

VALUE CREATION AND SUSTAINABILITY





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1.1. CONCEPT

V	Value addition: "adding value to a raw product by taking it into the next stage of the production value chain" (Kotler et al., 2008).			
	Refers to any additional activity that changes the nature of the product, adding value at the time of sale and can also be defined as the difference between the price of the finished product and the cost of the inputs involved in producing it. So, it is the increase in value that a company creates by undertaking the production process. In the case of food products is defined as any activity along the supply chain that increases the usability, culinary attribute or economic viability of a food item.			
	The value addition process could be defined as "the value customers receive and the value the company gives" and managing the value exchange among customers and the company is essential to achieve it.			
	The benefits that customers receive are expressed by the value proposition, which explains the relationship among the performance of a product or service, the fulfillment of the customer needs, and the total cost to the customer.			
	To evaluate this process, the company needs to determine the relative importance placed by consumers to the different attributes of the product. For example, it could focus on quality, freshness, or convenience of food products.			

of the Seafood Industry

1.1. CONCEPT

Added value: "the additional or differential characteristics of a product or service that make consumers choose that product or service over the competition" (Nilson, 1992).

- This concept in marketing aims to fulfil customers' needs and wants with products and services that have superior perceived value. With enhanced value provided to the customer and with each part of the business producing value, the company should be able to ask for higher prices and incur in lower cost; resulting in increased profitability and improved financial performance (Nilson, 1992). Added value' has been widely advocated as a strategy for achieving competitive advantage in an increasingly competitive commercial environment.
- Zeithaml (1988) noted four types of consumer added value:
 - 1) Low price (focus on sacrifice).
 - 2) Whatever the consumer wanted in a product or service (focus on benefits).
 - 3) The quality obtained for the price paid (trade-off between one sacrifice component and one benefit component).
 - 4) The total benefits obtained for the total sacrifice incurred (considering money, time and effort).



1.1. CONCEPT

Value: "what buyers are willing to pay" Porter (1985).

 Consequently, by adopting either a cost leadership or a differentiation strategy, companies create value for their customers by either lowering their costs or improving their performance.

COST LEADERSHIP STRATEGY

LOW COSTS:

Reaching the lowest costs through large-scale production + non-differentiated products

DIFFERENTIATION STRATEGY

DIFFERENTIATION:

Specialization in a key variable that will provide value to the market (ex. quality, design, innovation...)



1.2. IN THE FISH INDUSTRY

- Fishery is a very perishable food commodity that requires adequate handling and preservation to increase the product shelf life and retain its quality and nutritional attributes.
- In the fish-processing industry value addition is one of the possible approaches to raise profitability since this industry is highly competitive and increasingly expensive. Usually, value added fish products are perceived to be those that have supplementary ingredients such as a coating or a sauce, are prepared neatly or in some way provide more convenience to the user.
- □ There is a great demand for fish-based and seafood-based products ready to eat: Value addition ties with consumer convenience. Often, the resulting high-value fish products are commercialized as ready and/or portion-controlled, uniform quality meals.



1.2. IN THE FISH INDUSTRY

Processing and manufacturing techniques:

development of complex processing techniques.



Adding specialized ingredients: specifically in the canning industry the incorporation of special ingredients.



New sensory characteristics: incorporation of these can be found in processed fish.



Extending shelf-life:

products with an extended durability provide greater value.



Novel and convenient packaging:

convenient and time-saving packaging increases the product value.





Increasing the convenience:

easy to eat and easy to cook have great value among consumers nowadays.



1.2. IN THE FISH INDUSTRY

Benefits of adding value:

1) Benefits for consumers:

- Saving time to consumers: the offering of convenient fish products that are easy-to-cook or easy-to-eat saves time to consumers on a context of lifestyle with time constraints.
- Commercialization of a wide variety of fish products: the offering of wide assortment of fish products
 and fish species increases customer value providing a greater offer at the point of sale. For example,
 this wide assortment could be found in some distribution format such as for example closed fish
 markets or specialty food stores.

2) Benefits for the company:

- Improvement of processing utilization: the increase of customer value in the fish industry is often achieved through new processing techniques.
- Obtention of higher profits: when the company increases added value, its profits in the long term will increase, since the customers' needs, and demands are met.



