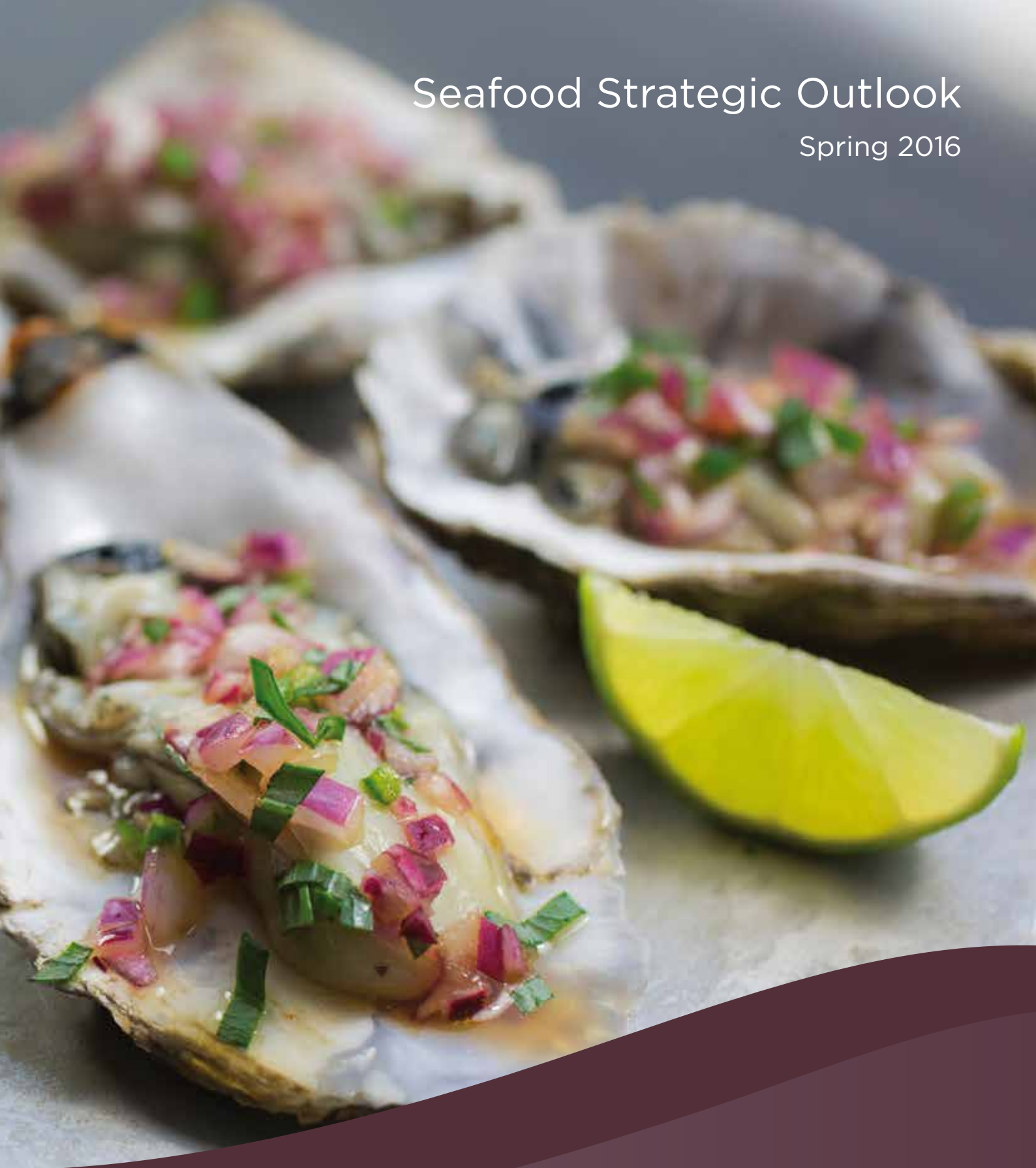


Seafood Strategic Outlook

Spring 2016



Fish as Food:

An initial review of developments, implications and practical responses from industry and Seafish

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SEAFISH
the authority on seafood

Contents

| | | |
|-----|---|----|
| 1. | Introduction and requirement | 2 |
| 2. | UK seafood industry and protein consumption | 3 |
| 2.1 | Consumer landscape | 4 |
| | UK consumer | |
| | Consumer attitudes and factors driving purchasing behaviours | |
| 2.2 | Protein and product landscape | 5 |
| | Key proteins | |
| | Product landscape | |
| 2.3 | Outlets | 9 |
| | Retail | |
| | Food service | |
| 2.4 | Framing seafood consumption risks (definition and dimensions) | 10 |
| 2.5 | Supporting consumption in the UK seafood and wider protein industry | 12 |
| 3. | Drivers and risk developments affecting seafood | 13 |
| | consumption – the long view | |
| 3.1 | Food security | 13 |
| 3.2 | Climate change | 14 |
| 4. | UK seafood consumption - recent and anticipated | 15 |
| | developments, impacts and response | |
| 4.1 | Consumers | 15 |
| 4.2 | Protein | 17 |
| 4.3 | Products | 18 |
| 4.4 | Outlets | 19 |
| 4.5 | Example impacts and response..... | 21 |
| 5. | UK seafood consumption – impacts and response | 24 |
| | to longer term developments | |
| | Bibliography | 26 |
| | Appendices | |
| | Appendix 1 – Locating fish as food in seafood risk landscape | 28 |
| | Appendix 2 – Consultees | 29 |
| | Appendix 3 – UK seafood industry | 30 |
| | – main systems, functions and activities | |

1. Introduction and requirement

This report is focussed on the UK consumption of seafood products. It considers the major industry impacts arising from key drivers of UK consumption and sets out major areas where industry and Seafish response may be required.

The Seafish mission is to secure a profitable, sustainable, and socially responsible future for the UK seafood industry. An important underlying function for Seafish in achieving this mission is to help protect the industry in the face of consumer and market-related risks and challenges.

Risk developments in the macro trade landscape can present longer-term, strategic challenges for the industry (see Appendix 1). Reflecting on these developments in 2015, the Seafish Board decided *“Where is seafood consumption heading, and what can be done to ensure stability - or even growth - in demand? How can seafood survive the pressure from other proteins?”* This review is an important part of responding to this need.

This report aims to support the UK seafood industry in understanding:

- The major characteristics of UK seafood consumption.
- The new and emerging developments expected to impact on this consumption.
- Industry impacts (positive and negative) likely to arise from these developments.
- Action industry (and Seafish) can take in response.

This exercise, conducted in 2015, involved desk research and consultation with Seafish staff and industry operators (see Appendix 2).

The review has limitations. The scope of consultation is not exhaustive. In addition, the review does not consider alternative future pathways (scenarios), but is based on ‘business as usual’ projections.

2. UK seafood industry and protein consumption

This chapter provides a representation of the seafood industry landscape and the major UK product categories. This representation frames the investigation, discussion and agreement on risk developments, impacts and responses.

The UK seafood industry, being reliant on wild capture and aquaculture produced raw material, is diverse, complex and dynamic. The seafood industry is considered here to operate as many subsystems (regional, sectoral), of varying degrees of interdependence, nested within one overarching global system.

In the global context, from a UK perspective, there are at least two major seafood systems that, although overlapping, have distinct characteristics:

- A domestic system – defined as a system reliant on domestically sourced material (material caught from stocks in North Atlantic/UK waters and landed in the UK, material farmed in the UK). Within the ‘domestic system’, the key UK actors are: producers (farmers/vessels), agents and merchants in the UK handling material

landed/farmed in the UK; UK processors of fish; and the downstream supply chain in the UK of all of the former including food service companies, retailers and exporters.

- An international system – defined as a system reliant on internationally sourced material (material caught from stocks in the North Atlantic and elsewhere landed outside the UK, material farmed outside the UK). Within the ‘international system’, the key UK actors are: agents and merchants in the UK importing fish and shellfish that is caught, landed or farmed and possibly processed outside of the UK; UK processors of imported fish; and the downstream supply chain in the UK of all of the former including food service companies, retailers and re-exporters.

It is notable that from a UK perspective, imported seafood material is largely for UK consumption, whilst material originating in the UK is generally exported for overseas consumption. The UK consumer maintains a robust preference for salmonids (farmed salmon), whitefish (cod, haddock and Alaska pollock), pelagics (tunas) and shellfish (cold-water prawn and farmed warm-water prawn). Meanwhile, UK landings volumes are dominated by mackerel and herring (pelagics), Nephrops (shellfish) and cod and haddock (whitefish).

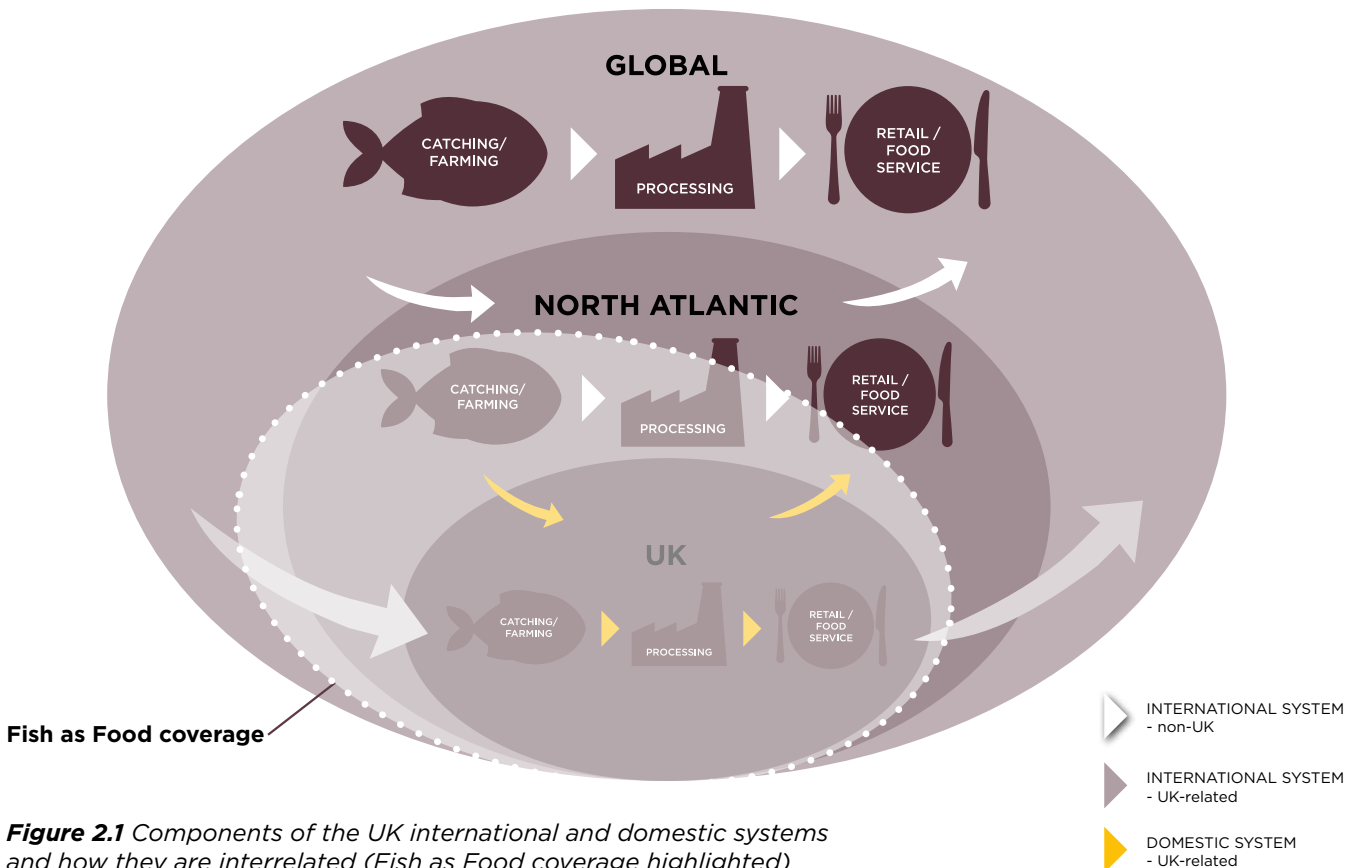


Figure 2.1 Components of the UK international and domestic systems and how they are interrelated (Fish as Food coverage highlighted)

2.1 Consumer landscape

2.1.1 UK consumer

In 2014, the population of the UK was estimated to be 64.5 million. Table 2.1 provides population age bands and shows the ‘outer envelope’ in scoping the number of potential seafood consumers.

