



# Demand perspectives on fishmeal & fish oil

Jonathan Shepherd

International Fishmeal & Fish Oil Organisation

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## IFFO

International Fishmeal and Fish Oil Organisation is the global trade association representing fishmeal and fish oil producers and related trades.

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



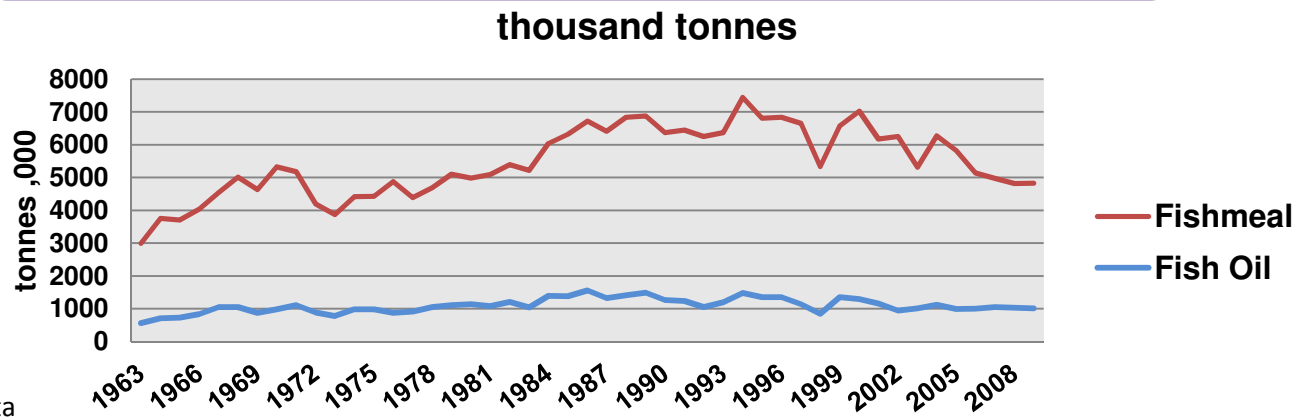


# Important feed ingredients

Fishmeal is an excellent high protein feed ingredient used at least at some stage in almost all intensive aquaculture systems

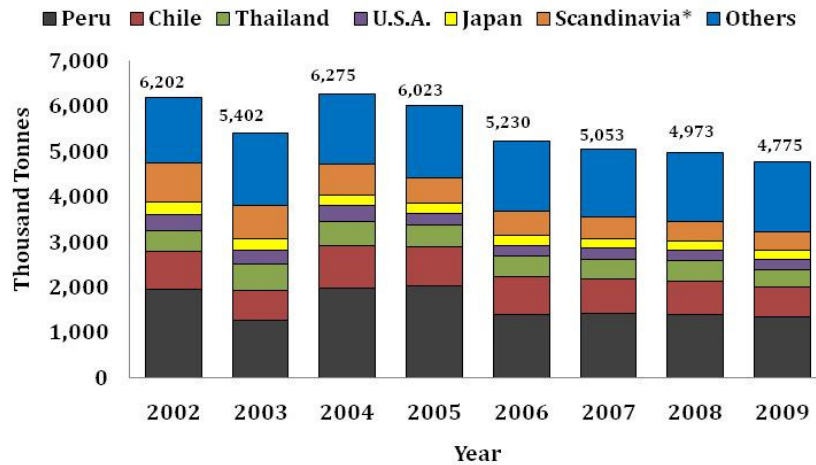
Fish oil is the best source of the omega-3 fatty acids EPA & DHA and its use in feeds ensures a healthy product for the final consumer

However, despite the growth of aquaculture the global production of both fishmeal & fish oil has remained fairly static



