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HARVESTING the products of INNOVATION



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This publication contains articles on the latest technologies, research results, updates, and breakthroughs in agriculture and fisheries R&D based from the studies and researches conducted by the National Research & Development System for Agriculture and Fisheries (NaRDSAF).

BAR R&D Digest welcomes comments and suggestions from readers.

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HARVESTING the products of INNOVATION

by DR. NICOMEDES P. ELEAZAR, CESO IV

There must be something innate in the Filipino that makes them constantly look for ways to make the most out of the things in their surroundings which can have surprising results. “*Sadyang malikhain,*” we may describe ourselves since we have the talent to transform basic things into wonderful creations.

The early inhabitants of our islands were great improvisers. Our ancestors made do with bamboo, palms, and grasses in building their abodes. Tools, utensils, furniture, and weapons were made from hardwoods, coconut, rattan, and other plants from the forest. For food, coconuts, rice, and roots were turned into a variety of preparations that we still see today, so were various wild endemic plants that continue to be useful as vegetables and as herbal medicine.

This creativity continues to this day. Improved education and the increased availability of information on new processes have led to burst of inventiveness with agriculture a fertile ground for fresh ideas. The farm and the products of agriculture are now undergoing “re-visioning” with farming regarded as a business enterprise.

New agricultural products are being created or developed. Either something is removed or added to an existing product to make it better. Or a new process has led to a new product. In some instances, an original creation may have been transformed into something completely different.

Under skillful hands, old products are repurposed or resurrected into better forms. Previously ignored materials such as waste find new life with new uses. The problem of excess production of agricultural commodities has urged entrepreneurs to develop alternate products which often lead to new product lines.

Innovation has many aspects and Bureau of Agricultural Research (BAR), through its banner programs, the Community-based Participatory Agricultural Research (CPAR) and the National Technology

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We live in a fast-changing world. Consumers are always on the lookout for something that is both inventive and creative.

Every now and then, a new product comes out in the market. It may not even be a new idea but a product that was given a twist, whether in packaging or in marketing, that immediately spurs the curiosity of potential buyers. This behavior is also elicited when developing products from research. Products that the public may have heard of before but if given a new spin can cater to a special clientele.

This has been the case for a breakfast cereal made from a totally unheard of rice-like crop called “*adlay*” which is cheaper

terms of sensory evaluation, i.e., sight, taste, smell, touch, and good packaging and labeling,” explained Dr. Nicomedes P. Eleazar, director of BAR.

On the need to make Philippine R&D products competitive, Rep. Evelina G. Escudero of the first district of Sorsogon, who is a frequent visitor of the NTF, said that, “the reality of global competition is here. Local goods need to compete with those from abroad which are often being sold at much cheaper prices. We also need to advertise our own products so that more people will know that better production technologies are already available and that all of these products are the results of research.”

of DA-RFO 2 in 2014.

Innovation in R&D products

Instant porridge, breakfast cereals, prunes, preserved fruit, wine, coffee, cookies, health products — one would easily find them in the mainstream market, so why develop the same thing?

By definition, “innovation” means introducing something that is new - either an idea, method or a device. Product development is always innovative with the innovative product offering something new that is more than its well-known use or original purpose.

Introducing a breakfast cereal made from a previously unheard of crop like “*adlay*” has spurred interest among

CROSSING THE CHASM:

R&D products find their way to the mainstream market

BY RITA T. DELA CRUZ

and even more nutritious than the established brands you often see in the groceries or supermarkets.

The emergence of products like breakfast “*adlay*” has prompted the Bureau of Agricultural Research (BAR) to establish and institutionalize the awarding of the “Most Innovative Product” during the conduct of the Agriculture and Fisheries Technology Forum and Product Exhibition (NTF) that is held every August. The purpose of giving the award is to encourage researchers to develop products from R&D that are either new, unique, or creative.

“The product has to have market potential, of course. If it is food, it must subscribe to the consumer’s preference in

The award was first given in 2011 during the 7th NTF and was then referred to as “Best Unique/New Product”. The main purpose was to recognize new product entries which have potential in the mainstream market. Among the past winners were: garlic pickles of DA-RFO 1, goat’s milk of DA-RFO 3, *adlay* products of RFO 4A, pili oil of DA-RFO 5, and bee products of the UPLB Bee Program. Since then, the award has become one of the anticipated activity during the NTF, a yearly event that showcases new and innovative products developed from R&D. Recent winners included turmeric product lines of GRO, Inc/DA-RFO 4A in 2012; *adlay* breakfast cereal of DA-RFO 10 in 2013; and Gourmix

the curious public. “*Adlay*” and rice belong to the same species and so have a lot of similarities. Many farmers grow *adlay* as their staple crop for it has good eating quality, and is cooked and served steamed just like rice. As food ingredient, what you can do with rice, you can also do with *adlay*. As a crop, *adlay* is easier to grow; as a food ingredient, *adlay* is more nutritious.

So what makes *adlay* breakfast cereal “innovative” compared to the commercially-available breakfast cereal? There is no point in introducing another breakfast cereal when the market already has tons of them. The answer: it’s made naturally from *adlay* grain - 80 percent of the whole product.

It has low glycemic index. Its grits can be made into flakes which have better characteristics as compared to commercially available corn flakes. Most of all, it is cheaper. A 45-gram pack of adlay breakfast cereal costs 12 pesos only.

Another innovative product from research is the instant porridge called “GOURmix”. Essentially, it is a mix of instant healthy food, but it’s better than “lugaw” both in nutrition and taste. It is a combination of locally-produced cereals, grains and grits (milled



rice, white corn grits, adlay grits) enriched with malunggay powder, soybean Texturized Vegetable Protein (TVP), ground mungbean, and yellow ginger (turmeric). It is a complete and smart food being high in protein and antioxidant content that has no exact equivalent and is superior to those presently available in the mainstream market.

How about wine from kamote (sweet potato)? Kamote products have come a long way from its “low tech” beginnings being a famous ingredient for kamote-cue and kamote fries sold in street corners. Now, this seemingly lowly rootcrop has found its way into the high-end market as from it can be made

the “wine of the future”. It is now being aimed as a wine that is at par with imported ones. The sweet potatoes are naturally processed and fermented to produce two varieties of wine – Classic Dry and Fruit Blend, both of which have 13.6 percent alcohol content.

