SINTEF Fiskeri og havbruk AS
SINTEF Fisheries and Aquaculture
Address:
Postboks 118
NO-9252 Tromsø
NORWAY

Telephone: +47 40005350
Telefax:+47

fish@sintef.no
www.sintef.no/fisk
Enterprise /VAT No:
NO 980 478 270 MVA

Analysis of marine by-products 2013
English summary

AUTHOR's

Trude Olafsen, Roger Richardsen, SINTEF Fisheries and Aquaculture AS
Ragnar Nystøyl, Gunn Strandheim, Jan Petter Kosmo, Kontali Analyse AS

Ref to SINTEF report nr A26097 (In Norwegian)

PROJECT NO / FILE CODE	DATE	CLASSIFICATION
6020 663	2014-05-06	Unrestricted

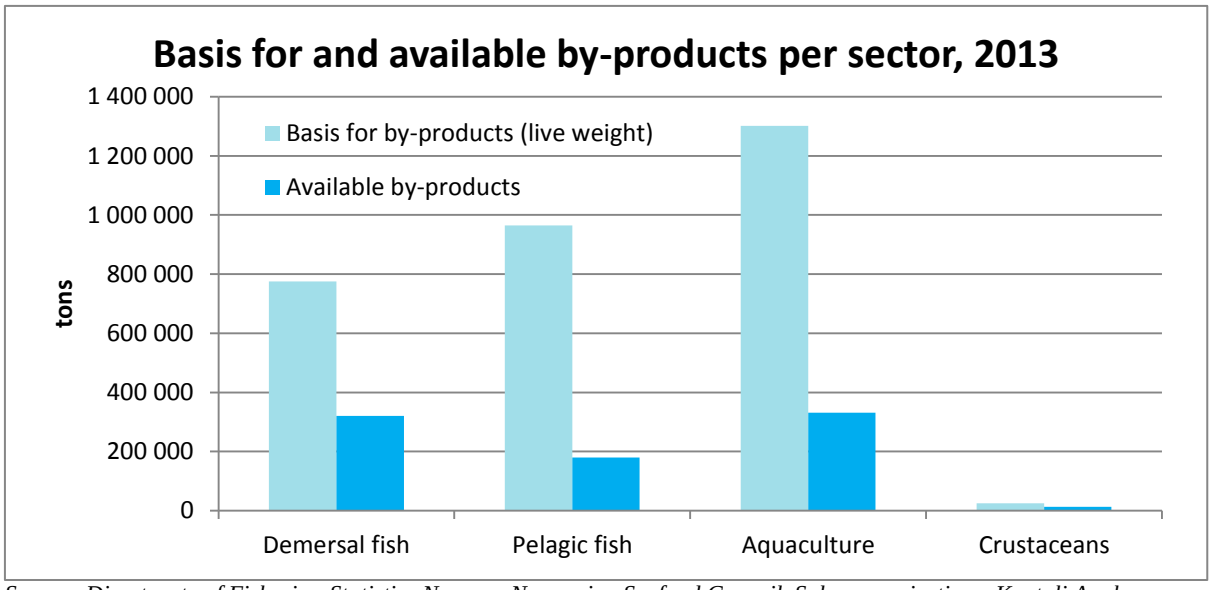
Marine by-products from seafood processing and aquaculture production make a valuable resource for further economic activity. In Norway, most of the raw materials are taken care of, but still there are a good potential both to increase the volumes and further value adding. Marine by-products add substantial value to the seafood industry, and many companies have a special focus on product development into a growing business of marine ingredients. Thus, this report is meant as a tool for the industry, sector administrations, and R&D institutions to have a best possible overview of volumes, types of by-products as well as main applications of the raw material. The main goal has been screening the raw material flow of products as detailed as possible.

To estimate volumes of by-products into secondary processing, various sources of public statistics has been used. The most important issued by Directorate of Fisheries, SSB (Statistics Norway) and the Norwegian Seafood Council. Figures and numbers of products and applications of by-products are sourced directly from the industry – as public statistics are scarce and not sufficient detailed for our purpose.

