

# Trends in supply and demand for fish meal and fish oil.

Andrew Mallison

The Seafood Conference, Reykjavik, 9<sup>th</sup> November 2012

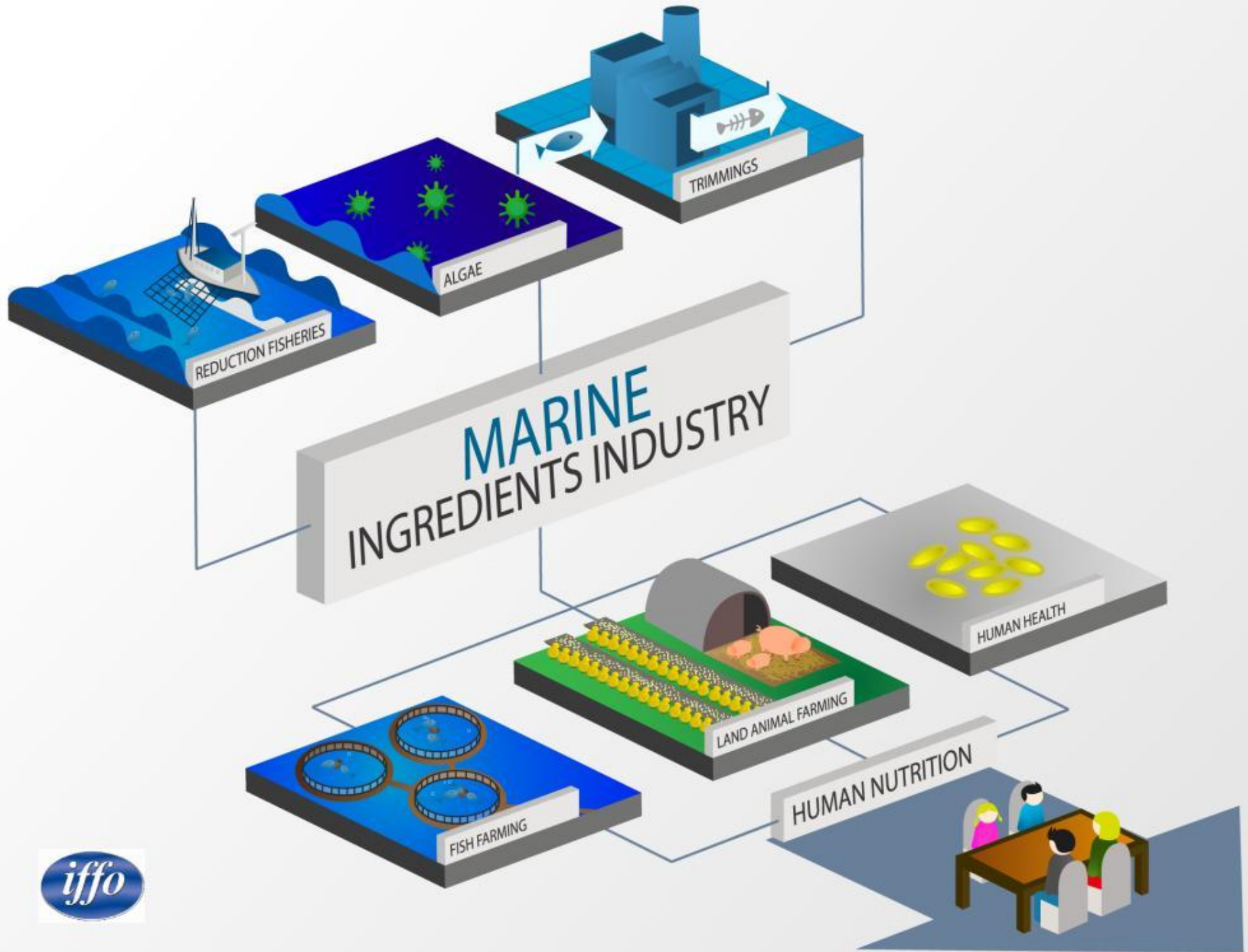


# IFFO

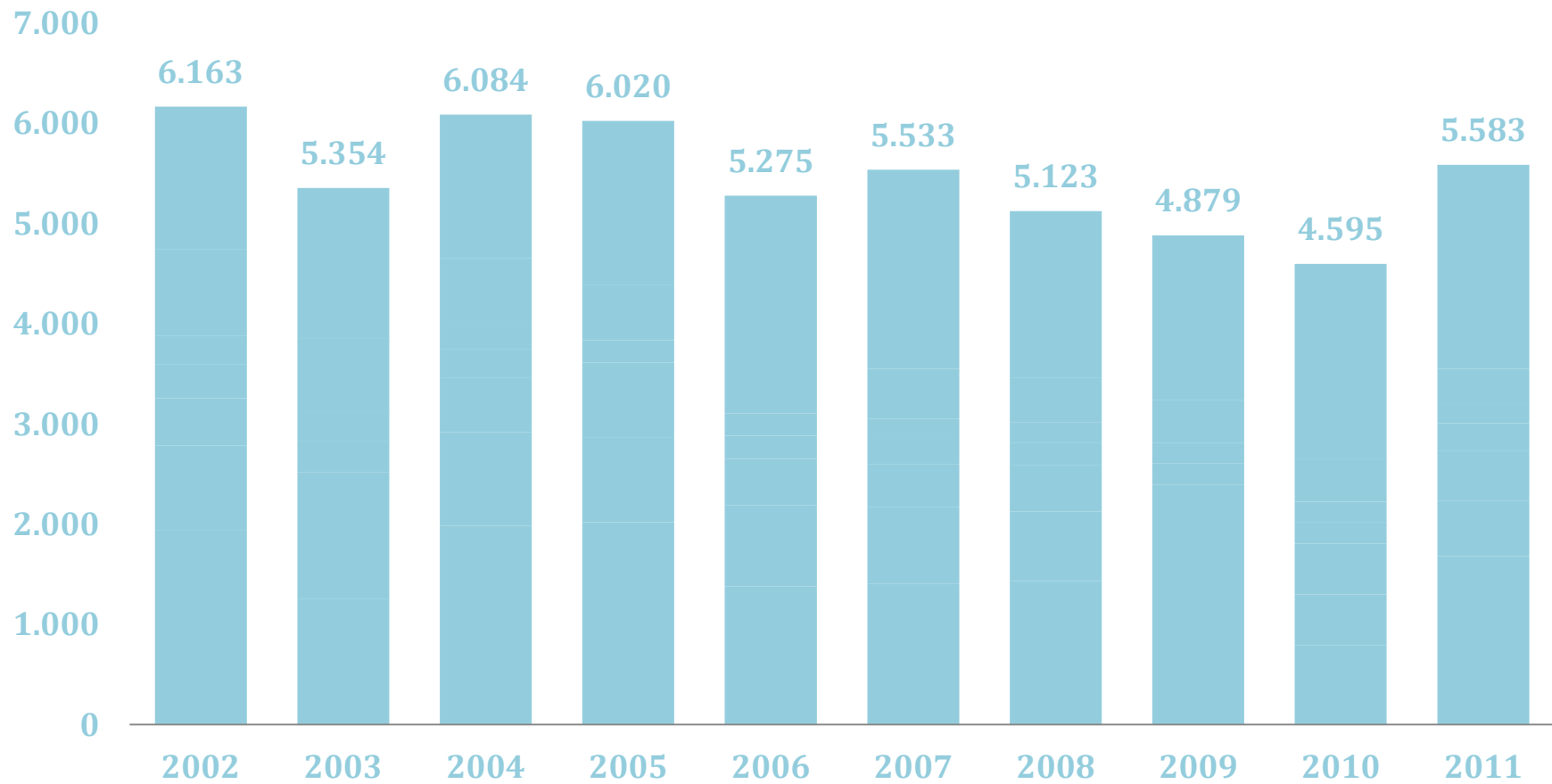
A global trade association representing the marine ingredients sector. Offices in London, Lima and Beijing.

