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L.A. TRADING

A sweet success that
is "ripe" in season

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Harvesting the fruits of research for development

It is with pride that we share with you the results of researches we support. These are the products of activities that are in line with our two banner programs: Community-based Participatory Action Research (CPAR) and National Technology Commercialization Program (NTCP). These two programs are interactive, complementary, and highlight BAR's commitment to developing innovative production management systems ably supported by technologies generated from research.

We are fully cognizant that effective management systems are only possible if these are strongly supported by technological advances coming from research. Such interaction is only realizable through the institutionalization of community-based action research. This approach guarantees the full utilization of research results.

Although we have not yet fully articulated the latest trend in management as result-based management (RBM), our research results are in this direction as shown by our banner programs. There are five key trends that you will readily notice in this set of research reports:

One, agricultural production is now enjoying the full benefit of the use of alternative technologies. Our investment in developing and harnessing the productive potentials of technologies is very much evident now;

Two, you will likewise notice that our technical interventions are strongly complemented by organizing and mobilizing communities through organizational development focused on

agribusiness development;

Three, we are equally investing not only in linking our farmers to the market but also in making them conscious of the importance of the concepts of value chain and consumers' demand;

Four, farmers are now being made sensitive to the value of information thereby making ICT important to them in effectively managing their production system. We are in the process of installing an information-driven agriculture and fisheries development; and,

Five, we are continuously sharpening the frame of reference of our production systems by critically analyzing the interaction and complementation of information and knowledge. In this way, we can generate a far more effective information management system in agriculture and fisheries. Work in this area is very much aligned with the aspiration of DA to install a unified information system.

We wish to assure our public that we, at BAR, will continue to pursue these trajectories in agribusiness development. More than ever, BAR is committed to shorten such trajectories with critical, relevant, and timely researches.

We, therefore, invite the public to support our work in R&D and help our farmers take advantage of the burgeoning information revolution in this time of globalization and competitiveness.


Nicomedes P. Eleazar, CESO IV
Director, BAR

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STORY & PHOTOS BY MARLOWE U. AQUINO, PhD

Taste is a matter of personal preference and this is certainly true when it comes to coffee. Individuals are fixated with coffee based on taste and aroma. These are considerations required by our daily cup of coffee. A strong or, equally, a milder flavor is dependent on how it was blended. Differences may exist in certain areas because of variations in the requirements of people engaged in coffee production and processing. Differences in the local taste may occur but Cordillera coffee has made its own distinction when it comes to taste and aroma.

To produce the desired flavor, various coffee varieties are blended together. The principal aim of blending coffee is to arrive at a flavor and aroma that can be consistently reproduced. Cordillera coffee is a natural product made to perfection and processed so as to elicit in the coffee drinkers the inner feelings of warmth and openness. Given the quality of harvest in the Cordillera mountain slopes, the bean tells the story of a perfect blend and a true work of art.

Cordillera coffee is considered the best coffee in town in cafés, coffee shops, restaurants, and most especially, in Cordilleran households. This is the reason

why it is dubbed the pride of every Cordilleran who has good taste and the proud bearer of his culture.

Every coffee drinker craves for a perfect blend with an oozing aroma. Whether it is brewed in the traditional way or using a more sophisticated coffee brewer, it is always the aromatic scent that leads a person to crave for a second serving.

How do Cordillerans prepare this coffee? Where do they get that perfect coffee blend? Do they follow certain procedures? Are coffee drinkers aware of such process? These are the subjects of shared stories behind the aromatic scent experienced by coffee lovers and produced by local growers.

Cordillera coffee

Being a Cordilleran myself, it is hard not to notice the aromatic scent of brewing coffee coming from a distant household prepared either in the traditional way from a steaming kettle over a hot fire or a percolator connected to an electric wall socket. The scent leads me to crave for the brew together with a slice of cinnamon roll or ensaymada found in a nearby bakery. It is like a feeling of love that once it is in

your blood, it will never leave you. The good thing is, coffee is life and it shows in every coffee drinker.

Cordillera coffee has been in existence for the past 50 years or so when rice and vegetable farming were intensified. It was a constant beverage among farmers especially in the early morning before going to the field to attend to their farming activities.

Cordillerans make sure that there is always a hot pot of brewing coffee. It became an energy drink to keep them warm together with the local wine, tapuey also brewed to perfection from traditional upland rice varieties. Coffee drinking also serves as a socializing activity that starts at four o'clock in the morning over burning firewood where stories are passed from generation to generation.

The introduction of coffee in the Philippines could be traced back to the arrival of Spanish traders in the early 1500s. However, there is no record that would show the exact date of coffee production in the country that led our indigenous people to cultivate the crop intensively.

Four coffee varieties were introduced in the country directly from

South America and Indonesia. These were Arabica, Excelsa, Liberica, and Robusta. Each variety has its own unique characteristics but all four require careful production management techniques. Variations in taste depend on the agroclimatic environment.

Cordillera coffee is made mostly of the Arabica variety. It thrives well under Cordillera climate and soil conditions.

Kalinga and Apayao produce a blend of Arabica, Liberica, and Robusta; Mountain Province produces Arabica and Robusta; Benguet produces Arabica, Robusta, and Excelsa.

These coffee varieties are grown based on farmers' and peoples' resources and preferences. As such, every coffee bean is itself a story of production on the hills and mountain slopes as retold by farmers in their tales of courage and strength.

Production management

The intensification of coffee production in the Cordillera is prompted by the concept of perfect blending. Researchers at the Benguet State University (BSU) have constantly been in search for innovative processes to produce that so-called "perfect blend" of coffee crop production.

BSU coffee is produced in the mountain slopes of their Nature Park located at Ampasit, Longlong, La Trinidad, Benguet—a place that is a picture of beauty. It shows the ideal production system under tall pine trees. Coffee production management technologies are shared with farmers with the goal of producing, managing and maintaining the best of Cordillera coffee.

Today, the production activities pass quality assurance procedures that combine organic farming and standardized coffee processing. BSU's coffee research, development and extension (RDE) activities are promoted and disseminated all over the Cordilleras with farmers and their communities participating to grow and manage the perfect coffee blend.

Coffee seeds are sown in small containers until they reach an ideal height prior to transplanting. The

seedlings are managed with good water supply, fertilization, and crop protection. Once they are ready for planting, they are transplanted in open spaces under pine trees or spaces with a distance of 3 meters x 3 meters apart. The distance gives the plant space to grow robustly and produce the quality coffee beans.

Coffee plants must be planted in partially shaded areas to ensure that there is balance in the overall climatic and topographic requirements of the plant. Too much sunlight makes the crop unproductive; it produces more vegetation than coffee cherries. This condition leads the coffee farmer to employ minimal production management activities. Combining nature's support and farmer's desire and attention to produce the cherries result to quality beans for processing.

Coffee bean processing

Coffee bean processing starts with proper harvesting time. Red colored cherries are harvested manually by trained farmers. On the other hand, there have been observations of coffee cherries being harvested by Cordillera wild cats or the

so-called Philippine civet cat (*Paradoxurus philippinensis*) in some remote communities. The civet cat, known in the Cordillera as motit, is one of the fast disappearing species of wild cats that eat coffee cherries. These wild animals excrete these as feces that, once cleaned, could be processed as premium quality coffee. This is the reason why government agencies and local communities are into its protection.

Harvested coffee cherries are de-pulped and sun dried. Sun drying shortens by one-third the roasting time. During the process, one cannot help but smell the aroma. Constant roasting to perfection is the key factor to obtain the best bean product. Once done, the beans are packed as whole beans or ground. Immediately upon grinding, these are packed in containers to maintain freshness and aromatic scent.

Cordillera coffee passes a whole process of quality perfection to obtain the best coffee ever. To experience the best local coffee, one must be into it to smell and taste what is believed to be Cordillera's pride. Smell it, taste it, and believe it exists. ☺



Improved and repackaged salted duck eggs from Ilocos

STORY & PHOTOS BY RITA T. DELA CRUZ

If you think all salted eggs are red, think again. With the recent technology developed by the Department of Agriculture-Regional Field Unit I (DA-RFU I), Ilocos Integrated Agricultural Research Center (ILIARC) led by its manager and principal researcher, Dr. Jovita M. Datuin, you'll never look at salted eggs the same way again.

Not only did they improve the taste and texture, they also gave our good 'ol itlog na pula a total make-over. Gone are the troublesome dyes that stick to your hands whenever you crack an egg. Customers need not worry about the suspected health risk from the colorings used in dyeing salted eggs.

Ducks as source of salted eggs

Duck, although it ranks second only to chicken for egg and meat production, is also an important sub sector of the Philippine poultry industry. It provides employment and income-generating opportunities for Filipinos, particularly those in the rural and marginal areas. Majority of ducks in the Philippines are kept by smallholder farmers in the villages.

Among the avian species, duck is considered the most adaptable because it can survive in almost all kinds of environmental conditions.

Raising ducks is simple, inexpensive, and requires non-elaborate

housing facilities. Ducks need very minimal space for rearing compared to chicken. They are relatively resilient, resistant to common diseases, and subsist on a variety of feeds. They can be fed on a variety of food, such as rice, cassava, copra, corn, and fruits.

And, since ducks live longer than chicken, farmers can already make a profit in the second year of laying. Another advantage is the longer interval required for the replacement of stock.

For the Philippine Mallard duck (*Anas platyrhynchos* L.), which is raised primarily for egg production, raising it offers a wide variety of business opportunities.



Studies on the laying performance of Mallard duck from several locations in the Philippines revealed wide variability in egg production. According to the study of Dr. Angel L. Lambio of the Institute of Animal Science, University of the Philippines, Los Banos (IAS-ULPB), on the average, egg production of Philippine Mallard ducks, also known as "Pateros duck", varied from 48 percent to 67.5 percent of the laying ducks.

As profitable business

Salted duck egg, locally known as itlog na maalat is a common feature in Filipino dining table especially during breakfast. It can be eaten alone or with steamed rice or mixed in salad style with diced tomatoes and onions. It is also used as an ingredient in pastries and toppings on breads and other bakery products, especially bingka.

In terms of its nutrient content, salted egg is packed with nutrients. It is highest in calcium (120 mg), carbohydrates (4.4 mg), ash (202 mg), and thiamin (0.47 mg) compared to fresh egg, balut, penoy, or century egg.

Whether it is home-based or commercially produced, salted eggs command competitive prices in the market providing profitable income for Filipinos.

With the ever-growing populations of Filipinos around the world, salted eggs have also become well-sought outside the country. According to the study of Dr. Datuin, the Philippines is already exporting processed duck products including salted eggs to Kuwait, Arabia, Peninsula, Bahrain, and even the Trust Territory in the Pacific Islands.

Improved technology

The technology came from the results of a study titled "Shelf-life Evaluation of Salted Eggs Cured by Different Processing Methods". The technology that was derived from the study deviated from the usual "itlog na maalat" known to most Filipinos since the technology uses four different processing methods.

Specifically, the study wanted to determine the shelf -life of salted eggs processed in different curing media to



Dr. Jovita M. Datuin lectures on improved salted egg production during a seminar sponsored by BAR.

appropriately indicate expiration date of the products, and to recommend the most appropriate processing method for local and export markets.

Four curing media were used to evaluate the quality of the salted eggs given specific criteria which included egg white color, egg white texture, egg white saltiness, yolk color, yolk texture and consistency, flavor, off-flavor, and general acceptability.

The curing media used were salt solution, ordinary clay method, heated clay, and autoclaved clay. Fresh duck eggs were submerged in the curing media for 20 days and then boiled for four hours.

