Agave: Nectar of the Gods?

By Rami Nagel

Agave nectar was first introduced to the U.S. market in Anaheim, California, at the 1995 Natural Products Expo West, the nation’s largest natural, organic and healthy products trade show. Marketeers have touted this tempting sweetener from Mexico for its low glycemic index and it soon became a favorite found in raw food circles and among enthusiasts of healthier foods. Agave nectar is often an ingredient in newer “health foods” including energy bars and organic ice creams. Advertisements for agave stress such attractive features as acceptability for vegan and raw food diets, grown in nutrient-rich soils, all natural, 100 percent organic, fair traded, sustainably harvested, and even kosher.

In researching agave nectar, I have found that many of these advertised claims are true, but even so, the fundamental question remains, “Is it good for us to eat?” Although possibly higher in minerals than most refined sweeteners, it is not likely healthy for regular use due to its high fructose level.
A PLANT OF MANY USES

Agave nectar is a sweetener produced from the agave plant. There are hundreds of species of agave, which is not a cactus as commonly believed, but a succulent that is more closely related to amaryllis and other lilies. Each species of agave has unique characteristics that make it suitable for different uses: food, clothing, fiber, beverage, construction, and so on.

The agave plant has a large root base with long pointy projections coming out of it. Each species of agave plant looks different and has its own features. A mature agave has leaves 5 to 8 feet tall, and is 7 to 12 feet in diameter.

AGAVE NECTAR

Commercial agave nectar is produced primarily by two companies, Nekutli SA de CV (distributed by the Colibre Company of Aspen, Colorado) and IIDEA (the latter also produces tequila). Each of these companies then sells its bulk product for repackaging under a variety of different brand names. Nekutli’s most familiar brand of agave nectar is sold as “Madhava Agave Nectar 100% Natural Sweetener” and IIDEA’s most popular brand is “Wholesome Sweeteners Organic Blue Agave Nectar.”

The nutrient profile below shows what Nekutli and IIDEA agave nectars provide in terms of chemical composition. I have included analyses from two comparable sweeteners, unheated honey and maple syrup.

The difference between Nekutli’s and IIDEA’s sugar profile reflects the fact that they are from different plants and are manufactured in different ways. Note that accusations have been made that some companies add filler sugars to their agave nectar. While this may indeed happen, I could neither confirm nor deny this fact for any particular brand.

IIDEA’S AGAVE

IIDEA’s agave is extracted from the blue agave plant when the plant is approximately eight years of age. What follows is not an exact factory tour of how IIDEA’s agave is manufactured, but rather a general overview.

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<table>
<thead>
<tr>
<th>NEKUTLI PREMIUM</th>
<th>RAW &amp; UNHEATED HONEY</th>
<th>CONVENTIONAL MAPLE SYRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Carbohydrates %</td>
<td>97.4 - 99.8%</td>
<td>Min. 98%</td>
</tr>
<tr>
<td>Water</td>
<td>trace</td>
<td>trace</td>
</tr>
<tr>
<td>Fructose</td>
<td>70.5 - 74.5%</td>
<td>78 - 85%</td>
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<tr>
<td>Dextrose (Glucose)</td>
<td>20.5 - 26.5%</td>
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<td>Mannitol</td>
<td>0.0%</td>
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<td>Sucrose</td>
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<td>Max. 3.0%</td>
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<td>0.0%</td>
<td>Max. 2.0%</td>
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</tbody>
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NEKTULI’S AGAVE

Nektuli’s agave is extracted from the salmiana agave plant. When the plant is seven or eight years old, it produces a long flower stem called a quíote. Soon after the quíote first appears, it is removed, leaving a hole in the center of the plant. The plant tries to heal this wound, and aguamiel collects in the hole. Agua means water, and miel, honey. This aguamiel is the true nectar of the agave plant. It is not the sap of the leaves, but the juice the plant stored to prepare to grow its quíote.

The aguamiel can be collected twice per day, each plant producing 6-8 quarts of aguamiel daily. This production continues for approximately eight months and can at times last for several years. The aguamiel is carefully removed by indigenous farmers using a gourd and a suction device. The aguamiel is placed in an evaporator to remove moisture. Here is where raw agave nectar is produced. If the vacuum evaporator is controlled to stay below 115°F then it is called raw nectar, and if it is not controlled, evaporation proceeds more quickly, and this creates regular, not raw, agave.