Represents 60% of world production and 80% of trade in fishmeal and fish oil worldwide with producers in Europe, South America, Africa, USA, China and India.



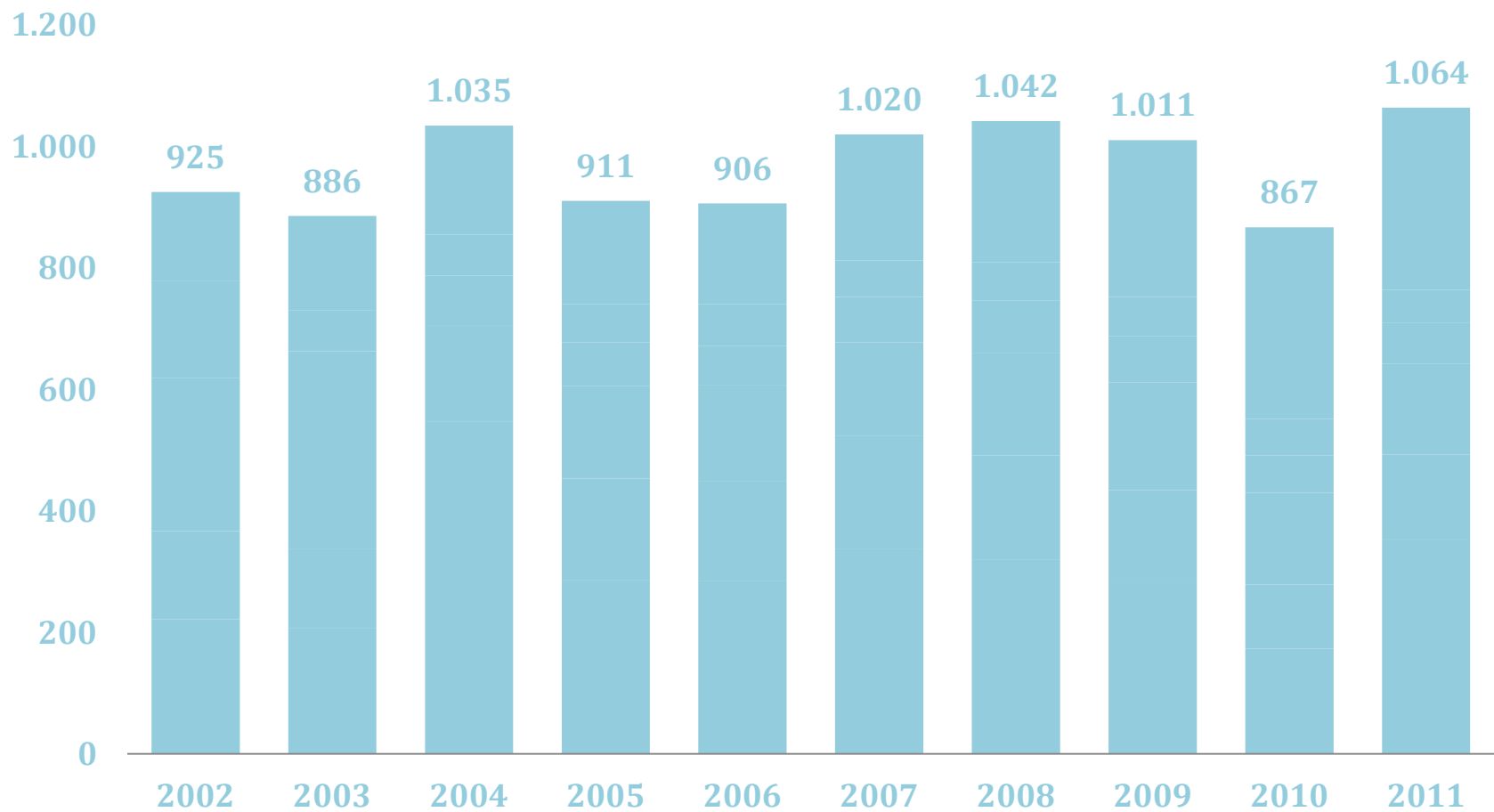


## WORLD FISHMEAL PRODUCTION ( '000 mt)





## WORLD FISH BODY OIL PRODUCTION (<sup>'000</sup> mt)





# Novel marine ingredients



Source: Aurora Algae / National Geographic

# Effect of precautionary fishery management?

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## MSC to strengthen fisheries assessment guidance on low trophic level fisheries

28 July 2010

New, detailed guidance on assessing sustainable stock levels and harvest strategies for low trophic level fisheries will be developed by the Marine Stewardship Council (MSC) following an expert scientific Working Group's recommendations for changes to the MSC Fisheries Assessment Methodology (FAM).

MSC to strengthen fisheries assessment guidance on low trophic level fisheries

The conclusions are the result of a year-long study by the Working Group, created in June 2009 by the MSC Board with the aim of improving understanding of global best practice for the sustainable management of low trophic level fisheries. A key aspect of the Working Group's research was the use of ecosystem models from five different regions where understanding of ecosystem dynamics is well developed. These models were adapted to evaluate how different harvest strategies for low trophic fisheries would impact on target stocks and dependent predators. Also evaluated were the likely assessment performance of these fisheries against the FAM and the adequacy of current guidance for certifiers.

The results of the modelling work suggest that the guidance in the FAM on low trophic level species should be strengthened, especially in relation to identifying suitable target stock levels. In certain situations, for example, the results indicate that a precautionary target stock level, which minimises ecosystem impacts, should be as high as 75 per cent of virgin biomass and, for some species, possibly even higher.

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# Is it right to feed fish to fish?

**The use of wild fish as aquaculture feed and its effects on income and food for the poor and the undernourished**

Ulf N. Wijkström  
FAO Consultant,

*“The idea of landing large quantities of anchoveta, or sand eel, or most of the other species used in feed fisheries, and using them to provide food for the poor is a laudable objective, but unrealistic*

*.....there does not seem to be any foundation for the argument that aquaculture threatens the sustainability of South American reduction fisheries and, therefore, endangers the food security of those who are already undernourished or the income levels of the poor in Chile, Peru or anywhere else”*





## The importance of sustainable fisheries:

*“Where feed fisheries are **not** managed sustainably, aquaculture today constitutes an important threat to world fish stocks because of aquaculture’s reliance on fishmeal and thus on reduction fisheries”*

- Most fisheries have been poorly managed at some stage
- Significant improvements have been made in the last ten years
- For example Peru now has some of the best managed fisheries in the world:

**Table 6. Average performance scores for the 53 countries.**

Country	Average score	Country	Average score
Peru	6.42	Sweden	3.82
Namibia	5.10	Pakistan	3.81
USA	5.10	Indonesia	3.80
Germany	4.90	Japan	3.78
Poland	4.82	Australia	3.78
Norway	4.71	Spain	3.77
Senegal	4.70	Taiwan	3.75
Chile	4.67	Thailand	3.74
South Africa	4.64	Viet Nam	3.70

**RANKING MARITIME COUNTRIES  
BY THE SUSTAINABILITY OF THEIR  
FISHERIES Mondoux *et al* (2008)**

# New website resources



The screenshot shows the iffo website homepage with a blue background and water texture. The iffo logo is in the top left. The main title is "International Fishmeal and Fish Oil Organisation". There are flags for the UK, Spain, and China in the top right. A "Members Login" box is on the right with fields for "Username" and "Password" and a "Log in" button. Below the login box is a link for "Forgot your password?".