Results – available volumes of by-products

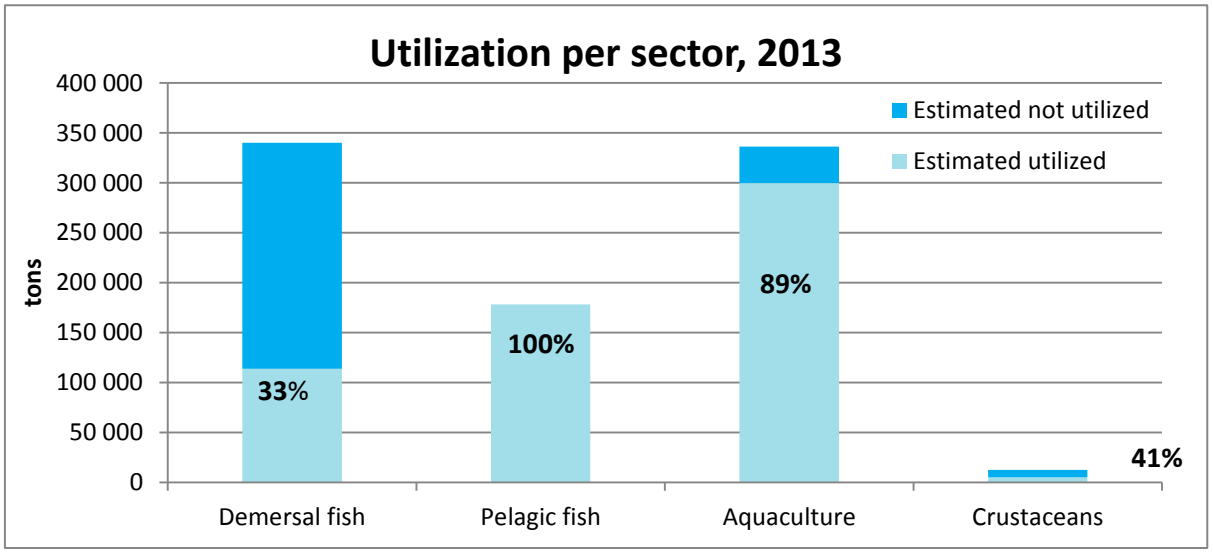
A starting point for an evaluation of available volumes in 2013 comes from a live weight catch and farming of totally 3.07 Mill tons fish and crustaceans. This create 0,87 Mill. Tons of by-products. In 2013, 69 % of the total was taken care of, approximately 600 000 tons. The table and figure below gives a summary of available volumes specified to sector of the industry.

	Total	Demersal fish	Pelagic fish*	Aquaculture	Crustaceans
Basis for by-products (live weight)	3 066 000	775 000	965 000	1 301 000	25 000
Available by-products	867 000	340 000	178 000	336 000	12 500
Available by-products as share of basis for by-products	28 %	44 %	18 %	26 %	50 %



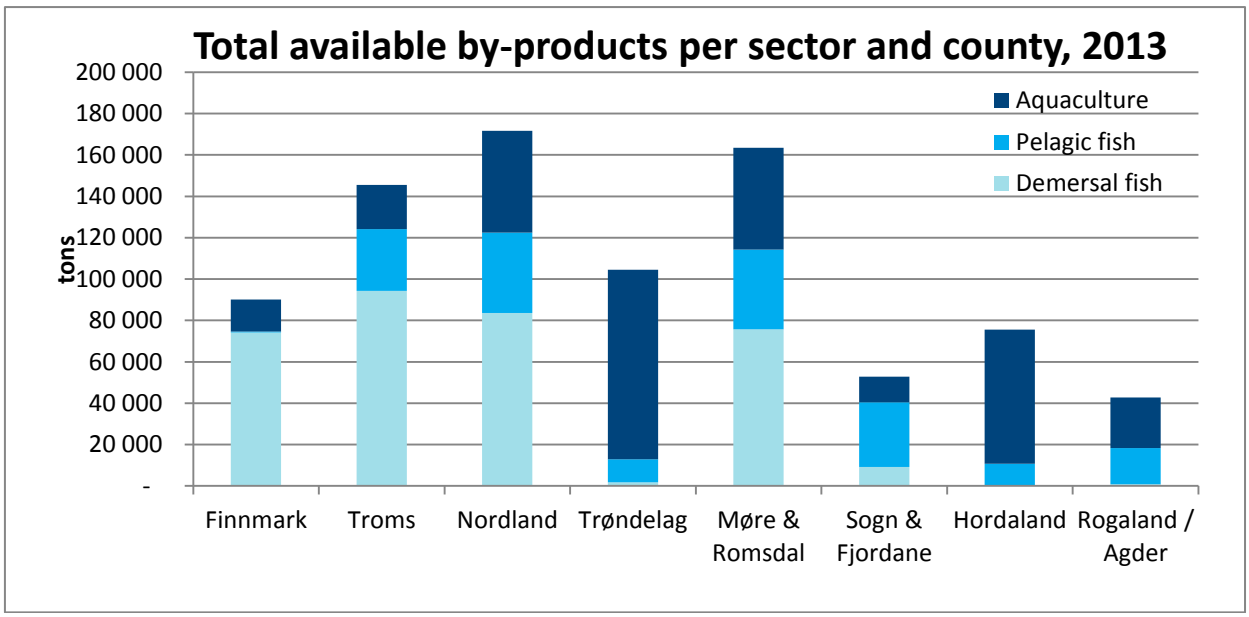
Source: Directorate of Fisheries, Statistics Norway, Norwegian Seafood Council, Sales organizations, Kontali Analyse og SINTEF

