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Horizon 2020 Programme

INNOVATIVE PRICE ANALYSIS AND WILLINGNESS-TO-PAY

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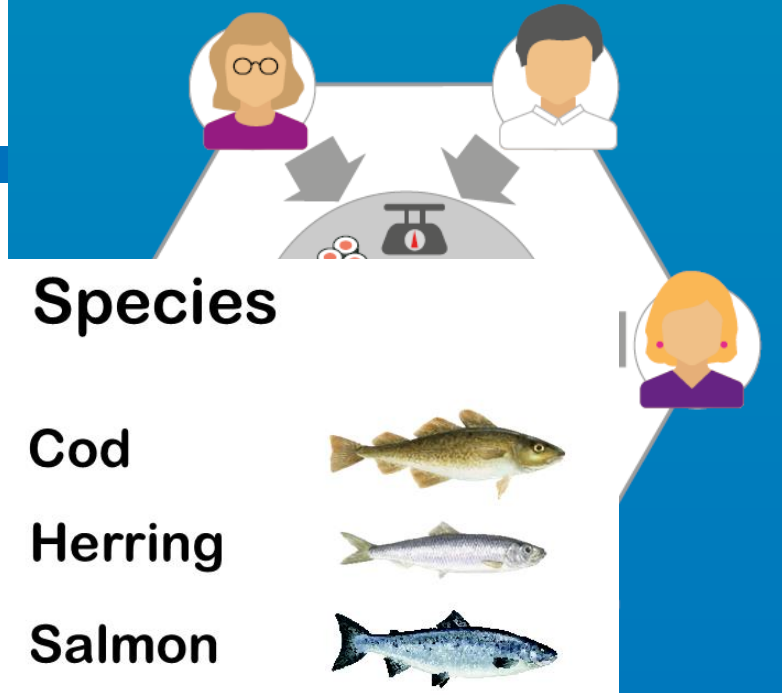
25th October – Aligning the PrimeFish Contributions to the Blue Growth Strategy

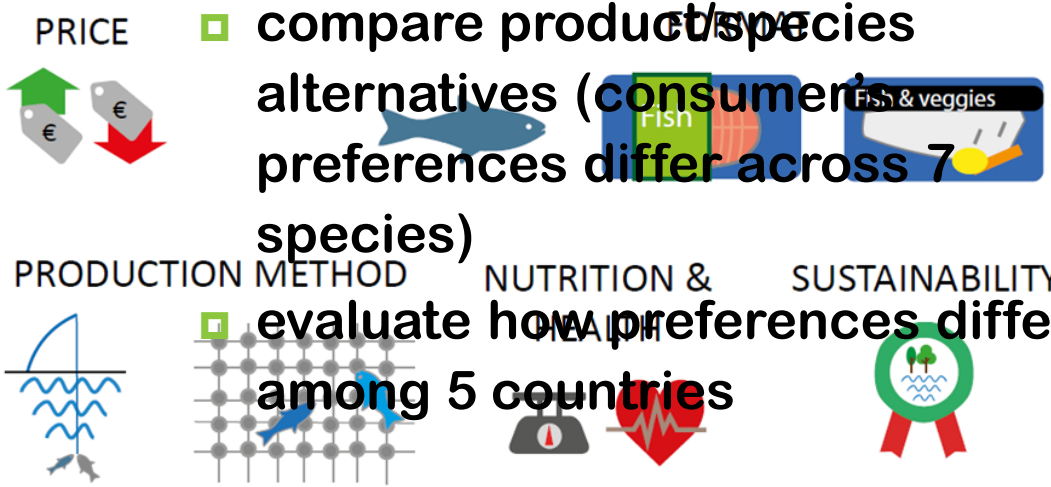
Suggested table of content

- Objective
- Material and method
- Main results (sustainability and nutritional&health claim)
  - Frequencies and choices
  - WTP estimates for sustainability label and for nutritional & health claim, and relative heterogeneity (clusters)
  - Role of personal beliefs, attitude and trust
  - Price eslasticities and Positioning map
- Policy-relevant conclusions

Objective

- Analyse consumers' choices and willingness to pay for innovative features:
  - evaluate fish attributes
  - compare product/species alternatives (consumer's preferences differ across 7 species)
  - evaluate how preferences differ among 5 countries





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Material and method

- Survey performed on 500 respondents per country
- The online survey included several items (attitude, frequencies, motives, etc.) and a (hypothetical) discrete choice experiment
- Attributes and levels defined by previous qualitative phase and literature
- Discrete choice model to to estimate beta coefficients for each product attribute (including fish species)
  - consumer's willingness to pay (WTP) for each attribute (incl. fish), and product profile
  - positioning map and elasticities

Attributes	Levels
Price	• Average market price per country/specie • -30% • +30%
Production method	• Farm-raised fish * • Wild caught fish
Format *(picture)*	• Whole fish ("Round cut" for salmon and pangasius) • Fillet • Ready-to-cook *
Sustainability	• None * • Sustainability certification
Nutritional and health claim	• None * • Nutritional & health claim

Trout in Italy, France, UK, Spain and Germany

Whole fish

Fillet

Ready-to-cook

Ready-to-cook Salmon in France

Ready-to-cook Salmon in Germany

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Stratified random sampling from 5 EU countries

Country	Total N	Female (%)	Age (Avg.)	Educ. Low (%)	Educ. High (%)
Italy	504	50.4	43.2	39.1	16.5
France	501	48.9	44.0	18.4	34.3
Germany	502	47.8	44.1	17.1	25.5
Spain	501	48.1	42.3	36.1	35.9
UK	501	49.3	42.1	15.8	40.3

