

Variety is the Spice of Life

By Glenn I. Teves, County Extension Agent, UH CTAHR CES Molokai

One of the most important concepts in marketing today is in offering many choices or options to accommodate the different needs and wants of consumers. Automobiles, food, clothes, cellphones, and almost everything we buy offer many choices, including colors, shapes, and materials, from but it wasn't always that way.

Once upon a time, there was only one choice of automobile, the Ford Model T, and this specialization made it possible to design and construct a one-size-fits-all car. The production line, where everyone specialized in adding a new part or component to the vehicle as it moved down the production line, was born. Today, robots can construct a vehicle in state of the art facilities with parts originating from all parts of the globe. The Mini Cooper 'S' is believed to be one of the first truly global cars, with parts manufactured throughout the globe, and there's more to come.



Today, we're taking choices to a whole new level in food by offering crops of all colors, some fueled by demands for healthy food, but also variety in our life. New niches for food include gathering wild plants from mountain, shore, and sea, and incorporating them into new regional cuisine. This is a worldwide trend, even in areas not known for cutting edge cuisine, such as Denmark.

Antioxidants are buzzwords for healthy, anti-cancer, anti-aging components in food sought after by baby boomers and youth alike. Baby boomers, those born between 1946 and 1964, face many health challenges and are forced to become more health-conscious. Also, new vegetable colors are chic, from carrots to cauliflower to peppers, and even purple tomatoes, fueled by the quest to incorporate more antioxidants into food. Carrots are the model; through conventional breeding, breeders were able to ramp up the Vitamin A content to the point where carrots provide 30% of our needs for Vitamin A. Although many of us eat with our eyes, good taste has to follow.

Bad Spice

For many, access to real food is getting harder to come by because food manufacturers are playing games with words. Sugar is public enemy number one for many of us; it's insidious and in almost everything we eat. If we were not eating sugar, then the food we eat is turning into sugar, like starches. Food manufacturers know this, and have devised ways of disguising the sugar in our foods by calling it different names to confuse us. They include corn sweetener, maltose, lactose, molasses, and malt syrup, the sugar roll call goes on and on. In a February 2012 opinion piece in the journal *Nature*, Doctors

Laura Schmidt, Robert Lustig, and Claire Brindus laid it out: too much sugar triggers all the diseases associated with obesity, diabetes, stroke, and hypertension. “It actually kills people”, says Schmidt. Although the human body needs sugar to survive because it’s the only fuel our brain cells can metabolize, too much is bad, but if you have too little you die”. In Hawaii, we don’t seem to have a problem with the latter as many, such as the Hawaiian community, face major challenges with the overconsumption of sugar.

The processing of corn into the sweetest dose of sugar quickly makes a smart, “natural” sugar into something very different. According to Schmidt, “You’re overloading the human body with what was otherwise a perfectly fine thing to consume.” In 2005, the National Library of Medicine found that our response to sugar mimics some of the mechanisms behind drug abuse. Those gummi bears stimulate the release of dopamine, which is often referred to as the brain’s reward chemical.

According to Dr. Cecily Poree-Turner of the Children’s Hospital Medical Practice Corporation in New Orleans, “When children are introduced early to sugary drinks, they often refuse other liquids and limit their intake of milk and water.” Some experts feel we have to take extreme action in order to control this supervillain. Dr. Laura Schmidt contends, “We need our government officials to address the fact that our food supply has been hijacked by companies selling us bad food. It’s about saving lives.” In my view, this seems to be the next tobacco, with a possibility of similar consequences for the industry. More reason to eat real food, starting with real fruits and vegetables. Or better yet, GROW YOUR OWN!

Designer Sweets



*Molokai Sweetpotato Field Day.
Photo: Alton Arakaki*

Most of the commercial sweet potato varieties grown in Hawaii originated from Okinawa. The isolation of islands allows island people to develop their own characteristics, their culture, their traditions, and also their food, away from outside influences. Okinawa and Hawaii are no exception. Plant and people origins are interconnected just like agri- and culture, and this area of knowledge always intrigues me. I continue to research about where people came from, and what foods were important to them. This is also a source of our gene pool to refine and create new, better adapted seed.

The ancestral homes of these plants contain its greatest diversity, and New Guinea is considered one of the homes of the sweet potato.

The University of Hawaii College of Tropical Agriculture and Human Resources had a Sweetpotato Improvement Program based on genetics from Okinawa up until the mid-1980’s. These varieties are earlier maturing than the Polynesian varieties, and most important of all, they’re flesh is firmer and more tolerant to two varieties of sweetpotato weevils, our major sweetpotato pests in Hawaii. Several years ago, the USDA initiated a research program to develop new sweetpotato varieties with tolerance to these major

pests. When they received the UH varieties, they decided to suspend the research because these varieties showed a high tolerance to the weevils, and is the main reason they're used for selection and breeding in Hawaii.