The date "24 October 2012" is displayed. A search bar is located below the date. The "Navigation Panel" on the left includes links for Home, About IFFO, News, Joining IFFO, Fishmeal & fish oil, Annual conferences, IFFO RS, Calendar of events, Resources, Members, FAQs, and Contact IFFO. A dropdown menu is open under "Resources", listing: IFFO Position Papers, Publications, IFFO Presentations, FIN Documents, Technical Bulletins, Fish Oil Bulletins, Technical Reports, Nutrient Analysis, Research reports, and Fishmeal flyer.

The main content area features an article titled "> How many kilos of feed fish does it take to produce one kilo of farmed fish, via fishmeal and fish oil in feed?". The article includes a "Key Points" section with three numbered points:

1. The correct FIFO (Fish in: Fish out) for the conversion of wild feed fish to farmed salmon is 1.4:1\*, not 5:1 as has been widely asserted in both publications and in the media (2010 ratio).
2. For all fed aquaculture, the FIFO is 0.3:1 (2010). In short more than three tonnes of farmed seafood is produced for each tonne of fish used in aquafeeds.
3. The often quoted '5:1' ratio has created an unjustified a priori case against the use of fishmeal and fish oil in aquaculture feed.

The article text continues: "It has been asserted, and widely disseminated in the media and conference platforms, that five, or even more, kilos of wild feed/industrial fish are harvested to produce, via fishmeal and fish oil in aquafeed, just one kilo of farmed salmon. This is often expressed as a Fish In: Fish Out (FIFO) ratio of 5:1."

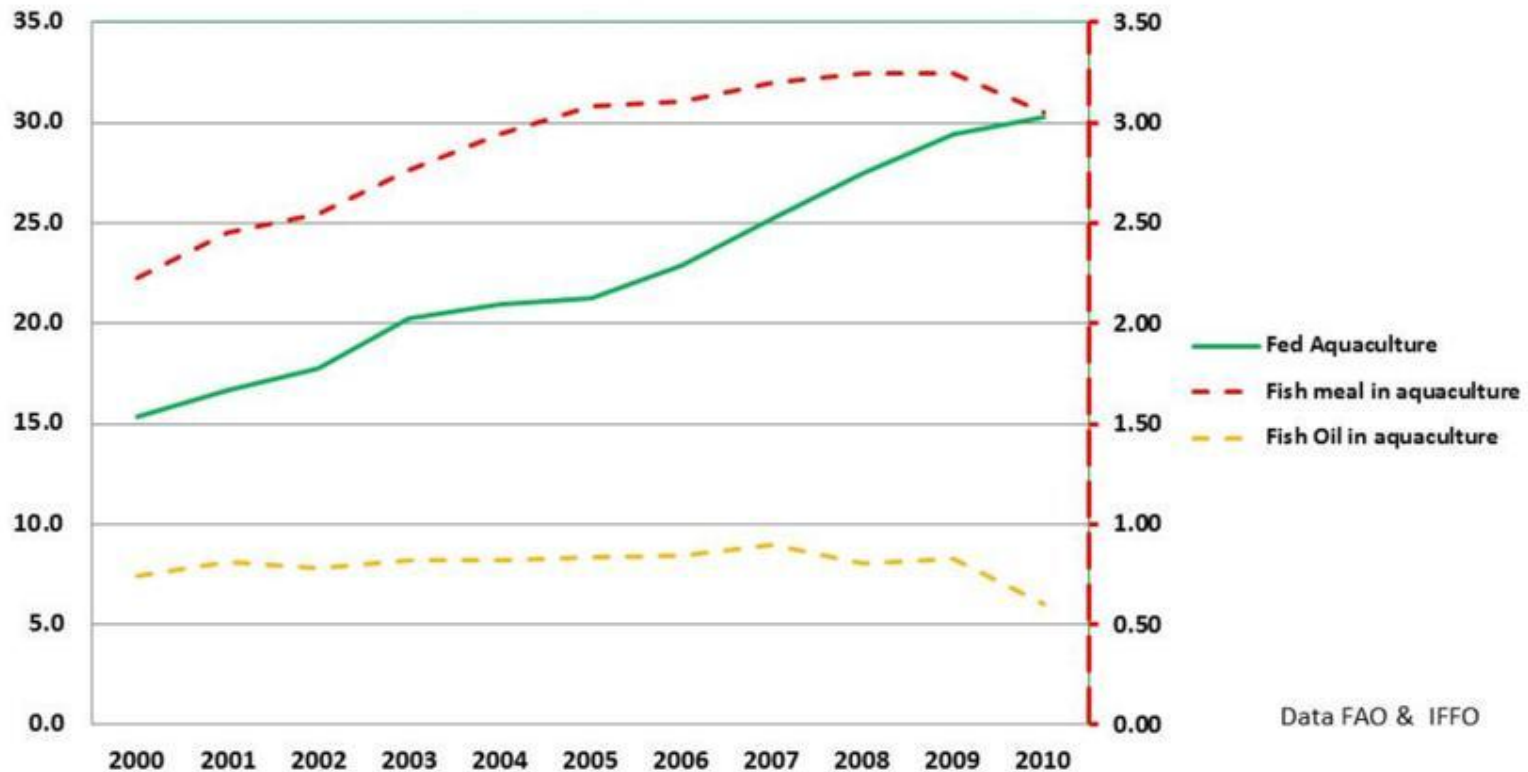
Below the text, there is a table with two columns. The first column lists "Publications" and "FIN Documents". The second column lists "Fish as Food or Feed?", "Demonstrating responsible marine ingredient sourcing", "Wild Fish in Farmed Fish out", and "Key organisations related to marine ingredients".

The article concludes with: "Salmon is just one farmed species. Looking at the whole of fed aquaculture<sup>(1)</sup> the accurate FIFO is 0.3:1 which means that about one-third of wild fish for each kilo of farmed fish..."



# Aquaculture is increasing...

Global Aquaculture Production with fishmeal and fish oil usage 2000-2010 tonnes millions



Data FAO & IFFO



## ...and an emerging middle class...

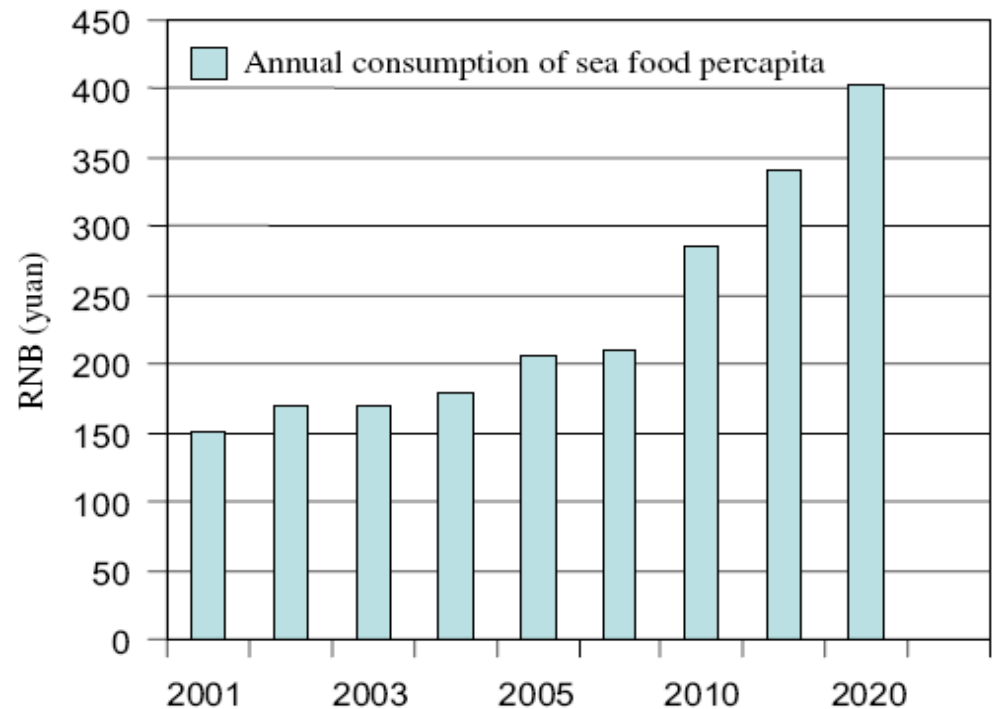
Numbers (millions) and share (percent) of the global middle class

