



BAR DIGEST

Research and Development

Official quarterly publication of the Bureau of Agricultural Research

Volume 20 Issue No. 2

April - June 2018

Cacao

**Food for the gods
turned into wine**





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BAR R&D Digest is the official quarterly publication of the Department of Agriculture-Bureau of Agricultural Research (DA-BAR). A staff bureau of DA, it was established to lead and coordinate the agriculture and fisheries research and development (R&D) in the country. Specifically, BAR is tasked to consolidate, strengthen, and develop the R&D system to improve its effectiveness and efficiency by ensuring customer satisfaction and continuous improvement through work excellence, teamwork and networking, accountability and innovation.

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 member-institutions of National Research & Development System for Agriculture and Fisheries (NaRDSAF).

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

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ISSN 1655-3934

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SalOkra: Wonder-duo for health and wellness



Farm produce repurposed into novel products

by Dr. Nicomedes P. Eleazar, CESO IV

A continuing story arising from our advocacy, we feature anew a number of breakthroughs in product developed from BAR-supported R&D projects particularly those funded under the National Technology Commercialization Program.

In a previous issue of the *BAR R&D Digest* (July-September 2014), we showcased innovations from research — new products from supported projects that have emerged to showcase our partners' creative abilities. This did not wane as new batch of innovative R&D products are continuously being developed, just as compelling as the previous ones.

Our researchers are prolific in innovation and skilled at coming up

with practical and ingenious solutions to everyday food concerns. However, as support for more intensive promotional activities is not always available, there is the chance that the products developed may not reach the mainstream market, let alone make people aware that they exist. Thus, stories of how these new products came about are included in this issue and other mediums as part of the bureau's commitment to assist our research partners and to help acquaint the public on new food possibilities.

We think that some things about Filipinos as consumers and the market have levelled up and these present opportunities for the commercialization of these products. As a people, we look for ways to make life better on a daily basis with an eye for things that will improve our well-

being. We are fast becoming citizens of the world and are acquiring tastes that encompass both local and international cuisine. We have become more adventurous about our food choices, being open-minded about alternatives to the daily fare and are more willing to try out new food that not only taste good but are also great for their therapeutic properties.

Today, we have science and technology that can give developers and consumers the latitude for innovation in products, and provide entrepreneurs with business opportunities that can provide the push for creative food products such as fortified produce and drinks, one-of-a-kind food and ingredients, organic and functional foods, or just simple food that have been given a twist that enhance their appeal,

and preparations for health and wellness.

Our partners' research has led to an array of new products from agricultural crops of which a number is featured in this quarter's issue of the *BAR R&D Digest*. With these samples of what our research partners have accomplished, we hope to prick the interest of our readers and stir them to look for more.

The stories we have are on:

Adlay sweet cone. With *adlay* softy ice cream already developed, what better thing than to make but an "apa" or ice cream cone made out also of *adlay*. With one stone, this hits two birds: maximization of the potentials of the *adlay* crop and the use of a safer material as ice cream cone rather than tapioca flour which is said to produce an ingredient not good for the health when taken in quantity.

Cacao wine. Another part of the cacao fruit aside from the seed itself can also be consumed but as an alcoholic drink. The mucilaginous seed pulp need not be thrown away as an exotic-tasting wine can be made out of it. The selling points of cacao wine do not end there as others are described more fully in our story.

Kapeng Barako liqueur. The taste of *Kapeng Barako* does not have to fade from memory. An agri-entrepreneur is doing their share of preserving the spirit of the *Kapeng Barako* of Batangas in the form of a coffee liqueur. An existing product was improved on in taste quality and was re-introduced to the market as a premium coffee liqueur with

a new brand name, and a distinctive bottle and packaging.

Coffee body scrub and massage cream. This new body scrub uses all-natural ingredients not found in ordinary chemical-based body scrub and exfoliators. Researchers have found new use for coffee beans. From it can be made a body scrub that is also a massage cream. It is reputed to have five health benefits. On top of these, producing and marketing them can add to the coffee growers' and community income and is a good alternative when the price of coffee beans is low.

Read-to-eat goat's meat products.

Goat meat preparations are widely appreciated in this country. Goat meat is healthy as it is low in total fat, saturated fat and cholesterol compared to poultry, pork, or beef. Chevron also contains higher levels of iron and protein. Processed, ready-to-eat goat meat products have been developed but are barely known to consumers. Researchers have gone beyond the traditional *papaitan*, *kaldereta*, and *kimilaw* and moved on to processed chevon meat that include goat jerky and kapukan, a type of *kilawing kambing*.

Kapis chip. To many, kapis is a material used in making traditional house windows and room dividers. Relatively unknown is that kapis is also a delicious marine bivalve that some say is better tasting than *tabong*, or *talaba*. Kapis chips are very rich in protein, making it a healthy option as finger food. Processing the kapis meat into chips is a welcome opportunity for making additional income and maximizes the use of the species.

Diuretic drink from corn silk. Corn silk (*Maydis stigma*) is the fine, soft,

fiber-like threads from the flower of the maize plant protruding from its top end. With the view to utilize corn to the utmost, a research team has discovered a use for what is otherwise a waste product. They found that a healthy juice drink can be made from corn silk. It is loaded with vitamins, proteins, carbohydrates, calcium, potassium, magnesium and sodium salts, volatile oils and steroids, and saponins. It is also a natural diuretic and would be of help to those who need them.

Queen Pineapple vinegar. In cooking adobo, vinegar is an important ingredient. Now there are vinegars and there are vinegars, so to speak, but one vinegar stands out. The vinegar made from the Queen pineapple variety is best for this purpose as it adds more flavor and aroma to the dish. The juice of Queen pineapple can be fermented to produce either vinegar or wine. To the producers of this pineapple, this property is a godsend during times of production surpluses or big quantities of market rejects. With the production of a desirable by-product from unwanted produce, what could have been waste is converted into income.

Cosmetics from saluyot and okra.

Saluyot and *okra* are two food plants that also have medicinal properties. *Saluyot* is rich in antioxidants and Vitamin A, while *okra* is good for diabetics and also contains a natural antidepressant, among others. Researchers decided to study, at length, the full potential of these two wonder crops and the possibility of combining extracts from the two in various preparations such as capsule, jelly, and cream to create new nutraceutical and cosmeceutical products. ###

A row of several glass bottles of Cacao wine, each with a white label and a purple cap, lined up on a dark, reflective surface. The background is a blurred green, suggesting an outdoor setting with foliage.

Cacao

Food of the gods turned into wine

by Rena S. Hermoso

Famous for being processed into chocolates, *Theobroma cacao* which literally means “food of the gods” started as a backyard industry in Region 4A.

“Ang cacao ay tinatanmin lang sa mga baku-bakuran at hindi ito isang pormal na industriya noong nakaraan,” according to Mr. Dennis Bihis, senior research specialist from the Quezon Agricultural Research and Experiment Station (QARES) of the Department of Agriculture-Regional Field Office (DA-RFO) 4A. He added, *“ang produksyon ng cacao ay sinimulang umangat noong 2007. Kung [kailan] nagkaroon na ng mga programa upang magpatanim ng mas marami pang cacao at gawin pormal na industriya.”*

The development of the cacao industry in the region started to grow to supply for the country’s production shortage. This led to the conduct of an agribusiness development project on cacao led by DA-QARES and funded by the Bureau of Agricultural Research under its National Technology Commercialization Program. He shared, *“Nagkaroon kami ng proyekto sa cacao, iyong Agribusiness Development Project.*

Upang magkaroon tayo ng mga pananim at matulungan natin ang mga magsasaka sa teknolohiya ng pagpaparami.”