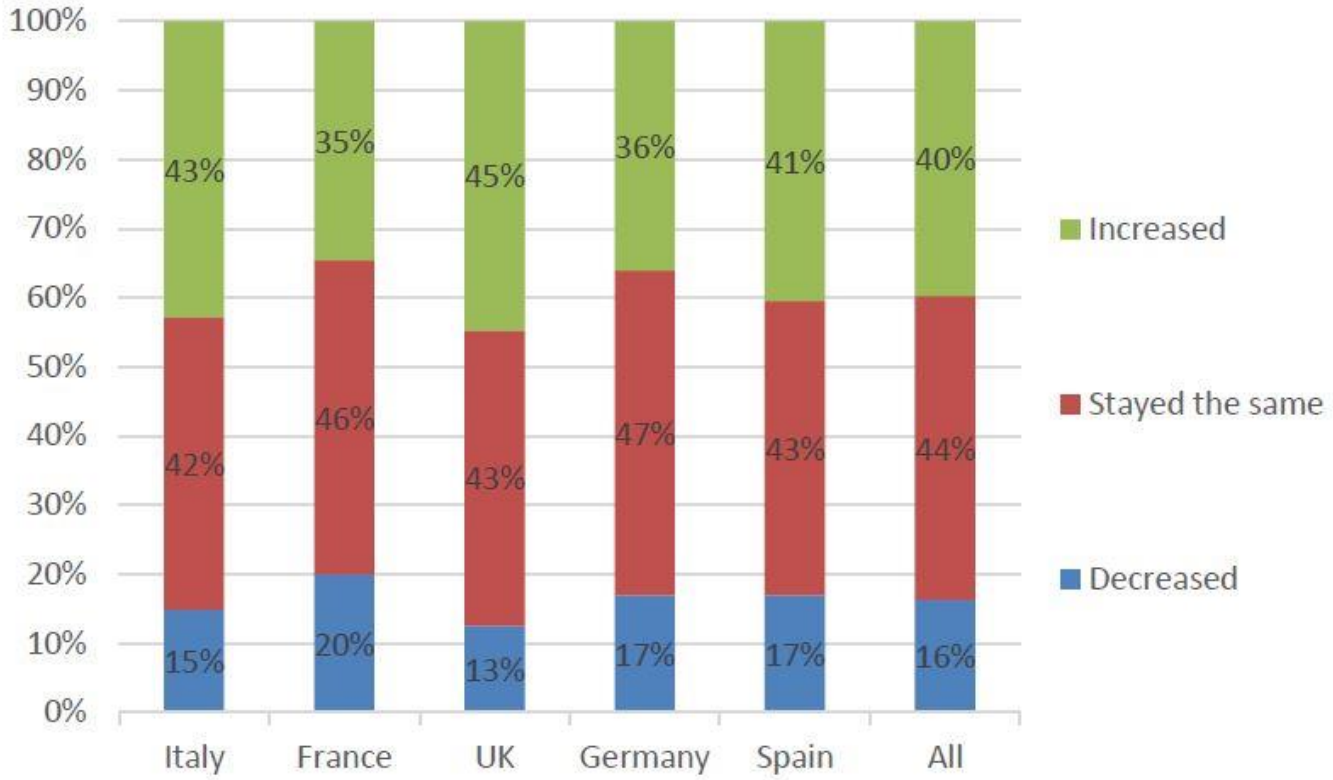
Representative of the national populations in at least three of the following criteria: age, gender, educational level and geographical macro-areas

Frequency of fish consumption (median)

Country	Fish	Trout	Herring	Salmon	Seabass	Seabream	Cod	Pangasius
Italy	3-4 times a week	Few times a year	Few times a year	Once a month	Once a month	Once a month	2-3 times a month	Few times a year
France	3-4 times a week	Few times a year	Few times a year	Once a month	Few times a year	Few times a year	Once a month	Never
Germany	2-3 times a month	Few times a year	Few times a year	Once a month	Never	Never	2-3 times a month	Few times a year
Spain	3-4 times a week	Few times a year	Few times a year	Once a month	Once a month	Once a month	2-3 times a month	Few times a year
UK	2-3 times a month	Few times a year	Never	Once a month	Few times a year	Never	2-3 times a month	Never

Evolution of fish consumption in the past 3 years

Overall, 40% of the respondents increased fish consumption in the past 3 years, 16% decreased fish consumption in the same period, and 44% maintained the same level.

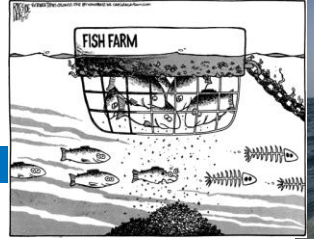


Fish choice motives

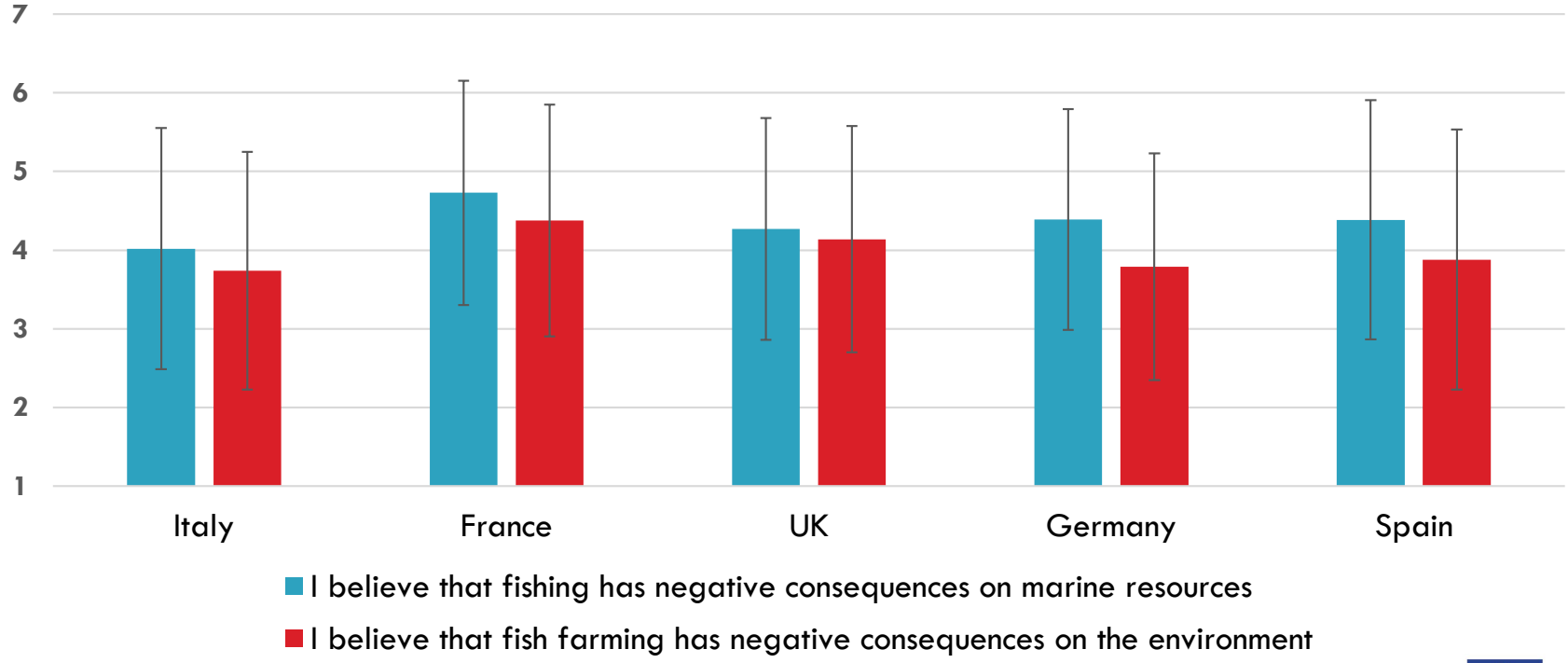
	France		Germany		Italy		Spain		UK		Total	
Fish choice motives	**Mean**	**sd**	**Mean**	**sd**	**Mean**	**sd**	**Mean**	**sd**	**Mean**	**sd**	**Mean**	**sd**
Value for money	5.63	1.24	5.15	1.39	5.61	1.17	5.62	1.27	5.33	1.42	5.47	1.31
Price	5.57	1.24	5.10	1.34	5.31	1.25	5.44	1.29	5.29	1.42	5.34	1.32
General appearance	5.43	1.49	5.19	1.48	5.66	1.38	5.38	1.47	5.01	1.65	5.33	1.51
Free of smell	4.81	1.64	4.77	1.64	5.17	1.48	5.34	1.49	4.90	1.76	5.00	1.62
Easy to cook	5.09	1.44	4.87	1.49	4.99	1.35	4.97	1.44	5.00	1.49	4.98	1.44
Days since catch/harvest	5.01	1.51	4.39	1.63	5.36	1.43	5.25	1.46	4.70	1.67	4.94	1.58
Sustainability certification	4.80	1.48	4.81	1.59	5.14	1.36	5.09	1.45	4.65	1.72	4.90	1.54
Domestic origin	5.01	1.47	4.13	1.57	5.26	1.42	4.97	1.49	4.35	1.68	4.74	1.59
Wild caught	4.77	1.44	4.01	1.47	5.39	1.34	4.74	1.49	4.33	1.64	4.65	1.55
Organic certification	4.60	1.45	4.04	1.69	4.94	1.45	5.00	1.47	3.92	1.77	4.50	1.64
Not previously frozen	4.54	1.61	3.88	1.55	5.11	1.54	4.81	1.58	4.16	1.70	4.50	1.66
Low in calories	4.28	1.61	3.89	1.65	4.45	1.61	4.62	1.50	4.16	1.77	4.28	1.65