Around two thirds of the UK population are working age. This amounts to around 41 million people. Around 11 million have reached retirement age.

Disposable income is a measure of households’ ability to increase spending without reducing savings or increasing borrowing. Any shortfall between average levels of disposable income and expenditure for the UK household illustrates a ‘squeeze’ in household finances.

Within these headline descriptions of the UK consumer, there are consumer groups based on life stage, age group, occupation group etc. Specific consumer segments for seafood are identified in section 2.2.3.

| Life stage | Population group | Age group | Typical consumer groups | 2014 | % |
|--------------|------------------|-----------|--------------------------------|-------------------|-------------|
| Striving | Non-working age | 0-15 | | 12,058,689 | 19% |
| | | 16-25 | Limited budget | 8,327,460 | 13% |
| Thriving | Working age | 26-30 | Students/young professionals | 4,336,002 | 7% |
| | | 31-40 | Busy young families | 8,282,437 | 13% |
| | | 41-50 | Older, more affluent, families | 9,246,943 | 14% |
| Surviving | Non-working age | 51-64 | Older families | 10,722,318 | 17% |
| | | 65 plus | Elderly people | 11,131,805 | 17% |
| TOTAL | | | | 64,596,800 | 100% |

(Source: ONS)

Amongst the working age population, 78% were economically active (either in work, seeking or available for work). The remaining 22% were inactive due to study, looking after family, sickness/disability, not needing to work etc.

Average disposable income for all households in 2014 was £30,716.

Average total household expenditure in 2014 was £27,627. The five highest categories of spend were:

- Transport (£3,890)
- Housing (net), fuel and power (£3,780)
- Recreation and culture (£3,578)
- Food and non-alcoholic drink (£3,057)
- Restaurants and hotels (£2,210)

An average 11.1% of all UK household 2014 spend went on food (15.7% for lowest 20% of household income).

2.1.2 Consumer attitudes and factors driving purchasing behaviours.

Consumer attitudes, and more specifically the factors driving their purchasing behaviours, are complex and interconnected. From a Seafish perspective, attitudes can be simplified and explored as ‘concentric circles of concern’ (noting that the boundaries are fluid and may vary significantly). See fig 2.2.

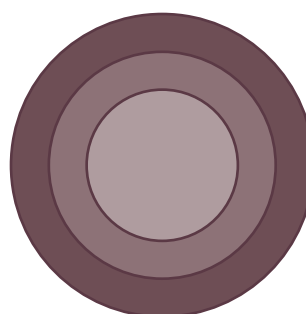


Figure 2.2 Concentric circles of concern

At the centre of the circle is 'Me and my family': where consumers' primary concern is the health and welfare of themselves and their children. Only once this need is satisfied, do consumers begin to widen their 'circle of concern'.

Other people (and animals) are of next concern (mid-circle). This is where we move beyond 'the garden gate' into beginning to be concerned about health and safety of other people, the way animals are treated and issues of fair-trade begin to play.

Finally, the outer circle is that of the environment - where once people are satisfied that all humankind is being fairly treated then consumers concerns move on to the environment (trees, landscapes, oceans).

Across these circles, economic, social and environmental factors influence consumer behaviours. At one end, economic factors play a dominant influence in 'Me and my family', whilst further out social, and then environmental, factors have an important influence. Factors include:

- Economic:
 - Price
 - Quality (freshness, taste, etc)
- Social:
 - Convenience (time, versatility, norms etc)
 - Nutrition
 - Welfare (people, animals)
- Environmental:
 - Resources

Consumer interest in food ranges from a functional concern (e.g. food as fuel), to seeking a convenience (e.g. quick meal/protein), or to a particular emotional and pleasurable experience (customised for titillation, "you deserve it" etc. - a special occasion for example, or around intrinsic attributes - what and where food comes from etc).

2.2 Protein and product landscape

2.2.1 Key proteins

Seafood sits within a broad protein landscape that contains a number of substitute proteins. This landscape includes the following protein categories:

- Fish (whitefish, pelagic, shellfish, salmon, exotic fish)
- White meat (chicken, turkey, gamebirds etc)
- Red meat (pork, lamb, beef, veal, etc)
- Meat substitutes (*mycoproteins* e.g. Quorn etc, *plant based proteins* e.g. grains, pulses, nuts, seeds etc, and *insect proteins*)

With each protein category comes a distinct set of attributes that provide advantages and disadvantages in the eyes of the consumer. These can drive consumption levels, but also where products are consumed (in-home or out-of-home).

- Price - fish is often relatively more expensive than other proteins.
- Quality - fish can show greater variation than other proteins in freshness, taste etc.
- Convenience - compared to other proteins, fish may offer a more limited product format and be less versatile (the UK consumer can be 'scared of seafood').
- Nutrition - fish has a number of health benefits relative to, say, red meat.
- Environment - fish credentials (e.g. sustainability and welfare) can be seen as more complex/uncertain compared to land based proteins.

The relative quantities of fish and selected white and red meats purchased for in-home consumption by UK households is shown in fig 2.3.

Quantity of selected meat proteins purchased by UK households (in home) 1974 - 2013 (average per person per week)

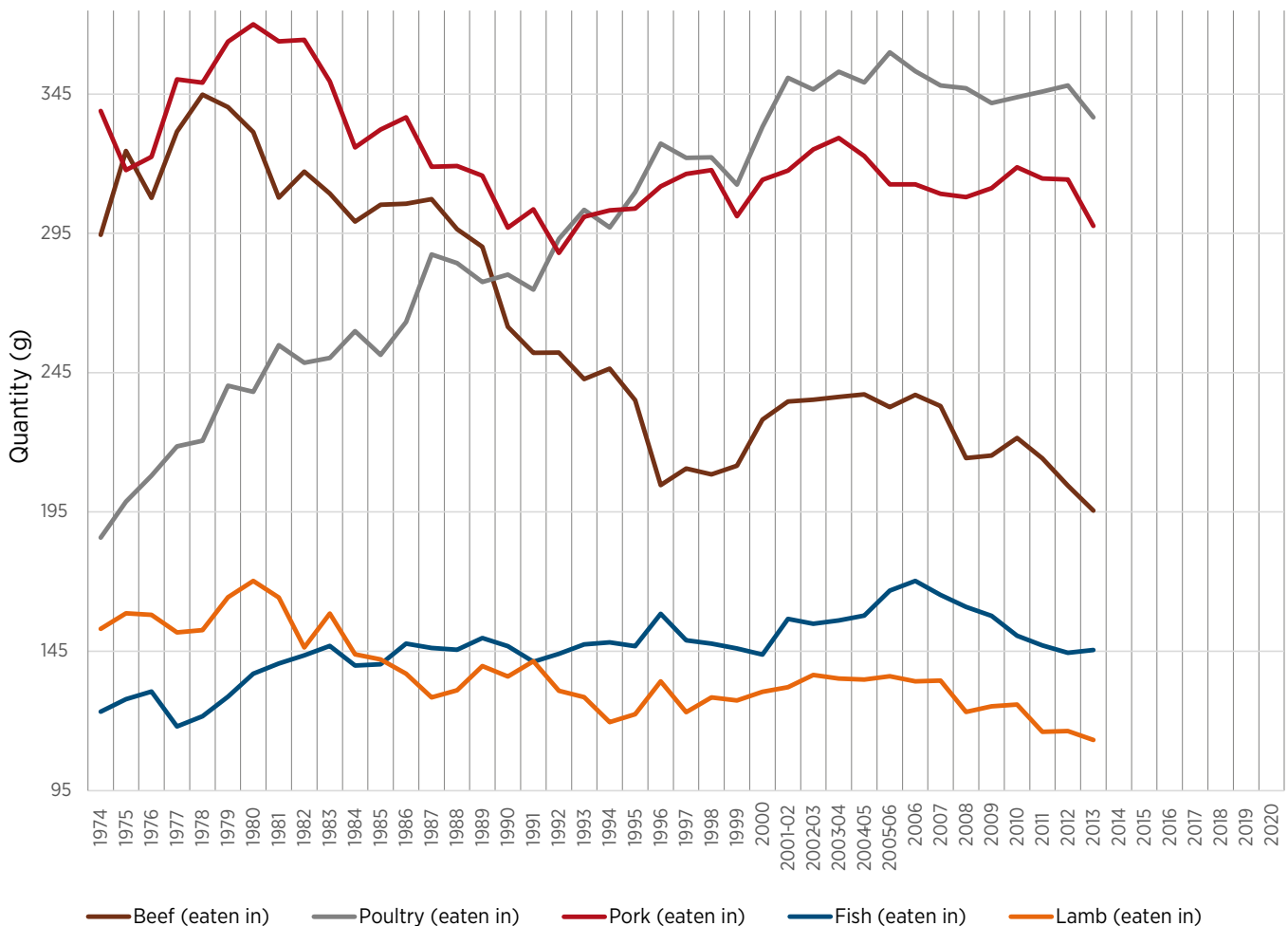


Figure 2.3 Quantity of selected meat proteins for in-home consumption (Source: Defra)

2.2.2 Product landscape

Within the protein landscape, *products available for direct consumption in the UK*, serve specific consumer interests. In serving these interests, proteins are processed to provide convenience (incl. *time saving*) for those storing/preparing/cooking the product (chefs or the consumer). Products offer a spectrum of solutions to the chef or consumer:

- Customised solutions (meeting a special/novel requirement e.g. special occasion)
- Kit/component solutions (meeting a convenience requirement e.g. quick meal/protein)
- Off-the-shelf solutions (meeting a general 'food as fuel' requirement e.g. meals)

At one end of the spectrum, products provide basic proteins made available in a simple format,

to support customised and kit/component solutions. At the other end of the spectrum, products that involve significant transformation of the original protein, can support off-the-shelf solutions.

Primary products are relatively simple in comparison to the more sophisticated, secondary and particularly tertiary, products. Greater product variation can be expected with the latter and in minor/specialised primary products.

Primary processed material is in the main considered a *fresh product* (chilled never frozen, including live animal in the case of fish). Secondary processed products are mainly *frozen* (including refreshed product) and *ambient* products (including prepared & preserved). Tertiary or composite products (where protein is one of a number of ingredients in the final product) could be fresh or frozen.

Table 2.2 Types of Seafood products

| Product Format | | Extent of processing None > Considerable | | | |
|----------------|-------------------------------------|---|---------|-----------|----------|
| | | Live | Primary | Secondary | Tertiary |
| Fresh | Chilled never frozen | x | x | | x |
| Frozen | Refresh - chilled previously frozen | | | x | x |
| | Frozen | | | x | x |
| Ambient | Prepared and preserved | | | x | |

In general, seafood products destined for the UK market can be briefly characterised as:

- **UK market products:** A diverse set of products, ranging from sale of live fish to sophisticated added value products that match consumer interests.
- **Species and chain:** A diverse range of species, with product supply chains ranging from short to long (reflecting species but also the time required to cook/consume versus time required

to produce seafood products). Variation in the level of control, ranging from vertically integrated chains to market based supply.