2. CREATING VALUE IN THE FISH INDUSTRY

□ From a market perspective fish can be treated as a commodity. □ There is an increasing demand for innovative fish products that offer a modern style, taste of international cuisine or follow the latest food trends. Three consumer segments are identified as potential customers of innovative fish products.

The "traditional" fish eaters (30%)	The "innovators" (36%)	Ambiguous indifferent (34%)
PSYCHOGRAPHICS -Involved, knowledgeable	-involved, knowledgeable, innovative when in comes to new fish	-Non-involved, non- knowledgeable
BEHAVIOUR -Highest number of regular fish	-Highest number of regular	
consumers across all fish types (farmed, wild, etc.)	farmed fish consumers, highest number of occasional wild fish consumers	-Highest number of occasional of non- consumers of all fish
PERCEPTIONS OF VALUE & COST -Average perceived value of the new		types
species, highest perceived cost (i.e. price, safety, effort), high WTP and	-Highest perceived value (i.e. functional, hedonic, ethical),	
PI	lowest perceived cost, highest expected outcomes (i.e.	-Lowest value perceptions and outcomes, average
BELIEFS	satisfaction, trust, WOM), high WTP and PI	cost perceptions
 Overall strongest beliefs: farmed 		
fish is handled, guaranteed, safe,	-Stronger beliefs about farmed	
tasty; wild fish suffers pollution, heavy metals, parasites	fish: easier to find, cheaper, more controlled	-Neutral, low-strength beliefs



2. CREATING VALUE IN THE FISH INDUSTRY

PRODUCTS WITH ADDED VALUE - EXAMPLES

Type of fish product
Fish ready to cook
Frozen filled fish
Mince and mince-based products (fish nuggets, fish sausage, fish burger, fish fingers)
Salted fish in retail packs
Dehydrated fish in retail packs
Breaded and buttered fish



MAJOR DRIVERS: PRICE AND CONVENCIENCE

□MAIN DRIVER IS PRICE followed by			



MAJOR DRIVERS: PRICE AND CONVENCIENCE

Consumer demand for innovative and more convenient food products is increasing rapidly. They want to spend less time and effort cooking and seek for the most convenient option possible.
This convenience not only impacts end consumers, but also food retailers and the HORECA channel (hotel, restaurant and food catering players). End consumers are demanding fresh food products that they can consume immediately after purchase, with no further heating or preparation.
The four main causes of this trend are busy lifestyles and higher incomers, decreasing household sizes, urbanization and aging population.
Food packaging needs to facilitate ease of consumption and should make the freshness and quality of the product evident.



DRIVERS OF VALUE IN THE FISH INDUSTRY

Health

- There is an increasing connection between fish and health.
- Consumers demand food products that are rich in nutrients and support a healthy lifestyle.

Convenience

- There is an increasing demand for food products that save time and effort.
- Maximize efficiency and leveraging time-saving for the consumer before, during and after purchasing food products.
- Easy to consume, to store and to cook.

Functionality

- Food products that offer health benefits beyond their nutritional value.
- Functional foods are food products that have been enriched with healthenhancing or disease-preventing ingredients.

Hedonism

- These products are demanded for their sensory characteristics and enjoyment in the purchasing process.
- Mostly consumed for pleasure, for the stimulation of taste, smell, or sight.



DRIVERS OF VALUE IN THE FISH INDUSTRY - EXAMPLES







Functionality





Hedonism









DRIVERS OF VALUE IN THE FISH INDUSTRY - EXAMPLE

Cheap and affordable canned fish products









2. CREATING VALUE IN THE FISH INDUSTRY

2.2. THROUGH THE LIFE CYCLE

Nowadays, the dominant economic model is based on a linear consumption model of "consume-use waste", where natural resources and raw materials are extracted, processed into final goods and ther become waste.
The shift to a circular economy model has a great potential to reduce the associated negative environmental impacts of production in any sector.
Material flow is understood as the logical of value creation in which only virgin material enters in the beginning of value chain. But this linear production model incurs unnecessary resource losses: production chain and end-of-life waste, excessive energy use and erosion of ecosystems.



