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Are our fish safe to eat?

CAUTION: Three years after an earthquake left Japan with a nuclear plant leaking radioactive material into the Pacific Ocean, people living in countries around the region continue to worry over whether their fish is safe to eat. The authorities are closely monitoring all food items that are coming in from Japan, as concerns around the world continue to escalate over the safety of its food products. Tan Choe Choe and Arman Ahmad take a look at the issue

IN the last few months, fish radiation fears spread across South Korea, prompting its government to issue a statement assuring the populace that fish is safe to eat.

Taiwanese officials have issued a similar statement to their populace.

Newspapers in the Philippines are talking about the possibility of "radioactive tuna".

Rumours of radioactive fish have spread to places as far as Hawaii, prompting experts from the University of Hawaii to reassure people that it's safe to eat fish.

But is it really safe? What measures are in place to ensure the public does not unwittingly eat radioactive fish in Malaysia?

The Malaysian Nuclear Agency says measures have been put in place to monitor whether radiation from the Fukushima disaster area has reached our shores.

Malaysia is part of the International Atomic Energy Agency's (IAEA) Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific efforts to monitor Fukushima from 2011 to 2015. Fifteen countries are taking part in the initiative.

Its aim is to monitor whether radioactivity reaches Malaysian shores.

Radiochemistry and environment manager at the waste and environment technology division of the Malaysian Nuclear Agency (MNA) Dr Abdul Kadir Ishak said they were on the lookout for three types of elements — cesium 134, cesium 137 and iodine 131.

"Cesium 134 and iodine 131 have short half-lives. However, cesium 137's half-life is 30 years.



Dr Abdul Kadir Ishak says there is little to worry about

"This is why there is concern that it could contaminate other areas. For this reason, sea water is constantly monitored."

Kadir said the project would go on for a few years.

"It's a regional project. However, up to today, there has been no increase in the readings."

He said the agency had a baseline reading from 2003 for the country's entire coast.

"We started gathering baseline readings for a database as we were asked to by the Atomic Energy Licensing Board. In 2003, the AELB wanted to know the natural radioactivity present."

There are five stations throughout the country and samples are taken twice a year. The stations are located on the islands of Tioman, Perhentian, Bakungan Kecil and Karimun, as well as Bintulu Port.

Kadir said up until October last year, the readings were normal, adding that whatever cesium 137 was found was there as a result of fallout.

"These are the remnants of above-ground nuclear testing from around the world. In the Asia-Pacific region, it is around 1 or 2 Becquerel per metre cube of sea water."

Kadir said if the reading was

higher than that, then there was new input from "some other activity", perhaps via an accident or discharge.

"Nuclear submarines, for example, could ply our waters without us knowing. These submarines might leak or release waste."

In the wake of the Fukushima disaster, the IAEA did modelling to find out where sea currents would take the radionuclides. Based on the model, the order in which it spread would see it heading west towards the California shore, said Kadir.

"By the time it reaches our shores, which will take many more years, it will be very diluted."

For the public, there is very little to worry about, as food coming from Japan is continuously tested.

"The Health Ministry sent food samples in the first year the incident happened. They imposed level 5 import controls, where the food consignment is held until tests are done," said Kadir.

Food samples reach Malaysia in the morning for testing. By the afternoon, after being tested, they are released.

The level 5 import controls were imposed between March and April 2011.

Samples were analysed using gamma spectrometry. The samples were taken from airports, seaports and land borders.

According to the MNA, airborne radioactivity could be deposited on the ground or washed out with rain. Vegetation and soil could also be contaminated. The deposited radioactive materials could also be attached to leaves, which later transfers to plants by foliar uptake.

The plants then transfer radioactivity to animal meat. Lactating animals produce radioactive milk. In the sea, there are a number of ways in which radioactive particles could be spread, including direct

release of contaminated water into the sea, the conveyance of airborne pollutants into rivers and seas and fallout in the sea from radioactive plumes.

Research officer and laboratory technical manager for radiochemistry and environment laboratory at MNA Yii Mei Wo said there were controls in place to ensure food was monitored for contamination.

"Recently, the highest radioactivity level recorded was a fish from the greenling family of fishes, recording 740,000 Becquerel per kg.

"Japanese authorities have put the safe limit at 100 Becquerel per kg of iodine and 1000 Becquerel per kg of cesium 137."

In Malaysia, in early 2011, the highest readings seen did not exceed 12 Becquerel per kg. "Only a few samples were contaminated, and even then they were nowhere near the minimum safety limit."

Kadir said in addition to testing

at ports, the agency also took live fish from local waters to be tested.