Another product from research that you might not have heard of is rimas ice cream. It’s not the usual flavor for ice



cream but is something that one must try before judging. A very common fruit that is usually just found in home backyards, rimas is an inexpensive fruit that is popular and abundant in Bicol. Rimas ice cream is made up of 80 percent rimas meat and comes in many variants: rimas with sweet potato, vanilla, cheese, chocolate, or langka, and even with siling labuyo.

Support to commercialization

While developing products that will click with the public is hard enough to achieve, making it commercially available becomes an additional challenge to those who want to venture into the bigger market. Thus,

to assist the industry, BAR has prioritized the commercialization of appropriate technologies from research through its National Technology Commercialization Program (NTCP).

“To close the gap between R&D and commercialization, BAR implements this program to facilitate the commercialization of newly developed technologies



and their use in the industry. Technologies are strategically placed and transferred to areas and communities that need them the most,” stressed Dr. Eleazar.

The NTCP highlights research breakthroughs and mature technologies generated and developed by partner R&D institutions and makes use of various modes such as seminars, industry-research encounters, agribusiness assistance, and the NTF. It serves as a vital tool for the development of enterprises and the improvement of agriculture and fisheries-related industries anchored on appropriate activities emphasizing technology transfer, promotion, adoption, utilization, and commercialization. ###

GOUR

BY DARYL LOU A. BATTAD

Filipinos are naturally drawn to instant food. This is manifested by the profuse availability of instant food in the market—instant noodles, 3-in-1 instant coffee, instant fruit juice, instant carbonara, instant sisig, and the list goes on.

In a cultural context, Filipinos have crafted a kind of environment where practicality, convenience, and affordability come along with the kind of food we eat. Sociologists attributed this phenomenon mainly to the country's relentless issue on poverty.

More often than not, instant foods fall under the category of unhealthy food, in which the old folks would never recommend as part of a sound diet.

But not if it is Gourmix.

The rise of the healthy, instant food

Gourmix comes from two words 'gour' (from the word gourmet, which is defined as food of very high quality) and 'mix' because it is a mixture of locally-produced cereals, grains and grits (milled rice, white corn grits, *adlay* grits) and enriched with malunggay powder, soybean Texturized Vegetable Protein (TVP), ground mungbean, and yellow ginger turmeric. This instant mix is a complete and smart food being high in protein and anti-oxidant content, and is composed of 53 percent carbohydrates, 22.3 percent crude protein, 5.62 percent total fat, 10.32 percent moisture, and 7.96 percent ash.

Ms. Rose Mary G. Aquino of the DA-Cagayan Valley Research Center (CVRC) in Ilagan, Isabela conceptualized Gourmix, as a product of goodwill and compassion. It started



MIX 8

Defying the unhealthy notion in instant food

during the time when Ms. Aquino assisted the typhoon Yolanda victims in Tacloban City early in 2014 through the promotion of soybean production and processing. During the Soybean Techno-Demo field day, she was among those who volunteered

in the distribution of the US Manna Rice Pack, a relief good for starving children acquired by a group of clergy led by Sister Eloisa David. During one of their operations, Sister Eloisa challenged Ms. Aquino, being a legume expert that she is, to

develop a local version of the US Manna Rice Pack.

“Why not develop our own, right? Something that is very close to the Filipinos, something that is more familiar to them,” Ms. Aquino recounted. It was from this challenge that Gourmix was

Packed with too much goodness

The team of researchers from DA-CVRC selected the combination of ingredients for Gourmix, those which are locally, abundantly, freshly, and continuously being produced by the farmers in Cagayan Valley—not to mention the nutritional benefits they contain.

Gourmix is the next-best-thing in the instant-food domain. Among the ingredients in this complete and smart food include: rice, white corn grits, *adlay* grits, TVP soybean, ground mungbean, malunggay powder, and turmeric ginger.

Rice. It is our main staple. Pinoys are widely-known as rice-eaters. A day can't go by without having rice in every meal. It will therefore comfort us to know that a pack of Gourmix has rice as part of its main ingredients. Rice has attributes which are beneficial to our health. It provides fast and instant energy; regulates and improves bowel movement; stabilizes blood sugar levels; and provides essential source of Vitamin B1 to the human body.

White corn grits. This crop is as widely-known as rice and is now considered as one of the major food staples in the country. White corn is identified to have low glycemic index, thus helps in preventing diabetes. It also aids in alleviating digestive problems such as constipation and hemorrhoids, as well as lowering the risk of colon cancer.

Adlay grits. This rice-like crop is getting a fair share of recognition these days because of government efforts in the adaption and promotion of this high-value crop. *Adlay* is an indigenous crop mostly found in the regions of Cagayan and Zamboanga. It is an excellent source of lipids, amino acids, thiamine or Vitamin B-complex, iron, calcium, has anti-oxidants, and is high in carbohydrates.

TVP Soybean. It is a defatted soy flour product, which is often used as a meat substitute or extender. Soybean is an excellent health food, being prescribed by the US Food and Drug Administration (FDA) as a food medicine. It is the most inexpensive plant-based protein source that includes 40-45 percent protein. It contains isoflavones that has anti-oxidant properties which has an important role in preventing degenerative diseases such as cancer and cardiovascular diseases. Moreover, it contains *lunasin*, a peptide found in small quantities of soybean seeds that blocks cell division, keeping cancer-related genes switched off.

Ground mungbean. Known to be rich in Vitamin C, protein and minerals, ground mungbean is a must-eat vegetable.

Malunggay powder. Scientists and health workers from around the world call *malunggay* a “miracle tree” or “nature’s medicine cabinet,” as it is loaded with vitamins and minerals that give effective remedy against any kind of ailments. It also strengthens the immune system, eye muscles; helps relax and promotes good sleep; and has phytochemicals that inhibit the growth of cancer cells.

Turmeric ginger. Studies show that extracts from turmeric have been found to inhibit the growth of cancer cells, and helps reduce symptoms of indigestion, such as bloating and gas.



water, bring to boil, then add content of package. Stir, cover, and cook over low heat for 10-15 minutes then voila! A healthy yet simple dish that serves 5-6 persons per 250-gram pack. It costs less time and less money too, because it is very affordable at Php 20.00/ pack.

Future plans

Gourmix bagged first place in the “Best Innovative Product” award in this year’s Agriculture and Fisheries National Technology Forum and Product Exhibition (NTF) organized by the Bureau of Agricultural Research (BAR). It captured the hearts of the judges because of its noble intent as it targets poorly-nourished children, currently supporting

the feeding program of the Department of Social Welfare and Development (DSWD) and the Department of Education (DepED) particularly in their needs for highly nutritious food. It is also an ideal relief food in times of

conceptualized.

