Skipjack tuna—a fish dear to the Japanese people since ancient times. It is one of the riches of the sea with an essential place in the Japanese kitchen, from dried bonito flakes and skipjack stock to sashimi.

One of Ajinomoto Co., Inc.’s main products, HON-DASHI®, has also supported home cooking in Japan as a seasoning to complement skipjack stock since it went on sale in 1970.

In order that it will always be able to provide HON-DASHI®, the company has started activities to monitor the state of skipjack tuna resources. It is also involved in R&D initiatives aimed at using this precious bounty of the seas as efficiently as possible and without any waste, thereby attempting to create a seamless recycling-oriented cycle of resources.
What is the current state of our fishery resources?

As populations and food consumption have grown, the total catch in the world’s oceans has quadrupled over the half-century since the 1950s. This has resulted in global-scale overfishing, and it is believed that around one third of fish species are caught in excessive numbers, while approximately half are hovering around critical point. This means that there is a need for fishery resources management that focuses on the ecosystem as a whole. However, elucidating the marine ecosystem is a task that is fraught with difficulties. It is important that scientific knowledge is built up and the state of marine resources should be monitored at an early stage, before these resources and the ecosystem become threatened.

In order to ensure a constant supply of HON-DASHI®

The dried bonito that is the main ingredient of HON-DASHI®, one of Ajinomoto Co., Inc.’s major products, comes from skipjack tuna caught mainly in the Western and Central Pacific Ocean. But demand for skipjack is soaring across the world.

What is the state of skipjack tuna resources?

Skipjack has had a profound relationship with the Japanese people in some way or another, and dates back to antiquity. As well as contributing to shaping Japanese food culture through sashimi and dried bonito and so on, the fish has also played a role in traditional customs. The skipjack of early summer and the returning skipjack of late autumn conveyed a message of the changing seasons, but in fact the main distribution range of the fish lies in tropical waters with most of spending their lives near the equator. The skipjack found in Japanese waters are a small section of migrant immature one-year-olds. They rarely spawn in the sort of temperatures found in Japanese waters, but spawn throughout the year in tropical seas starting from about one and a half year old and are famed as a highly productive fish.

Skipjack are now a vital food resource, not only in Japan but also throughout the world as an ingredient in tinned tuna. This has led to a continuous and marked increase in the skipjack catch, which in 2009 amounted to 1.8 million tons, the highest on record, in the Western and Central Pacific Ocean—the region that accounts for about 70% of the worldwide catch—an eightfold increase on the 1972 catch. In particular, the dramatic increase witnessed since the latter half of the 1990s is due to the purse seine fishing that accounts for 90% of the catch. Moreover, more than 90% of the catch takes place within ten degrees north and south of the equator, and most of the skipjack used in HON-DASHI® derives from these tropical waters. On the other hand, in the Japanese waters that lie in the peripheral areas of the fish’s distribution range, recent years have seen very poor catches along the western coast of Japan. In 2004 there was a decline in trolling and small-scale pole-and-line fishing, and catches slumped to a low level by 2008.

The company has launched activities to monitor skipjack stocks, to make sure that skipjack stock is always available, and so that its bounty can be forever enjoyed by people in Japan and elsewhere throughout the world.

What about skipjack resource management?

Various international fishery management organizations composed of the nations concerned, conduct the resource management of skipjack tuna which migrate across the wide seas. In the case of the Western and Central Pacific Ocean, the body in charge is the Western and Central Pacific Fisheries Commission (WCPFC),

At the 6th Regular Session of the WCPFC’s Scientific Committee (SC6) that was held on the South Pacific island country of Tonga in August 2010, an assessment of the tuna species in the Western and Central Pacific Ocean was conducted. Ajinomoto Co., Inc., as a company that has started initiatives to monitor skipjack, was keen to clearly understand the circumstances surrounding skipjack stocks and their management, and therefore participated in SC6 and directly listened to the discussions of researchers from various countries.

The resources assessment at SC6

The assessment stated that skipjack stocks in the Western and Central Pacific Ocean were still plentiful and that they were moderately exploited and subject to neither overfishing nor overfished. However, the indicators showing the state of the resources suggested that there were some signs indicating decrease of the population in recent years. The assessment stated that since there had been a rapid rise in catches and the indicators of the state of the resources were changing, monitoring would be necessary for any further attempts to increase the catch.