The success of this project was followed through by another project titled, “Cacao Commercialization in the Province of Quezon.” According to Mr. Bihis, project leader, “*iyong second project natin ay ginawa natin upang palawakin iyong taniman ng cacao. Pangalawa, bigyan natin ng pagsasanay ang mga magsasaka upang mapaayos ang produksyon nito at hindi lang maging backyard kundi maging commercial iyong level ng produksyon. Pangatlo, mag-develop din ng mga produkto mula sa mga buto ng cacao. At pang-apat ay magkaroon ng pormal na tie-up sa mga merkado.*”

As part of the project, different product lines (i.e. table, cacao soap, cacao wine) were developed to provide farmers an additional source of income.

The cacao wine, as shared by Mr. Bihis, was developed “*kasi masyado ng saturated ang merkado ng mga sabon, tableya. So kailangan natin ng ibang produkto na pwedeng pagkakitaan ng ating beneficiaries.*” After developing the product, QARES submitted it for analysis and packaging. After which, the technology on cacao wine was disseminated to various associations and beneficiary groups including the Cacao Farmers’ Association of San Antonio, Quezon; and the Laguna Cacao Farmers Association, which were beneficiaries of the projects.

Cacao wine goes to Madrid Fusión Manila

On the second day of the Madrid Fusión Manila (MFM) 2017, the cacao wine of QARES was featured in one of the food presentations during the Regional Lunch sponsored by



DA. Madrid Fusión, an international culinary event held yearly in Spain, is where international culinary legends and rising stars showcase new techniques and cutting-edge innovations, while paying tribute to culinary traditions from where these contemporary cuisines have sprung. Arguably, the MFM 2017 is one of the better arenas where local ingredients, products, and gastronomy talent can be featured and promoted as it has always been one of the biggest culinary events in the world.

In her creation dubbed as “A Toast to Chocolate” during the MFM 2017, Ms. Pamela Lim Cinco of Risa Chocolates presented the cacao wine topped with white chocolate disc with cacao nibs

served with their white chocolate truffle with dark chocolate ganache and milk butter from carabao. With the theme of the Regional Lunch being “Nose-To-Tail,” Ms. Cinco said that “[she] wanted to show how the different parts of the cacao fruit can be consumed and do not need to be thrown out.” “In addition to our chocolates which are mostly made from the seeds or the cacao beans, the cacao wine is a perfect example because it uses the pulp of the cacao which is usually just absorbed by the cacao bean or is dried up by the sun,” she added.

The cacao wine, according to Ms. Cinco, is “light and delicious.” She also added that “it reminds [her] of young champagne with notes of sweet cacao fruit and vanilla.” Further, Ms. Cinco

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Kapeng Barako Coffee Liqueur: *Keeping the spirit of Batangas Coffee*

by Victoriano B. Guiam

Time was when the coffee of Batangas was the coffee of commerce of the world. Historical accounts tell of the unparalleled wealth of the coffee-growing families in Lipa of the 19th century in the remaining decades of Spanish colonial rule. This was most pronounced when the Philippines became the world's major producer of

coffee in the mid-1880s as the crop from the major coffee-producing plantations of Brazil, Africa, and Java failed because of the airborne fungal virus, *Hernileia vastatrix*, the cause of coffee rust, that made coffee a scarce commodity in the world market.

Those were the golden years of

Manufactured in Batangas where the first coffee seed in the Philippines is planted almost 300 years ago, and where the "Barako" coffee variety grows in the wild, seasonally harvested for its uniquely robust brew and enthralling bouquet, reserved only for the distinguished few.

Batangas coffee and a period of great prosperity and opulence for Lipa. The town became the richest municipality in the Spanish colony and, for this feat, was declared the city of Villa de Lipa by royal decree in 1887. There was international preference for Philippine coffee with beans shipped to America and Europe commanding five times the price of those coming

from other Asian countries. Those heady times did not last very long as Batangas coffee fell from its lofty height with a thud in 1889 with the arrival of the dreaded coffee rust in the province.

The romance of Batangas coffee began with its gradual introduction to the province beginning in the middle of the 18th century with importations of planting materials from Mexico and, in the next century, from Brazil. The Kapeng Barako that we know took form in the 19th century when coffee was widely planted in Lipa such that by the mid-1800s about two-thirds of the municipality was planted to the crop. By the 1860s, Batangas was already exporting its Kapeng Barako to the Americas via San Francisco and, later on, to Europe with the opening of the Suez Canal.

The word barako comes from the Spanish word for wild boar, varracó, which is said to have a taste for the *Coffea liberica* plant's leaves and berries. Liberica coffee is also associated with the Batangueños' trait of being matapang because of its strong flavor and distinct aroma. With this association, Liberica coffee came to be called "Kapeng Barako".

Batangas coffee gained so much of a reputation that all coffee coming from the province were called "Kapeng Barako" regardless of the variety. But to the Batangueños and true-blue connoisseurs, it can only be *C. liberica*. Today, Kapeng Barako is considered part and parcel of the Batangueño culture.

Of the coffee varieties that are grown in Batangas and other coffee-growing areas in the country (*Coffea arabica*, *C. robusta*, *C. exvelsa*, and *C. liberica*), *C. liberica* is different. In the international coffee trade, it is rarely seen as it

accounts for less than one percent (<1%) of total coffee products. It is also grown commercially in Asia in Malaysia and, to lesser extents, in Indonesia, Thailand, Vietnam, and Taiwan. As with the Philippines, Liberica coffee is not exported by Malaysia with production coming from small farms that cater to niche markets such as tourists and the local café crowd.

C. liberica has the largest leaves and coffee beans of the four varieties. The bean is asymmetrical, with one end being smaller than the other. It also has a skin that is more resistant to peeling. Liberica coffee can grow in a wider range of soil types than the others. It is also taller and can reach a height of 17 meters. Owing to its resilience, it is sometimes used as rootstock for *C. arabica* and *C. robusta* seedlings. It was once thought to be resistant to coffee rust, but the experience of Lipa in the 1890s showed otherwise.

Kapeng Barako in coffee revival

In just two years after the coffee rust invasion of 1896, the country's coffee output fell to one-sixth of its peak level. Since the fall, the produce from *C. liberica* never regained its pre-eminent position in the Philippine's coffee industry again.

The coffee rust that hit the Philippines in 1889 was coupled with an insect infestation which destroyed nearly all the coffee trees in Batangas. With the loss of the country's major coffee-producing province, national coffee production also went down and, with it, its global significance. Cavite took over some of the slack but less area was allotted to coffee because of the attraction of other crops.

By the 1950s, new more disease-resistant coffee strains had been

introduced to the islands. In time, *C. robusta* became the more extensively planted variety, eclipsing all other varieties including *C. liberica*. The emergence of instant coffee as the popular coffee form was an unfortunate development as this meant that coffee prepared brewed – the hallmark of Kapeng Barako – would be preferred less.

Not wanting to have Kapeng Barako become one of the "lost coffee species", attempts have been made by the Philippine Coffee Board to keep it from being just a memory. Ms. Pacita Juan and the Figaro Coffee company also joined the fray about 20 years ago to save it from extinction by initiating the "Save the Barako" campaign that helped return *C. liberica* coffee to the coffee map, aided by its re-discovery by a new generation of coffee enthusiasts.

The Kapeng Barako coffee liqueur project

Now, the Department of Agriculture-Region Field Office 4A would like to contribute to the preservation of Kapeng Barako/*C. liberica* by doing improvements on a coffee liqueur that is based on the brew.

Coffee liqueur is a combination of two favorite drinks: coffee and alcohol with much sugar added to balance out the alcohol's sharp taste. Kahlua and Tia Maria are among the recognizable names in liquor stores. As far as is known, mass produced coffee liqueur does not make use of pure Kapeng Barako (*C. liberica*) as the coffee component (some brands are said to use inferior coffee) and this is what the SJB Liberica Enterprises, a small niche company and the main project partner, set out to do. SJB had previously worked

on the marketing of a Kapeng Barako-based coffee liqueur but had limited success.