The heated clay method is a treatment similar to the ordinary clay method usually used in processing salted eggs, except that the clay is pulverized and heated for one hour before mixing with salt.

Results of the sensory evaluation showed that salted eggs that were subjected to the four curing methods significantly differed in quality and taste compared to the usual soil-salt mixture. The egg white is off white, smooth but not soft and the saltiness is moderately normal. The yolk is yellow orange in color, gritty and oily in texture and consistency, and rich and full in flavor.

While the usual salted eggs expire after 3-4 weeks, those that were subjected to heated and autoclaved clay methods can last until six weeks. Flavor and general acceptability decline if the storage period reaches the eighth week.

For the most appropriate method

for the local and export markets, Dr. Datuin recommended the autoclaved clay process as it has a good general acceptability rating and offers a longer storage period of eight weeks.

For the local market, however, producers are advised to process duck eggs into salted eggs using the clay method either heated or autoclaved. The autoclaving process may entail an extra cost on the part of the processors, thus heating the clay for one hour is considered more practical and easier to prolong the storage period and improve the quality of salted eggs. For the export market, autoclaved clay salted eggs gives longer storage period and better quality.

Aside from achieving the longer shelf life, improved taste and texture of the egg white and yolk, Dr. Datuin and her group thought of a value-adding touch for their product. Prohibited colorings such as the cancer-causing Sudan Red have been found in China-made salted eggs. This has made some customers wary of colored eggs.

"We do not use dye to color the eggshell. Instead we use corn stovers to package and adorn them," Dr. Datuin enthusiastically explained during a seminar wherein she gave samples of salted eggs now with an enhanced packaging to the audience.

For more information, please contact Dr. Jovita M. Datuin, manager of the Department of Agriculture-Regional Field Unit I, Ilocos Integrated Agricultural Research Center, DMMSU Compound, Bacnotan, La Union or contact her at telephone no. (072) 888-5315 or mobile no. (0918) 85123918 or via e-mail at: jovidatuin@yahoo.com

Expanding agribusiness potential of malunggay and its products

STORY BY **MA. ELOISA E. HERNANDEZ** and **LOVELLA P. GUARIN**

PHOTOS BY MA. ELOISA E. HERNANDEZ

Take a second look at that lowly malunggay in your backyard. Oftentimes we just ignore it and we would rather spend our precious money for those expensive vegetables in the market. Little did we know that this very ordinary vegetable is packed with essential vitamins and minerals that our body needs.



Fresh malunggay (*Moringa oleifera*) leaves are rich in vitamins A, B, C, calcium, potassium, protein and iron. Studies show that malunggay gives a feeling of wellness and at the same time balances sugar and cholesterol content in the body. Leaves can be prescribed to treat anemia. Dubbed as miracle vegetable or the power gulay, malunggay is now being processed as food fortificant, food supplement, and even potent medicine.

Seeing the great agribusiness potential of malunggay, Agriculture Secretary Arthur C. Yap urged agriculture stakeholders to increase its production and diversify the uses of this vegetable and thereby help in fighting hunger and malnutrition especially in the rural areas.

The Bureau of Agricultural Research (BAR) included malunggay in its Indigenous Plants for Health and Wellness Program and identified the development of malunggay as priority project.

For its part, the DA RFU 5, through its research arm, the Bicol Integrated Agricultural Research Center (BIARC), has been developing and piloting promising technologies for the banner commodities of Bicol, one of which is malunggay. The DA-5 Regional Executive Director, Dr. Jose V. Dayao, has also instructed the six Research Outreach Stations (ROS) in Bicol to facilitate the propagation of planting materials in support to the program.

Developing food products from malunggay

Under the on-going DA-BAR funded project entitled "Development, On-Farm Demonstration and Piloting of Promising Value-adding Technologies for Export Potential and Banner Commodities of Bicol," BIARC has found new ways to integrate malunggay in various food preparations as well as

package it into different product lines. These include malunggay tea, instant juice, malunggay powder, polvoron, yema, cookies, noodles, pastillas, and the "malunggay surprise".

Malunggay leaves were separated from the stalks and were either oven dried or sun dried. These dried leaves become "malunggay tea." The pounded dried leaves of malunggay, on the other hand were turned into "Moringa powder" which can be mixed into common Filipino delicacies such as soups, sauces, instant noodles, polvoron, cookies, and chocolates as an added ingredient. In this way, children who are not very fond of vegetables get to eat essential nutrients present in malunggay without knowing it. The newly developed products have shelf lives of six months at the most depending on the packaging materials used.

BIARC, under the leadership of

its Center Manager, Dr. Elena B. de los Santos, is now in the process of establishing the nutrient facts of these products. They are also conducting further trials to improve their shelf life and enhance product packaging and presentation.

Enhancing the role of R&D and technology commercialization

This initiative of BIARC is being supported by BAR under its National Technology Commercialization Program (NTCP), together with the GMA High Value Commercial Crops (HVCC) Program of the Department of Agriculture RFU 5.

"Through the help of the NTCP, BIARC was able to create awareness regarding the importance of this valuable commodity and at the same time promote the products developed from malunggay," Dr. de los Santos said.

NTCP, one of BAR's flagship programs, is aimed at facilitating the commercialization of newly developed technologies for maximum utilization. Technologies shall be strategically placed and transferred to areas and communities that needed them most. This strategy shall enhance technology transfer as well as realize the impact of research results.

"The processing technologies for Moringa developed by BIARC are a prime example of technologies generated by DA-BAR supported projects which are already ripe for

commercialization," she added. She considers encouraging the development of new production and processing technologies for malunggay products as a big role for BIARC.

BIARC has participated in local and international trade fairs, technology demonstrations, technology fora, trainings and seminars that draw a lot of interested participants. The group also conducted sensory evaluation and consumer acceptability trials as part of their promotional and marketing strategies. They did market matching, domestic marketing trials, and export marketing trials.

The malunggay industry is still very young in the Philippines. Dr. de los Santos envisions that after the implementation of the project, appropriate package of technologies (POTs) can be developed and new products can be made from malunggay.

"In addition, expanded markets for these products shall be developed as additional sources of livelihood in the countryside. At the same time, majority of the people in the community will utilize malunggay as a cheap source of nutrition," she added. 🌱



BIARC develops and pilots promising value-adding technologies from *Moringa*.



Various products from *Moringa oleifera*

Getting one-step closer to pigeon pea's commercialization

STORY BY MIKO JAZMINE J. MOJICA

PHOTOS BY MMSU/HERALDO LAYAOEN



How many Filipinos do you think know about pigeon pea? What do you think the total stranger next to you will say when you ask him or her about it? "I don't know" and "I don't have any idea" are the answers that you'll probably get. But try to talk to any Puerto Rican and he or she will likely tell you that rice with green pigeon peas is their favorite dish. And if you happen to be in India, it's possible that you'll see hectares upon hectares of this crop planted in their semi-arid lands. But what exactly are pigeon peas?

Use and benefits

Pigeon pea (*Cajanus cajan*) is considered both a food and forage crop. It is grown most abundantly in India but can also be found in some regions of Africa, Central America, Australia, and Asia. Because it is a small, round off-white vegetable grown in a pod similar to a pea or bean, it is often used as an alternative to the lima bean. Traditionally, in India and Pakistan, pigeon peas are cracked and made into "dhal", a type of purée that is used as a base for many dishes. The pods and leaves of the pigeon pea are consumed as vegetables. Pigeon pea greens, as well as the peas themselves,

are used as feed to animals. The woody stems of pigeon peas are used as firewood or fence.

Besides its dual purpose, pigeon pea is likewise grown to control erosion which is particularly done in the hilly slopes of Southern China. Pigeon peas are also very drought-resistant and can be grown in areas with very minimal annual rainfall. Moreover, pigeon peas are considered as an important crop for producing green manure to add nutrients and organic matter to the soil. As a medicinal crop, the Hamdard Publication 'Dehati Mualij' from New Delhi, India says it is useful as remedy to the swelling of internal organs like the stomach, liver, and intestines. Because pigeon pea contains high levels of Vitamin B, protein, and, amino acids such as methionine, lysine, and tryptophan, it makes for a well-balanced human food.

Local adoption

It was through the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) that pigeon pea was introduced in the Philippines not too long ago. In 2006, the Philippine Association of Agriculturists, through Dr.

Heraldo Layaoen, a professor and vice-president of the Mariano Marcos State University (MMSU) in Batac, Ilocos Norte, embarked on a project funded by the Bureau of Agricultural Research (BAR) called "Pigeon Pea Commercial Production and Utilization Program".

The program, which lasted for over a year, selected two varieties from the six varieties obtained from ICRISAT. The two varieties are ICPL 88039, a short duration variety that is a good crop after rainfed rice; and ICP 7035, a medium maturity variety, which is good in marginal and rolling areas.

The Bungon Seed Producers Multi-purpose Cooperative (BSPMC) was tapped to develop a village-level seed production system. According to Dr. Layaoen, 4,087 kg pigeon pea seeds were produced but only 1,835 kg of these were accepted as SEEDGRADE. Two private firms, Seed World and Harvest Agribusiness Corporation, were tapped to help in marketing the seeds nationwide.

To familiarize farmers and other stakeholders on the crop's cultural management and pest control, several seminars and trainings were conducted at different venues where collaborating

agencies such as the Department of Agriculture Regional Field Unit (DA-RFU) I, II, III, and CAR; Department of Agrarian Reform (DAR) offices in Ilocos Norte, Isabela, and Zambales; MMSU; Ilocos Sur Polytechnic State College; Tarlac College of Agriculture; Ramon Magsaysay Technological University; and the local government units (LGUs) in Regions I, II, III, and CAR are located.

Product development, packaging, and commercialization

Pending the establishment of a dahl mill, Dr. Layaoen led the promotion of village-level processing of pigeon pea seeds into flour which is used to fortify cookies and biscuits with protein. Housewives and out-of-school youth in Batac, Ilocos Norte were trained to produce these products. The flour made from pigeon pea seeds are also roasted, milled, and used in making beverage similar to coffee. "We are currently developing a blend of sweet sorghum

and pigeon pea beverage," said Dr. Layaoen.

Although no formal study was conducted on its market acceptance, Dr. Layaoen said that random visits to vegetable markets in Ilocos Norte reveal that fresh pods are being sold in the market already. "Seeds prepared similarly to mungbean or dahl are not yet in the market. But given that the sources of fresh produce are many, this is a good sign that people are starting to take interest in this nutritionally important crop," said Dr. Layaoen.

Taking one step further

Dr. Layaoen himself lamented that, at present, pigeon pea is still grown in small patches of land in the Philippines as shown in his study. He said the probable reason is the unavailability of high yielding cultivars for farmers to use and lack of concerted efforts to promote the commercial production and utilization of this crop.

If this crop has been promoted in the scale discussed by Dr. Layaoen's study, it would mean that pigeon pea has a place in the local economy. But what can we do to boost the interest of farmers and the other stakeholders to realize the full-blown commercialization of this crop so that it will be widely accepted and sold in the local market?

Perhaps one probable marketing strategy is to promote it as a nutritious delicacy á la Puerto Rican's national dish, Arroz con Gandules, which is basically rice with pigeon peas. In Hawaii, pigeon peas are reportedly canned. A 2006 study by the American Chemical Society used fermented pigeon pea flour as an ingredient to make pasta products that are nutritionally enhanced. Aren't these great ideas to produce value-adding products with long shelf-life and capture the international market? Maybe a little more benchmarking and innovativeness will do the trick. 🌱

"Seeds prepared similarly to mungbean or dahl are not yet in the market. But given that the sources of fresh produce are many, this is a good sign that people are starting to take interest in this nutritionally important crop." ~ Dr. Layaoen ~



When you talk about wines, the first thing that would enter your mind is grapes and the popular wine-producing European countries such as France, Italy, and Spain. However, with the advances brought about by technological and scientific exploration, a variety of substrates aside from grapes is now utilized in the Philippines. These include tropical fruits such as mango, duhat, and bignay, among others.

