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Bovine Somatotropin Increases Milk Production and Feed Efficiency

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Bovine Somatotropin Increases Milk Production and Feed Efficiency

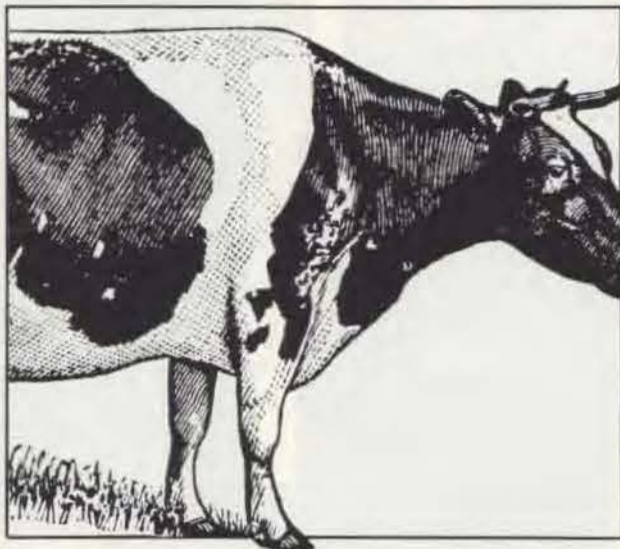
For fifty years researchers have known that extracts from pituitary glands can stimulate milk flow. In 1944, bovine somatotropin, a hormone produced by the pituitary gland, was isolated. Almost 20 years later, in 1973, it was demonstrated that cows injected with bovine somatotropin had an increased production of milk. That same year scientists determined the structure of somatotropin, a protein, and in 1982 recombinant DNA-produced bovine somatotropin was first used to enhance milk production in cows.

Researchers at New Bolton Center, under the direction of Dr. William Chalupa, began to study the effects of somatotropin in 1983. At first, pituitary somatotropin was used. In 1985, the group began a 38-week study using recombinant somatotropin. "Until this time we could only study small numbers of cows for short periods of time because the substance was quite expensive and not plentiful," said Dr. Chalupa. "The recombinant somatotropin produced in the laboratory made larger studies possible."

The researchers found that cows receiving somatotropin daily for 38 weeks had increased milk production from 20 to 35 percent. "Lactating cows treated with somatotropin produce at higher levels for longer periods of time," said Dr. Chalupa. "In effect, 'good' producing cows become 'better' producers, and 'better' producers become 'excellent' producers. Production increases of 40 percent have been obtained, but responses of 10 to 20 percent are more

likely under field conditions."

The substance is injected daily, either subcutaneously or intramuscularly. The amount of injected material is small, and there is no discomfort to the cow. The cows in the New Bolton Center study received somatotropin daily after the fourth week of lactation. "When the animals are on this regimen, they consume more feed," said Dr. Chalupa.



"But we also found that somatotropin enhances the efficiency with which feed is utilized, because more nutrients are directed to milk. Cows injected with somatotropin produced an additional 0.57 pounds of milk per pound of feed consumed. However, the feed has to be of good quality and dairymen need to follow the normal strategies for high-producing cows to fully realize the benefits of somatotropin."

It was found that milk composition was not

changed when cows received somatotropin. There is also no evidence of increased amounts of somatotropin in the milk. Milk from cows not treated with the substance often contains low levels of naturally produced somatotropin. Bovine somatotropin is not biologically active in humans, and if ingested, the protein is broken down during the digestive process.

The researchers feel that bovine somatotropin can enhance milk production and, more importantly, improve feed efficiency. "It is not expensive, and it will enable the dairyman to increase his production and efficiency without major capital expenses," said Dr. Chalupa. "Increased milk yields from continued advances in nutrition, management, and genetics and from new technologies like somatotropin mean that fewer cows will be needed to produce the same amount of milk. Some dairymen may use new discoveries to maintain total production with fewer cows so that the number of dairies may not decrease."

Dr. Chalupa pointed out that somatotropin has not yet received FDA approval. "That probably won't happen until 1989," he said, "More studies are needed to determine the long-term impact of somatotropin on dairy cows. Also, research is needed to develop a method by which somatotropin can be administered in time-release form."

The 1983 study was supported by funds from Church and Dwight. The 1985 study was supported by American Cyanamid Co.

Dr. William Chalupa is professor of nutrition at the University of Pennsylvania School of Veterinary Medicine. The other researchers on the team are Drs. J. D. Ferguson, D. R. Galligan, W. E. Marsh, E. J. Robb, P. L. Schneider, and Mrs. Bonny Veccharelli.

