Gasohol venture; an alternate energy source

By Stan Linhorst

The success of a consumer test sale of gasohol at a Holdrege, Neb. filling station has made the administrator of the project optimistic about gasohol's future as a fuel.

Charles Fricke, administrator of Nebraska's Agriculture Products Industrial Utilization Committee, said he is optimistic about the future of gasohol because "if we are patient long enough, more opportunities arise for the chances of its development in the market place."

Citing diminishing energy supplies, Fricke said it is necessary to develop alternate energy sources, including gasohol.

Gasohol is a mixture of unleaded gasoline and grain alcohol.

Besides using gasohol as a possible answer to the energy problem, William Scheller, chairman of the UNL Chemical Engineering Dept., said byproducts of the production of gasohol may help combat the world's food shortage.

"If we take grain and make alcohol and extract protein for human consumption from distiller's byproducts and feed the residual byproducts to cattle, we wind up with 40 per cent more protein than if we had fed the whole grain directly to the cattle," he said.

Protein shortage

Scheller called the world food shortage a misnomer because it is actually a protein shortage.

"We have the potential here for helping relieve the protein shortage as well as yielding alcohol for use as a fuel additive or chemical raw material," he said.

A UNL study completed in July and financed by a $125,000 National Science Foundation grant, stated that it would be possible and profitable to extract protein suitable for human consumption from the byproducts of the distilling process.

James Kendrick, professor of agricultural economics and head of the study, said research showed that it is possible to extract protein from distiller's byproducts with a dry weight of 80 to 90 per cent and suitable for human consumption.

Byproducts valued

Kendrick said the findings "will enhance the economic value of distiller's byproducts and will make production of alcohol more profitable."

The production of alcohol from grain only involves the carbohydrates of the grain, he said, and "doesn't bother the protein at all."

According to the report issued by the researchers, the protein extract "can be used in the fortification of cereal-base snacks, cookies and bread," and as a binder and extender in emulsified meat products.

Kendrick said this could be compared with current uses of soybean protein.

Gasohol road test

The results of the Holdrege test, the protein extract research, and a gasohol two-million-mile road test to be completed next summer, "created a tremendous amount of interest around the nation," Fricke said.

"The Holdrege project has been the single most important factor in making people across the country aware that agricultural products are important for future energy needs," Fricke said.

Scheller, technical coordinator of the Agricultural Products Industrial Utilization Committee, said the Holdrege test originally was planned to last until 20,000 gallons of gasohol had been marketed, or for one year, whichever came first.

"We thought the 20,000 gallons might last a year," he said, but it was received by consumers much better than expected. The first 20,000 gallons were sold in 16 days, he said.

Sales underestimated

By Aug. 19, when the project was discontinued, 93,000 gallons of gasohol had been sold at the Holdrege station.

A gallon of gasohol consists of 10 per cent alcohol and 90 per cent unleaded gasoline, Scheller said.

The alcohol for the consumer test and at Holdrege and the two-million-mile road test being conducted with 45 State Department of Roads cars was purchased from Georgia-Pacific Corp. in Billingham, Wash., Scheller said.

The alcohol was shipped to a Cooperative Refiners Assoc. refinery in Phillipsburg, Kan. where it was mixed with the gasoline and then sent to Holdrege. Farmland Industries owns the Cooperative Refiners Association.

Scheller said no modifications were required in the Phillipsburg plant to produce the mixture.

Prices comparable

Including shipping charges, the alcohol cost about 90 cents per gallon, he said, and after mixing with gasoline, the gasohol sold for the same price as unleaded gasoline.

However, this price included a three cent state gasoline tax reduction on the price of each gallon, he said. The tax is normally 8 and one-half cents per gallon.

The tax break for gasohol and the creation of the Agriculture Products Utilization Committee to research and promote gasohol were authorized by LB776 and LB1208 passed by the Legislature in 1971 and 1972, respectively.

The bills allowed a three cent reduction of the gasoline tax on the first 10 million gallons of gasohol sold in the state.

The committee comprises four farmers, two businessmen and one oil industry representative. The seven were appointed by Gov. J. James Exon.

Proximity important

Fricke said the Holdrege Co-op station was chosen for the test because of its affiliation with Farmland Industries, its closeness to the Phillipsburg plant (43 miles) and the area's interest in gasohol.