Preparing Gourmix

Preparing this nutritious instant *lugaw* is simple and easy. Just sauté garlic, add two liters of

calamities.

The research team behind Gourmix was awarded a research grant for technology commercialization as part of their prize, and according to Ms. Aquino, the project will then focus on the improvement of product packaging and labeling, trademark application, and registration through the Intellectual Property Office of the Philippines (IPOPHL) and the Intellectual Property Rights Office (IPRO) of BAR, and product promotion and marketing.

As the existing food war between healthy and unhealthy foods continues to rise, an advocacy such as this somehow aims to challenge the eating habits of what we call the “generation of instant,” making the unhealthy foods less appealing, redirecting Pinoy to a more nutritious and healthier food options. ###

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The CVRC bags the grand prize for the category “Best Innovative Product” for their product Gourmix during the 10th NTF.

Cashew apples turn into prunes

BY PATRICK RAYMUND A. LESACA

Cashew (*Anacardium occidentale* L.) or “kasoy” in the local language is a widely-grown fruit in the Philippines mainly for its nuts. In fact, the nut is considered to be the most important product from cashew, putting the fruits (cashew apple) to waste. Palawan, considered as the cashew capital of the country, is supplying 90 percent of the nut requirement.

Due to the high astringency of cashew apples, they are seldom eaten fresh, thus completely neglected. In a farm that commercializes cashew nuts, cashew apples go to waste, until the idea of turning them into prunes came into the scene.

Organic Facts (2014) cited that cashew apples possess anti-bacterial properties and have been proven to be effective in treating stomach ulcers and gastritis, which is usually caused by *H. pylori* bacteria. Its juice is rich in vitamin C and has an anti-scurvy effect.

Although Palawan leads the production of cashew, many farmers are still facing problems of low income and productivity. Among the identified factors were inferior quality of processed kernels (cashew fruit seed) and unutilized cashew apples. Very little activity is being done in the processing of cashew apples in terms of value-adding. Since





the nut is only 10 percent of the total average weight of the fruit, around 90 percent goes to waste.

To address this concern, the Bureau of Agricultural Research (BAR) collaborates with the DA-Palawan Agricultural Experiment Station (PAES) - Research Outreach Station (ROS) in Puerto Princesa, Palawan, to conduct research on cashew and explore the versatility of cashew apples to process them into prunes.

Essentially, a prune is any of various plum cultivars preserved by drying, having a black and wrinkled appearance. They are also rich in vitamins and minerals. For the case of cashew, its apples are processed to make them the local version of prunes.

The prune is made from the pulp of cashew after the juice has been extracted. It is cooked in syrup together with other additives to give a plummy delicacy, brownish-black in color with sour taste. In terms of health benefits, the cashew prune is also rich in vitamins A and C, and high in fiber. It can be eaten as a snack food, dessert or used as ingredients in

baked products. Cashew prunes is not sour as compared with other typical prunes and its natural cashew flavor is prominent in its prune form. It can also be a good substitute for raisins.

In early centuries, cashew apples were eaten by the Westerns to treat various ailments such as fever, dysentery, diarrhea, and warts. Recent medical studies also revealed that cashew apple has anti-microbial, as well as good

source of probiotics.

Aside from product development, future R&D plans of DA-PAES on cashew will concentrate on Good Manufacturing Practice (GMP) and BFAD/Halal registration.

“Cashew prune is not that popular yet compared with the typical plum prunes, but with more promotional assistance and further product improvement in terms of packaging and labeling, we can put cashew prunes at par with our commercial prunes. In fact, our products are for sale and are being displayed already in the Pasalubong Centers within the city,” said Ms. Librada L.

Fuertes, chief of the Research and Development Section of PAES-ROS and project leader.

The cashew prune initiative is part of the project, “Technology Commercialization of Cashew-based Products/Agribased Enterprise Development,” which aimed to introduce and promote other cashew value-adding activities that can be developed and at the same time generate viable agribusiness enterprise for the cashew



municipalities in Palawan.

Cashew product diversification in terms of value-adding is seen to boost the farmers' incomes and benefit local farmers.

According to Ms. Fuertes, farmers are now selling the cashew apple at P11.00 per kilo, which is not bad for something not valued before. With the value-adding technologies developed, the apple extracts are also being used as raw materials for making cashew juice, cashew wine, and cashew soap. The soap from cashew is still in its research

stage. If it progresses, the cashew soap will be the first of its kind. "Through the project, we were able to successfully process about 220 kilos of cashew prunes, which is now being sold at Php35.00 per 300 gram pack," Ms. Fuertes concluded.

The cashew prunes won second place as the "Most Innovative Product" during the "10th Agriculture and Fisheries Technology Forum and Product Exhibition" held in August 2014 at the SM Megamall. ###

Reference:

Organic Facts. (2014). Health Benefits of Cashews. Bangalore, India: Organic Information Services Pvt Ltd., Bangalor, India. Retrieved from: <https://www.organicfacts.net/health-benefits/seed-and-nut/health-benefits-of-cashews.html>

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The DA-PAES wins second place for the category "Best Innovative Product" for their Cashew prunes during the 10th NTF.

Harvesting the...from page 3

Commercialization Program (NTCP), takes into account its "social and organizational dimensions" that are key to the success of innovative agricultural products. With this outlook, R&D is not just a mere producer of technology but, rather, considers the farmers and fishers' situation at the farm, community and market levels, and recognizes the importance of stakeholders being organized.

Since R&D is all about innovation, BAR continues to support the development of

new agricultural products and processes in a bid to enhance the productivity and income of farmers, fishers, and agricultural entrepreneurs. BAR is committed to further develop its traditional products and the rational use of the unexplored or overlooked agricultural resources. We have partnered with the business sector to transform product ideas into marketable realities for the benefit of our farming communities. We are certain that innovation will play a central role in shaping the agriculture of the future.

The third quarter issue of the BAR R&D Digest features nine innovative products of R&D, specifically those that won the "Best Innovative Products" during the last four Agriculture and Fisheries Technology Forum and Product Exhibition held since the award started in 2011 until the present. The nine featured innovative products include: 1) gourmix, 2) cashew prunes, 3) pigeonpea products, 4) *adlay* breakfast cereal, 5) vacuum-fried jackfruit, 6) rimas ice cream, 7) arius wine, 8) turmeric products, and 9) sweet potato wine. ###



MAINSTREAMING PIGEONPEA FOOD PRODUCTS INTO MARKET

BY PATRICK RAYMUND A. LESACA

Pigeonpea (*Cajanus cajan*) is a leguminous crop that can easily be integrated in crop-based farming systems. It is locally known as “kadyos” and is considered a versatile crop due to its uses as food, feeds, forage, and medicine. It can thrive under poor soil conditions and in areas where

there is minimal annual rainfall. It is easy to grow and requires little capital investment, making it an excellent crop for farmers.