Furthermore, it has been hypothesized that the increase in exploitation in the equatorial region may be causing the distribution range of resources to shrink. This could possibly be the cause of the declining number of skipjack that reach the waters on the periphery of their distribution in other waters in latitudes further from the equator, such as the seas of Japan, Australia, and New Zealand.

State of skipjack and tuna species resources in world’s major fishing grounds

1. An indicator used in marine resources management. A fishing mortality at maximum sustainable yield (F/Fmsy) of over 1 indicates overfishing, and a biomass at maximum sustainable yield (B/Bmsy) of less than 1 means that the resource is scarce. Source: International organizations managing the world’s main fishing grounds. The data for skipjack, bigeye, and yellowfin tuna is from the WCPFC, the data for bluefin tuna is from International Commission for the Conservation of Atlantic Tuna (ICCAT).
Cooperation in tagging to deepen understanding of sea life

Understanding and monitoring skipjack stocks. As an initiative to collaborate and contribute in these efforts, in fiscal 2009 Ajinomoto Co., Inc. started the Joint Tagging Survey into Pacific Coast Skipjack in conjunction with the National Research Institute of Far Seas Fisheries (NRIFSF) of the Fisheries Research Agency (FRA). The NRIFSF has hitherto conducted tagging surveys on many species of fish for the purpose of investigating into the ecosystem and stocks of marine resources, but this fully-fledged research into the waters of Western Japan is the first of its kind.

In this survey, the skipjack caught with pole-and-line methods are tagged and released. When the fish are recaptured, on which reporting is made via the fisheries cooperatives, it is possible to estimate from the time and place what route the fish travelled, how much they grew en route, and the size of the stocks.

Tagging procedures

1. Choosing the skipjack
   Fishermen on a small pole-and-line fishing boat catch the fish. The researchers wait on the deck, choosing a healthy-looking specimen from among the fish that spill down from the bow.

2. Measuring the skipjack
   The place and time where they were caught, and their length, are all recorded.
During the first research activities in May 2009, 1,000 skipjacks were released in the vicinity of Amami Oshima, 34 of which were reported as recovered in Western Japan coasts by the end of the year. The project was expanded in fiscal 2010, with a further 3,000 fishes being released off Amami Oshima and the coast of Kochi.

We believe that acquiring the basic data requisite to properly understanding skipjack, and providing fisheries stakeholders with information on fluctuations in resources through this research, are vital for sustainable fishing. Moreover, pursuing research into skipjack in the temperate region could probably be regarded as a Japanese contribution to the assessment of skipjack stocks in the entire Western and Central Pacific Ocean. The research will not lead to immediate results, but it is an effort that the company intends to patiently pursue.

As it is vital that the members of the fishing community tell us about the recapture of fish, notices, posters and goods have been made to inform them through the fisheries cooperatives.

Supporting sustainable skipjack stocks is one of the environmental targets set as a business project by the Seasonings Department. Some of the company’s environmental personnel and myself took part in the joint tagging survey, and all of us lent a hand in the survey work carried out on the boat. Seeing for myself how the size of catches varies with the weather and sea conditions over the few days of the survey, I gained a first-hand understanding of just how hard it is to estimate and secure the resources of the sea, and how limited these resources are. In order to keep on supplying HON-DASHI®, it is essential to have a stable supply of skipjack. Though this research is still in its infancy, I hope that it will serve as the foundation for finding out even more about skipjacks and protecting them.

The seas are currently undergoing a major and rapid change. The worldwide consumption of fish is rising, but natural fish are a form of wildlife. While the amount caught by humans increases, the number of the fishes themselves will not suddenly rise. In order that we can still eat fish in the future, we need to prevent overfishing with a monitored fisheries management mechanism based on scientific evidence. It is also vital that consumers know about the seas and fishes. We have great hopes for this initiative of the Ajinomoto Group, which seeks to protect skipjack with the collaboration of various stakeholders including fishermen, fisheries people, researchers, NPOs and consumers.
Making the most efficient use of the riches of the seas, and creating a cycle of resources that is beneficial both at sea and on the land

When skipjack are considered as a resource it is important to know about their stocks, but is also vital that we use them without any waste. Ajinomoto Co., Inc. established Bonito Technical Laboratory Co., Inc. jointly with a dried bonito maker in 1997. The joint company is engaged in R&D to use all parts of the skipjack without any waste.