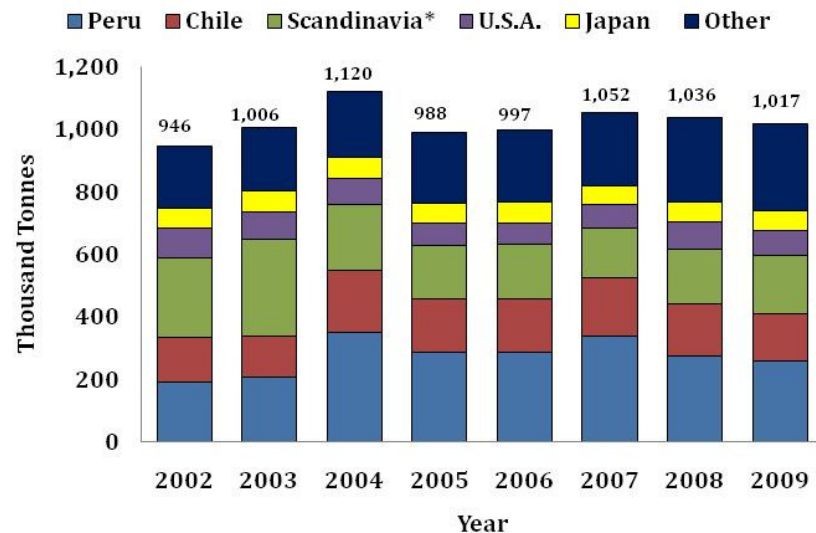


### WORLD FISHMEAL PRODUCTION MAJOR PRODUCERS



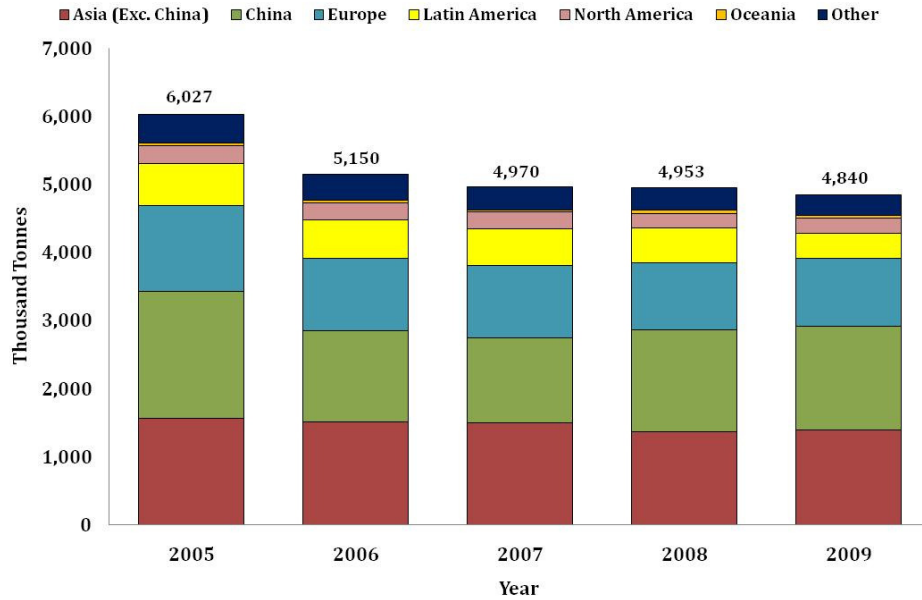
Production of fishmeal and oil has remained relatively steady although the introduction of precautionary quotas & increased use for direct human consumption has resulted in reduced volumes of whole fish going for fishmeal & oil

### WORLD FISH BODY OIL PRODUCTION MAJOR PRODUCERS



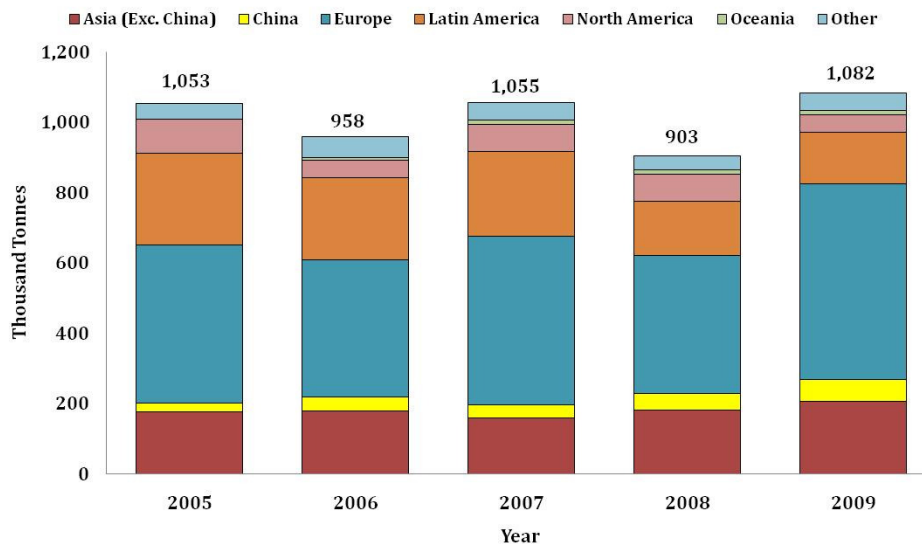


### WORLD FISHMEAL APPARENT CONSUMPTION



Consumption of fishmeal is increasingly being concentrated in Asia with China continuing as by far the single largest market. In fish oil Europe continues to dominate the market with Latin America using less with the reduction in salmon production in Chile

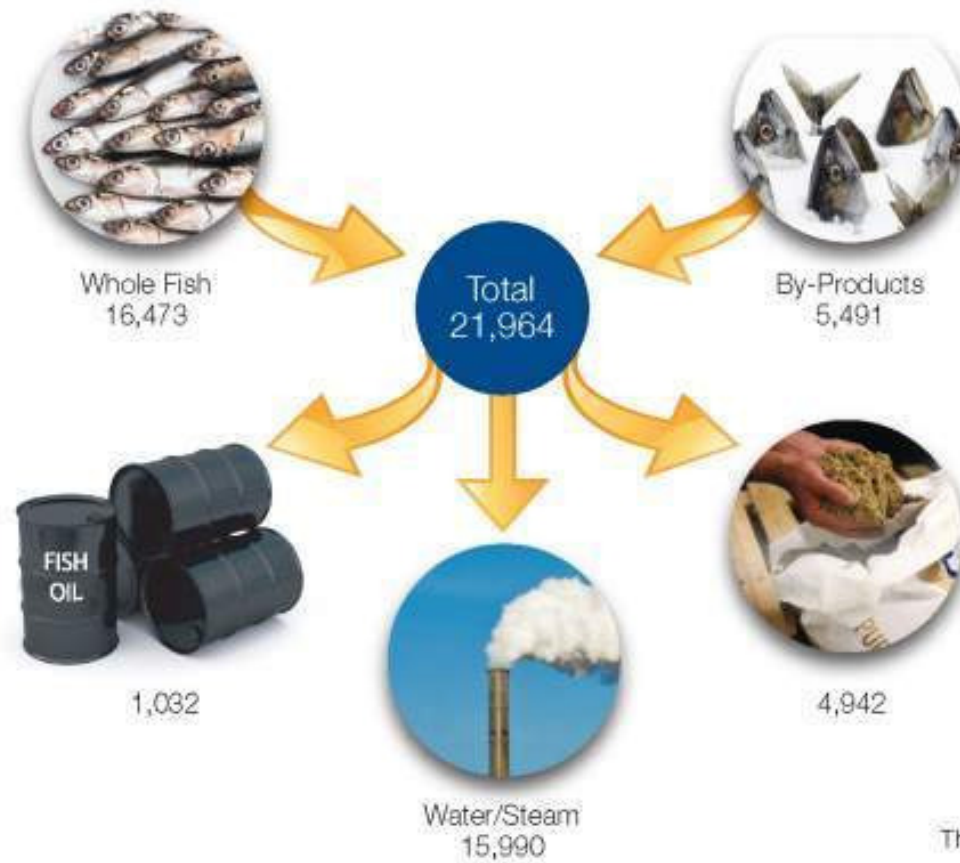
### WORLD FISH OIL APPARENT CONSUMPTION



# Eco-efficiency of fishmeal & fish oil

Seasonal surplus of less desirable fish and inedible by-products are collected.

