



## **Marshak Dairy**

The Marshak Dairy is named in honor of Robert Marshak, the ninth dean of Penn Vet, whose support was instrumental in establishing the farm. Built in 1996, the greenhouse dairy uses natural lighting and excellent ventilation within the barn to promote a healthy environment for the cows. This dairy design was the first of its kind and was recognized as a dairy of distinction in 1998.

### **Facilities**

The lactating cow barn has 160 free stalls divided into four different pens. There are an additional 40 stalls that can be used either as free stalls or tie stalls if individual feed intake data is needed. The barn's alleys are flushed twice daily with recycled water that is filtered through a separator. The separator filters out manure solids, which are then used to fertilize crops on New Bolton Center fields. Those crops, in turn, produce feed for the cows. Water from the manure storage facility is also used for fertilization and irrigation, further ensuring that nutrients are recycled as efficiently as possible.

## **Herd Demographics**

The Dairy herd is composed of about 180 milking cows, 30 dry cows and 180 calves and heifers. The Holstein herd produces about 70 pounds of milk per cow every day for a total of 1,500 gallons of milk per day. This milk is sold and marketed through Land-O-Lakes Dairy Cooperative. The cows are milked twice per day in a double ten-herringbone parlor that identifies each cow and measures her milk production and her activity during the previous 12 hours. After milking, the lactating cows return to straw-bedded free stalls with rubber mats that are cleaned and filled with fresh bedding daily. Adult cows are fed a total mixed ration of feed formulated by veterinarians to meet each group's specific nutritional requirements for health, production, pregnancy, and growth.

## **Cow Life Cycle**

After cows become pregnant, they are dried off 60 days prior to their due date and housed in the dry cow free stall barn. Here, they are fed a specific diet that reduces the risk of illness by balancing energy, protein, and minerals such as calcium. Cows give birth in sand-bedded box stalls that allow individual care and isolation from pathogens potentially carried by herd mates. After birth, calves are bottle-fed four quarts of colostrum within 12 hours to ensure adequate passive immunity is transferred from cow to calf. Calves are raised in individual hutches that minimize disease transmission and allow them to grow at their own rate. After weaning, they are moved into larger hutches in groups of three. This allows a smoother transition to the next larger group by ensuring calves already have social interactions with some calves in the new group. At 750 to 800 pounds of body weight, heifers are bred through artificial insemination, and calve at an average age of 22 months. The dairy uses an outside contractor to raise the heifers from about four months of age. These heifers return to the farm two months after they have been diagnosed as pregnant themselves.

## **Teaching**

One of the main objectives for the Marshak Dairy is to provide a laboratory for teaching students. Topics include cow healthcare, preventive medicine, nutrition, and food safety. In addition to veterinary students, high school, college and veterinary-technician students spend time at the dairy.

## **Research**

The Marshak Dairy's other main objective is to provide an easily accessible working dairy farm for research trials. Research projects have largely focused on nutrition, environmental sustainability, mastitis, and cow comfort. The Marshak Dairy continues to look for interesting and valuable research projects.