2. CREATING VALUE IN THE FISH INDUSTRY

2.2. THROUGH THE LIFE CYCLE

The linear production-consumption-waste model

Resource extraction

Production

Distribution

Consumption

Waste



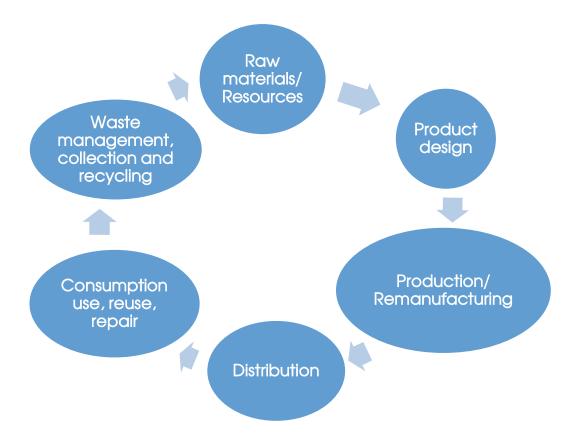
THE CIRCULAR ECONOMY

The concept of circular economy originates in the inability of linear production models to reconcile current levels of production and consumption with the limited availability of resources (Bradley et al., 2018).
The circular economy proposes the transformation of the linear consumption model into a closed-production model, so that production and consumption waste is reused and reincorporated into the economy to create more value.
In this model resources are reused and kept in a loop of production allowing the generation of more value. The circular economy aims to keep products, components, materials and energy in circulation to continue adding value and maintaining their value over a long time period.
The circular economy proposes restoration and circularity to replace the traditional concept of end-of-life, shifting towards the use of renewable energy, eliminating the use of toxic chemicals and waste.



THE CIRCULAR ECONOMY

The circular economy transforms the traditional economic model replacing the "linear production model" (consume-use-waste) by a "closed production model".





res 🔾 rtecs®

THE CIRCULAR ECONOMY - EXAMPLE IN THE FASHION INDUSTRY



What is it?

It is a Belgian company that offers global patented solutions that enable garment recycling thanks to automatic disassembly of apparel at industrial scale.



Data

- 300% more premium recyclable textile material without import issues.
- Fully circular while simultaneously reducing with 52% the cost of your unsold inventory.
- Start recycling garments with reflective ribbons and reduce the cost of End-Of-Life with 64%.



What is their objective?

To engineer circular economy in fashion by keeping products, components, and materials at their highest utility and value at all times. It efficiently recirculates the raw material and valuable resources used to produce new goods.



Rebirth® custom-fit dissolvable thread jeans in comparison to benchmark jeans CO2 reduction is estimated to be 53%, including:

- 25% reduction in transportation
- 58% reduction of raw material
- 99% reduction of waste generation



Sources: Resortects website & EU Social Innovation Competition 2020

THE CIRCULAR ECONOMY - EXAMPLE IN THE FASHION INDUSTRY

Rebirth® is an unspun® digital fit jeans produced with Resortecs® soluble sewing thread.

Table 1: LCA comparing the incineration to landfill disposal of benchmark jeans.

	Process type	Countries Benchmark jeans Incineration		Benchmark jeans - Landfill	
	Material sourcing (virgin)	India	2.047	2.047	
	Material component manufacturing	Bangladesh	14.783	14.783	
Benchmark jeans	Garment manufacturing	Tunisia	6.535	6.535	
enchma	Transportation (boat and road)	Hongkong	0.174	0.174	
0	Cut-off waste disposal (15%)	China	0.011	0.011	
	Unsold (20%)	China	4.7252	4.7682	
	Disposal Incineration- landfill	Hongkong	0.076	0.291	
	Total kg CO2/item		28.3512	28.6092	

Comparative Life Cycle Assessment (LCA)



Table 2: LCA comparing the mechanical to chemical recycling of Rebirth®

	Process type	countries	rebirth Jeans- Mechanical recycling	rebirth Jeans- Chemical recycling
	material sourcing (60% recycled)	India	0.864	0.864
_	material component manufacturing	Italy	11.717	11.717
Rebirth®	garment manufacturing	China	0.346	0.346
sbir	Transportation (boat and road)	HongKong	0.13126	0.13126
ď	cutoff waste disposal (0%)	China	0	0
	Resortecs processes	HongKong	0	0.038
	Sorting	HongKong	0.00002	0.00002
	Recycling	HongKong	0.0001	0.282
	Total kg CO2/item		13.09638	13.37828



Source: Resortects & Rebirth white Paper (dec, 2019)

2. CREATING VALUE IN THE FISH INDUSTRY

2.3. CUSTOMER VALUE CONCEPT

Cı	ustomer value: "a trade-off between the quality or benefits consumers perceive in the product, relative to the sacrifice they perceived by paying the price" (Monroe, 1990).
	Consumers will be disappointed when the ratio value (the economic sacrifices of customers with the products offered by the company) are not in accordance with customer expectations. When the ratio value is appropriate or exceeding customer expectations, customers will feel satisfaction.
	Customer value can be measured by functional, emotional and social.