Fricke, with the help of the Nebraska Department of Economic Development, now is compiling statistics on the Holdrege customers' attitudes on gasohol use and its performance and development, he said.

Two Holdrege high school students were hired to record information about gasohol customers during the test.

The information was used to send questionnaires early in September to the customers to record people's reaction after using gasohol. About 600 of the 1,425 questionnaires sent out have been returned, Fricke said.

Test provides data

The two-million-mile road test began Dec. 23, 1974, Fricke said, and is designed to gather data on fuel consumption, performance, composition of exhaust emissions, and engine cylinder wear.

"In the first quarter of the test we found that the gasohol cars were using five per cent less fuel than cars running on unleaded gasoline," he said.

Scheller said that detailed examination of the valves and valve seats of the gasohol cars used in the road test indicated deposits were reduced, which results in "reduced maintenance."

Data also indicates that gasohol produced less exhaust pollution, he said.

"We're trying to get the word out about the opportunity that exists," Scheller said. Including protein recovery, an "alcohol plant looks as if it would be profitable," he said. Plant operation would require 25,000 to 30,000 bushels of a grain per day.

$30 million investment

There has been an interest shown in building a grain alcohol plant, Scheller said, "but we're talking about an investment of $30 million."

Fricke said his committee will ask potential plant builders if any more research needs to be done.

"All our projects are directed to getting an alcohol plant in Nebraska," he said, which must be done to satisfy "an investor's curiosity and investment requirements.

"We're trying to establish the credibility of gasohol," he said. "I feel we've done that this summer."

Fricke said the committee will be considering options to provide further incentives for private industry to build a grain alcohol plant in the state. He said this includes Congress, federal agencies and the Legislature.

Photo by Liz Beard

William Scheller, chairman of UNL's Chemical Engineering Dept.

Photo by Kevin Higley

Charles Fricke, Nebraska Agricultural Products Industrial Utilization Committee administrator.

"I hate to make predictions," he said, "but I think we should definitely come up with something (an alcohol plant) by 1980."

"We're faced with the reality of diminishing energy supplies," he said, "and sooner or later people will have to realize we need to take advantage of alternate sources of energy, including gasohol."

Bill Hoppner, administrative assistant to Exon, said the governor has stressed the importance that grain and grain alcohol can play in the energy problem.

He said Exon's goal is "trying to get an alcohol plant in Nebraska on a continual large scale basis."

Exon has met with governors and agriculture industry representatives to promote gasohol, Hoppner said.

There are economic problems involved with the development of gasohol, such as insuring an adequate grain supply and getting the food value out of the grain, he said. Gasohol has been criticized by some as using food to make fuel when there are many starving people throughout the world.

Exon critical

Exon has criticized the Ford administration, Hoppner said, for not creating a system to ensure an adequate supply of grain.

He said Exon has urged the establishment of a federal board to regulate supply and production of raw agricultural products as "the Federal Reserve Board regulates money."

According to Scheller, the problems outlined by Hoppner are not serious enough to hamper development of the grain alcohol industry.

"From my technical position and understanding of alcohol and protein processes," he said, "I feel the concerns about supply and nutritional aspects of the governor's office are not justified.

Spoiled grain used

"One of the big factors here is that we can use spoiled grain," he said.

Since an alcohol plant would be able to use poor quality or spoiled grain and probably still extract usable protein, Scheller said, food supply actually would be increased.

He said the Nebraska Department of Agriculture has estimated that there is enough spoiled grain in Nebraska alone to "feed" an alcohol plant.

Besides Nebraska's research with alcohol, which Fricke termed "the best in the nation," Scheller said there are several other groups studying grain alcohol and its possible use with gasoline.

Volkswagen joins research

He said he has visited with Volkswagen officials who are conducting research in Wolfsburg, Germany patterned after Nebraska's road test. He also has been contacted by a Swedish corporation planning a road test using methyl alcohol.

Scheller said he has heard that General Motors Corp. is doing research on gasohol and that tests are planned with methyl alcohol at the University of California at Santa Clara.

Scheller said he will present a paper S to the National Wheat Utilization Research Conference at Seattle, on the commercial design and process economics for the extraction of protein from distiller's byproducts.