(1 = Not at all important; 7 = Extremely important)

Results – attitudinal variables

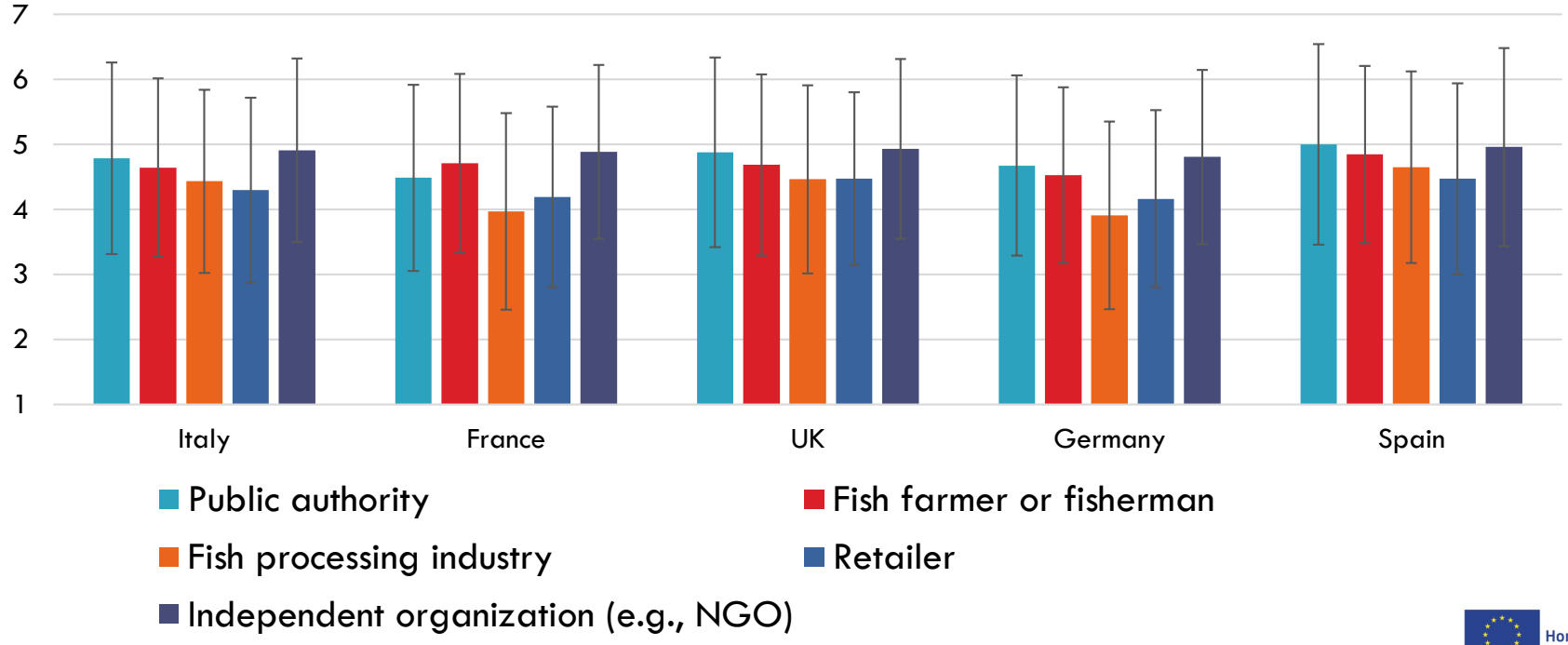


Environmental concerns



Trust in the information source

I would **trust** the information provided about the **sustainable** fish production practices if they were certified by a:



