

An unusual application to animal farming leads a sampling of food and agriculture spinoffs

Technology And Pregnant Pigs

One of the interesting things about aerospace spinoff is the way it keeps cropping up in uncommon applications unimaginably remote from the original technology.

For example, the pig pregnancy detector.

The pig pregnancy detector? City folk may be surprised to learn that

there is such a thing—and wonder why. The *why* is because it is a sow's job to produce piglets and farmers can't afford to keep those who don't; it costs about a half-dollar a day in feed, labor and facilities, and even in small herds that's intolerable. So the barren sow must go.

Until recently, the best method of determining pig pregnancy was "eyeballing," daily visual examination over a period of time. The problem with eyeballing is that pregnancy is not evident until well advanced; when there is no pregnancy, the farmer learns too late that he has been feeding a sow that won't give him a litter. Advancing technology provided an answer: the quick, easy-to-use, accurate automatic detector for *early* evaluation of pregnancy status.

Among the most popular of these devices are Scanopreg* and Scano-probe*, to whose development NASA technology contributed. Scanopreg is an ultrasonic system which detects pregnancy about 30 days after breeding, long before eyeballing can provide an

*Registered trademark, Ithaco, Inc.



answer. The companion Scanoprobe is a dual-function unit which not only determines pregnancy but also gives farmers an analysis of a hog's meat-fat ratio, an important factor in breeding. Only a short time on the market, Scanopreg and Scanoprobe have already found wide acceptance among meat producers because they rapidly repay their cost.

Developed and manufactured by Ithaco, Inc., Ithaca, New York, Scanopreg and Scanoprobe are adaptations of technical expertise acquired by the company in years of work as a space equipment contractor. Ithaco specializes in spacecraft attitude control systems and the firm has been a participant in 20 different NASA satellite programs.

Scanopreg and Scanoprobe are portable, battery-powered devices that provide instant, simply-read information that meat producers need for profitable and efficient herd management. Each consists of an ultrasonic transmitter, a receiver, a mini-computer which processes information about the animal's innards, and a lighted display of the desired information.

For pregnancy testing, using either Scanopreg or Scanoprobe, the farmer places the instrument's cable-connected probe on the animal's lower flank. The transmitter sends harmless ultrasonic waves into the animal's body and "listens" for echoes. Echoes occur where there are changes in body density, so the receiver picks up reflected sound from the fluid surrounding fetuses in a pregnant animal. The processor interprets the echoes and the pregnant-or-not verdict appears on the screen in a matter of seconds.

Scanoprobe handles the additional assignment of determining the leanness of the meat the animal will produce. For this test, the probe is placed on a hog's back near the spine. The ultrasonic waves penetrate the multiple layers of fat and muscle and the type of echo returned permits the processor to compute the depth of each layer, or the ratio of fat to muscle.

The farmer is using Scanopreg, an ultrasonic device which determines whether the sow will produce a litter. It saves money by permitting farmers to cull non-productive animals out of the herd.

This type of measurement is economically important. Packing houses want lean meat and they pay premium prices for it. It has been established that the fat-to-meat ratio is a matter of heredity. Scanoprobe findings, therefore, contribute to herd productivity and profitability by enabling selection of the best boars and sows for breeding.

Used primarily by hog farmers, Scanopreg and Scanoprobe are also applicable to other animals for either pregnancy testing or fat-muscle measurement. They have, for example, found a market among New Zealand sheepherders. The devices have proved popular with foreign as well as American farmers and overseas purchases account for up to 40 percent of Ithaco's animal evaluation equipment sales.

This Scanopreg operator is applying corn oil to the unit's transducer to insure good contact between skin and probe. He will get an audible tone and a green light on the display if the animal is pregnant. If the sow is "open"—not pregnant—the red light will come on.

Companion unit to Scanopreg is Scanoprobe, which is also used as a pregnancy tester but has the additional capability of providing information on meat leanness, important in selecting animals for breeding.

