



On March 1, 1954, the most powerful nuclear device ever detonated by the United States set the sky above the Marshall Islands ablaze. In a second, Castle Bravo formed a fireball almost four and a half miles across. A minute later, a mushroom cloud 47,000 feet high and seven miles across had formed. It contaminated more than seven thousand square miles of the Pacific, including not only Bikini Atoll but also Rongelap, which had not been evacuated. Life in The Marshall Islands would never be the same.

The devastating affects of radiation sickness soon became apparent among the bewildered population, many of whom had gazed in awestruck terror as the sky was ripped apart and whose children had played in the white powder that rained down on them.

The defenseless people of the Marshall Islands were used as unwitting human guinea pigs for 67 nuclear blasts: they died by the score from thyroid and other cancers, gave birth to unspeakably deformed children and were displaced from their homelands - only to be intentionally subjected to further radiation when they were returned. And beyond this, survivors from Rongelap who were eventually relocated to Majuro and other atolls, lost not just their health, their homes and their livelihoods, but their entire way of life.

Almost sixty years on, and in spite of its natural beauty, the Republic of Marshall Islands (RMI) is still no paradise for the people who live there.



Jobs are few—work in the tuna loining plant, subsistence farming and handicrafts, for the most part, land is scarce and climate change puts the sea-level atolls in imminent danger of inundation. United States aid and lease payments for the use of Kwajalein Atoll as a military base are the mainstay of the country. The need for job creation and food security is acute, made more so by the looming end of the Compact of Free Association agreement with the U.S. in 2024, and with it, the financial aid that props up this remote island nation.

No one is more concerned for the future of RMI than the Hon. James Matayoshi. Since he was elected Mayor of Rongelap in 1994 at the age of 26, he has worked tirelessly to bring home the Rongelap diaspora and to improve the quality of life for all Marshallese. In late 2012, Mayor Matayoshi had an epiphany: he recognized that while the atolls provided little soil to grow food, what the Marshall islands do have in abundance is the ocean: he would farm that.

Feed at the foundation

Aquaculture is not a new idea in the Pacific Islands but development has too often been initiated without consideration of cost effective feeds. Consequently many promising ventures have failed to take off. This project has started with feed at the foundation.

Mayor Matayoshi put together a team that includes feeds consultant, Dr. Warren Dominy,



recently retired Director of Aquatic Feeds and Nutrition at Oceanic Institute, Hawai'i and Ryan Murashige, President and CEO Hukilau Foods Inc, Hawai'i, and Vice President of Hawaii Moi and Fish Company. Murashige, an expert in both moi hatchery and grow-out operations, had successfully produced the highly sought after Pacific Threadfin, which is known as moi in Hawaii, in submerged deep-ocean cages – the first of their kind in the United States.



Polydactylus sexfilis, *at kadu*, moi, Pacific threadfin—a sought after fish by any name—enjoy the first Marshallese made feed

Moi, which is also indigenous to the Marshall Islands, is known locally as *at kadu*. It seemed a good place to start.

Less than a year on, the project is making real strides. Moi are being raised successfully by Rongelap Local Government (RALGOV), in the first stage of what will become a major fish farming project, and a preliminary feed has been trialed.

“Development of a locally sourced and produced feed is key to the success of this project”, Matayoshi said.

“An important part of the feed produced was local fishmeal from Pan Pacific Food Company. We are fortunate to have fish byproducts that are readily available in RMI – and what could be better than recycling it into feed to raise locally famed fish to improve food security, sustainability and create jobs for the Marshallese people?” said Dr. Dominy.

Though well accepted by the fish, the feed that was trialed was a preliminary diet for the *at kadu* sea cage system. It is being analyzing to make sure all the nutrient requirements of the fish have been met. “Once we see the analysis we will fine-tune it to reduce cost, maximize health and growth”, Murashige said.

“In this initial feeding trial using the locally sourced ingredients, feed was made very basically—with a mixer and meat grinder - and was tested with the *at kadu* and with pigs. The animals ate all that was given to them”, Mayor Matayoshi said.

Significant progress has also been made in raising the fish. “With collaboration between Mayor James Matayoshi, Rongelap Local Government (RALGOV), and The College of Marshall Islands (CMI) Land Grant Facility in Arrak, Majuro, we were able to achieve a 17 per cent survival rate in the hatchery phase with purchased eggs”, Murashige said.

The success of the first hatchery run conducted by the Rongelap hatchery staff, who were trained and instructed by Murashige, holds promise for *at kadu* fry health and condition.

“Deformity of the gills is a key indicator of how the protocols were followed and understood during the hatchery phase”, Murashige said. “Impressively, gill deformities were less than five per cent”.

The fry from the hatchery went through the nursery phase with 98 percent survival. These fish were then transported to surface nursery cages in the lagoon for growout trials. “The fish are showing great potential in growth and survival thus far”, said Murashige.



Dr. Warren Dominy (left) and the Hon. James Matayoshi (right) discuss feed development

Just the beginning

As for future plans, broodstock are currently being maintained, collected and conditioned for egg production. A new hatchery/nursery research and production facility for *at kadu* and other targeted marine species is in the construction phase and discussions are in pro-

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gress to secure locations for 60 ft diameter surface cages.

The next step for feed will be the purchase of a feed manufacturing system to utilize local ingredient resources to produce higher volumes for the current production of *at kadu* and other species in the pipe line, as well as feeds to help the local swine and poultry farmers.

"This is just the beginning", Mayor Matayoshi told Aquafeed.com. "The dream is becoming reality and the dream is very big".

The team sees the Marshall Islands as a major center of fish and aquafeed production for the entire Pacific. Explaining the concept, Dr. Dominy said: "Visualize an atoll. It is in effect a gigantic natural sea cage. And in the Marshall Islands they have hundreds of them and they come in all sizes".

"What we plan to do is use this wonderful natural resource to create huge fish farms. It is really just a scaled-up version of the concept that Hawaiians and other Pacific people were using two thousand years ago with their fish ponds", Dominy explained.

"Right now, fishing vessels chase tuna and other high value fish all over the ocean, depleting wild stock, burning energy and catching other fish along with them", he said. "It is simply not sustainable; we know that can't go on the way it is". Aquaculture needs to step up development and production volume to meet the growing demand".

As the project scales up, it will require capital investment. "We are actively seeking grants and private investment to move this forward", Dr. Dominy said. "There is so much potential but we need to find the right partners: we have to do this right. This is not just about innovative aquaculture and aquafeed development, exciting and promising as that is, but for the very deserving people of these islands".



For more information about this project, please contact: [The Hon. James Matayoshi, RALGOV](#)

