Florida’s Hard Clam Industry and Ft. Lauderdale’s Composted Seaweed: What Do They Have in Common?

By Mary Jo Fahey
December 29, 2016

Florida’s hard clam industry and Fort Lauderdale’s composted soil made from seaweed are probably unappreciated. One of the threads that ties these two endeavors together may be two billion years old. This article explains how these subjects are related.

Florida’s Hard Clams
Hard shelled clams, or thick shelled quahogs, are native to the eastern shores of North America and Central America, from Prince Edward Island to the Yucatán Peninsula. They’re distinguished from soft-shell clams that have thin calcium carbonate that break easily.

Nature is extremely complex and very old with interesting connecting points. For example, on a microscopic level, there is a tiny bacteria that makes Vitamin B12 or cobalamin that is critically important for animal and human health. The bacteria is a symbiote that produces Vitamin B12 in 30 steps requiring enzymes as well as the mineral cobalt. The bacteria lives in the rumen of dairy animals and inside sea mammals such as clams and shrimp. Cobalt may not be available in soil, but it is readily available in the ocean making clams a rich source of Vitamin B12.

Florida clams are grown on submerged lands leased to growers from the state. Charlotte Harbor and Pine Island are home to several lease sites where Northern Quahogs or hard clams are raised. Shrimp are potentially a rich source of cobalamin, but researchers have identified the exponential growth in Asian aquaculture as a source of global trematodiasis which means infection by trematode worms (“Emerging Foodborne Trematodiasis,” Jennifer Keiser and Jürg Utzinger, Emerging Infectious Diseases, Vol. 11, No. 10, October 2005). The problem is not aquaculture, but aquaculture that is infected with parasitic worms.

Why Do We Need Vitamin B12?
In the past twenty years, scientists have studied vitamin metabolic pathways. Dr. Jeffrey Bland is one of the most famous contributors to the field of nutritional medicine that is largely ignored by allopathic schools. Allopathy is a system of medicine that uses drugs and surgery to treat disease. Although allopathic medical doctors do not study vitamin metabolic pathways, they are familiar with vitamin and mineral deficiencies. Deficiency symptoms have been identified for thousands of years. For example, an iodine deficiency causes a neck swelling called goiter. Although iodine was not given a name until 1811, Chinese Emperor Shen-Nong, whose reign began 4,748 years ago, advised his subjects with goiter to eat dried seaweed and burnt sponges.

The Vitamin B12 metabolism is very large and deficiencies can manifest as heart, blood, skeletal, gastrointestinal and psychiatric problems. Of these, psychiatric symptoms of Vitamin B12 deficiency are serious because they can include a wide range of cognitive and behavioral changes that include dementia, hallucinations, psychosis, paranoia, depression, violent behavior, and personality changes.

Genes for Vitamin B12 Pathways Are Still Unidentified
We need Vitamin B12 to prevent deficiency diseases, but this nutrient can only be used in people with a complete set of genes. Although the molecule's three-dimensional structure was discovered by British biochemist Dorothy Hodgkin in 1956, much of the Vitamin B12 metabolism remains a mystery to scientists. For example, several genes for the Vitamin B12 metabolism have never been identified.
The most ancient part of the B12 molecule is a flat molecular cage called a corrin/porphyrin ring that scientists theorize is two billion years old. Vitamin B12 (also called cobalamin), heme (oxygen-carrying component of hemoglobin) and chlorophyll contain similar corrin/porphyrin rings that are very old. Cobalt, magnesium and iron ions in the ring clusters provide blue, green and red colors. They have been called the "pigments of life."

**Benefitting From Nutrients Found in Nature**

So far, we’ve learned that those who are lucky enough to have a complete set of genes and a Vitamin B12 metabolic pathway that works, will need to eat foods that contain Vitamin B12 made by beneficial symbiotic bacteria. Florida is not a dairy state, but we do have an important clam industry using submerged land with plenty of cobalt. Supplement manufacturers make Vitamin B12, but the most widely used form contains cyanide that needs to be “cleaved” off by the liver. If you see “cyanocobalamin” on your Vitamin B12 supplement bottle, you’ve purchased a form that the body needs to convert to methylcobalamin before it can be used. But why do supplement manufacturers make Vitamin B12 with cyanide? This form is the easiest to crystallize and it is air-stable. Oral or injectable Vitamin B12, derived from animal sources, is available from high-end supplement manufacturers such as Thorne Research.

Even if you take high-end supplements, you’ll still need other nutrients used in the Vitamin B12 metabolism. Humans have interconnected and cyclical folate and methionine/homocysteine cycles that are both need Vitamin B12.

Although the dietary supplement industry has created a synthetic folic acid, it is important to obtain folate from food. Although most people consider folate and folic acid to be the same nutrient, there is an important distinction between these two different compounds:

- **Folate**
  Folate refers to the various tetrahydrofolate (THF) derivatives naturally found in food.
- **Folic acid**
  Folic acid refers to an oxidized synthetic compound used in dietary supplements and food fortification.

Broccoli is a particularly rich source of folate. Broccoli is a cruciferous vegetable that has 63 μg (16% of DV) of folate per 100 grams (3.5 ounces). Note: One cup of broccoli contains 156 grams.

**What About Fort Lauderdale’s Composted Seaweed?**

If you recall, we learned that Vitamin B12 is produced by symbiotic bacteria that can live in the rumen of dairy animals. The dairy animals need to eat plants grown on soil with cobalt. Fort Lauderdale has been making mineral rich soil from seaweed since 2007. While most municipalities along the South Florida coastline move seaweed into landfills, Fort Lauderdale’s Department of Public Works understands that seaweed, when composted with the help of Nature’s beneficial bacteria, creates the very richest soil. Californians understand the value of seaweed. California law sets a limit on seaweed collection to 10 pounds per person.

Fort Lauderdale crews use a specialized beach cleaning machine called a “Surf Rake” developed by
Harold S. Barber in the 1960s. The rake, which is popular with resorts, hotels and lakeshore communities, is pulled with a tractor cleaning sand up to nine acres an hour with a seven foot wide cleaning path. This represents about six tons of seaweed on most days, but the total may be as much as 40 tons on high tide days. Seaweed is taken to Snyder Park (3299 S.W. 4th Ave., Fort Lauderdale, Florida) where it is allowed to ripen for 90 days. During this period, microorganisms break down organic matter and produce carbon dioxide, water, heat, and dark humus.

If dairy is more to your liking than clams, consider Florida’s potential for raising dairy animals. Female cows weigh about 1,600 pounds, but a female goat weighs about 140 to 150 pounds which is the size of a large dog. Tradewinds Farm on Sample Road is a children’s attraction that has goats, chickens, and a few cows, but it has potential as an adult education center. Margueritte C. McLean left her family’s 600 acre farm to Broward County that includes her farm house, barns and several enclosed pastures. Fort Lauderdale's compost could produce the very best pasture for goats. Florida’s Dairy Goat Association (fdga.org) could be approached about a partnership for developing classes that teach residents (and tourists) about compost, the nutrition in dairy, as well as cheese making (the French call goat cheese “Chev”) and goat milk soap. Unlike alkaline soaps made with lye, goat milk soap has the correct pH for human skin (slightly acidic to protect the body’s acid mantle and stimulate new cell production — due to the caprylic acid in goat milk).

Photo

Filename: clam_beach.jpg (wikipedia commons, public domain
Caption: Hard shelled clams, or thick shelled quahogs, are native to the eastern shores of North America and Central America, from Prince Edward Island to the Yucatán Peninsula.