However, one of the major constraints of the pigeonpea industry is the unavailability of planting materials and the lack of awareness of farmers on the

various uses and food products that can be developed and produced from this leguminous crop.

To address the lack of planting materials, to explore the potential of the crop, and to upscale the pigeonpea, the Bureau of Agricultural Research (BAR) and the Central Bicol State University of Agriculture (CBSUA), through its Department of Food Science, have conducted a value-adding and product development project titled “Pigeonpea Research and Development Project”. The initiative is led by Dr. Fe B. Perlas, CBSUA research director. She mentioned how this continuing R&D effort was able to develop various pigeonpea products geared towards upscaling the multiple uses of pigeonpea.



As results of this R&D initiative, CBSUA was able to produce *kadyos*-based food products including cookies, polvoron, milk, pretzel, coffee, puto cake, *pandesal*, cake, sweetened and instant pigeonpea, tea, wine, *hopia*, *pancit* noodles, *tempeh* (fermented pigeonpea cake), porridge, and *kropeck*, among others.

The products underwent shelf-life testing and microbial analysis and appropriate packaging and labeling materials. All products have market potentials and technology transfer was well accepted. According to Ms. Melanie Abalayan, component researcher, the processed pigeonpea-based flour is good and can be used as substitute for wheat flour and other ingredients. Furthermore,

the Department of Food Science came up with pigeonpea product lines called “Verdant Fields”. The individual recipes and the step-by-step procedures are now available in the university, Ms. Abalayan added.

To improve its product lines, the university is pursuing further standardization processes like consumer acceptability, shelf-life stability, packaging, and marketability.

According to the proponents, they are also conducting series of cooking demonstrations to educate farmers and boost their appreciation on the versatility of pigeonpea since some of them are still not aware or lack information on how to plant and process the crop. “We are now producing various IEC materials and production guide on pigeonpea,” said Ms. Teresa Lirag, CBSUA researcher. “As of now, we are focus more into promotions and information dissemination and so we want to share to the farmers what our findings were so that they will become more interested in pigeonpea farming,” she added.

During the BAR-led 10th Agriculture and Fisheries Technology Forum and Product Exhibition held on 8-10 August 2014, CBSUA won the “3rd Best Innovative Products” for showcasing various product lines

made of pigeonpea. The products have been judged based on its uniqueness, good packaging, and high market potential. The search for best products was introduced in the forum to promote proudly Philippine made products developed by various R&D institutions from the government, private sector, and state universities and colleges.

As a result of CBSUA’s R&D output, the university’s future plan for pigeonpea’s extensive promotion is to widen the information dissemination among farmers, stakeholders, and other beneficiaries.

The product development and patent application are also being prioritized as well as the conduct of institutional activities like nutritional feeding to undernourished school children in Camarines Sur. Promotional and marketing activities has also been conducted in various municipalities through seminars and trainings as well as seed distribution to local farmers. ###

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The CBSUA gets third place for the category “Best Innovative Products” for their Pigeonpea products during the 10th NTF.



Filipinos love rice. Although breakfast cereals have been long introduced in the country as a healthy alternative to the usual *longganisa-sinangag-itlog* breakfast combo, many still prefer eating rice.

Essentially, breakfast cereal is a packaged food product made from processed grains. A ready-to-eat meal, it is eaten hot or cold, and is usually mixed with milk or water and is sometimes added with yogurt or fruits. The target market for breakfast cereal products are the health-conscious consumers. Hence, commercially-available breakfast cereals are either packaged as oat-based or high-fiber cereal and are often fortified with vitamins.

With support from the Bureau of Agricultural Research (BAR), a new product was recently developed by the Northern Mindanao Integrated Agricultural Research Center (NOMIARC), Department of Agriculture-Regional Field Office (DA-RFO) 10 to address both



Adlay: Healthy, all-Filipino breakfast cereal

BY RITA T. DELA CRUZ

the convenience of preparing breakfast meal and ensure its healthful benefits while still getting the “heavy on the stomach” feel of eating rice. Introducing “Adlay Breakfast Cereal” (ABC).

Developing the product

“Nowadays people are always in a hurry, so we developed a product that can answer their needs, minimizing their time to prepare their usual breakfast meal,” said Antonieta S. Tumapon, *adlay* project leader and researcher from DA-NOMIARC. She added that the ABC is easy to prepare, “just add hot water, 220 ml of water for every 45-gram pack of Adlay Breakfast Cereal.”

ABC was developed in 2013, three years after BAR was tasked by DA, through Secretary Proceso J. Alcala to look into the potential of *adlay* as a staple crop. From then on, a series of adaptability trials has been conducted nationwide, including Region 10, to assess the performance of the different varieties of *adlay*. Alongside these trials are the production of seeds and development of various

products from the *adlay*.

“ABC was first introduced into the public in August 2013 during the conduct of the 9th Agriculture and Fisheries Technology Forum and Product Exhibition” organized by BAR at SM Megamall, Mandaluyong City wherein it bagged the first prize for the “Best New Product Award,” explained Ms. Tumapon. Other awardees that year were jackfruit vacuum-fried (Region 8) and rimas ice cream (Region 5), winning second and third prizes, respectively.

Adlay resembles and tastes like rice

Adlay belongs to the family *Poaceae* or the grasses, the same family to which wheat, corn, and rice belong. It produces good yield in areas where rice and corn hardly grow like the highlands. Just like rice, farmers grow *adlay* as their staple crop for its good eating quality. It bears tear-shape grains which when matured are harvested, pounded, threshed, and winnowed, cooked and served steamed just like rice.

“Adlay looks and tastes like rice, only the grains are a bit

larger, *mas matagal magutom kapag kumakain kami ng adlay* [it takes time to feel hungry when we eat adlay],” said one of the locals from Malaybalay, Bukidnon who had been invited to try the cooked *adlay* grains. A common remark is that, “compared to rice, *adlay* takes a bit more time to cook due to the size of the grains.”

