

fresh

News from AVRDC – The World Vegetable Center



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Taste put to the test



I Han Du, summer student from Rutgers University, introduces seven bitter gourd dishes for sampling.

*A vegetable crop can be sown, grown, harvested, and marketed—but if people are unfamiliar with the produce or uncertain about how to prepare it, there's no guarantee it will actually be consumed. Taste is one sense that must be satisfied if a vegetable is to gain wide acceptance. Recent taste tests carried out by AVRDC – The World Vegetable Center aimed to collect data on the palatability of **bitter gourd** and **vegetable soybean**, two nutritious vegetables that are well-known and sought after in some parts of the world, and unknown in others.*

Biting into bitter gourd

Here's a tall order for a nutrition intern: Take a bitter-tasting vegetable and find ways to make it appealing for palates in...New Jersey, USA, where hot dogs and pizza are considered high cuisine.

During her month-long internship at Center headquarters in Taiwan, **I Han Du** of Rutgers University has been

collecting and developing nutritious **bitter gourd** (*Momordica charantia*) recipes she hopes to introduce in New Jersey—and beyond.

To test the recipes I Han invited 25 AVRDC staff and family members from the US, Canada, Taiwan, India, Ireland, Germany and Nigeria to the AVRDC cafeteria on 3 August 2011



(l): Young evaluators rank the dishes. (r): Jen Wen Luoh, Community Nutrition (standing), explains the ranking system to tester Mythili Nagaraj.

to sample seven dishes incorporating bitter gourd: chicken soup, two salads (one pickled, one with mango), pizza, curry, spiced yogurt, and a guava-pineapple-bitter gourd juice. Participants ranked each dish on a scale of 1 to 5 (with 1 being “Dislike Very Much” to 5, “Like Very Much”), offered comments and suggestions to improve the recipes, and indicated whether or not they would recommend the dish to family and friends.

Pizza was the most promising recipe, followed by a tie between the juice and the pickled bitter

gourd salad. Many tasters noted (with relief) that the bitter gourd wasn’t nearly as bitter as they had expected. That’s not a surprise: The many varieties of *M. charantia* display significant variation in shape, size, and level of bitterness.

Compounds in bitter gourd can help type 2 diabetics control blood glucose levels. Diabetics living in areas where medication is unavailable or unaffordable may find bitter gourd helpful in managing the disease; with improved, tasty recipes, it will be that much easier to make the “medicine” go down.

The Center is leading a three-year multidisciplinary, multinational collaborative project funded by the Federal Ministry for Economic Cooperation and Development (BMZ), Germany to optimize the content of antidiabetic compounds in bitter gourd and determine appropriate food processing methods and consumption guidelines. The research aims to improve the incomes and health of the poor in developing countries, particularly the quality of life of diabetics.

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(l to r): Top palate-pleasers: bitter gourd pizza, pickled salad, and guava-pineapple-bitter gourd juice.

Savoring soybeans



A recent taste-testing of **new vegetable soybean lines** confirmed the growing popularity of the crop in India among both rural and urban consumers.

Soybean is India's most commonly grown legume, but vegetable soybeans are virtually unknown, and provide a whole new market opportunity for soybean growers.

Run by AVRDC World Food Prize intern **Izzy Esler**, the taste testing in the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) canteen in Hyderabad put five new lines of the crop before the discerning palates of local staff. Lines with the new basmati rice flavor proved particularly popular.

Vegetable soybeans have much larger and sweeter seeds than commodity soybeans. They're commonly consumed green as a snack food, and are particularly high in protein and vitamins A and C.

China and Japan have been the main global markets for the crop in the past. Taiwan has been a major supplier of frozen pods to the Japanese market, where it is known as *edamame* and trades for around five times the price of commodity soybeans.

Only one variety introduced from AVRDC has been released in India, and farmers in the northeast are eagerly adopting it. In the state of Jharkhand, 3400 farmers grew the crop last year, and this year 50,000 want to grow it, but demand far outstrips the available seed supply.

Indian farmers also are finding new ways to use the crop. In addition to harvesting it green and shelling pods like green peas, the crop is also being allowed to dry and seed is then cooked like other legumes in *dhal*, a traditional legume porridge.

Previous introductions of vegetable soybean into India met with less



A taste test run by AVRDC World Food Prize intern **Izzy Esler** (top right) in the ICRISAT canteen, Hyderabad, India.

Inset: Known as *edamame* in Japan, vegetable soybeans are becoming more popular in India.

enthusiastic response, but high legume prices have increased demand, and testing in diverse communities has shown that vegetable soybean has a bright future.

