



MOTHER EARTH NEWS

Urban Alcohol Fuel Production

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By the MOTHER EARTH NEWS editors



The hundreds of tons of bruised or spoiled produce discarded by supermarkets every day could become part of the feedstock in an urban alcohol fuel operation.

PHOTO: FOTOLIA/VITEZSLAV HALAMKA

Rural folks have been paying a lot of attention to alcohol fuel recently, and now even a few *urban* residents are getting into the act. Such a move is only natural, too, since our cities produce tons of organic waste each day ... refuse that could be used as raw material in the making of alcohol. In fact—when paper waste is added to the "garbage tally"—a typical metropolis's trash "stream" is made up of almost 70% organic material!

Throughout the entire business of food transportation, processing, preparation, and consumption—much of which takes place in or near large cities—a tremendous amount of waste is produced, and then often disposed of at considerable expense. For example, supermarkets routinely discard bruised or spoiled produce from the shipments they receive, sometimes tossing out as much as 200 pounds of rich organic material *a day!*

Such a large untapped source of potential "mash" would seem to indicate that urban production of alcohol fuel is an immediately viable course of action ... but there *are* certain problems to be resolved before cities can become active ethanol production factories.

For example, municipal waste *paper* is relatively easy to collect, but its high cellulosic content makes it, as yet, generally unsuitable for alcohol fuel production. Other wastes—such as cheese whey—are usually free for the taking, but hauling costs are sometimes so high that such products must be considered unprofitable raw materials unless their source is located within 40 miles of the alcohol fuel plant.

Another factor that will help determine the future of urban alcohol production is *demand*, both for the ethanol itself *and* for the byproducts of the fermentation process. Farms provide their own constant market for the alcohol fuel they produce, while leftover mash is used to feed livestock. The urban market isn't quite that flexible. Many potential purchasers in metropolitan areas would insist that the fuel be made anhydrous (completely without water), so it could be mixed with gasoline to make gasohol. Such a process is, of course, more expensive and energy-intensive than is simply producing 170- to 180-proof ethanol.

Cities *can* create demands for alcohol fuel, however, by converting entire transportation fleets—such as taxis, postal cars and trucks, and municipal governments' motor pools—to ethanol use. If the vehicles were all modified at the same time—and if a base station were established to dispense the fuel—a constant demand for pure ethanol could be assured.

Current Research

Currently, there are almost no commercial non-farm alcohol fuel plants of any kind, but a lot of research and experimentation is being done. In Grand Forks, North Dakota—for instance—the Minnkota Power Cooperative converts wastes from a local potato processing plant into ethanol using the company's conventional pot column still, which they assembled from scrounged parts for around \$15,000. Minnkota's operation (which returns its spent feedstock to the potato company for disposal or for use as a cattle feed) can produce a steady 200 gallons of fuel per week, and—according to spokesman Gary Kapity—has the *potential* of generating 400 gallons a week.

Cheese whey is the focus of experiments at Milbrew, Inc. in Juneau, Wisconsin. Researchers there hope to expand the market for spent whey, which is one of the non-grain raw materials regarded as having the most potential for conversion to alcohol fuel.

Other than those two operations, however, urban applications of alcohol fuel are still in the laboratory stage. The U.S. Army Research and Development Command (in Natick, Massachusetts) is currently testing a special enzyme which will break cellulose down into fermentable sugars. If that idea could be adapted to a larger scale, a wide variety of materials could be used to produce ethanol.

(Leo Spano, spokesman for the Natick research group, estimates that urban waste cellulose alone could provide two to three *billion* gallons of fuel annually! Furthermore, if just 20-30 percent of all agricultural, urban, industrial, and forestry cellulose wastes were converted, our national alcohol fuel production could reach ten billion gallons a year.)

One of the most reliable sources for information on alcohol fuels is the National Alcohol Fuels Information Center. The agency is quite new, however, so it may not be able to provide absolutely up-to-date news on non-farm or urban developments. For such information, you might want to contact Scott Sklar, at The National Center for Appropriate Technology.

For the past several years, the good folks at the Institute for Local Self-Reliance in Washington, D.C. have

worked to help urban residents gain greater control over their lives through the use of low-technology, decentralist tools and concepts. We strongly believe that more people (city dwellers and country folk alike) should be exposed to the Institute's admirable efforts ... which is why we've made this "what's happening where" report by ILSR staffers one of MOTHER EARTH NEWS' regular features.