As a food source, *adlay* is as versatile as rice. It can be cooked and processed as main ingredient for favorite Filipino *kakanin* products including *maja blanca* and *sinukmani*, even *chamorado*, *polvoron*, and *turones de adlay* to name a few. It can also be an ingredient in soups and broths. The grains can be ground into flour and used to make breads, pastas, and porridge.

Nutritive value of ABC

“What makes *adlay* breakfast cereal different from the commercially-available breakfast cereal we have is that it’s made naturally using *adlay* grain as main ingredient which is 80 percent of the whole product,” shared Ms. Tumapon.





Left: The DA-NOMIARC bags the grand prize for the category “Best New Product” for their Adlay breakfast cereal during the 9th NTF.



Right: Cooking demonstration of Adlay breakfast cereal

According to experts, eating 100 grams per serving of *adlay*, one is less likely to feel hungry after awhile compared to eating rice or corn. This is because *adlay* has the highest food energy content (356 kcal) compared to corn, white rice or brown rice. It is also superior to its staple counterparts when it comes to carbohydrate content (73.9 g), protein (12.8 g), and fat (1.0 g). *Adlay* is also packed with other minerals including calcium (25 mg), phosphorus (43.5 mg), iron (5 mg), niacin (4.3 mg), thiamine (0.28 mg), and riboflavin (0.19 mg).

“In terms of its nutritive value, *adlay* breakfast cereal has low glycemic index. Its grits, which is the main ingredient in the ABC, are made into flakes and have better characteristics as compared to corn flakes, which is sold-commercially in the market,” Ms. Tumapon added.

Directions and future plans

“Aside from its healthful benefit, ABC is relatively cheaper.

A 45-gram pack of *adlay* breakfast cereal costs 12 pesos only,” Ms. Tumapon explained.

Although the product has the potential, she admitted that it’s not available in the market yet. “At the moment we can only make this available to the public through field days, trainings, project reviews and other activities wherein *adlay* is being promoted,” she said. However, the product is available at the NOMIARC’s Technology Commercialization Center (TCC) in Malaybalay, Bukidnon.

When asked on how the public is taking the product, Ms. Tumapon said that it’s being taken well considering its sensory attributes, taste and nutrient content, and uniqueness of *adlay* as a staple food crop.

“We are still facilitating and waiting for its Nutrition Facts from DOST. From there, we can proceed to its mass production and develop a good strategy for packaging and labeling to better promote it to the public,” she said.

The group of Ms. Tumapon intensifies their promotional strategy through the conduct of various activities that will make ABC known more to the public. In fact, she revealed that they are planning to bring ABC to malls like Gaisano, a shopping mall chain in the Philippines, owned by a Cebu-based prominent family. “Our plan is to eventually bring *adlay* breakfast cereals to the mainstream market including grocery stores and supermarkets,” she concluded.

Aside from the *Adlay* Breakfast Cereals, NOMIARC has developed other *adlay*-based products including wine, coffee, polvoron, and even beauty soap. Currently, they are developing their latest product line, which is the *adlay* crunchy bar. ###

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Turning JACKFRUIT into a healthy snack

BY MA. ELOISA H. AQUINO

You can eat and enjoy your good ol' jackfruit without the hassle of gumming your fingers on the sticky latex oozing out from its spiked skin.

The Visayas State University (VSU) developed a value-adding technology to jackfruit by turning into a snack and putting a twist to the traditional way of eating fresh jackfruit.





Commercially known as “Baybay Delights,” the snack is composed of vacuum-fried and dehydrated jackfruit pulp that is synonymous to commercially available chips but more nutritious. The best thing about it is that even though the jackfruit pulps were processed and underwent dehydration, it has retained its natural smell, color, and sweetness. This is because the pulp came from “EVIARC Sweet”—a jackfruit variety known for its superior natural sweetness, aroma, quality, and color. Thus, jackfruit products offer no need for any amount of

sugar. The variety was developed by the Department of Agriculture-Regional Field Office 8, through the Eastern Visayas Integrated Agricultural Research Center (EVIARC).

The technology was conceptualized with the aim of reviving and promoting the jackfruit industry in Eastern Visayas, since it’s the region’s banner crop.

Jackfruit or *langka* is widely-grown and cultivated in the Visayas region resulting to the continuous expansion of its production areas from backyard type to commercial orchards.

Major jackfruit growing areas are located in Western, Central and Eastern Visayas. Eastern Visayas alone exports 100-500 fruits or 2-3 tons per week to Cebu, Manila, and other cities and regions.

As a health food, jackfruit is rich in dietary fiber, vitamin C, B-complex, and a good source of calories. The pulp of EVIARC Sweet jackfruit variety contains carotene, lutein and phenolic compounds as anti-oxidants.

The VSU-Department of Food Science and Technology (DFST) conducted various R&D activities to produce a ready-to-eat snack for jackfruit lovers.

Through a thorough refinement of the process and procedure, the taste of “Baybay Delights” is now comparable to that of the “Vinamit” jackfruit chips of Vietnam and Thailand.

The technology developed by VSU is able to retain the original taste of the jackfruit pulp was maintained. “These are also processed without or with minimum preservatives depending on the product. Even with dehydrated jackfruits containing minimal amount of



The DA-EVIARC wins second place for the category “Best New Product” for their Jackfruit products during the 9th NTF.

preservative, the products is still a healthy alternative to many other snack items in the market,” said Dr. Roberta Lauzon of VSU.

The “Baybay Delights” are now available in supermarkets, airport, seaport terminals, *pasalubong* centers, government offices, trade fairs, and direct customers.

In a study conducted by Dr. Carlos dela Cruz (2010) of EVIARC, “based on a viability analysis for jackfruit conducted, jackfruit processing is a very profitable and feasible venture with payback period of 3.51 years. It has also an IRR (internal rate of return) of 22 percent. With this, the Fifth District of Leyte alone can actually welcome many potential processors/investors. Business training to potential investors will be suitable for this purpose.”

The Jackfruit TechnoMart Project, serving as the accelerator of commercialization and consolidator of the mature technologies on jackfruit, establishes a formal linkage with

interested entrepreneurs from Baybay City and Mahaplag Leyte. The Jackfruit TechnoMart Project is developed by the Visayas Consortium for Agriculture and Resources Program (ViCARP) and Regional RDE Network (RRDEN) that are mentoring jackfruit interested entrepreneurs under their Technology Business Incubation approach.

Currently, two Memorandum of Agreements (MOAs) have been signed with two private entrepreneurs: Mr Job Abuyabor of Mahaplag, Leyte for the dehydrated and Ms. Martha Villalino of Baybay City for the vacuum fried. Likewise, marketing agreements were made between the entrepreneurs and the existing jackfruit growers.

