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Clean fuel for Americans

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A very popular discussion of the 21st century is America's need to enter a "green revolution." What if there were a fuel that burned cleaner, lowered our dependence on foreign oil, lowered gasoline prices, created jobs, and had a co-product that could be used in feeding livestock? Such a fuel exists. It's corn based ethanol.

Ethanol is extracted from corn through the dry milling process. In this process, corn is ground, fermented, distilled into alcohol, and then blended with gasoline. The solids that are extracted are called distiller's grain, a co-product of ethanol production.

Opponents make the argument, "should we be using corn as a bio fuel when it could be used to feed the world?" The answer is a resounding yes! This statement is supported in part because for every bushel of corn turned into ethanol, 1/3 of the bushel is processed into distiller's grain, which is used to feed livestock, specifically cattle. The other co-product formed is CO_2, which takes up 1/3 of a bushel of corn and can be captured and sold to be used in dry ice and new forms of dry cleaning. The last third of a bushel is made into useable fuel.

Many complain that by increasing the amount of corn processed into ethanol, the amount of corn available for foods such as cereals, chips, tortillas and feed for livestock will decrease. This fact will decrease the supply of corn available for food, which will raise corn

prices, leading to a rise in prices on beef, pork, chicken, eggs and other products we consume from livestock.

However, the higher prices of food cannot all be blamed on ethanol. According to Keith Olsen, president of the Nebraska Farm Bureau Federation, "the use of energy adds significant costs to foods as they move through growing, processing, packaging and shipping," and with higher energy costs, the price of food will increase whether it has corn in it or not. Also, the world's population and the income per capita is increasing. As the population increase so will the need for food, causing a higher demand for corn, which will increase the price.

Ethanol plants are powered by two different energy sources, coal and natural gas. Many uneducated consumers think the production, processing, and burning of ethanol is dirtier than the processing and burning of gasoline. This statement is true when the ethanol plant is powered by coal, because coal emits more harmful emissions than natural gas. However, according to the congressional budget office, in the United States there are very few coal-powered ethanol plants.

Lifecycle greenhouse emissions are emissions from the production, processing, and burning of a fuel. According to Argonne National Laboratory researchers in the congressional budget office, ethanol that was produced at a plant that used natural gas to fuel its production has 30 percent less lifecycle emissions than gasoline.

While some complain that as more ethanol is being used, the demand for corn will increase along with the price, generating a need for more corn to be planted. This new corn will be planted in new areas that will have to be cleared of forests and grasslands. When this takes place, CO_2 would be released, adding pollution to the atmosphere. This

phenomenon is called indirect land use emissions, and it is incorporated in the lifecycle emission totals. Indirect land use emissions should be taken into account one time in the lifecycle emission calculations.

There are many benefits ethanol gives our economy. According to the U.S. department of energy, ethanol production creates about 365,000 jobs across the country. With ethanol being in high demand, there will be a push for more technologies to further develop the use of ethanol to support America's green revolution. These new technologies may create more job opportunities.

The U.S. imports about 160 billion gallons of petroleum per year, with Canada, Saudi Arabia, and Mexico being our biggest suppliers. Saudi Arabia supplies 21 of the 160 billion gallons of oil imported from foreign countries. The amount of ethanol produced in the U.S. per year is 13.3 billion gallons. These gallons take away 62 percent of imports from Saudi Arabia. This is over half of what we import from the Middle East! If the Mideast supply is cut off, all oil prices—including those from Canada and Mexico—would rise. Even though ethanol does not substantially take away our dependence on foreign oil, it helps and with technology strides we can expand and make ethanol even more popular.

Sources

- Klein, Randy. Telephone Interview. 11 Novem 2013.
- Lastly, Trisha. "Agriculture Education Imperative." Www.onlineathens.com. N.p., 10 Mar. 2010. Web. 07 Nov. 2013.
- Abebe, MIMI. "Running on empty Food vs. Fuel." *Ethanol: salvation or damnation?*. Fall 2008: 6-9. Print.
- Gecan, Ron, Rob Johansson, and Kathleen FitzGerald. United States. Congressional Budget Office. *Impact of Ethanol Use on Food Prices and Grenhouse-Gas Emissions*. 2009. Print.
- United States. U.S.Energy Information Administration. *How much petroleum does the United States import and from where?*. 2013. Web. <http://www.eia.gov/tools/faqs/faq.cfm?id=727&t=6>.
- United States. U.S.Energy Information Administration. *How much ethanol is produced, imported, and consumed in the U.S.?*. 2013. Web. <http://www.eia.gov/tools/faqs/faq.cfm?id=90&t=4>.
- United States. Department of Energy. *Ethanol Benefits and Considerations*. Web. <http://www.afdc.energy.gov/fuels/ethanol_benefits.html>.