The plan was to develop further the SJB product using the traditional Batangueño preparation of Kapeng Barako. A project proposal, “Production and Processing of Premium Quality Coffee Liqueur and Packaging Development for the Niche High End Market”, was presented by Mr. Dennis DL Bihis of the DA-Quezon Agricultural Research and Experiment Station (QARES) in Tiaong, Quezon and was approved for funding by the Bureau of Agricultural Research, through its National Technology Commercialization Program. The proponents also hope that this project will stimulate the development of other products aside from coffee liqueur and, therefore, encourage the continued cultivation and preservation of the *C. liberica* cultivar.

The niche market is the project’s target as there is less competition, the profit margin is better and the volume requirement is lower. For these consumers, value-adding through good processing practices and excellent packaging are musts. To ensure success, project efforts included not only the active collaboration of a private sector enterprise, but Kapeng Barako growers in San Jose, Batangas as well. The project had two components: 1) improvement of the overall quality of the existing BARrako Coffee Liqueur; and 2) redesigning of the brand name and packaging to be re-introduced as premium coffee liqueur.

Market demands better Kapeng Barako coffee liqueur

While SJB already had the *Barako* Coffee Liqueur product, market tests done abroad yielded mixed results. It

was well received by the Japanese in the FoodEx of 2003 and 2004. Participants in the Gulf Food 2003 and MENOPE 2012 held in Dubai also drew very encouraging responses on its taste but it was also pointed out that its packaging left much to be desired for it to be displayed in Duty Free Shops. Even in the USA, Filipino stores may carry the brand but it does not attract the attention it needs.

In the Macau International Investment Fair 2012, a big wine and liquor importer was profuse in his appreciation for the taste of the product but also pointed out shortcomings which were its clarity and packaging. Same was true for another Chinese wine merchant who was apprehensive for the response of his high end market.

If the product is to do well in the local and foreign markets, its quality and appearance had to be upgraded. The project’s Part 1 involved the development of a new liqueur formulation. Mechanical and chemical filters were used to improve clarity. Alcohol content was also increased to 18 percent to give it added liveliness.

Various blends were tested. In this effort, the key coffee ingredient was produced following a meticulous process in which the first extract from select Kapeng Barako beans from San Jose growers was brewed with naturally balanced mineral water, qualifying the brew to be of single origin. This was then blended with unfiltered caramelized sugarcane extract and an aromatic fine spirit, and then ripened for several months to develop a distinct bouquet.

For Part 2 of the project, the focus was on the development of the brand and packaging. Various bottle configurations were designed and evaluated. Expert and other external opinions/inputs were also sought. Lessons were drawn from the experience of international makers of alcoholic beverages on bottle design, packaging, presentation, and marketing.

A group of small coffee growers in San Jose, Batangas, the Kapeng Barako Producers at Atibapa Association (KBP Atibapa), was organized as the source of *C. liberica* beans. Its members stand to benefit from the enterprise once it gets going. At the same time, the bean supply for the coffee liqueur enterprise will be assured. Key members underwent training on good agricultural practices in preparation for certification. The other members plan to replant or rehabilitate their *C. liberica* coffee farms in anticipation of new demand.

Kapeng Barako coffee liqueur reborn

After two years of product development, the project finally arrived at a top product worthy of a place alongside the established coffee liqueurs of the world. The proponents settled on a distinct coffee liqueur blend, and box and bottle design. It was re-introduced to the world as “Aldio Barako Coffee Liqueur”.

The Aldio brand is now being sold at SM Lipa, SM Mall of Asia, and SM Megamall. The producer has also participated in events and expos in various localities to showcase Aldio to the public.



Coffee Liberica (Kapeng Barako)

Strategic meetings have been held with local wine and liquor stores as well as potential distributors operating in Dubai and Singapore.

With this successful product development, Kapeng Barako will be better known in the Philippines and abroad. The BAR-supported project may be coming to an end but the spirit of Batangas coffee will live on and it is in a nice bottle. ###

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Sweet success from Queen PINEAPPLE VINEGAR



by Ephraim John J. Gestupa

Eight hours southeast of Metro Manila is the Province of Camarines Norte with Daet as its capital. Tourists usually visit the province in search for the white-sand paradise that is the Calaguas Group of Islands but Camarines Norte holds another thing of beauty beneath the shade of its palm trees: the Queen Pineapple.

“Ang Queen Pineapple *ay matamis kesa sa ibang variety. Tsaka kapag kinakain siya, ito ay crunchy*,” described Mr. Reynaldo Retosis of San Lorenzo Ruiz. He has been directly buying Queen Pineapple by bulk from local farmers for the past three years.

If one were to visit Daet, it wouldn’t take much of an effort to discover countless pineapple-based products lining the shelves of its *pasalubong* centers. Among these are Queen Pineapple wine and vinegar.

The Women and Families of San Lorenzo Ruiz Association is a 30-member organization based in Camarines Norte that is into the processing of wine and vinegar from Queen Pineapple. According to Imelda Pimentel, the association’s

treasurer, the idea of processing Queen Pineapple into vinegar and wine only came naturally as the raw material that was readily available in their area. Through the assistance from the Department of Agriculture (DA), the women’s group underwent product development training and was also given an industrial juicer that can convert pineapple chunks into juice that would then be fermented into wine or vinegar. They also sell pineapple juice but for now it is only by order, since their juice does not contain any preservatives.

According to the women of the association who also serve as homemakers in their respective households, the vinegar they make from Queen Pineapple is best used when cooking chicken adobo as it adds more flavor and aroma to the dish. Ms. Virginia Rancho, chair of the San Lorenzo Ruiz Association, said that the vinegar has been a favorite of their local customers as it has helped maintain their blood pressure from getting too high.

Camarines Norte’s pineapple industry wasn’t as vibrant as it is today. When Mr. Innocencio Obredo began his

work at DA in 1987 as a researcher, pineapples were only sold within the Bicol Region. “...*marami sa mga nagtatanim ang gumagamit ng mga traditional na pamamaraan. Ilan dito ay ang paggamit ng di parehong laki ng pagtatanim, kakulangan ng inilalagay na pataba, di maayos na pagpapabunga, at kakulangan ng kaalaman sa postharvest handling*,” he added.

Seeing the potential of Queen Pineapple to become the Province’s champion commodity, Mr. Obredo and his colleagues set out to do pioneering research that identified the good agricultural practices that would improve the taste and yield of Queen Pineapple.

Today, Mr. Obredo is the chairman of the Bicol Pineapple Board for the Province of Camarines Norte. He has been involved with the 37 research initiatives on pineapple production.

“*Marami na ang mga technologies na na-develop from Queen Pineapple, isa na dito kung papaano ma-attain yung pinaka-ideal size for importation; ikalawa, yung sweetness nito ay improved; ikatlo, kung papaano naming itatanim in*

an ideal distance of planting ang Queen Pineapple sa isang buong *ektarya*.” said Ms. Luz Marcelino, research division chief of the Bicol Integrated Agricultural Research Center (BIARC), DA-Regional Field Office (RFO) 5.

Mr. Obredo also did research on the use of fertilizers which can induce off-season fruiting so that local farmers won’t be confined in just one batch of harvested pineapple per season. His studies on the good agricultural practices on Queen Pineapple production are now packaged into technology guides published in local vernacular. The technology is also shared through farmer’s field schools and hands-on trainings conducted by other government agencies like the Agricultural Training Institute and the Department of Agrarian Reform.

Today, most pineapple growers have managed to increase their yield to 20-30 percent by adopting technologies introduced by the DA.

Queen Pineapple is continuously brought to Manila and cooperatives, like Labo Progressive Multi-Purpose Cooperative, have products showcased in supermarkets all over the Bicol region.