Budding fruit wine industry

Despite the lack of proper weather conditions to grow grapes, Filipinos still can use various local fruits in making wines. Given that our fruits are abundant, readily available and inexpensive, securing consistent and low-cost supply for the Philippine fruit wine industry is highly feasible.

Tropical fruit wine-making in the country started during the early 1980's, explored and spearheaded specifically by the then Institute of Food Science and Technology (now Food Science Cluster) of the University of the Philippines-Los Baños (UPLB). Guyabano (sour sop), pineapple, kamias (ginger lily), mango, duhat (Philippine black plum), and bignay (Philippine wild berry) are among the many tropical fruits commonly used in producing unique-tasting wines. Other fruits like sampalok (tamarind) and granadilla (passion fruit), mangosteen, *lipote*, rambutan are the most recent additions to the list of locally-produced fruit wines.

According to Dr. Erlinda I. Dizon, wine expert and professor at the Food Science Cluster under the College of Agriculture in UPLB, there are around 20 different fruits in the country that can be processed into wines. Dr. Dizon is the proponent of the project titled "Technology Commercialization and Packaging Development of Wine from Selected Local Fruits" funded by the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA). This project is part of the National Technology Commercialization Program (NTCP) which is one of BAR's banner programs.

The project aimed to showcase the appropriately packaged quality wine from selected local fruits. Specifically, it was designed to: 1) validate the process for commercial production of wine from mango, bignay, and duhat; 2) improve the

NO GRAPES ALLOWED:



Filipino wine-making with homegrown tropical fruits

STORY & PHOTOS BY CHRISTMAS B. DE GUZMAN

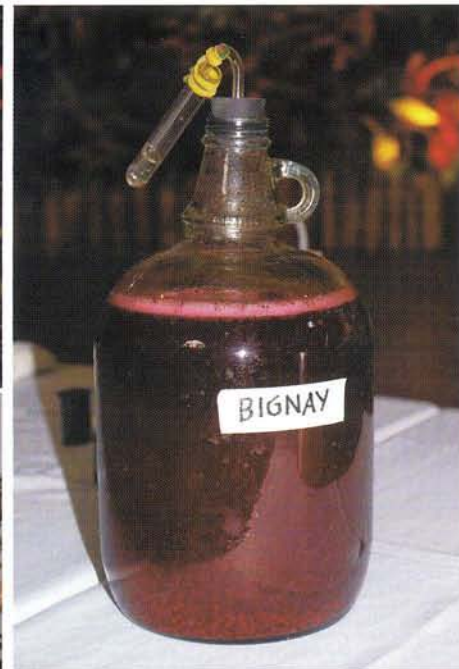
packaging design that will gratify both product stability and market viability; 3) expand market for local fruit wines; 4) enhance the capability of the end-users of the technology with regard to wine processing; and 5) assess the profitability of wine processing.

Tropical fruit wine processing

Fruit wine is a product made from alcohol fermentation of fruit extracts/juice by yeast (*Saccharomyces ellipsoideus*) under anaerobic condition. The quality and taste of wine solely depend on the type of fruit and on how it is processed. Sweet wines, for example, are made from

fruits wherein the initial sugar content is adjusted to 25°Brix with refined sugar and contains considerable amount of sugar left after fermentation (usually 3-4 weeks) for taste perception. On the other hand, dry wine is adjusted to 20°Brix and with almost all fermentable sugar utilized by yeast during fermentation. In relation, substrate acidity produces sourness in wine, while too much alcohol can produce a strong astringent taste.

Dr. Dizon presented tropical fruit wine-making using bignay as the substrate in particular, during the UPLB-CA Agri-Trade Fair and Exhibit in UP Diliman on 26 November 2008. Bignay are small round or ovoid-shaped fruits. They are



Dr. Dizon demonstrates the process of making wine from bignay.

Extracted juice from *bignay* that is ready for fermentation.

clumped together like grapes and are colorful because berries ripen unevenly. Some are pale yellowish-green, white, bright-red and/or nearly black. The skin is thin and tough but yields an abundance of bright-red juice which leaves a purple stain on fabrics. The fruit can be very acid, much like cranberries, when unripe but become slightly sweet, when fully ripe.

She explained that the first step in wine-making is crushing the fruits to extract juice. According to her, while grape-based wines are directly fermented, local fruit wines require dilution first which means adding a certain amount of water to the fruit juice. She added that the amount of water varies also depending on the type of fruit. For instance, high acid-containing fruits like sampalok and kamias need more water than duhat or bignay. After dilution, the solution will be added with refined sugar to increase the carbon source for yeast utilization in the production of alcohol. Around 5-10% of the total solution will be separated for preparation of starter. Then the bulk of the mixture will be transferred into containers where it will undergo anaerobic fermentation after addition of the starter culture. During fermentation, the yeast will convert sugars to alcohol. The type of alcohol produced during fermentation is known as ethanol, a colorless liquid with pleasant smell. Aside from being the source of alcohol in

liquors, it can also kill disease-causing bacteria, thus making wine safe to drink.

"Fermentation usually lasts for about three to four weeks producing harsh tasting alcoholic liquid," Dr. Dizon stated. The fermented liquid will be transferred to glass containers for the aging process (6-12 months) to mellow down the harsh taste. This process makes it possible for the residues or lees to settle, thus, making the wine clearer. After this, the wine will be transferred regularly into another container (racking process) to separate the residues during aging period. The final step in wine-making includes bottling, corking, labeling, and packaging.

Nutritional and health benefits

In 1990's, the health benefits of wine was reported and termed as the "French Paradox." It says that mortality levels provoked by coronary heart disease are much lower in France than in other industrialized countries even though the consumption of unsaturated fats is much the same. Justifiably, this is because the French consider wines as a staple in their diet.

Plants like grapes have naturally-occurring colored pigments called flavonoids, which act as antioxidants that prevent certain cancers. Red wines contain high level of antioxidants which help increase blood flow and prevent heart

diseases.

In the country, our own bignay is never far behind. It also contains flavonoids comparable to that of grapes. Its reddish to purplish color on the other hand, is due to anthocyanin pigment. Anthocyanin is considered a powerful antioxidant and has potential health effects against cancer, aging and neurological diseases, inflammation, diabetes, and bacterial infections.

"Recognizing bignay's health benefits plus its exotic taste, it is not surprising why it remains to be the best-seller among our tropical fruit wines," Dr. Dizon said.

Product stability and market viability

Consumers of wine may be used to drinking traditional grape wines, but Dr. Dizon pointed out that our local fruit wines have a distinctive taste and aroma, which are sometimes better compared to imported grape wines. Wines from selected local fruits such as mango, duhat, and bignay have shown unique characteristics that could equal or even surpass the sensory attributes and composition of imported wines.

In the past years, there was a substantial growth of wine consumption in the country. According to data from the National Statistics Office, wine imports increased by roughly 15 percent annually

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The emergence of the melamine scare in dairy products has caused the strict enforcement of product regulation, refocusing, and redirection of plans and programs of the local dairy industry in the Philippines. The detection of melamine substance found in milk products, caused a scandal to break out that led to testing and evaluation of manufactured milk products especially those coming from China.

Melamine is an organic base and a trimer of cyanamide, with a 1, 3, 5-triazine skeleton. Like cyanamide, it contains 66 percent nitrogen by mass and, if mixed with resins, has fire retardant properties due to its release of nitrogen gas when burned or charred, and has several other industrial uses.

Given this scenario, the government has re-evaluated its policies in import and export procedures on certain commodities especially when it comes to human health and nutrition. Programs on national dairy development have been intensified with the end view of collaboration and complementation of efforts among participating development-oriented agencies

to boost local dairy production.

Over the years, the government has been pressed to address social welfare issues and the development of communities when it comes to basic needs and services. One of the programs implemented is the localized nutrition program. Several government and non-government agencies have developed and formulated their programs to answer this call. The Department of Agriculture (DA) through the Philippine Carabao Center (PCC) operationalized and managed the Carabao Development Program using the National Impact Zone (NIZ) strategy for localized buffalo-based dairy industry development.

National impact zone for dairy buffalo development

Under the auspices of the Philippine Carabao Center (PCC) located at the Science City of Munoz, Nueva Ecija, the National Impact Zone (NIZ) was developed to address, support, and enhance the buffalo-based village dairy industry as a viable enterprise in

communities. The NIZ development concept has four main components, namely: production, processing, marketing, and support services (Cruz and Battad 1998).

The NIZ pilot operation was done in partnership with the local government of Nueva Ecija through the primary farmer-cooperatives of dairy buffalo enterprise in the province. It has utilized the concept of "impact zone" by integrating all "primaries" in a compact area (preferably one or adjoining villages or communities) and puts in place all components necessary towards sustainable buffalo-based enterprise development.

Through continuous technical support and assistance provided by key players, the NIZ has expanded and became institutionalized in the plans and programs at the national and regional levels. The establishment of the PCC's 13 regional networks and centers resulted to better operation and management of the impact zones. The NIZ has provided an avenue for the attainment of the carabao



Mainstreaming carabao dairy products for community enterprise

STORY BY MARLOWE U. AQUINO, PhD

PHOTOS BY RICARDO G. BERNARDO

development goal particularly the alleviation of poverty and effective contribution to nutritional improvement, promotion of income equity and distribution, and people empowerment.

Based on the NIZ's components, the carabao was put in context not only as draft animal but as a source of meat, milk, and hide that would eventually provide smallholder rural farmers with better nutrition and additional income. In this regard, it has supported the overall carabao development program including community dairy enterprises and nutrition development program of key players and stakeholders.

Community dairy enterprise and nutrition program

The success of the PCC program initiatives could be gauged by the number of locally established and supported enterprises. This can be shown quantitatively but not the conditions and situations of its smallholder farmers. The design and development of the community dairy enterprise is carried out through the pilot cooperative, Nueva Ecija Federation of Dairy Carabao Cooperative (NEFEDCCO).

PCC has set-up mechanisms that will evaluate quantitatively the program on the farmers' condition such as changes in animal inventory, animal mortality incidence, reproductive performance, calf production, milk production, milk sales, and mortuary fund payments. However, the Center believes that quantitative performance is not the only guarantee of success. So, in an effort to determine holistic dairy community development, it has lined-up evaluation activities that would relate and integrate social factors and indicators that would then tie a number of loose-ends and unify efforts of communities to become better dairy farmers. The community dairy enterprise is perceived as enhancing the experiences shared by its members through dairy-related activities on improved families' and farm conditions.

The outputs of dairy enterprises particularly products must be further developed, produced, processed, and marketed. Development should include community responsiveness on demand and consumer preferences. These must be further shaped by community participation, leadership, partnership, and collaborative



activities that support the operation of community dairy activities. Dairy products should illustrate success stories including influencing factors that positively changed the management of the dairy enterprise and lifestyle of the smallhold rural farmers. These aspects will be done by conducting development researches and socially relevant activities for communities.

Furthermore, these activities have to include desired outcomes which highlight the nutrition aspect for target beneficiaries. The nutrition aspects will not only enhance the carabao dairy products but will promote and place them in a competitive mode which sets the trend for innovative local dairy products. Toward this end, sufficient and sustainable supply of dairy products for all can be guaranteed.