- **Major supplying regions:** Origin and main producing countries being both UK and international.

Table 2.3 shows some typical product examples in fish, white and red meat.

Table 2.3 Example products in fish, white and red meat sectors

| | Primary | Secondary | Tertiary |
|----------------|---|--|---|
| Fish | Whole Loins Filletts - skin on Filletts - skinless Portions - skinless Meat in shell Meat | Crabsticks Fish balls Fish paste Roe Taramasalata Tuna pate | Curry Fishermen's pie Kedgerie Salmon en croute Seafood cocktail Seafood pasta Szechuan prawns with vegetables Spring rolls Prepared pre-school meals (<5yrs) |
| Chicken | Whole Dark meat Light meat Meat Breast Roasted Skin | Burger / grillsteak Chicken nuggets Chicken roll Meat spread Pate Chicken in white sauce Chicken wings | Chicken pie Chicken chasseur Chicken chow mein Chicken curry Chicken satay Chicken tandoori Chicken tikka masala Chicken stir fry Coronation chicken Sweet and sour chicken Coq au vin Spring rolls Prepared pre-school meals (<5yrs) |
| Pork | Bacon Ham Belly joint Diced Fillet strips Leg joint Loin chops Steaks | Frankfurter Luncheon meat Meat spread Pate Salami Sausages Savaloy Faggots in gravy | Pork pie Sausage rolls Scotch eggs Pork casserole Sausage casserole Sweet and sour pork Spring rolls Prepared pre-school meals (<5yrs) |

(Source: Food Standards Agency, 2008)

Table 2.3 Example products in fish, white and red meat sectors (Cont.)

| | Primary | Secondary | Tertiary |
|-------------|---|---|---|
| Lamb | Neck cutlets Breast Leg Loin chops Mince Neck fillet Shoulder Stewing lamb | Donor kebabs Shish kebab | Lamb curry Lamb kheema Lamb hot pot with potatoes Irish stew Lancashire hot pot Meat samosas Moussaka Spring rolls Prepared pre-school meals (<5yrs) |
| Beef | Braising steak Rib Roast Mince Rump steak Silverside Stewing steak Topside | Burger / grillsteak Corned beef Meat spread Pate Sausages | Cornish pastie Beef pie / steak & kidney Stewed steak with gravy Beef bourguignon Beef casserole Beef chow mein Beef curry Beef stew Beef stir fried Bolgnese sauce (with meat) Chilli con carne Cottage/Shepherds pie Goulash Beef hot pot with potatoes Lasagne Meat samosas Moussaka Pasta with meat and tomato sauce Spaghetti bolognese Prepared pre-school meals (<5yrs) |

(Source: Food Standards Agency, 2008)

2.2.3 Meat products by key consumer groups

Consumption of meat products is not uniform across the population. Particular age groups may tend to eat less meat e.g. those in younger cohorts. Men tend to eat more meat than women. Overall meat consumption across social groups may show little difference yet, in contrast with

lower income groups, higher income groups may consume products that are less processed.

For Seafish, typical consumer groups are associated with specific interest in particular fish product formats. Table 2.4 shows a summary of these consumer segments by age group.

Table 2.4 Key consumer segments for seafood products

| Life stage | Population group | Age band | Typical consumer groups within the age band | Fish Interest |
|------------|------------------|----------|---|------------------------|
| Striving | Non-working age | 0-15 | | |
| | | 16-25 | Limited budget aged 18-25 years | "Frugal frozen fish" |
| Thriving | Working age | 26-30 | Students/young professionals aged 26-30 years | "Forgotten fish" |
| | | 31-40 | Busy young families aged 36-40 years | "Fish finger families" |
| | | 41-50 | Older, more affluent, families aged 46-50 years | "Fabulous fish" |
| Surviving | Non-working age | 51-64 | Older families aged 61-65 years | "Fresh fish families" |
| | | 65 plus | Elderly people aged 86-90 | "Fish on a friday" |

2.3 Outlets

Consumers are exposed to products through a wide range of outlets. Outlets can support general mainstream consumption, offer convenience or serve specialised interests. Outlets can be broadly categorised as retail (in-home consumption) and food service (out-of-home consumption). Food service can be considered the avant-garde of the retail sector, developing product innovations (providing seafood solutions for unsure consumers and generating awareness of novel products) that are then diffused into more general mainstream food service and retail outlets. See figure 2.4 and table 2.5.

2.3.1 Retail

Within retail, outlets that support general mainstream consumption include the major multiples. These include M&S, Waitrose, Tesco, Sainsbury, Asda, Morrison's and Co-op (with Aldi and Lidl now growing their mainstream market share).

Convenience outlets tend to offer a more limited range of convenience products. These include the likes of Lidl, Aldi and Iceland and the metro outlets of the major multiple retailers.

Outlets that serve specialist interests include fishmongers, delicatessens and fish counters within multiple retailers. Ethnic supermarkets, like Wing Yip and Seewoo, also serve niche interests.

2.3.2 Food service

Within food service outlets that support general mainstream consumption (meals) cover the non-profit sector and the profit sector. Non-profit outlets include schools, colleges, hospitals, prisons, etc. For profit outlets include hotel restaurants, bistros, gastro pubs etc.

Convenience outlets tend to offer a more limited range of convenience meals and snacks. These include the likes of 'fast casual' and 'quick service' outlets.

Food service outlets that serve specialist interests include ethnic and other specialist restaurants.

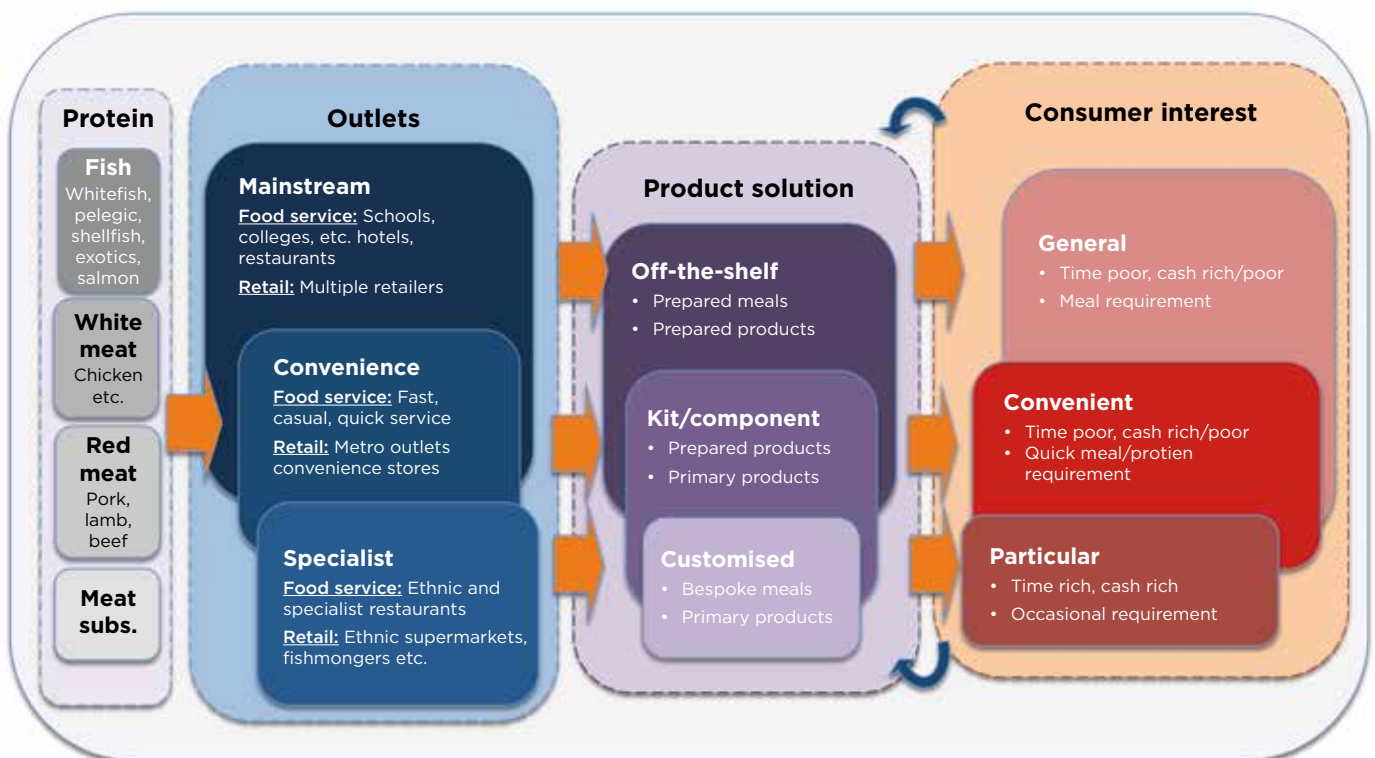


Figure 2.4 Current UK seafood and protein landscape from consumers to products and outlets.

Table 2.5 Key Characteristics of whitefish, pelagic, shellfish and exotic fish

| | Major supplying regions | Species and chain | UK market products |
|-----------|--|---|---|
| Whitefish | UK domestic sources include UK waters and NE Atlantic. International sources include Arctic/Barents Sea (Norway, Russia, Iceland) and North Pacific/Bering Sea (USA). | Cod, haddock, whiting, monkfish, sole, plaice, hake, Alaska Pollock. UK domestic more fragmented than integrated chains of competitors e.g. Iceland. Fresh product sent direct by truck. Frozen product held in storage, containerised and shipped and sent by truck. | Whitefish products for the UK market include domestic sourced fresh product (lower volume and higher value (£/kg)) and internationally sourced refreshed/frozen product (higher volume and lower value (£/kg)). |
| Pelagic | UK domestic sources include UK waters and NE Atlantic. International sources include Eastern Atlantic ocean (Spain, Morocco), Indian ocean, Pacific ocean, and Atlantic ocean. | Herring, mackerel, sardine/pilchard, anchovy, tunas. UK fresh product sent direct by truck, overseas fresh material sent by truck and air freight. Frozen product held in storage, containerised and shipped and sent by truck. UK domestic more fragmented than integrated chains of Iceland and Faroes. | Pelagic products for the UK market include fresh product (lower volume and higher value (£/kg)) that is either domestically sourced or internationally sourced and frozen product (higher volume and lower value (£/kg)) that is internationally sourced. |
| Shellfish | UK domestic sources include UK waters and NE Atlantic. International sources include North Atlantic, and farmed sources in South East Asia and Central America. | Nephrops, cold water prawn, farmed warm water prawn. UK fresh product sent direct by truck. Frozen product held in storage, and sent by truck with international material containerised and shipped. | Shellfish products for the UK market include fresh but a sizeable volume of frozen product is also represented from UK and international sources. Fresh domestic product tends to be high value low volume, and frozen product tend to be low volume and high value (£/kg). |
| Exotic | UK domestic sources include UK waters. International sources include EU, Asia, Australia, and Africa. | Carp, wild and farmed bass, farmed bream, snappers, kingfish, parrotfish, and groupers. | Exotic seafood products for the UK market include fresh (including live) product, and frozen product. Both fresh and frozen product tend to be low volume and range from low to high value (£/kg). |

2.4 Framing seafood consumption risks

Risks to UK seafood consumption are summarised in table 2.6. Specific risks vary by consumer group, product type, as well as outlets. Examples are provided to illustrate how these risks impact on the industry - particularly in price, quality, and convenience as these risk areas are elevated in current conditions.

