Ten Myths about Mastitis Therapy

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1. Once a Staph aureus cow, always a Staph aureus cow.

Although a difficult therapeutic challenge, intramammary infections (IMI) caused by Staph aureus are not necessarily incurable. Depending on the herd, 30 to 70% of individual quarters may be cured during the dry period. Thus, if a little judgement is exercised in selection of cows as therapeutic targets, treatment can be reasonably effective and economical. The dry period offers the best time to administer therapy because milk withholding expenses are negligible, residue risks are reduced, and it is the optimum time in the lactation cycle of the cow to enhance the synergy between antimicrobial activity and the immune system. It is potentially beneficial to administer systemic antimicrobials to dry cows in addition to intramammary therapy to enhance the elimination of IMI. This combination may be beneficial to lactating cows as well; however, the costs of therapy and potential decreased efficacy should be considered carefully before treating lactating cows. Prolonged use of intramammary therapy (multiple regimens of labeled doses) also may increase efficacy, and vaccination prior to therapy may augment efficacy as well. However, cows with multiple infected quarters, or those that are chronically infected (several months with elevated somatic cell counts (SCC)) are poor therapeutic candidates. Additionally, it is highly recommended to use culture and susceptibility information to assist drug selection and dosing regimens.

2. It doesn’t pay to treat clinical mastitis.

This depends on the severity and history of the affected cow. Although many herds have reduced the use of antimicrobials for therapy of clinical mastitis, it cannot be assumed that treatment can be avoided for all cases in all herds. Severe clinical mastitis (cow displaying systemic signs) almost always should be treated initially until a clinical evaluation can be made. Milk samples collected at the onset of the mastitis case (before treatment), and then submitted for bacteriology can also help treat-
ment decisions, although this may not be attained until the second or third day. The usefulness of intramammary antimicrobials as a means to affect the outcome of clinical mastitis caused by coliform bacteria is questionable, although systemic therapy may be beneficial. Additionally, severe mastitis caused by organisms such as staphylococci and streptococci are likely to benefit from therapy, even if only to reduce the severity of clinical signs. Therapy should be discontinued within 1 to 2 days after severe clinical cases have responded to the point where the cow has started to recover dry matter intake and milk production, despite continued swelling or abnormal milk. It is difficult to correctly determine the causative bacteria for a severe clinical mastitis case from clinical signs of the cow. This forces a therapeutic decision before we have culture results available. Additionally, it is typical for 30 to 35% of all clinical mastitis cases that are sampled to yield no bacteria on culture.

Interest in a non-therapy approach to mastitis was initiated by a study in California in which bacteriologic cures for mild clinical mastitis caused by streptococci or coliforms did not differ between cows treated with cepahpin, amoxicillin, or no antibiotic (oxytocin and stripping). However, an economic analysis of this study determined that although milk production and survival in herd did not differ between antimicrobial-treated and non-treated cows, the rate of recurring cases was higher in the oxytocin plus stripping cows, especially for streptococcal IMI. A case report from Colorado supported this concern for streptococcal cases. A marked increase in the incidence of clinical mastitis caused by streptococci and an increase in herd SCC was reported following initiation of a non-antimicrobial program for clinical mastitis. Additionally, a study in Illinois determined that bacteriologic cure and return to normal udder appearance occurred more frequently when clinical mastitis caused by streptococcal mastitis was treated with intravenous injection of oxytetracycline, intramammary cepahpin, and supportive care, as compared with supportive care only. (Supportive care includes intravenous fluids and anti-inflammatory drugs.) Thus, initial cases may benefit from therapy, particularly if the causative agents are streptococci. Nonetheless, therapy of mild clinical mastitis is not likely to be effective or economical when treating chronic, recurring cases. It is important to monitor success of therapy by SCC and rate of recurring cases, in herds where minimal therapy is used. Some herds can use minimal therapy successfully.

3. Oxytocin and stripping is the way to treat.

Although popular, frequent stripping of the quarter may not be beneficial for all cases. For severe mastitis cases where the secretion of the gland is watery and discolored, frequent stripping actually may be more harmful than beneficial. Certainly, if cows are having difficulty releasing or ejecting milk because of clots and flakes that plug the teat canal, these should be stripped out. However, more frequent stripping has not been demonstrated in clinical studies to be any more beneficial than milking at regular intervals.