Promotion and commercialization of carabao dairy products

In response to the evolving trend in community dairy enterprise in the country, the Philippine Carabao Center (PCC) in partnership with the Bureau of Agricultural Research (BAR) developed the project to put dairy products in mainstream markets. The comprehensive carabao development program (CDP) supports the farmers and their partners in community dairy enterprise and nutrition program.

Now on its 12th month of implementation, the project has developed mechanisms to improve the socio-

economic performance of primary stakeholders by strengthening their organizational and technology commercialization capability for the promotion and effective marketing of carabao-based milk products; evaluating carabao-based milk products more suitable for niche marketing in selected key areas; and enhancing market competitiveness of carabao-based milk products. These are being done to address among others, the conservative promotional strategies for buffalo milk products, lack of critical post-production facilities, and lack of market information to access milk markets in key areas.

Based on the foregoing, PCC together with its regional networks and centers will continue to work for strengthening linkages and networking towards the promotion of local awareness and patronage of buffalo milk products. This is being done through intensified collaboration and partnership with LGUs, NGO and private entities; development of market driven product lines and packages through DOST and DTI collaborations; strengthened interface (partnership to include linkage and networking) between LGU and concerned agencies in the delivery of support services to village-based dairy enterprises of primary cooperatives; and collaboration and complementation among R&D and extension agencies in technology commercialization, resource management and production operations at the national, regional and local levels.



Technology development and promotion of milk based products will be enhanced by providing transfer of milk technology activities to identified investors and massive information campaign among industry participants. This will include the expansion of market coverage of carabao milk and milk products. In support to such activities, the PCC research and development team will continue to conduct market researches that will identify relevant market opportunities that will aid decision making for effective and efficient management of the CDP. The center shall

work to empower communities and clientele through organization development and capability building through seminars, training-workshops, cross postings and field visits to support production operations, marketing, organizational management, technology commercialization, and product competitiveness.

Directions ahead

The implementation of the CDP through complementary mechanisms and strategies leads to more innovative

interventions for dairy enterprise development. However, its success depends on the assurance of commitment of key players and stakeholders.

To do this, everybody must be mutually responsible and accountable for its action. PCC and its local partner for national concern, the NEFEDCCO, must use their experiences and lessons learned to further enhance the dynamic and proactive characteristics of its constituents.

Hopefully, these will be the bases to further improve our local dairy industry. PCC's vision and direction started with "Changing lives beyond the draft Carabao". Today, it shapes the dairy industry with its partners with "Beyond technologies ... creating enterprises for smallholders".

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No grapes... from page 12

from 4.5 million liters in 2001 to 7.5 million liters in 2005. Hence, utilization of local fruits in the making of alcoholic beverages like wines would certainly stimulate the development of the domestic economy and reduce importation of alcoholic beverages.

Consecutively, product packaging signifies marketing functions for display, information, promotion and selling. Glass is still considered the best container for alcoholic beverages. Since shape, size and color of bottles differ widely, selection of the proper packaging (primary and secondary) design and labeling of the homegrown fruit wines is

very vital.

Dr. Dizon said that, annually, 300 to 400 bottles of wine with bignay as the substrate are being produced by the Food Science Cluster. Taking fruit wine processing to a larger scale means they would have to employ mass production of tropical fruit wines. More important, acceptable packaging has to be ensured for the competitiveness of the product both locally and internationally. In retrospect, the demand for underexploited or minor fruits in the country for wine-making will certainly provide additional income for local producers of these commodities.

This article was based on BAR-funded project titled "Technology Commercialization and Packaging Development of Wine from Selected Local Fruits" by Dr. Erlinda I. Dizon of Food Science Cluster, CA, UPLB. For information, please contact Dr. Dizon at tel. no. (049) 536-3472 loc. 2312.

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LA TRADING:

A sweet success that is “ripe” in season

STORY BY RITA T. DELA CRUZ

PHOTOS BY NICANOR B. DEL ROSARIO III and RITA T. DELA CRUZ



LA Trading office



PTFMPC plant



Lito M. Arenas, a successful farmer-entrepreneur from Pangasinan.

Mangoes are at their best when they are ripe in season and not induced by chemicals or some special processing technique to speed their ripening process. Mangoes that are harvested at the right picking season are best consumed because they naturally smell and taste good. But before it reaches maturity—every mango needs to go through different production stages, one that requires careful attention and effective cultural management.

The successful story of farmer-

entrepreneur, Lito M. Arenas, is somewhat likened to a seasoned ripe mango—rich, lush, and sweet. The Filipino phrase, *hindi hinog sa pilit*, expresses it fully. His life has gone through the natural course of “ripening” such that he and his family are now reaping the sweet fruits of their success.

But like every mango, it goes through the sour stage. How Lito came through the sour stage is not purely based on luck. “Life is never easy. Our success was founded on hardwork, perseverance, dedication, and resolute

faith in God,” Lito confessed as he retold his humble beginnings.

His success in mango farming has been featured on the radio, television, and print that he is now one of most familiar faces in the agriculture scene. His name automatically pops up whenever one needs a testimony of a successful farmer-entrepreneur. And truly, he continues to live up to the expectation not only of the officials from the agriculture sector but also his fellow farmers who look up to him for guidance and inspiration.

"Everything has to start from scratch"



Lito and Ching Arenas during their wedding day wherein a sum of P2,500 was collected from the money pinned on their dresses.

Like every beginning, it starts (almost) with nothing. For Lito and his wife Ching, their beginning is synonymous to P2,500.

Their story started when the couple met at the Luzon Colleges in Dagupan, Pangasinan. After finishing their courses in nursing, Lito and Ching got married. In the traditional dance at their wedding, guests pinned money and P2,500 was collected which later become their capital to start their mango buying and selling business.

From then on, hardwork, perseverance, and a wink by lady luck took over their fate. Lito went as far as Batac, Ilocos Norte just to find the best mango planting materials for his farm. He started providing a stable ground for his business by establishing connections in different regions as a mango contractor.

He started his venture at his father's farm, a three-hectare land which has become utterly familiar to him as this was also the place where he gained his

first experience in planting mangoes being the eldest of the Arenas clan.

"When I was still in elementary school, I helped my father and uncle in the farm. Since I was just a child then, my work was limited to cleaning and cutting the grasses. In the afternoons after school, I was in-charge of manning our mango stall in Urdaneta," recollected Lito. His experiences as a child taught him a lot which eventually brought him closer to the heart of the business.

As a nursing graduate, Lito finds no regret when he took firm grip of his fate as a farmer-entrepreneur. "God had other plans for me. I did not have the opportunity to practice what I studied in college but it played an important factor for me. In business, you need people's trust in establishing linkages. Our clients and partners trust us. Besides, I might not have met my wife if I had not taken nursing as a course." Lito avowed that they can still practice being dedicated nurses to their four children.

"The sour taste could sometimes make you cringe"

For anyone who wanted to make it big, success never comes easy. And just like any mango that goes through the process of maturity, one needs to experience the sour stage.

During the course of establishing his business, Lito encountered several difficulties. One major problem that he needed to deal with was the high input and fertilizer costs. He outwitted these problems by seeking financial support from creditors endorsed by the Department of Agriculture (DA).

To make up for his lack of technical know-how in mango production, he attended trainings and seminars on production and post-production technologies. This complemented his innate entrepreneurial skill, developing further a deep sense of understanding of the mango industry.

To strengthen his stake in mango production, Lito established the Pangasinan Tropical Fruits Multi-Purpose Cooperative (PTFMPC) located in front of

LA Trading's office in Brgy. Matulong in Manaoag, Pangasinan.

Lito's hardwork paid off when he started supplying mangoes to big local companies. "We were supplying fresh mango fruits to big local companies such as KLT Fruits, Pure and Rich, Tres Martires, and Hi-Las Marketing Corp.," said Lito.

But the best is yet to come. The biggest break for him came a decade later when Zest-O Corporation, one of the major fruit drink manufacturers in the country, contracted him to supply mangoes for them. "We are supplying 60 percent of the mango demand of Zest-O Corporation and 30 percent of KLT Fruits.

This prompted Mang Lito to



Lito continues to learn the heart and soul of his mango trading business.

establish more buying stations and expand the hectareage of his mango plantation. "Due to the high demand for our mangoes, we needed to increase our production," he said. He also started the mango processing business to make use of the surplus production.

"Expanding horizon means going global"

Although the demand in the local market is already good, Lito and Ching are also aiming for the world market, finding a way to introduce one of the best (if not the best) mango varieties from the Philippines.

The international market opened its doors to Lito's company when he was introduced by a friend to mango distributors serving Hongkong. Soon, his mangoes found their way to Hongkong, and later, Japan.

"In 2006, with the support of DA-BAR under the leadership of Director Nicomedes P. Eleazar, we conducted a market reconnaissance study together with experts from UPLB, AMAS, and BAR. We visited major market outlets in countries of the European Union (EU) and United Arab Emirates (UAE) to identify potentially profitable markets for Philippine fruits and vegetables," narrated Lito.

The funding of the market reconnaissance study was made possible with the assistance of the Bureau of Agricultural Research (BAR) through the National Technology Commercialization Program (NTCP).

NTCP is one of the banner programs of BAR in meeting its goals for the modernization of agriculture, jobs creation, and building profitable enterprises. With the implementation of NTCP, it is envisioned that technologies are strategically placed and transferred to areas and communities that most need them and thus enhance technology transfer as well as realize the positive

impact of research results.

Specifically, the study hoped to 1) identify the profile (kind, quality, selling price, labeling and packaging) of tropical fruits that are currently being marketed in EU (Rome, Switzerland, France, and UK) and UAE; 2) determine the main routes and transit time along with the handling route of tropical fruits from the country of origin to major market outlets in UAE and EU; 3) identify possible importers of Philippine-grown tropical fruits and vegetables; and 4) determine sanitary and phytosanitary requirements, problems and constraints in exporting.

"During the study, we visited wholesale retail markets that conduct quality profiling of their imported fruits. We wanted to know the retail prices of their commodities and how the Philippines can comply with the packaging and labeling requirements. This was done so that we could look into the possibilities and potentials and how our mangoes can break into the world market particularly in those countries wherein quality standard needs to be strictly complied."

Visits were coupled with interviews and discussions with the importers and retailers to determine the import demand volume and quality requirements as well as the distribution channels of imported produce. The group of Lito also gathered secondary data on sanitary and phytosanitary requirements and trade regulations from concerned agencies and collected actual fresh samples and obtained specific information for promotional purposes.



Lito with Digna L. Sandoval of TCU-BAR check how mangoes from Iran are exported during a market reconnaissance study in EU and UAE.



Lito looks into the packaging process of Karachi mangoes from Pakistan that are sold in the European market.



Karachi mangoes from Pakistan

"No man is an island"



Lito is the only BPI-certified producer of grafted mango seedlings in Region I.

Lito's mango recipe for success is not a one-man-effort. He sought help from various government agencies either through financial support or by availing of the latest technologies on mango production and post-production.

Aside from being a mango grower/contractor, Lito is also a nursery operator and seed grower. He buys his propagation materials from accredited agencies such as the Bureau of Plant



Lito with Agriculture Secretary Arthur C. Yap and other DA key officials during the launching of DA-funded projects in Pangasinan.

Through the DA-High Value Commercial Crops (HVCC), Lito was also provided the Extended Hot Water Treatment (EHWT) facility to comply with the phytosanitary requirement imposed by the Chinese government for the export of mangoes to Hongkong and mainland China. The EHWT facility destroys eggs of fruit flies in fresh mangoes. "The requirement was imposed by the Chinese government due to the discovery of mangoes infested with fruit flies from previous exports," Lito said.

