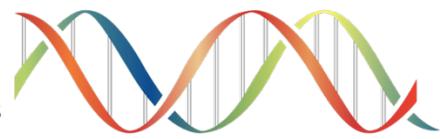


Community BioRefineries
The Epitome of American Innovation



By Scott Hewitt CEO and Vincent R. James Ph.D. CTO
Community BioRefineries,

Our Bioreaction blog tells the stories of our journey from the simplest to the most complex discoveries made by the Community BioRefinery that will change the way the world looks at 'carbon neutral world' – and how the Community BioRefinery seeks to 'feed and fuel the world'. Our Bioreactions involve a process that leads to chemical transformations from food to fuel and everything in between.

A "bioreaction" (in biochemistry terms) includes five types of general chemical reactions. They include: Combination synthesis; Decomposition; Single displacement; Double displacement; and Combustion. (Don't worry; there won't be a quiz...)

Bioplastics from Leftover Biomass Fibers

Bioplastics, quite simply put, are the same as the plastics we have become accustomed to over the years that are sourced from petroleum components; however, bioplastics contain no petroleum residuals, are plant-based, and (the best part) are biodegradable.

Simply put, the Community BioRefinery process creates bioplastic by combining the left-over fibrous material from a variety of biomass sources, combines it in a certain way with the recovery of PLA and PHA (naturally occurring biochemicals from the fermentation process). Not only does this aspect of the CBR process create another value-added aspect, but also allows us to remain faithful to our requirement to waste nothing.

With the introduction of hemp as a processing source material, the hemp fibers remaining after processing join the other left-over fibers from sweet cane sorghum, corn stover, rice straw, and the like as the basis for bioplastic production by the CBR. We will not use left-over fibers from *feed stocks* (corn, soy, rice, etc.) to create bioplastic; there are a far more beneficial uses for those fibers in aquaculture, as described elsewhere on this site. The residual fibers from processed *biomass* (corn stover, rice straw, sweet cane sorghum, etc.) will be dedicated to the production of bio-plastics.

Bioplastics are increasing in demand. Using hemp as our example, the worldwide commercial market size was approximated at \$4.71 billion in 2019 and is anticipated to register a revenue-based annual growth rate of 15.8% over the next 5-10 years. The bioplastics market is growing, and the hemp marketplace, for example, is now being driven by the expanding need for hemp oil and fibers in the auto, building and construction, food and beverage, individual treatment, and fabric industries, especially in emerging regions such as the Asia Pacific. Increasing need for oil paints, varnishes, printing inks, gas, solvents, chain-saw lubes, putty, and finishing is expected to push the product need even more. Additionally, growth in the financial investment for the manufacturing of hemp-based items is expected to drive the market growth.

Since the 2018 Farm Bill and the government acceptance of hemp and hemp-based products by the FDA slightly over a year earlier, the number of hemp-based bioplastics products has increased in the marketplace. Whatever form taken by consumables made using the blossom as well as seeds; to industrial as well as customer items utilizing the hemp bast fiber and hurd (both components of the hemp stalk), have come to be more and more typical.