Sweetpotato Field Day & Tasting
Photo: A. Arakaki

The main challenge is maintaining cultivars. Although plants can be propagated by planting a sprouted piece of the tuber, in production systems they're propagated by tip cuttings from the vines, also called 'lau'. About 12-20" cuttings are planted, with about half of the cutting covered with soil. Covering a stem with three leaf scars will produce three good sized tubers. Sweet potatoes are hilled about 5 weeks after planting, and before vines cover the soil surface. It takes anywhere from 90 to 150 days from planting for sweetpotato to mature, with faster production in the warmer, longer days of the year.

The variety Waimanalo Red was the backbone of the selection program. It's a red-skinned variety with pale white flesh and is revered for its sweet flavor and smooth texture. The original plants came from Okinawan farmers in Windward Oahu. Probably its most important characteristic is its earliness. When other varieties can take anywhere from 120-150 days to mature, Waimanalo Red can mature in 90 days under ideal conditions found in the hot, long days of summer. Waimanalo Red is the parent of many of the varieties grown today.

A lot can happen in a decade or two. About 20 years ago, this was the main production variety. Today, it's hard to find, because planting material needs to be maintained. If farmers don't propagate it regularly, soon a variety is lost. Many of our kupuna (elders) still ask for Waimanalo Red today because they like the taste.

The other important variety, called Okinawan, is a white skin, purple flesh variety. There are many selections of this variety out there, such as Rapoza and others. Not as sweet as the red skin types, it's very popular and is a favorite for making tempura. Many are attracted to its intense purple color, and when mixed with other varieties of sweet potato, including yellow, orange, and white create a food kaleidoscope for the eyes.



Heinie and Becky Mokuau planting sweetpotato lau with a tobacco transplanter. Photo: Hawaii Farm Newsletter

The late Heinie and Becky Mokuau were our premier Hoolehua Homestead sweetpotato growers, and the backbone of our farming community who started growing sweetpotatoes in the 1970's. They grew both Waimanalo Red and Okinawan sweetpotato, but the challenge in growing the Okinawan was to remove the red dirt from its white skin. I used to joke with them that we needed to find a red skinned variety with purple flesh so they wouldn't have to work so hard, washing off the red dirt from the white skin.



Molokai sweetpotato field with two varieties

One day, I received a telephone call from Hienie to stop by his house because he wanted to show me something. Lo and behold, he shows me this red skinned, purple flesh sweet potato that he found in his field. He was sure it was a seedling, and was found in a field where he previously grew a variety called Onokeo, a brown skin light yellow flesh variety known for its

excellent eating quality. Hienie was so excited and soon he was growing fields of this new variety which we now call Mokuau. It could have originated from a lot of different varieties previously grown in that field because sweet potato seed has a hard shell that can sit in the ground undisturbed for years, even decades.

Genetically, sweet potato is a hexaploid; it contains three sets of chromosomes. Most crops are diploid, which means they have one chromosome from each parent or two chromosomes just like us. For hexaploid sweet potatoes, it's like having three sets of parents and the possible combination of traits is endless. Planting seeds can produce new varieties that look nothing like their parents.

The basis of UH sweetpotato selection program involved growing seedlings, and selecting them for important characteristics, including earliness, yield, shape, lack of stringiness in the flesh, skin color, flesh color, and disease resistance. Growing two different varieties side-by-side, such as Hawaiian and Okinawan, will double the combination of possibilities. Many of the varieties developed by UH are hard to find today due to the difficulty in maintaining sweetpotato germplasm.

There are two types of sweet potatoes, dry and moist. All of the Okinawan types are dry types while those from the mainland, also referred to as yams, are moist types, sometimes referred to as yam types. The type of sweet potato most of us eat for Thanksgiving are orange moist- or yam types, while the local population prefers the dry type for eating and preparing tempura.



George Mokuau digging sweet potatoes with a sugar beet digger. Photo: A. Arakaki

Our Lanikeha Recreation Center is named after a famous sweet potato from Hoolehua. I believe we found Lanikeha when it showed up in one of George Mokuau's fields; a white skin, light yellowish flesh variety with yields exceeding 80,000 pounds per acre. The problem is the shape was erratic and not acceptable for the retail market, but boy did it produce! When homestead farmers open up new land, especially near old pig pens or gardens, they inevitably bump into old sweet potato

varieties, some grown by their grandparents and great-grand parents. Most are seedlings from the plants their ancestors grew.

If you want to create new varieties of sweet potato, just watch for the plants to flower and collect seeds when the flower starts to dry up. Scarifying them in order to break the seed coat allows water to get in and germinate the seed. Sweet potatoes flower in the cold months, and soon thereafter the seeds are formed. This is a good time to collect them. A good way to crack the seed coat is to put rough sandpaper on the inside of a jar, including the bottom and shake the seeds around. Another way is rolling them between two chopping boards to crack the seeds. You will never know what you'll find, maybe the next commercially important sweet potato variety for Hawaii or your own designer sweetpotato. It's like digging for hidden treasure. See you next month...