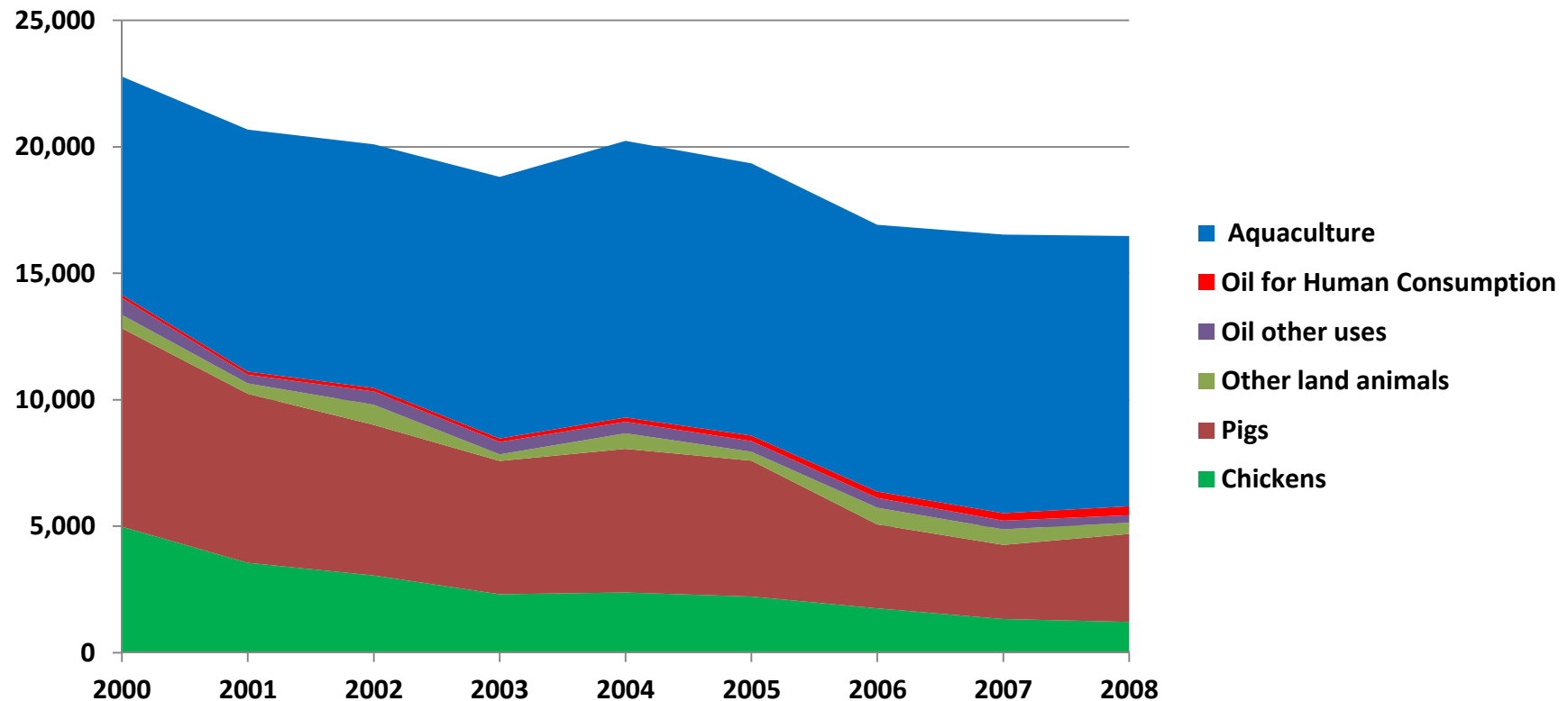
They are efficiently converted into concentrated stable products which can be economically shipped to where they are required





# Volumes of whole fish being used as feed are decreasing

Whole fish rendered for different purposes  
Tonnes ,000





## Will static supplies of marine ingredients limit aquaculture growth?

As prices rise alternatives (e.g. soy meal, rapeseed oil) are used in partial replacement

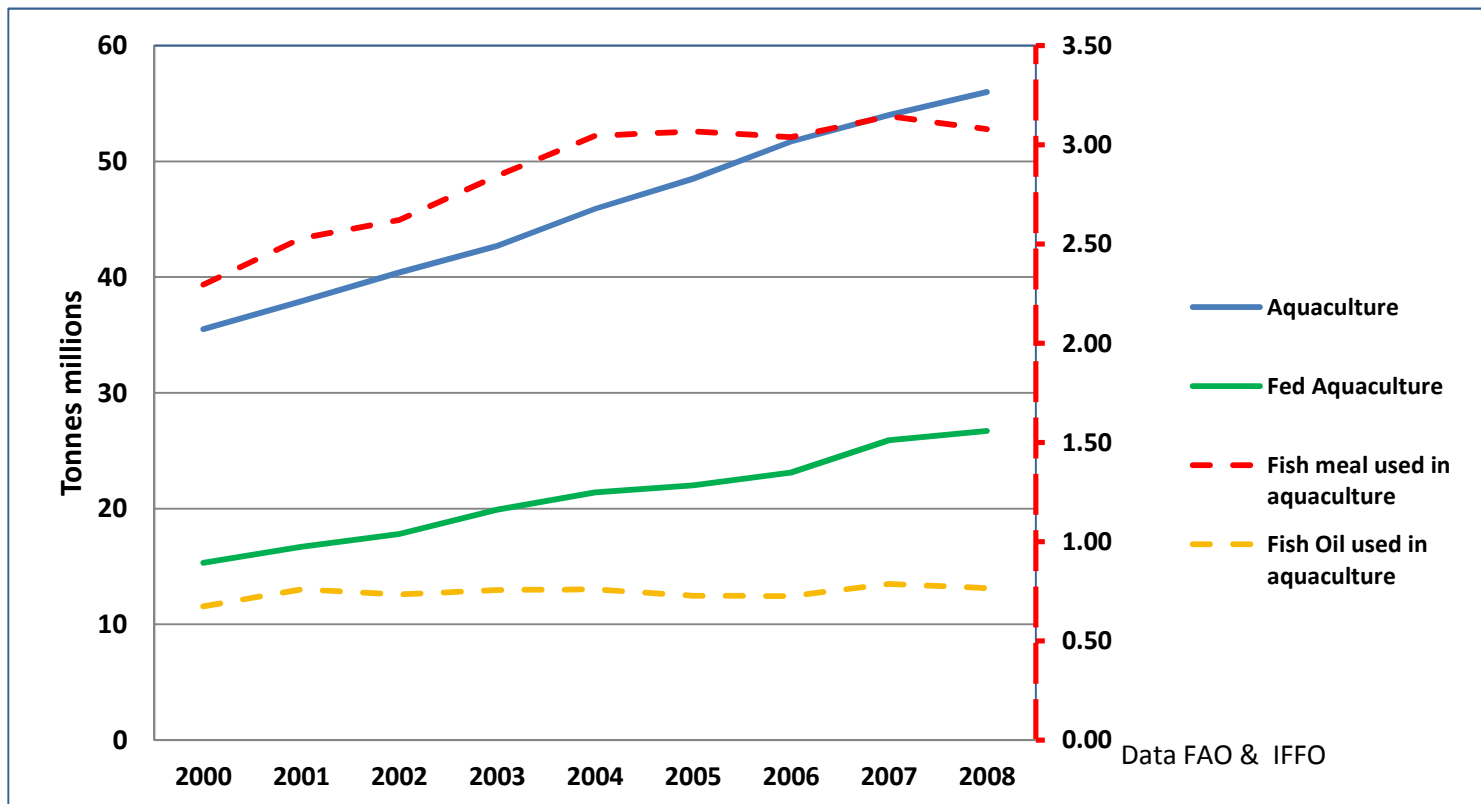
Increasing nutritional knowledge allows more replacement to take place particularly on more established species

