



THE FUTURE OF FISHMEAL AND FISH OIL

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Points to cover

- IFFO
- Current Supply Trends
- Current Demand Trends
- Mass balance of production and use
- Future Trends
- Ensuring responsible supply
- Conclusions



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.



Current Supply Trends



Focus on sustainability driving precautionary quotas

- Peru through IMARPE is moving towards an ecosystem approach
- Chile through IFOP are setting tighter quotas and also trying to control international fishing for jack mackerel
- Europe rebuilding fisheries and reforming Common Fisheries Policy

Negative effect on fishmeal & fish oil production volumes

Increased use of raw material for direct human consumption

- Norway - Capelin, Herring & Blue Whiting
- Denmark - Herring & Blue Whiting
- Chile - Jack Mackerel & Chub Mackerel
- Peru – Last year approx. 190,000 tonnes of anchovy went for human consumption (3%)

Negative effect on fishmeal & fish oil production volumes



Estimate of Global Production By-Product Fishmeal 2008

Total Production .000 tonnes	Fishmeal	By-Product Coefficient %	By-product FM Production
ANGOLA	5.3	50	2.7
ARGENTINA	50.0	55	27.5
AUSTRALIA	14.0	50	7.0
BRAZIL	42.5	22	9.4
CAMBODIA	3.0	60	1.8
CANADA	31.2	100	31.2
CHILE	673.3	14	94.3
CHINA	141.0	5	7.1
DENMARK	161.3	20	32.3
ECUADOR	48.0	14	6.7
FAROE ISLANDS	44.4	5	2.2
FINLAND	3.6	70	2.5
FRANCE	13.7	100	13.7
GERMANY	19.0	100	19.0
ICELAND	140.9	32	45.1
INDIA	19.3	5	1.0
INDONESIA	15.0	30	4.5
IRAN	29.8	30	8.9
IRELAND	19.3	40	7.7
ITALY	4.3	100	4.3
IVORY COAST	1.0	60	0.6
JAPAN	202.9	90	182.6
KOREA (Rep)	49.6	20	9.9
LITHUANIA	22.0	20	4.4
MALAYSIA	44.2	40	17.7
MALDIVES	2.0	80	1.6
MAURITIUS	5.0	60	3.0
MEXICO	105.8	50	52.9
MOROCCO	78.0	15	11.7
NAMIBIA	12.5	100	12.5
NEW ZEALAND	27.0	10	2.7
NORWAY	135.0	22	29.7
PAKISTAN	56.2	20	11.2
PANAMA	55.2	10	5.5
PERU	1,396.1	2	27.9
POLAND	22.4	40	9.0
RUSSIAN FED.	71.0	50	35.5
SENEGAL	4.3	100	4.3
SEYCHELLES	20.0	70	14.0
SOUTH AFRICA	83.8	10	8.4
SPAIN	20.0	100	20.0
SWEDEN	23.6	50	11.8
TAIWAN	18.2	70	12.7
THAILAND	468.0	60	280.8
U.K.	42.0	70	29.4
U.S.A.	216.2	25	54.1
VIETNAM	45.9	50	23.0
TOTAL 47	4,706.8		1205.6
OTHERS	111.2	20	22.2
TOTAL WORLD	4,818.0	25%	1227.9



Increasingly fishmeal is coming from fisheries by-products - now reached over 25% of Global Production.

Alaskan Pollock meal is a good example

Positive effect on fishmeal & fish oil production volumes



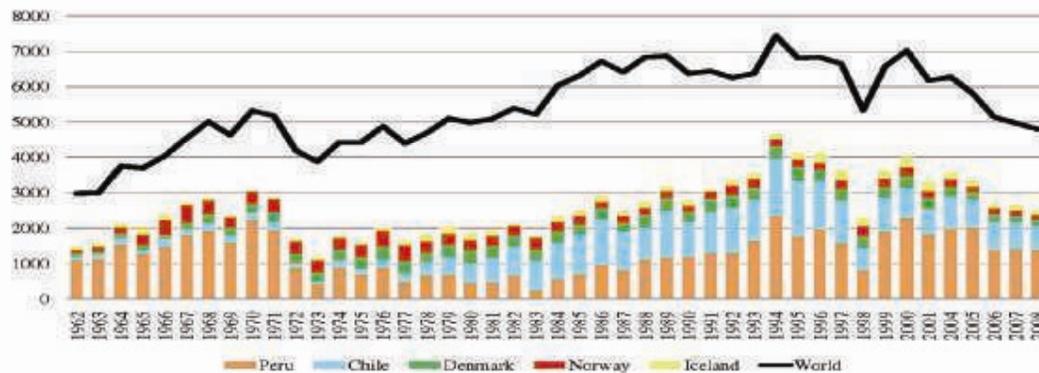
Increased pressure to convert trash fish to fishmeal & fish oil in S.E.Asia