In general it can be concluded that it is by-products from the demersal fisheries which is not being used, and this sum up to 260 – 280 000 metric tons for the year 2013. It is mainly due to on board processing on board trawlers and other types of long distance fishing fleet, which lack technical solutions and perceived economic intensives to bring by-products ashore. On the other hand: Almost everything which is brought ashore is utilized as raw material for further processing. In aquaculture processing a substantial amount of blood is not utilized, but is taken care of according to regulatory prescriptions.



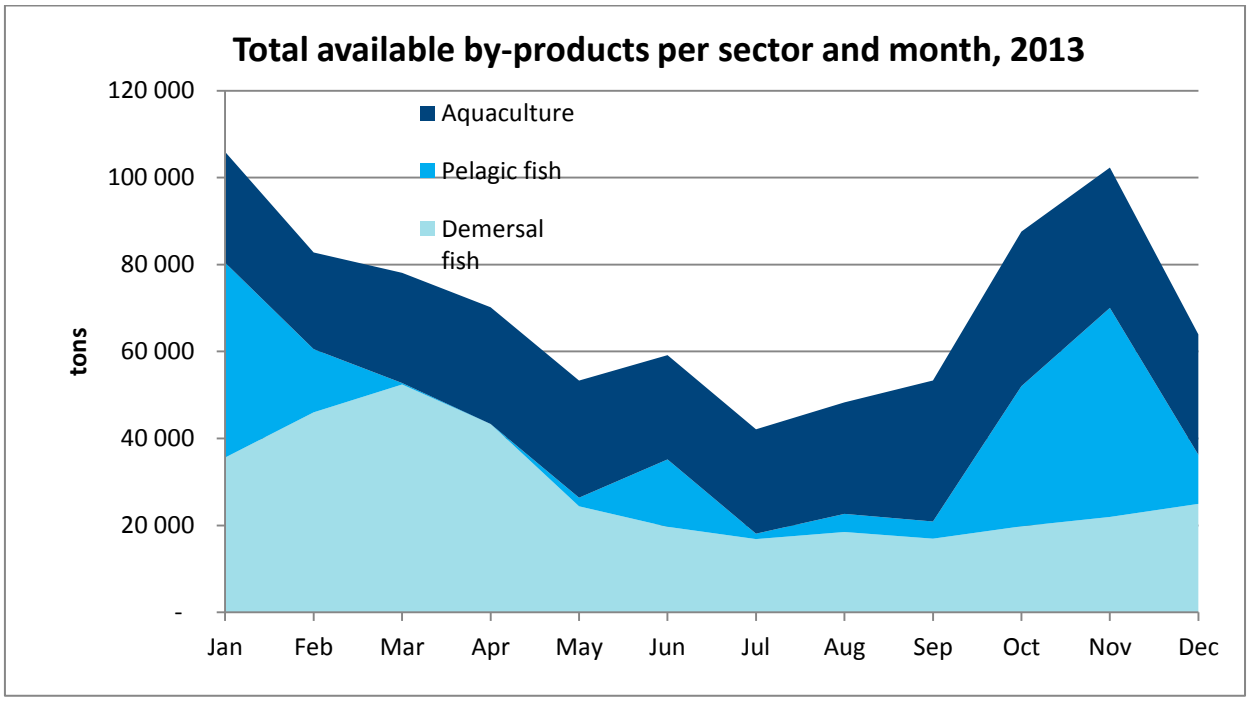
Source: Directorate of Fisheries, Statistics Norway, Norwagian Seafood Council, Sales organizations, Kontali Analyse og SINTEF