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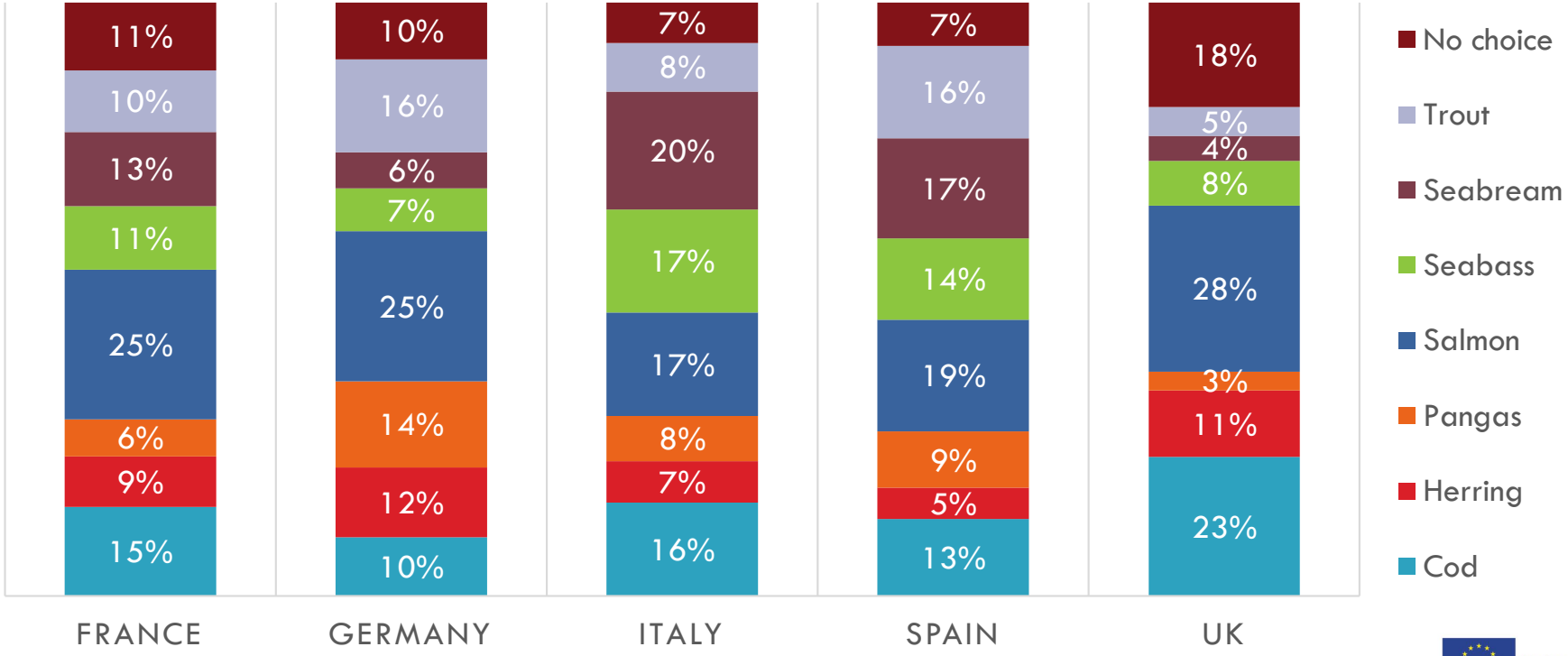
Choice probability

Choice probability based on the choice experiment



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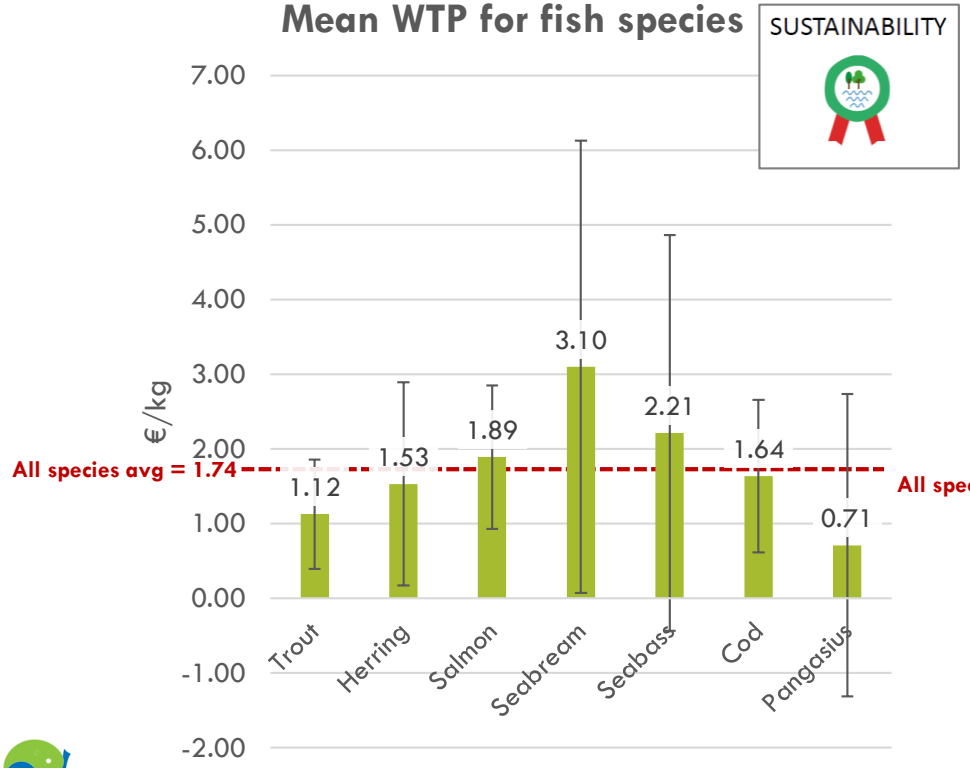
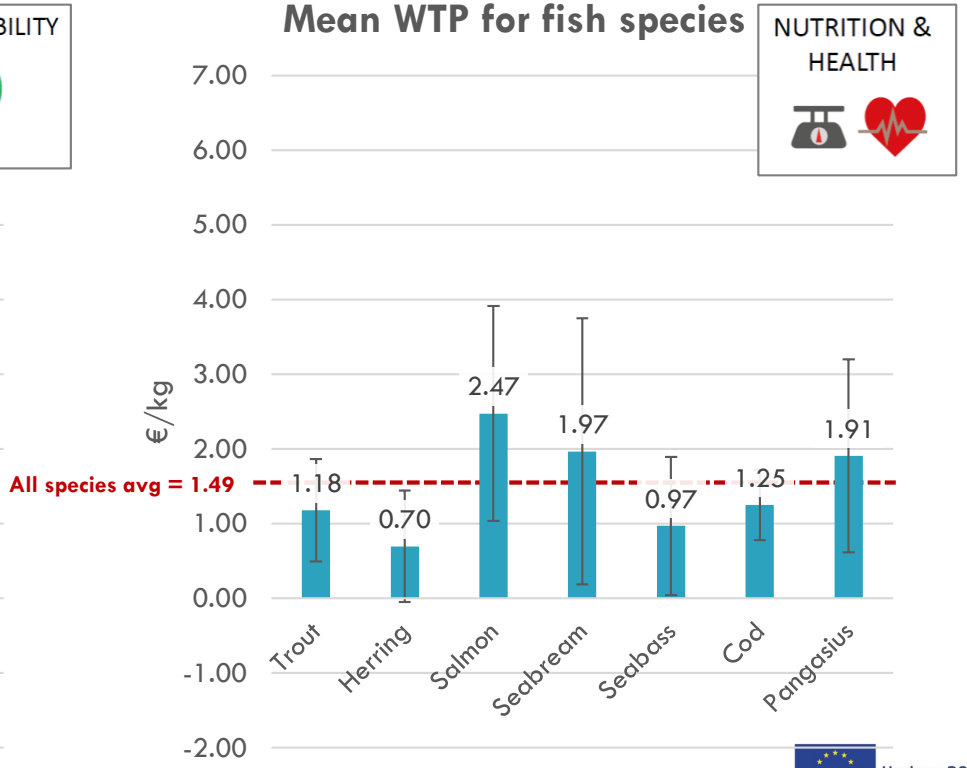
Parameter estimations (extract)

