New device tells when cows are in heat

ITHACA, NY – Higher profits might be in store for the nation's dairy farmers as the result of a Cornell University invention that takes the guesswork out of determining when cows should be bred.

When it is in place on a dairy farm operation, use of this electronic device–called a "Passive Electronic Activity Monitor"–can reduce long calving intervals, resulting in more profitable milk production, says Norman R. Scott, one of the system's co-inventors.

Scott, a professor of agricultural engineering, is also director of research for the New York State College of Agriculture and Life Sciences at Cornell. He developed the estrus detection system with two of his former graduate students, John W. Gettens and Nicholas A. Sigrimis.

The invention is based on researchers' observations that the activity levels of cows increase when they go into estrus. It differs from other systems in that it is fully automated and needs no batteries.

At the heart of the estrus detection system is a small, circular transponder, about two inches in diameter and about a half-inch thick, a bit smaller than a hockey puck. Worn much like a dog tag on a collar around the cow's neck, the transponder includes a sensor for detecting and recording the cow's movements as a part of an electronic cow identification system.

The transponder is designed to be used in conjunction with an automatic milk metering system and other herd monitoring systems.

Scott says this invention will enable farmers to know, at a glance, which of their cows are in heat, and the milk production of each cow, or the total herd, at every milking.

"The potential is significant," Scott says. "By increasing the detection rate of estrus and therefore presumable breeding the cows on time, you will produce more milk without additional inputs."

The system consists of the transponder, equipment to activate the transponder, a receiver, and a microcomputer. Scott says that the biggest advantage of the system is its complete automation.

As cows walk into the milking parlor on a farm, the activity monitoring and identification devices contained in the transponder and the cow's neck are activated by an electronic coil at the parlor entrance. the activated transponder sends signals containg the cow's identification and its recorded movements to a receiver, which relays that information to a microcomputer.

"The microcomputer printout will show the likelihood of estrus and also how much milk is produced by each cow," Scott says.

In addition, the system can use a video display screen in conjunction with the computer printout equipment. The screen, if mounted in the milking parlor, will enable the farmer to monitor the herd at milking time; a more permanent record will be kept in the computer or printed on paper.

Scott and his colleagues are now looking for manufacturers who would build and market their invention.

The Cornell invention has been tested at the university's Animal Science Teaching and Research Center at Hartfor, where hundreds of milking cows are used for a variety of research projects. Tests have shown that the automated estrus detection system is efficient, reliable, accurate, and fully automatic, Scott says.

"No other estrus detection sensor provides the automatic input of information without a power source (battery)," Scott explains.

The accuracy of the existing estrus detection methods in use ranges from 40 to 60 percent. The new Cornell system is expected to boost that rate by 10 percent or more. This would result in an increased earning, on average, of at least $30 in increased milk production per cow per year, Scott estimates.