Lito said that a lot of his fellow mango growers and contractors are benefiting from these facilities. The mango processing business employs more than 200 workers especially during peak season. They could now command higher prices for their produce.

Each month, a ton of dried mangoes is produced for export to Japan and the United Arab Emirates. The plant has also started producing pickled mangoes and papaya for export to Canada.

"Pangasinan is a top producer of mango in the country, contributing 41 percent of the total production. This was the first time however, that a mango processing plant was established in the province. That's why I am happy to note that government agencies are supporting this kind of endeavor for the mango industry," Lito enthused.

Industry (BPI) and seeks technical assistance on Good Agricultural Practices (GAP) from the University of the Philippines Los Baños (UPLB).

He started operating his nursery in April 2006 establishing his own greenhouse for all his planting materials. He is the only BPI-certified producer of grafted mango seedlings in Region 1. He produces 65,000 pieces of grafted mango seedlings. "We grow the seeds out of our dried mango processing business and we use them as rootstock so that there is no wastage in our operation," said Lito.

His nursery operation continues to

thrive along his other booming business—dried mango processing.

In the form of a grant, DA-BAR provided him two units of drying machines to process his fresh mangoes. This takes care of the postharvest losses during peak season in the forms of mango rejects and market wastage. The facility can produce 27 metric tons of dried mangoes per month. At least 180 metric tons of fresh mangoes are needed to produce 27 tons of dried mangoes. This provided him the opportunity to export processed mangoes to Guam and Dubai.



Extended Hot Water Treatment (EHWT) facility from DA-HVCC.



One of the units of drying machine facility from DA-BAR.

"You reap what you sow"



PTFMPC is producing export quality processed products from mango.



By now, the name Lito Arenas or LA Trading is becoming a hallmark. Favorably, his story is often cited by Agriculture Secretary Arthur C. Yap as a classic example of someone who rose the ladder of success not by sheer luck but by hardwork and perseverance. As the Secretary once said: "Lito started as a mango picker and now he is one of the biggest exporters of mangoes in the country."

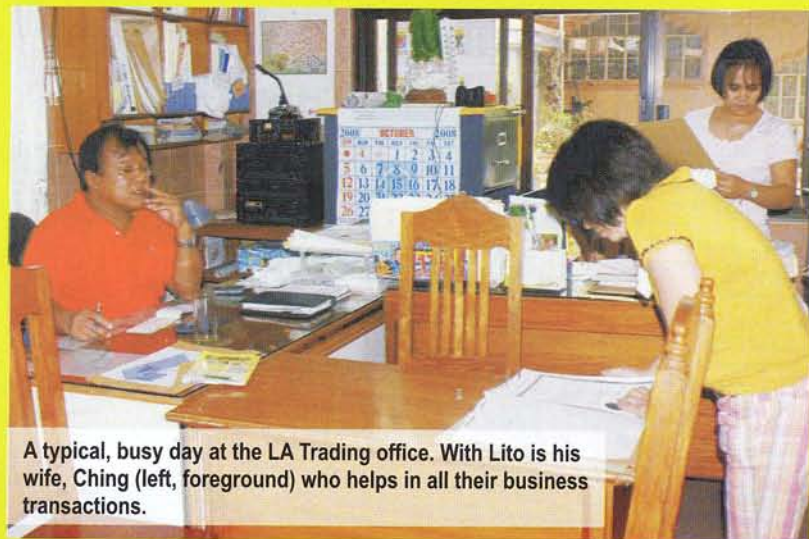
Currently, LA Trading is not only into fresh and dried mangoes. They have expanded their market by producing

other mango processed products such as dried mangoes, pickled mangoes, tamangoes (mangoes in tamarind syrup), and pickled papayas. Recently, they ventured into pineapple processing. Locally, these products are also sold on a consignment basis to leading specialty shops and restaurants all over Pangasinan. LA Trading products are also gaining fame all over the country through local distribution. They are exhibited during agricultural exhibits and technology seminars and fora.

Lito is all thanks and praises to

the Lord for all the blessings He has given him and his family. This has made him and his wife want to share his blessings with others.

He said, "I return all my blessings by helping others. Those who need guidance and inspiration, they could come to me. Those who need the advice I am all willing to serve." When asked what his advise is to farmers who also wanted to make it big in the business but do not know how, he said: "Kung may tiyaga, may ilalaga". He added, "It is good to have a dream in life but you also need to do something to achieve it."



A typical, busy day at the LA Trading office. With Lito is his wife, Ching (left, foreground) who helps in all their business transactions.



Lito repays his blessings by giving free seminars and advice to his fellow farmers and agriculturists.



Enjoying yummy *ubi* in powder form

STORY BY **MA. ELOISA E. HERNANDEZ** and **TEODORA M. DE VILLA**

PHOTOS BY MIKO JAZMINE J. MOJICA and RITA T. DELA CRUZ

Yam (*Discolorea alata* L.) commonly known as ubi is a main ingredient to the processed ubi powder. With about 300-600 varieties, this promising rootcrop grows abundantly in Central Visayas, Northern Mindanao, CARAGA, CAR and some parts in Luzon. This rootcrop is traditionally planted in March to June and harvested from December to February.

The varieties with purple to deep purple color are the commercially grown varieties in the Philippines. Other varieties which have flesh that are only very lightly tinged with purple pigment are also grown. The in-demand varieties are the Kinampay in Bohol, Ozamis variety in Mindanao, the Tagalog variety in Southern Luzon and Sampero variety in Benguet.

The ubi tuber is rich in starch. It also contains substantial amounts of calcium, phosphorous and potassium. Nutrient content of the tuber varies with the variety and the cooking procedure.

The demand for ubi is influenced by its quality and is determined largely by the different food processing companies that use ubi as raw material for their products. Kinampay with "pandan" like aroma, and Tagalog variety with intense purple color are very popular and are preferably sought by the processors.

Ubi tuber can be processed into flour or powder, flakes, chips, puree and

jam. The puree is used as food flavoring or coloring for ice cream, for bakery products such as cakes, pies, donuts, hopia and also in pastries and candied products. Ubi is also an added ingredient in Filipino kakanin like "sagobe" or "guinataan".

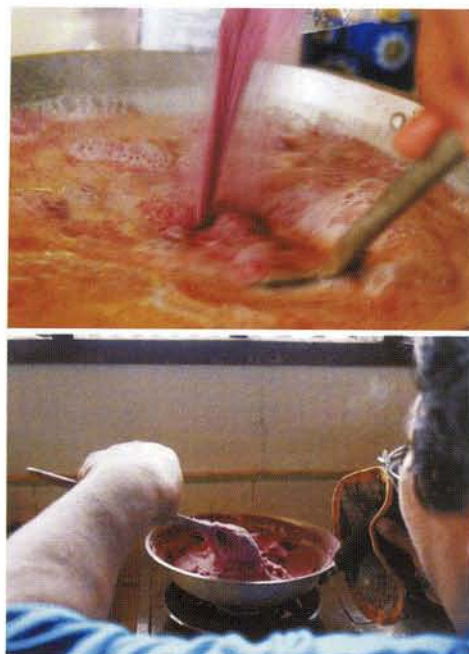
Demand for ubi powder

The demand for ubi powder can be attributed to its natural, highly appealing color due to anthocyanin pigment. It is more stable and more convenient to use in food preparations normally requiring fresh ubi especially for those who neither have the time nor the skill to prepare it from the fresh one.

Most overseas Filipino workers (OFW) who come for a visit to the University of the Philippines Los Baños (UPLB) take ubi as pasalubong when they go back to their different destinations. Even Filipino Chef Ryan Jaranilla who cooked for the players in the Olympic Games in China did not miss to take this ubi powder on his return home to California. The increased awareness of Filipinos in different parts of the world of the availability of high quality ubi powder will boost exportation and will surely make a niche in the international market.

With the promising export

demand and potential use of ubi powder in many food preparations, the Bureau of Agricultural Research (BAR), under its National Technology Commercialization Program (NTCP), supported the project entitled "Technology Commercialization and Packaging Development of Ubi powder". The project aims to package the technology for commercialization to meet new local and international requirements on packaging and labeling. It also aims to promote the technology to generate business opportunities.



Preparing ubi powder

Production of ubi powder is simple and requires few equipment such as pressure cooker, grater, forced convection dryer and pulverizer to start the operation of a small scale processing plant.

The Tagalog variety with a deep purple color is more suitable as raw material for the production of ubi powder because of its strong ubi aroma when cooked. The tubers should be thoroughly cleaned and embedded dirt in the spaces between the tubers should be removed. The big tubers should be sliced into 7 to 10 cm long pieces and peels should be left intact. The tubers are steamed until cooked and then allowed to cool. The tubers are then manually peeled and the diseased and remaining small roots removed. The peeled ubi are passed through the feather mill in drying trays and loaded in the dryer. The ubi chips are then dried at 70°C for 12-14 hours and then allowed to cool at ambient condition. Finally, the chips are packed in polyethylene plastic bags and sealed tightly. The chips are stored in this condition until ready for powdering.

For powdering of ubi, the dried chips are passed through the pulverizer with 60 mesh screen. The powdered ubi should then be cooled at room



temperature and packed in aluminum or laminated polyethylene pouches. Ubi powder lasts for more than a year when stored in a cool, dry and dark place.

Ubi powder can now be used in preparing sweetened ubi or "halaya". It can also be added to glutinous rice to prepare "palitaw", "puto" or "guinataan" and in cake preparations.

To improve product quality for competitiveness in the domestic and international market, quality control monitoring system for ubi processing includes standard sanitation operating procedure (SSOP), good manufacturing practice (GMP) and hazard analysis critical control points (HACCP) were

established. The quality standards will be in line with the international quality regulations which will increase the confidence of local consumers and improve the products' prospects for export.

Ubi powder production is considered a profitable business venture. The technology can generate 58.13% net income after deducting the operating cost of the production. Return on investments (ROI) of 143% can be realized in this operation.

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Taking chances... from page 24

Potential areas

The study specifically identified the provinces of Saranggani, South Cotabato, Sultan Kudarat, Misamis Oriental, General Santos, and Zambales as target sites for cassava production while the potential areas can be found in Bukidnon, Negros, North Cotabato, and Davao where sugarcane plantations are mostly located.

The study also named four companies which have signified intention or are producing cassava already as feedstock for bio-ethanol production. These companies are Eastern Petroleum, Robson Agro Ventures, Alsons-Saranggani, and Alsons-Cagayan de Oro.

Meanwhile, BusinessWorld Online reported in November that publicly listed bio-ethanol producer Basic Energy Corp. will focus on its cassava plantation in the next two years and raise up to \$30 million from foreign and local investors to partly finance its operations for 2009.

The other side

After learning what it takes to produce bio-ethanol from cassava in terms of its viability, it is only sensible to take into consideration both its positive and negative impacts in pursuing such a large-scale project. Taking, for example, the perspective of Engr. Greg Macabodbod, convenor of the people's organization Kagay-an Watershed

Alliance (Kawal), regarding the areas of concern for the cassava bio-ethanol project:

"In pursuing such projects, we must also empower the public to be aware of its effect on the environment so that toxic effluents and solid waste can be properly addressed. We also recommend the strengthening of local capabilities to identify, package, and promote an environment-friendly and socially-sensitive bio-fuel projects and do project pre-implementation activities. There should also be a continuing flow of information from the government, academe, and private institutions so that the proper implementation of such projects can be put into place," Engr. Macabodbod states. 🌱

I remember one bewildered professor in college recounting how a top man of a business firm asked him naively what a feasibility study is. How's that for a chief executive officer?

