



**SPECIAL REPORT**

**GRAZING BEHAVIOR OF COWS ON PASTURE**

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Grazing studies at Penn State with high producing cows on pasture show that the inability of the cow to harvest enough forage during the time available for grazing is an important factor limiting milk production. This is especially true if the dry matter (DM) content of herbage is low, such as for fresh wet spring growth which may contain only 12-16 percent DM. For example, a cow with a forage intake requirement of 30 lbs. DM/day has to eat 200 lbs. of wet pasture if the DM content is 15 percent! The demands that are placed on the dairy cow to eat this quantity of forage can be more fully appreciated if they are expressed in terms of grazing behavior. The amount of pasture consumed

by the amount of time spent grazing, the rate at which pasture is taken into the mouth, and the amount of herbage taken with each bite. This can be written more simply as:

$$\text{Intake} = \text{grazing time} \times \text{biting rate} \times \text{bite size}$$

These variables, which have been quantified by grazing behavior studies (mainly in the British Isles and France), show that grazing time for dairy cows ranges from 420-700 minutes/day (7.0-11.6 hours) with a median of around 510 minutes/day (8.5 hours). The amount of time spent grazing increases as the amount of pasture decreases, which is why high producing cows need to be provided with pastures at least five inches tall. Grazing time is also influenced by sward structure (e.g. how dense the pasture is), daylight hours, and the level of milk production. The rate of biting for dairy cows is in the range 55-54 bites/minute.

An Australian researcher suggested that the maximum number of bites a Jersey cow could take per day was 36,000 a cow grazing at 60 bites/minute for 510 minutes would take 30,600 bites in a day. Pasture bite sizes for European dairy cows vary from 0.022 to 0.007 ounces DM/bite, and probably average 0.012 ounces DM/bite over a grazing season. Variation in bite size is the most important factor determining how much pasture a cow can eat per day.

Under pasture grazing only, dairy cows usually consume less than 3 percent of the bodyweight as DM, but in high producing cows this may be increased to the equivalent of 3.4 percent bodyweight. This suggests that high producing Holsteins have a potential milk production of about 60 pounds per day if high quality pasture was the sole source of energy. This corresponds to the consumption of 295 pounds/day of fresh herbage with a DM density of 15 percent, or an average bite size of 0.023 ounces DM. At a bitesize of 0.022 ounces/day, the cow would need to spend 584 minutes/day grazing to achieve a 44-pound DM intake.

Grazing time will increase in high producing cows. A French study, for example, found that cows rotationally grazed on

ryegrass and producing 45-77 pounds milk/day increased grazing time by 12 minutes for each 2.2 pound increase in milk production.

The grazing behavior calculations have important practical applications. First, they broadly define the physical constraints in DM intake of pasture by dairy cows and clearly show that some supplementation with high energy concentrates is required in high-producing herds on pastures even if "ideal" herbage

could be offered throughout the grazing season.

Second, they emphasize the importance of grazing management in providing high quality pastures to the lactating dairy cow so that she is able to take large bites of herbage. The pasture research at Penn State is therefore taking cow behavior into account when ration programs and grazing management systems are being developed for high producing dairy cows.

**Project Grass Northeast Spring Meeting Set**

BLOOMSBURG (Columbia Co. — Project Grass Northeast will have its spring educational meeting on April 16. The meeting will begin at 10:30 a.m. in the large meeting room of Penn State Cooperative Extension in Columbia County. The office is located on Sawmill Road near Lightstreet.

The morning speaker will be Tim Fritz, agronomist for King's Agri-Seeds in Lancas-

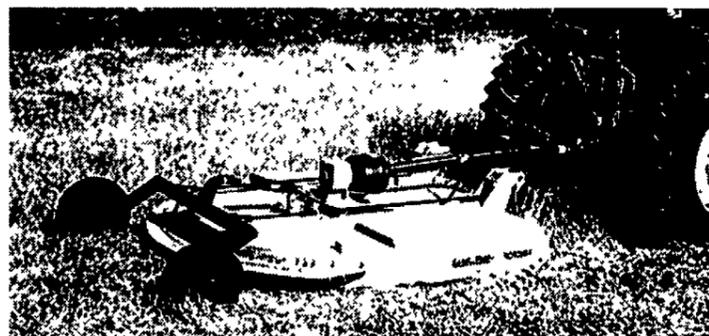
ter County. Tim will profile dairy grazing economic data from Maryland. He will also update the group on new developments in the forage seed industry.

After lunch the group will tour the beef farm owned and operated by Greg and Deb Farr, Millville.

For more information call Dave Hartman at (570) 784-6660.



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