Improved genetics and processing are improving the quality of alternative proteins

Increasingly fishmeal is being used as a strategic ingredient at lower levels and retained in special diets e.g. fry and broodstock diets

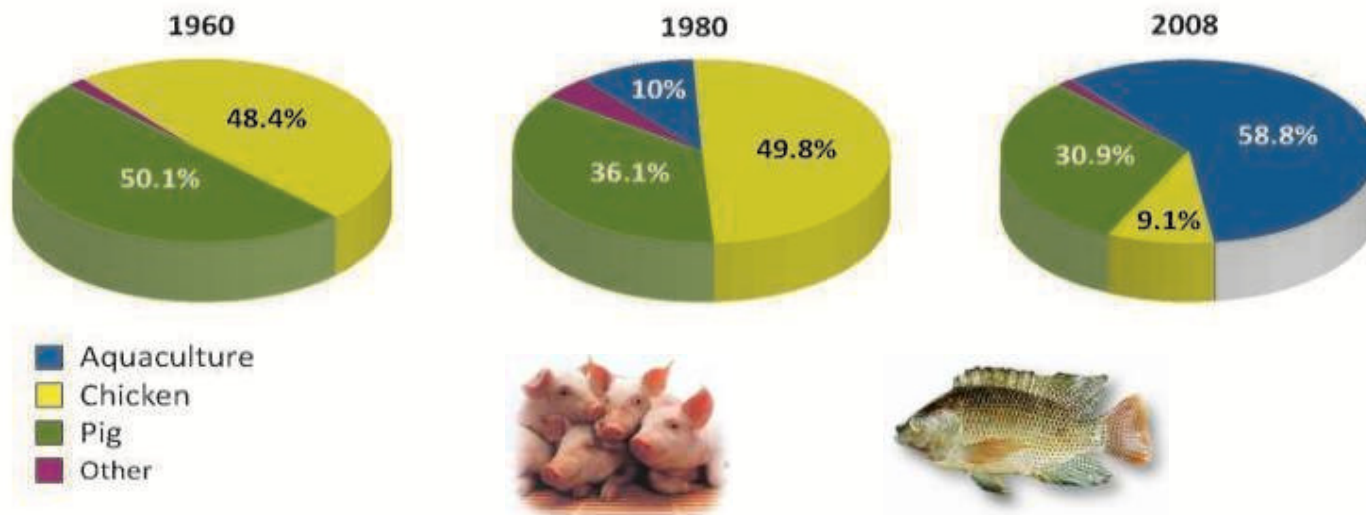


Global aquaculture production has continued to grow while usage of fishmeal & fish oil is static



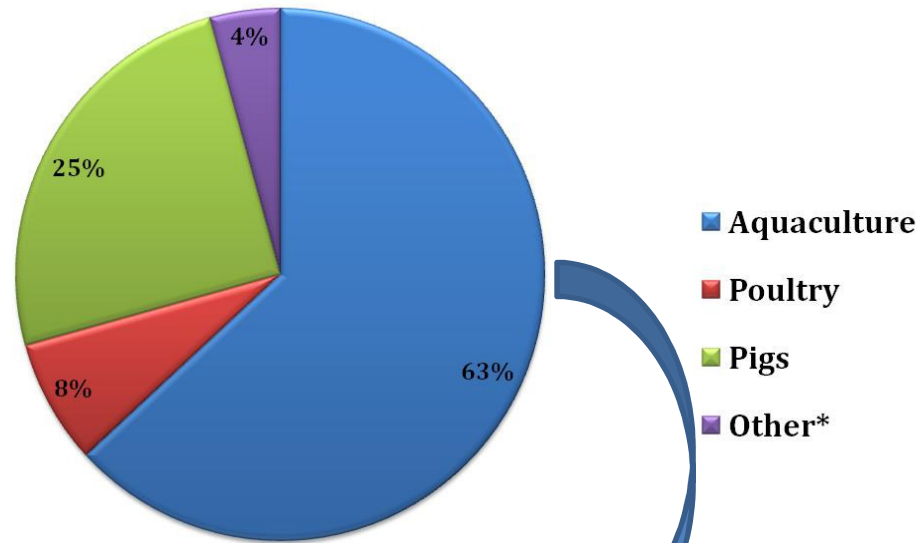
## Fishmeal usage moves from 'Agri' to 'Aqua' sector