	France			Italy			Germany			UK			Spain		
Sustainability	**Mean**	**SD**		**Mean**	**SD**		**Mean**	**SD**		**Mean**	**SD**		**Mean**	**SD**	
Cod	0.017	0.094	**	0.336	0.092	***	0.153	0.111	***	0.124	0.080	***	0.153	0.097	***
Herring	-0.068	0.119	***	0.144	0.126	***	0.223	0.105	***	0.249	0.108	***	0.174	0.148	***
Pangasius	0.220	0.136	***	0.221	0.121	***	0.173	0.094	***	-0.204	0.186	***	0.156	0.108	***
Salmon	0.171	0.077	***	0.066	0.088	***	0.105	0.077	***	0.073	0.076	***	0.064	0.086	***
Seabass	0.389	0.105	***	0.095	0.085	***	0.473	0.130	***	0.032	0.120	***	-0.069	0.093	***
Seabream	0.059	0.099	***	0.222	0.081	***	0.447	0.138	***	0.165	0.162	***	0.162	0.086	***
Trout	0.162	0.108	***	0.200	0.119	***	0.106	0.092	***	-0.018	0.152	***	0.176	0.091	***
Health & Nutrition	**Mean**	**SD**		**Mean**	**SD**		**Mean**	**SD**		**Mean**	**SD**		**Mean**	**SD**	
Cod	0.095	0.093	***	0.173	0.088	***	0.180	0.109	***	0.054	0.079	***	0.096	0.096	***
Herring	0.014	0.116	***	0.081	0.125	***	0.242	0.102	***	0.003	0.108	ns	0.023	0.142	**
Pangasius	-0.009	0.132	ns	0.180	0.120	***	0.157	0.091	***	0.176	0.181	***	0.349	0.109	***
Salmon	-0.010	0.074	**	0.148	0.084	***	0.165	0.073	***	0.178	0.071	***	0.181	0.080	***
Seabass	0.258	0.107	***	0.153	0.087	***	-0.052	0.123	***	0.034	0.122	***	0.189	0.095	***
Seabream	0.036	0.098	***	0.363	0.082	***	0.255	0.136	***	0.027	0.166	**	0.174	0.086	***
Trout	0.027	0.110	***	0.105	0.120	***	0.105	0.091	***	0.139	0.155	***	0.198	0.091	***
Log-likelihood	-7509.23			-7666.7			-7529.17			-6818.34			-7820.09		
Accepted Rate	0.602			0.626			0.575			0.437			0.621		
Hit probability	0.167			0.165			0.164			0.201			0.154		
Avg. efficiency	0.647			0.710			0.598			0.372			0.696		

Mean WTP for fish species





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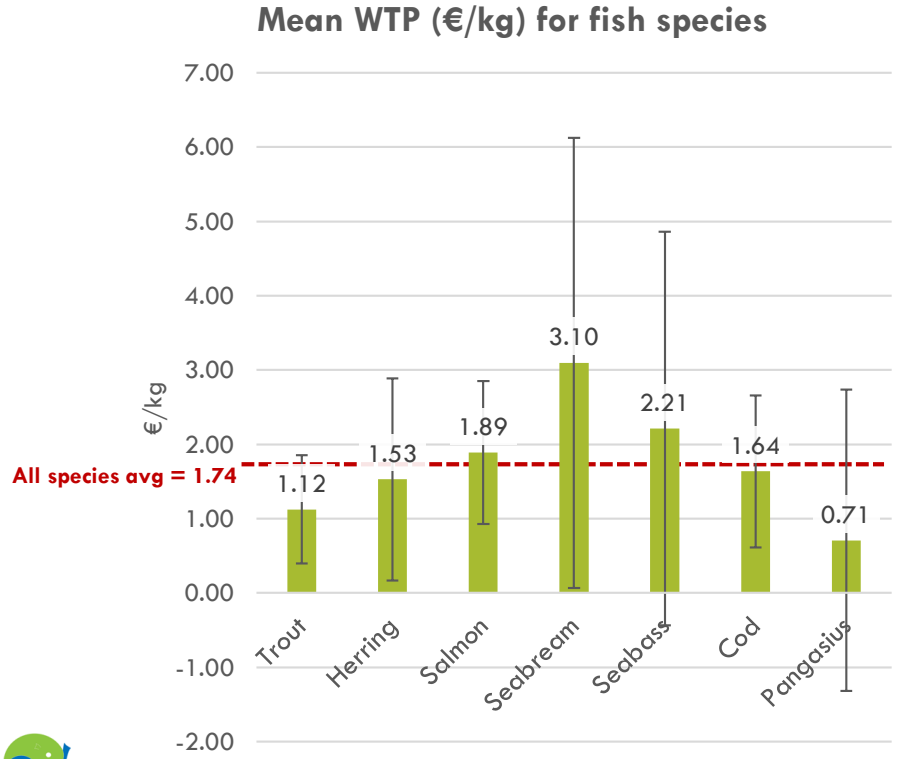
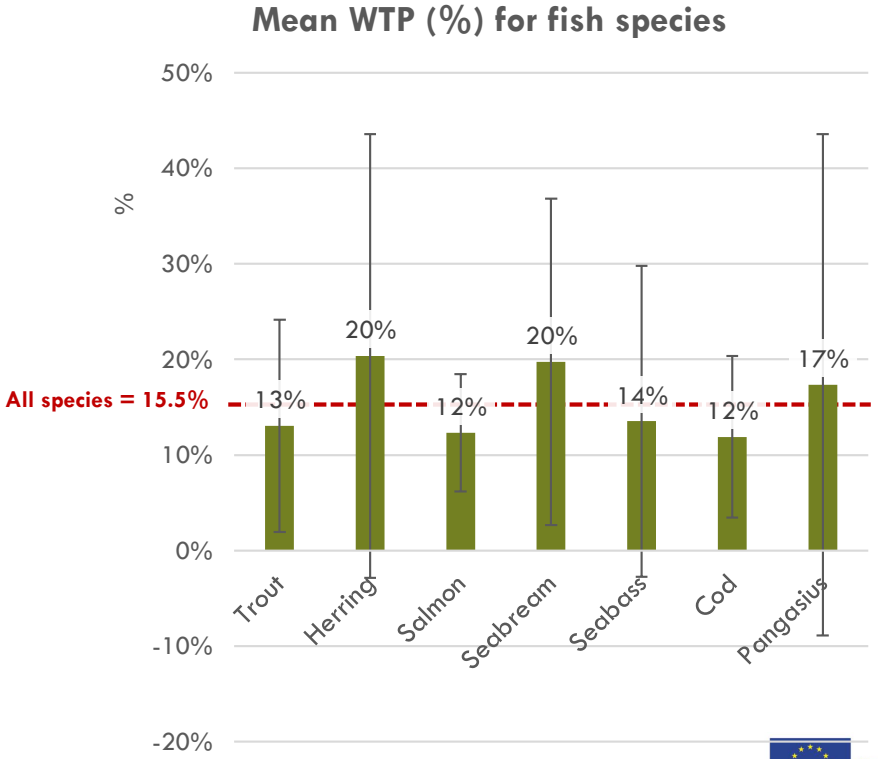
WTP for sustainability label – mean values