EVIARC, through its Abuyog Experiment Station, is also developing various processing technologies for jackfruit like preserves, puree, tart, jam, pastillas, jelly, leather (chewy sweets), and juice.

The uniqueness and creativity of the “Baybay

Delights” along its market potential and good packaging and labeling, earned the product and award as the second place winner as “Best New Product” during the 9th Agriculture and Fisheries Technology Forum and Product Exhibition organized by the Bureau of Agricultural Research in 2013. ###

Reference:

De la Cruz, L.K.C. and E.B. Rodriguez. (2010). Occurrence, levels, antioxidant and anti-inflammatory activities of carotenoid and phenolic compounds in the edible portions of jackfruit. An undergraduate thesis, University of the Philippines Los Baños, College, Laguna.

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AN ICE CREAM-y DESSERT FROM RIMAS

BY ANNE CAMILLE B. BRION



Ube, strawberry, chocolate, and cheese—these are the usual flavors of one of our favorite desserts of all time, ice cream. But a new and unusual flavor stood out and made its way to become one of the best innovative products during the 9th Agriculture and Fisheries Technology Forum and Product Exhibition in 2013, the *rimas* ice cream.

“The fruit’s fleshy, succulent endosperm makes *rimas* a very good raw material in making ice cream,” said Luz Marcelino, manager of the Bicol Integrated Agricultural Research Center (BIARC). According to Marcelino, *rimas* ice cream is special with its own unique taste that makes it different from the ones already available in the market. “It is special in the sense that it can easily blend with other

materials that are indigenous to Bicol such as the taro. Its taste and consistency is not altered as you add more flavors to it,” she added.

Dessert lovers and food enthusiasts will surely like the distinct taste and creamy texture of the *rimas* ice cream. As a matter of fact, just by basing on the product acceptability survey conducted during the technology forum, the *rimas* ice cream gained high acceptance in terms of taste, aroma, texture, and appearance from the evaluators.

Ms. Arlene de Asis, chief of BIARC-Product Development Unit, spearheads the preparation of this delightful snack. She likened *rimas* to sweet potato. “They almost have the same texture, so I used sweet potato as basis in making the different products from *rimas*,” she

described.

“*Rimas* ice cream is actually very simple and easy-to-prepare. After boiling, just cut them into small chunks and place them inside the blender. Once turned into jam, put all the other ingredients just like when making your ordinary ice cream. Cool for 6 hours, and you already have a delicious tasting ice cream in your refrigerator. In case the fruit is off-season, *rimas* can be processed into flour, and this is what you can substitute in place of the jam,” de Asis explained.

The *rimas* ice cream is made up of 80 percent *rimas* meat and comes in many variants: *rimas* with sweet potato, vanilla, cheese, chocolate, *langka*, and even with *siling labuyo*. Now, they are trying to include taro and pili nut in the mixture, crops that are also abundant in the region.

Targeted to cater to everyone, especially those with sweet tooth, the *rimas* ice cream however is not yet available in the market. “We are still in the process of coming up with the nutrition facts, proper packaging, and labeling to make our product more appealing and competitive. We also plan to link with private companies and train members of coops and women’s organizations in manufacturing the *rimas* ice cream,” Marcelino uttered.

R&D project on *rimas*

A very common fruit that are usually just found in home backyards, *rimas* is an inexpensive fruit that is popular and abundant in Bicol. Prepared only by boiling and steaming, *rimas* is served to children who are used to eating it as a merienda without any flavors added to it except coconut milk and salt and/or sugar.

“*Rimas* is one of the fruit



trees being given priority in view of the Food Staples Sufficiency Program of the Department of Agriculture,” stated Marcelino. Being rich in carbohydrate, it is highly encouraged to be utilized as an alternative food staple. Nutritionally speaking, *rimas* is high in starch making it a good source of carbohydrate, as well as Vitamin C and calcium that can help in addressing malnutrition.

As one of the pioneers of R&D initiatives on *rimas*, BIARC embarked on a project, “*Rimas* Biodiversity Research, Conservation, Propagation, and Utilization in Bicol Region” which was funded by Bureau of Agricultural Research and the High Value Crops Development Program of the DA. It aims to determine the biodiversity of *rimas* in the Bicol region, to conserve and maintain germplasm collection and propagation of *rimas*, and to establish a *rimas* demonstration farm in the different Research Outreach Stations.

Under the utilization component of the project, *rimas* is being used as an ingredient in many food products through the



product development initiatives undertaken by BIARC. This gave birth to the *rimas* ice cream and the production of other by-products including caramel candies, pastillas, cheese cupcake, chips, and *ginataan*.

“Through this project,

we can create awareness on the importance of this plant species as a nutritious food and we can develop various products through food processing techniques that could help farmers and groups of people to have an additional source of income,” Marcelino shared.

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The DA-BIARC wins third place for the category “Best New Product” for their *Rimas* ice cream during the 9th NTF.



Uniquely **BATANES**. Now serving **ARIUS FOOD PRODUCTS**

BY DIANA ROSE A. DE LEON

When one talks about Batanes, one will probably blabber about the endless rolling hills, the majestic view of the Pacific Ocean, the rustic Ivatan traditional house, the lofty lighthouses, the heartwarming Ivatans, among others. One would perhaps miss out on mentioning those pine-like trees that gloriously stand out along the sidelines and provide a decorative landscape on the roads and landmarks of Batanes. Given their abundance, particularly when traversing the streets of Basco, Mahatao, Ivana or even in the islands of Sabtang and Itbayat—this tree will awe any tourist on how the Ivatans make use of them.

The tree, known as arius (*Podocarpus costalis*), is an endemic in Batanes. It serves as an excellent ornamental tree often used by the Ivatans as Christmas tree during the Yuletide season.

“It is regrettable that the Ivatans are not aware that these fruits can be processed into valuable products.” - Dr. Edwin F. Macaballug, president of the Batanes State College



Arius bears fruits from July to October. Its berries are edible and its appearance and taste compare to that of *duhat*. The arius berry is fleshy and turns from red to purple when mature. The taste is mildly sweet and tangy. The berry has a single green seed attached to it. Just like the cashew, its seed is found at the end of the fruit.

Not just for decoration

“It is regrettable that the Ivatans are not aware that these fruits can be processed into valuable products,” said Dr. Edwin F. Macaballug, president of the Batanes State College (BSC). This observation was reaffirmed by the faculties of BSC who also shared that the Ivatans would just usually let the arius berries fall and rot from the tree or be eaten by the birds. “I told them that in the

mainland (general term for Luzon) arius is only used as ornamental plant because it would not bear berries outside Batanes,” added by Macaballug.