According to Ms. Marcelino, community based organizations that process pineapple products help maximize the harvest of pineapple growers. “*Dahil sa surplus of production, kalimitan may hindi pumapasa sa quality control. Kaya namin isinagawa ang project na ‘Utilization and Processing of by-products out of Pineapple.’ Ito ay isang BAR-funded project na isinagawa noong 2008 at maganda naman ang kinlabasan kasi may mga takers kaagad sa aming mga teknolohiya,*” added Marcelino.

A lot of the pineapple products in Camarines Norte are processed into



batterball pineapples, these are ripened pineapples that have failed to grow in size due to poor cultural management. It tastes the same as regular sized queen pineapples, but way smaller, usually about the size of a man’s fist. Batterball pineapples do not make it to Manila and are sometimes thrown away because no one would buy them. Through the community-based processing

centers, batterball pineapples are utilized as main ingredients for products such as pastries, juices, wine, and vinegar.

Still, one of the challenges faced by Ms. Rancho and Ms. Pimentel of the San Lorenzo Ruiz Association is their supply of pineapple. Having been invited to a number of trade

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Maize Silky Sip:

Your diuretic juice fix

by Daryl Lou A. Battad



Diuretics are medicines that help reduce the amount of water in the body. They are used to treat the buildup of excess fluid in the body that occurs with some medical conditions such as congestive heart failure and liver and kidney diseases. Some diuretics are also prescribed to treat high blood pressure by reducing the amount of fluid in the bloodstream. There are various types of diuretics that are ought to treat existing medical conditions but some perceive them to

bring harmful side effects. With the growing health-conscious population, more people are resorting to alternatives while still in good shape because after all, “prevention is better than cure.”

Amazing maize silk

Maize or corn is one of the major crops grown abundantly in the Philippines. In fact, it is considered a staple food of most Filipinos. Aside from being a food source, the use of

maize has greatly expanded to feeds, fuel, and other value-added products thanks to technological advancements and research and development (R&D).

Cagayan Valley is considered the corn capital of the country, being the top producer contributing about 23.9 percent to total corn production. Through the initiatives of the Department of Agriculture-Cagayan Valley Research Center (DA-CVRC) of the Regional Field Office (RFO) 2, there is an increased consumption and appreciation of corn in the region that resulted from its R&D activities, that subsequently leads to increasing the crop's by-products. Maize silk is one.

Traditionally thought of as a waste material in corn production, maize or corn silk (*Maydis stigma*) is a collection of fine, soft, fiber-like threads from the flower of the maize plant. Its color can range from yellow, green, to red and light brown. However, its medicinal properties made it a popular remedy of indigenous Western communities to various illnesses such as urinary tract infections (UTI), and kidney and bladder infections.

Among its numerous health benefits, corn silk is best known for its diuretic properties. Since then, corn silk has been purposed as an important natural-based alternative that can also treat cystitis, edema, kidney stones, prostate disorder, bedwetting, and obesity. Various studies likewise point to the silk's other uses such as its anti-fatigue, anti-depressant, and antioxidant properties. Such amazing potentials propelled researchers to further study the maize silk's pharmacological applications.

The Maize Silky Sip

Given these health benefits, DA-CVRC researchers, led by then Rose Mary Aquino, now the DA-RFO 2 regional technical director for research and regulations, furthered the potentials of corn silk. Not only does it add more value to the crop, but more importantly, it will aid in the increase of income of corn farmers in the province.

With the wide range of value-added products that DA-CVRC already developed out of corn, Aquino's research team intended to utilize even the waste product. "Currently, we have developed food products from corn such as coffee, pancit, corn-rice mixed grits, and fried binatog. We mostly use the grains, and that's the

time when we asked ourselves how do we utilize the waste?" Aquino said. Thus, the project came about.

Under the Bureau of Agricultural Research's (BAR) National Technology Commercialization Program (NTCP), the project "Technology Commercialization of Developed Corn Silk Products from Corn Silk in Region 02" aimed to increase the income of corn farmers through additional returns from corn silk utilization. To achieve this, the project was set to develop healthy and market-attractive corn silk-based products; develop capability of potential farmers' organization and processors to engage in product processing and commercialization; establish product profitability analysis; and eventually register the products with the Department of Trade and Industry (DTI) and the Intellectual Property Office of the Philippines.

The project adopted the technology for green corn production, preferably Open Pollinated Variety (OPV) which involved securing certified seeds, soil testing, land preparation, pest and fertilizer management, and harvesting. The corn silk was then collected after harvesting green corn, and was processed immediately after collection.

With the brand name, Maize Silky Sip, this became the newest addition to the Mangi Maxi product lines of DA-CVRC. So far, the silk is processed through boiling and fermentation, blended with lemon grass, and sweetened with honey. "We would like to target the health-conscious market, that's why we used these to appeal to their taste," Aquino shared.

Packed with vitamins, proteins, carbohydrates, calcium, potassium, magnesium and sodium salts, volatile oils and steroids, and saponins, the Maize Silky Sip is sure to become a

drink craze for consumers, young and old alike.

In fact, in collaboration with the national Nutrition Council of the Philippines, Aquino and her team are looking into the possibility of promoting the Maize Silky Sip safe for infant use, targeting those who suffer from pediatric UTI.

Currently, the Maize Silky Sip is packaged in a 350-ml glass bottle and priced at 25 pesos. To further improve the packaging without compromising market competitiveness, the research team is now collaborating with the Department of Science and Technology to analyze and establish its nutritional value and specially to determine appropriate natural preservatives that can prolong the shelf life of the product. Presently, a bottle of the Maize Silky Sip can last for up to five days.

Further, field trials are continuously being undertaken at CVRC to establish the best stage to gather the silk without affecting the grain quality. This, according to Aquino, is a measure to sustain the supply of the silk as this will be integrated to the region's value addition to corn.

"We want the silk to be out of the corn's list as a waste product. DA-CVRC commits to fully utilize the silk as a refreshing, healthy diuretic beverage," Aquino concluded. ###

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Ice cream cone

made from Adlay

by Leoveliza C. Fontanil



Ice cream is one of the most popular summertime cravings. It is always best served in a cone rather in a cup. Cones are designed to complement the sweet, creamy taste of ice cream. One is better fulfilled if after consuming the ice cream, one is treated to a crispy crunch of sugar cone.

As ice creams become more elaborate, one can choose to have chocolate, nuts, honeycomb or colored sprinkles as decorations, adding a little extra excitement, and giving a much better “wow” of flavor to the whole ice cream eating experience.

An ice cream cone or “*apa*” in Tagalog, is a dry, cone-shaped pastry, usually made of wafer similar in texture to a waffle, which enables ice cream to be held and eaten without a bowl or spoon.

Nowadays, there are many types of cones to choose from in the market. Various types of commercially available cones include cake cones, sugar cones, waffle cones, and pretzel cones. Most of them are now creating much more appeal in the market as they value the uses of each cone type with the different variations, uniqueness, and special features.

But have you ever heard of sweet cone made from Adlay?

How it all started

As one of the active implementers

of research activities on adlay, the Department of Agriculture-Regional Field Office (DA-RFO) 4B (MIMAROPA) has been consistent in developing technologies and carrying out initiatives that will further improve and promote the adlay crop. One of its most notable feats is a product called Adlay Sweet Cone.

Adlay, known as a healthy, versatile food ingredient, can be ground into flour and used to make breads, pastas, porridge, and among others just like rice. It has a good eating quality, revealing that adlay grains can also provide essential nutrients needed by the body.

The DA-MIMAROPA, led by Ms. Lorena B. Mendoza, also the Adlay focal person, was on its track in showcasing techniques on how to prepare various affordable, nutritious, and palatable adlay delicacies.

“*Marami na kaming nagawang products out of adlay, katulad ng adlay broas, cookies, kalamay, pandesal, turones de adlay, arrozcaldo, champorado, patiktik, sinukmani, polvoron, noodles, at shingaling,*” Mendoza said. “*Nakagawa na rin kami ng adlay softy ice cream, naisip namin ang ka-partner ng ice cream ay apa, at doon nga pumasok yong adlay sweet cone,*” she added.

