (1.56)	-	
Anchovy	-	-	4.44 (4.44)	-	2.01-2.83 (2.42)	
Mackerel	-	-	1.50 (1.50)	2.49 (2.49)	-	
Swordfish	-	-	3.30 (3.30)	-	-	
Seabass Organic	-	-	6.50 (6.50)	-	-	
All species	1.96-4.00 (3.00)	1.57-2.77 (1.91)	1.00-6.5 (3.02)	1.56-2.49 (2.03)	2.01-2.83 (2.42)	1.00-6.50 (2.68)

*Conversion rate (1 pound = 1.27 euros) on 10th of May 2016.

Source: Mintel (2016).

Table 15. Most often used claims for newly launched products similar to fish fillets in olive oil.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Ethical & environmental	Responsible sourced		x	x		
	Ethical animal (fish welfare)					
Nutritional	Omega3			x		
	No allergen			x		
	No gluten			x		

Source: Mintel (2016).



Table 16. Most often used logos for newly launched products similar to fish fillets in olive oil.

Category	Logo	Countries				
		France	Germany	Italy	Spain	UK
Organic production	Bioagri Cert			X		
Sustainability	MSC - Marine Stewardship Council		X			
	Friends of sea			X		
Ethical animal	Dolphin safe		X	X		
Multiple certifications	Quality with responsibility		X			

Source: Mintel (2016).

3.3.6 Fresh fish steak for grilling in the pan

There has been only handful of new products similar to fresh fish steak launched at the European marketplace and across investigated countries (**Figure 8**). Prices of newly launched products similar to fish steak for grilling in the pan vary from 0.68 to 4.07 euros (**Table 17**). Similar to previous products most often used claims and logos are again in relation to environment, ethics and sustainability (**Tables 18 and 19**).

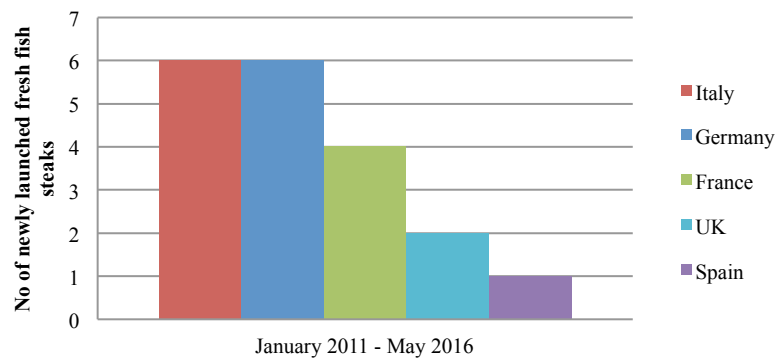


Figure 8. Number of newly launched products similar to fresh fish steak for grilling in the pan, Mintel (2016).



Table 17. Prices of newly launched products similar to fresh fish steak for grilling in the pan.

Fish species	Price range (average) per country (€/100gr)					Total
	France	Germany	Italy	Spain	UK	
Salmon	1.60-4.07 (2.44)	1.11 -1.60 (1.36)	-	-	1.17-2.37 (1.77)	
Tuna	-	1.60-2.50 (2.03)	1.6-3.04 (2.32)	2.00 (2.00)	-	
Swordfish	-	-	1.8-2 (1.9)	-	-	
Blue Shark	-	-	0.68 (0.68)	-	-	
All species	1.60 – 4.07 (2.67)	1.11-2.00 (1.76)	0.68-3.04 (1.82)	2.00 (2.00)	1.17-2.37 (1.77)	0.68-4.07 (2.04)

*Conversion rate (1 pound = 1.27 euros) on 10th of May 2016.

Source: Mintel (2016).

Table 18. Most often used claims for newly launched products similar to fresh fish steak for grilling in the pan.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Ethical & environmental	Responsible sourced	x	x	x	x	
Nutritional	Omega3	x		x	x	
Health	Improves cardiovascular function	x		x	x	
Natural	No GMO fed	x	x			

Source: Mintel (2016).