Defined simply, a feasibility study is a study undertaken to determine a project's viability. For any organization going into a new and unfamiliar venture, is an imperative. This need becomes all the more essential when the project is as novel and debatable as bio-ethanol production from cassava.

Although agricultural products in the country specifically grown for use as biofuels include several crops, RA 9367 or the Biofuels Law at present mandates only coconut for biodiesel; and sugarcane, sweet sorghum, cassava, and corn for bio-ethanol.

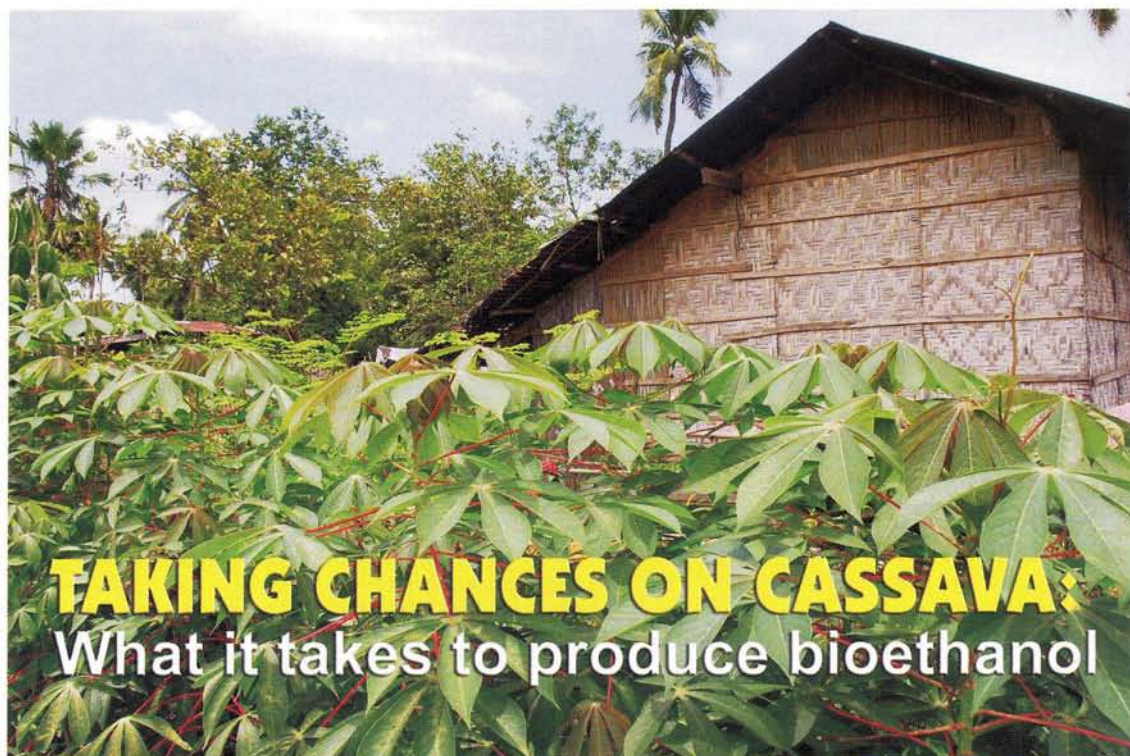
The bio-fuels law took effect in 2007 and but the mandated minimum blend of one percent coconut bio-diesel or coconut methyl ester (CME) for all diesel engines was the first to be implemented. The law says a minimum two percent of bio-diesel should be implemented by 2009 as well as the minimum blend of five percent bio-ethanol (E5) for all gasoline engines. The 10 percent blend of bio-ethanol (E10) is scheduled for implementation by 2011.

Nonetheless, the E10 blend is available in the market today; with sugarcane probably holding the biggest share of the market at present as records from the Bureau of Agricultural Statistics (BAS) show it does best in terms of productivity compared with other sources of bio-ethanol.

Given this background, what then are the chances of cassava if one decides to be actively engaged in its bio-ethanol production? Now that's one wise question to ask to show just how smart you are.

Feasibility study completed

The Bureau of Agricultural Research (BAR) funded the recently completed feasibility study of bio-ethanol



STORY BY MIKO JAZMINE J. MOJICA

PHOTOS BY RITA T. DELA CRUZ

production from cassava in the Philippines which was undertaken by the International Society for Southeast Asian Agricultural Sciences (ISSAAS).

The comprehensive study covered all important aspects that need to be considered in producing bio-ethanol from cassava --from production, to post-harvest, processing, marketing, organization and management, and, most important, financing.

From the point of view of financial analysis, the study considered three types of investors that would likely go into it. These are: corporate- and joint venture-run cassava plantation; ethanol processing (primary and secondary); and integrated cassava plantation and ethanol production.

The researchers assumed that the equity of investors for the three cases is 20 percent of the initial capital investment. They likewise considered loaning the remaining capital requirement from the Development Bank of the Philippines (DBP) at 9.75 percent interest payable in seven years with a grace period of three years.

Cassava's edge

The hyped-up global concern

over climate change and the depleting sources of fossil fuels triggered the renewed interest on bio-fuels. As a matter of fact, the researchers of the feasibility study observed that cassava is becoming an important bio-fuel crop in China, Thailand, Brazil, and other countries with more advanced national programs for bio-fuel production. But why this lowly root crop, you might ask?

With regard to its cultural management, the study says that cassava needs only minimum crop maintenance, responds well to fertilization, is typhoon- and drought-resistant, and can be harvested year-round in areas with evenly distributed rainfall. "In general, areas suitable for sugarcane production are also favorable for growing cassava," the study says.

According to the study, cassava has a very high starch-to-sugar conversion ratio. This high starch content means that a high percentage of sugar can be converted from it, and which, in turn, is needed to produce bio-fuel. The study likewise heralded it as the cheapest feedstock among the major starch-based feedstock for ethanol production. "Average costs of feedstock per liter of ethanol from molasses and corn are quite high, while those using sweet

sorghum is comparable to that of sugarcane. Potentially, feedstock from cassava can be produced at the lowest cost. With high feedstock yield levels, ethanol yield from cassava becomes comparably better than those from sugarcane or sweet sorghum," the study illustrates.

Sensitivities

Part of a feasibility study is a sensitivity analysis on the financial viability of a project. In this particular study, the researchers pointed out sensitivities of cassava's bio-ethanol production depending on the prevailing price of tubers, changes in yield levels, variation in overall production, and total production cost.

"Cassava can also be the most expensive among the major feedstock depending on prevailing prices of tubers or derived products. Cassava used for food preparations are purchased at a higher price than those used for industrial purposes," the study reveal.

Generally, the study's computation shows that an increase in tuber yield by 10 percent will increase the average net income by 32.5 percent. On overall production, slight reductions of at least five percent in production cost will increase average net income by 10.1 percent, return on investment by 2.3

percent, and shorten the payback period by 0.3 years.

"The major components of cost are direct labor cost (44.6%) and direct materials (30.4%). The biggest cost item for direct materials is the cost of fertilizer (73.9%) while harvesting expenses accounts for the larger fraction of direct labor costs," says the study.

Production

The study strongly recommends that the production site be located in areas with uniform rainfall distribution to ensure constant and uniform supply of the feedstock all year round for the distillery plant. Doing this, the study says, would ease the burden of planting and harvesting the feedstock in an exceptionally vast production area in a very short period of time. Moreover, according to the study, more uniform year round harvesting is advantageous for primary processing operations as it reduces the need for larger processing equipment and storage facilities.

The primary processing, as indicated by the study, transforms the freshly harvested cassava tubers into cassava flour. A typical cassava processing system goes through the following procedures: harvesting, bagging, transporting, receiving, washing, cleaning, peeling, chipping, drying,

storage, and milling.

"The primary processing system will provide the necessary cassava flour for the production of the 30 million liters of ethanol per year which is the required capacity of the distillery plant essential for bio-ethanol production. An estimated 10,000 hectares of cassava plantation would be required to supply feedstock for the plant's optimal operation. Assuming a 300-day operation per year, a daily output of 100,000 liters of ethanol is produced," according to the study's computations.

Key factors

In designating plantation areas, the study recommends that it should be near where the produce will be conveyed for processing. The study says that primary processing centers should be established in selected strategic sites so that harvested tubers may be processed without delay. Doing this would likewise facilitate inbound logistics to minimize costs of transport to the distillery site. This goes without saying that road system and related infrastructure connecting the plantation sites, primary processing facilities, and the distillery plant are critical.

Moreover, contract arrangements between the distillery company and the farmer-landholder were found to be necessary to assure the continued supply of feedstock to the processing plant. The study likewise concedes the fact that the estimated area of 10,000 ha required to generate feedstock for the full production of the distillery is quite sizeable. "To attain this area requirement would take a minimum of at least three years given the time of developing the production area as well as the anticipated deficiency for the large quantity of planting materials required for such a vast plantation," it explains.

Furthermore, the study states that the duration of time required to meet the target production area is consistent with projected time needed to build a distillery plant. Accordingly, "Full capacity of production area may be scheduled to coincide with completion of the ethanol plant. In the interim, harvest for the first two years can be traded to feed mill or starch factories already existing along the location of production sites."

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Messy no more with bagoong in cubes

STORY BY CHRISTMAS B. DE GUZMAN
and CARMENCITA L. CULASING, PhD

PHOTOS BY CSU-CFMS and RITA T. DELA CRUZ



Who would have thought that the messy bagoong (fish paste) can be packaged into cubes?

Fish paste, commonly known as bagoong here in the Philippines, is a result of fish fermentation which is one of the traditional techniques of fish preservation. Due to its appetizing flavor, the product is highly preferred by local people especially those from Northern Luzon, Bicol Region and Western Visayas.

As we all know, the traditional bagoong is usually packed in bottles and is quite messy to handle. In addition, they are packaged in heavy container requiring bigger space that demands higher fare rate.

Bagoong in cubes, however, are packed in cut rite, aluminum foil and carton. Filipinos fond of adding bagoong in their dishes would find it more stable, handy, and appealing as compared to bagoong in the traditional market form.

Novelty product

Bagoong cube, which is now in the market, is a novelty product developed by Dr. Carmencita L. Culasing of the Cagayan State University-College of

Fisheries and Marine Sciences (CSU-CFMS) in Aparri, Cagayan. This was an offshoot of a study titled "Preparation of Dried Products from Fish Paste (Bagoong Cubes)" conducted through the assistance of the Department of Science and Technology-Philippine Council for Aquatic and Marine Research and Development (DOST-PCAMRD).

Dr. Culasing conducted three specific studies. The initial study aimed to identify the best fish species for bagoong cubes; the second, investigated the optimum fermentation period for bagoong cubes making, and the third focused on the effect of antioxidant on the sensory qualities of bagoong cubes.

According to these studies, the hairtail ("espada") was the best fish species or raw material for bagoong cubes making because of its color (lighter brown). But in terms of the general acceptability test, all the species used (hairtail, marine anchovies, freshwater anchovies, and round scad) were acceptable. It was also suggested in the findings that fermentation period of four to five months contributed the best sensory characteristics of bagoong

cubes – four months for smaller fish and five months for bigger fish. Lastly, it was indicated that the effect of adding antioxidants improved the quality of bagoong cubes, particularly the odor of the product.

Dr. Culasing pointed out that the product was put into development because of the abundance of fish species used in making the condiment in the province.