DA-MIMAROPA developed various products because they

wanted to make unique products that are not yet done by other regions. They are always looking for the other potentials of crop. “*Kaya sa tuwing makakakita kami ng tindahan or pasalubong center ay lagi kaming nagtitingin ng mga products na pwede magawa out of adlay at iyon ang bigla naming naisip,*” she revealed.

It was during the 12th Agriculture and Fisheries Technology Forum and Product Exhibition (NTF) held at SM Megamall, Mandaluyong City that the Adlay Sweet Cone was first exhibited. “*At that time, eight packs of Adlay Sweet Cone lang ang aming nagawa at nang nakita ito ng Mama Sita’s binili nila labat ang display namin, at simula noon ay nag-oorder na sila sa tuwing may event,*” Mendoza said.

When it comes to taste, Mendoza shared that the Adlay Sweet Cone is thicker, crispy, and has a little bit lumpy texture as one chews it providing an interesting twist to the customers’ delight. Even if eaten alone, Adlay Sweet Cone is more delicious compared to other commercially available cones in the market. “*Marami nang nakapag-try ng aming adlay sweet cone at laging may product display kami sa tuwing may invitation. At humanga talaga sila na yong adlay flour pala ay nagagawang adlay sweet cone at mas masarap daw sa karaniwang cone,*” she added. The product shelf-life of the product can reach up to four months with proper

keeping at the storage.

Today, Mendoza said that the product has made many orders from Mama Sita's and the DA-RFO 5 has also been ordering their products to complement Bicol region's bread fruit or *rimas* ice cream.

"Sa ngayon plano naming magkaroon ng information caravan, una sa area namin to promote the product. We also prospect na magkaroon kami ng ugnayan sa DA-AMAD," she added.

The DA-MIMAROPA envisioned a partnership with the DA-Agribusiness and Marketing Assistance Division (AMAD) to give them important information on market development services, assist them in identifying potential market linkages, private adopters, and market matching activities so that they are able to develop an agricultural product market for the Adlay Sweet Cone.

Comparing it to the commercially-available cones

Commercial cones are mostly blended with lots of sugars, wheat flour, and tapioca flour (a starch from cassava plant). Other than having one percent of the amount of iron recommended daily, there is no nutritional benefit in having an ice cream cone. Based on its percent daily values and nutrition facts by the Food and Nutrition Research Institute (FNRI), 100 grams of servings of any type of commercial cones has a total of 417 calories percent daily values.

A typical cone will net around 10 grams of sugar which is almost 50 percent of the recommended daily intake. Consuming high amounts of sugar can lead to weight gain, diabetes, and increased production of ghrelin - a hunger hormone that

tells the body that we are still hungry so you may want to have a second serving.

Aside from sugar, tapioca can cause certain concerns as well. Tapioca naturally produces cyanide. While the manufacturing process most likely gets rid of the cyanide, there is still a risk, no matter how small, that eating tapioca or anything with tapioca in it could introduce cyanide into the body. Products that have tapioca can enjoy every once in a while without worry, but real problems can quickly arise when you are consuming multiple per day.

Unlike typical commercial cones, the Adlay Sweet Cone is made from brown sugar, water, and wheat flour, and instead of using tapioca flour, adlay grain flour is being used.

Adlay grain is highly nutritious. According to a chemical analysis also provided by the FNRI, a 100-gram serving of adlay is superior in terms of its food energy content (365kcal), rich in carbohydrate content (73.9 g), protein (12.8 g), and fat (1.0 g). It is also packed with other minerals

including calcium (25 mg), phosphorus (43.5 mg), iron (5 mg), niacin (4.3 mg), (0.28 mg), and riboflavin (0.19 mg), and has a high fiber that shows promising results in anti-cancer, anti-inflammatory, and blood sugar-lowering properties for optimum health of the human body.

That is why consuming a piece of Adlay Sweet Cone is considered a sweet treat much better than eating the usual, commercially-available ice cream cone.

A year after DA-MIMAROPA first introduced Adlay Sweet Cone into the public; they showcased it again during the 13th NTF hailing it as one of the winners of the best innovative products. ###

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Kapis chips: Nutritious finger food from the sea

by Rena S. Hermoso

Known for its ivory translucent shell, *kapis* or window-pane shell (*Placuna placenta*) is mainly processed into lanterns, candle holders, window panes, lamp shades, flower vases, chandeliers, among other decorative items. Indigenous to various parts of our country, *kapis* is a very promising fishery commodity given the local and global demand for it either as a raw material or as a processed product. However, unbeknownst to many, *kapis* is also an edible marine bivalve mollusk like *tabong*, *talaba*, *kuhol*, and *tulya*.

Samal, Bataan is one of the municipalities in the country that has a rich resource of *kapis*. Thus, most

locals usually engage in *kapis* craft making. The knowledge of processing kapis shells into exquisite decorative and gift items has been passed down from one generation to another.

Aside from this, they also utilize the kapis meat by cooking it into delectable Filipino dishes such as *adobo*, *afritada*, *shanghai* and by processing it into finger foods such as chips and *kropek*.

The idea of *kapis* chips came from one of the members of the KALIWANAG Rural Improvement Club (RIC), a cooperative in Samal that engages in the development of kapis-based products. According to Dr. Lilian C. Garcia, regional director

of Bureau of Fisheries and Aquatic Resources (BFAR) Region 3, by processing the *kapis* meat into chips, an opportunity for additional source of income has opened and at the same time maximum utilization of *kapis* was made possible.

Smaller than the commercially available chips such as tahong chips, the *kapis* chips is very rich in protein making it a healthier option for finger food. If properly stored, it can last up to six months. Currently, the available flavors of *kapis* chips are original and sweet and spicy. *Kapis* chips are available in 75g, 150g, and 250g pouches and sold at Php 100, Php 200 and Php 300, respectively. It can be bought at the municipal and provincial

tourism offices in Bataan and at the pasalubong center in Samal, Bataan, as well.

Six years after its inception, the *kapis* chips with its palatable taste have continued to spark and attract the attention of the buyers according to Ms. Gladys T. Resubal, aquaculturist from the Office of the Provincial Agriculturist in Balanga City, Bataan. Aside from the income generated through making wonderful decorative and gift items from *kapis*, they are also now earning an additional estimated annual income of Php 200,000 from the profits of selling *kapis* chips.

To ensure that they would have sufficient stock of *kapis* and to avoid its exploitation, Ms. Resubal said that per sanctuary they “stock more than a ton of *kapis* breeders,

iyon ang nanganganak to increase production.” She also added, “We regulate harvesting of small *kapis* and breeders. *Bawal kunin iyong* less than two inches *na kapis and iyong* breeders.”

KALIWANAG RIC is one of the cooperatives in Samal that was supported through the project, “Technology Promotion and Utilization of Window Pane Oyster (*Placuna placenta*) Products,” funded by the Bureau of Agricultural Research and implemented by BFAR Region 3, provincial government of Bataan, and local government unit of Balanga.

Dr. Garcia, project leader, and Ms. Resubal, co-project leader, realized the potential of the *kapis* industry in Bataan. They saw that

the “maximum utilization of fishery products through application of appropriate technologies increases productivity and income, and generates jobs.” With this, the project was aimed to: improve the existing *kapis* based products and develop new ones; develop the packaging of the products; capacitate cooperators/beneficiaries in the production of *kapis* products; improve production facilities; and assist in the promotion and marketing of the *kapis* products. ###

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Fresh Kapis (*Placuna placenta*)

Kapis Chips

Goat meat **on-the-go**

by Ephraim John J. Gestupa



Filipinos have impeccable taste and it shows even to the simplest “*pulutan*.” In an occasion where eating isn’t even the main activity, the food still has to be delicious.