	2009		2020		2030	
North America	338	18%	333	10%	322	7%
Europe	664	36%	703	22%	680	14%
Central and South America	181	10%	251	8%	313	6%
Asia Pacific	525	28%	1740	54%	3228	66%
Sub-Saharan Africa	32	2%	57	2%	107	2%
Middle East and North Africa	105	6%	165	5%	234	5%
World	1845	100%	3249	100%	4884	100%

Source: University of Stavanger

# ...drives increased consumption.

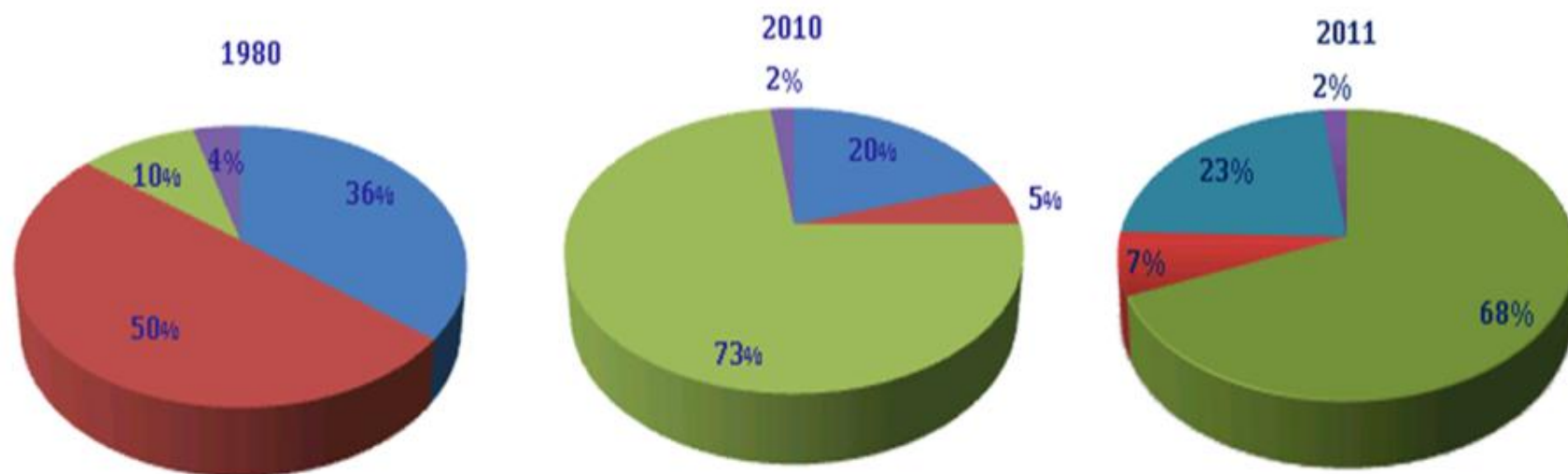
Domestic demand for seafood in China has increased from 7kg consumption per person in 1985 to about 25kg in 2005.



Source : Kontali / University of Stavanger

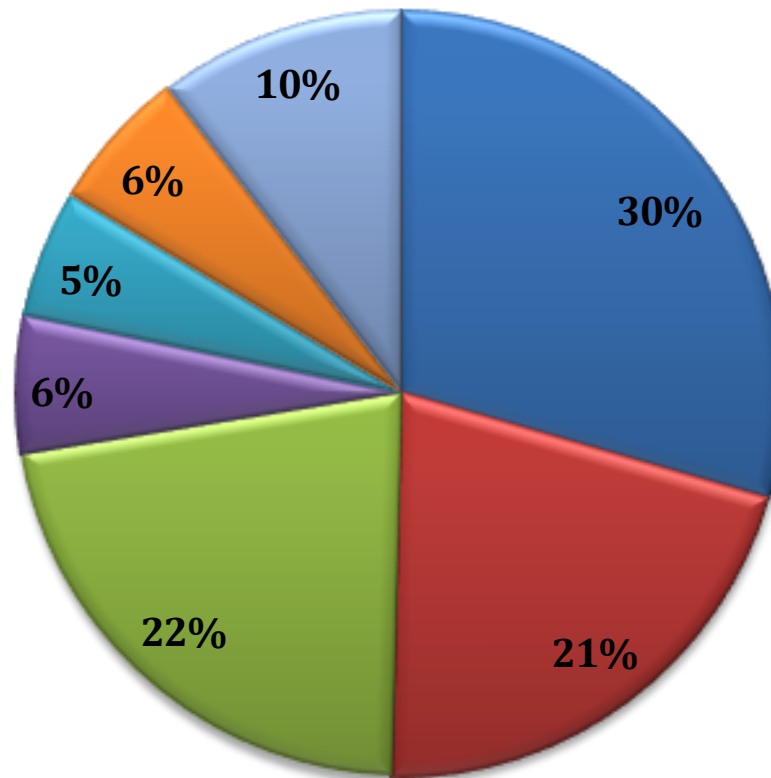
# Usage of fishmeal

■ Pig ■ Chicken ■ Aquaculture ■ Other



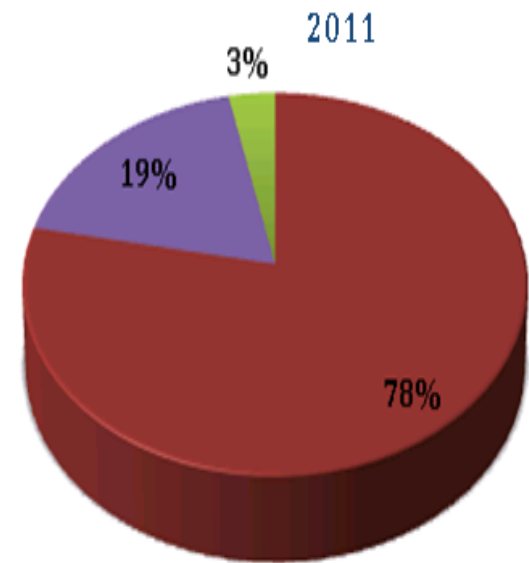
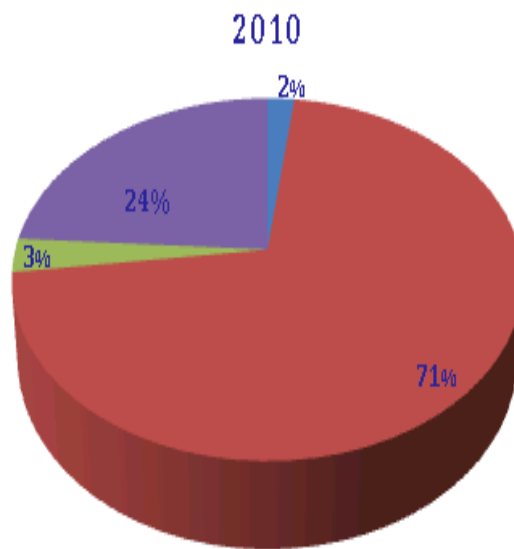
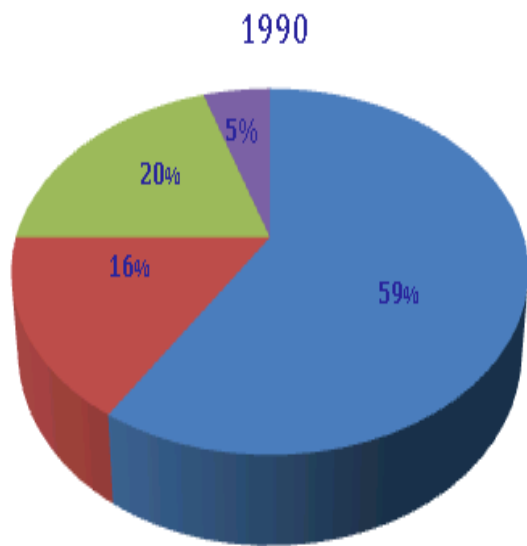
## PERCENTAGE OF FISHMEAL USAGE IN AQUACULTURE 2011