2.3. CUSTOMER VALUE CONCEPT

DIMENSIONS

Functional value

 Focuses on product performance and functionality including the economic benefit or the utility that is provided by the product. p

Emotional value

• Derives from the feelings or affective states that a product generates.

Social value

• Derives from the product's ability to enhance social self-concept.



2.3. CUSTOMER VALUE CONCEPT

PRIMARY FACTORS

Quality:

Customer value is the perception of the quality and benefit of a product, compared to the sacrifice made to purchase it.

 Fish and seafood products with high quality provide great customer value. For example, Galician shellfish or Iranian caviar.

Brand image:

A positive brand image builds customer value in the long term and creates brand equity. Some companies own and manage brands, providing customer value when they have a positive and favorable image in the marketplace.
 For example, the positive image of Pescanova or Rianxeira.

Price:

Represents the value trade-off (benefits vs costs) that the consumer places on the product or brand.

 Fish products with a low or high price could provide value to customers, since they examine the trade-off to obtain the products. <u>For example</u>, a cheap canned fish product and a expensive Norwegian smoked salmon.

Competitive comparisons:

Evaluation of how well competitors meet customer value requirements.

Consumers compare the different competitive alternatives and when a fish product meets their needs well, then customer value is created. For example, the "ready-to-eat" fish meals of Pescanova "Pescanova y listo" may not have a competitive alternative in the marketplace.



2.3. CUSTOMER VALUE CONCEPT

SECONDARY FACTORS

Perceived substitutes:

When few substitutes are available for a particular product, the value becomes greater

When a fish product has no substitutes or few substitutes, its customer value increases. For example, there are few substitutes for sea urchins or for octopus, thus increasing their value. However, canned sardines could be easily substituted by other type of canned fish

Uniqueness:

Products and brands perceived as unique provide greater customer value

 When fish and seafood product or brand is viewed as unique, then its customer value increases. <u>For example</u>, Iranian caviar could be considered a unique fish product with great customer value

Switching costs:

The greater the costs of switching to another brand/product, the more value the brand /product holds

 fish products have low switching costs, since fish could be easily substituted by meat or poultry in developed countries. Therefore, fish companies should put emphasis on creating awareness about the unique fish health and sensory properties different from meat

Product availability:

The more difficult a product/brand is to find, or the less it is available, the more valuable it becomes in interior urban areas fresh fish becomes less available than in port cities, thus, increasing the value of this type of fish. Similarly, scarce fish species such as red tuna makes the product less available, and in turn increases its customer value.



CONCEPT AND CONTEXTUALIZATION

Strategic orientations: "1	the degree to which a company possesses and uses information about consumers, and
then develops a strateg	y that meets the demands of consumers and implements it by responding to consumer
	needs and desires" (Ruekert, 1992).

- So, it is an approach to business that prioritizes identifying the needs and desires of consumers and creating products and services that satisfy them. They are also generic philosophies that have been linked to specific economic conditions, and to certain periods in economic history.
- □ Today, five marketing concepts or orientations are distinguished through which the companies can design and carry out their marketing strategies (Kotler et al., 2008). In addition, there is a final marketing orientation which is clearly emerging today: the sustainable marketing orientation.





3.1. PRODUCTION

- Economic context: minimal or total lack of competition in the marketplace. Product demand is higher than product supply.
- Company beliefs: "anything that is produced or processed will be sold".
- Company focus: product availability.
- Consumers' preferences: products that are widely available and inexpensive.
- Conclusion: The company produces products based on what is good at doing and focuses on improving production/processing and distribution.
- Example: Over exploitation and the treatment of fish as simple food commodity.