SUSTAINABILITY





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WTP for sustainability label

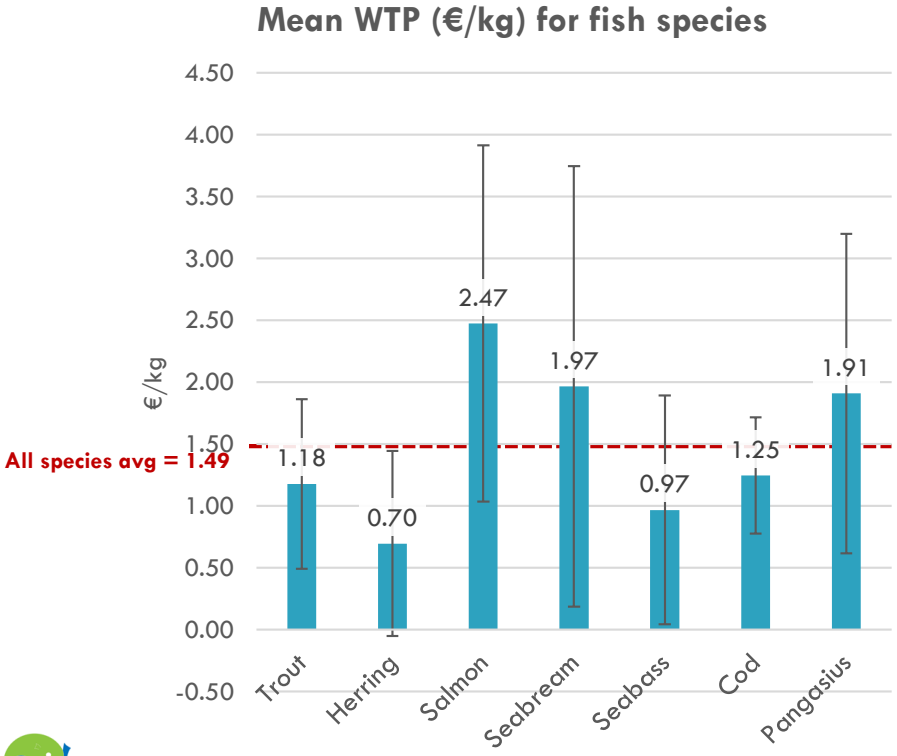
SUSTAINABILITY

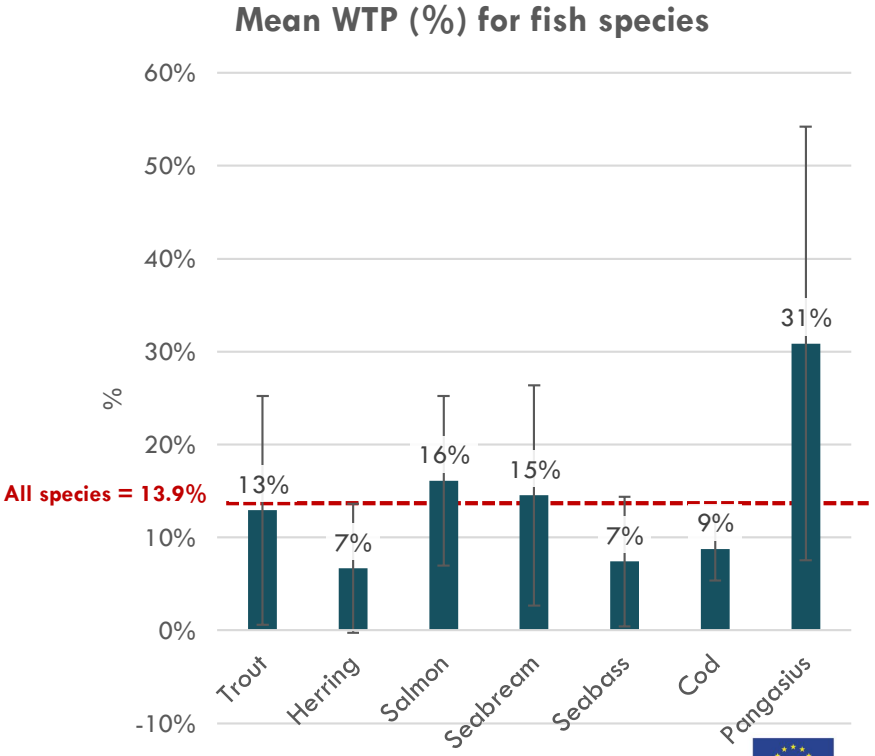
% of average market price

Cod	1.3%	27.2%	9.6%	11.5%	9.9%
Herring	-8.3%	20.4%	16.7%	62.4%	10.7%
Pangasius	17.3%	21.1%	48.6%	-30.4%	30.2%
Salmon	22.8%	9.4%	15.5%	6.7%	7.1%
Seabass	19.6%	7.2%	42.0%	3.6%	-4.8%
Seabream	3.9%	16.5%	52.7%	15.7%	10.0%
Trout	10.3%	14.1%	9.3%	-1.2%	32.8%

WTP for health & nutritional claim – mean values

NUTRITION & HEALTH





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WTP for health & nutritional claim

NUTRITION & HEALTH

% of average market price

Cod	7.2%	14.0%	11.3%	5.0%	6.2%
Herring	1.7%	11.5%	18.1%	0.8%	1.4%
Pangasius	-0.7%	17.2%	43.9%	26.3%	67.6%
Salmon	-1.3%	21.2%	24.4%	16.2%	20.2%
Seabass	13.0%	11.6%	-4.7%	3.8%	13.2%
Seabream	2.4%	26.9%	30.1%	2.5%	10.8%
Trout	1.7%	7.4%	9.2%	9.4%	36.9%