Table 2.6 Dimensions and risk to seafood consumption

| Dimension | Areas of specific risk | Example areas of specific risk |
|--|--------------------------|---|
| Price | Price range | Polarisation of product value – premium versus value |
| | Price ceiling (max) | Expectation that fish price should fall / or be at a low price |
| | | Fish can be expensive relative to substitutes as disposable income decreases |
| | Price floor (min) | The availability of volume supply – top 5/salmon/alternative species/etc |
| | Price of edible protein | Level of waste involved in storing/preparing/cooking fish products |
| Quality | Taste | Changes in ethnic mix and the influences on fish as a protein and particular species within that. |
| | Freshness | Capability of freezing technology to support this |
| | Consistency | Level of consumer trust : chefs ‘versus’ brands ‘versus’ consumer (themselves or trusted advocates e.g. bloggers) |
| | | Brand loyalty falling with a more promiscuous consumer |
| | | Enhanced by trusted brands, trusted outlets and online purchasing |
| Capability of a consolidated -v- fragmented industry | | |
| Convenience | Availability | Presence and presentation of fish on online retail platforms |
| | | Heightened awareness with rise of digital marketing, real-time campaigns |
| | | Awareness constrained by fragmented industry/promotion |
| | | Priorities of influential outlets |
| | | Focus of outlets (e.g. discounters/number of metros) constraining shop window |
| | | Specialisation (e.g. focus on chilled OR frozen) undermines diversity message |
| | | Range and exposure of fish on offer resulting from store layout/formats & fragmented internal operations e.g. presence of fish counters |
| | | Packaging |
| | Product Format | Fish sitting alongside/given lower billing versus other proteins (e.g. Deli’s/ Number of fish dishes on menu’s/in restaurants) |
| | | Fish a more difficult protein to choose (chilled/fresh requires ‘eyeballing’) |
| | | Format matching to suit evolving eating habits (consumers grazing/ on the go snacking/household size - older people ‘eating for one’) |
| | | Range of product formats (fresh, frozen, ambient) and requirement for pre-processed |
| | Versatility/ preperation | Format matching the deskilling of kitchen staff (reduced whole fish/ increased portions) |
| | | Protein versatility |
| | Time | Norms/traditions versus experimentation (younger people, more adventurous) |
| | | Variety driven by time/experience seeking |
| | | Competing demands on consumers’ time |
| | | Purchase frequency/footfall/traffic |

Table 2.6 Dimensions and risk to seafood consumption (Cont.)

| Dimension | Areas of specific risk | Example areas of specific risk |
|-----------|------------------------|---|
| Health | Safety | Health, fraud and mislabelling concerns e.g. Horse meat scandal |
| | Health awareness | Promotional focus on emotion/experience at expense of function & vice-versa |
| | Nutritional content | Polarisation of role - 'functional' versus 'experience' |
| | | Health credentials |
| Welfare | People | Slavery, bonded labour concerns, fair trade etc |
| | Animals | Welfare of fish and others in food chain e.g. seals |
| Resources | Oceans | More environmental factors now required (market access requirement) |

2.5 Supporting consumption in the UK seafood and the wider protein industry

At present there are various levels of initiative by industry, policy, and research stakeholders supporting responsible protein consumption and production. Examples are listed below.

Industry:

- General protein awareness, generic marketing, and data
 - Fish (Seafish) – Fish is the dish, Seafood week, F&C shop of the year
 - Pork, Lamb, Beef (Agriculture and Horticulture Development Board (AHDB))
- Specific seafood promotions (often species specific) by regional sources of supply
 - Norwegian Seafood Council (cod, haddock, etc)
 - Alaska Seafood Marketing Institute (Salmon, Alaska Pollock, etc)
 - Seafood Scotland (cod, haddock, mackerel, herring, Nephrops, etc)
- Specific seafood product promotions
 - Individual brand owner campaigns
 - Multiple retailer campaigns
 - Scottish salmon, Scottish shellfish, etc.

Policy: Regulation, Government, NGOs

- Global
 - UN FAO – The Livestock, Environment & Development initiative (LEAD)
 - UN FAO/UNEP – Sustainable Food Systems Programme (SFSP)
 - Global Roundtable for Sustainable Beef
- UK
 - Eating Better campaign (encouraging dietary shifts towards less and better meat consumption)
 - World Wildlife Fund Livewell Plate
 - Celebrity and celebrity chef campaigns – including Paul McCartney's Meat Free Monday campaign, Hugh Fearnley-Whittingstall (sustainable diets) and Jamie Oliver (healthier school meals).

Research:

Specialist research centres with an interest in food and seafood consumption include: Stirling University (consumers and marketing), Bournemouth University (consumers), Aberdeen University (health and nutrition), and Oxford University (Oxford Martin Programme on the Future of Food and Food Climate Research Network).

3. Drivers and risk developments affecting seafood consumption – the long view

This chapter summarises the main drivers and risk developments affecting the seafood industry over the long term, with a focus on seafood consumption in particular. This draws on developments that are both observed (by 3rd parties) and experienced (by industry operators).

Table 3.1 shows the long view of drivers and risk developments affecting seafood consumption, experienced or observed in the period 1997-2008 through to those anticipated in 2019-2029.

Systemic global risk developments, notably food security and climate change, act as multipliers to amplify the above risk developments and their impacts (threats and opportunities).

3.1 Food security

The main aspects of food security are: a globalised economy; global population increase; and global availability of raw material. Projected economic growth, growth in population (and middle class income), and changing tastes and diets in regions around the world suggest:

- A world economy rebalancing towards Asia.
- An expanding global middle class (squeezed in developed countries).
- Increased protein consumption with regional differences, regions in which per capita fish consumption (Fig 3.1):
 - high and predicted to grow strongly (China, South East Asia and North America)
 - high and predicted to grow weakly (East Asia and Pacific, Europe and Central Asia, Japan)

Table 3.1 The long view: 1997/2007 – 2008/2018 – 2019/2029

| Driver | Risk Development | |
|-----------------------------|---|--|
| | From | To |
| Economic developments | UK economic growth, with premiumisation convenience and added value products | Limited economic growth, expanding overseas markets with greater focus on convenience and added value products |
| | Constrained supply in traditional supplies with opening up of new supply sources | Broadening of species and supply sources with traditional supplies potentially constrained |
| | Expanded middle - 'we're all middle class now' (disposable income/debt increasing) | Squeezed middle (low wage economy, reduced disposable income) and savvy shopper |
| Trade developments | Diminishing tariffs (new sources of protein) | Free trade agreements (UK won't run out of food, but higher prices, less choice) |
| | Sporadic supply disruptions in producing countries | Competitive pressure to secure supply, more processing in third countries (outside UK control) |
| Population | Growing UK population, globalisation, tourism | Growing population that is diverse and ageing |
| | Erosion of family as stabiliser | Fragmented, greater demands on individual (work, leisure, caring) |
| Scrutiny/regulation | Introduction/growth in scrutiny (medical community 'don't eat' lists), increased testing | Forensic testing (allergies etc) |
| Media influence (Incl NGOs) | Emergence of celebrity chefs | Influence of social media (trusted advocates) |
| Outliers | Static web information (1st generation) | Dynamic internet (2nd generation) and "internet of things" (3rd generation) |
| | Technical innovations driving aquaculture (making salmon, prawns, pangasius, available in volume) | Technical innovations driving aquaculture (making new species available in volume) |

- Global fish production expected to increase, based on:
 - wild capture having zero growth with aquaculture expanding at a declining rate.
 - concentration in Asia (particularly India, South East Asia and China) driven by species amenable to aquaculture (prawn, salmon, tilapia, carp and pangasius).

contributed to changing distribution of target species (as some traditional species may move away and warmer water species move in) whilst in shellfish fisheries there are changes in the prevalence of non-native species/jellyfish. In all fisheries, offshore operations will be impacted with challenges to safe working conditions and gear deployment/performance.

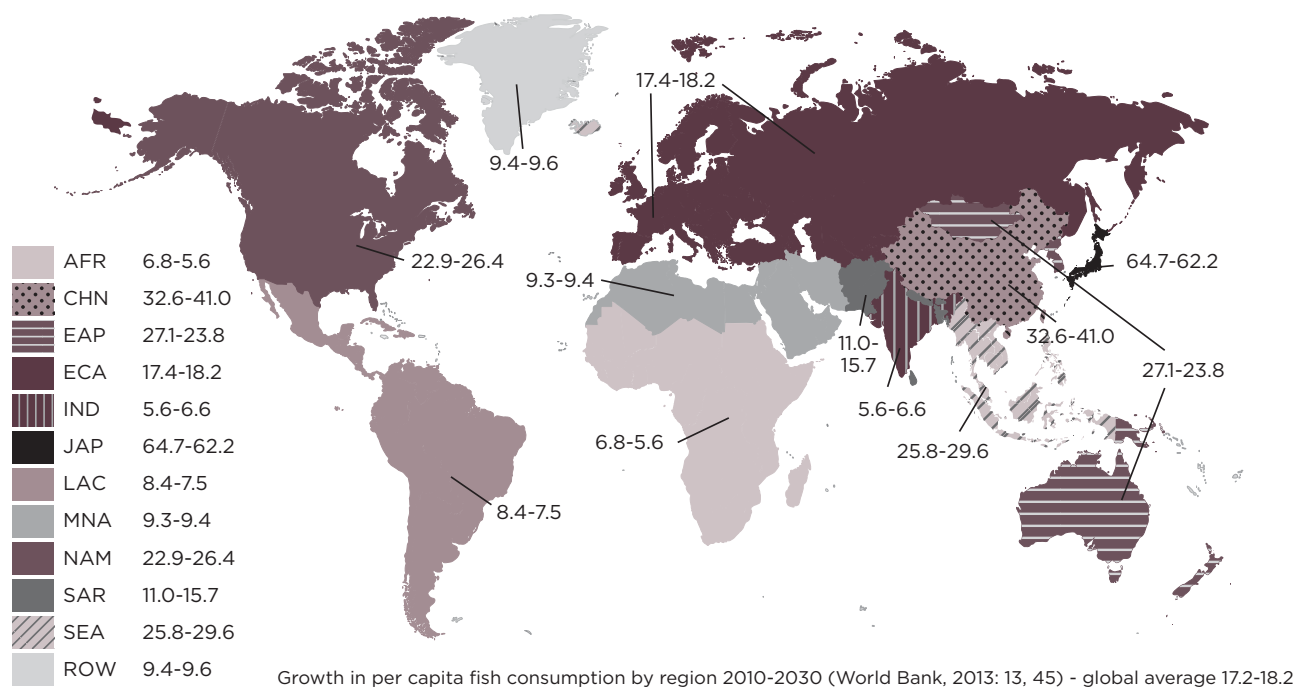


Figure 3.1 Projected growth in per capita fish consumption by region, 2010-2030 (kg/person/year). World Bank (2013:13,45)

3.2 Climate change

The main physical climate change impacts of interest to industry are:

- Sea level rise and extreme water levels
- Changes in storms and waves
- Changes in temperature
- Ocean acidification and de-oxygenation of sea water
- Changes in terrestrial rainfall (i.e. through surface flooding of land-based infrastructure, plus its role in transferring water, contaminants, and pollutants from land to sea).

The two main climate change drivers that lead to priority risk developments for wild capture seafood are *increased storminess and waves* and *air or sea temperature change*. In shellfish an additional driver is *changes in rainfall/land run-off*. For whitefish and pelagic fisheries, this has

Climate change may also have implications for aquaculture supplies, especially those originating in estuarine areas. There may be impacts from *increased storminess and waves, air or sea temperature change, changes in rainfall/land run-off, and acidification*.