- Over 5 million tonnes of low value fish is used for animal feed each year
- Most of this used to be fed directly to pigs, poultry and increasingly aquaculture
- Now discouraged due to poor storage qualities and high levels of wastage at feeding
- Trend to pelleted feed with fishmeal

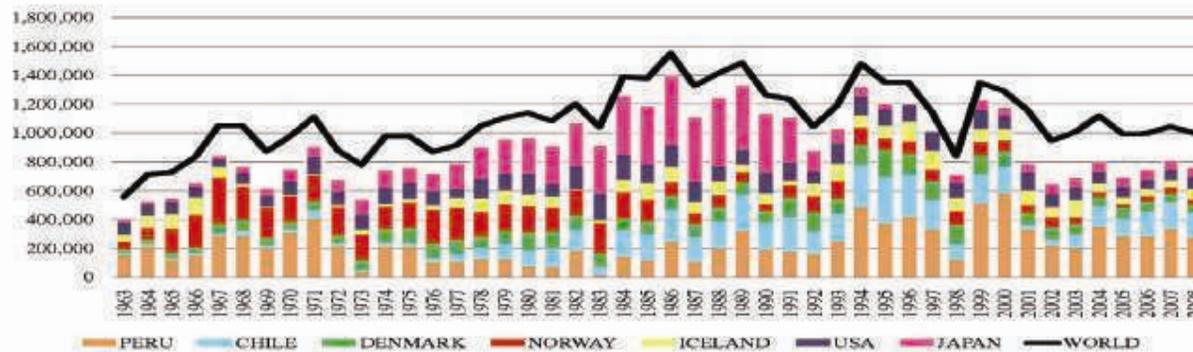
Positive effect on fishmeal & fish oil production volumes

Result: Static or declining volumes

Fishmeal production 1962 onwards (tonnes '000)



Fish oil production 1963 onwards (tonnes)