■ Crustaceans ■ Marine Fish ■ Salmonids ■ Eels ■ Cyprinids ■ Tilapias ■ Other\*



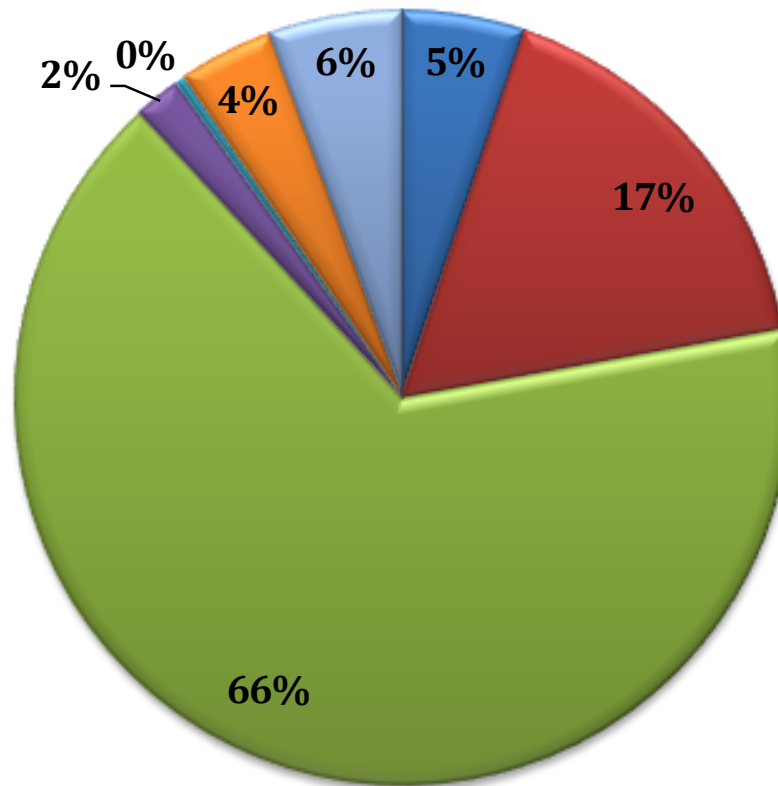


■ Hardened Edible ■ Aquafeed ■ Industrial ■ Refined Edible



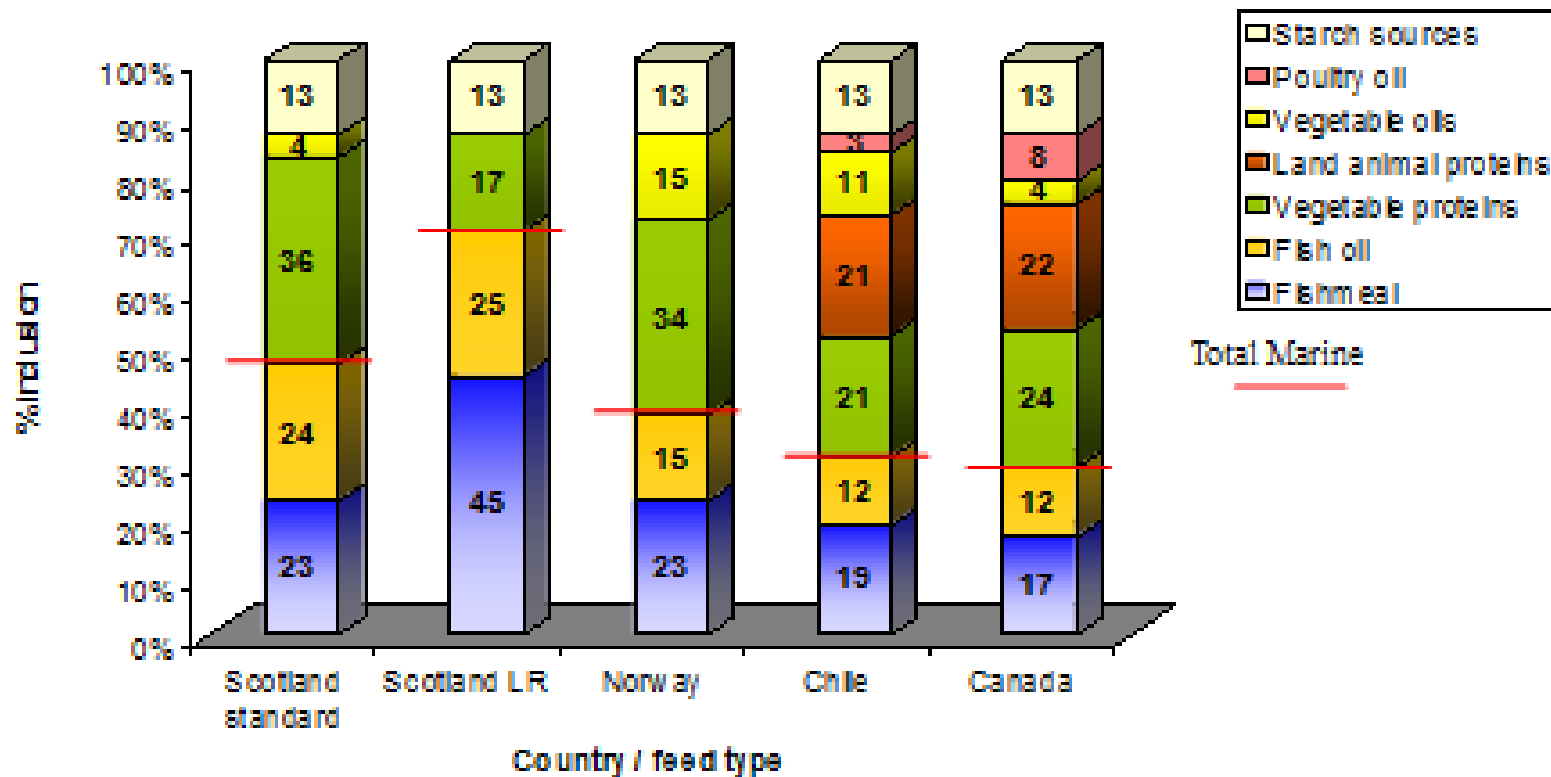
## PERCENTAGE OF FISH OIL USAGE IN AQUACULTURE 2011