Award winning technology

Bagoong cubes making is feasible throughout the year. The raw materials can be sourced out from the bagoong processors making it an additional means of livelihood for coastline communities. Producing bagoong cubes is technically viable since the raw materials are abundant and readily available.

Similar to the traditional bagoong making, bagoong cubes are prepared from dried fish species (hairtail, marine anchovies, freshwater anchovies, and roundskad). Basically, the product is prepared by cleaning the fishes in running water and cutting the fleshy portion into smaller pieces. After cutting the fishes, salt is added at a ratio of 1:3 salt to fish. The liquid portion is then separated and used for fish sauce ("patis") manufacture. The flesh from the bones of the fermented fishes are then separated, dried using a mechanical dryer, pulverized, and formed into cubes.

Bagoong cubes making has a return on investment of 52.25% and a promising business producing export products. According to Dr. Culasing, the product has a longer shelf-life and the technology per se eliminates the problem of toxin production by *Clostridium botulinum* due to the anaerobic condition and water content of the traditional bagoong. Furthermore, the absence of anaerobic bacteria makes it a safer food additive.

"As for the busy housewives, food



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preparation is minimized and cooking is easier when using bagoong cubes instead of the traditional bagoong," Dr. Culasing stated. "It is also convenient to handle and cheaper to transport because of its light packaging materials and absence of extreme ammoniacal odor," she added.

Taking into consideration its several advantages, Dr. Culasing's bagoong cubes won the second prize in the Aquatic Technology Competition and Marketplace sponsored by DOST-PCAMRD on 31 January 2007.

Market and economic considerations

The process of making bagoong cubes involves shorter fermentation period for it does not require a total dissolution of the fish flesh. Thus, an immediate turn-

over of capital and greater profit could be attained.

Looking at shelf stability, bagoong cubes could last longer than the traditional bagoong which takes six months for the fermentation process to finish. With lengthy fermentation process, in the traditional product, maggots could also be observed.

Production of bagoong cubes is sometimes not feasible during rainy months. Processors have to use a cabinet dryer as a substitute drying facility for the reason that sun drying may be impracticable or fermentation may take longer period of time. If not properly dried or packed, bagoong cubes may promote the growth of undesirable molds.

Packaging of the product has an important role when it comes to market prospects. Dr. Culasing said that further

improvement of the total packaging of bagoong cubes, including the product logo design and quality of materials used, is what she has been working out with the Industrial Technology Development Institute (ITDI) of the DOST.

"Another thing that could expand its market and make it more profitable is good product packaging that's why we are seeking the assistance of ITDI-DOST," she emphasized.

The product is at present being promoted by the Northern Luzon Aquatic and Marine Research and Development Zonal Center (NLAMRD-ZC) based at the Don Mariano Marcos Memorial State University (DMMMSU) in Bacnotan, La Union which is one of the zonal centers coordinated by DOST-PCAMRD.

Price in the market is Php15.00 per pack containing 3 pieces of bagoong cubes. 🌱

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cooks, chefs, and households on what makes for a delectable feast.

Overall, culinary herbs command high prices and have created a niche in the market. Whether in small stalls or fresh deli in supermarkets, these are surely a hit with buyers. Because of their high-end market characteristics, they have competitive advantage over other commodities. This also led farmers to specialize and produce the desired and assured quality products.

Some of the farms that are into the competitive mode outside the Cordilleras are found in Tagaytay City, Bacolod, Cebu, Cagayan de Oro, and Davao City. These places are usually the key cities across the archipelago that can address the requirement for culinary herbs. Although not in similar agroclimatic condition like Cordillera, these places have invested resources and now practice protective agriculture just to meet demand. These factors together make culinary herbs more competitive over other commodities in the market.

Future of Philippine culinary herbs

Although they have competitive advantage over other Philippine products, the culinary herbs must be given enough support in Philippine food and culture. The utilization of these crops in the local cuisine can come about as a result of the integration of traditional and modern food preparations.

Research and development must play an important role in the development, promotion, and dissemination, to include commercialization, of the crops. Specific research could focus on marketing, processing, business or enterprise development, community development including farmer-consumer partnership. At the same time, the food discoveries and preparations should be developed



more within mainstream culinary art.

In order that more farmers will engage in this crop production system, support of the government is a must. Consumer demands must be institutionalized so that farmers will do their share of growing culinary herbs the natural way. As new cuisines are developed and served, these must tell a story of production, of a people's culture and lifestyle. 🌱



Cashew is not just about the nuts

STORY BY RITA T. DELA CRUZ

PHOTOS BY SALVAIDE.CA

Most people, when they talk about cashew, refer only to the nuts. With the growing popularity of cashew nuts as a snack food and ingredients in bakery products, it is thought to be the most important product from cashew.

In the Philippines, Palawan is considered the cashew capital of the country supplying 90 percent of the nut requirement. Specifically, in Roxas, there are 1,161,576 fruit-bearing trees producing an average of 13,938 metric tons of nuts.

Due to the abundance of this fruit, cashew is the major One Town, One Product (OTOP) of Palawan. OTOP is a priority program of President Gloria Macapagal-Arroyo to promote entrepreneurship and create jobs by promoting a specific product or service with competitive advantage in each city and municipality of the country. For the OTOP program, a projected 24,300 hectares was used for cashew plantations in 2004 alone.

A versatile plant, cashew thrives well in Palawan's changing seasons. It is both drought-resistant and can survive heavy rainfall. Cashew bears fruit during dry season and never misses a year without bearing. It can also adapt to different soil types even on marginal and acidic lands where no other crop could thrive.

Most farmers grow cashew for the nuts. The apple only becomes a by-product of the cashew nut industry. The cashew apple is often referred to as the pseudofruit (false fruit) because it is actually the swollen stalk of the true fruit which is the cashew nut.

Owing to the high astringency of cashew apples, they are seldom eaten fresh, thus completely neglected. Imagine how much of these fruits go to waste just so the country can achieve the cashew nut

requirement in a commercial scale.

Concerned with this scenario, the Research Department of the Western Philippines University (WPU) in Aborlan, Palawan led by its researcher, Estrella B. Equiña, thought of how the unconsumed cashew apples could gain economic value for the Palawenos farmers. The group of Equiña, in collaboration with the Food Processing Center of WPU, developed village-level processing technologies to utilize the cashew apple.

New product lines from cashew apple

The technology uses the fruits of the cashew as raw materials in the production of a new line of products: wine and prunes. The technology involved the natural extraction of the juice from the cashew apple through osmotic process wherein the natural fibers and membranes of the pulp filter the undesirable organic components that are responsible for the astringent and acrid taste of the juice. The extracted juice is now the material

used to produce wine while the remaining pulp is used to make prunes.

The wine is sparkling yellowish-brown when fermented from the juice extract of the cashew apple and becomes reddish-brown upon aging for more than a year. The developed technology for wine contains 10-12 percent of ethyl alcohol.

Meanwhile, the prune which comes from the pulp of the cashew fruit is brownish-black, plummy and sweet-sour in taste. The cashew prune is synonymous to the raisins, dates, and plums which can be eaten as snack food or dessert.

The cashew wine is being sold at 200 pesos a bottle while the prunes cost 110 pesos a kilo.

Putting the technology into action

To put into operation the village-level cashew apple processing, the Turbudan Food Processor, the registered business base in WPU, adopted the technology to commercialize the production of



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cashew wine and prunes.

The project was operated and managed by 17 personnel. For two months, the group was able to process 300 kgs of cashew apple in a day. In the report of Equiña, she cited that "the production output is 30% recovery yield for wine and 25% for the prunes which is equivalent to an annual production of 8,353 bottles of wine and 3,264 kgs of prunes." She also reported that the total project cost amounted to P 1,339,611 covering fixed capital investment of P 403,390 and P 936,221 working capital for two months.

The project was funded by the Commission on Higher education (CHED) and WPU. The Return on Investment (ROI) is 63.84% with a payback period of 1.52 years.

Instead of being a complete waste, the cashew farmers in Palawan are gaining profit from cashew apple. According to the report of Equiña, cashew apple is gradually gaining economic value of more than four times the value of the nuts. It has also contributed to the creation of jobs in the countryside because more than half a million pesos salary compensation has flowed into the economic stream of the community.

Since the inception of the project in 1990, this technology has been adopted by various Rural Improvement Clubs (RICs) around the country. Among them are the RICs in Bataan, Cagayan de Oro, Roxas, Palaman, and Zambales along with other smallscale food processors.

For more information about this technology, please contact Estrella Equiña of the Western Philippines University, Aborlan, Palawan Campus. You may contact her at 0906-8360101 or send an email to: spcpweb@yahoo.com

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In view of the above, agriculture can no longer be viewed other than an organized management system and the issue facing us today is how to mobilize this system for profit and welfare. Hence, the demands of the farmers have become entirely different and complex. This is perhaps the main reason why the DA is moving into an intervention modality based on a unified information system. This is the right direction. It must be noted however, that the installation of a unified information system requires two other unities and these are: 1) unified management system; and 2), unified framework. When agriculture is viewed in this manner, all interventions must be based on a unified framework of action.

A unified system orientation to agricultural development is akin to the holistic approach to development. The value of the former lies in calling to mind the interactive and complementary nature of the elements of the system. A new agriculture must be developed emphasizing unity. Over and above all strategies and methods to be used in agricultural development, all actions are dependent on the right RDE. There is a need for a new information system focused on innovative information management. The unified framework must be institutionalized. A more program type research must be developed and supported.

It must be noted that BAR through its two Banner Programs, CPAR and Technology Commercialization, has already taken steps to address the unified approach to agribusiness development. A more unified research and development orientation is, therefore, in order.

It is the extension service that needs major attention. It has no choice but to adopt and incorporate into its major activities the resource management framework with strong emphasis on organizational development. Its major extension activities must be focused on agriculture as business and farmers must be made information-sensitive. It must put into practice these operations in order to chart the role of extension in projecting the directions of agribusiness development.

In order to do this, ATI may consider partnering with OPTISERVE, INC. a Consulting Firm actively engaged in systems-based monitoring and evaluation and related information management services. It is

instructive to mention at this point that OPTISERVE is completing a two year M / E contract with BAR to monitor the performance of its banner program – CPAR. It is using the resource management framework recommended by AFMA. It is an action-oriented research and development systems which is expected to do four things: 1) collect comprehensive body of information about agriculture as community activity; 2) assess the capacity of the community to make decisions based on the research-generated information system; 3) assess the uses of information for agricultural action planning in transcending the stage specific to CPAR for agribusiness development; and 4), identify key issues requiring further research.

In theory, what OPTISERVE monitored are agriculture related activities that rightly fall into the category of RDE. It must be mentioned that while this is duly acknowledged, the initial set of activities were focused on R and D. With the installation of M / E at BAR, the appropriate institutional mechanism for research has been institutionalized and the environment for making farmers information-sensitive has been set in place.

The next cycle of activities is intended specifically to design a RDE system focused on Integrated Community-based Information Management System (ICOBIMS) to meet the growing requirements of agribusiness development. This is not equivalent to the so-called One Stop Shop. This will be equivalent to the Internet Café that will house computer network systems which will be used mainly for the exchange of information in agriculture. It will be an important ground breaking activity to institutionalize information-driven agriculture.

This is about the best time that the complete turn around in the entire agriculture system is instituted. Integrating RDE will be a landmark contribution in hastening the trajectory of agribusiness. It is through this system that farmers and fisherfolk will be truly sensitized to information for decision-making.