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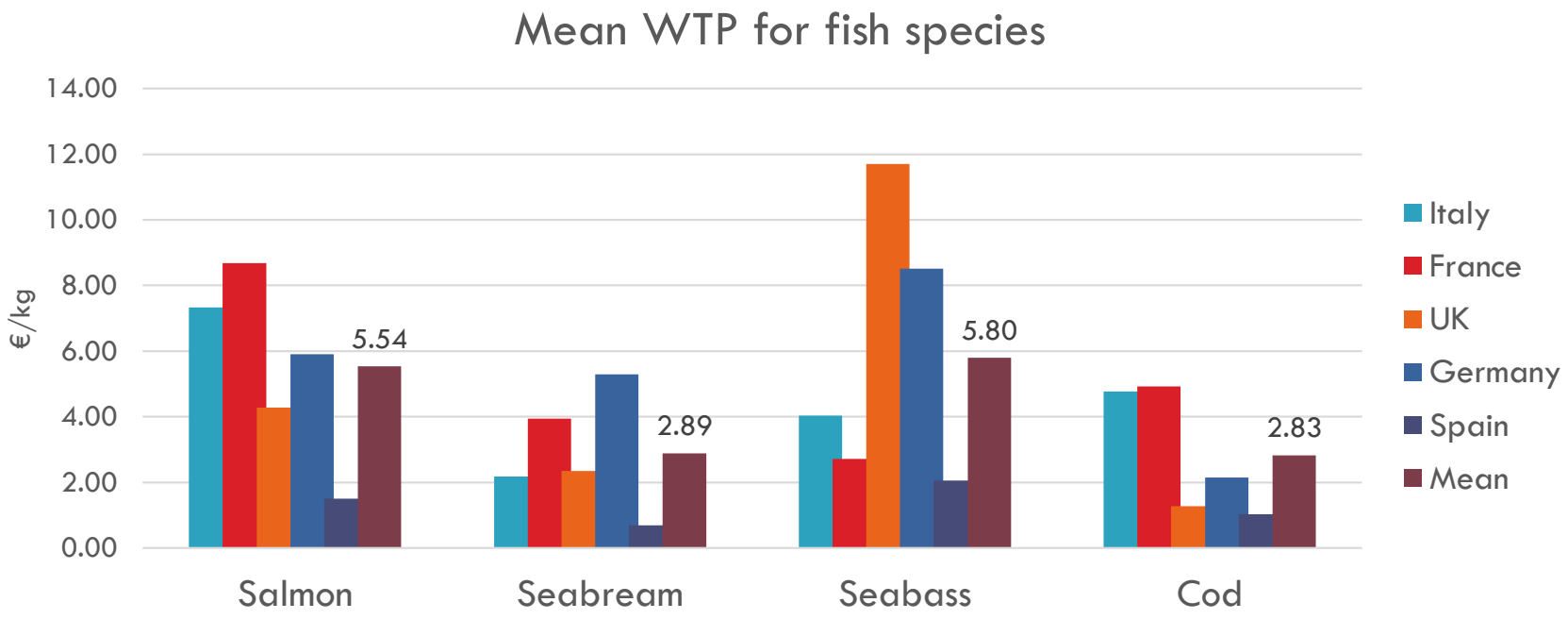
WTP for sustainability label – mean values

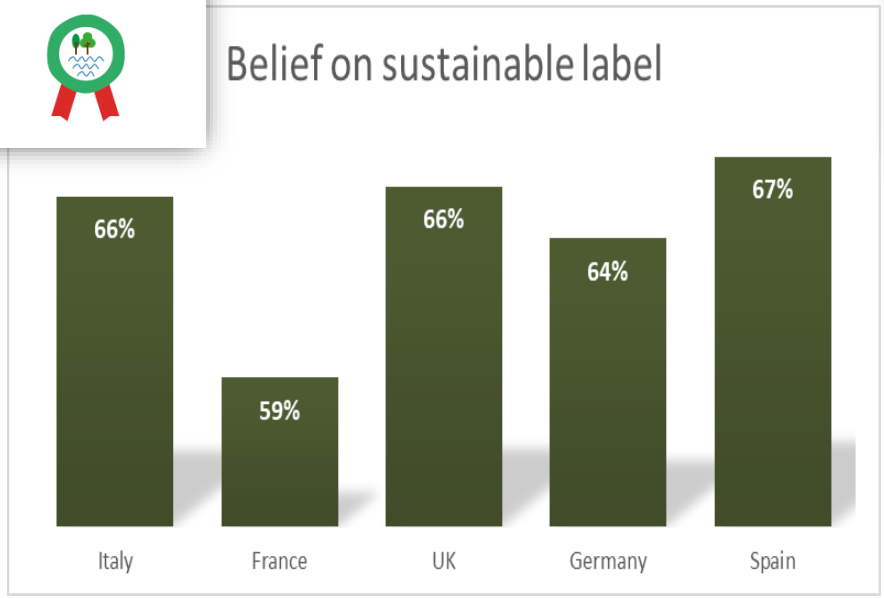
SUSTAINABILITY



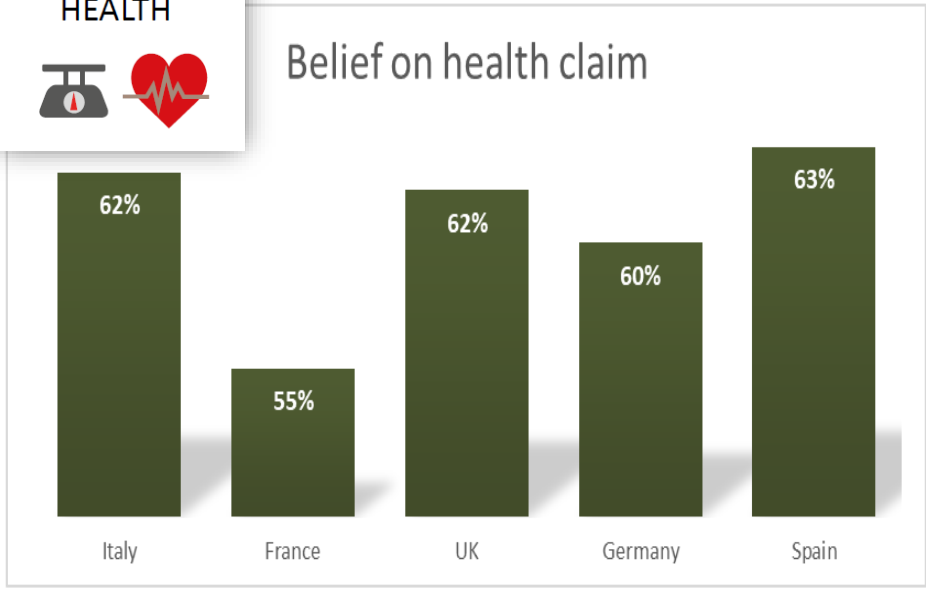
Belief strength

"Consumers' WTP" for functional foods significantly varies with [...] different subjective beliefs about functional and non-functional foods" (Pappalardo & Lusk 2016, FQP)

