

Questions and answers concerning fish feed for Norwegian salmon farms

1. Where does the farmed salmon come from?

ANSWER: Most of the farmed salmon sold in Norwegian supermarkets is produced in Norway, but consumers can also buy salmon produced in Scotland and Chile.

2. Is the Norwegian salmon industry sustainable?

ANSWER: Environmentally sustainable use is defined in the Convention on biological diversity: "Sustainable use" means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

The Norwegian fish farming industry is sustainable food production. This is absolutely essential in order to be able to operate this type of business enterprise. There are however areas where there is room for improvement. This is something the whole industry is continually working on.

3. Is salmon farming the reason for wild fish being overexploited?

ANSWER: No. Overexploitation is a consequence of poor management of the fisheries and marine resources, not the farms. Fish of the wild varieties used in the production of fish meal and fish oil are used over the whole world. Five million tonnes of fishmeal are produced annually, and Norwegian aquacultures use less than 10% of this (6.8% in 2007). The remainder goes to other domestic animal production in farming and feed for other fish varieties.

4. Where does the wild-caught fish come from that are used in fish feed?

ANSWER: Most of the wild fish is caught in the North Atlantic, and in addition some come from the south-eastern part of the Pacific Ocean. As long as the stocks are managed responsibly and there is no consumer market for these fish, it can best be used as a raw ingredient for fish or animal feed.

5. Does one pass the problem to other world oceans by buying more fish meal and fish oil from South America?

ANSWER: No, the fish varieties which are used for fish meal and fish oil in South America are regulated. The feed companies deal with suppliers who are bound by the quota-regulated fisheries' and researchers' recommendations and the guidelines and rules set by the authorities.

6. Is it environmentally sustainable to produce farmed salmon as long as the industry uses wild fish in the feed?

ANSWER: Environmental sustainability succeeds or fails depending on whether the wild fish stocks which are used for the feed production are harvested in a sustainable manner. Therefore the feed producers demand that the raw ingredients they buy must come from quota-regulated fisheries which are determined according to scientific advice. It is the individual countries with fisheries that set the quotas.

7. Do farmed salmon eat only fish?

ANSWER: No, marine raw ingredients comprise around 50% of the feed. An increasing proportion of the protein and fat requirements are met by vegetable ingredients, which means a corresponding reduction in the need for wild fish as a raw ingredient.

8. Why is wild fish needed in the feed for farmed salmon?

ANSWER: Under natural conditions the salmon eat other fish and other marine organisms. In the farms the fish receive dry feed so that the salmon get the correct protein and fat needed for growth. This comes partly from wild fish, including offal and trimmings material from the fishing industry. But an increasing portion of the protein and fat requirement is supplied by vegetable raw ingredients such as rape seed and maize, making it possible to produce much more farmed salmon without increasing the consumption of wild fish in the feed.

9. Wouldn't it be best for the wild fish stocks if fish farming were stopped?

ANSWER: There are examples of overfishing of fish stocks, but the reason for this is not to be found in the development of Norwegian aquaculture. The growth in the Norwegian salmon industry has not led to any increase in the fishing of wild fish either regionally or globally. On the contrary, the fish farming industry has meant that important raw ingredients such as fish meal and fish oil are now utilised in a much better way for the production of food for human consumption than was the case previously. Erroneous overfishing and overexploitation is blamed on poor fisheries management within the individual fishing nations.

10. How much wild fish is used to produce a kilogram of farmed salmon?

ANSWER: This varies according to which raw ingredient mix is used in the feed, and the proportion of wild fish has been significantly reduced in recent years. Today about two kilograms of wild fish are needed to produce one kilogram of salmon. This does not mean that one *uses* two kilograms of wild fish, because there will be fish meal left over which is used in other areas, for example in feed for land-based animal farming.

11. Some claim that only one kilogram of wild fish is needed to produce one kilogram of salmon?

ANSWER: It is correct that under research conditions it has been possible to produce one kilogram of salmon with 0.9 kg wild fish. But this has only been achieved in research projects. It is therefore incorrect to claim this as representing current production, but it does show some of the possibilities for future development.