### Changing uses of fishmeal



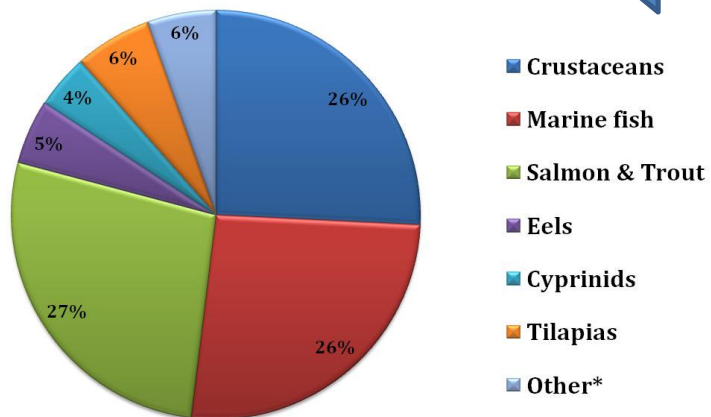
Two species (chicken & pigs) used over 98% of production in 1960 but dropped to 40% of usage while production grew from 32 to 182 million tonnes

PERCENTAGE OF FISHMEAL USAGE PER MARKET 2009



IFFO data

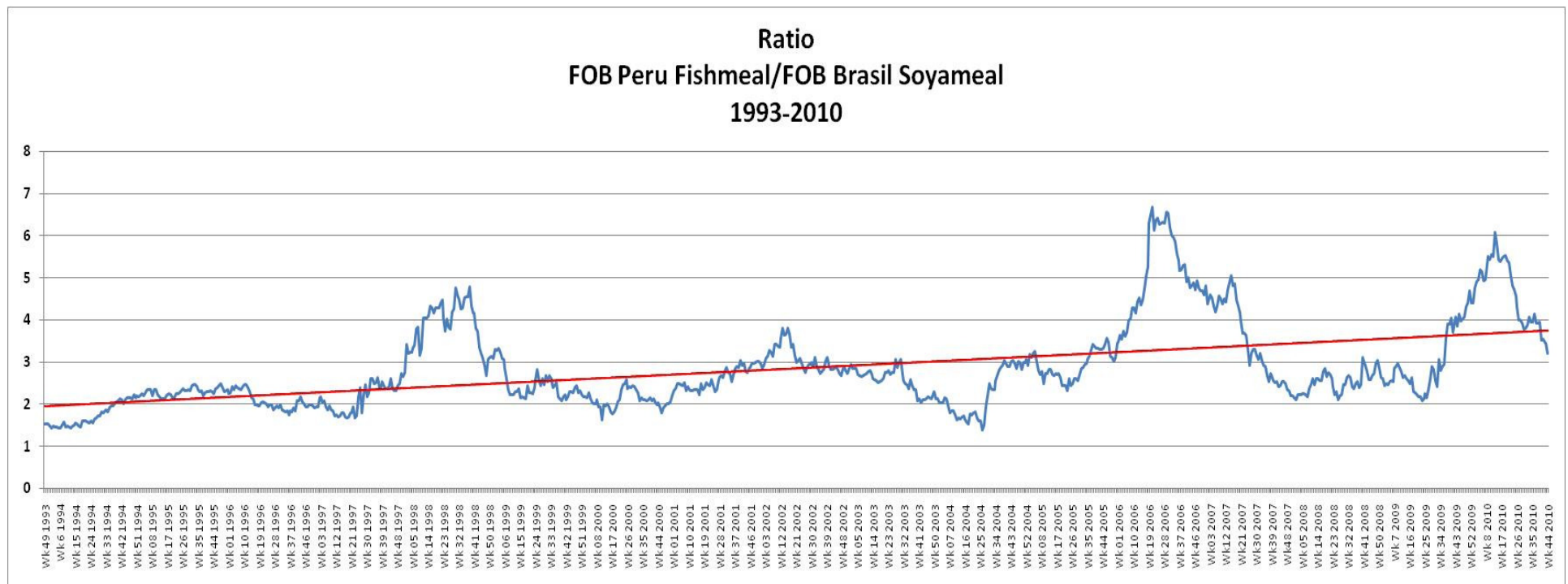
PERCENTAGE OF FISHMEAL USAGE IN AQUACULTURE 2009



We estimate that in 2009 63% of global fishmeal production went to aquaculture and that was split almost equally between salmonids, marine fish, crustacean and others.



The transition of fishmeal from commodity to strategic ingredient has been accompanied by an upwards trend in relative value





## Why are fishmeal prices again at a historical high?

All feed commodities have risen strongly – current ratio with soymeal is still around 4:1

Continuing strong demand for fishmeal from SE Asia - particularly China

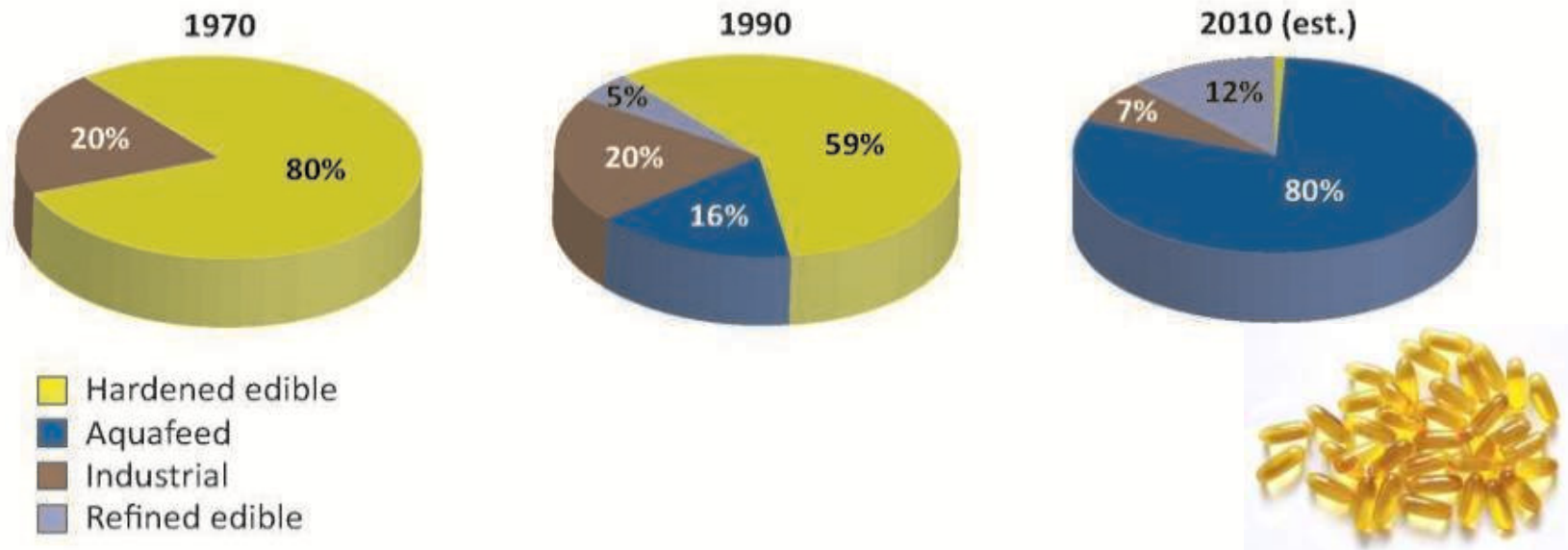
Last year's El Niño in Peru resulted in a large number of immature fish which has caused the early closure of the fishery – but the fish will mature and breed