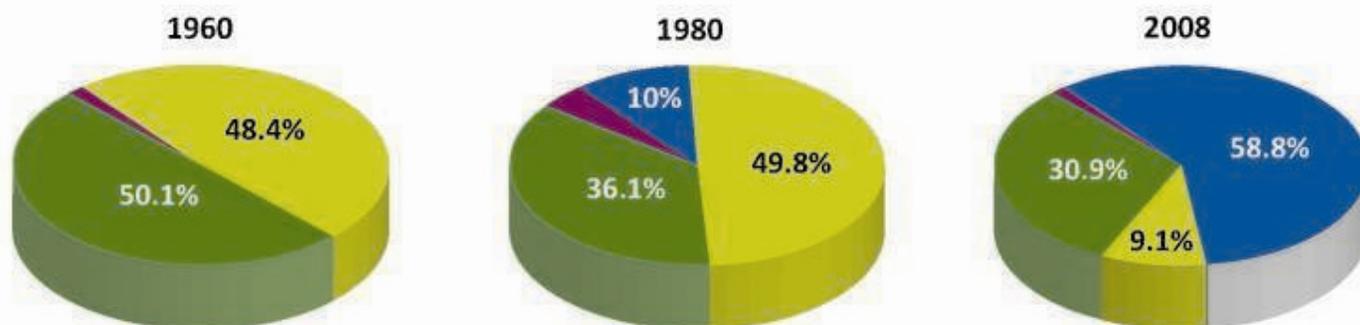




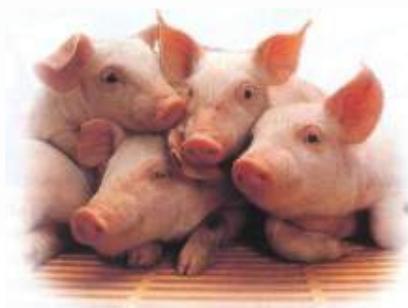
Current Demand Trends

Move from 'Agri' to 'Aqua' sector

Changing uses of fishmeal

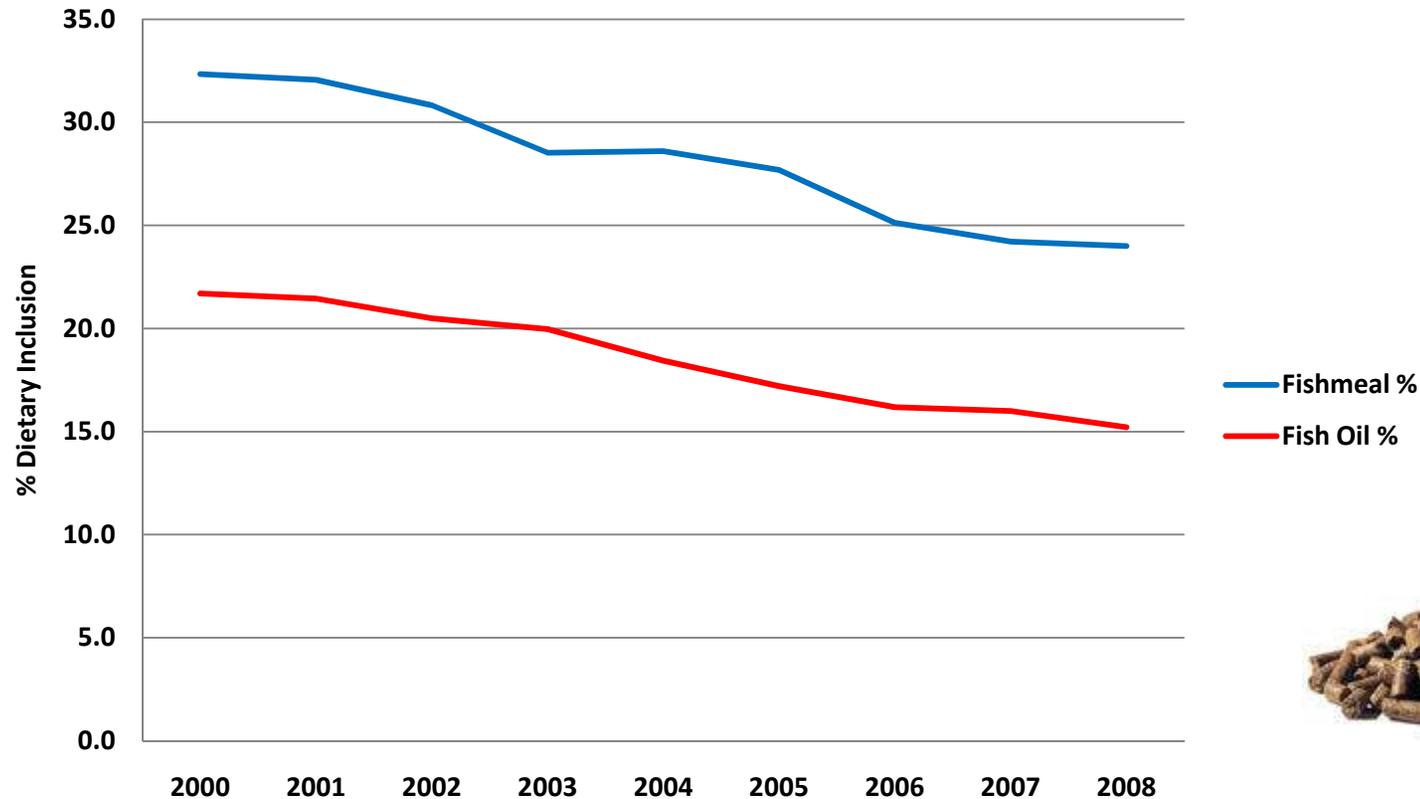


- Aquaculture
- Chicken
- Pig
- Other



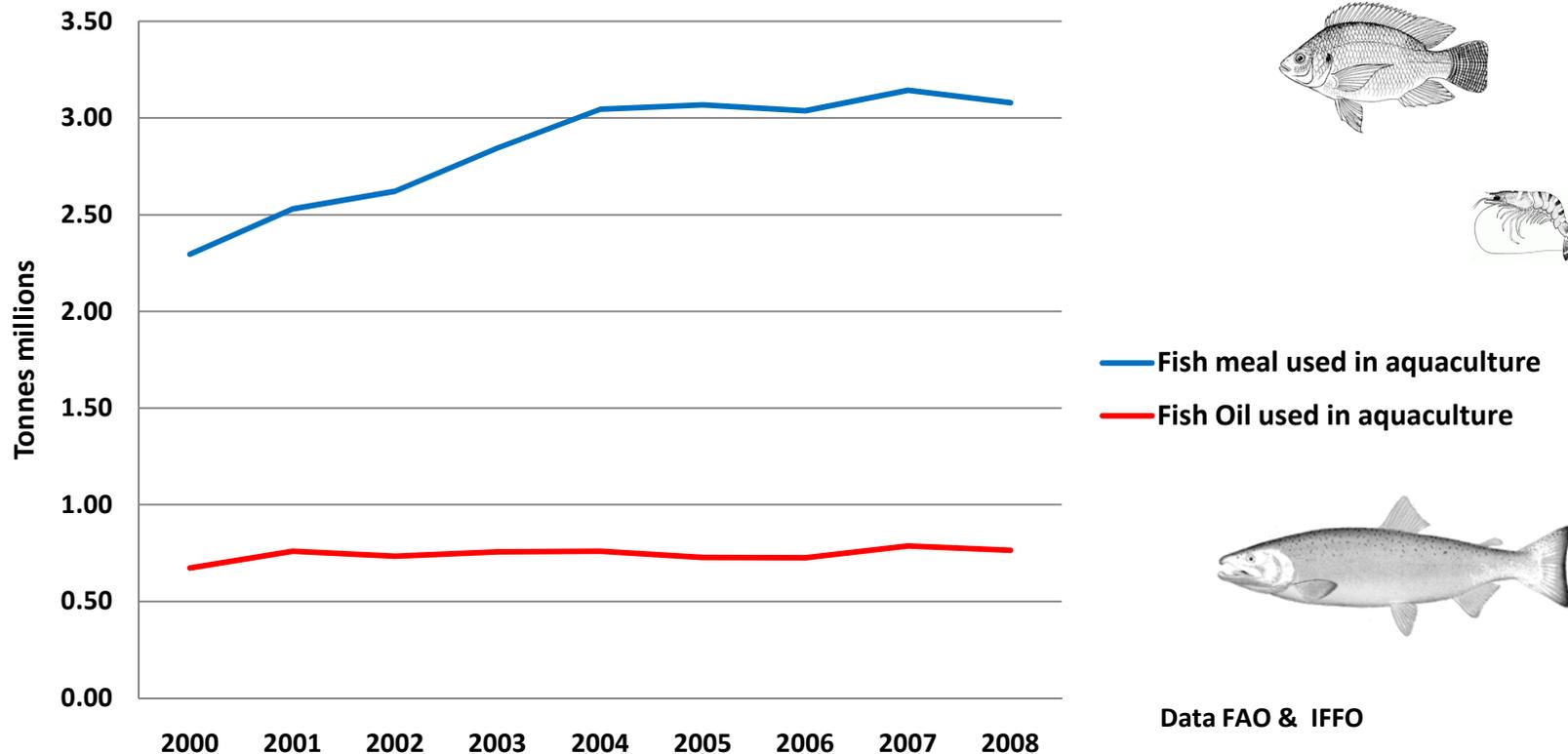