Onshore, the above risk developments are compounded by *sea level rise and extreme water levels*. This can give rise to impacts affecting onshore operators:

- Damage to site infrastructure (port & processors).
- Integrity of electricity supplies.
- Transport distribution (including ferries).
- Integrity of housing and reduced employment.

4. UK seafood consumption – recent and anticipated developments, impacts and response

Given the drivers and longer term developments set out in the previous section, this chapter identifies the recent and anticipated risk developments and impacts for industry. These are described as they relate to the consumer, proteins, products and outlets (retail and food service). The chapter concludes with examples of industry impacts and a list of action areas suggested by way of response to anticipated developments.

All protein sectors (including seafood) share a common exposure to changing consumption and expectations of consumers relating to:

- **Price** - a more challenging price environment (with the upward pressure on prices)
- **Quality** - raised expectations of consistent quality
- **Convenience** - a desire for products that fit with increasingly busy lifestyles
- **Health** - a greater awareness of nutritional merits.
- **Welfare and resources** - an expectation that these aspects are 'taken care of'.

Whilst the UK meat protein industry may share these concerns, the seafood industry and individual sectors within that have exposure in different ways. This exposure is briefly explored in the next few sections.

4.1 Consumers

4.1.1 Recent developments

- UK population has grown at an accelerating rate and is ageing. Population grew by 7.8m since 1980 with about half of this growth since 2005; propelled by, amongst others, a stronger economy (from 2012) and immigration (particularly from the EU).
- From 1980-2007 UK households enjoyed a long period of rising household disposable income, coupled with widening inequality. Since 2007 households have been under pressure with disposable incomes having plateaued (younger cohorts particularly challenged; older cohorts less so). Household expenditure has shown a decrease since 2006, with the major cost items being housing costs (higher share of households renting) and fuel and power.
- All age cohorts are seeking to maintain, or enhance, their standard of living. Overall, households are choosing to save less in an attempt to maintain living standards with some able to achieve this more easily than others. For example, in general terms:
 - 'Strivers' may be increasingly time poor and cash poor
 - 'Thrivers' may be increasingly time poor and cash poor/rich
 - 'Survivors' may be increasingly time rich and cash rich
- 'Thrivers' are having more demands put on them; examples include caring for elderly relatives (as public services become stretched) and younger cohorts remaining at home longer (being unable to afford housing), and women having to switch family for work to maintain disposable income. Economic inactivity has reduced for women, with the main reason being a decline in the share of women staying out of work to look after the family or home. *This has not been compensated for by men staying at home to look after the family or home.* Meanwhile 'strivers' are exposed to opportunities that can be increasingly out of reach.
- UK population dynamics mean the older cohort ('survivors') is generally expanding and able to work longer, relative to the younger cohorts ('strivers' and 'thrivers'). The development of technology and online services has meant the consumer is more 'connected' than ever, and has been relieved of burdensome, mundane and time-consuming tasks; increasing leisure time and exposure to wider influences and opportunities. Yet ironically this is leading to lifestyles that are increasingly fragmented (tastes, smaller households, the 'always on' consumer). With a progressively individualistic society, consumers are increasingly dining alone. Consumers are moving from the traditional lifestyle arranged around 'three-meals-a-day' towards 'grazing' that fits around lifestyle. This is reflected in food preparation time (which, in some studies, has fallen from 60 mins in 1980 to 34 mins in 2015).
- Consumer attitudes are shaped by two opposing dynamics: value for money for *me and my family* (price, quality, convenience, and health) and what's right for *other people and the wider world* (health, welfare, and resources). There has been a long trend towards food consumption as a pleasurable experience and attitudes that embrace the wider world. Since economic conditions tightened from 2008, UK

consumer attitudes have sharpened. Greater interest was shown towards *me and my family* (price and quality) relative to *other people* (convenience, nutrition, welfare) and *the wider world* (resources) (see Fig 4.1). As economic conditions have eased initial sharpening has given way to a widening interest in convenience, nutrition, and welfare (supported by an ageing population and recent scandals such as 'horsegate'). Consumer attitudes around price, quality and health now have much greater influence than sustainability concerns, with the latter remaining a confusing concept to many consumers.

- Having relegated health concerns in the aftermath of the 2008 recession, *health* awareness and nutritional aspects of food has regained ground. Awareness of health as a factor has recovered perhaps as mid-age cohorts ('thrivers') take on caring responsibilities, those moving into the older cohort ('survivors') engage with the health agenda (GPs, hospitals, etc) and events such as 'horsegate' that highlight food fraud and undermine product integrity.
- Beyond the legal requirements over *welfare* and *resource*, the range of expectations concerning these attributes is broad and in

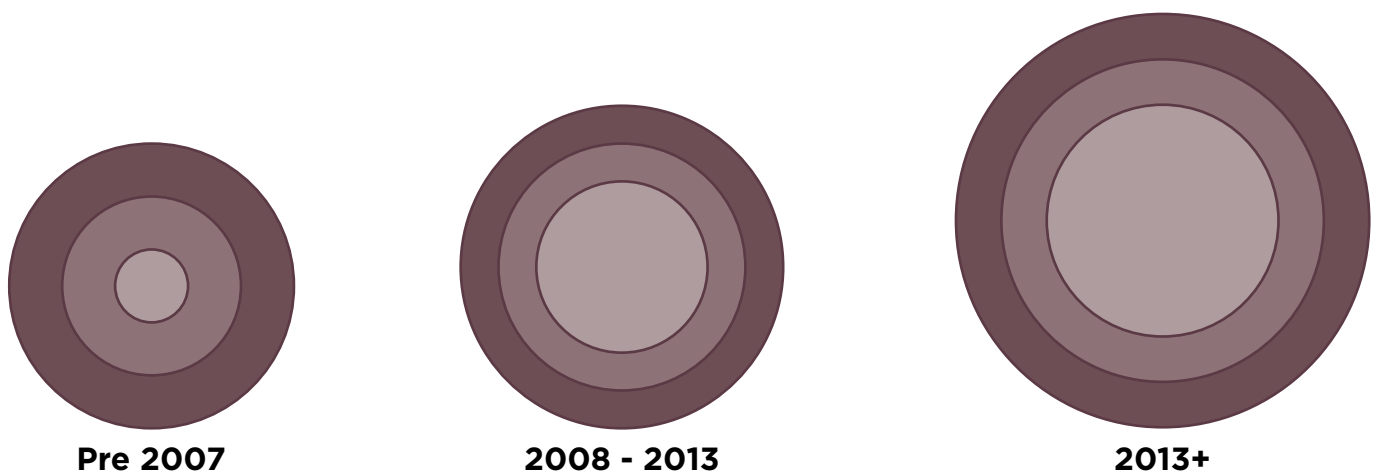


Figure 4.1 A growing concern for price and widening expectations

- In food, the longer term trend of cheaper food relative to income, and widening access to food, is being challenged. With significant numbers of consumers of reduced spending capacity, there is a growing consumer focus on *price* (for consumers in general the price range has narrowed and the price ceiling lowered). The requirement of all age groups has given additional impetus to a longer term trend in *convenience*. There has been the rise of the 'savvy' shopper, prepared to 'shop around' and cut corners in order to maintain an expected level of purchasing and range of experiences. Product attributes commensurate with busy, connected lifestyles include formats suited to small basket shopping, kit-cooking (a substitute to the full cooking experience) and versatility to overcome lack of confidence in cooking skills and encourage experimentation. Attributes suited to the older cohort include product formats that match smaller households or individual living.

the case of seafood (with shifting arguments around sustainability) particularly *confusing*. In the years since 2008, these attributes have diminished in importance relative to price for a large number of consumers.

4.1.2 Anticipated in the next five years

- Increasing births and net migration will drive continued population growth by nearly 0.5 million p.a. Population is expected to reach 73 million (and potentially 79 million) by 2037. This population will be older (longer life expectancy), and more diverse (immigration).
- If population increases faster than the economy then UK consumers will get poorer on a per capita basis. These developments will increase pressure on housing, services, and disposable income (consumers will either cut spending or, failing that, cut savings or increase borrowing). We might expect this to put further pressure to be active in the economy (with more pressure for both parents to work at the expense of looking after the family/home)

- If economic conditions hold rather than deteriorate, consumers concerns for food will continue to focus on function (food as fuel), balancing this where possible with food as an experience (emotion and pleasure). Attitudes will continue to focus on *me and my family* (price, quality, convenience, and health) with an expectation that concerns of *other people* and *the wider world* (health, welfare, and resources) are 'taken care of'.
- We might expect the consumer to show continued sensitivity to food price with low price ceilings before consumers show interest. This may mean a growing concern for waste and sensitivity to what consumers are getting for their money (price of edible protein).
- The demands placed on mid-age cohorts (particularly 'thrivers') are unlikely to retreat. Leisure time can be expected to increase in value and become part of the 'value for money envelope'. In managing this the shift to grazing (and further erosion of three-meals-a-day) will continue, and we may see consumers managing their connectivity (connections reduced to known and trusted parties) to reduce the 'always on' access. To manage leisure time, consumers will place a higher premium on convenience. Specifically this may mean higher interest in food that is targeted/available, in formats that support grazing and reduce waste (storage, preparation, cooking), and can meet the time requirement – i.e. supports experience/experimentation, and offers versatility).
- We may also expect health aspects to be of continuing and growing interest for those in, or approaching, the older cohort ('thrivers' and 'survivors'). For these consumers, health features may form part of the value envelope i.e. if the product cannot compete on price then experience and health attributes may prove attractive features.
- Beyond the legal requirements, the relative importance of welfare and resource attributes are likely to remain diminished, of major concern only to a minority. In seafood, given the levels of confusion, there will be an expectation amongst the majority that any legal requirements will be 'taken care of'.
- UK meat consumption levels have remained steady since the mid-1970s (although declining in recent years), but culinary styles and tastes have broadened. Important changes in the types of meat eaten include:
 - Rise in poultry consumption - increases may reflect sector consolidation and declining relative costs, convenience (versatile protein), and health attributes.
 - Decline in red meat, particularly beef and lamb - having suffered a number of food safety concerns (from BSE to 'horsegate') this may have led to lower consumption and a focus on higher quality meat.
 - Relatively stable consumption of fish - with a broadening of species so that consumers are able to switch between close substitutes.
 - Meat substitutes (such as tofu or Quorn) – these have emerged as alternative options in traditional meat products (stir-fry, Bolognese, etc) and may appeal to certain age cohorts (younger age groups for example).
- Although seafood is perceived to be expensive, longer term changes in fish supply have kept prices in check by lowering the price floor for raw material. This includes switching of wild capture supplies of whitefish (Alaska pollock for cod), and innovation in aquaculture introducing higher supply volumes - specifically in salmon, shellfish (warmwater prawn) and whitefish (pangasius). Since 2008, the relatively high price of seafood has seen a decline in overall fish consumption.
- Between 2007 and 2014, overall food prices increased by 22%. Within this, the price increase of specific proteins varied: lamb (42%), fish (36%), beef (35%), pork (30%), poultry (13%), and bacon (12%). With less money, the general response from consumers was to spend less and trade down to make savings. Lower income groups were disproportionately affected (spent more, purchased less and saved less than average). More specifically, consumers:
 - Increased quantity of pork, spending more, switching to lower priced items
 - Reduced quantity of poultry, spending more, and switching to higher priced items
 - Reduced quantity of lamb, lower spend, and switching to lower priced items
 - Reduced quantity of fish/beef/bacon, lower spend, switching to lower price items

4.2 Protein

4.2.1 Recent developments

- UK per capita meat consumption¹ is high in global terms but average for western Europe.