Issue with uncontrollable fishing in international waters has given problems to the Chilean Jack mackerel fishery

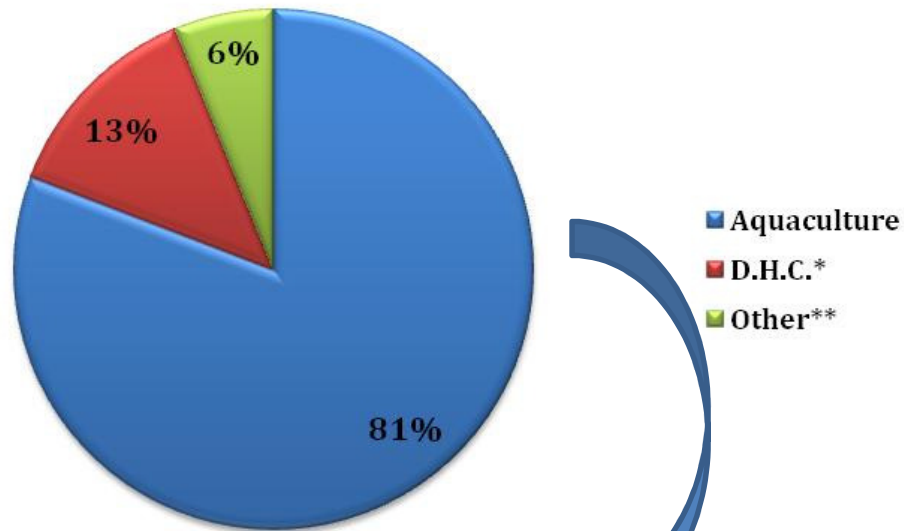
# Fish oil usage moves from hydrogenated fat to aquaculture & capsules

A growing recognition of the importance of EPA & DHA

## Changing uses of fish oil

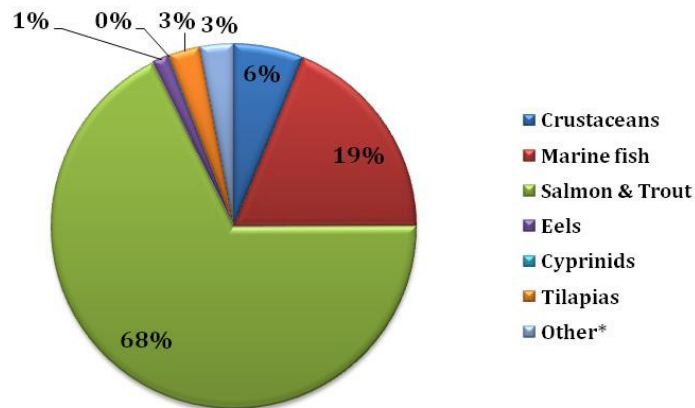


### PERCENTAGE OF FISH OIL USAGE PER MARKET 2009



We estimate that in 2009 81% of global fish oil production went to aquaculture and that 68% of that went to salmonids.

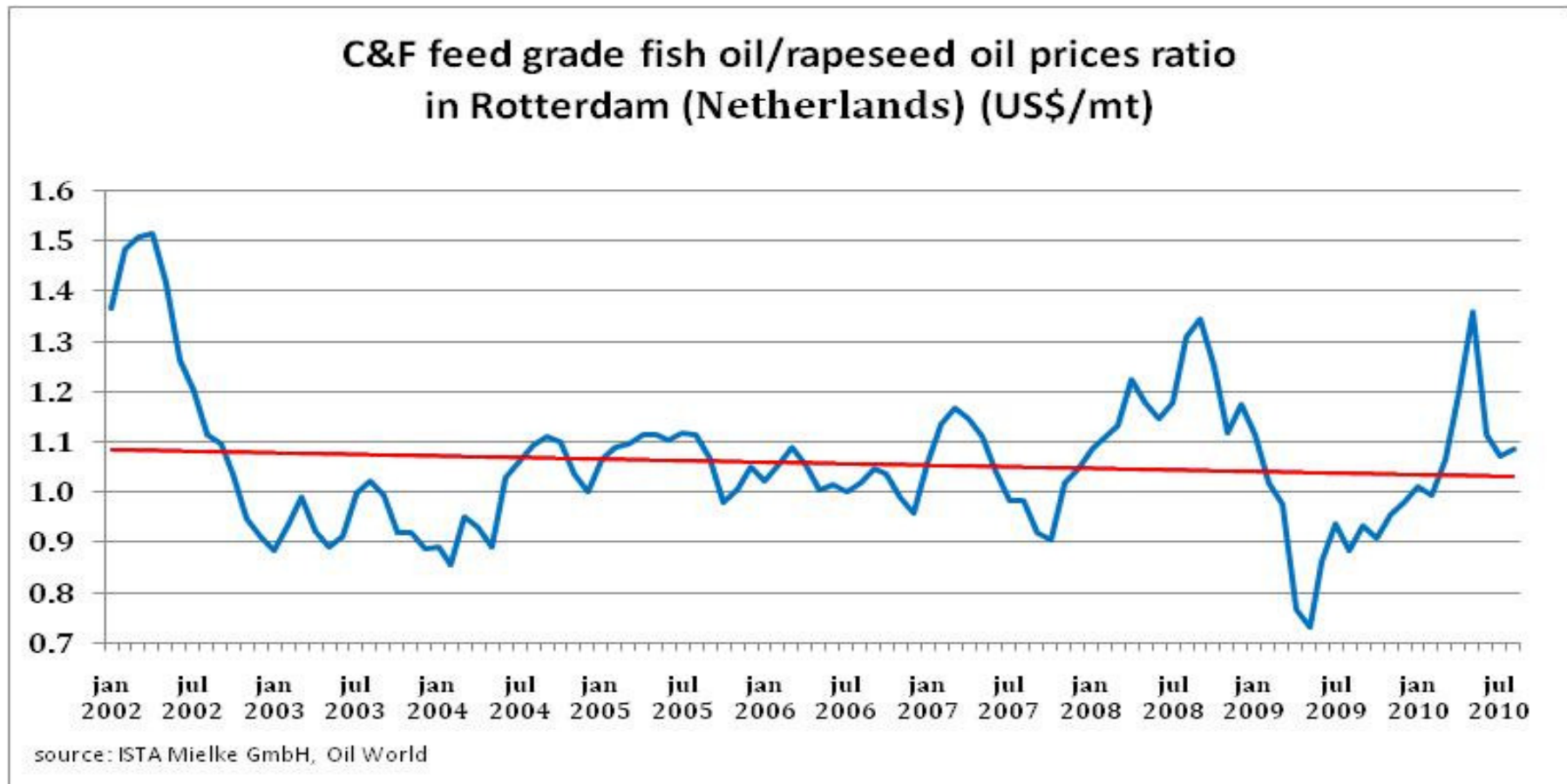
### PERCENTAGE OF FISH OIL USAGE IN AQUACULTURE 2009