Reducing dietary inclusion levels

Inclusion levels of marine ingredients in Salmonid diets
2000-2008



Growing aquaculture demand & reducing inclusion – resulting usage

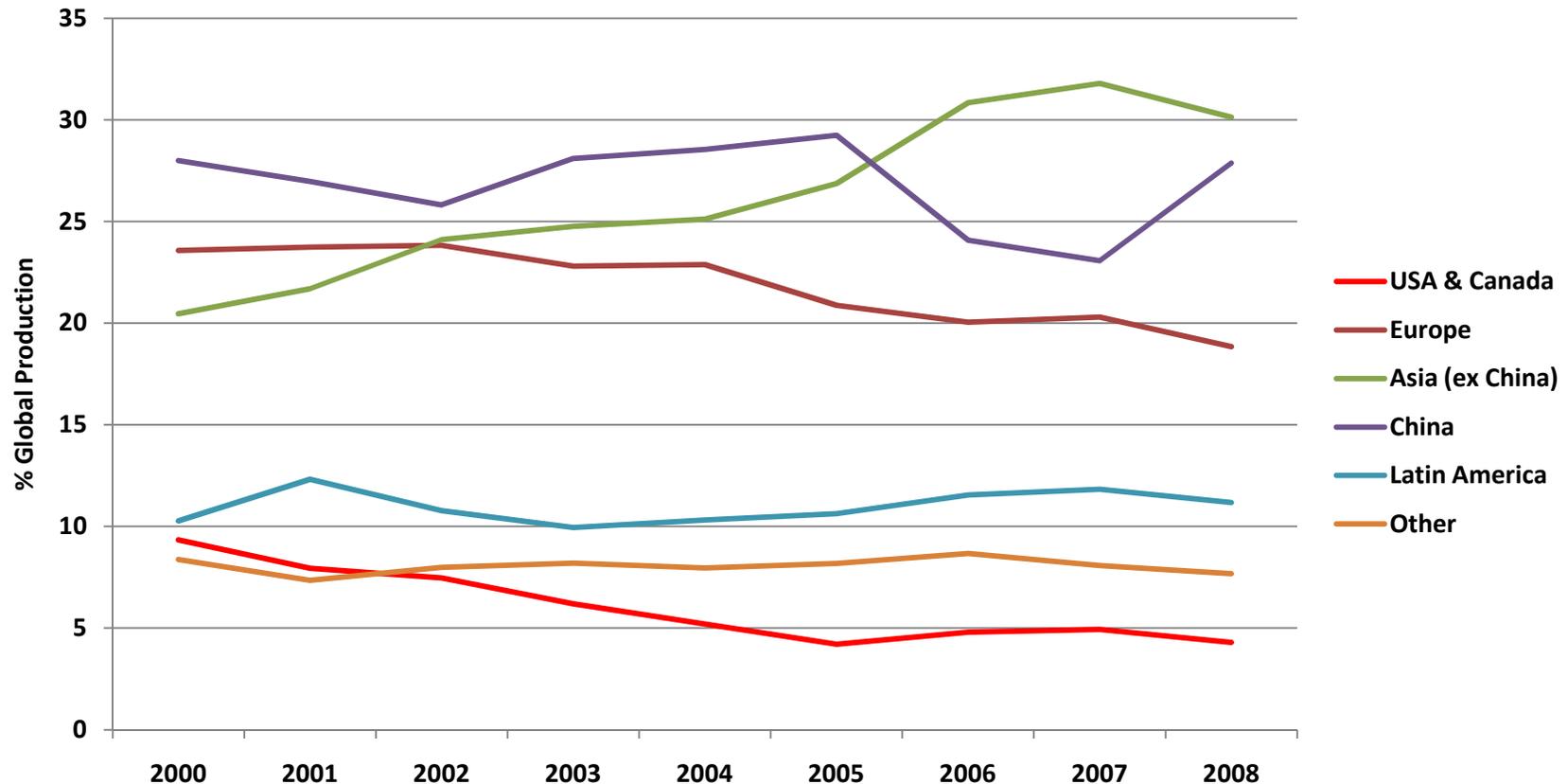
Global fishmeal and fish oil usage in aquaculture
2000-2008