3.2. PRODUCT

- Economic context: increase in competition or a greater balance between supply and demand in the marketplace.
- Company beliefs: "if the product has high quality, then it will be demanded, even without promotion".
- Company focus: Product quality as the main competitive factor; however, alone does not guarantee success in the marketplace.
- Consumers' preferences: products with higher quality, better performance or innovative characteristics.
- Conclusion: The company produces products based on what is good at doing and focuses on improving production/processing and distribution.
- Example: offer of high-quality products without promotion. For example, the commercialization of Galician shellfish in open markets.



3.2. PRODUCT - EXAMPLE

- Asociación de Armadores de Buques de Pesca en el Gran Sol: Los armadores de buques pesqueros que realizan su actividad en aguas de la Unión Europea.
- Warranty mark for the high-end rooster, only for specimens weighing more than 800 grams, measure more than 35 centimetres and caught in the last days of the tide.
- Shipowners who take advantage of the regulations for the use of the mark will work on the care of the fish from its catch to its first sale, taking extreme caution in the factors that contribute to the deterioration of the fish.
- □ To guarantee the whole process each fish will carry a serial number on the label, through which the consumer (from the www.arvi.org website) will be able to access the fish curriculum.







3.2. PRODUCT - EXAMPLE

- Pieces of fresh hake, captured with hook in the mythical fishing grounds of Gran Sol, in an "unsurpassed offer".
- The "unsurpassed offer" of Celeiro skewer hake on the occasion of the Vuelta improves the prices of an alliance between producers and distributors that until the end of next week allows to buy in Carrefour whiting at 5.90 €/kg and hake at 7.90€/kg.















Source: Puerto de Celeiro









3.3. SELLING

- □ **Economic context**: product supply is higher than demand.
- Company beliefs: "must sell what is produced"/" sell what the company makes".
- Company focus: aggressive product promotion, as well as on advertising and sales promotion.
- Consumers' preferences: they can be pushed or induced into product purchase, even though the product may not satisfy a real need.
- Conclusion: This orientation aims to obtain short-term sales, with little concern about who purchases the product or why the consumer buys the product.
- Example: aggressive promotion and advertising of fish products that may not be the best option for consumers' health or for the environment.







NORDSEE We are fish.

3.3. SELLING - EXAMPLE

Since 1896, it has developed its unique position in the restaurant industry as a company that provides variety and first-class quality and sources its fish sustainably.

RESTAURANTS



Variety of fresh and natural fish dishes, salads and drinks. To eat or takeout.

SNACKS



All stores sell snacks to enjoy them to-go.

RETAIL



It offers
products to
enjoy at home
and custom fish
dishes
preparation

SUPERMARKETS



Variety of Nordsee products, since 2015

DELIVERY



Though partners
it delivers
products at
home, now in
pilot cities











3.3. SELLING - EXAMPLE

The Company Nordsee is an example of the selling orientation in the fish industry









3.4. MARKETING

- Economic context: product supply is higher than demand.
- Company beliefs: "must produce/process what is demanded by consumers".
- Company focus: needs and wants of target markets and deliver better value than competitor.
- Consumers' preferences: products that identify their needs and with which the company satisfy them at a profit.
- Conclusion: The aim of this marketing orientation is building long-lasting relationships with consumers. The main factor is whether the company is tuned to the changing customer needs and competitor strategies.
- Example: commercialization of sushi or convenient "ready to cook" fish products.









3.4. MARKETING - EXAMPLE

- □ The project, the result of the company's industrial transformation plan with an investment of 30 million euros in the last 4 years.
- It has in turn in the development of its own technology Real Peel® and a redesign of the manufacturing process at its plant in Europe, located in Carballo (Coruña).
- Some of it benefits are:



Easy dump: allowing 100% of the product to be easily extracted.



Easier and safer opening thanks to the flexible aluminium lid and tongue.



Greater **product juiciness**, by Real Peel® technology.



Reducing the amount of oil by being more **environmentally** responsible.

• The impact on the environment is 35% less than the traditional product.

NUEVO ENVASA

- Reducing oil contributes to the reduction of food waste.
 - The can is still 70% recyclable.

3.4. MARKETING - EXAMPLE

An example of marketing orientation in the fish canning sector is the Vuelca Fácil developed by Calvo, since it increases consumers' convenience when consuming canned fish products.







