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Virginia Cooperative Extension
Knowledge for the CommonWealth

VIRGINIA STATE UNIVERSITY

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Dairy Pipeline

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The Composting Bedded Pack Barn

This is not your conventional bedded pack! A composting bedded pack is a deep bedded pack actively going through a rapid decaying composting process. It is a natural biological process carried out under aerobic conditions. In the process, various microorganisms break down organic matter into simpler substances. The essential elements required by the composting microorganisms are carbon, nitrogen, oxygen, all of which are present in a properly managed bedded pack. **Optimal composting conditions will convert organic matter into stable compost that is odor and pathogen free.** Achieving high temperatures within the pack is important to kill pathogen and keep the surface dry. Maintaining a temperature of 130 degrees or more for 3 to 4 days favors the destruction of weed seeds, fly larvae, and pathogens.

A composting bedded pack should be bedded with at least one foot of fine dusty wood shavings or sawdust. The fine particles are easier to handle and mix and will speed bacterial growth and increase temperatures sufficient to inactivate pathogens. This space should be well ventilated to remove heat and maintain a dry bedding surface. Sidewall curtains and fans are recommended. The current recommendation is 100 square feet per cow if used for the milking herd. Less space is needed for dry cows and more is beneficial for transition and calving areas.

Once begun, the pack must be stirred twice daily to a depth of at least ten inches. This removes manure and urine from the surface and incorporates oxygen into the pack allowing for faster aerobic decomposition. If the pack is not aerated, it will become anaerobic causing the decomposition rate to slow and temperatures to drop. The pack will lose the ability to kill pathogens and may also create unpleasant odors. Fresh bedding should be added every three to six weeks, but will vary depending on the weather and surface condition. Hot and humid weather requires more frequent application of bedding.

It is also important to remember that bedded pack barns are most effective if used in a loafing lot system. It is very difficult and costly to maintain a bedded pack barn that is the sole source of housing for a dairy herd. Cost of bedding and the potential for mastitis is greatly increased in these situations.

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Relative feed value (RFV) and Relative Forage Quality (RFQ). . .

are methods used to evaluate hays. To calculate RFV it is necessary to have a forage analysis for acid detergent fiber (ADF) and neutral detergent fiber (NDF). Protein is not considered but higher RFV values *are* usually associated with higher protein. The ADF analysis is used to predict the digestible dry matter = (88.9 – (.779 * % ADF)) and NDF predicts dry matter intake = (120/% NDF). RFV is calculated by multiplying digestible dry matter by dry matter intake and then dividing by 1.29 (the expected digestible dry matter intake as % of body weight for full-bloom alfalfa). The RFV for full-bloom alfalfa would be expected to be 100. For an alfalfa hay containing 29% ADF and 36% NDF the RFV = (66.3 * 3.3)/1.29 = 170. Grasses typically have higher ADF and NDF concentrations and consequently have lower RFV. For instance a grass or mixed grass/legume hay having 32% ADF and 50% NDF would have an RFV = (64 * 2.4)/1.29 = 119. Note that grasses and corn silage have a greater NDF:ADF ratio than legumes.

	ADF %	NDF %	NDF:ADF	RFV
Alfalfa A (mature)	40	51	1.28	105
Alfalfa B (immature)	29	36	1.24	170
Grass	32	50	1.56	119

What the RFV calculation does not account for is fiber digestibility.

Relative Forage Quality (RFQ) Index is similar to RFV except NDF digestibility is used. NDF digestibility allows for a more precise estimate of the energy in the feed and many laboratories are offering an in vitro NDF digestibility to account for fiber digestion. Grasses typically have fiber digestibility's greater than legumes because legumes have more lignin associated with the fiber. Legumes make up for this by having more cell contents (non-NDF material) that are highly digestible thus elevating energy concentrations to higher levels than in grasses. **When using RFV or RFQ it is best to compare hays that are within a similar classification such as alfalfa, grass, or mixed.** RFQ gives more credit for digestible fiber in grasses and grasses will typically have higher RFQ than RFV but will still be less than many legumes. Type, quality and price should be taken into consideration when purchasing hays.

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Take a look at your genetic improvement program

Just how good are the proven AI bulls you use in your herd? Do you use AI more or less than other herds? Do you rely on AI young sires more or less than average and just how good are they compared to proven bulls? Here are state DHI averages for March 2006 to use as benchmarks. Average herd size in Virginia is 149 cows, of which 105 cows (70%) carry service to some bull.

1. The average Virginia herd on DHI uses 14 different proven AI bulls to breed 71 cows (5 mates per proven AI bull.)
2. Genetic merit for proven bulls is $307 for Net Merit, which ranks at the 64th percentile against all active AI proven bulls.
3. Eight young sires in AI are mates for 17 other cows (two mates per young sire.)
4. Pedigree merit is higher ($389 for Net Merit) than the proofs for proven AI bulls.

There will be some "pedigree slippage" by the time the proofs are out on the youngsters, but they will still compete very well with proven bulls at the 64th percentile. Another category of service sire is reserved for "all other bulls". Generally these are herd bulls kept to cover problem breeders or used in place of AI sires. Very seldom is any genetic information available for them. Check your herd's figures by looking at the "Genetic profile of service sires" on the DHI herd summary 202. Good goals for a herd breeding program would be:

1. Rely on proven AI sires for 80-85% of all services.
2. Strive for average rank for proven bulls above the 80th percentile.
3. Use AI young sires for remaining services with no services to "other" bulls.

Virginia herds do use AI extensively in the lactating herd, but sire selection could be more intense in many herds. **Before buying semen, check the rank of each bull for Net Merit. Stay above the 80th percentile for Net Merit on the most recent sire summary.** There are plenty of choices for different traits within the top bulls for Net Merit.

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Upcoming Activities

Dairy Club Invitational
Youth Dairy Judging Contest - April 29
Virginia Tech-For more information, contact Dave Winston at (540) 231-5693; dwinston@vt.edu

Dairy Quiz Bowl
Northern District – Saturday, May 20 – Orange County
Northwest District – Saturday, June 3 – Augusta County
State- Tuesday, June 27 – Virginia Tech
For more information, contact Dave Winston at (540) 231-5693; dwinston@vt.edu

Southeast Dairy Youth Retreat
North Carolina will be hosting the Southeast Dairy Youth Retreat this year July 10-14 in Jonesville. Please check http://www.dasc.vt.edu/youth/index.html for additional details as they become available.

If you are a person with a disability and require any auxiliary aids, services or other accommodations for any Extension event, please discuss your accommodation needs with the Extension staff at your local Extension office at least 1 week prior to the event.

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