12. Isn't it a waste of natural resources to feed salmon with wild-caught fish?

ANSWER: No, the farming of salmon is the most resource-effective method for animal-based food production. Today, 1.15 kg of feed is used to produce one kilogram of salmon. This feed comes from around two kilograms of wild fish. In comparison, salmon in the wild must eat ten kilograms of wild fish to grow by one kilogram.

13. Is Icelandic mackerel used in the feed for farmed salmon?

ANSWER: No, not usually. Iceland does not have a quota on mackerel (Norway, the Faeroe Islands and the EU do). Mackerel is a fish type which normally goes directly to food for human consumption and is therefore too highly priced to use in feed production. The industry is aware, however, that last year Iceland fished mackerel and that this was claimed to be bycatch, which was sold to the feed industry. Fish which on grounds of quality are not suitable for food for human consumption are used in feed production. In 2009 the Icelandic fishing authorities have set a quota of 112,000 tonnes of mackerel. It is expected that most of this will be consumed directly, since this normally provides a return which is close to ten times better than if the mackerel is used for fish meal and fish oil.

14. Is blue whiting used in the feed for farmed salmon?

ANSWER: Yes, blue whiting is one of the raw ingredients used in fish meal and fish oil production in Scandinavia. Even though blue whiting is now regulated (since 2005) there is debate among professional experts as to whether the fisheries fall within sustainable frameworks. This is because the quotas are set higher than the researchers have recommended, because the authorities want a longer period of time to find the balance between reproduction at sea and the catch volumes. The feed companies are expecting the authorities to manage the fisheries in a responsible and sustainable way, and have no influence on the setting of quotas.

15. Are sandeels used in the feed for farmed salmon?

ANSWER: Sandeels are also used in fish meal and fish oil production, but in small quantities. Moreover, this fish is regulated by quota. It is the responsibility of the authorities to ensure a sustainable management of the fish stocks, and the feed companies have no influence on the setting of quotas.

16. Isn't it foolish to use food to produce another type of food, such as salmon?

ANSWER: No, most animal food production (e.g. meat, milk and eggs) is based on feed containing raw ingredients which could have been eaten by humans. Most humans eat both meat and fish, which is in line with recommendations from the health authorities for a varied and balanced diet. WHO maintains that the intake of seafood needs to increase to provide for better public health. If this need for seafood for the world's population shall be met, the UN's food organisation (FAO) considers increased food production from aquaculture to be the only way to achieve this. Thus, Norwegian fish farming must be viewed in the light of this. Concerning wild species which is used in fish feed, this mainly concerns those types which are unsuitable for the consumer market. Had there been a demand and market for these types of fish as food for human consumption, the raw ingredients would have been priced higher and not used for feed production.

17. Why could the wild fish used in salmon feed not have been used as food for human consumption?

ANSWER: Not all fish species are suitable or in demand to be used directly as food for human consumption. In those cases where these types of fish are caught, it is because they can be used as raw ingredients for the production of food for human production from farming and fish farming. Those types which can be consumed directly are included in another market. (See also the answers overleaf.)

18. Why is the farming of salmon necessary? Isn't it enough to produce meat from pigs, cattle and poultry?

ANSWER: No, WHO maintains that the intake of seafood needs to increase to provide for better public health. In order to meet this need for seafood for the world's population, the UN's food organisation (FAO) considers increased food production from fish farming to be necessary. Health authorities recommend that part of this intake of seafood should consist of fatty fish, e.g. salmon. Furthermore, the utilisation of feed in fish farming is much better than in the production of animal-based products from warm-blooded animals such as cattle, pigs and poultry.

19. Couldn't we just stop the salmon industry and invest in traditional fisheries and farming instead?

ANSWER: No. The fisheries are regulated and the wild-catch is not expected to increase. The fishing industry is our largest food producing sector and an industry that is free from subsidies which provides important contributions to the national economy. In 2008, over 800,000 tonnes of salmon and trout were produced in fish farms in Norway. That is three times more than the combined meat production from traditional farming.

20. Has the growth in the Norwegian fish farming industry led to the catching of more wild fish in the sea?

ANSWER: No, five million tonnes of fish meal are produced annually, and Norwegian aquaculture uses less than 10% of this (6.8% in 2007). Before the fish farming industry was able to use the fish oil, this was a by-product of meal production which was used, for example, as a fuel. Viewed globally, the growth in the industry has not led to any increase in fishing of fish as raw material for fish meal and fish oil production.