3.5. SOCIAL MARKETING

Economic context: product supply is higher than demand. Company beliefs: "must produce/process what is demanded by consumers, but the social responsibility of the company must be taken into account". Company focus: meet the needs of target markets and deliver satisfaction effectively while preserving and enhancina consumer and society well-being in the long term. Consumers' preferences: products that while preserve and enhance consumer and society well-being in the long term. Conclusion: The aim of this marketing orientation is to build social and ethical considerations in the company marketing practices. **Example:** programmes that increase fish and seafood education and helping to tackle poverty in the community.





3.6. SUSTAINABLE ORIENTATION

- □ **Economic context**: product supply is higher than demand.
- Company beliefs: "The companies should consider both the social and the environmental dimensions of their activity, in their relationship with the market and society."
- Company focus: consider both the social and the environmental dimensions of their activity, in their relationship with the market and society.
- Consumers' preferences: Products that consider social and environmental dimension.
- Conclusion: The aim of this marketing orientation is to meet the expectations of society as a whole, upholding environmental and sustainability issues.
- Example: The inclusion of fish sustainability certifications in fish products.







ORIENTATION	COMPETITION	FOCUS	MEANS	GOAL
Production orientation	Minimal or none competition. Demand is higher than supply.	Satisfying high demand.	Production and distribution . Product availability is the key issue. «Everything that is produced will be sold».	Profit trough massive sales.
Product orientation	Increase in market competition. Greater balance between supply and demand.	Maintain and improve existing product concept/ product quality.	Product quality . «If the product has quality, it will be demanded and sold, without promotion».	Profit dependent on stable market conditions
Selling orientation	Strong competition. Market supply is higher than demand.	mprove and enhance existing and new product features.	Promotion and advertising. Consumers can be pushed into purchasing products, even though a need is not satisfied. «The company must sell what is produced».	Profit through sales volume
Marketing orientation	Strong competition. Market supply is higher than demand.	Better satisfaction of customer needs and wants.	Long lasting customer relationships. The company must analyse and try to satisfy customer needs and demands. «The company must produce what is demanded».	Profit through customer satisfaction
Social orientation	Strong competition. Market supply is higher than demand.	Socially concerned companies and products.	Long lasting customer relationships and society well-being. The company must analyse and try to satisfy customer needs and demands, but the social responsibility of the company should be considered. "The company must produce what is demanded, considering social well-being».	Profit through enhanced image and customer satisfaction
Sustainable orientation	Strong competition. Market supply is higher than demand.	Environmentally concerned companies and products.	Environmental sustainability and society wellbeing. The company considers both the social dimension and the environmental aspects in the exchange relationship between the market and society.	Profit through environmental benefits in the long term



4.1. CONCEPT

Sustainability: ''development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987)
Similarly, it refers to acting in a way that avoids environmental pollution, adverse effects for humans and animals and the extortion of natural resources. In the fish industry can be measured through greenhouse gas emissions (GHGE) and land use, fish stocks and bio-diversity; mainly reflects in fishing methods and quotas.
The sustainability of fish production depends not on the abundance of a fish stock, but on the ability of the fishery management system to adjust fishing pressure to appropriate levels
 Factors increasing the demand for sustainability in the fishing industry: European system of fishing quota that reduce catches for many fish species as part of conservation. A growing pressure of consumers' focus on biodiversity and animal welfare.



4.1. CONCEPT

CONSUMERS' DEMANDS

- □ Consumers are concerned with all dimensions of sustainability, and more precisely consumers' demand:
 - A sustainable management of natural resources
 - Environmental protection
 - Shorter transportation distances of fish products to local markets
 - Attention to animal welfare
 - Avoidance of incidentally by-caught non-targeted species
 - Use of sustainable fishing methods



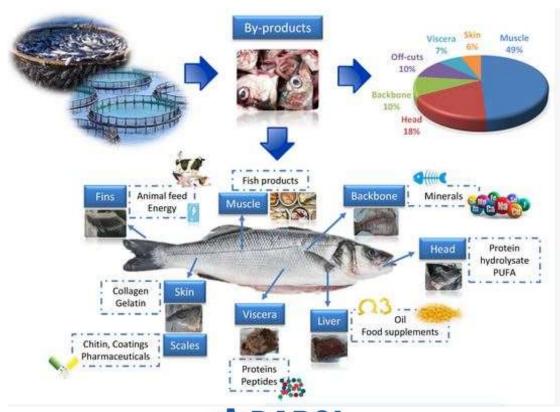
4.2. FISH BY-PRODUCTS

There is considerable potential to increase the sustainability of the industry through maximizing human edible fish products by strategically managing "fish by-products". About the 45% of the weight of fish is used for direct human consumption, so there is a huge resource for exploitation.
Fish by-products are defined as all the raw material, edible or inedible, left over following the preparation of the main product. This includes trimmings, skins, heads, frames (bones with attached flesh), viscera (guts) and blood.
They can be processed into added-value products such as fertilizers or fish oil and used in human consumption or in animal feeding.
Countries with both high demand and cultural reliance on fish are potential candidates for the marketing and sale of fish by-products.



