

Frequency Makes A Beneficial Difference

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Frequency can be a philosophical principle with many consequences. I always told my students that if they wanted to succeed on their tests, they must adopt the principle of frequency in their studies. They could not hope to be successful on a test by studying only the night before.

The term "frequency" may also mean, in many cases, repetition. To study a language, for example, one must memorize vocabulary, which requires a certain frequency of repetition to succeed.

Many situations in dairy farming call for repetition, and a certain frequency of repetition has interesting results. As we study the fermentation in the rumen of animals fed a certain ration, we observe peaks of fermentation soon after each meal.

If we feed twice a day, we get two big fermentation peaks in the rumen. However, if we divide the feed into several meals in a 24-hour period, we observe smaller peaks after each meal, which is nutritionally better to handle and more efficient for our animals—dairy cows, dairy goats and dairy sheep.

A higher frequency of feeding meals or more repeated meals during 24 hours benefits the dairy animals nutrition, therefore benefiting milk production and profits.

The question then is: how can repeat feedings be done—labor-

and equipment-wise—and still be profitable? Free choice feeding of hay, silage, haylage, and total-mixed ration will provide a more frequent availability of feed.

Will animals actually eat more frequent meals? Not to the extent that is nutritionally optimal. However, grain supplement feeding can be provided by computer feeding equipment without additional labor.

We have programmed the University of Delaware dairy farm computer feeding system for a minimum of 6 meals in a 24-hour period for each cow. No cow can eat more than 1/6th of her daily grain ration at one time. This optimizes frequency of feeding for nutritional benefits.

In addition to the frequency of grain feeding, we can also regulate the frequency of milk nursing by our calves. Feeding milk more frequently than twice a day reduces overfeeding scours and provides the same nutritional benefit as frequent grain feeding.

Our computer system is also programmed for a minimum of 6 milk meals for our calves. With ordinary labor, this would be impossible or unprofitable. So more frequent but smaller meals are beneficial for animals, and with today's computers, it is feasible and profitable.

Among other benefits of "frequency" on the dairy farm is interesting new research about milking. We know that twice-a-day milking of our cows yields more milk per cow per day than

once a day and three times milking yields more milk than twice a day, especially in fresh and high milking cows. We also know that more frequent milking improves the recovery from mastitic infections.

On the other hand, it is not uncommon to find in other countries (for example, in the mountains of Italy, Greece or Spain) that the many goat flocks are milked only once a day. The explanation is in the different udder anatomy. Goat udders usually have much larger volumes of gland cistern than cows, which means they can produce milk much longer in their secretory alveoli before the back pressure from the filled-up cistern reduces alveolar secretion. Thus, once a day milking is less detrimental to high milk production in goats than in cows.

Comparing this situation with dairy sheep or even with milking horses (as in some countries in northeast Asia) explains why frequency of milking is critical for good yields or, under natural situations of suckling by lambs or foals, is typical. These species usually have an udder anatomy that shows very little gland cistern, thus very little storage volume before back pressure reduces alveolar secretion.

The practical dairy sheep or horse farmers know this without going to college. When I was in the mountains of Romania last year, where there are many thousands of dairy sheep providing the only source of livelihood for mountain farmers, I observed that shepherds living

with their flocks milked them three times a day, thus yielding milk and income for 9 months a year instead of the usual 5 months in other parts of the world. I observed the same situation on a horse-milking farm in Germany, where the mares are milked three times a day, even though in both cases this means tremendous labor costs.

Research on these topics is done mostly in other countries. In the United States, we don't worry much about problems in milk production of goats or sheep or even horses, although a trend toward more goat and sheep dairying is increasing here.

A Virginia State University study 10 years ago (Journal of Dairy Science 73 (1989):1603-1611) showed that a three-times

milking frequency increased milk yield of Holstein cows over twice-a-day milking if cows also ate more feed with a higher nutrient density.

A later study at the Volcani Research Center in Israel (Journal of Dairy Science 78 (1995):2726-2736) comparing three times with six times milking of cows per day found that "increased frequency of udder emptying increased milk production." They also found that the higher milk production was associated with increased but insufficient feed intake and elevated blood levels of growth hormone, prolactin, and oxytocin.


It has been known for a long time that oxytocin is necessary for milk let-down and complete

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SAT., MARCH 25 - 9:00 AM

Included in this auction, a fine collection of firearms from the **WILLIAM O. RUTSONG ESTATE** - Bendersville, PA

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PUBLIC AUCTION

MODERN FARM MACHINERY, (4) TRACTORS, N.H. L-565 DIESEL SKID LOADER, CASE #580 BACKHOE, TMR MIXER, DAIRY EQUIPMENT, PATZ BARN CLEANER, TRUCKS, HAY & STRAW, LUCK NOW 8 1/2' SNOW BLOWER & (1) WAGON SMALL ITEMS

SATURDAY, APRIL 1, 2000 AT 10:00 AM

LOCATION: Turn off Rt. 78 at Exit 8 (Shartlesville) onto Mountain Rd. past Mountain Spring Campground for 1.7 miles to farm on left, Upper Bern Twp., Berks Co., Pa.