Table 19. Most often used logos for newly launched products similar to fresh fish steak for grilling in the pan.

Category	Logo	Countries				
		France	Germany	Italy	Spain	UK
Organic production	EU leaf (Ecocert)	x				
	AB logo	x				
Sustainability	ASC - Aquaculture Stewardship Council	x				
	MSC - Marine Stewardship Council				x	
	Friends of sea			x		
Ethical animal	Dolphin safe		x	x		
Quality	Label Rouge Superior Quality	x			x	

Source: Mintel (2016).



3.3.7 Overall prices, claims and logos

In general, it is worth mentioning that very few fish products found in the Mintel GNPD Database are similar to the new fish product ideas of DIVERSIFY (e.g. greater Amberjack). Prices across products vary depending mainly on the fish species. This variation goes from +50% up to +200% of the average price per country. Therefore, for the experiments, variation for each product idea should be +50%, +100% or +200% from the average price (base: 0%).

Regarding the use of different claims across selected product ideas, claims most often used are nutritional and health, followed by ethical and environmental claims (**Table 20**). ‘Omega 3’ nutritional claim, followed by ‘high in protein’ and ‘no gluten’ are most often used across product ideas and countries. Thus, besides the rather obvious ‘Omega3’ claim, it would be pertinent to use claims such as ‘high in protein’ and ‘no gluten’, due to the most recent craze for proteins and healthy diet without gluten (Aiking, 2011).

Table 20. Most often used claims across all product ideas.

Category	Claim	Countries				
		France	Germany	Italy	Spain	UK
Ethical & environmental	Responsible sourced	x	x	x	x	x
	Ethical animal (Fish welfare)	x				
Nutritional	Omega3	x	x	x	x	x
	High in protein	x		x	x	x
	Reduced fat	x		x		
	No gluten		x	x	x	
	No lactose		x		x	
	No allergen			x		
	Less salt/ iodine				x	x
Health	Improves cardiovascular function	x	x	x	x	
	Good for bones					x
	Brain Function					x
	Improves Immune System					x
Natural	No GMO fed	x	x	x		
	No hormones			x		

Source: Mintel (2016).

Use of logos varies across the countries (**Table 21**), with the most commonly used being those on sustainability, organic and ethical production, that is ASC, MSC, EU leaf and Dolphin safe.

Based on the above, and in order to be able to compare products across countries, the proposed strategy for fish product ideas would be to use standardized design across countries.



Table 21. Most often used logos for newly launched products similar to fresh fish steak for grilling in the pan.

Category	Logo	Countries				
		France	Germany	Italy	Spain	UK
Organic production	EU leaf (Ecocert)	x	x		x	
	AB logo	x	x			
	AGRIconfiance	x				
	Bioagri Cert Organic			x		
Sustainability	ASC - Aquaculture Stewardship Council	x	x		x	
	MSC - Marine Stewardship Council	x	x		x	
	Friends of sea			x		
	Acquacoltura Sostenibile			x		
	Responsibly farmed					x
	Forever fish					x
	Forever food					x
	Ethical animal	Dolphin safe		x	x	x
Multiple certifications	Quality with responsibility		x			
	Certico fiance	x				
Quality	Label Rouge Superior					
	Quality	x				

Source: Mintel (2016).



3.4 Experimental design

In order to prepare mock-ups for the experiments in sub-task 29.3.2 (i.e. Discrete choice experiments) in the five countries investigated, the product attributes and attribute levels in the experimental design must be carefully chosen in order to reflect key product characteristics or dimensions which consumers may use to assess the newly developed fish products (Hair, 2009). In particular, the attributes should embrace the most relevant attributes to potential consumer segments (see Deliverable 29.2). Attribute levels correspond to the points along chosen attribute dimensions and should likewise cover most representative levels. As only two out of six product ideas will be tested across the investigated countries, the same attributes and their levels have to be assumed. This being said, and based on the previous literature review and secondary data analysis, the suggested attribute levels for product mock-ups, are as follows:

1. **Country of Origin** - (produced in EU/own country/produced outside of EU);
2. **Price** - 1, (50%, 100%, +200% of average price²);
3. **Nutritional claim** – Omega 3 (yes/no);
4. **Nutritional claim** – High in protein (yes/no); No gluten (yes/no);
5. **Nutritional claim** – No gluten (yes/no);
6. **Health claim** – Improves brain function (yes/no);
7. **Health claim** – Improves cardiovascular function (yes/no);
8. **Environmental claim** – ASC logo, responsibly sourced (yes/no), and
9. **Ethical claim** – Fish welfare logo (yes/no)

The above attributes and their levels were varied according to a $3^2 \times 2^7$ orthogonal design in SPSS statistical software as recommended by Addelman (1962) and Hair (2009) which produced 30 experimental sets (**Table 22**). The design was further partitioned into ten versions of choice set size of three that will be randomly assigned to consumers (**Table 23**) (Train, 2009).

Product mock-up stimuli will be presented in a visual shelf simulation mimicking realistic purchase decision and in order to capture subliminal effects of different labelling information. The example of the graphical simulation of the product idea is presented in **Figure 9**. Thus, to conduct the choice experiment, consumers will be first asked to imagine that they want to buy a fish product from aquaculture production to eat with their family and/or friends. In each screen, they will be asked to indicate the product they are most likely to choose and if that would be their realistically purchased product (see example in **Figure 9**).

By assessing consumer choice of different product attributes and their levels, the valuation of the assigned information and ways how it affects consumer decision-making and choice of fish products will be better understood contributing ultimately to the launch of new fish products at the European fish markets.

²Average price for each product idea based on the secondary data analysis of new product launches from Mintel GNDP Database, see section 3.3.

**Table 22.** Proposed orthogonal design for each product idea.

Stimuli	Price	Country of Origin	ASC logo	Ethical Animal logo	Omega3	High in Protein	No Gluten	Brain Function	Improves Cardiovascular Function
1	200%	Produced outside of EU	no	no	yes	yes	no	no	no
2	50%	Own Country	no	no	yes	no	yes	yes	no
3	50%	Own Country	no	no	yes	yes	no	no	yes
4	200%	Own Country	no	no	no	yes	yes	no	no
5	50%	EU produced	no	yes	no	yes	yes	yes	no
6	200%	Own Country	yes	yes	no	no	no	yes	yes
7	100%	EU produced	no	no	no	no	no	yes	yes
8	100%	EU produced	no	no	yes	yes	yes	no	no
9	200%	EU produced	no	no	yes	no	yes	no	no
10	50%	Outside of EU	no	yes	no	no	no	no	no
11	50%	Own Country	yes	yes	yes	no	no	no	no
12	50%	Outside of EU	no	no	yes	no	yes	no	yes
13	100%	Outside of EU	no	no	yes	no	no	no	no
14	200%	Outside of EU	no	yes	no	no	yes	no	yes
15	100%	EU produced	no	yes	no	yes	no	no	no
16	50%	EU produced	no	no	no	no	no	no	no
17	50%	Outside of EU	yes	no	no	yes	no	no	no
18	100%	Own Country	no	no	no	yes	no	yes	no
19	50%	Outside of EU	no	no	no	no	yes	yes	yes
20	50%	EU produced	yes	no	no	no	no	no	yes
21	200%	EU produced	yes	no	yes	no	no	yes	no
22	100%	Own Country	no	no	no	no	no	no	yes
23	200%	Outside of EU	yes	no	no	yes	no	yes	no
24	100%	EU produced	yes	no	no	no	yes	no	no
25	50%	Outside of EU	no	yes	yes	yes	yes	no	no
26	100%	Outside of EU	yes	no	yes	yes	yes	no	yes
27	100%	Outside of EU	no	yes	yes	no	no	yes	no
28	200%	EU produced	no	yes	yes	yes	no	no	yes
29	200%	Outside of EU	no	no	no	no	no	no	no
30	100%	Own Country	yes	yes	no	no	yes	no	no



Table 23. Proposed choice set for each product idea.