- Alongside reasonable prices, the growth in farmed production – and salmon in particular – has supported the fish category in terms of *quality* (providing consistency in a category otherwise mistrusted, and even feared, by many consumers). The sheer diversity of seafood is a strength in terms of availability but is also a weakness in communicating to the consumer. By providing a focus, the continued availability of key species – salmon, cod, haddock, tuna, and warm water prawn – in suitable formats (e.g. chilled) has presented seafood as a *convenient* protein option for the consumer.
- With the majority of the UK population relatively high meat eaters, there is a view that a general overconsumption of protein is a *health* concern. *“Meat consumption has already reached excessive levels in many western countries, in industrialised countries (including the UK) it’s around twice as much as is deemed healthy”* (Chatham House, 2015). This, together with safety concerns in other meat categories e.g. red meat, the nutritional benefits of seafood highlights the health standing of this category.

4.2.2 Anticipated in the next five years

- Looking ahead, there is a concern that a reduced seafood supply base may raise the price floor for supplies, placing upward pressure on *prices*. There is a specific concern that the significant increase in salmon production since the 1990s has reached a plateau and without further innovation (e.g. offshore farming) is unlikely to be the seafood driver it once was. Much depends on well managed and efficient wild capture fisheries and expanded aquaculture. Looking ahead, opportunities in the supply base include healthy cod stocks and farmed pangasius, with other farmed species (e.g. tilapia) deserving further exploration. If the category becomes more expensive the risk is that consumers, with continued price sensitivity, will trade down further or trade out of the category altogether. In leaving the category, consumers may opt for substitute meat proteins (particularly chicken), or reduce the amount of meat in their overall protein intake.
- If seafood supplies are maintained, and if suitable species are secured, increased availability could continue to support seafood as a *convenient* protein in terms of diversity, format (i.e. chilled) and versatility. However, barriers will have to be overcome²: for example pangasius was introduced to the market successfully but convenience has been limited in terms of versatility, and fragmented promotion. Tilapia, meanwhile, has not established itself in the UK despite prevalence elsewhere e.g. North America.
- With recommendations for limiting meat consumption, and red meat in particular, for reasons of *health* and environmental *resources*, we may expect consumers (particularly ‘thrivers’ and ‘survivors’) to look more favourably on seafood as a protein of choice. However, given the advice on overall protein intake levels, this may only go so far.

4.3 Products

4.3.1 Recent developments

- The greater emphasis on low *prices*, has forced the general premiumisation of seafood and red meat products relative to products in other protein categories. In seafood, the ability to draw on high volumes of key species (salmon, cod, haddock, warm water prawn etc) has helped to keep certain seafood products within the reach of consumers.
- Food fraud (mislabelling, deception etc) generally, and ‘horsegate’ in particular, has increased the attention given to *quality* and fully processed products have suffered, assisted in seafood with declining consistency in 3rd country seafood processing.
- Since the 1960s, the shift to *convenience* has seen reduced purchases of carcass meats and increasing interest in processed meat products and ready meals. Proteins that can accommodate this changing product profile have been favoured. More recently convenience has propelled certain product formats (ready to cook products and development of kit products) and spurred the decline of others (prepared meals and traditional meals e.g. Sunday roast). The range of seafood product formats has increased; with the ‘big five’ species dominant – supporting the arrival of tuna salad, prawn salad, sushi etc in the last ten years. Beyond the ‘big five’ there is now a much longer tail of seafood products (helped by the diversity of fish). In seafood, increased supply and packaging has improved availability, elevating the chilled category and giving further support to the ready to cook product format. Ready to cook products have been further advantaged where they can offer versatility. Across proteins, particular cuts (mince – the ‘ultimate kit food’, and ready to cook meats in foil), species (recipe oriented salmon and tuna), and proteins (chicken) are better positioned to offer this – allowing the consumer to adjust these components to a variety of final meals.
- The range of meat-based protein products has evolved and expanded over recent years in order to keep pace with changing consumer expectations regarding food as fuel, food as

convenience, and customised food.

- The growing attention to *health* has meant higher scrutiny of meat products with attention drawn to negative attributes of red meat - and processed products particularly - (for example the high salt content and unhealthy fats). Processed products have been challenged further with concerns over product integrity; the recent 'horsegate' scandal prompted consumers to 'trade up' with some buying less meat (particularly ready meals and processed meats) and avoiding cheaper meats. This has meant fully prepared products have to 'work much harder' (less salt, reduced fat etc).

4.3.2 Anticipated in the next five years

- There is continued risk of increasing *price*, and product premiumisation. This may be held if new supplies can contribute to the volume market currently held by the big five species (salmon, cod, haddock, tuna and warmwater prawn).
- With *convenience* becoming a more important factor, we can expect an expansion of the convenience food market and products that can fit with component or kit cooking. New formats appeal to busy consumers buying perishable foods, not only making life easier but avoiding waste (as larger portions can be left to go stale), whilst challenging the suitability of existing formats (for example multipacks, for an increasingly individualistic consumer, may contribute to food waste). The preference for a chilled format will remain strong (supporting chilled and refresh product). Convenience will be tempered by availability and this may see some fragmentation in the seafood category (large versus niche volumes). Notwithstanding a 'major event' affecting the supply base, the big five species are expected to stay and compete more directly with red meat cuts (e.g. mince), and chicken for a role in component products. The remaining seafood species are more likely to serve niche products.
- We might expect *health* awareness to continue pressure on highly processed products given health recommendations. These call for consumers to reduce saturated fat and salt intake, whilst highlighting the benefits such as reduced blood cholesterol, blood pressure, heart disease, and some cancers. Although specifically targeted at reduced red meat & processed meat consumption, this may steer consumers to reconsider processed products in general (including processed seafood products).

- The complexity of *welfare* and *resource* attributes as they relate to seafood, provide opportunities for specialist seafood products. Such products can use these attributes to differentiate themselves within the protein category, meeting the needs of specific consumer groups.

4.4 Outlets

Retail and food service have had a symbiotic relationship, with innovations in the latter providing product development opportunities in the former. In recent years, this has increased such that distinctions are beginning to blur; examples include food service outlets operating within larger retail outlets to drive footfall. Distinctions may be expected to blur further, combining with social media, to shorten the transfer from novelty to mainstream products. This will challenge the supply base by putting pressure on the time and cost of producing prepared/bespoke products.

4.4.1 Recent developments (retail)

- Over the longer term the consolidation of the retail multiples coupled with the decline in independent outlets has helped to deliver volume and keep *prices* in check for food and seafood. More recently, the shifting interest to low price and simplicity has favoured discount retailers - with lower overheads that can reduce prices substantially - at the expense of the major multiples. In seafood, retail sales volume has remained static over the last five years, indicating a decline in volume consumption per head (given population increase).
- In the wider protein context, *quality* and trust aspects brought about by product integrity concerns led some consumers to switch outlets. The integrity of red meat, brought about by food fraud (including 'horsegate' etc), led some consumers to switch from supermarkets to local butchers for example.
- A number of structural changes in the retail sector have supported the push for *convenience*. The major multiples, with large store footprint, have increased grocery sales value by around 4% in the last five years, whilst discounters and online sales value have doubled (110% and 117% respectively) - albeit from a low base. This broadening of outlets increases exposure to the consumer and enhances availability.
- The consumer shift towards smaller, more frequent, baskets has spurred the growth of discounters allowing them to 'take the shop window to the customer'. Although enhancing

availability by broadening outlets, the smaller footprint of these outlets also reduces choice to key lines of convenient product – narrowing the core range of products.

- Online food sales have further enhanced availability, offering new opportunities for reaching busy consumers; evolving from price comparison, to click and collect, towards timed delivery. Online grocery sales face unique challenges; food can spoil, be bulky or fragile, be difficult to return, and sometimes has to be refrigerated whilst consumers are unwilling to accept delivery fees or inconvenient slots. Although online grocery profit margins are considered worse than shop sales (as the delivery costs are not fully recovered) online continues to develop, as illustrated by:
 - Sainsburys' interest in buying Home Retail Group (in an effort to leverage the Argos delivery network that has set out to achieve same day delivery to meet consumer demands for immediate 'I want it now' service).
 - Morrison's deal with Amazon (to offer next-day delivery service fresh and frozen food to customers - generally regarded as an initial move by Amazon into the UK grocery sector).
- The priorities of major multiples (and decisions around fish counters, layout, promotion etc) has expanded volume for a number of years, heavily influencing the availability of seafood and broadening choice. However, the growth of new retail channels has challenged this and the major multiples have responded by shifted their orientation towards metro outlets and away from large out of town stores. Digital aspects have also been incorporated to enhance the in-store experience. Challenges remain with large stores where layout has tended to lump fish, of a specific format, together in one location. For example fresh/refreshed seafood products alongside (increasingly limited) fish counters oriented to 'theatre'.
- At a broader level, availability has been affected by the effectiveness of promotional campaigns; these have been weakened by media fragmentation (channel explosion). The long term trend in promotion has been concerned with emotional experience rather function. The 2008 recession returned function to the fore with promotions focussed on low price rather than buy-one-get-one-free offers. A simple (lowest price) message to busy consumers further favours discount outlets, unlike multiples. Where promotions focus on emotional experience, these centre on affordable experience.

- The changing retail landscape has favoured certain product formats. Reflecting consumer attitudes, the growth in smaller outlets has provided support for convenient products. For example, discount outlets focus on frozen product alongside a number of key lines of convenient product (e.g. salmon fillets with chilli sauce for the microwave) whilst new premium product formats have been developed as a substitute for fine dining experience (that consumers can ill afford, or have little time for, but don't wish to lose).

4.4.1 Anticipated in the next five years (retail)

- With *price* remaining forefront, the smaller, discount outlets will continue to find favour. Sensitivity to price will also heighten attention to waste (and all that entails for format, storage etc) particularly if penalties for waste are introduced.
- Outlets that can provide products where *quality* is 'good enough' will be in a favourable position. For online sales, consistent quality will become a key requirement as there is less opportunity to interact with the product and a high degree of trust required. Online sales may be better suited to the frozen, rather than chilled, category – but this will require very high quality assurance.
- With pressure on price (and a potentially rising price floor) there will be much more emphasis on moving towards consumers by improving *convenience*. Availability will play a large part in this. Changes in the mix of channel outlets will continue in the next five years. The pressure on the major multiples is expected to continue with anticipated sales value declining by around 3%, whilst convenience, discounters and online sales will drive growth (17%, 82% and 93% respectively).
- Amongst smaller outlets we might expect those at 'hotspot' locations to be more successful. This can already be seen with retailers such as M&S providing small outlets at key transportation points – petrol forecourts and railway stations.
- The implications of online food sales could be significant if challenges are overcome, or the costs reduced. For example, margins could improve if technology eliminated waste between ordering and delivery, enabling prices to adjust to the expiry date of the product (near expiration date costs less, 'expired today' is on sale). If this is realised, online platforms could be very attractive for retailers, with the likes of Amazon – given the range of products offered – presenting a significant challenge to existing operators.

- Large store outlets will continue to be challenged. As a consequence outlets will have to offer consumers a superior experience (more marketing platform than essential distribution outlet for consumers) leaving online, convenience and discount outlets to focus on consumers' functional requirements. We might see improved availability where retailer operations re-engineer store layout and how buying and marketing teams interact with each other and across protein. In product format, chilled sales are expected to increase, whilst new technology platforms will support new product formats delivered to the door when needed e.g. kit meals.