Production practices will be integrated to become the basis of creating an innovative management system focused on change. Hence, the process of making the farmer a business person has come of age. ☺



Culinary herbs: Creating a new trend in Filipino cuisine

STORY BY MARLOWE U. AQUINO, PhD

PHOTOS BY RITA T. DELA CRUZ

The evolution and fusion of oriental and western culinary arts led to the proliferation of indigenous or exotic culinary herb in the Cordilleras specifically within the Baguio-Benguet production areas. Placing the different culinary herbs in local markets has been the challenge for local farmers today. Although these come in small volumes, assurance of stable production is still of primary concern. Specialized herb farmers make it a point to produce the requirements of consumers which include restaurants, shops, and hotels that are into the culinary business.

The entry of culinary herbs in local markets is creating waves especially if these are produced by well known farmers or farms which are into health and wellness programs and organic farming. In the same manner, farmers who are into business have combined entrepreneurial skills and management to make these a balanced competitive endeavor.

Culinary herbs grown, produced, and cultivated

Quite a number of herbs have been identified by specialized farmers who are into the culinary band wagon. Combined with the demand of consumers, herbs are cultivated and produced mostly

through the practice of organic farming or through minimal use of inorganic fertilizer or even through pesticide-free management. To produce such products, the farmers must strictly adhere to accepted production management standards and practices to command high price vis-à-vis their quality produce.

As defined, culinary herbs are those crops used either as fresh or in dried form during the cooking process to add flavor and aroma to a dish. These are chopped thinly or boiled and used as broth for specific food preparations. The commonly found herbs in the market are parsley, basil, coriander, cilantro, chives, rosemary, mint, oregano, lemon balm, tarragon, sage, and thyme.

The herbs are planted in plant boxes or trays and some are grown in elevated plots which are well drained and managed. Because of their special agroclimatic requirements, these crops are ideally grown in semi-temperate areas. In the Cordilleras, these are found in households and in commercial scale in suburban areas of Baguio like Green Valley. They may also be seen in nearby farming barangays in Mount Sto. Tomas Irisan, Baguio City and La Trinidad particularly in Longlong, Ambiong, Balili,

Shilan, Tawang and Alno barangays, and Tublay and Itogon municipalities of Benguet. These areas can produce the required demand of Baguio market including those of nearby provinces and Metro Manila.

Competitive edge of culinary herbs

The limited supply and increasing demand for culinary herbs coming from Cordillera has led other provinces to produce and cultivate the crops. With the proliferation of restaurants and hotels, the culinary herbs have created a market of its own. Locally, consumers go for the fresh produce because it spices up food. In Metro Manila alone, the culinary herbs post high demand because a lot of preparations now use these in keeping with changes in food preference and preparations of the urban Filipinos.

Before, people just add simple spices like garlic, onions, tomatoes, and ginger for taste. Nowadays, the culinary herbs are brought into food preparation and this brings about nuances in culinary product. Included as fresh or dried, the herbs make every meal mouth watering and something to crave for. Culinary herbs make it to the top of the list of

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AGRICULTURE:

In search of a new modality of development management

BY MANUEL F. BONIFACIO, PhD

The roles performed by the Non-Government Organizations (NGOs) in institutionalizing the community-based resource management system are duly recognized and acknowledged. Quite a number of these organizations are very active in creating the right environment for the emergence of a new culture of authority – empowerment. Oftentimes, this idea is treated in terms of self-determination through people-based decision-making. While it would be fair to say that most NGOs are cognizant of the value of the role and impact of empowerment, oftentimes, however, the political underpinning of the concept is muted.

It seems that a new interpretation of empowerment is in order to ensure that the right environment for its appreciation and use is in place. The key to the understanding of empowerment is located in the appropriate use of authority. Its use is empowering because it is an instrument to take action that is duly recognized as legitimate and it will lead to a completion of action which is perceived to reduce inequities and injustice in society.

It is duly noted that many NGOs associate empowerment with decision-making. This is correct! It is based on collective agreement which reflects the general need of the community and is arrived at through participatory dialogue. Thus, it is through this process that the decision is made to reflect a sense of ownership. The idea of ownership needs to be expanded since it readily involves three vital psychological processes and these are accountability, responsibility and trust (A R T).

These three processes are easily institutionalized through collective action. It is through this action that the social

foundation of trust is developed. People, in general, will feel empowered if their collective action is mobilized and organized. In reality, trust is developed through participatory dialogue. Self-confidence emerges through this process. It is likewise true that in active participation, one can reveal and share what one knows, his needs and aspirations. This process allows for the unfolding of self-confidence that what he shares are appreciated and respected and that he can be himself.

It is in building self-confidence that mutual trust is cultivated. Responsibility and accountability are developed only through the building of mutual trust. The process, therefore, is to build self-confidence in order to develop mutual trust. A strong sense of accountability and responsibility will only take place through the building of mutual trust. Hence, trust building is the foundation of empowerment and therefore – responsible action.

From the above description, one can readily see why a number of empowerment activities did not take-off and were not institutionalized since its major focus is on active engagement in advocacy. This is best illustrated by the activist stance in a number of social issues. Demonstration is a good example of this. Yet, what apparently has been missed through the years is how to institutionalize empowerment. It is not merely a tool to get what one wants which one feels he has a right to claim! Or that something must be done immediately to overcome one's impoverished situation. Presently, empowerment is viewed mainly as an instrument to correct and rectify inequities in society. There is no question about this orientation. However this view is too limited and narrow. Hence, it must be corrected.

More than anything else,

empowerment is a tool to create new consciousness and new relations in society. In other words, empowerment is transformative, both at the individual and social levels. It is a tool for improvement, innovation and change in the institutional relations in the community. In this sense, empowerment must be taken as a critical process of collectively the interpreting existing condition in the community and what people, together, can do about it. It is, in theory and in practice, a case of social activism.

One can, therefore, understand why there is a need to organize the community. It is, however, not being taken that it is not organized. It is, but it can be organized better. As already indicated, empowerment is psychological and social at the same time. These are interactive and reciprocal in nature. It is a process that begins where the people are, what they have, what they can do together, where they want to go and how they want to get there.

The foregoing is best illustrated in agricultural development interventions. Approaches to promote agricultural development are not wanting. Through the years, different approaches have been developed and utilized. Perhaps the most notable are technology transfer and capacity building. Although expectations are high, very often, these interventions have limited impact. The amount of investment in these two interventions strategies through the years is huge.

In many countries, part of spending for agriculture was allotted to enhancing community participation and cooperatives development. Despite this, their impact has also been limited due to the failure of planners to put in the right context what they are trying to achieve. In

other words, there is need to unravel the real intent of participation and cooperatives development. In theory and in practice, participation is woven into cooperatives development in the true sense of broadening the democratic space of action. This, however, remains to be achieved. Since this has not been attained, the search for the right approach goes on in research and development. Government programs in these two areas are still being pursued with vigor. This is evident in the current investment of the Department of Agriculture in its rice enhancement program through cooperatives development.

What should be noted as most glaring in these interventions is that through the years, the planners failed to place agriculture-related interventions in their proper context. It failed to recognize the organized nature of agriculture and situate the interventions in such organized activity. Extension activities, in particular, take the individual, groups and communities as its target audiences. Undoubtedly this has to be the case. However, its intervention strategies failed to take agriculture as an organized activity of the community. In other words, any intervention in agriculture has to be placed in the context of an organization and organized activities.

This could be the main reason why, oftentimes, an intervention does not begin from an appropriate framework of action. In other words, present day intervention is individual action oriented that technology adoption is taken to promote higher productivity and improved welfare. These assumptions are defective in form and content. Without giving appropriate attention to the organized nature of production, a program intervention will be fragmented; those who are better producers will have better access to services while those at the other end will be further marginalized. Program orientation will be fragmented and impact will be limited.

Hence, it is not difficult to understand why up to now, technology transfer is still a mystery and the search for the right approach is still going on. The two sided nature of technology has not been considered. As it is often the case, only one side is given substantial attention and this is technology as a means to increased production. The other side is the impact of technology on the relations of production. These two are naturally complementary and therefore cannot be separated. To do so, is to invite failure as this has happened

through the years.

This is best illustrated in the Agriculture and Fishery Modernization Act (AFMA). Its main organizing principle revolves around the notion that agriculture must be transformed from a resource-based to technology-based industry. This pronouncement, of course, raises many issues and some of which have been tackled in the AFMA evaluation. Nevertheless, it is worth noting that the intention is to promote agriculture development that is technology-driven.

When the methodological orientation is framed in this manner, i.e., without putting the technology in its most appropriate context – means and relations of production, the historical problem of technology transfer remains as it is today. Unless the two-sided nature of technology is taken into consideration, the mystery will remain unresolved.

The other side of technology transfer must be given its much needed attention with emphasis on the relations of production. In theory, the emphasis is on the social and not on the psychological. The very fact that emphasis was placed on the relations of production means that it is taken as an organized activity. Obviously, the context of technology transfer cannot be other than the organized nature of agricultural production. If the assumption is placed on the positive impact of technology on production, this, however, cannot materialize if the relations of production are ignored.

This means that production must always be taken as an organized system of farmers. It is only in this way that an appropriate framework can be developed. In the AFMA evaluation, a framework was recommended focused on management. It advocated a resource management framework. This recommendation is very timely and must be given appropriate attention by those involved in agriculture.

In view of its orientation, the framework identified five major resources that must be considered and these are: social, technical, economic, environmental, and political (S T E E P). These are interactive and complementary. Its methodological orientation is focused on management. Hence, the notion of linking technology transfer (means) to the relations of production is now placed in its most appropriate context which includes social (relations), economic, political and environmental. The context of production

can be viewed in terms of constraints, opportunities and potentials.

The intervention strategies are focused on improvement, innovation and change. These strategies are interactive and complementary. However, its development bias is to begin from systems improvement to be complemented by innovation and change. In the language of management systems, improvement is complemented by systems innovation. It could be taken that in the end the concern of management is systems change. Hence, the point of entry in technology transfer is to consider the natural and historical nature of agriculture as an organized activity of the community.

The other point is related to poverty alleviation and the attention given to small scale farmers especially those who are marginalized. Many efforts are being harnessed to help this sector of agriculture. However there is one critical point that must be considered and this refers to attempts to make their production competitive. The real picture of agriculture today is global competition. There is no question about raising, diversifying and developing alternative production schemes and investing in alternative commodities so that poor farmers can move into the direction of agribusiness development.

The point that has not, at all, been given attention is the fact that they are faced with organized competition in agribusiness – especially from agribusiness conglomerates. They are not only organized but organized as efficient corporate bodies with global operations. They have better access not only to technologies but to the best technologies available anywhere. They are more than capable of investing in new R and D. Moreover, they can readily commission research works that will better position them in the global market of agriculture. Where do we go from here?

As things stand today, there is nowhere to go but to organize the farmers. This becomes all the more urgent based on the pronouncement of Secretary Yap that agriculture is business. In fact, this is complemented by a similar pronouncement which states that the farmers must be information-sensitive. Embedded in these two pronouncements is the need to organize agriculture as agribusiness. It must be organized and an efficient management system installed. Taken in this light, one can fully appreciate the meaning of making farmers information-sensitive.

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Improving the way people live through R&D



OLD NEWSPAPERS FIND USE IN MANGO PRODUCTION

Mango pickers from Tiblawan, Davao Oriental sort mangoes after harvesting them from mango trees. These mangoes still have newspaper wrappers. Fruit wrapping is a widely used practice to protect mangoes from insects and solar burns, particularly those grown for export. The mango sap naturally attracts insects and the paper wrap acts as a perfect barrier. Newspaper wrapping is done 55-60 days after flower induction.



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