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“Meatless Monday” campaign launched in the Philippines



(l to r): Robert Holmer, Nona D. Andaya-Castillo and Custer Deocarís give Meatless Monday a try.

More than 25.7 million students in the Philippines will get a healthy start to the week as the country joins the global “Meatless Monday” (*Luntiang Lunes*) movement.

School cafeterias across the nation will be approached to serve vegetarian meals featuring indigenous vegetables and brown rice on Mondays in an effort to improve diets and mitigate climate change by reducing carbon footprints from livestock.

Nongovernmental health and environmental organizations and **AVRDC - World Vegetable Center East and Southeast Asia** will work with **Custer Deocarís** of the Department of Science and Technology to promote healthy food choices for *Luntiang Lunes*. Deocarís is an award-winning neuroscientist and gerontologist with expertise in stem cell technology.

The “Meatless Monday” campaign began in 2003, when the Johns Hopkins and Columbia University Schools of Public Health in the USA encouraged people to cut their milk and dairy consumption by at least 15% to mitigate the impact of global warming and reduce the prevalence of cardiovascular diseases.

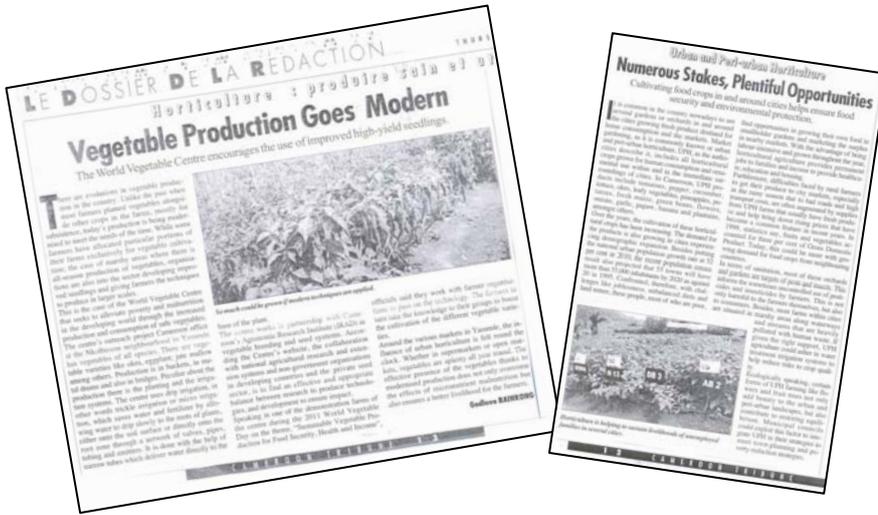
Meatless Monday

<http://www.meatlessmonday.com/>

Consumption of red meat associated with increased risk of type 2 diabetes, *American Journal of Clinical Nutrition*:

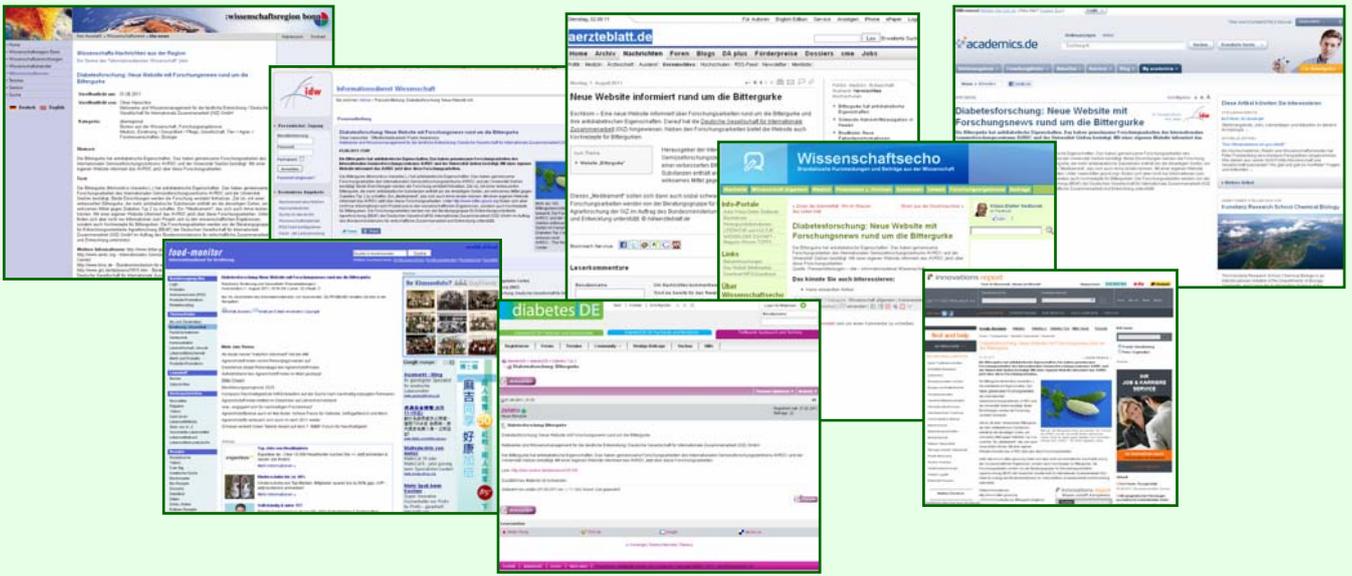
<http://www.ajcn.org/content/early/2011/08/10/ajcn.111.018978.abstract>