Choice set / Stimuli	1	2	3	4	5	6	7	8	9	10
1	5	27	24	7	18	8	10	20	26	17
2	11	22	14	9	6	2	12	16	19	15
3	29	4	12	30	1	23	3	28	13	21

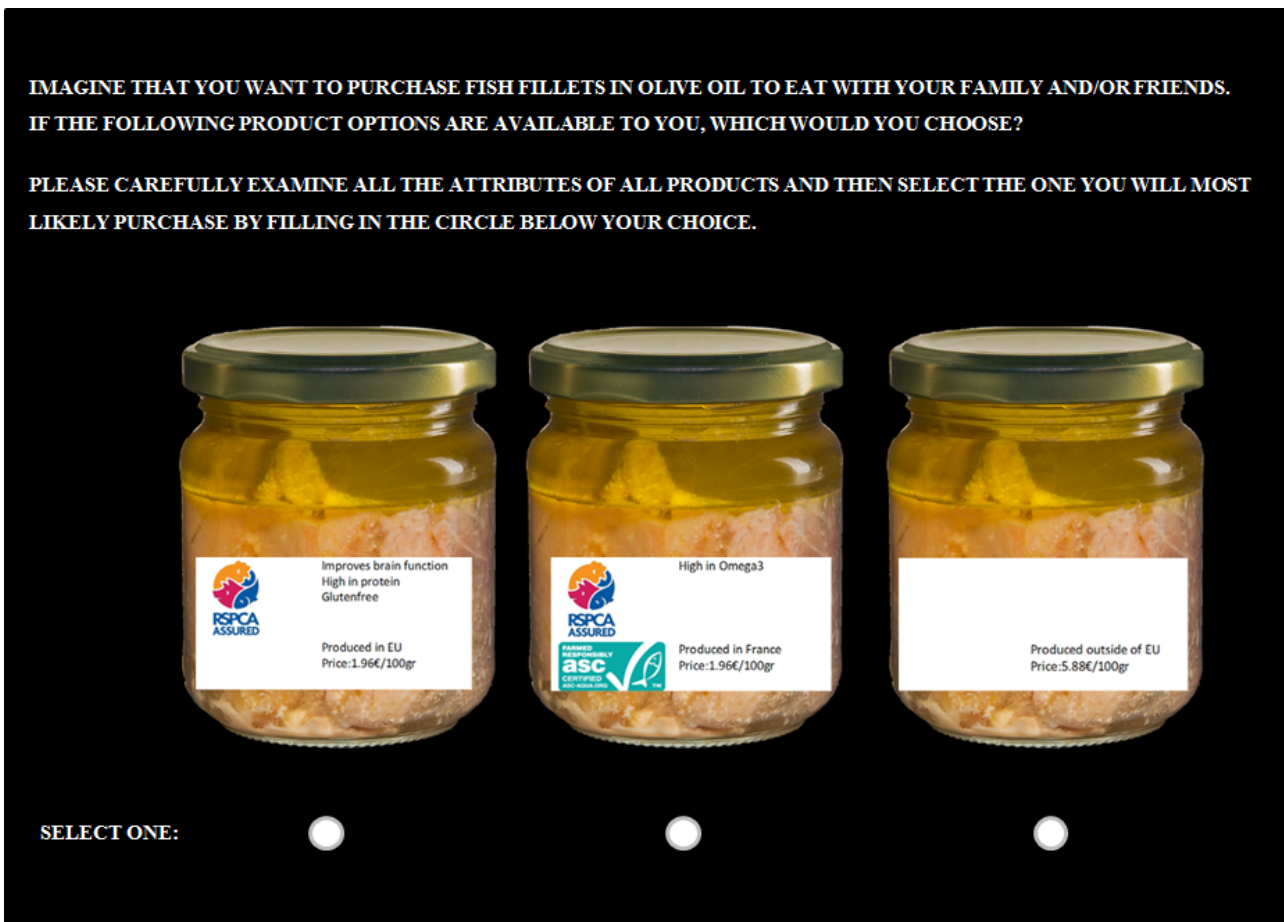


Figure 9. Example of experimental set-up for product idea: Ready-made fish fillets in olive oil.



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