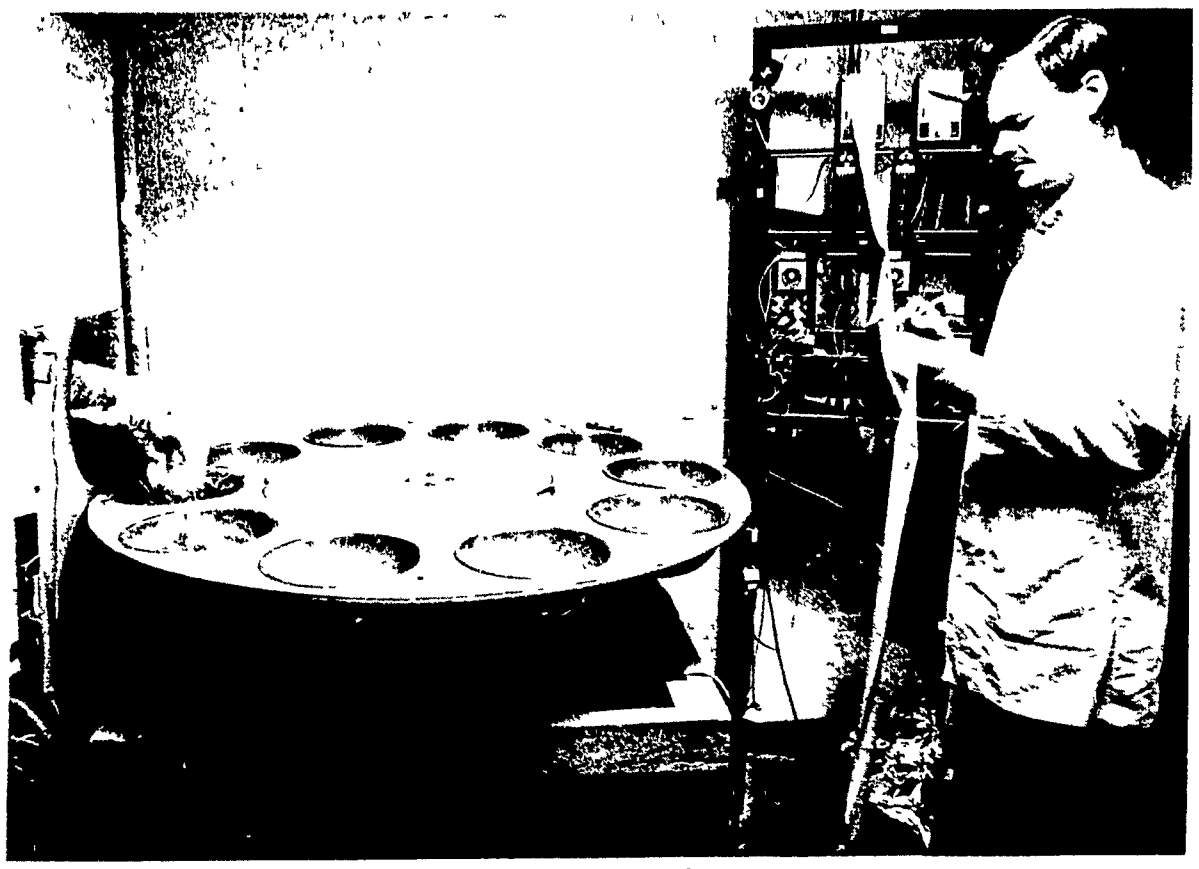
Animals Are "Tricked" Into Eating More



Electronically controlled feeding behavior unit at Penn State shows sheep eating from rotating turnable. The device measures the frequency and length of eating and size of meals. Dr. Paul Wangsness, in charge of the experiments, studies electronic "printout" of the sheep's eating and drinking patterns.

Experiments to trick livestock and dairy cattle into eating more feed than they normally consume are a new approach to more economical meat and milk production Such studies are being carried out by animal nutritionists at The Pennsylvania State University

The Penn State scientists have been able to increase short-term feed intake of calves and sheep tenfold by injecting a small amount of tranquilizer, pentobarbital, into a specific area of the brain. The studies have shown that certain areas of the brain control an animal's feeding behavior Directing the studies were A. D. Peterson, Dr. B. R. Baumgardt, and Dr C. A. Baile of the department of animal science

The work indicates that there are "feeding centers" in the brains of cattle and sheep which signal the animal to start and stop eating. The blood acts as a communicator between all parts of the body and the nervous system.

As an animal eats, end-products of digestion are absorbed from the stomach into the blood. The end-products, or other chemicals triggered by them, can quickly reach the brain and communicate a signal of being fully fed.

Unfortunately, today's high energy feed rations tend to produce a "full" signal from the brain and animals stop eating before their stomachs are full. This occurs in feedlots and dairy operations where the trend is toward large amounts of grain concentrates and small amounts of roughage. Rations high in grain are desirable since they produce increased yields of meat and milk per dollar of feed.

Dr. P. J. Wangsness, a new member of the animal nutrition faculty, is working with the Penn State research team to determine exactly how the control mechanism of feed intake works. Such knowledge will enable nutritionists to develop the most economical ways for farmers to control feeding of livestock.

Equipped with adequate information, farmers could increase feed intake above that now possible for milking cows and meat producing animals. On the other hand, farmers could more easily limit the feed intake for mature, non-milking livestock.

The Penn State experiments are carried out in unique, electronically controlled feeding unit. Using a rotating turntable, the unit allows the animal to eat and drink whenever it desires. The device measures the frequency and length of eating and size of meals. The unit helps identify changes in levels of disestive end-products in blood or rumen fluid which may act to control feed intake.

Sheep placed in the feeder units are surgically equipped with plastic sampling tubes. These long tubes enable researchers to remain outside the feeder unit while withdrawing blood or rumen fluid from the undisturbed animal.

Among end-products of digestion that lower feed intake are fatty acids and glucose. In ruminants or cud-chewing animals such as sheep and cattle, large quanities of volatile fatty acids are produced in the rumen or stomach and are absorbed into the blood. These acids can reduce feed intake significantly.

The sheep experiments reveal rapid changes in levels of blood and rumen fluid metabolites such as volatile fatty acids before, during, or after feeding. Blood levels of hormones, such as insulin, also fluctuate and may be a part of the signal carried to the feeding centers of the brain.