The Center in the news



The Center's work in introducing new vegetable production methods and improved indigenous vegetable varieties to Africa was noted in the **Cameroon Tribune**.

The Center's new **bitter gourd website** (<http://www.bitter-gourd.org>) received wide coverage in Germany, thanks to the efforts of project funder **BMZ**.



Vegetables have a beauty all their own. **Shiu-luan Lu**, AVRDC's Visitor Coordinator, was featured in *China Daily News Taiwan* for the attractive floral displays and corsages she made from broccoli for a recent field day. Shiu-luan's artistry in combining vegetables, fruit, flowers and greenery is often on display during events at Center headquarters.



Welcome



Triwidodo Arwiyanto, a visiting scientist from the Department of Crop Protection, Faculty of Agriculture, Gadjah Mada University, Indonesia, arrived at AVRDC headquarters on 31 July 2011 for three months of study. Dr. Triwidodo will conduct research on “Using biochar as an activator to promote the growth of beneficial indigenous microbes” under the supervision of Jaw-Fen Wang in Bacteriology.

On the air



Takemore Chagomoka, Seed Marketing Specialist in Cameroon, was interviewed for Cameroon Radio and Television’s national radio program “Farmers’ Friend” on Monday 25 July 2011. Listen to the interview on the AVRDC website: <http://www.avrdc.org/index.php?id=496>

Visitors

Yong-song Kang, Chief Coordinator of the Strait Agricultural Network, Fujian Province, People’s Republic of China, and a group of 14 researchers from the **China Society for Agricultural Sciences** toured the Center on August 3 and 4, respectively. The visitors received a briefing from Shiu-luan Lu and were guided through the Demonstration Garden by Deng-lin Wu and Yu-hsia Huang.



Indigenous vegetables you should know

The foliage and stalks of Ashitaba (*Angelica keiskei*) are high in folic acid and contain vitamin B₁₂, a nutrient normally not found in terrestrial plants. Both are important for the production of red blood cells. AVRDC conserves a collection of more than 10,000 indigenous vegetable species—plants with the potential to improve diets, health and livelihoods around the world.

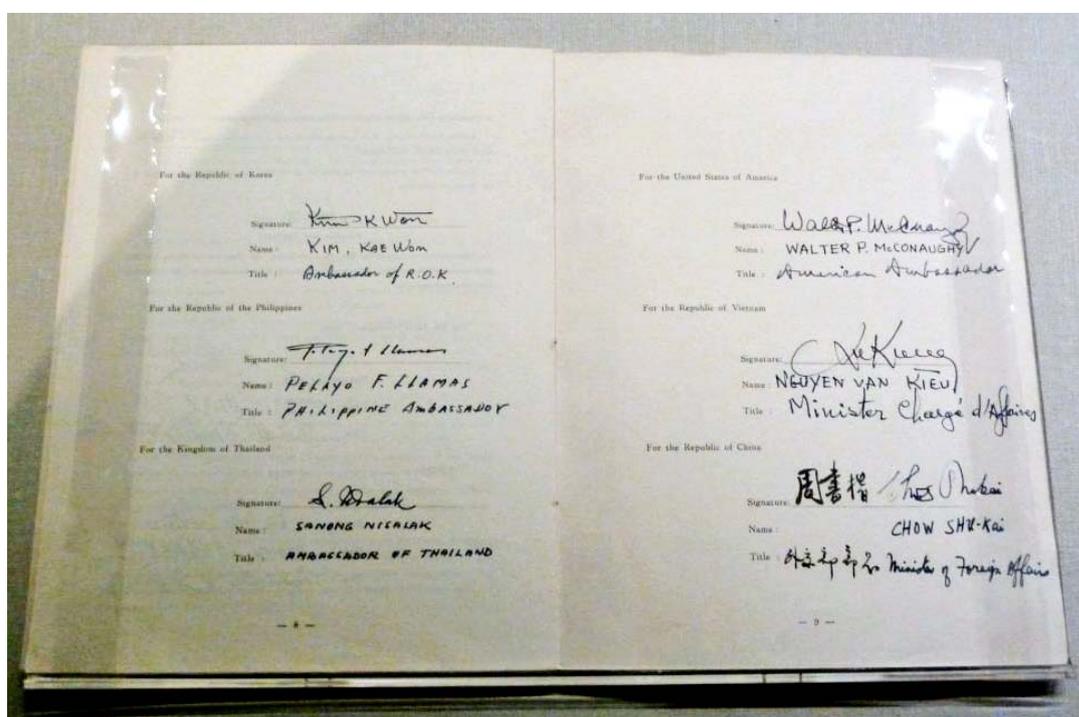
40 years of service to tropical agriculture