A detailed regional distribution of where the by-products are landed, conclude that Nordland, Møre & Romsdal and Troms Counties are the top three.



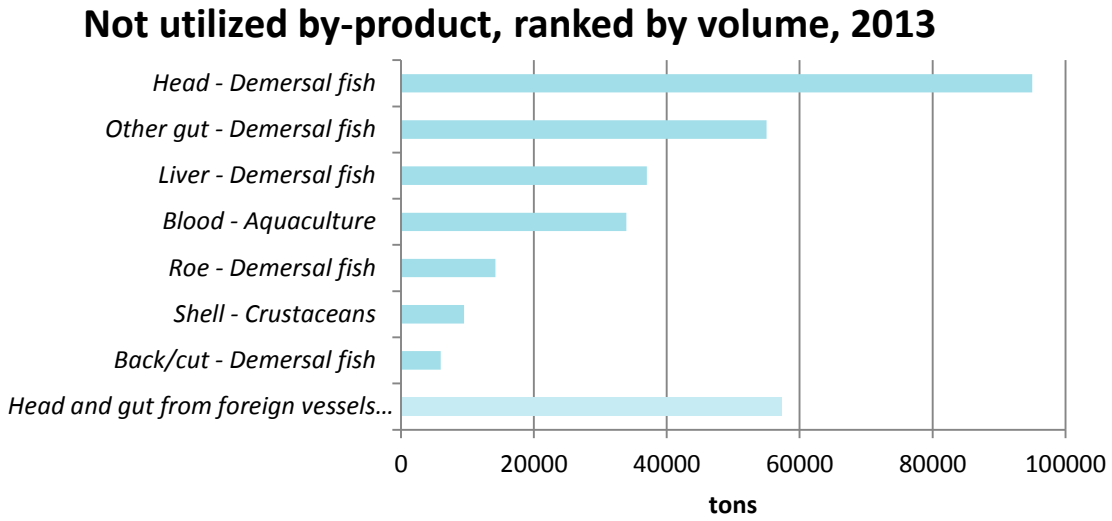
Source: Directorate of Fisheries, Statistics Norway, Norwagian Seafood Council, Sales organizations, Kontali Analyse og SINTEF

The calculation of seasonal landing figures (below) gives rather big variations. October and November, as well as January, February and March are months with the biggest supply of raw material. This follows natural by the normal seasonal patterns of the fisheries.



Source: Directorate of Fisheries, Statistics Norway, Norwegian Seafood Council, Sales organizations, Kontali Analyse og SINTEF

Most of the *non-used* volumes of marine by-products consist of heads, guts and livers from demersal species. In this report we have also calculated the amount of "free" blood from farmed salmon and trout, which has a potential to be utilized. In 2013 this accumulated to approximately 34 000 tons.