Fishmeal usage moving to Asia

Usage of fishmeal by region
% of global production





Increasingly fishmeal and fish oil being used as strategic feed ingredients

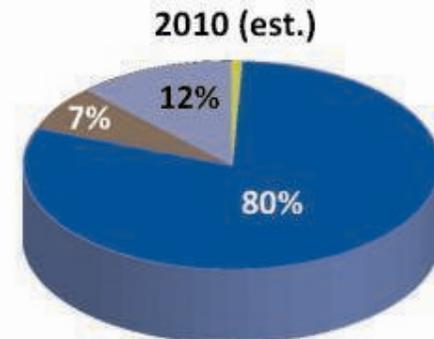
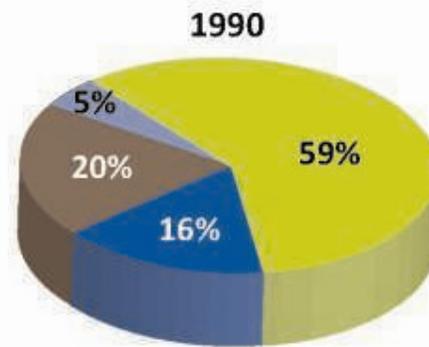
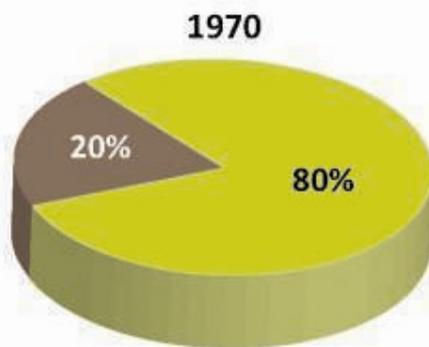
- Fishmeal still used for pigs in weaner feeds
- Fishmeal still critical in all aquaculture hatchery feeds
- Fish oil used to produce healthy aquaculture products
- And increasingly in agricultural feeds to provide EFA's to animal & final consumer



Fish oil usage moving from hydrogenated fat to aquaculture & capsules for human use

