

## Lecture 18 Photosynthetic Organisms and Animals

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Photosynthetic organisms like algae and plants do not need to be fed sugar or kept in a low O<sub>2</sub> environment like fermentation microbes. They produce their own sugars using photosynthesis and they do not really need O<sub>2</sub> as much as they need CO<sub>2</sub>. Photosynthetic organisms can be high tech like algae used for fuels/oil or low tech like canola and peanut plants that are used to produce vegetable oils.

Likewise, animals are their own class of biomass because they require O<sub>2</sub> and can be fed more complicated forms of biomass that haven't yet been turned into sugar. Mammals tend to produce oils in the form of fats which are often converted into oils after harvesting. Insects have long been used to produce chemicals and are quickly gaining interest as a source of oils as well. The noble tunicate a funky looking slimy filter feeder found in cold oceans may also become a fascinating new source of cellulose sugars. Like grains, animals are often overlooked in all the bioenergy media and this is unfortunate because they currently play a role and will likely continue to play an increasing role in the biological conversion of biomass into useful chemicals and fuels.

Another misconception is that when we think about algae we always think about green ponds outside. This is ironic because some of the most valuable commercial algae products are generated by growing algae inside in the dark. Algae only need the sun to produce sugars that they then consume to grow. So, if you provide algae sugar they don't technically need the sun and then you can work on getting that algae to focus on making what you need. Free Solar power is cheaper than sugar so this isn't always economic, but for some things it really is.

□□□□ : <https://www.youtube.com/channel/UCiFXuor4e2agZo5aApgVpTQ>

□□□□□□□□□□ An Introduction to Bioenergy & Biofuels