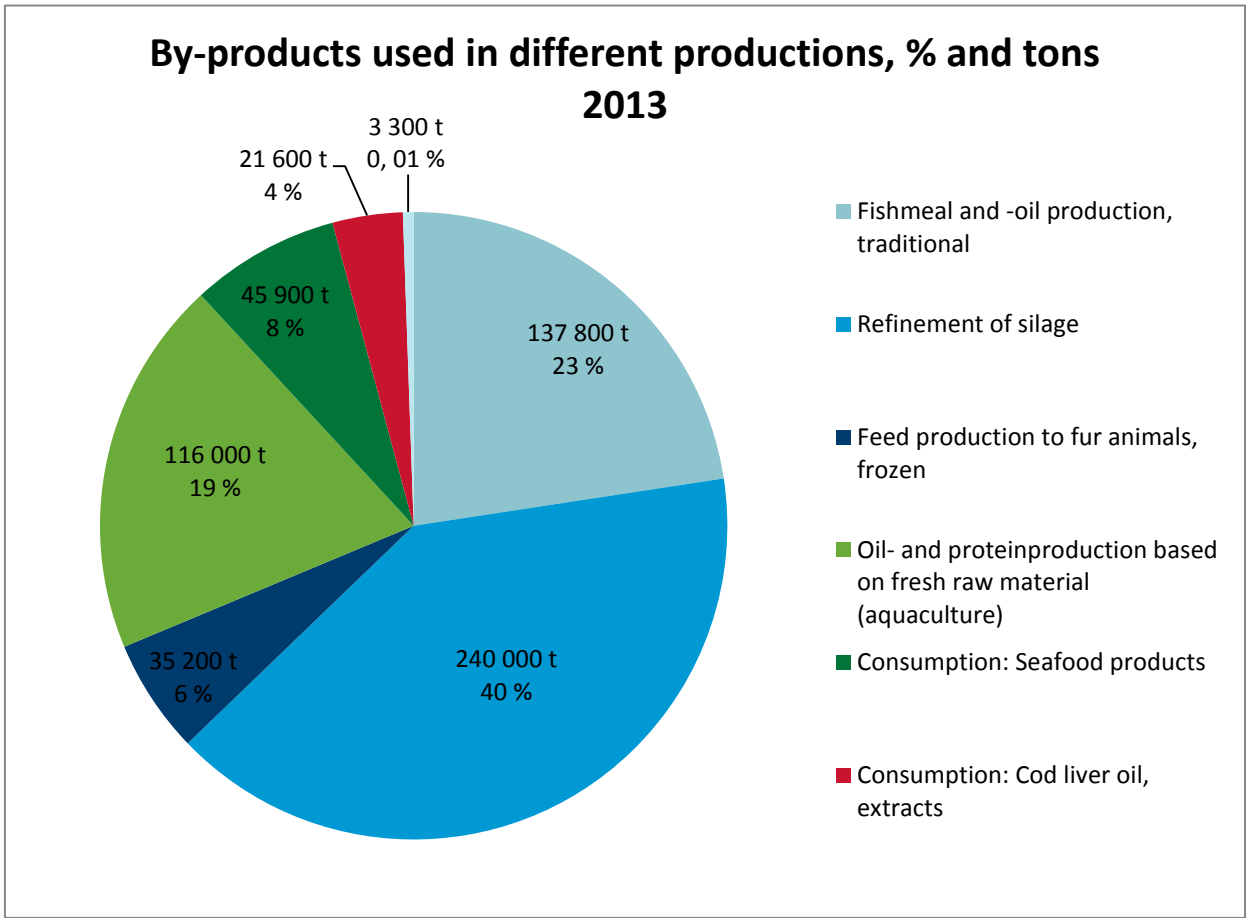


Source: Kontali Analyse, SINTEF

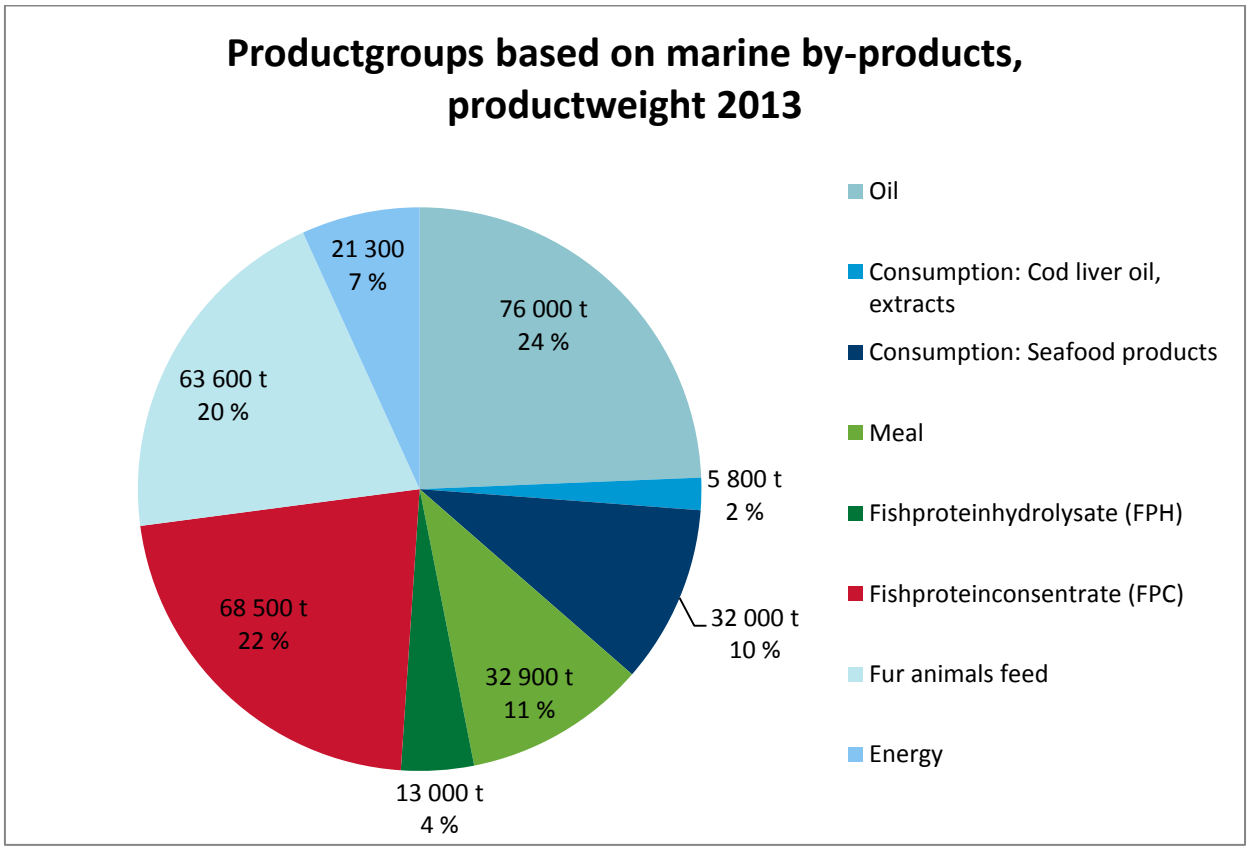
Utilisation of marine by-products

The available amounts of by-products have a wide range of applications. Some goes for direct human consumption as fresh or frozen seafood products, but the main volumes are used for further processing. 40 % of the volume is taken care of as silage and reprocessed into oils and fish protein concentrate (FPC). Traditional application through production of fish oil and meal is the second most important application in volume terms.

Production of fresh raw material of by-products from the aquaculture sector (salmon oil and fish protein hydrolysate (FPH) is the third most important, while approximately10 % of the volumes are used for human consumption, either directly as seafood products or more indirectly as cod liver oil or nutraceuticals for human applications.