The potentials of arius berries to turn into processed food products only started in 2012 when the director for research and extension of BSC, the late Dr. Roger G. Baltazar, took interest on arius berries. This prodded him to submit a proposal to the Bureau of Agricultural Research (BAR) which was then funded under its National Technology Commercialization Program (NTCP). The realization of a vision to make arius known across the country as commodity that is uniquely Batanes started to take shape.

Developing food products

Upon the approval of project, the first product that BSC developed was the arius wine. Fruit-based wines are considered a healthy beverage if taken in moderation. Red wine, such as those from arius wine, helps fight heart diseases. The berries are high in flavonoids which function as antioxidants in human.

Capitalizing on the situation that fruit-based wines have progressively carving its niche in the beverage market, the BSC joined numerous product trade fairs and exhibits to market test arius products especially the wine. Based on the results, arius wine passed the standards of a

fruit-based wine.

After being satisfied on the quality of arius wine, the project team focused on the improvement of its packaging which they have satisfactorily done. They have tapped the weavers of Batanes to make the special wine holder and it is made out of the same material used in making *vakul* (Ivatan traditional head gear). “We paid the elderly weavers 100 pesos for every wine holder. It is especially designed for the arius wines. It is our way of helping them in getting income and promoting the handicrafts of Batanes,” said Djovi R. Durante, study leader of the project. Other arius-based products developed include pastillas, tart, jam, jelly, and tea.

The project team has foreseen that the demand for the arius wine and other arius-based products will boom once it has been commercialized in the whole province and most likely, the





products will also appeal among the tourists who are looking for souvenir gifts.

The BSC is making strategies on how to expand their production and widen their market reach. However, they are having problems on the availability of the arius berries because of its seasonality. The influx of tourists visiting the island starts from November to June which is the lean season for the arius berries. They came up with a solution which is to acquire additional cold storage equipment to store the arius berries so that even if it is off-season, they

can still produce the products. They will start on the technology transfer of arius processing to the Ivatan housewives to help them in supplying the arius products.

“Due to word-of-mouth, the tourists came to us to buy arius products especially the wine which surprised us because we are not yet promoting it heavily to the public. There are also travel agencies who were vocal in their intentions of becoming an exclusive distributor,” shared Durante.

The project team is also

planning to organize an arius tree planting activity. Durante mentioned that with the recent developments in Batanes such as the road widening, many arius trees are being cut down. A newly-planted arius tree usually takes 10-15 years before it bears fruit. With this initiative on tree planting, there is an assurance

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TURMERIC'S NATURAL HEALING WONDER

BY LIZA ANGELICA D. BARRAL



Turmeric (*Curcuma longa*) also known as *luyang dilaw*, is deep yellow-orange in color which is widely used as a condiment, textile dye, and natural healing remedy. During ancient Chinese and Indian times, turmeric is used as an anti-inflammatory agent and as treatment to various ailments such as flatulence, jaundice, menstrual difficulties, hemorrhage, toothache, bruises and a lot more.

Due to the advent of technological advancements, turmeric was discovered as a great protector against Alzheimer's Disease, cardiovascular diseases and other life threatening diseases like breast, prostate, lung and colon cancer.

Given the various natural healing benefits of turmeric and other natural herbs in general, more individuals nowadays are going back to the basics by patronizing health and wellness products made from natural ingredients. As a result, researchers and businessmen venture on



the production and utilization of turmeric into safe and effective value-adding products.

Let nature do the rescue

“I am always envisioning of green places, rescuing the environment, rescuing people’s dreams by gaining hope, and this thing should always be in line with the organic concept of life,” said Dr. Estela Taño, founder and consultant of Green Rescue

Organic Association Inc. Through the support of the Bureau of Agricultural Research (BAR), under its National Technology Commercialization Program (NTCP), Dr. Taño was able to expand the association and transferred the technology to the respective beneficiaries. As a result, GRO was able to produce various products from oregano, fruits, coconut, cacao, and other herbs and spices into wine, vinegar, juice, tea, soap, healing cream, concentrate, and fertilizer. One important product among GRO’s many lines involves exploring the healing wonder of turmeric.

The Turmeric Natural Healing Cream was introduced during the 8th Agriculture and Fisheries Technology Forum and Product Exhibition in 2012. It won

the “Best New Product” together with the Turmeric Multi-purpose Tea.

GRO’s Turmeric Healing Cream helps to ease and remove skin itchininess, insect bites, wounds, burns, scratches, swelling, cramps and other inflammatory problems. According to Ms. Lucia Dalisay, president of GRO, she received positive feedbacks from her clients who already used the product. “It provides instant relief to our clients with allergies and insect bites.” The GRO president even gave a testimonial about their wonder product. “*Nadulas ako two weeks ago at namaga yung kamay ko dahil itinukod ko sa semento. Nilagyan ko agad siya ng turmeric. Two times ko lang nilagyan ng gabing iyon at nawala na ang pamamaga kinabukasan,*” revealed Dalisay.



Gently reaching the mainstream market

The wonder cream even caught the attention of the medical professionals. “Nitong huli lang sa NTF, dalawang doktor na ang nakakita at nag-ke-carry ng mga produkto sa Tarlac, Pampanga at Biñan, mga Dermatologists at Pedia”, shared Dr. Taño.

Aside from promoting the product in trade fairs and exhibits, GRO is ensuring that their products are reaching the tourist destinations in Quezon like Villa Escudero where high-end customers usually visit. They are also looking for the possibility of establishing a shop in a famous mall together with other local companies and another shop located in the Grand Terminal of Lucena in collaboration with Department of Trade and Industry (DTI).

It is a challenge for every aspiring producers to create safe and effective product, but in the case of GRO’s Turmeric Natural Healing Cream, it is evident the name itself is true to its promise. ###

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Uniquely Batanes...from page 25



that there will be arius trees available for the future Ivatans.

Owing to the uniqueness of the commodity, the arius wine was given a citation award as “Best New Product” during the BAR-organized event, the 9th National Agriculture and Fisheries Technology Forum and Product Exhibition held at SM Megamall in 2013.