•Direct Human Consumption,  
 •\*\* Other usage including fat hydrogenation & industrial use  
 Source IFFO



The easy replacement of fish oil by rapeseed oil in salmon diets has meant the price ratio of feed grade oil has slightly trended down although current ratio is around 1.2-1.3:1

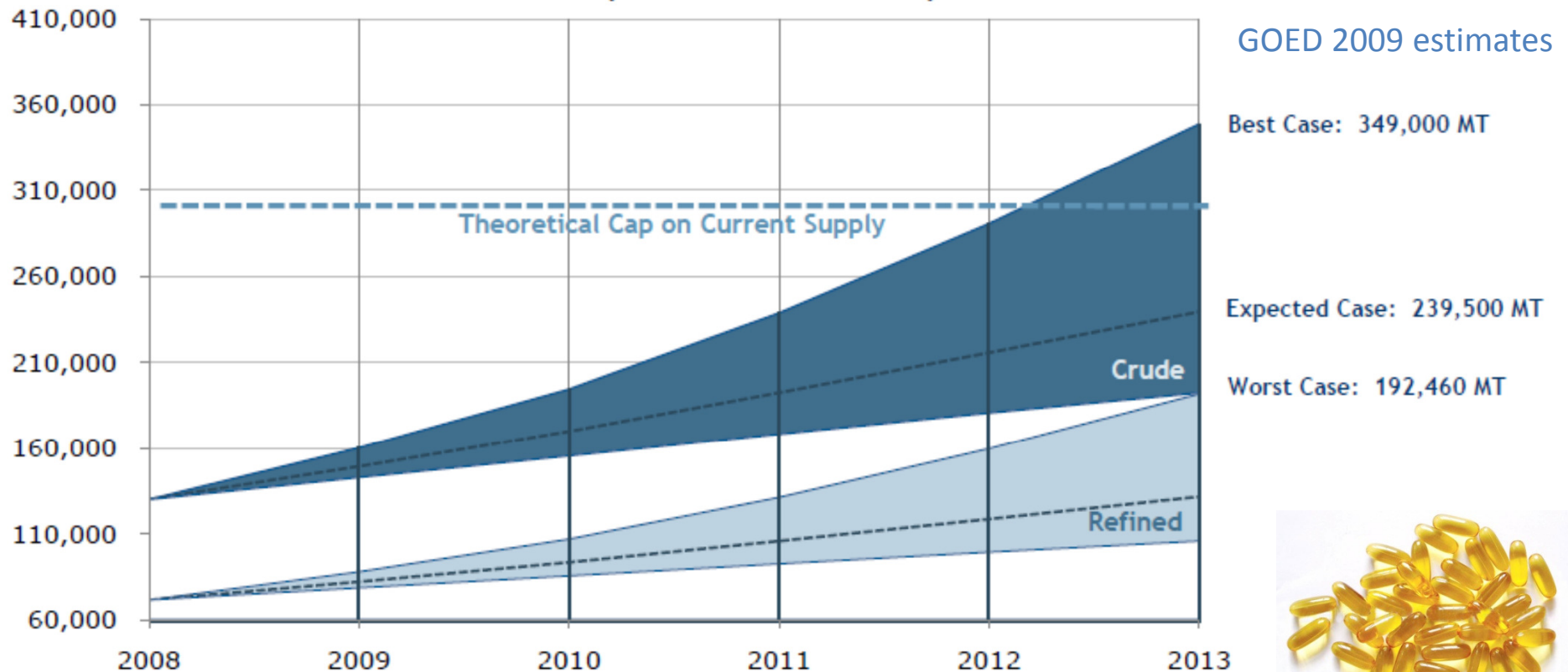






However, the growth of fish oil for direct human consumption is opening up a significant market (currently 20-25%) with a price premium

### Projected Global Marine Omega-3 Market Volume (Metric Tons of Oils)





## The result of the growing replacement of fish oil in salmon diets:

The nutrient requirements of the salmon can be met by low dietary levels of fish oil (5%)



However, this might have a negative effect on their performance and survival under stressful conditions, especially given high omega-6



The final level of EPA/DHA in the fillets is decreasing

Salmon have been sold on their health giving properties and this will be increasingly challenged



Professor: salmon becoming a floating vegetable



## Feeding fish to fish is the most efficient feed use

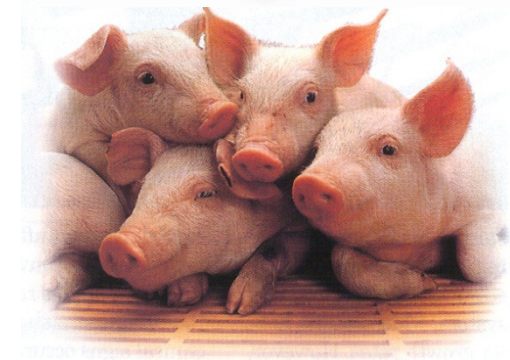
Fish being cold blooded animals and supported by water are the most efficient users of feed