4.4.1 Recent developments (food service)

- The rising *price* of seafood is a challenge in food service. Government austerity means price concerns are particularly acute in the not-for-profit sector. The for-profit sector is affected differently, and less so than in retail, as consumers place more trust in chefs than themselves (concerning skills and time to prepare) and are willing to pay for that. That said, prices have been kept in check over the longer term as the food service sector has consolidated. The growth in big chains, and the emergence of gastro pubs, has helped in this. Seafood within the traditional fish and chip shop sector has struggled to compete with other proteins provided at a lower price, in some cases relegating fish to being 'part of the theatre' for that type of outlet.
- Consolidation, either through national or franchise operations in outlets but also in the supply chain, has also helped to deliver more consistent *quality*.
- *Convenience* has been enhanced through a much greater availability of seafood, both in terms of a broadening range of outlets and an increasing number of items on the menu. Since 2008, the food landscape has responded to changing consumer requirements (lower disposable income, reduced time etc) with a decline in full service restaurants and growth in quick service restaurants (QSR) and fast casual outlets.
- The food service product format provides a direct solution to address consumers' lack of confidence with seafood (lack of cooking skills, time, etc). The growth of QSR has supported those consumers with a convenient means of having a full service restaurant experience but on a budget and in quick time. The emphasis on costs, combined with de-skilling of kitchen staff, has seen a shift towards kitchens heating pre-prepared products. This trend has accelerated in recent years with new entrants challenging incumbent outlets by providing a superior food offer delivered through more integrated supply chains. New innovative outlets, such as street food, capitalise on convenience and support consumer 'experience' (with the novel eating and 'theatre' experience communicated - i.e. promoted - by consumers themselves via social media networks).

4.4.3 Anticipated in the next five years (food service)

- In the next few years, the rising *price* of seafood is expected to be a challenge, particularly in the not-for-profit sector, and in a less direct way in the for-profit sector. More generally, new entrants and consolidation in the sector will help keep prices down for the consumer. However, fine dining may be out of reach for the majority of consumers. Price will also heighten attention to waste particularly if penalties for waste are introduced and this may aggravate product integrity challenges.
- With new entrants and investment alongside consolidating supply, *quality* and consistency will be substantially elevated.
- To cater for *convenience* the high street is expected to become much more like an American mall. Formulaic menus will drive demand for pre-prepared product formats and consolidation in the supply chain is expected to provide that. This will support concerns over cost and waste; expected to receive higher attention over the next few years. New opportunities may be expected in format and delivery. For example outlets may be expected to become more adventurous, responding to consumers' interest in 'emotional experience' through novel products. In addition, the blurred lines between food service (out of home) and retail (in-home) may push operators further in delivering the food experience in-store (to further enhance the purchase experience) and in-home e.g. professional chefs offering their services to prepare meals in-home.

4.5 Example impacts and response

- In responding to the anticipated problems confronting UK seafood consumption in the next few years, a number of suggested actions are shown in table 4.1.

Table 4.1 Suggested actions in response to anticipated UK seafood consumption risks

| Dimension | Anticipated consumption risk | Sector | Suggested action | Owner* |
|-------------|------------------------------|-----------|--|--------|
| Price | Increasing price | Protein | Given the price sensitivity of protein, look ahead at what the supply base will look like in 15 years,. We cannot rely on existing species, alternatives need to be explored (pangasius is only going so far, tilapia is not successful despite being huge elsewhere) | |
| Quality | Inconsistent quantity | Product | With seafood exposed to product integrity issues, there needs needs to be more engagement in international networks and emerging collaborative ventures seeking to develop standards, risk assessments, testing methodologies etc. | |
| | | | Food service: suppliers take on aspects of product preparation previously undertaken by the outlet: <ul style="list-style-type: none"> • Filleting • Dressing • Accompaniment | |
| | | Outlets | Food service: industry consolidation is required to secure opportunities to supply into this sector. | |
| | | | Retail: quality needs to improve if online sales opportunities are to be secured. As technology allows frozen to compete, and in some cases be superior to chilled, there is scope for the frozen sector to achieve this if available defrosting technology can be harnessed | |
| Convenience | Reduced availability | Consumers | As salmon is very stable for freshness, and therefore dependable, the time may be right for freshness quality mark in seafood generally | |
| | | | With fragmenting consumers, increasing protein competition and cost pressures, develop collaborative promotional efforts that are more integrated, tied together, and closer to those eating seafood. In seafood promotion, co-branded marketing and promotions activity have worked well e.g. Focus on a branded products, or an own label branded product with a byline detailing the regional source, or a campaign to cook from frozen (given there is a lot less waste). Simplicity and standardisation of responses, with simple messaging to consumers should be sought. The development of a broader campaign could set the manifesto and synergies gained working with other brands, and other organisations. Over the next 2 years, an overarching campaign could be developed that's emotive and powerful and can provide some lift (see Ford's 'Go Forward', Nike's 'Just Do It'). | |
| | | | To reach a busy consumer, in an increasingly competitive protein environment, simplify promotions by moving away from health/sustainability towards 'smart buying' (appealing to consumer ego). | |
| | | | Marketing/promotion might be better focussing on those consumers approaching the older age group i.e. shouldn't necessarily focus on the younger cohort (a long held view is that older people tend to eat more fish; as these die out we need to encourage more consumption in younger age groups. This needs to be challenged; consumers grow into fish as they continuously coming into that age cohort.) | |

*to be agreed

Table 4.1 Suggested actions in response to anticipated UK seafood consumption risks (Cont.)

| Dimension | Anticipated consumption risk | Sector | Suggested action | Owner* | |
|-------------|------------------------------|----------|--|---|--|
| Convenience | Reduced availability | Outlets | Explore how Seafish can put together RASS, RFS etc and present to the consumer in a trusted way (in the same way the Marine Conservation Society has achieved a position). | | |
| | | | In promoting seafood don't just think of fish, explore beyond fish i.e. take fish to the consumer rather than try and bring consumer to fish. <ul style="list-style-type: none"> In food service, explore how subculture trends and viral marketing can be utilised In retail, to reverse decline review how fish is presented in-store (the product needs to be in the aisle where non-fish consumers will be. Why are fish products located in the fish aisle? If you're not a fish consumer you're not looking at the fish counter or aisle.) | | |
| | | | Retail: Review the developments in online food sales and identify the implications for industry. | | |
| | | | Retail: Review the online landscape to assess promotional effectiveness. For example the taxonomy currently used for presenting the seafood category could be examined e.g. is smoked salmon in with ham/chicken/delicatessen? | | |
| | | | Food service: Develop and push stories that cover interesting developments in particular areas, for example getting a few chefs to back the stories (people follow chefs). Retail has performed better in this, but with food service consolidating it is easier to talk to the sector and get a message across. | | |
| | | | Food service: Develop a true understanding of fish amongst chefs. Sessions could be held with chefs to communicate the fish story. Although industry operators do this already with a select few, this could be taken up a level, with Seafish providing a platform for the broader chef community. | | |
| | Unsuitable product format | Products | Seafood week provides promotional opportunities but should be reviewed. 'When' in the calendar is a key question. If you look at seasonality it's not right (people think of cottage pie in the autumn). Spring into early summer might be better. | | |
| | | | Given that protein is an expensive food category, there is a great deal of opportunity to reduce household food budget by reducing waste in protein consumption. Industry should review seafood portion sizes. For example, in red meat, the rise of ethnic dishes and the decline in the traditional Sunday roast has provided the rationale for an industry 'mini roast' initiative. | | |
| | | | | Review changes in consumer eating habits (desire versus time to cook, convenience) to identify opportunities to encourage the consumer to consider seafood over other meats (particularly poultry). A similar approach by the red meats sector has led to initiatives that focus on: <ul style="list-style-type: none"> casseroles (and 'cooking time') pulled pork (can be microwaved or cooked slowly - and therefore left alone - in the oven) thin cuts (exploring stir-fry kits for example). | |

*to be agreed

5. UK seafood consumption – impacts and response to longer term developments

The impact of longer term developments on UK seafood consumption is multiplied by food security and climate change challenges:

- The challenge of food security, a growing world population and middle class offers opportunities for protein suppliers in an enlarged global market but also the considerable challenge of intensified competition. Longer term trends suggest global demand growth will increase meat prices, including fish (with the projected changes dependent on how aquaculture develops). Although seafood could potentially play an important role in supplying this protein, from a UK perspective the industry is not as integrated as other protein sectors which could mean cost efficiencies are limited (in contrast to poultry for example), and avenues for product interference are opened.
- The challenge of climate change brings additional uncertainties to the seafood industry. The industry may be directly impacted by disruptions to the fish resource, as well as the catching/harvesting, onshore handling and distribution activities. This will directly affect availability. There may also be indirect impact if other protein sectors are disrupted. Finally, discussions in some policy circles are already suggesting that beyond health reasons our appetite for meat is a climate change driver. Dietary change, and reduced meat consumption, is advocated as a means of mitigating climate change. Recommendations include, amongst others, government intervention and the need for a national debate on meat overconsumption. In seafood there are calls, at a global level, for marine protected areas in order to mitigate climate change (potentially restricting resources).

Food security and climate change therefore aggravate existing challenges in seafood, particularly to international seafood supply. *Price* may be forced upwards as supply is disrupted and cost efficiencies cannot be secured. *Quality* may be compromised through product interference. *Convenience* may be undermined by reduced availability. Finally, as limited resources and the environmental impact of protein production come to the fore, consumers may be alerted to the *resource* attributes of particular proteins.

The longer term tensions provided by food security and climate change only add further uncertainty to consumers vacillating between value for money for *me and my family* (price, quality, convenience and health) and what's right for *other people and the wider world* (health, welfare, resources). At some point, as the market gets seriously competitive, we might expect various protein categories to 'break ranks' and start highlighting their respective advantages over each other.

The industry and Seafish have a choice as to whether or not to respond to this emergent landscape at this stage. Responding could involve a range of defensive or offensive actions, *initiated in advance*. Deciding not to respond at this stage would mean industry and Seafish are subject to events as they unfold, requiring strong capabilities to react quickly. If there is an appetite to respond at this stage, this review exercise has highlighted the following conclusions and requirements:

- **Making the case for seafood, with busy consumers, may have greater success through simplified promotion that offers 'smart' products.** Emphasis should be placed on smart choices, appealing directly to consumer egotism rather than altruism (which only goes so far). Within this, consumer perceptions on seafood, climate change and food security should be addressed by *highlighting seafood merits – energy / water / emissions – within the protein envelope (making seafood a smart wholesome choice)*. Compared to other animal proteins, seafood is extremely efficient in protein conversion, with low footprints in energy and water (for example water passes through, and is not consumed by, aquatic production systems). Seafish/industry should stress how seafood is part of the food production solution in a low carbon economy. By communicating the positive contribution seafood can make, the industry can be given the licence to grow.
- **The challenge of UK seafood consumption should be addressed in concert with others (internally and externally).** There is fragmentation within organisations (technical versus marketing), and across industry. At present the efforts to support UK seafood consumption are fragmented; there is no such forum or platform for industry to discuss and respond to this challenge. This sits in marked contrast with the technical part of the industry, that have had collaborative platforms, e.g. sustainability concerns to work through, for a number of years. Resources and impact could be leveraged further by operating at

the higher levels (at the seafood, and then the protein, category levels). Drawing from those at the coalface (working with major outlets and suppliers) could help Seafish, and the industry, maintain a valuable 'bigger picture' whilst collaborative promotions across platforms, could have greater impact. This approach departs from traditional approaches in which promotions and overviews are delivered by contracting out e.g. through consultants.