TRACTORS: Int. #1066 turbo w/Cab & TA 18-4-38" rubber & weights, Int. #856 TA w/weights, Farmall #460 tricycle fast hitch, Farmall C (needs work), Case #580 diesel backhoe.

TILLAGE: White 4-bottom 16" auto reset plow, Taylorway 10-tooth chisel plow, Ford 14' disk, J.D. 12' disk.

HAY EQUIPMENT: N.H. #326 baler w/#72 thrower & hyd. tension (nice), N.H. #640 round baler w/Agri-King applicator (nice), N.H. #258 side rake, (3) 18' Hetty steel hay wagons w/8-ton Zimmerman gears, N.H. #492 haybine, Zimmerman 36' pipe elevator on transport, Farmlund round bale wrapper (like new), N.H. #33 chopper, Badger forage wagon w/10-ton Zimmerman gear, Fox forage harvester w/2-heads - 1000 RPM.

DAIRY & BARN EQUIPMENT: Delaval 1000 gal. milk tank #17304, Surge bulk tank washer, Surge electroban pipeline washer, rinse tubs, (5) Westfalia Visotron milk units, (5) Surge orbit claws, Alamo Surge vacuum pump, 1 1/2" st. st. & glass pipeline for 54 cows w/3" airline, (3) large circulating fans, (35) drinking bowls, Zimmerman head gate (new), feed carts & troughs, round bale feeders, cattle gates, lots of steel & step in fence posts, pile of 1 1/2" PVC pipe, Rissler TMR mixer (like new), GSI 10-ton feed bin (new), Rissler conveyors, GSI 4" auger.

HAY & STRAW: Approx. 1000 bales 2nd & 3rd cut orchard & alfalfa mixed, approx. 1000 bales rye straw, (35) round bales mixed, Hay & straw sold by bales.


MISC. EQUIPMENT: J.D. #8300 grain drill w/grass box (nice), Itco 300 gal. field sprayer, N.I. #314 2-row corn sheller, Int. 4-row 2-pt. cultivator, Int. 7' 2 pt sickle mower, 295 bu. gravity bin wagon on 10-ton Zimmerman gear, 45 kw, PTO generator on trailer, Hedlund Martin #8166 tank manure spreader, 28' feeder wagon, 20' Cardinal alum elevator.

AUCTIONEER NOTE: Small items 10:00 AM - Farm Machinery approx. 11:00 AM - Milking Equipment, Hay & Straw approx 1:00 PM.

TERMS: Cash or PA check day of auction. NO OUT OF STATE CHECKS without current bank letter addressed to Ken Leiby. Auctioneer guaranteeing payment

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MON., MARCH 27, 2000 AT 11:00 AM

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SELLING 4 TRACTORS & JOHN DEERE COMBINE

Tractors & Combine: 1990 JD 9600 4WD combine w/2800 hrs, #9600 8-row corn head & #922 22' flex platform; '89 Versatile #936 4WD tractor w/cab, Cummins 6-cyl turbo, 310 HP and 20.8x42 duals; JD 8430 articulated tractor w/7500 hrs & 18.4x38 duals; JD 4430 tractor w/6700 hrs. and 18.4x38 duals; JD 4030 tractor w/8000 hrs. & 18.4x38 tires;


Tillage & Planting: Wil-Rich 9-btm 18" trailer plow w/INT bottoms; JD #7000 planter 6-row w/insecticide & liquid fert; Brillion 25' hyd foldup cultimulcher; Amco 24' hyd foldup disc; 25' Knowles transport drag; JD #960 31' field cultivator; JD #8350 21x7 grain drill; Dunham 6-row 3" cultivator; 3-pt ditcher; 4000 and 11000 gal. glass-lined upright tanks; two 10,000-gal. steel fertilizer tanks;

Forage & Harvest: Hi-Cap #40 grain cleaner; J&M gravity wagon 350-bu; 3 transport augers - 8'x53' PTO, 6'x51' w/elec motor, 7'x35' PTO; INT #1800 truck w/16' dump box; Chevy C-60 and C-50 trucks with 16' dump boxes.

NOTE: This Equipment is well cared for and is field ready.

CONSIGNED: 9000 gallon tank trailer.

Terms: Cash or good check day of sale with ID, nothing to be removed until settled for. Out of State buyers must bring a Bank Letter of Guarantee made out to William Kent, Inc.



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