4.2. FISH BY-PRODUCTS - EXAMPLE

Fish by-product fractions as a percentage of the total wet weight



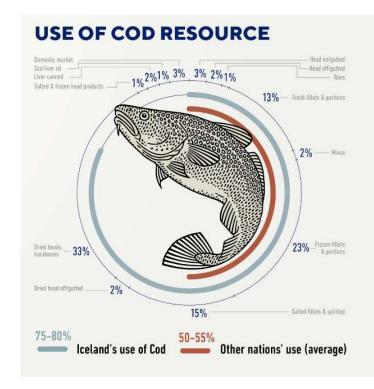


4.2. FISH BY-PRODUCTS - EXAMPLE

- □ Key findings:
 - Icelandic Cod Sustainability:
 - The fishing industry, directly and indirectly, counted for roughly a quarter of Iceland's GDP.
 - 4.3% of Icelanders work directly within the fishing industry, and up to 13% when including indirect jobs created.
- □ <u>Iceland Responsible Fisheries</u>:
 - Cod accounted for 49% of the export value of marine products in 2020.
- Financial and social value of cod is maximized:
 - Enzymes for fish flavouring.
 - Leather used in the shoe and fashion industry...
 - Caviar, enzymes used by the cosmetic industry.
- Environmental impact:
 - The carbon footprint of the Icelandic fishing fleet has decreased by 43% since 1990.
 - A decrease of 87% by 2030 has been projected.







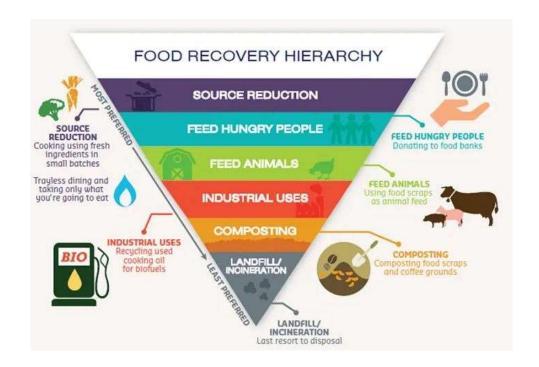
Source: Iceland seafood website

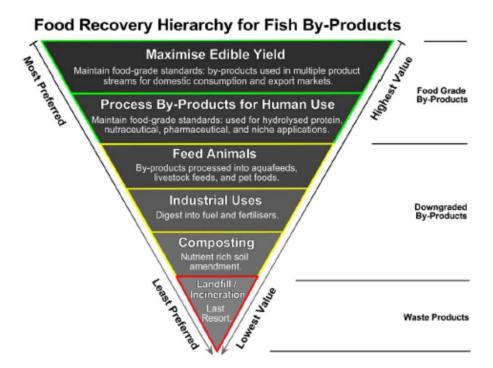
4.3. THE FOOD RECOVERY HIERARCHY

- The **food recovery hierarchy** is a graphic tool that can help the fish industry as it moves towards greater sustainability throughout the value chain. It indicates that the best use for fish by-products to add value is as food or as food ingredients.
- Steps in the hierarchy:
 - 1) Environmentally the most preferred and most valuable way to utilize fish by-products is to maintain their food grade quality and maximize edible yield.
 - 2) Proposal of processing fish by-products into high-value consumables for human use.
 - 3) Recommendation of using fish by-products to produce feed for animals.
 - 4) Use in industrial fuels and fertilizers, followed by composting.
 - 5) Sending fish by-products to landfill is the least preferred and lowest value option.