■ Crustaceans ■ Marine Fish ■ Salmonids ■ Eels ■ Cyprinids ■ Tilapias ■ Other\*



# Typical feed composition

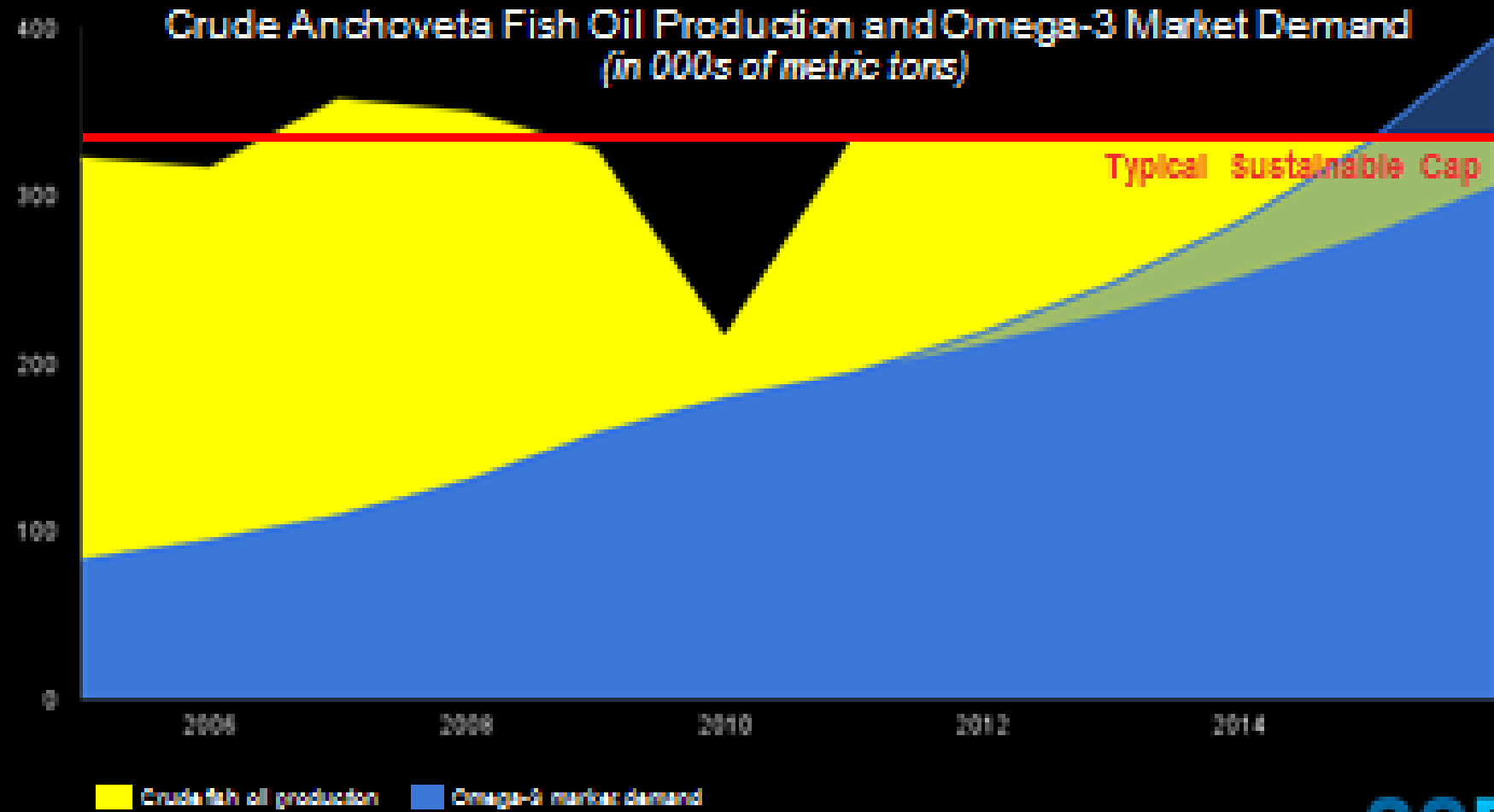
Current estimated raw material inclusion (weighted average of all products) in different salmon farming regions







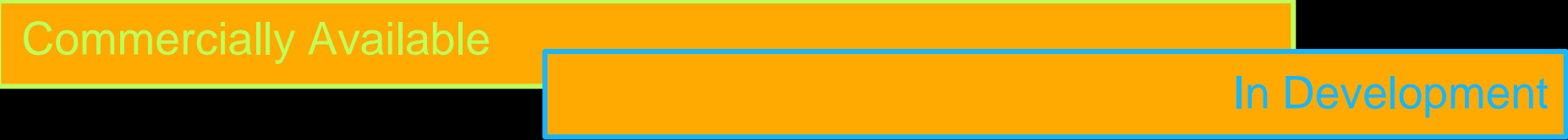
# Omega-3 demand continues towards the point where the market will restructure



Source: International Fishmeal and Fish Oil Organisation, GOED Analysts



# New sources will have to be developed just from the eventual pharma demand



Fish



- Anchovy
- Sardine
- Mackerel
- Tuna
- Cod
- Salmon
- Menhaden
- Trout
- Pollock
- Hoki
- Halibut
- Sandeel
- Angelfish
- Saithe

Squid



- Market Squid
- Argentine
- Shortfin Squid

Zooplankton



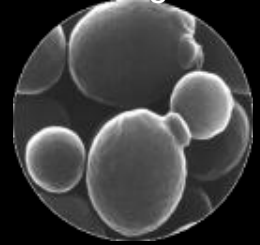
- Antarctic Krill
- Pacific Krill
- Northern Krill
- Calanus

Algae



- Schizochytrium
- Cryptocodium
- Euglena
- Phaeodactylum
- Nannochloropsis
- Nitzschia alba

Fungi



- Y. Lipolytica
- M. alpina
- Sap. diclina
- Sac. kluyveri
- C. elegans

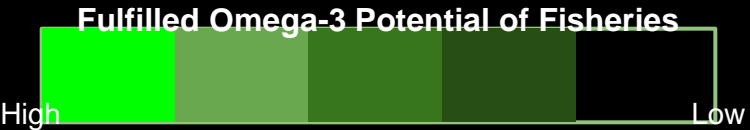
GM Plants



- Soybeans
- Rapeseed
- Brassica
- Linseed
- Rockcress

# Up to 1.4 million tons of other fish oil could be sourced for omega-3s, but FA profiles vary

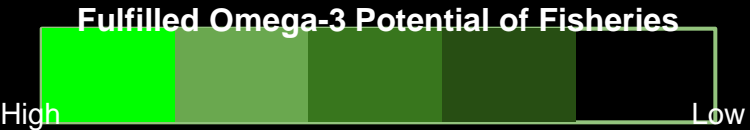
Crude Fish Oil Potential for Omega-3 Products  
(metric tons of oil)



Source: Tony Bimbo GOED Exchange Presentation

# But even on an EPA/DHA basis, there is still ample competition for anchoveta

Crude Fish Oil Potential for Omega-3 Products  
(metric tons of EPA and DHA)



Source: Tony Bimbo GOED Exchange Presentation



## Omega 3's and Omega 6's

- Well documented health benefits of EPA and DHA (heart and brain).
- Developed world diets too high in Omega 6, too low in Omega 3.
- Omega 6 tends to block absorption of Omega 3.