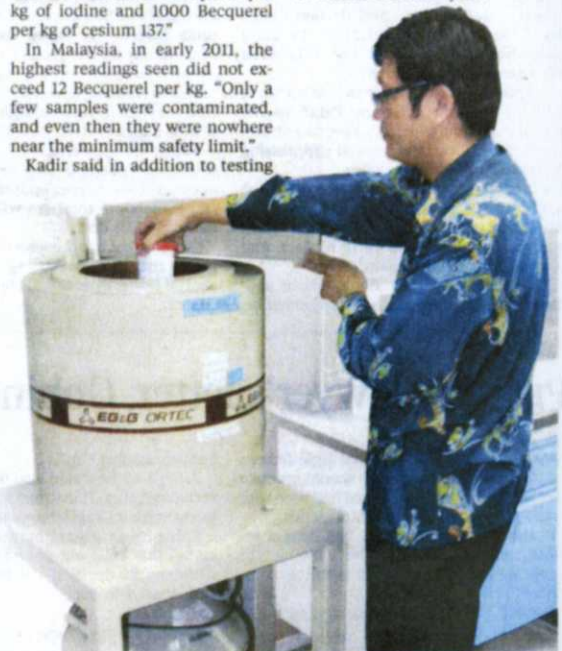
"We collected fish from Sabah and the peninsula and none of them was contaminated."

Among the species tested include ikan kembung, rays, squid and prawn. The food is analysed, first by drying it, then tested for radioactivity.

The increase of radioactive nuclides in the body raises the risk of cancer, said Yii. The more exposure that you are exposed to, the higher the risk.

Nuclear workers at MNA, for example, have a limit of 20 millisievert of exposure in a year.

"Meanwhile, civilians are limited to 1 millisievert in a year."



Yii Mei Wo says there are controls in place to ensure food was monitored for contamination

Moulding a Malaysian laureate of global stature

In 1998, then Prime Minister Tun Dr Mahathir Mohamad threw the gauntlet to the Malaysian scientific community to strive for scientific excellence and produce a Nobel Laureate by 2020. With six years to go, are we on track to meet the challenge?

Stories and photos by
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AIMING to be a Nobel winner calls for a lot of patience and perseverance.

It is another form of entrepreneurship where not unlike the business entrepreneur, you must be willing to take risks and you must be ready to fail. Academy of Sciences Malaysia (ASM) chief executive officer Dr Ahmad Ibrahim explained.

He added that while we have some scientific talents, many have left to work overseas where the research environment is more conducive, especially in basic and fundamental research.

"We tend to give more emphasis to applied research here because of the urgency to create wealth from science rather than to really contribute towards the advancement of scientific knowledge," he said.

"This will change as the country moves towards a developed country status. By then we should be able to fund more long-term basic science than the short-term science just to create wealth."

Welcoming former premier Tun Dr Mahathir Mohamad's challenge for the nation to produce a Nobel winner by 2020, Dr Ahmad pointed out that realistically, we have less than seven years to make it.

Setting the mark

"So far we have not seen any promising Nobel research but at least by setting the challenge, scientists have been alerted to their mission," he said.

"This is a good start. If we look at past winners of the Nobel prize, all took many years of scientific research before they eventually made the kind of breakthrough deserving of such a prestigious award.

"With the exposure to Nobel meetings that the academy has been



Imagine this: Goggles that show you what it feels like to have various visual impairments at the Tom Tits Experiment.

sponsoring, scientists will hopefully continue to harbour the ambition and dream to strive for the award," he added.

The ASM also organises the annual National Science Challenge (NSC) - a much anticipated event among students.

The NSC is meant to cultivate a culture of competition among science students.

The competition was based on a quiz format. But last year, a week-long hands-on competition in a research laboratory setting at a local university was introduced at the semi final stage.

The reward which was won by three fifth formers from Kolej

Yayasan Saad Melaka, was a trip to witness the Nobel Prize giving ceremony in Stockholm, Sweden as well visits to the Nobel Museum and some science centres in the country.

"The idea of the reward is to make the NSC as prestigious as possible and to fire up the interest in science among students. We want to inspire them to pursue science as a profession and aspire to one day be a Nobel Laureate," said Dr Ahmad.

Apart from the NSC, the academy has sent young scientists to the Lindau programme in Germany which also brings together many Nobel Laureates.

It has also brought a number of Nobel winners to Malaysia to give

presentations and talks to young scientists here.

The Nobel recognition is often bestowed upon scientists who contribute to the advancement of scientific knowledge.

Malaysia must continue to expose our young scientists to the research culture of Nobel winners while simultaneously creating a motivating eco-system for the conduct of basic and fundamental research, he stressed, as Nobel prizes are given for breakthroughs made in the frontier science.

Prof Dr Yang Farina Abdul Aziz, who is a Fellow of the ASM and Malaysian Institute of Chemistry, said Malaysians already have the



Mind games: (clockwise) Muhammad Haq was one of the science centres' it



Prof Yang Farina says that Malaysia needs a strong research eco-system if it wants to produce Nobel Laureates.

right mindset and capability to produce Nobel Laureate-worthy research but still lack the necessary eco-system to pull it off.

"Facilities, equipment and a large team of post doctorate students to assist are crucial to support Nobel-type studies.

"We need to work towards creating a strong research eco-system if we want to realise the dream of producing a Nobel Laureate," said Prof Yang Farina, who is a senior professor of Inorganic Chemistry at Universiti Kebangsaan Malaysia.