In Northern Luzon, a favorite partner for a round of drinks is chevon or goat’s meat dishes. Ask anyone from Ilocos Norte and they would tell you that no celebration is complete without *papaítan*, *kaldlereta*, or *kinilaw na kambing*. It’s no wonder the Ilocos region is among the top producers of goat and goat-based products.

Because we live in such a fast-paced world, the locals who once enjoyed eating goat’s meat at home in the province may have likely moved to the city or even overseas, the laid back provincial lifestyle was traded in for a busy and frantic urban hustle.

What still remains is a longing for a taste of home. So the folks from Central Luzon, a region that also has a growing goat production industry, set out to bring beloved homemade goat dishes to the city.

According to Ms. Venus Quines from the Department of Food Science and Technology of Central Luzon State University (CLSU), goat’s meat may be popular among those who eat it as pulutan, but as processed, ready-to-eat products, such form has not yet been properly developed. CLSU has therefore placed themselves to be among the universities at the forefront of further realizing the profitability of chevon through product development. “Together we can claim *na sa kambing, may kita*,” said Ms. Quines.

This year, CLSU unveiled three new and innovative chevon-based products through a research initiative funded by the Bureau of Agricultural Research (BAR) through its National Technology Commercialization Program titled “Enhancement if Innovative Chevon-Based Products Towards Commercialization.”

CLSU saw that the time was ripe to bring chevon-based products not only to the local market but also internationally. Both Central Luzon and Northern Luzon had earlier began improving the practice of

goat-raising through the research and development (R&D) efforts done by BAR.

According to Dr. Alma De Leon from the Department of Food Science and Technology in CLSU’s College of Home Science and Industry, “some of CLSU’s R&D activities supported by DA to improve goat production are the breed improvement through the three-way-cross goats and mutton commercialization.” Now that the supplies of goat’s meat were improved it was only natural to begin building product-based enterprises.

Aside from the development of local goat production Central Luzon, another reason why CLSU ventured into chevon food processing is the increasing awareness of consumers to be more health conscious. When compared to traditional protein sources such as poultry, pork, or beef, goat meat has the lowest total fat, saturated fat, and cholesterol. Chevon also contains higher levels of iron and protein compared to equal portions of other cooked meat.

CLSU’s project developed the

following products: Instant chevon *papaitan*, chevon jerky which they branded as *bak-wa*, and Instant *kapukan*. From the recipe, to the business mode, to consumer feedback, to the packaging, CLSU's project identified and enhanced the production process of the ready-to-eat chevon products.

Earlier on during the study, CLSU conducted a survey in 10 towns within Nueva Ecija through self-administered questionnaires. The survey helped determine the most popular chevon dishes among consumers as well as served relevant baseline information for the university to come up with a marketing strategy. Based on the results of the study, the three most popular dishes were *papaitan*, *kapukan*, and *kaldereta*.

Prototypes of these products were then made as part of the undergraduate thesis of the BS in Food Technology students. They used various kitchen recipes in cooking these dishes for the initial formulations and developed specific protocols to stabilize the products. Resulting prototypes were then subjected to consumer testing and the most acceptable ones were used in the pilot production operation of the study.

Instant *papaitan* is a take-off from the traditional *papaitan* which is a native delicacy from Northern Luzon. The chevon meat is dehydrated and placed inside a sealed container for longer shelf life that lasts for six months. The spices and seasoning have already been incorporated to the chevon bits and all one needs to do is boil the dehydrated chevon bits for 10 minutes.

Instant *kapukan* follows a similar concept but the goat's meat for this

particular dish is tenderized and grilled goat's skin. *Kapukan* is a salad (ceviche) while *papaitan* is a stew. Both are sour but *papaitan* has bitter notes in its taste. Instant *kapukan* can be conveniently consumed by boiling the dehydrated chevon skin bits for 10 minutes and then drained. After which it is spiked with mixture calamansi and ginger juice, finely chopped dehydrated onions, bell pepper and chili pepper which are also found in the packaging container.

Probably the most unique of the bunch is the chevon jerky or *bak-wa*. *Bak-wa* is a Chinese meat snack made up of the ground goat's meat spiced with salt and chilli, marinated for two days, made flat against a sheet tray, dried and cut to pieces around an inch wide. After drying, staff at CLSU's food laboratory would coat the flattened chevon first in mango puree before packaging them in vacuum sealed ziplock containers that keep the products fresh for six months. One just has to pop them out and eat the chevon jerky off its packaging, no cooking needed.

CLSU is currently working on developing a fourth instant chevon dish. "We have come up with the prototype of *binalot na kalderetang*

kambing. However, the vacuum packed chevon *binalot* needs to be packed and sterilized in a food processing facility in Metro Manila. Due to the distance of our University to the food processing facility, the team decided to process vacuum-packed restructured chevon *tapa* instead," explained Dr. De Leon.

CLSU, through its Technology Transfer Office headed by Dr. Pablo Rafael, is offering the technology they have developed in processing instant-chevon products to private individuals who are interested in starting a business on chevon products.

As of July of 2018, CLSU has been selling their instant chevon products on campus: at Dairy Box located at the PCC Compound and at U-Mart. *Papaitan* and *kapukan* are sold at Php150.00/ 50 gram pack while *bak-wa* is being sold at Php 250.00/100 gram pack. ###

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Feeding your skin with coffee

by Rita T. dela Cruz

Imagine the smell of roasted fine ground coffee beans, brewed and poured in a cup. Now scrap that and imagine the same freshly-roasted ground coffee being slathered on the face and the body as part of a beauty regimen. The lush coffee aroma does not only make the skin smell amazing, it also has the ability to exfoliate leaving the skin polish as well.

Packaged and bottled into a two-in-one wonder product called “Coffee Body Scrub and Massage Cream,” a result of years of study led by Dr. Estela Taño of the Green Rescue Organic Association, Incorporated (GRO, Inc.).

This research initiative was part of the outputs of a project titled, “Promotion of Organic Coffee and Cacao under Coconut in Candelaria, Quezon” implemented by the Quezon Agricultural Research and Experiment Station (QARES) in Tiaong, Quezon in 2011-2014. Funded by the Bureau of Agricultural Research (BAR), under its National Technology Commercialization Program (NTCP), the project aimed to promote organic production technology for coffee and cacao under coconut plantation.

One of the activities undertaken under the project was product development using materials from

organic plantations and marketing of these farm products. “Value-adding activities and establishing new markets were implemented to increase people’s income, divert them from uncontrolled exploitation of natural resources in the area and to show them that they do not have to migrate in search of better jobs once enterprises have been put in place,” explained Dr. Taño.

First public appearance

The Coffee Body Scrub and Massage Cream was first introduced by the group of Dr. Taño in 2015. It was one of the featured products of GRO, Inc. at their booth during the 11th Agriculture and Fisheries Technology Forum and Product Exhibition (NTF) on 7-9 August 2015 at SM Megamall, Mandaluyong City. The event was organized and spearheaded by BAR in support to the funded researches implemented by partner-institutions all over the country.

The product took the limelight further when it won the second prize for the “Best New Product Award” during the 2015 NTF. All the entries for that year were evaluated based on creativity and uniqueness, relevance to food security, health and wellness, good product attributes, packaging and labeling, and market potential and

competitiveness.

The product was adjudged as a winner because the product provided a good option for coffee farmers in terms of marketability, especially in cases when the price of coffee is low. According to the judges, “*Tuloy-tuloy lang ang production nila ng kape kahit mababa ang presyo ng bentahan, kasi sure sila na may market pa rin, at equally-competitive prices kahit papano.*”


According to Dr. Taño, the product is being marketed under the trademark Masalukot, named after a mountain in Candelaria, Quezon Province, which was also the site of the project. The Masalukot Black Gold Coffee Body Scrub and Massage Cream comes in two sizes: small (120ml) and big (250ml) which are sold for Php199 and Php399, respectively.