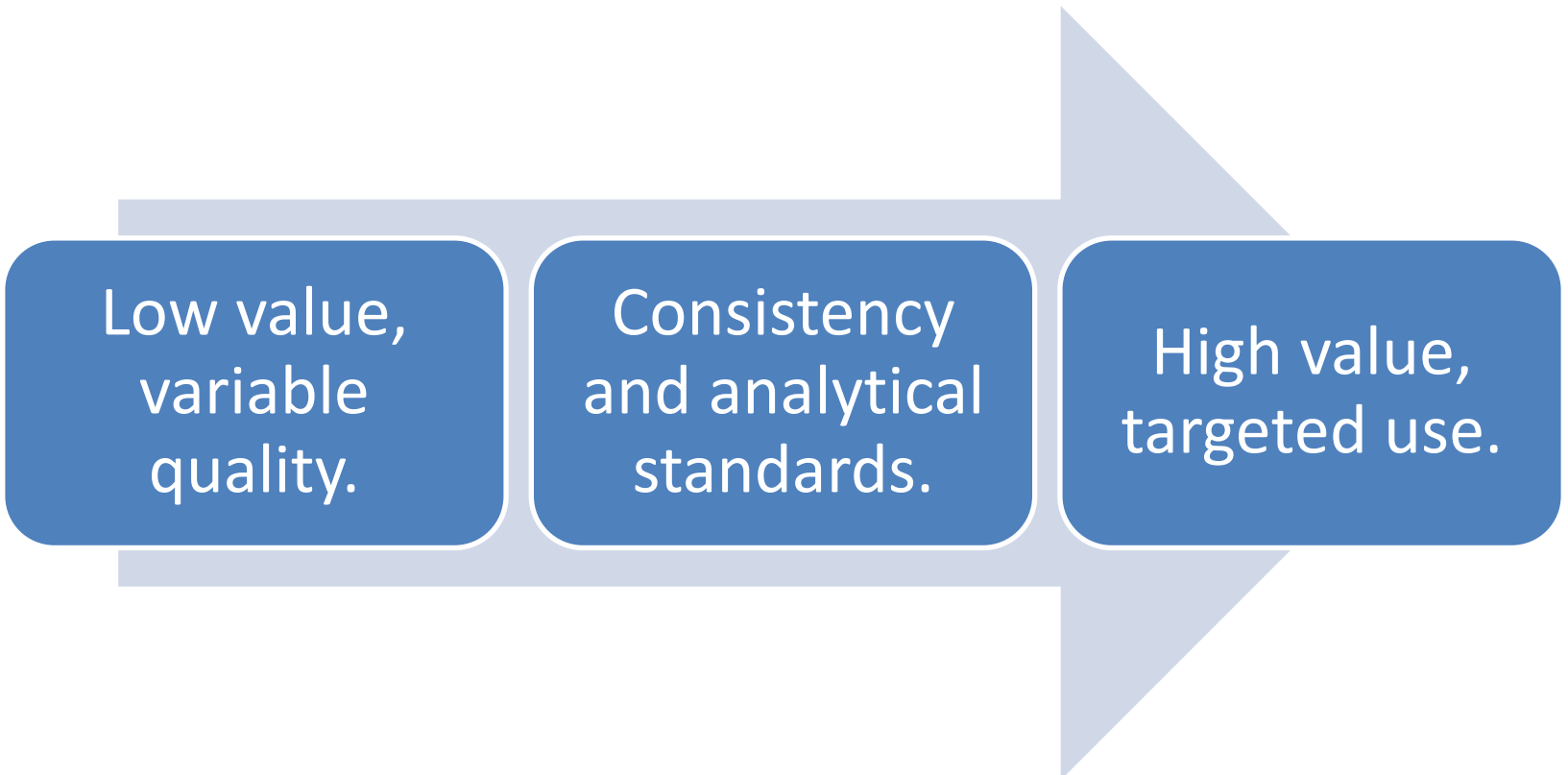


## New IFFO Video

Marine Omega 3's, the healthiest fats

<http://www.youtube.com/watch?v=YV1OVXy6dBQ>

# From commodity to speciality:

A large, light blue arrow pointing to the right, containing three rounded rectangular boxes. The first box on the left contains the text 'Low value, variable quality.' The middle box contains 'Consistency and analytical standards.' The final box on the right contains 'High value, targeted use.'

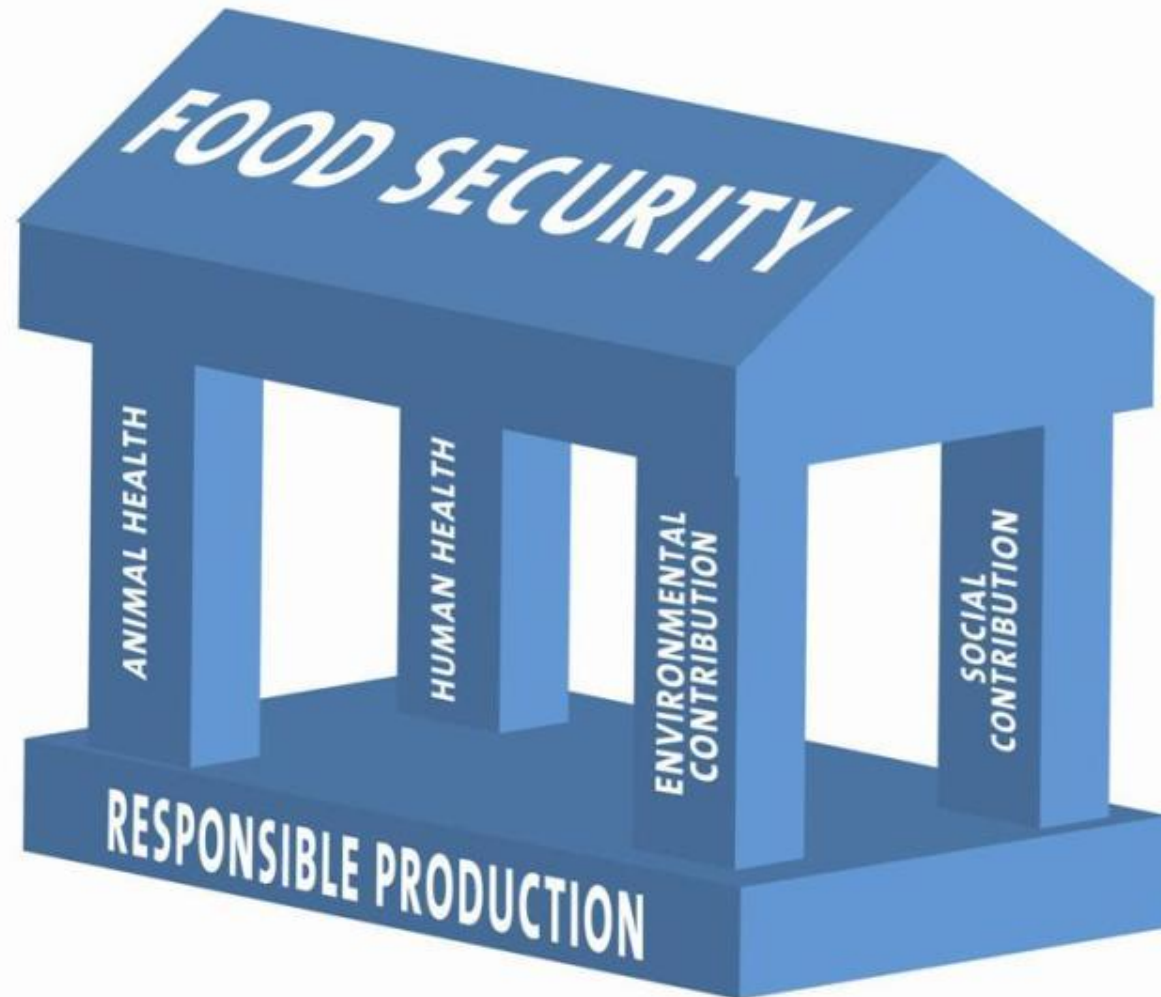
Low value,  
variable  
quality.

Consistency  
and analytical  
standards.

High value,  
targeted use.

# Benefits of fishmeal and fish oil

- Renewable and increasingly well managed.
- Better nutritional performance in fish diets than vegetable proteins and oils.
- Fish oil main contributor to human dietary Omega 3's.
- Efficiently recycles by-products.
- Employment and income for developing countries.