SUSTAINABILITY



NUTRITION & HEALTH



- On a scale of 0-100, to what extent do you believe in the benefits of such certification to the environment and society? (e.g., 0 = completely unbelievable; 50 = neutral; 100 = completely believable)
- On a scale of 0-100, to what extent do you believe such health benefit claims? (e.g., 0 = completely unbelievable; 50 = neutral; 100 = completely believable)

WTP estimates into the PrimeDSS

Italy – WTP for Seabream attributes

Italy – Seabream WTP	€/kg	% average price
Average price	10.82	-
Production Method (Wild caught vs. Farmed)	2.19	20.2%
Format (Wholefish vs. Ready-to-cook)	1.44	13.3%
Format (Fillet vs. Ready-to-cook)	1.54	14.2%
Sustainability label	1.78	16.5%
Health & nutritional claim	2.91	26.9%

the amount of money respondents are willing to pay for a change in the attribute from one level (the base level) to another one

- The WTP for **sustainability label** of seabream are coherent with other Italian studies: e.g., Stefani et al. (2011), WTP organic seabream = 2.76 €/kg
- It shows that "consumers with the highest WTP for organic fish were characterized by high interest in **health-related issues** and pronounced concerns for environmental issues"

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The WTP tool in the DSS

Seabream
Fillet
Wild caught
Sustainability

WTP 16,33 €/kg

Seabream
Ready-to-cook
Farmed
Health claim

WTP 13,73 €/kg

WTP

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WTP estimates by cluster

Germany – WTP for Cod attributes in segment with high WTP (28%)

Germany – Cod WTP	€/kg	% average price
Average price	16.75	-
Production Method (Wild caught vs. Farmed)	6.72	40.1%
Format (Wholefish vs. Ready-to-cook)	-5.25	-31.4%
Format (Fillet vs. Ready-to-cook)	1.65	9.9%
Sustainability label	4.66	27.8%
Health & nutritional claim	2.52	15.0%

Segment description

51% females

40% <40 ys

medium-to-high educational level

48% high incomes

76% small family units (one/two members)

Cod
Ready-to-cook
Wild caught
Sustainability

WTP 28.13 €/kg

WTP

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Price elasticities

Own- and Cross-price elasticities: estimate a change in "market share" (choice probability) for seafood *i* associated with a change in the price of seafood *i* or *j*

UK

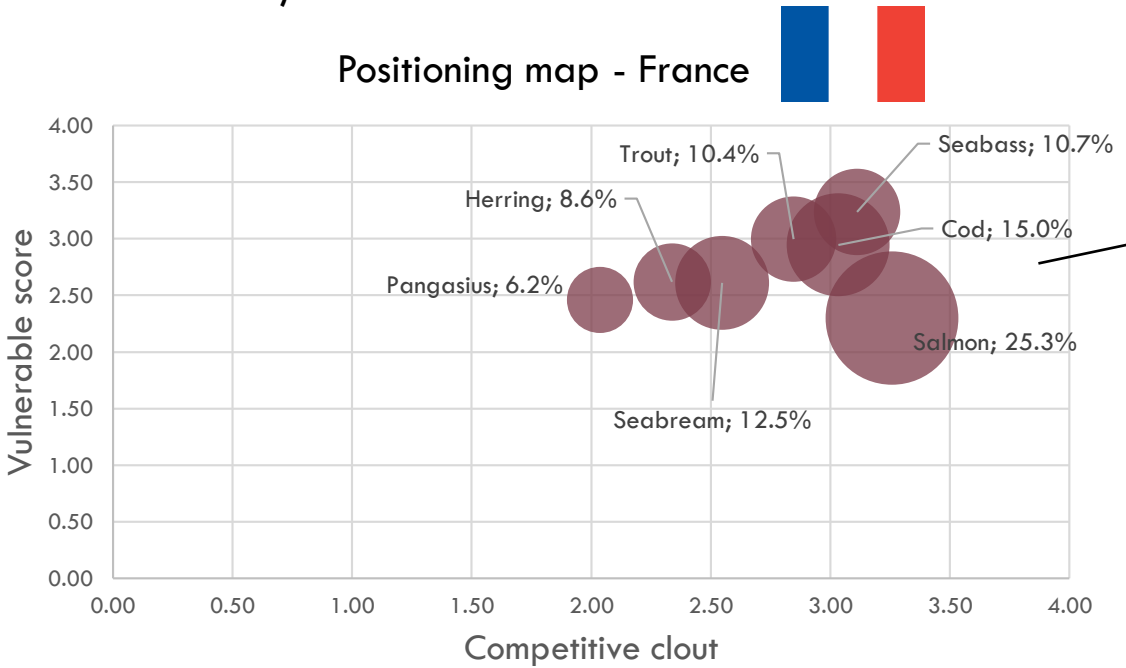
Market	Cod	Herring	Pangas	Salmon	Seabass	Seabream	Trout
Cod	**-1,17**	0,08	0,04	0,38	0,10	0,06	0,07
Herring	0,41	**-0,81**	0,06	0,49	0,10	0,06	0,09
Pangasius	0,10	0,06	**-1,33**	0,47	0,10	0,06	0,08
Salmon	0,32	0,07	0,04	**-1,11**	0,10	0,06	
Seabass	0,27	0,05	0,03	0,33	**-1,48**	0,05	
Seabream	0,29	0,06	0,03	0,35	0,10	**-1,52**	
Trout	0,34	0,08	0,04	0,40	0,10	0,06	

*if the **cod price rises 1%**, the **share of cod** would be **decreased by 1.17%**, and the **share of the other seafood** would be increased by a range of 0.04% (pangasius) to 0.38% (salmon)*

Positioning map

Positioning map measures the **competition between seafood alternatives** in the market (based on price elasticities)

*the degree to which a fish product is **vulnerable to its competitors***



the size of the bubble is proportional to the overall choices (proxy of market share)

*the ability of a fish product to **gain share** from the competitors*

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Final remarks

- **'Sustainable label'** and **'Nutritional & health claim'** preferences varied among species and countries (likely affected by personal beliefs, attitude and trust)
- The **PrimeDSS tool** can assist the producers (fishermen, processing industries, etc.) to evaluate the consumers' WTP and identify the segment characteristics (target)
- **For policy makers**:
  - awareness and use of fish quality schemes
  - how to improve consumers' knowledge as well as beliefs/trust?

"*Knowledge about specific health and nutritional benefits of fish consumption does not appear to be very strong*" (Carlucci et al. 2015)

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Thank you!

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