All-natural body scrub and massage cream

“Who would want to rub chemicals on their skin when there is an all-natural alternative?” asked Dr. Taño to the attendees during the BAR Seminar Series on 23 June 2016 wherein “Coffee Body Scrub and Massage Cream in One” was one of the two featured topics.

According to the presentation of




Masalukot
BLACK GOLD

**COFFEE
BODY SCRUB
AND
MASSAGE
CREAM**

Ingredients: Virgin coconut oil, coffee powder, beeswax, and essential oils.

Grown among the rocks, underneath of which the remains of the retreating Japanese Army of World War II are buried, Masalukot coffee is the real black gold which enriches the lives of the people in this area. Formulated with Virgin coconut oil, Masalukot Black Gold Body Scrub and Massage Cream brings back the strength, smoothness and cleanness of anyone's body and skin.

Let the black gold continue to shine from among these hills and mountains.

120ml

Manufactured by:
GRO-Green Reseach & Development
Association, Inc. Tiaog, Benguet, Philippines

Bureau of Agricultural Research
Department of Agriculture

Proudly Philippine

9614386287

Dr. Taño, “this new coffee body scrub uses all-natural ingredients not found in ordinary chemical-based body scrub and exfoliators.”

When asked why a coffee body scrub and massage cream in one, she cited [at least] five benefits of the products. “Because it has exfoliating and anti-inflammatory properties, temporary cellulite reduction effect, improves blood circulation, reduces eye puffiness and makes skin super smooth and clean.”

She added that aside from being an “amazing exfoliant”, the product itself has caffeine, an effective stimulant when consumed as beverage but has “lesser known benefits” when it comes to its effects when applied on the skin.

“Caffeine helps tighten the skin and helps reduce cellulite. When applied under and around the eyes, it can minimize the appearance of puffy eyes because caffeine restricts blood vessels, reduces swelling and inflammation. It can also help treat

non-hereditary dark circles under the eyes,” she explained.

She added that “caffeine is loaded with antioxidants which help fight premature skin aging, wrinkles, sun spots and fine lines.”

However, she mentioned that not all coffee scrubs are created equal since according to her, the caffeine content of the coffee scrub is an important factor. “Some coffee scrubs use recycled brewed coffee grounds which means much of the caffeine content is depleted. This new coffee body scrub is made from the finest roasted ground beans ever thus, cannot be compared with any other known body scrub,” she explained.

Do-It-Yourself body scrub and massage cream

During the seminar, Dr. Taño demonstrated how an individual can prepare the product even at the comfort of their own homes. Among the basic materials were: 150 grams roasted fine ground

coffee beans, 300 ml Virgin Coconut Oil, and 5 grams beeswax.

“Heat all together under low fire for about 30 to 45 minutes. Stir occasionally. Let it cool. Pour in suitable containers and label,” she methodically explained.

She also demonstrated how the product is used. “First, shake the bottle, put drops of the coffee scrub on the skin. Rub gently on the skin. Dead skin cells and dirt will fall off. Continue scrubbing until the skin is clean and smooth.” She also cautioned users that “they may experience perspiring indicating that the skin pores had been opened, just dry with a towel.” ###

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“This new coffee body scrub uses all-natural ingredients not found in ordinary chemical-based body scrub and exfoliators... it has exfoliating and anti-inflammatory properties, temporary cellulite reduction effect, improves blood circulation, reduces eye puffiness and makes skin super smooth and clean.” - Dr. Estela Taño





Slimy veggies, saluyot (*Corchorus olitorius*) and okra (*Abelmoschus esculentus*), although not as popular as other vegetables, are considered powerhouse when it comes to valuable nutrients.

Saluyot is an excellent source of vitamins A, C and E, fiber, minerals including calcium and iron and other micronutrients. The leaves are highly nutritious and rich in essential amino acids and proteins. It contains antioxidants such as β -carotene, α -tocopherol, glutathione and phenols, among others. Its extract has been reported to suppress the inducing effects of dioxins. Its polyphenolic isolate has shown anti-obesity effect, while its aqueous extract has been found to have protective effect in arsenic-induced myocardial injury. The methanolic extracts of *saluyot* seeds have also shown a broad spectrum of antibacterial activity.

Meanwhile, *okra* has the most important vegetable source of viscous fiber, an important dietary component to lower cholesterol. It has high-content of carbohydrates, proteins, glycol-protein, and other dietary elements enhance the importance of this foodstuff in the human diet. Due to the various uses of its leaves, buds, flowers, pods, and stems it has been labelled as a multipurpose crop. *Okra's* nutraceutical value may be regarded as an important area of the nutritional and phytotherapeutic research being an important source of vitamins, calcium, and potassium.

SALOKRA:

Wonder-duo for health and wellness

by Patrick Raymond A. Lesaca

Not only are saluyot and okra nutritious, they are also widely attributed for their medicinal properties, having found no toxin or significant anti-nutritional factors. This makes saluyot and okra or simply, “*SalOkra*”, a term coined by Atty. Abdurrahman T. Canacan, Chancellor of Mindanao State University - General Santos City (MSU-GSC), a wonder-duo for health and wellness.

SalOkra for health and wellness

Given the huge potential of *SalOkra*, researchers from MSU-GSC conducted a study that evaluated the nutraceutical and nutricosmetic properties of saluyot and okra through chemical and bio-guided assays specifically, their antioxidant, antimicrobial, antihyperglycemic properties. The project titled “Evaluation and Development of Nutraceutical and Cosmeceutical Products from *Saluyot* and *Okra*: Protective and Preventive Alternatives for Health

and Wellness” was funded by the Bureau of Agricultural Research through its National Technology Commercialization Program.

According to Ms. Tres Tinna Martin, project leader, specifically, their research study aimed to: 1) develop capsule, jelly, and skin cream products from the extracts of *saluyot* and *okra*; 2) determine safety, quality, and biological property of nutraceutical and nutricosmetic products developed from saluyot and okra through Food and Drug Administration (FDA)-approved analytical tests; and 3) provide training to target adopters of the technology for potential entrepreneurship.

Considering its nutraceutical and nutricosmetic properties, and with people going more health- and beauty-conscious, *SalOkra* can be considered as valued sources of raw materials in the development of products for nutraceutical and cosmeceutical purposes.

As a matter of fact, in a projection made by the Nutrition Business Journal, there will be an increase of 10-18 percent per year on nutraceutical and cosmeceutical production. Putting this into perspective, *saluyot* and *okra* may deliver a strong impact not only to health, beauty and wellness industry, but also to the agri-business sector and the small-time farmers and backyard gardeners.

The researchers from MSU-GSC conducted several tests and experiments including phytochemical screening, microbiological test, pharmacotoxicological, validation tests, antioxidant activities, Radical-Scavenging Activity, and anti-hyperglycemic property test, among others.

The scientific validation of the identified medicinal resources of saluyot and okra were



Technology transfer participants with research proponents, Prof. Maria Amelia Punla (seating 2nd from the right) and Prof. Angem L. Descallar (standing 4th from the right)

conducted through bioguided assays (pharmaco-toxicological and microbiological). The bioassay tests (antioxidant, antimicrobial, and anti-hyperglycemic) that will confirm the nutraceutical and cosmeceutical properties of the plants were also conducted as well as the product development, safety testing, and quality screening of *saluyot* and *okra* nutricosmetic products were conducted.

All tests were carried out and done using the standard research protocols. The capsule, face cream, and lotion generated from *saluyot* and *okra* were subjected to post production testing to validate their antioxidant, antimicrobial, and antihyperglycemic analyses.

Products developed from SalOkra

Three products were developed from *SalOkra*. These are: 1) *saluyot* and *okra* capsule, 2) hand and body lotion with *saluyot* and *okra* extracts, and 3) face cream with *saluyot* and *okra* extracts.

Individual preparations for each line

product were meticulously conducted at MSU-GSC. The product lines were developed under the name “Nateura,” which pertains to the natural ingredients *saluyot* and *okra* as its major components.