21. We hear that the salmon industry is growing, so will that not mean that we must constantly catch more wild fish to feed the farmed salmon?

ANSWER: No, increased production must be based on increased use of alternative raw ingredients. Eventually this means that fish farms will have to consume a larger proportion of the fish meal which today goes to traditional farming. Even though there has been a considerable growth in Norwegian fish farming, this has not led to a parallel increase in fishing for feed globally. The proportion of wild fish which is used in salmon feed has been reduced and replaced with vegetable raw ingredients.

22. What were fish oil and fish meal used for previously?

ANSWER: Fish meal has been used for many years in feed for farm animals and the fish oil has been used for, among other things, fuel. In this way, valuable elements from marine raw ingredients, such as Omega 3 fatty acids, have been lost. Now more goes into the fish farm industry. The Norwegian salmon industry has ensured that there is more, and healthier food produced today from these resources than ever before.

23. Who is responsible in deciding how much fish can be caught?

ANSWER: The individual fishing nations set quotas, normally according to scientific advice from their own marine researchers and the international marine research bureau, ICES. With regard to the Norwegian shared stocks, Norway does not make its own decisions. More than 90% of these fish are managed in cooperation with other nations. Norwegian feed and salmon producers have no influence on setting the quotas.

24. Why are some stocks harvested more than researchers have recommended?

ANSWER: The individual fishing nations set quotas. In accordance with international guidelines and the nations' legislation, sustainability will be a balancing between economic, social and environmental sustainability. In practice this means, for example, that a fishing nation will not necessarily totally stop the fishing of overexploited stocks. Instead, they can choose to use a longer period of time to build up the stocks again out of regard for necessary social and economic considerations in their society.

25. How can the Norwegian fish farming industry contribute to ending the overfishing of some species?

ANSWER: Feed and fish farming companies have no influence over the fishing nations' setting of quotas, but as one of many purchasers of fish meal and fish oil Norwegian players can ensure that the raw ingredients they purchase are documented as administered in accordance with the authorities' regulations. See also below.

26. What requirements are set by the feed companies for their suppliers?

ANSWER: The companies place stringent requirements for the raw materials which are used in the production of fish meal and fish oil. These include that such raw materials must be supplied from regulated fisheries which are sustainably administered and approved in accordance with public fishery authorities. The raw ingredients must not be from threatened fish species. Moreover, suppliers must be able to provide satisfactory and systematic tracking documentation for fish used in meal and oil production. Feed companies also conduct regular audits of their suppliers to guarantee and check that questions of sustainability are being dealt with.

27. How can the feed companies be sure that suppliers are complying with the laws?

ANSWER: The feed companies conduct regular audits of their suppliers to guarantee and check that questions of sustainability are being dealt with. A traceable system and audits are the most important means the feed companies use to ensure that the requirements are being followed, but they are also dependent on good public control of the fisheries and registration of catches landed. The feed companies select suppliers who operate in countries with good control of their fisheries. In the same manner as in other parts of the value chain, the feed companies will continue working on this issue to further develop and rationalise today's inspection and tracking system.

28. Are there any consequences if we have a poor fisheries management?

ANSWER: Yes. Norwegian feed companies have excluded from their purchasing policies those nations who have not documented that their fisheries are regulated by quota and based on scientific advice.

29. Is the fish farming industry not merely interested in profit and growth at the expense of the marine environment and fish stocks?

ANSWER: No. All food production must be economically sustainable for the individual businesses in the industry. Salmon farming is an important industry which has great significance for the Norwegian national economy. Aquaculture in Norway is a success story with regard to food production, and also in relation to economic sustainability, but to claim that this means lasting damage to the environment is untrue. Over the short period in which the salmon has been bred as a domestic species, it has advanced to become our most effective "meat" producer. Twice as effective as pig to convert feed to meat, it creates fewer CO₂ traces than all other meat production, and is not a factor in the overexploiting of wild fish stocks. At the same time it is important for the fish farming industry to take into account the protection of the survival conditions for the wild salmon. Norwegian salmon is a high quality product which thanks to the fish farming business has become available to more than just the richest among us.