

# Penn State Dairy Facility Projects Summary

**UNIVERSITY PARK (Center Co.)** — The Dairy Teaching and Research Complex at Penn State has been operational now for three years. With any new facility there are growing pains and adjustments. Fortunately we have gotten past those hurdles and are close to utilizing the facility to its full potential. The herd presently consists of 160 milking cows, 20 dry cows, and 155 youngstock. The lactating cows on average are producing around 78 pounds of milk with a 3.8 percent milk fat and 3.1 percent milk protein. The somatic cell count has been averaging under 225,000. At this point in time, every cow or heifer that freshens will be involved in someone's research project until the fall of 1997. All the close-up dry cows and heifers over six months of age are being utilized for research. The following describes some of the projects that have been completed or are in progress at the dairy center.

Dr. Gabriella Varga and her graduate students have been focusing their attention on protein and carbohydrate metabolism in both lactating and dry cows. Theo Lykos, a recent doctoral graduate, examined the effect of varying ruminal degradabilities of protein and total nonstructural carbohydrates on the animals' metabolism, milk production and milk composition. Some conclusions drawn from their data suggest that the amino acid profile of bypass protein is not similar to that of the original feedstuff, steam flaked corn is a source of bypass protein, and roasted soybeans that are ground eliminate the added benefit of heating on protein degradability. In addition, they found that carbohydrate sources that are degraded rapidly in the rumen can increase both milk and protein yields.

Dana Putnam, a current doctoral candidate, has conducted several trials with close-up dry cows. His first project examined the effects of increasing dietary protein density on nitrogen balance in late gestation animals and on postpartum dry matter intake and production. Thirty-nine close-up dry cows were fed a diet with a total dietary crude protein of 10.5, 12.6, or 14.5 percent on a dry matter basis. No observed differences were seen in postpartum dry matter intake or production regardless of protein level fed. However, increasing dietary crude protein had some interesting effects on certain blood metabolites.

Heather Dann, a master's student of Dr. Varga, is beginning her project using dry cows. They will be feeding close-up dry cows two different sources of carbohydrates that vary in rate of ruminal degradation. They will also be determining the effect of prepartum and postpartum ration interactions on animal performance such as health, dry matter intake, and milk production.

Projects conducted by Dr. Jud Heinrichs and his graduate students are geared mainly to heifers. Julianne Longenbach, a recent master's graduate, examined feed bunk space requirements for rapid rates of growth and performance for heifers aged 4, 11.5, and 17 months. They looked at growth responses and feeding behavior based on various feed bunk space allotments. Heifers were fed a high quality total mixed ration in a free-stall or bedded pack group housing system. From their results they made the following conclusions about adequate feed bunk space: 0.0 inches per animal for 4 to 8-month-old heifers; 12.0 inches per animal for 11.5 to 15.5-month-old heifers; and 18.0 per animal inches for 17 to

21-month-old heifers.

Brian Lammers, a current doctoral candidate, has been conducting research involving calves, growing replacement animals, and heifers in their first lactation. Brian and Dr. Heinrichs have recently completed a study examining whey protein concentrate versus dried skim milk as the major protein source in milk replacers. The four treatments were 100 percent skim, 67 percent skim and 33 percent whey protein concentrate, 33 percent skim and 67 percent whey protein concentrate, and 100 percent whey protein concentrate. The results from their study showed that when no grain was fed, calves receiving the 67 percent whey protein concentrate had higher average daily gains and better feed conversion efficiency ratios. However, when grain was offered free choice, no milk replacer effects were found between the different whey protein concentrate and dried skim milk protein ratios.

Brian Lammers' second project is a long-term study evaluating the effects of accelerated growth rates and estrogen implants in prepubertal heifers. There has been some speculation that estrogen implants may effect mammary development. He will be collecting data on 68 heifers from 4.5 months of age up until they complete their first lactation. To date, Brian has collected data on growth and feed efficiency. The results of the growth data showed that increasing growth rates from 1.8 to 2.2 pounds per day increased structural growth by 27 percent. There does not appear to be any effect on conception rate with accelerated growth or estrogen implants.

Brian's third research project involves determining the protein requirements of growing heifers.

There has been almost no work done that clearly defines what the protein requirements are for dairy replacements. Brian will be feeding total mixed rations varying in protein content (12, 14, 16 percent crude protein on a dry matter basis) to heifers 6 to 11 months of age. All animals will be fed individually and dry matter intakes will be controlled. He will be evaluating various growth parameters as well as feed efficiency.

Dr. Lisa Holden is another faculty member actively conducting research with an emphasis in forage systems and intensive grazing. Her current doctoral candidate, Kathy Soder, has finished her first project. They examined the influence of dietary cation-anion balance in grazing dry cows on metabolic health and milk production.

Their treatment diet consisted of an anionic salt pellet which was compared to a control pellet. Both diets contained a high calcium content. Kathy is in the process of analyzing the data.

These are the summary of just a few of the projects being conducted at Penn State. In subsequent articles I'd like to share other projects and activities that are going on at Penn State's dairy facility. Many of the projects that were mentioned in this article have been or will be presented at the American Dairy Science Association meetings. Anyone interested in obtaining detailed information on these projects or providing suggestions for future research proposals can contact the extension office at University Park: 814-865-5491.

## Students Sought For Farm Bureau's 'Classroom At The Capitol'

ALBANY, N.Y. — High school juniors with an interest in the workings of state government can learn more about the process by applying for New York Farm Bureau's upcoming Governmental Awareness Institute.

Scheduled May 13-14 and headquartered at the Albany Marriott, "The Institute offers students a first-hand look at how their state government functions," said Mark F. Emery, director of communications for the 27,000-member New York Farm Bureau.

"Last year, students had an opportunity to hear from Governor George Pataki; Assemblyman Bill Magee; John Boltz, an independent lobbyist; Rex Smith, managing editor of the Albany Times Union; Jeff Martin, a dairy farmer

from Madison County and NYFB's state membership chairman; and Bob Bellafiore, a special assistant to Governor Pataki," said Emery. They also visited with their own assembly member and participated in a computer game that allowed them to be a lawmaker for a term.

He said, "We are currently lining up a number of excellent speakers, tours, and other activities for this year's institute."

High school juniors interested in attending the 1997 Governmental Awareness Institute should contact the chairman of their school's social studies department, an agriculture teacher, the county Farm Bureau president in their area, or call the NYFB Communications Department at (518) 436-8495 before Feb. 21.



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