Nateura Antioxidant Capsule boosts the body’s natural defences against lifestyle-related diseases. It was made from combined phytonutrients of *saluyot* and *okra* that helps the body fight daily stress.

Nateura Hand and Body Lotion is formulated to give a baby-smooth skin. Enriched with natural antioxidants and emollients from *saluyot* and *okra*, it helps prevent the skin from looking dry and unhealthy.

Nateura Face Cream moisturizes and soothes tired and dry skin. It contains natural antioxidants from *saluyot* and *okra* proven by science to promote fresh and younger-looking skin.

In 2016, Nateura was officially registered as a trademark for the nutraceutical and cosmeceutical products of MSU. Likewise, the

university has patented 12 Utility Models (UMs) for the formulations and processes in product preparation.

Quality analysis of all the products in determining the heavy metal content, moisture and pH were measured. All parameters tested for quality assurance showed results that conform to the standards specified for cosmetic products. The other physico-chemical parameters such as size, shape, color, uniformity of weight, viscosity, and skin irritation likewise conformed to the standards.

Saluyot leaf and *okra* pod extracts, which were used in the products, have shown antimicrobial and antioxidant activities.

Saluyot leaf extract administered orally and subcutaneously exhibited notable antihyperglycemic activity in both alloxan-induced and normoglycemic rats. *Saluyot* capsule has shown capacity to reduce blood glucose levels comparable with the commercially available supplement. Developed products exhibited acceptable physico-chemical properties and heavy metal content. Meanwhile, both the face





cream and lotion exhibited capacity to retain moisture in a comparable degree to the commercial products.

The MSU-BAR partnership through this study is in line with the drive of the government to promote the use of traditional medicine. Republic Act 8423, otherwise known as the Traditional and Alternative Medicine Act (TAMA) of 1997, advocates the use of traditional medicine nationwide.

With the utilization of the research output, it is expected that demands for *saluyot* and *okra* will escalate necessitating mass cultivation of these vegetable not only as food crop but also for its cosmeceutical need,

thus providing opportunities for local farmers/growers to generate additional income. Furthermore, when the novel plant material sources become readily available and are sufficient to meet local demands, the new line of drugs and cosmetics to be manufactured will be cost-effective targeting improved health and personal care of the general populace.

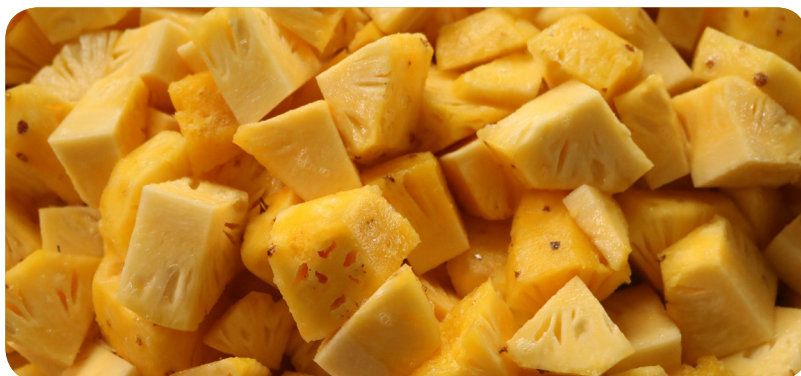
As for the marketing strategy, the group of researchers from MSU-GSC will focus on grassroots marketing, targeting the masses as consumers. The Nateura products will be made cheap and affordable to the buying public while ensuring their nutraceutical and cosmeceutical

properties. Furthermore, trainings on product development on capsule, face cream and lotion were conducted for technology transfer to potential adopters and entrepreneurs. The MSU-GSC is currently complying with the requirements set by FDA to be granted a License to Operate (LTO) for the full-scale production and marketing of the Nateura products. ###

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fairs where the demand for their products is high, Pimentel expressed their need for an area where they can grow their own supply of Queen Pineapple, and the support needed to put up a production facility in order for their products to secure Bureau of Food and Drugs accreditation. Right now, their association relies on its women members to buy the excess harvest from their farmer husbands who manage pineapple plantations.

Another challenge faced by pineapple growers in Camarines Norte was observed by both Ms. Marcelino and Mr. Hetosis. They pointed out the need for farmers to adhere to a cropping calendar that would ensure a steady supply of Queen Pineapple throughout the year.

“Minsan ang nangyayari po ay dahil walang control yung pag-aani balos nagsasabay sabay yung supply ng pineapple at doon po bumababa yung presyo ng pinya,” revealed Mr. Retosis.

This year, Camarines Norte Lowland Rainfed Research Station (CNLRRS), BIARC’s research station in Daet, Camarines Norte, is working on a compendium project under the leadership of Ms. Maria Christina Campita, senior science research specialist at CNLRRS, that would consolidate the extensive body of knowledge on pineapple generated by research and development (R&D) activities in the region. This compendium project serves as a user manual for Good Practices (GP) stakeholders highlighting the technology generated, existing practices, success stories, and SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of the industry.

Through the continuous R&D efforts of DA-RFO 5 and the growing enterprises established in Camarines Norte, Queen Pineapple has grown to be a sweet staple of Bicolandia.

Seeing the success of the research projects focusing on Queen Pineapple, BIARC, CNLRRS, Aklan State University, and the Bureau of Agricultural Research (BAR) have moved on to adopting similar research strategies in improving the yield of other pineapple varieties such as Red Spanish Pineapple. This was after Secretary Emmanuel Piñol’s marching orders for BAR to conduct research initiatives aimed at improving the taste of the Red Spanish Pineapple variety which is usually only used for fiber production. ###

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said that “if marketed well, the selling points of the cacao wine are: 1) its unique origin—that it comes from the pulp. If I am not mistaken, this is the first cacao wine in the world that is made from the pulp. Most cacao wines are wines that have been infused with either cacao beans or chocolate; 2) its delicious taste—it is a good option for a dessert wine; and, that 3) it is made by our local farmers.” “Grape farmers have their own wine. Now, our local cacao farmers make cacao wine. How wonderful is that!” ended Ms. Cinco.

Ms. Cinco learned the existence of the DA-QARES cacao wine when she visited Mr. Godofredo Dereza (or Mang Fred for short), a cacao farmer from Nagcarlan, Laguna. “He showed me the cacao wine that Mr. Bihis of DA-QARES taught and trained them to make,” she added. According to Mr. Bihis, “Mang Fred was the president of Laguna Cacao Farmers’ Association (LACAFA) when they approached us for cacao processing technologies. They adopted the technologies and are producing cacao wine.” “Currently, [he] is the president of Samahan ng Magsasaka ng Barangay Banilad, member of LACAFA and Cacao Farmer’s Association of Nagcarlan (CFAN). He’s still producing cacao wine together with other members of CFAN,” added Mr. Bihis.

The Cacao Farmers’ Association of San Antonio, Quezon are now producing cacao wines in commercial scale. The wines are available at 375mL bottles and sold for Php350 at Quezon’s BEST, Tiaong and Tiaong Tourism. “Ngayon ang pinakamalaking pinagbebentahan ng cacao wine natin ay sa TienDA na ginagawa ng Department of Agriculture,” concluded Mr. Bihis. ###

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Do you know that cocoa butter, which is processed into chocolates, is not the only product from Cacao beans (*Theobroma cacao*)? The Quezon Agricultural Research and Experiment Station (QARES) of the Department of Agriculture-Regional Field Office 4A has been developing novel products from cacao pulp (*mucilage*). One of these products is the healthy soap that comes in two sizes: regular bar soap and hotel-sized soap. According to Dennis Bihis, project leader, they've thought of this product due to its demand in a number of hotels in the area. This initiative is part of the BAR-funded project, "Cacao Commercialization in the Province of Quezon" under the National Technology Commercialization Program. (Photo by RDelaCruz)



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