A year after, heeding the recommendations for the further improvement of the product and its packaging, the arius-based

products bagged the grand prize for the “Best Packaged Product” and “Best Newly-Developed Product” during the North Luzon Cluster S&T Fair organized by the Department of Science and Technology (DOST). ###

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Elevating the lowly KAMOTE into a high-end wine

BY VICTORIANO B. GUIAM

Philippine fruits such as bignay, mango, duhat and rambutan, have long been known to be suitable for winemaking. It may not be easy to believe at first but there is another common plant from which wine can also be made from - the humble “kamote” or sweet potato.

Sweet potato is a good source of carbohydrates. Packed with starch, the stuff which can be fermented for ethyl alcohol, this makes sweet potato an excellent material for making spirits. Some accounts report that red wine from sweet potato can compare to the imported kind.

Wine is widely claimed to be good to the health. The French who are great drinkers of wine, particularly red wine, do not appear none the worse for coronary heart disease even if French cuisine is rich in saturated fats from meats and dairy products.

In this country, imbibing wine on a regular basis is not within easy reach of the ordinary Filipino, even prohibitive. As most wine is imported, it is an expensive commodity. More Filipinos would be able to benefit from wine if it were produced locally.



Demarginalizing sweet potato

Most Filipinos are a rice- and corn-eating people. But during emergencies and times of scarcities, root crops, particularly sweet potato, are used as substitute sources of carbohydrates. For many communities living in the hinterlands and other marginal areas, sweet potato is the staple. It is also a “survival” vegetable along with kangkong for many of the poor.

With the extensive dependence on and reliability of sweet potato as a carbohydrate source, it has been included as one of major commodities in the

DA’s Food Staples Self-Sufficiency Program (FSSP) along with rice, white corn, cassava, and *adlay*. The program was called for by the Department to help ensure that food is on the table for Filipinos every day. This initiative thus ensures that the cultivation of sweet potato shall continue to grow and shall remain with Filipinos for generations to come. It also elevates the status of sweet potato from a “poor man’s crop” to a commodity that has high commercial value and importance.

Sweet potato is a hardy plant able to thrive in agriculturally-challenged

conditions and can survive calamity conditions such as typhoons. In the good soils, even if only a minimum of investment and care is given to growing *kamote*, farmers can still be sure of getting a decent produce come harvest time. Under an enhanced market demand for sweet potato and more extensive cultivation, farmers are able to get better returns within a shorter period than most other crops.

It is because of its hardiness and adaptability that sweet potato has played a crucial role in disaster recovery in the typhoon and volcanic eruption affected regions. In the aftermath



of typhoon Yolanda, sweet potato was found to survive. In the communities in which fresh sweet potato roots remained available, these did not experience as severe food crises as those without them. With sweet potato, local populations were able to hold on until relief efforts arrived.

In Central Luzon, the eruption of Mount Pinatubo in June 1991 inundated a wide swath of the area with ash fall and mudflows rendering much of the rice land unsuitable to the crop. Sweet potato was a logical crop to replace rice. While a complex of sweet potato viruses affected the sweet potato areas in Central Luzon that greatly reduced crop yield and incomes among the mostly smallholder farmers, the Tarlac College of Agriculture (TCA) in Camiling, Tarlac rose to the challenge. In cooperation with the International Potato Center (CIP) and the Philippine Root Crops Research & Training Center (PhilRootCrops), TCA promoted the use of tissue-culture-generated sweet potato clean planting materials (CPM). CPM was used in developing the technology for off-season kamote production in 14 lahar-laden 'barangays' of Concepcion, Tarlac, eventually spreading to save the day for other municipalities in Tarlac, Pampanga and Bataan.

Moncada LGU adopts kamote for its OTOP

The municipality of Moncada in Tarlac adopted sweet potato as its one-town, one-product (OTOP) commodity. Beyond its use as key food and cash crop for

livelihood rehabilitation in farming communities affected by natural disasters, the LGU realized that there is a large potential for diversified livelihood opportunities from sweet potato. It encouraged kamote farmers to capitalize on the availability of disease-resistant and fresh roots and opportunities in its processing and utilization. However, the municipality made its mark in an innovative use of sweet potato harvests – fine wine.

In 2010, with Mayor Benito Aquino at the helm, selected employees of the local government were sent to TCA to learn the basics of winemaking using sweet potato. Under the brand name of Don Benito Sweet Potato Wine, the Moncada LGU collaborated with TCA for continuous development and refinement of the brand's products. With new facilities made available by the Department of Science and Technology, the local government of Moncada is aiming to produce sweet potato wine that is at par with imported ones.

Moncada sweet potatoes are naturally processed and fermented to produce two varieties of wine – Classic Dry and Fruit Blend, both of which have 13.6 percent alcohol content. Don Benito Sweet Potato Wines of these varieties were showcased by TCA in its booth in the 10th Agriculture and Fisheries Technology Forum and Product Exhibition held on 8-10 August 2014 at the SM MegaMall in Mandaluyong City. With its attractive bottle and labeling, it easily caught the interest and taste of the visitors.

Kamote products come of age

Kamote products have come a long way from "low tech" beginnings in the form of kamote-cue and kamote fries sold in street corners. With the continuing development of products from sweet potato in the country, such as those turned out by TCA and the PhilRootCrops in the Visayas State University in Baybay, Leyte, we now have more sophisticated food products such as sweet potato jam, jelly, sauces, sweet-sour sweet potato (similar to dried mango strips), catsup, and sweet potato beverage/concentrate. With assistance from CIP, Philippine institutions working on sweet potato have also developed sweet potato muffins, doughnuts, pastries, ice-cream, and even handicrafts from dried vines

Sweet potato has also found use in the formulation of feed (chips) for livestock and fish, and as industrial starch for still other varied uses. In the near future, we will be seeing other new product lines in the form of flavored chips, fruity products, tarts, and candies; flavored sweet potato beverages; sweet potato flour-based products such as breads, hotcake mixes, noodles, and dehydrated sweet potato cubes for export. ###

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PHOTO BY RDELACRUZ

Adlay Breakfast Cereal (ABC) is a new product recently developed by the Northern Mindanao Integrated Agricultural Research Center (NOMIARC), Department of Agriculture-Regional Field Office (DA-RFU) 10, with funding support from the Bureau of Agricultural Research (BAR), to address both the convenience of preparing breakfast meal and ensure its healthful benefits while still getting the “heavy on the stomach” feel of eating rice. ABC was first introduced into the public in August 2013 during the conduct of the 9th Agriculture and Fisheries Technology Forum and Product Exhibition” organized by BAR at SM Megamall, Mandaluyong City wherein it bagged the first prize for the “Best New Product Award” (full story in page 14-16).W



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