—H.W.

Veterinarians Co-Sponsor National Pet Week at Carnegie Museum of Natural History, Pittsburgh

Members of the Western Pennsylvania Veterinary Medical Association, for the second year, co-sponsored activities for Pet Week, May 4 through May 10, 1986 at the Carnegie Museum, Pittsburgh, PA.

Planning began in the fall of 1985, when the local committee headed by officers of the WPVMA joined with museum staff members to organize a poster contest for area schools and a week of activities. Pet Week began on May 4 with a reception held in the museum's Architecture Hall. Twenty copies of *After 1883. One Hundred Years of Organized Veterinary Medicine in Pennsylvania* were presented to the Carnegie Library and its branches in memory of Dr. A. Wayne Mountan (V'51).

Winners of the poster contest were presented with their prizes by Lynn Cullen, a local television personality. The WPVMA auxiliary provided the refreshments at the reception. Following this, 70 pure-bred dogs belonging to members of the Western Pennsylvania Kennel Association took part in an invitational dog show and obedience demonstration.

Another highlight of the week's activities was a seminar on May 10 featuring two speakers from



Dr. George Meerhoff and Dr. Harvey Bendix, President-elect of the Western Pennsylvania Veterinary Medical Association, making a donation in memory of Dr. A. Wayne Mountan.

Penn's School of Veterinary Medicine. Dr. Peter F. Jczyk spoke on animal pediatrics, reproduction, and birth control, and Dr. Alan M. Beck discussed the human/animal bond. Both were well received by an audience of animal health technicians and animal fanciers.

Other events of Pet Week included lectures and demonstrations. Area animal welfare organizations were represented and veterinarians held a career day featuring a tape of the University of Pennsylvania School of Veterinary Medicine. The Pittsburgh Zoo brought examples of "good" and "bad" pets, and birds, cats and exotics were shown. Programs on pets for the handicapped and on farm animals were also presented.

Student Research Paper Competition

Each year in March, the Beta Chapter of the National Honorary Veterinary Society, Phi Zeta, presents a veterinary student research competition. This year four papers were presented:

"Equine Leukocyte Antigens: Relationships with Sarcoid Tumors and Laminitis in Two Pure Breeds," by Donald Meredith;

"Expression of Oncogenes During Early Stages of Aflatoxin B1 (AFB1) Carcinogenesis," by Deanna Purvis;

"Monitoring the Acrosome Reaction in Equine Spermatozoa in a Chemically Defined Medium," by Cindi Ward;

"Growth Hormone Mediated Regulation of Murine Hepatic Drug Metabolizing Enzymes," by James MacLeod.

MacLeod, a student in the combined degree program (V.M.D. and Ph.D.), won the first prize awarded to students in the combined program.

A first prize awarded to students in the V.M.D. program was presented to Cindi Ward. Donald Meredith and Deanna Purvis tied for second place in that category.

Dr. Brinster Honored

Dr. Ralph L. Brinster, Richard King Mellon Professor of Reproductive Physiology at the School, was one of the 30 newly elected active members of the Institute of Medicine. New members are elected by present active members from among candidates chosen for major contributions to health and medicine or such related fields as social and behavioral sciences, law, administration, and economics.

The Institute of Medicine was chartered in 1970 by the National Academy of Sciences to enlist distinguished members of medical and other professions for the examination of policy matters pertinent to the health of the public.

At the 206th annual meeting of the American Academy of Arts and Sciences, held May 14, 1986, in Cambridge, MA, Dr. Brinster was elected a Fellow of the Academy.

Founded in 1780, the Academy is a learned society with a dual function: to honor achievement in science, scholarship, the arts, and public affairs, and to conduct a varied program of studies reflecting the interests of its members and responsive to the needs and problems of society and the intellectual community.

Services

The oncology service, staffed by Drs. Jeglum and Helfand, is seeking a larger number of canine patients with lymphoma and feline patients with mammary cancer and squamous cell carcinoma. Dr. Jeglum is investigating the use of monoclonal antibodies for the diagnosis and treatment of canine lymphoma and feline mammary cancer. Dr. Helfand is investigating the use of retinoids to treat feline patients with mammary tumors and squamous cell carcinoma.

The reproduction clinic in the Section of Medical Genetics will see cases on Tuesdays, beginning the middle of September. The clinic will evaluate reproductive problems of dogs and cats, both male and female. The clinician is Dr. Vicki Meyers-Wallen, assistant professor of reproduction.