Skipjack are a food resource widely loved by the Japanese since the old days, and dried bonito has a deep enough link with Japanese food culture to merit a mention in the Kojiki: Records of Ancient Matters compiled in the 8th century. It is also used overseas in tinned tuna, and worldwide demand for the fish is rising in line with the increase in fish consumption. Under circumstances such as these, the company believes that it is vital that we make the most efficient use of skipjack without waste.

The Bonito Technical Laboratory Co., Inc.’s research to turn fish into various food products, and fertilizers that will nurture the fruits of the land

Ajinomoto Co., Inc. purchases dried bonito for use in HON-DASHI® from a specialist dried bonito manufacturer. The head, bones and innards are removed during the production process, and around 70% of the fish becomes dried bonito. However, the remaining 30% of the fish that does not become dried bonito is also packed with nutrition, to such an extent that it would be wasteful just to dispose of it. This is why the company uses the bones as a raw material for calcium food products and the concentrated and refined broth as an extract ingredient in HON-DASHI®. The heads and innards are also processed for use in seasonings such as fish sauce and skipjack soy sauce. Moreover, recent research is looking at ways of using enzymes inherent in skipjack to decompose the residual parts of the fish and turn them into fertilizers and feeds. Currently, experiments are underway to test the efficacy of a liquid fertilizer on green tea fields, and the fertilizer is showing signs of being particularly effective in stimulating the growth of new tea bush shoots. The company expects to popularize the skipjack liquid fertilizer now on sale as a product that helps create a permanent cycle of skipjack resources, by playing a part in using the goodness of these fishes to nurture fertile fields back on the land.

Pursuing high-added-value usage methods, and using every ounce of resources—the company hopes to express its gratitude for the riches of nature through its business operations.

An initiative that aims to use 100% of the skipjack by the effective utilization of all the by-products arising from the production of dried bonito

The Japanese people have had a long acquaintance with skipjack, and the bones of the fish have been found all over Japan in Jomon Era burial sites dating back to around 7,000 to 8,000 years ago. They appear to have been caught using tackle made from deer horns and bones.
The environmental consideration taken in the production of HON-DASHI® is not limited to materials. The product is available in refill pouches to cut down on waste, and ongoing environmental care is taken with all containers and packaging.

In recent years the pollution of rivers and seas, the oligotrophication (or nutrient depletion) of seawater and the desertification of coasts due to global warming, a phenomenon in which algae become depleted, have grown into serious problems. Since algae are one of the keystones of the food chain, encouraging their growth will lead to the vitalization of the seas and rivers.

This is why a group centering on Ajinomoto Co., Inc., Nikken Kogaku Co., Ltd., and the University of Tokushima’s Institute of Socio Techno Sciences (headed by Professor Yasunori Kouzuki) has jointly developed Environmentally Active Concrete1, in which the amino acid arginine is mixed. Arginine is an amino acid found in large quantities in marine products, and it has a growth-promoting effect on plants and certain types of algae. When arginine impregnated concrete was submerged in the sea, there was a notable difference in the growth of microalgae varieties around it compared to ordinary concrete, and fish and shell life were also attracted to it.

The results of experiments conducted thus far in seven maritime locations and on one river show that, in comparison with ordinary concrete, there is a marked difference in the growth of algae and abalone that adhere to it. Further attempts in the future will be made to test on a long term basis and verify the concrete’s effects on larger algae like wakame seaweed and kelp, as well as coral. By turning the inorganic concrete used in seas and rivers into an organic material it is hoped that it will be possible to improve the compatibility of natural and manmade objects, and help in supporting the food chain and ecosystem.

The arginine created from riches of the fields such as cassava helps to nurture life in the seas. Ajinomoto Co., Inc.’s amino acid business, which set out to provide people with tasty food, has blossomed out into medicines and feeds and so on, and is continuing to make fresh challenges in the field of fostering marine resources.


Much is expected of the concrete’s efficacy in attracting primary creatures such as fish and shellfish. Below left: Abalone; Below right: Sweetfish

The Ajinomoto Group Initiatives “Work for Life”

Arginine powder

To the Future

An amino acid derived from the land ensures the recovery of algae in the sea?

Joint development of Environmentally Active Concrete that helps to grow algae

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