

# Treating starch



**ASSIGN  
BUSTER**

Treating Starch How are starch and cellulose treated to allow them to be used in yeast? Starches: · All potable alcohol and most fermentation industrial alcohol is currently made principally from grains. · Fermentation of starch from grain is somewhat more complex than fermentation of sugars because starch must first be converted to sugar and then to ethanol. · Starch is converted enzymatically to glucose either by diastase presents in sprouting grain or by fungal amylase. · The resulting dextrose is fermented to ethanol with the aid of yeast producing CO<sub>2</sub> as co-product. A second co-product of unfermented starch, fiber, protein and ash known as distillers grain (a high protein cattle feed) is also produced. Cellulosic Materials: · Each step in the process of the conversion of cellulose to ethanol proceeded with 100% yield; almost two-thirds of the mass would disappear during the sequence, most of it as carbon dioxide in the fermentation of glucose to ethanol. · This amount of carbon dioxide leads to a disposal problem rather than to a raw material by credit. Another problem is that the aqueous acid used to hydrolyze the cellulose in wood to glucose and other simple sugars destroys much of the sugars in the process. · One way of making cellulose wastes more susceptible to hydrolysis is by subjecting them to a short burst of high energy electron beam radiation. An alternative to acid hydrolysis is the use of enzymes. · Although they avoid the corrosion problems and loss of fuel product associated with acid hydrolysis, enzymes have their own drawbacks. Enzymatic hydrolysis slows as the glucose product accumulates in a reaction vessel. This end-product inhibition eventually halts the hydrolysis unless some way is found to draw off the glucose as it is formed.

Source: <http://www.thestudentroom.co.uk/showthread.php?t=2221553>

One potential ethanol feedstock is starch. Starch molecules are made up of <https://assignbuster.com/treating-starch/>

long chains of glucose molecules. Thus, starchy materials can also be fermented after breaking starch molecules into simple glucose molecules. Examples of starchy materials commonly used around the world for ethanol production include cereal grains, potato and sweet potato. A great amount of ethanol fuel is currently produced by starch fermentation. This starch comes from grains such as wheat and maize. Fermentation is produced by a yeast culture. The digestion of starch by yeasts is done in two stages: the starch is initially hydrolyzed in sugars by a chemical or enzymatic process then sugars are converted into alcohol and carbon dioxide by yeasts. This operation is effective and extracts the solar energy stored in the starch. Enzymes are proteins which catalyse, or speed up, biological reactions. Enzymes usually have an -ase suffix, eg. lactase, protease, amylase and so on. Biological reactions are the reactions that occur in living things. For example, when we eat food we need to digest it. Without enzymes in our bodies, digestion could take weeks instead of a matter of hours. Enzymes are specific for a certain reaction, for example, the enzyme lactase will only work in reactions where the chemical lactose is present. Enzymes have a structure that is called active site. Only one substance can fit into the active site to be digested, and it is the only substrate that this particular enzyme works with.