A growing recognition of the importance of EPA & DHA

Changing uses of fish oil



- Hardened edible
- Aquafeed
- Industrial
- Refined edible



Mass Balance of Production 2008



IFFO estimates published OECD 2010

Thousand tonnes



Total Mass Balance and resulting FIFO's

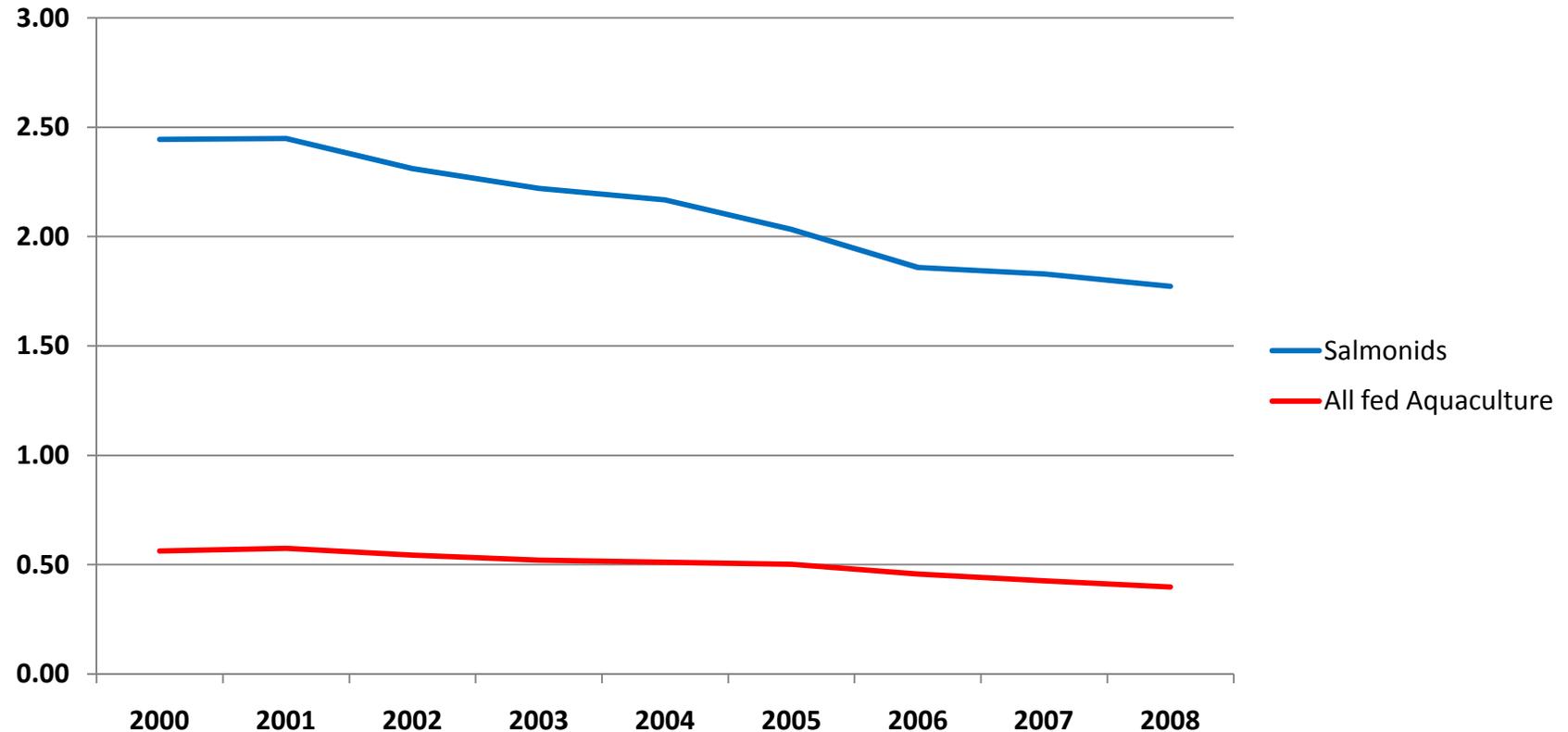
thousand tonnes except fish-in-fish-out ratio

	FO	FM	Water	Total RM	Whole Fish	Farmed Production	FIFO
Chicken	0	440	1178	1619	1214	N/A	N/A
Pig	0	1263	3380	4643	3482	N/A	N/A
Other Land Animals	0	160	428	588	441	N/A	N/A
Other oil uses	110	0	294	404	303	N/A	N/A
Human Consumption	126	0	337	463	347	N/A	N/A
Crustaceans	28	786	2178	2992	2244	4673	0.48
Marine Fish	115	738	2285	3138	2354	2337	1.01
Salmon & Trout	604	916	4069	5588	4191	2365	1.77
Eels	15	186	537	738	554	244	2.26
Cyprinids	1	130	350	481	361	13037	0.03
Tilapias	18	143	430	591	443	2737	0.16
Other Freshwater	15	180	521	716	537	2102	0.26
Aquaculture Sub-total	796	3079	10371	14246	10684	27495	0.39
Total	1032	4942	15990	21964	16473		