The resulting syrup is next hydrolized using enzymes. So rather than using a heat process, Nektuli uses an enzyme process with organic enzymes to convert the carbohydrates into sugars. Finally the agave is filtered, which results in a light syrup.

INDIGENOUS AGAVE SYRUP

Some indigenous peoples of Mexico make a sweetener with the aguamiel, called in Spanish miel de agave, or miel de maguey. The production of this sweetener is quite simple: pour the agave nectar into some type of pot and then boil it. The result is a very dark, thick liquid with a characteristic smell and strong flavor. Even to this day this dark syrup liquid is used to treat several illnesses.

The strong syrup has a high concentration of mineral salts such as calcium, magnesium, sodium and potassium, as well as amino acids. It has been consumed since prehispanic times. The main difference between traditional agave syrup and Nektuli agave syrup is that Nektuli vacuum evaporates their product at a lower temperature and then uses enzymes rather than boiling to hydrolyze the sugars. This process results in the removal of many of the mineral salts and amino acids.

While I have heard mention of a company selling what appeared to be traditional agave syrup, I could not get in contact with them. When I tried to ascertain why nobody was selling traditional agave syrup, I discovered that the flavor is too strong to be palatable for most people. That “most people” surely does not include many of the members of the WAPF, who relish their potent cheeses and fermented “smelly” foods of various sorts!

In order to sell agave sweeteners to a wider market, commercial manufacturers decided to create a more delicate product with a more palatable flavor and this is the agave nectar we see on store shelves.

BLUE AGAVE AND TEQUILA

The story goes that IIDEA, originally a tequila manufacturer, one day approached the University of Guadalajara to find out what to do with all of their extra agave plants from a year of high agave yield. The University suggested and devised a way to make a sweetener.

When the Spaniards came to the New World around 1535 they brought with them a passion for brandy. When their supplies ran out they had to find a new alcoholic beverage to replace their lost brandy. The Spaniards found that by distilling the juice of the plant now known as the blue agave plant they could produce a potent alcoholic beverage which over time has evolved into what we now call tequila.

AGAVE OBSERVATIONS

Using the term “agave nectar” for a sweetened syrup produced from the aguamiel of an agave plant, or from the juice of the heart of the blue agave plant, seems like mislabeling to me. Some agave sellers properly label their nectar as syrup. And that is what this really is, a syrup produced from the agave plant; it is not nectar. To me, nectar would be the aguamiel or some unadulterated version of it.

The traditional sweetener and healing remedy made from boiled nectar of agave is called in English a syrup. To be clear, when you are buying agave nectar, you are not buying the nectar, but
a syrup made from the agave’s nectar.

The agave made by Nekutli seems far closer to tradition than IIDEA’s agave made from blue agave that has been selectively bred, for perhaps centuries, to produce large plants with higher levels of inulin (linked sugars). Enhanced inulin and sugar levels make the blue agave a better plant for tequila production.

Meanwhile, Nekutli takes the original aguamiel and processes it to remove strong flavors and odors. But agave syrup made by Nekutli is not the traditional sweetener either, as it uses modern vacuum evaporation techniques, enzymes rather than heat, and a filtration system to remove many of the minerals and thereby create its light flavor.

I purchased the raw varieties of Nekutli and IIDEA’s agave nectars and sampled them, both plain, and also in my daily raw milk smoothie with raw eggs. In texture and form, both nectars were very similar to honey. They had a sweet flavor; the difference in flavor between the agave syrups and honey was noticeable but not extreme.

In a crude science experiment, I placed petri dishes with the agave syrups, and petri dishes with two brands of unheated honey out for the bugs to eat. From a visual perspective one can hardly tell the difference between the agave syrups and the honeys. The ants preferred the agave syrups over the honeys, especially the dark raw agave manufactured by IIDEA.

During the taste test, and through observing myself afterwards, I had a hard time finding fault with the agave sweeteners. While agave syrup is not a product I will continue to use, the organic varieties I tried were clearly not worse than, say, organic evaporated cane sugar found in many organically labeled products. Further detailed testing would be required to ascertain how good or bad they truly are. As a side note, both of these agave syrups seem to come from agave grown in pristine lands with rich soils.