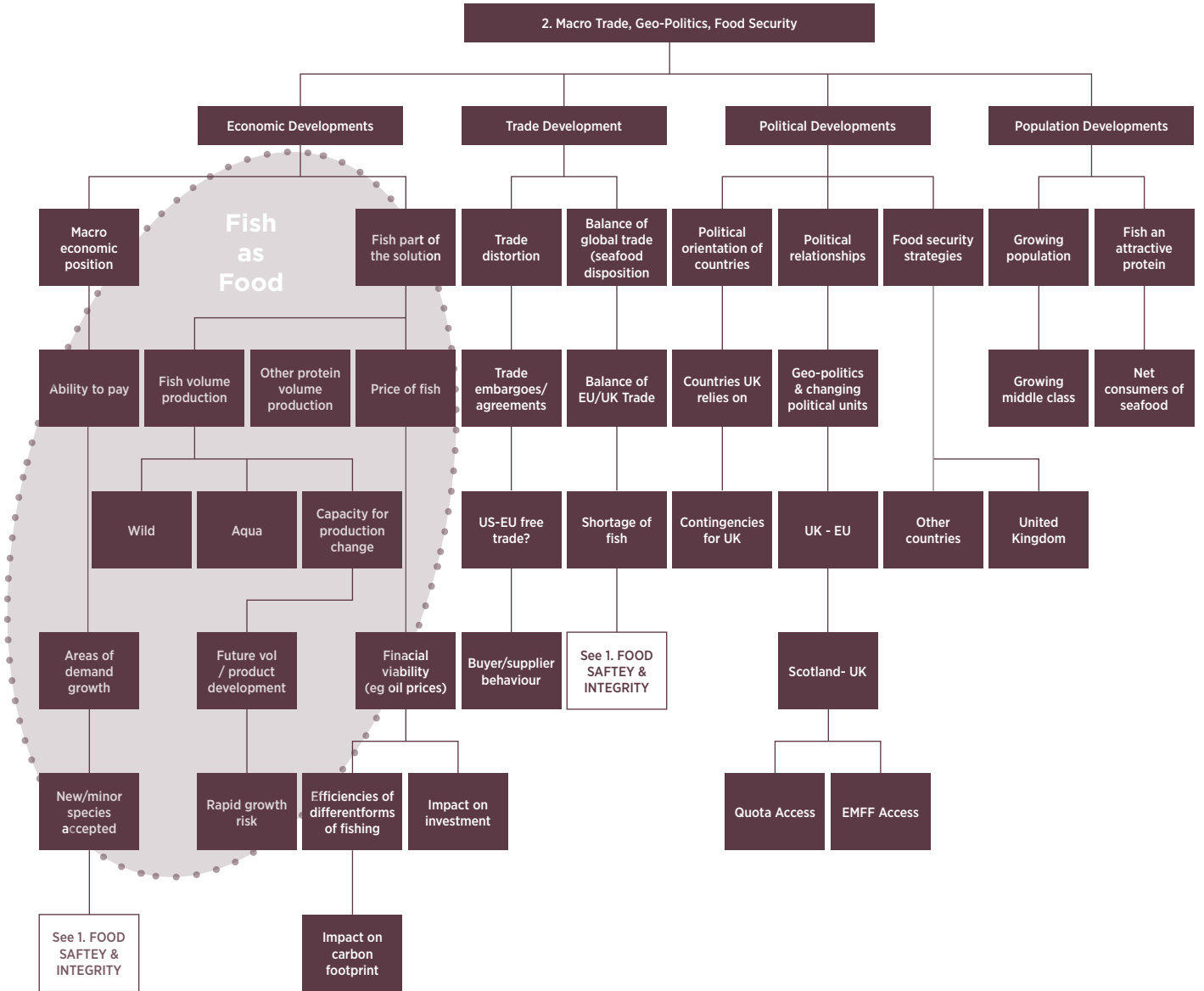
- **Responding to the UK seafood consumption challenge must be robust and more firmly grounded.** With the changes afoot, our understanding of the UK consumer and sales outlets falls short in several respects. Our understanding of online technology and how it may affect the industry is limited. For example, there are real risks that if online shopping is dominated by individual platforms, from which consumers automatically source food, this could challenge the industry e.g. limit 'market access'. There are major gaps in understanding consumer age-groups and life-stage (e.g. the older cohort and their requirements), in understanding consumer attitudes (price, quality, convenience etc) and sentiments as these evolve. Seafood trends need to be understood in an engaged fashion to *identify not only how these play out but what is practically possible (mechanics/tools) to increase seafood consumption and by whom* (Seafish, industry etc). A more sophisticated understanding of consumer requirements could be gained through closer collaboration in industry (including Seafish) and across the protein category. For example, AHDB are similarly concerned with consumer age groups and life-stage examining how these groups are reacting to events. Industry needs a better idea of how consumers think about value for money; not just price but quality and convenience/time etc. Long term tracking of value for money factors as they apply to seafood and other proteins could support this.

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Appendix 1 - Locating UK seafood consumption in seafood risk landscape



Appendix 2 - Consultees

1. **Dr. Jon Harman**
Alaska Seafood Marketing Institute
2. **Dr. Martin Jaffa**
Callandar MacDowell
3. **Laky Zervudachi**
Direct Seafoods
4. **Nigel Edwards**
Icelandic Seachill
5. **Simon Smith**
Icelandic Seachill
6. **Mike Berthet**
M&J Seafoods
7. **Iain Lowrie**
Young's Seafood
8. **Simon Tipper**
Young's Seafood
9. **Karen Galloway**
Xenosophy
10. **Julia Brooks**
Seafish
11. **Andy Gray**
Seafish
12. **Malcolm Large**
Seafish
13. **Heather Middleton**
Seafish
14. **Richard Watson**
Seafish
15. **Clare Dean**
Seafood Scotland
16. **Steven Evans**
*Agriculture & Horticulture
Development Board*
17. **Stephen Howarth**
*Agriculture & Horticulture
Development Board*
18. **David Swales**
*Agriculture & Horticulture
Development Board*
19. **Andrew Niven**
Scotland Food & Drink
20. **Graham Young**
Scotland Food & Drink
21. **Dr. Dawn Birch**
Bournemouth University
22. **Prof. Jimmy Young**
Stirling University

Appendix 3 – UK seafood industry - main systems, functions and activities

Source: Seafish, Defra

| System | Species distribution (and main producing countries) | Source method | Capture method |
|---------------|--|---------------|--|
| Domestic | UK waters/NE Atlantic (UK) | Capture | Whitefish & flatfish (bottom trawl) |
| Domestic | UK waters/NE Atlantic (UK) | Capture | Whitefish (gillnets) Whitefish (minority line-caught) |
| Domestic | UK waters/NE Atlantic (UK) | Capture | Flatfish & rays (beam trawl) |
| International | NE Atlantic/Barents sea (Norway, Russia, Iceland) | Capture | Demersal fish (bottom trawl) |
| International | North Pacific/Bering sea (USA) | Capture | Whitefish (pelagic trawl) |
| International | South East Asia (Vietnam) | Aquaculture | Freshwater pond culture |
| Domestic | UK waters/NE Atlantic (UK) | Capture | Small pelagic (purse seine & mid-water trawl) |
| Domestic | UK waters/NE Atlantic (UK) | Capture | Small pelagic (line caught) |
| International | Eastern Atlantic (Spain, Morocco) Eastern Pacific (Peru) | Capture | Small-pelagics (purse seine) |
| International | Indian ocean (Spain/France/Sri Lanka) Pacific ocean (Philippines/ Mexico) Atlantic ocean (Spain/France/ Ghana) | Capture | Tunas (long line) Tunas (purse seine) Tunas (pole & line / handline) |
| Domestic | UK waters/Eastern Atlantic (UK) | Capture | Crustaceans (pots) |
| Domestic | UK waters/NE Atlantic (UK) | Capture | Prawn (trawl) |
| Domestic | UK waters/Eastern Atlantic (UK) | Capture | Molluscs (dredged) |
| Domestic | UK waters/NE Atlantic (UK) | Aquaculture | Molluscs (rope grown/longlines) Molluscs (bottom grown) |
| International | North Atlantic (Denmark/ Greenland/ Iceland/ Norway/ Canada) | Capture | Prawn (trawl) |
| International | Mixed (Eastern Pacific, Mediterranean, North & South Atlantic, Indian ocean) | Capture | Cephalopods (jigging, trawl in North Atlantic) |
| International | South East Asia (Indonesia/ India/ Thailand), Central America (Ecuador/ Honduras) | Aquaculture | Shrimp farming (intensive > extensive) |
| Domestic | UK | | |
| International | Asia, Africa | | |
| International | Pacific ocean (USA / Canada / Russia) | Capture | Salmon (nets) |
| Domestic | UK waters/NE Atlantic (UK) | Aquaculture | Marine cage farming Freshwater ponds/raceways |

| Transportation | Format and processed form | Species | Broad species grouping |
|------------------------------|--|---|------------------------|
| Road, container | Fresh - Whole, fillets/loins, smoked, prepared | Cod, haddock, whiting, monkfish, sole, plaice | Whitefish |
| Road, container | Fresh - Whole, fillets/loins, smoked, prepared Whole, fillets/loins, smoked, prepared | Cod, haddock, Pollock | Whitefish |
| Road, container | Fresh - Whole, fillets/loins, prepared | Sole, plaice, rays | Whitefish |
| Road, container, Air freight | Fresh/Frozen - fillets/loins, smoked, prepared | Cod, haddock, hake, halibut, plaice | Whitefish |
| Road, container | Frozen - fillets/loins, smoked, prepared | Alaska Pollock | Whitefish |
| Road, container | Frozen - Whole, fillets/loins, prepared | Pangasius | Whitefish |
| Road, container | Fresh/frozen (including frozen at sea) - Whole, fillets/loins, smoked, fishmeal, preserved, aqua feed | Herring, mackerel, sardine/pilchard, blue whiting | Pelagic |
| Road, container | Fresh - Whole, fillets/loins, smoked, prepared | Mackerel | Pelagic |
| Road, container | Fishmeal, fish oil, canned, aqua feed | Anchovy, sardine/pilchard | Pelagic |
| Air freight, Container | Fresh/frozen - Whole, fillets/loins, preserved Preserved Whole, fillets/loins, preserved | Tunas (yellowfin, albacore, skipjack, swordfish) | Pelagic |
| Road, Air freight | Live Fresh/frozen - Whole, prepared | Crabs, lobsters, Nephrops, whelks | Shellfish |
| Road | Live Fresh/frozen - Whole, shelled, preserved | Nephrops | Shellfish |
| Road, Air freight | Live Fresh/frozen - preserved | Mussels, scallops | Shellfish |
| Road, container, Air freight | Live Fresh - preserved | Mussels, oysters | Shellfish |
| Road, container | Frozen - Whole, shelled, preserved | Northern/cold-water prawn | Shellfish |
| Road, container | Frozen - prepared, brined | Squid, octopus, cuttlefish | Cephalopods |
| Road, container | Frozen - Whole, shelled, preserved | Warm-water prawn | Shellfish |
| | | Carp, bream | Exotics |
| | | Kingfish, Parrotfish, Groupers, Snappers | Exotics |
| Road, container | Frozen - Whole fillets/loins, smoked, prepared | Pacific salmon | Salmonids |
| Road, container, Air freight | Fresh/frozen - Whole, fillets/loins, prepared, smoked Fresh/frozen - Fillets/loins smoked, prepared | Atlantic salmon, Rainbow trout (NE Atlantic small pelagic, waste and some imported fisheries (anchovy, sardine) input as feed in stage 2) | Salmonids |



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