Typical Feed Conversion Ratios: Pigs 4:1, Poultry 2:1, Fish 1.2:1



Typical Protein Retention levels: Pigs 13%, Poultry 18%, Fish 40%





## Feeding fish to fish

Fish is a natural food for fish – all fish are carnivorous at some stage

Fishmeal & fish oil provide an almost perfect nutrient balance promoting health & welfare

Ethical objections about not feeding the poor are misplaced

Increasing amounts are going for direct human consumption



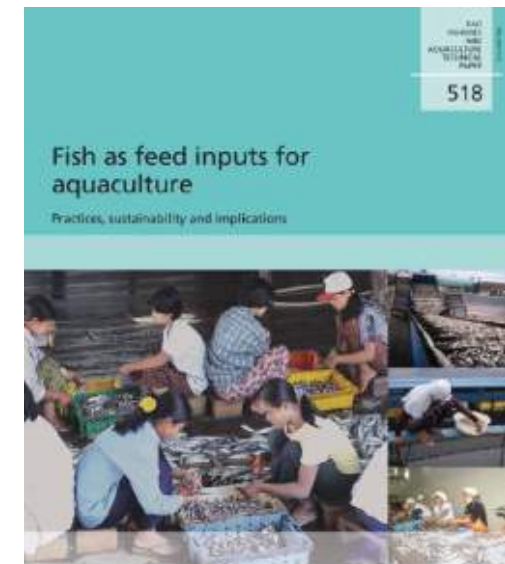
## Some are concerned about the ethics of feeding fish to fish – subject of a recent FAO report

**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”*



But he says :

*“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)**



## Responsible management of fisheries

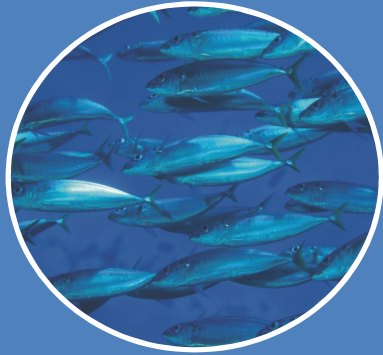
World's largest feed fishery - the Peruvian anchovy – now well managed

Europe re-building their feed fisheries

Still concern over feed fisheries in Asia – mostly due to the use of trash fish and a lack of fisheries information

It is becoming increasingly important to be able to demonstrate responsible fisheries management of the raw material

## So there is continued value chain concern over two critical areas



The need to demonstrate that any whole fish processed come from well managed fisheries and that there are no illegal, unreported or unregulated (IUU) fish included. Also that any fisheries by-products do not come from endangered or IUU fish



The need to demonstrate that production in the factory ensures pure and safe products. Also that the supply-chain then maintains the purity and identity of the products with a chain of custody demonstrating traceability







# To reassure the value-chain IFFO launched its Global Standard for Responsible Supply

- RS is a B-to-B initiative following the ISO-65 Standard
- Standard developed by multi-stakeholder committee including retailers & NGOs
- 3<sup>rd</sup> party auditable standard ensures responsible raw material procurement & good manufacturing practice
- The standard requires an applicant to demonstrate that the factory:



Sources its whole-fish raw material from fisheries managed according to the FAO Code of Conduct for Responsible Fisheries

Avoids the use of Illegal, Unreported & Unregulated fish IUU

Does not source fisheries by-products from IUCN red listed fisheries

Manufactures under a recognised quality control scheme to ensure product safety & purity



# IFFO-RS progress to date - 1

Launched  
to  
members  
in October  
2009

First factory  
was  
awarded  
certification  
in February  
2010

Country	Fishery	N° of companies	N° of certified factories	N° of factories pending
Peru	Peruvian anchovy ( <i>Engraulis ringens</i> )	9	44	10
USA	Gulf menhaden ( <i>Brevoortia patronus</i> )	2	2	0
Iceland	Summer spawning Herring ( <i>Clupea harengus</i> )	7	6	7
	Capelin ( <i>Mallotus villosus</i> )			
	Blue whiting ( <i>Micromesistius poutassou</i> )			
	Atlanto spring spawning herring ( <i>Clupea harengus</i> )			
Denmark	Norway pout ( <i>Trisopterus esmarkii</i> )	2	2	1
	Sand eel ( <i>Ammodytes marinus</i> )			
<b>Total</b>		<b>20</b>	<b>54</b>	<b>18</b>



## IFFO-RS progress to date - 2

This represents  
over 20% of  
world production  
of fishmeal and  
fish oil

There are more  
factories in  
assessment

Factories utilising  
fisheries by-  
products can now  
apply for approval  
under a recently  
launched new  
extension to the RS  
standard

The IFFO-RS  
standard is under  
continuous  
development e.g.  
Chain-of-Custody,  
Improvers  
programme



## Certification - a new market driver

We estimate that it should be possible to get around 9 million tonnes of raw material RS approved by 2015.

That is around 2 million tonnes of fishmeal and 420K tonnes of fish oil.

This represents around 40% of global production.

There will also be some MSC material available (RS recognises MSC as proof of responsible fisheries management)



## Contrasting roles of MSC and IFFO RS

	IFFO RS	MSC
Feed/Food Safety	Yes	No
Ecolabel	No (B2B)	Yes
FAO Code for Responsible Fisheries	Yes	Yes
Claim	Responsible	Sustainable
Main Focus	Fishmeal Factory	Food Fisheries
By Products Standard	Yes	No



# Conclusions

Volumes of marine ingredients are static as more fish go for human consumption but more by-products are used to make fishmeal & fish oil

Marine ingredients are no longer commodities and are increasingly being used strategically in specialist diets or as nutraceuticals

Sustainable Aquaculture will continue to grow using the same or lower volumes of higher value marine ingredients

The market will increasingly demand responsible sourcing of marine ingredients with independent certification eg IFFO RS which now covers over 20% world supply