The physical properties of agave make it ideal for manufacturing—perhaps that was the original intent for developing this processed sweetener. Agave syrup blends well with food, has a bland and mild taste, and does not compete with other flavors.

However a major concern is the high level of free fructose in agave syrups—much higher than honey and maple syrup. Given what we now know about the deleterious effects of fructose compared to sucrose, honey and maple syrup would seem to be better choices than agave for home cooking. Questions also remain about the end products of rapid enzymatic hydrolysis.

NECTAR OF THE GODS

Two thousand years or more ago, in the central highlands of Mexico, the Native Americans consumed a sacred drink made from a variety of agave, such as the agave salmiana, called pulque (pronounced pool-kay). Pulque is a thick, whitish drink of 3-4 percent alcohol made via a brief fermentation of the aguamiel.

Traditionally pulque was used by the Aztecs for special celebrations, served as a ritual intoxicant for priests to increase their enthusiasm, and as a medicinal drink. Pulque was also considered a nutrient-rich drink reserved for pregnant and nursing women; its nutrients decrease the risk for anemia. A mildly alcoholic drink that is good for pregnancy and breastfeeding definitely goes against modern conventional beliefs. (To be clear, I am not suggesting pregnant women drink alcohol such as wine or beer.) This shows that the form and preparation of alcoholic beverages, as well as the concentration of the alcohol, dramatically affect the beverage’s positive or negative effects on the body. Pulque provides thiamine, riboflavin, niacin and pantothenic acid, as well as enzymes and beneficial bacteria from the natural fermentation process.

The first stage of pulque production is the same as the first stage for producing Nekutli’s agave syrup. During maturity of the plant the giant flowering stalk is cut before it grows, and each day a natural bowl in the base of the plant fills with aguamiel. The aguamiel was originally ceremonially collected and carefully fermented without any additional processing. The native enzymes and bacteria in the aguamiel naturally and automatically turn the aguamiel into pulque. In 36-48 hours, the famous drink is finished. The liquid is said to be very sour and smelly, similar to the taste of fermented sorghum beer from Africa—definitely an acquired taste!

Still, just hearing about this mythical and revered drink, filled with life-giving nutrients,
The substance sold as agave nectar on today's market shelves is not the true nectar, neither is it the traditional syrup.

which brings about a heavenly intoxication while also possessing medicinal and aphrodisiac qualities, tempts me greatly. Unfortunately, traditionally made pulque is difficult to find even in Mexico, and the location of those rare sources is a closely guarded secret. Due to the rapid natural fermentation process, storing the pulque for transportation while keeping its natural probiotics intact is a difficult task that no one seems to have successfully accomplished.

THE LOST NECTAR

Weston Price frequently commented that with the coming of the modern white man and his depleted foods of modern commerce, also came a plague that destroyed indigenous civilizations across the planet. This plague not only deteriorated the flesh and bones of all people consumed by it, but their hearts and minds as well.

Refined agave syrup, labeled as agave nectar, is an example of this process, wherein goodness and harmony are lost. Here, pulque, a lightly alcoholic life-giving food, considered to be the nectar of the gods due to its intoxicating effects, is replaced with poor facsimiles of tequila.

And traditional agave syrup, made by boiling the aguamiel, which today is still used for traditional healing methods, is replaced with a more refined syrup, that has lost at least some of its minerals, and is no longer produced by original methods. These modern interpretations of ancient whole foods do not offer the same life-giving properties, nutrients, and good spirits of their wholesome ancestors.

It is a sad reflection today that even in the central highlands of Mexico, the use of pulque is in rapid decline, no longer available in its genuine form for today's people who deserve this divine nectar in its carefully harvested, pure, and unrefined state.

The substance sold as agave nectar on today’s market shelves is not the true nectar, neither is it the traditional syrup.

I feel the calling and desire within me to return to the old ways. I can imagine a time and a place where people trust in nature's principles to guide their food creations. In such a time we will not require research articles to figure out what a food really is behind its marketing hype and product labeling. I look toward that time when we rely on nature's principles and the heritage of wise traditions to educate us about the most vibrant and rich ways to live.

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XYLITOL: IS IT BENEFICIAL, OR EVEN SAFE?