# Feeding a growing population.

Responsible Feed Ingredients

Responsible Feed

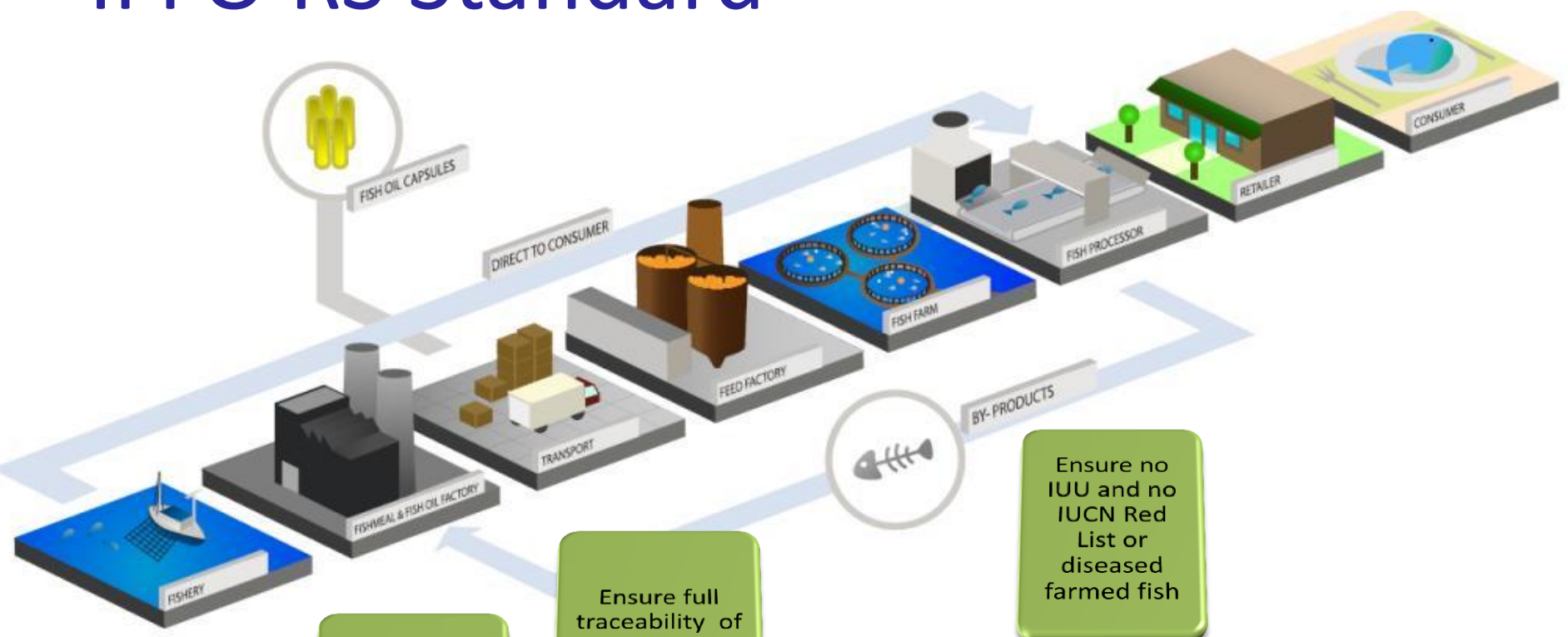
Responsible Aquaculture

Global Food Security





# IFFO RS Standard



Ensure managed according to the FAO Code of Conduct for Responsible Fisheries

Ensure no IUU and complete control of intake species and volumes

Ensure full traceability of pure and safe products produced under QMS

Ensure no IUU and no IUCN Red List or diseased farmed fish

# Set by multi-stakeholder group





# Improvers' Programme -how it works

The applicant applies to IFFO to be accepted on the IP



An initial assessment is conducted to identify the issues



A stakeholder committee is formed consisting of: applicant, IFFO, fishing interests, Government bodies, FIP specialists (SFP), FAO and funding bodies



The Fisheries Improvement Plan and the Factory Improvement Plan form the IFFO Action Plan which includes auditable milestones

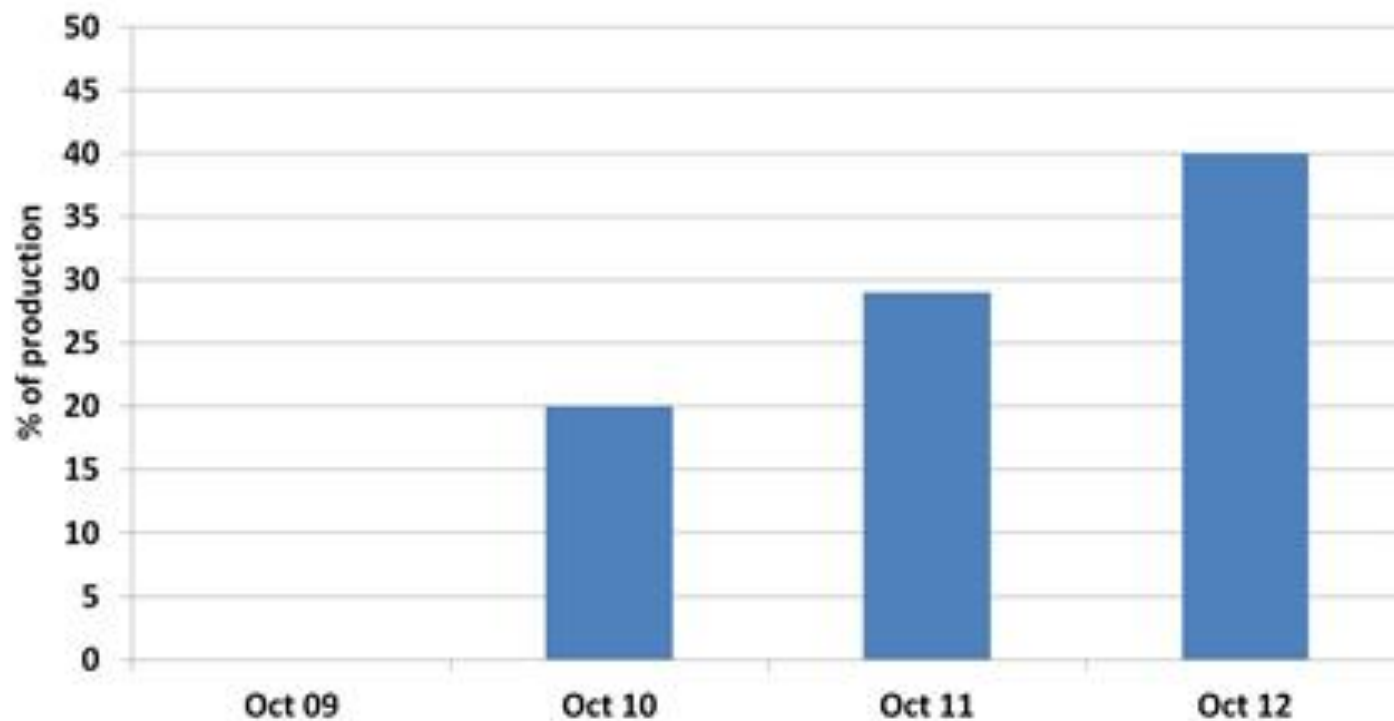


The plan length varies according to the issues



If the plan is adhered to on completion the applicant should be able to achieve the RS Standard

## IFFO RS volumes as a % of global production since launch Oct 2009



This rate of growth cannot be maintained and adding the next 10% to reach 50% will take 3-4 years

# Summary.

- Highly nutritious and renewable resource.
- Contribution to human health
- Supply stable but demand increasing.
- Move from commodity to high value ingredient.
- Upward pressure on price pulling in vegetable substitutes and increasing Omega 6 contribution
- Markets need to make informed choices on health and environmental benefits of alternative feed compositions.





# Video



Thank you for listening.

*þakka þér fyrir að hlusta.*