Four decades ago, a research and development institute dedicated to alleviating poverty and malnutrition in Asia by increasing the supply and quality of vegetables was established in Taiwan. Today, AVRDC – The World Vegetable Center operates on a global scale across Asia, Africa, and Oceania. In future issues of Fresh we will track the Center’s long and fruitful history through photos.

During a recent visit to Taiwan’s renowned National Palace Museum in Taipei as a guest of the Ministry of Foreign Affairs (MOFA), AVRDC Director General Dyno Keatinge had the opportunity to view the original **Charter and Memorandum of Understanding** establishing the Asian Vegetable Research and Development Center. The historic documents drawn from MOFA’s diplomatic archives were included in a display commemorating the 100th anniversary of the founding of the Republic of China in 1911. Dr. Keatinge noted the Center would

continue its efforts to bring prosperity to the poor and health for all—the declared intention of the Charter’s signatories 40 years ago.



inside insight

Stone Age diets for better health?

The benefits of a “Paleolithic approach” to food consumption—a diet consisting of fruit, vegetables, nuts, lean meat and fish—have been established through observation and experimental evidence. Diets rich in plant-based foods are strongly associated with reduced risks of major chronic diseases, but the constituents in plants that promote health have proved difficult to identify with certainty. This, in turn, has confounded the precision of dietary recommendations.



AVRDC's high beta-carotene tomato

In a recent article in *The Plant Cell*, authors Cathie Martin, Eugenio Butelli, Katia Petroni, and Chiara Tonelli note that unhealthy eating underlies much of the increase in mortality from chronic diseases occurring worldwide. They describe nine ways **plant research** can contribute to understanding the relationship between diet and health, and reducing chronic disease:

- Identification of nutritional factors in plant-based foods
- Measurement of phytonutrients in plant-based foods
- Assessment of the impact of individual phytonutrients on disease
- Establishment of toxicity and dose–response curves for phytonutrients on a food-based scale
- Comparative assays of health-promoting effects of different phytonutrients
- Assays of the impact of the food matrix on the ability of

phytonutrients to promote health

- Identification of the mechanisms of action of phytonutrients in reducing chronic disease
- Investigation of the effects of phytonutrients on different diseases
- Investigation of the effects of combinations of phytonutrients on health

Research at AVRDC – The World Vegetable Center actively engages these topics to help extend the base of practical nutritional knowledge. The Center's current research projects on the **antidiabetic compounds in bitter melon** and the **anti- and pro-inflammation characteristics of indigenous vegetables** including onion, roselle, nightshades, and *Moringa* complement previous work in breeding high beta-carotene tomatoes and enhancing the nutritional quality of mungbean. Based on strong research, more confident recommendations can be

made to improve diets through vegetable consumption.

Martin C, Butelli E, Petroni K, Tonelli C. 2011. How Can Research on Plants Contribute to Promoting Human Health? *Plant Cell* DOI 10.1105/tpc.111.083279

To compile and distribute the latest research on nutrition, the World Health Organization has opened **e-LENA**, the electronic **Library of Evidence for Nutrition Actions**. This new web-based library consolidates and centralizes the latest evidence-informed guidelines, data and resources for nutrition policymakers and organizations developing nutritional interventions.

e-LENA

www.who.int/elena