Heralded as an ally in the battle against tooth decay and diabetes, xylitol is another sweetener to enter the market with a great deal of hype. Xylitol is a five-carbon sugar alcohol found in some fruits and vegetables and produced in small amounts by the human body. Because mouth bacteria cannot ferment sugar alcohols, xylitol is said to prevent cavities; and because the body metabolizes it primarily through the liver rather than the pancreas, it is said to be good for diabetics in limited amounts (no more than 60 grams per day).

Xylitol is less sweet than sugar and produces a noticeable cooling sensation in the mouth when highly concentrated, as in “sugar-free” candy and chewing gum. It is often added to foods sweetened with aspartame, to mask the bitter taste. And because xylitol contains fewer calories than sugar, products containing it can carry weight loss claims.

HOW IS XYLITOL MADE?

Originally made from birch bark, and hence associated with the very natural, nutritious and traditional birch syrup (similar to maple syrup), xylitol is anything but a natural product. The typical manufacturing process goes like this:

1. Obtain some source material containing xylan. One commonly used source is corn cobs imported from China. Hardwood and the waste from cotton ginning are other sources.
2. The xylan needs to be broken down, either through a chemical process called acid hydrolyzing or through microbial fermentation. (Genetically engineered bacteria have been proposed for this step.) The results of this process are xylose and acetic acid.
3. The concentrated acetic acid, described as “very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation... Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive),” must be removed.
4. Next the hydrolyzing acid and organic residues must be removed, which is done by heating the mixture and evaporating it.
5. The resulting syrup is now free of acetic acid, hydrolyzing acid, and other residues.
6. The syrup is crystallized by stirring ethanol into it.
7. The crystalline xylitol is now separated in a centrifuge. The ethanol is separated from the sorbitol remaining in solution.
8. Voilà! You have xylitol.

XYLITOL’S DUBIOUS HEALTH CLAIMS

Since xylitol is an industrial product, it pays to be dubious about the industry’s health claims for it. First among these is the claim that xylitol prevents cavities. Indeed, many studies can be cited to support such a claim. But not all. The results of a recent two-year trial found no difference in cavities between those who chewed xylitol-containing gum and those who did not. In an earlier study, researchers concluded that “Overall, consumption of xylitol-containing snacks and candy did not reduce S. mutans levels.”

As for the claim that xylitol is good for diabetics, the fact that this sweetener is not completely absorbed comes at a cost: bloating, diarrhea and flatulence. In a study performed on 18 diabetic children who consumed a dose of 30 grams of xylitol per day, researchers found a significant elevation of the uric acid concentration. And since 80 percent of xylitol is metabolized through the liver, a danger to liver function similar to that of fructose is a distinct possibility.

The official website for xylitol, xylitol.org, states, “In the amounts needed to prevent tooth decay (less than 15 grams per day), xylitol is safe for everyone.” Fifteen grams of xylitol is about 0.5 ounces. What about doses over 15 grams?

In a long term toxicology study on rats researchers found that xylitol caused a significant increase in the incidence of adrenal medullary hyperplasia in male and female rats in all dose levels tested (5%, 10% and 20%). That means it caused abnormal cell growth in the adrenal glands. In one higher-dose study in which mice consumed 20 percent of their diet as xylitol, there was a significant increase in the mortality of the males as compared to those consuming sucrose. A major study in dogs found an increase in liver weight associated with xylitol use.

CONCLUSIONS ABOUT XYLITOL

Xylitol’s own promotional material says it is not safe for everyone to use. Since children are smaller and less developed than adults, they will obviously be much more sensitive to xylitol’s effects. There are no safety data or tests to indicate a safe dosage for children. And foods containing xylitol may also contain additional sweeteners that are undeniably harmful, such as aspartame.

As for claims that xylitol can prevent tooth decay, I can only say, “Buyer beware!” Such claims are based on the faulty theory that bacteria cause tooth decay. We know from the work of Weston Price that tooth decay is a problem of nutrient deficiencies—the bacteria are just there cleaning up dead tissue.

Finally, and most importantly, this industrial product is just not necessary. Nature has provided us with many wholesome sweeteners that can be used in moderation without adverse effects in the context of a diet of nutrient-dense traditional foods.