FIFO Ratios in Aquaculture

FIFO 2000-2008 based on whole rendered fish

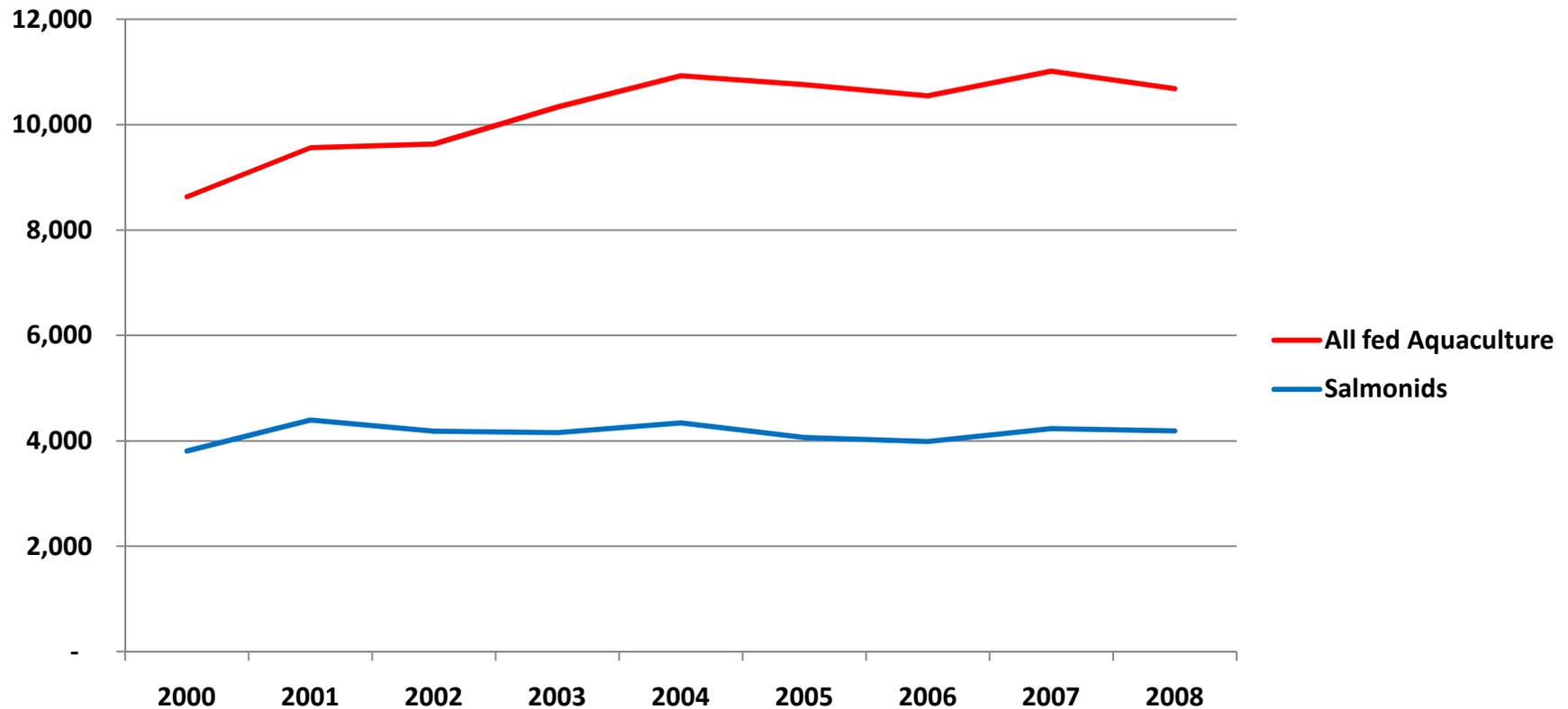


IFFO estimates



Use of whole fish in Aquaculture

Volumes of whole fish rendered for Aquaculture
,000 tonnes

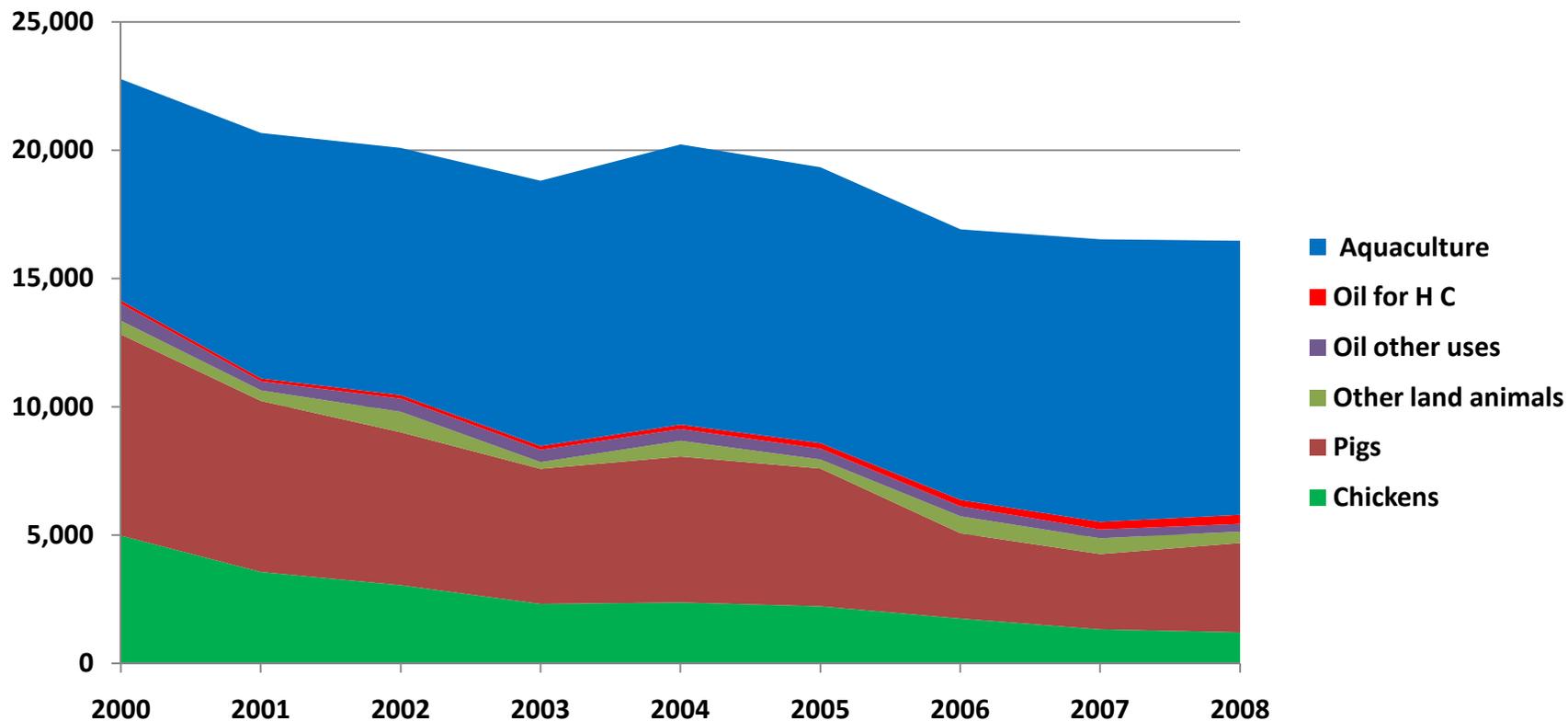


IFFO estimates



Global use of rendered whole fish

Whole fish rendered for different purposes
Tonnes ,000



IFFO estimates



Future Trends



Fishmeal future usage trends

- Aqua will continue to take a larger share
- Dietary inclusion levels will continue to fall in established species; new farmed species will start with high dietary levels (eg Tuna, cobia)
- Lower inclusion levels will require higher quality and special products e.g. controlled enzyme produced peptides



Fish Oil future usage trends

- Increasing confirmation of the importance of EPA & DHA in human & animal health
 - Heart function
 - Brain Function
 - Diabetes
 - Allergies
- Increasing volumes going for direct human consumption
- New GM plant products with long-chain omega-3 will appear but likely to be a precursor of EPA and not DHA in the foreseeable future
- Increasing volumes of fish oil from aquaculture – but beware the levels of EPA & DHA



Fishmeal future supply trends

- Fishmeal supplies will continue to be tight
- Increasing volumes of raw material will come from fisheries by-products
- More & more of the fisheries by-products will come from aquaculture
- Supplies of whole fish will increasingly come from stocks shown to be responsibly managed in order to reassure concerns over sustainability



Reassuring the value-chain about fisheries management

- FAO Code of Responsible Fisheries is the only internationally recognised measure of good management
- MSC standard certifies fisheries that are managed according to the FAO Code
- Currently small volumes of fishmeal & fish oil available from MSC approved fisheries