4.3. THE FOOD RECOVERY HIERARCHY





Source: Stevens et al. (2018)



4.4. SUSTAINABILITY LABELS

These labels were developed in order to guide consumers and food retailers towards a more sustainable fish consumption. From the consumers' viewpoint the decision whether a fish product is sustainable is mainly based on labels. There is a potential use of product differentiation through sustainable labelling.
The use of sustainability labels indicating credence cues has become an important search attribute for consumers, and an important instrument in the promotion of sustainable fish products.
Consumers have positive perceptions regarding sustainable fish products and show a willingness to pay price 10% higher for the attribute of sustainability.
Carbon footprints of fish products are rarely integrated into assessments of their sustainability or in sustainability labels.



4.4. SUSTAINABILITY LABELS

LABEL	TYPE OF CERTIFICATE	TYPE OF INITIATIVE	DESCRIPTION
Global Sustainable Seafood Initiative (GSSI)	Certification mark	Private nonprofit organization	Supply and promotion of certified seafood
Marine Stewardship Council (MSC)	Certification mark and aquaculture certification	Private nonprofit organization	Applied to wild fish or seafood from fisheries that have been certified to the MSC Fisheries Standard, a set of requirements for sustainable fishing.
Aquaculture Stewardship Council (ASC)	Certification mark and aquaculture certification	Private nonprofit organization, founded by WWF (World Wild Fund)	Certification of sustainable and well-managed fish farms, aiming at a standard of sustainability.
Best Aquaculture Practices (BAP)	Certification mark of farm raised fish products.	Private nonprofit organization	Aquaculture certification program that encompasses the entire production chain (processing plant, farm, hatchery and feed mill).
Seafood Sustainable Certification (Friends of the Sea)	Certification mark of sustainability	Private nonprofit organization	Certification standard for products and services which respect and protect the marine environment
Naturland/Naturland wildfish	Certification mark of sustainability	Private nonprofit organization	Certifies both organic aquaculture and the sustainable capture fishery standards is on small-scale fisheries.
Alaska Responsible Fisheries Management (RFM)	Certification mark	Private nonprofit organization	Certifies whether a fishery meets strict criteria to be certified as meeting "responsible fisheries management."



4.4. SUSTAINABILITY LABELS

LABEL	TYPE OF CERTIFICATE	TYPE OF INITIATIVE	DESCRIPTION
International Marine Mammal Project	Certification mark	Private nonprofit organization	Protects dolphins, whales, and the ocean environment
Iceland Responsible Fisheries Foundation (IRFF)	Certification mark	Public-Private partnership	Preserve fisheries' management and improvie the competitive position of Icelandic industries
Bord lascaigh Mhara (BIM)	Certification mark	Public organization (Ireland's Seafood Development Agency)	Support and enable an increase in value creation of an Irish sustainable seafood sector, across the supply chain, from catch to consumer
_Pescaenverde	Certification of environmental impact of fishery products	Private organization	Promotes fishery products and fresh fish in particular. This certificate indicates the carbon footprint and energy rate adapted to the specific characteristics of the fisheries sector.
PescadeRias	ldentity mark	Public organization (Xunta de Galicia)	Identity mark which promotes and defends fish and shellfish from the small-scale fleet.
Puerto de Celeiro	ldentity mark	Private organization	Certifies fresh hake captured with hook in the fishing grounds of Gran Sol. It also certificates of social and environmental sustainability.
Monterey Bay Aquarium's Seafood Watch	Advisory list	Private nonprofit organization	Fish and seafood guide that provides consumers advice for fish species and farming method, with each species and harvest method graded as "best choice", "good alternative", or "avoid



4.4. SUSTAINABILITY LABELS

REQUERIMENTS

CULTIVATED FISHERIES	WILD FISHERIES
LEGAL COMPLIANCE	MAINTENANCE OF WILD FISH POPULATIONS
CONSERVATION OF NATURAL HABITAT	RECOVERY OF WILD FISH POPULATIONS
CONSERVATION OF BIODIVERSITY	MAINTENANCE OF INTEGRITY OF ECOSISTEMS
CONSERVATION OF WATER RESOURCES	CLIMATE IMPACT OF FISHING
CONSERVATION OF SPECIES DIVERSITY AND WILD POPULTAION	
USE OF FEED AND OTHER INPUTS SOURCES RESPONSIBLY	
GOOD ANIMAL HEALTH	
SOCIAL RESPONSIBILITY FOR WORKERS	
SOCIAL RESPONSIBILITY FOR THE COMMUNITY	