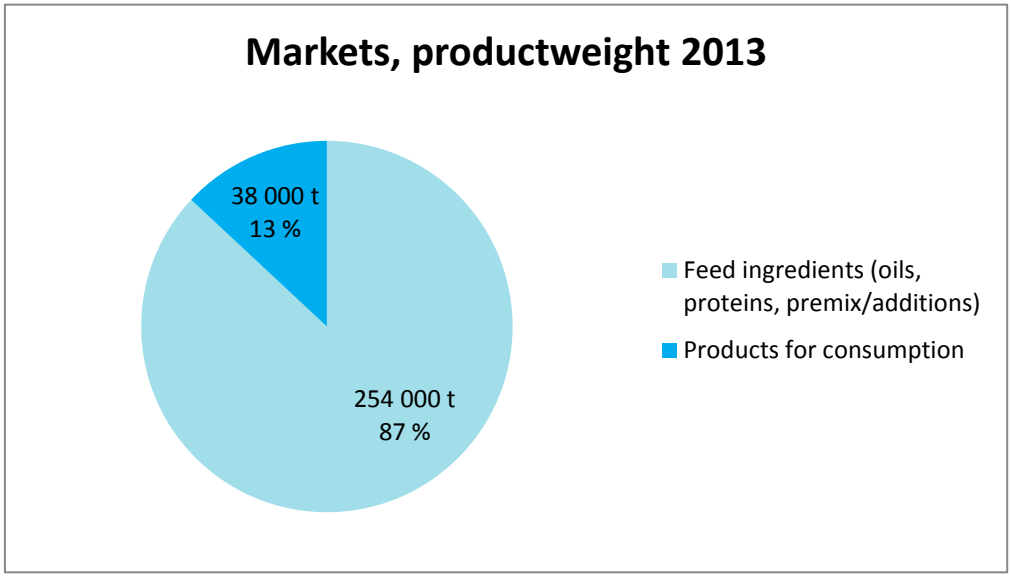


Source: Industry survey, SINTEF



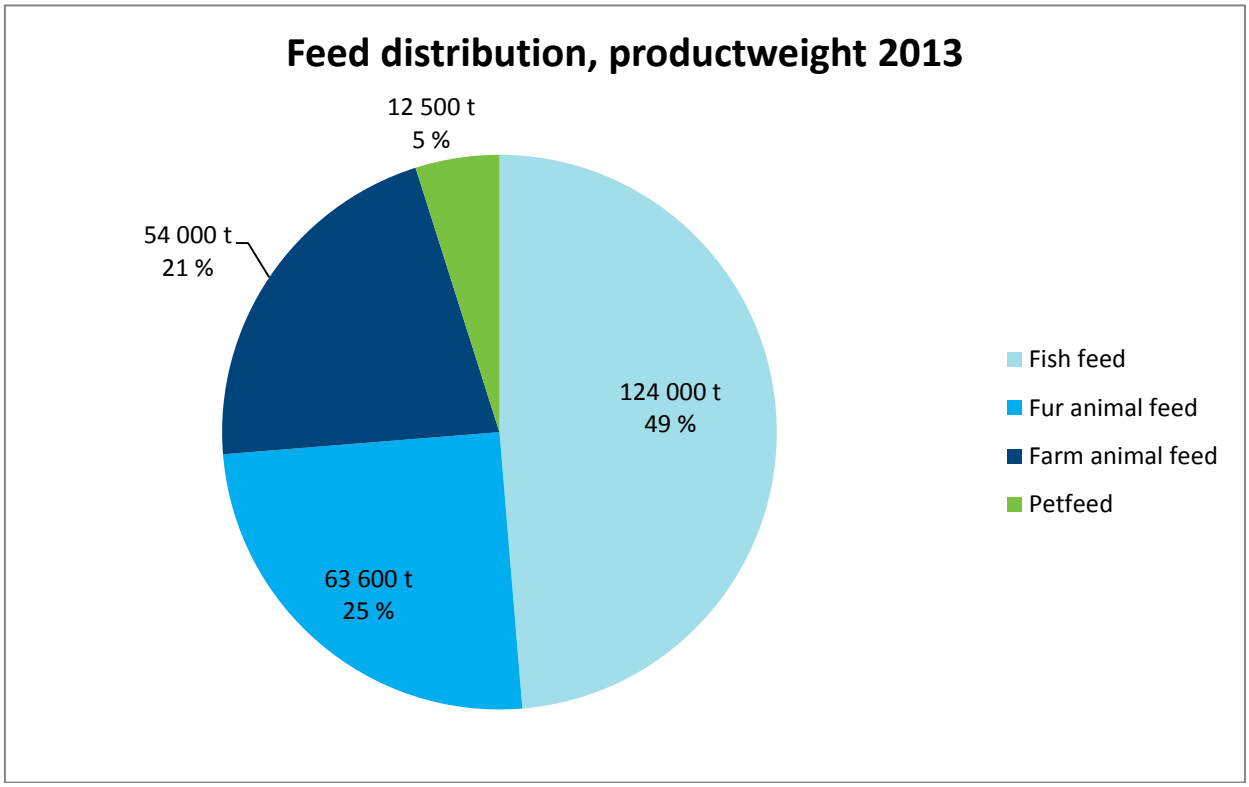
Source: Industry survey data, SINTEF

A rough summarize of applications shows some 87 % of products ends up as various types of feed ingredients. 13 % - 38 000 tons in 2013- goes directly or indirectly to human consumption. A minor fraction – not shown in the figure below – is used to produce biogas-/energy.



