

# Biodegradable Plastics Made Economically From Potato, Cheese Waste

ARGONNE, IL — Scientists at the Department of Energy's Argonne National Laboratory have developed an economical method of making biodegradable plastics from potato and cheese waste.

The plastic can be adjusted during manufacture to be either biodegradable -- deteriorate under bacterial action -- or photodegradable, deteriorate from exposure to sunlight or ultraviolet. If desired, both features can be incorporated in the same product, said Robert

Coleman, head of the Argonne development team.

Patrick Bonsignore, an Argonne polymer chemist who has been working most closely with the deterioration characteristics, says the rate of decay can be selected during the manufacturing process. He points out that besides obvious uses, such as material for degradable garbage and supermarket bags there are numerous less obvious applications, such as degradable containers for time-released fertilizers and insecticides. Such

bulk plastic items as mulch covers for fields could be made to last all summer and then decay around harvest time.

"An estimated 10 billion pounds of potato waste are created each year from the peeling and cutting of potatoes for french fries alone," says Coleman. "About half the weight of the potato is lost in this process and even though the nutritional value is the same as the part that is used there is so little for the remainder that it is either totally discarded as waste or sold as cattle feed for \$3-\$6 a ton." Similarly, several billion pounds of cheese whey are created each year as a little used watery byproduct in the manufacture of cheeses.

Both of these waste products are rich in carbohydrates that can be converted to glucose, Coleman says. This in turn can be converted to lactic acid, which can be directly polymerized into plastic sheets.

Coleman points out that the process developed at Argonne has reduced the time for converting carbohydrates to sugars from the more than 100 hours now required by conventional technology to less

than ten hours. "This makes it an inexpensive and very commercially feasible undertaking," Coleman says.

While plastic has been made from lactic acid before, the Argonne research has refined the process. At present the process is on a laboratory scale but can be scaled up to a commercial level. The only major hurdle still to be crossed, Coleman says, is an efficient method of separating the lactic acid from other components of the treated waste.

A major economic advantage to using the waste from potatoes and cheese to make degradable plastics is that the raw material can be gained from large and readily identifiable sources, i.e. food processing plants, and that it is fairly clean and free of contaminants,

Coleman says. For example, one large plant which processes potatoes for french fries, produces more than 80,000 gallons of clean potato waste a day. This waste is 12 percent starch that can be converted to glucose and lactic acid.

Two additional and significant advantages to plastics produced in this way are one, that they have already been accepted by the FDA as biocompatible and non-allergenic materials, and two, that degradable plastics based on lactic acid are already used for biomedical applications and would seem to have much larger markets if the cost could be brought down.

This research was funded by the Department of Energy's Office of Industrial programs. Argonne National Laboratory is operated by the University of Chicago for DOE.

## Shepherd's Symposium

(Continued from Page D2)

shop session on "Getting Started Right With Sheep," a topic to be addressed by Dr. Ron Parker of Henning, Minnesota. Parker is the author of the handbook for the modern shepherd titled "The Sheep Book," pub. Charles Scribner's Sons, N.Y.

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## Ground Chicken Is Here

Hamburger lovers look out! The newest ground meat on the market comes from chickens.

Using the leg and thigh meat, which are slow movers, poultry processors are hoping to grab a share of the hamburger market. Hamburger, which by law is

defined as ground beef, is about a \$10 million industry.

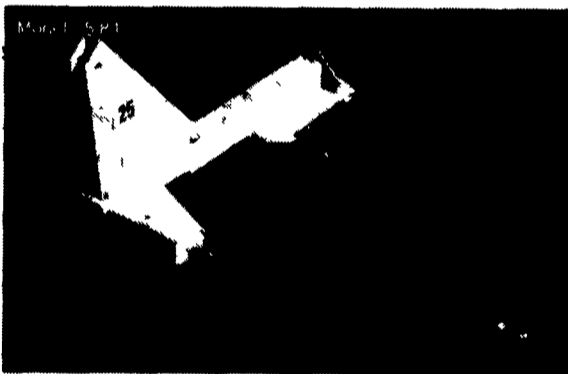
International Dehydrated Foods in Springfield, Mo., is making and marketing ground chicken nationwide under the name Menu-Master. It is sold primarily as a frozen product in one- to 2,000-pound packages. The product, which uses both light and dark meat, has about 15 percent fat.



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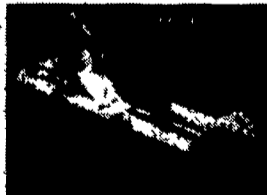
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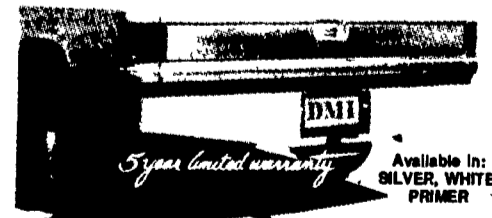
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