IFFO recently launched its Global Standard for Responsible Supply (RS)

- RS is a B-to-B initiative following the ISO-65 Standard
- 3rd 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
 - Avoids the use of IUU fish
 - Manufactures under a recognised quality control scheme to ensure product safety & purity





IFFO RS - progress to date

- Launched in October 2009
- Recently announced first approved plant – one in Peru for the processing of Peruvian Anchovy
- Another 70 factories under assessment as of April 2010 in four different countries (over 25% of world production)



IFFO RS – The Future

- Continuous development of the programme
- Fisheries by-product element being added
- Discussions on how to cover factory pollution





Improvers Programme 1

- Concern that Factories in some countries will find the RS Standard difficult to achieve
- No wish to dilute the Standard
- Desire to bring about fishery and factory improvement where required
- May require government commitment
- May require access to capital funds for investment in factory & fisheries management
- IFFO in discussion with FAO on implementation



Improvers Programme 2

To consist of:

- Identification of areas of non-compliance
- Structured programme of continuous improvement
- Agreed milestones along a defined timeline
- Final goal to be accreditation to RS Standard





Conclusions

- Fishmeal and fish oil will continue to play an important role in the healthy production of many farmed aquatic and terrestrial animals
- Fishmeal is becoming less of a commodity and more of a strategic nutritional ingredient
- The unique properties of fish oil will ensure continued strong demand to promote human health
- It will become increasingly important to be able to demonstrate that production is being conducted in a responsible manner