A minor application as biogas-/energy,-/fertilizer is not marked in the figure
Source: Industry survey data, SINTEF

The feed market consists of producers to fish feed, farm animal feed, pets and fur. The marine feed ingredient producers process (marine) oils, proteins and premixes to all of these types. All applications are valuable market segments to the total use of marine by-products, but the demand from fish feed producers have increased the most up to 2013. Both by-products from pelagic fishery and salmon oil have for many years had its best markets as fish feed ingredients, as feed to salmon-/trout and as feed to seabream/seabass, respectively.



Source: Industry survey data, SINTEF

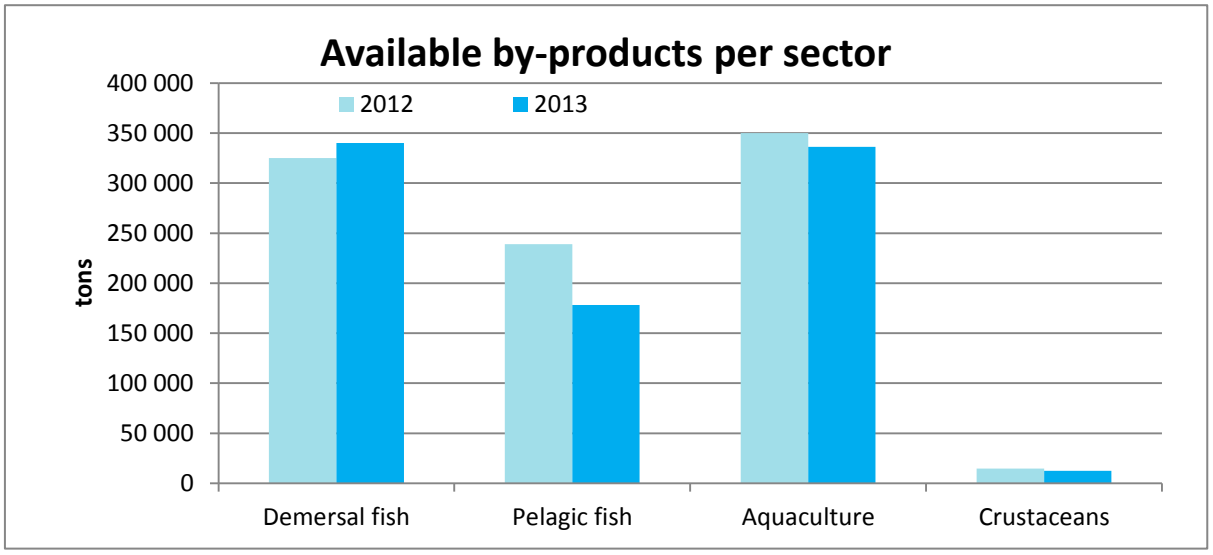
Therefore, marine by-products give a vital contribution to production of edible products for human consumption converted through applications as feed.

Fish feed market takes close to half of the volume (49 %). Second in 2013 is feed to production of furs, while feed to agriculture accounts to 21 % of the feed application. Feed to pets take only some 5 %. The feed market has changed somewhat from 2012. In particular by fur production taking a substantially larger proportion of total volumes. This may be caused by a good demand from the Scandinavian fur producers, who both take frozen blocks of cuttings, raw silage and fish protein concentrate. A registered decrease to the fish feed market segment is mainly due to lack of herring oil and meal caused by decreased landings, rather than due to reduced demand.

Marine lipids have their most important application as fish feed ingredient. Fish feed segment also takes most of the protein derived from other species than farmed salmon and trout.

Trends from 2012 to 2013

From 2012 to 2013 volumes of by-products from demersal fisheries increased, while volumes from pelagic fisheries and aquaculture decreased. Pelagic fisheries saw decreased TAC's and production from farming decreased slightly from previous year. There is also seen a slight decrease in shellfish sector.



The figure below shows trends in products produced from available quantities of raw material for the same period. As stated, decline in pelagic fisheries has led to less products available to the fish feed segment. There is also a decline in volumes produced for the purpose of biogas-/energy caused by a bigger proportion of "Category II" material from farming meant for fur production abroad.