4. Keep on treating a clinical mastitis case until the milk returns to normal.

The immune system of the cow eliminates infectious organisms, and antimicrobials act in a supporting role towards this goal. While initial recognition of a clinical mastitis case should initiate immediate therapeutic decisions, non-responsive cases need to be recognized as failures of the immune system. This is especially the case for chronic recurring infections. Following coliform mastitis cases, it is typical for the cow’s immune system to continue to react, even after a successful elimination of the infection. The quarter may go agalactic (stop producing milk). This is a normal response to inflammation and cannot be “turned off” with antibiotics. Many cows produce well with three quarters, and in the case of coliform mastitis, affected quarters are likely to come back to production in the following lactation. Additionally, non-responsive quarters are often the sign of a resistant organism, including yeasts and Pseudomonas. Thus, it should be a very rare situation where a clinical mastitis case is treated for more than 4 to 5 days. If the average number of days that milk is discarded per case of clinical mastitis in a herd is greater than 5, the therapy protocol should be reviewed.

5. Commercial infusion tubes today aren’t as good as in the old days.

It may appear in the literature that we are not achieving cure rates that are comparable to previous reports from 25 years ago; however, current assessment of efficacy is more critical in determining a true cure than reported previously. Previous results had less rigorous definitions of cures and had greater levels of Streptococcus agalactiae (which are more susceptible to cures than many other organisms) as part of the data. Antimicrobial susceptibilities for many of the mastitis organisms isolated from laboratories have not changed over the years. The major problem is the method we use to administer our drugs, including dosing, not necessarily the drugs we select.

6. A double dose of antibiotics is better.

Excepting aminoglycosides and fluorquinolones, the most critical factor in successful antimicrobial therapy is the length of time that the drug concentration in milk and mammary tissue is above the MIC (minimum inhibitory concentration) for the causative bacteria. Being much higher than the MIC is not helpful. Increasing the dose only gains one half-life (hours) of effective concentration. It is much more beneficial to extend the therapeutic period, beyond the typical 2 to 3 days for most commercial preparations.

7. Extra label products are more effective.

The pharmacokinetics and antimicrobial activity for most
antimicrobials has not been tested in relation to the presence of milk and mammary inflammation. Some of the typical extra-label drugs used for mammary infusions are detrimental to leukocyte function at the concentrations achieved in milk. Most drugs that are available for systemic use in dairy cattle penetrate into the gland very poorly, with the exception of macrolides and oxytetracycline. Drug clearance and withholding for extra-label drugs is unknown, especially in cows with mastitis. The majority of studies that have investigated extra-label drug use for treatment of mastitis determined that there is little positive effect as compared with cure rates achieved by labeled drug regimens. This is especially true for intramammary infusions.

8. If, after two treatments there are still clots and flakes, I need to switch to a new antibiotic.

The key to successful therapy is staying with the same drug as long as possible. Thus, it is better to stay with the same drug for a longer period of time, rather than switching. Switching drugs starts the therapeutic clock all over again, and can lead to bacterial resistance. Thus, if the best potential of therapy is to be realized, then consideration should be given to staying with the same therapy rather than switching. This concept is in contrast to the approach to mastitis therapy that tends to minimize milk withholding periods. If not achieving desirable results with extended therapy, consider if it is an IMI that should not be treated, (i.e, bacteria that are not susceptible to the specific antimicrobial being used) or a recurring chronic infection. Use of susceptibility tests can be useful for predicting therapeutic efficacy against streptococcal and non-chronic IMI.

9. First generation cephalosporins and synthetic penicillins are more effective treatments for clinical mastitis because they are active against Gram-positive pathogens and coliforms.

Antimicrobial susceptibility data suggest that 50 to 80% of E. coli isolates from mastitis cases are susceptible to ampicillin. However, susceptibility data based on disk assay methods can be misleading. The “breakpoints” or zones of inhibition that determine susceptibility of the bacteria to the drug generally are based on human drug metabolism and clinical experience. It is difficult to maintain inhibitory concentrations of ampicillin for greater than 50% (MIC50) of E. coli isolates if the drug is administered intramuscularly. This is critical because antibiotic treatments should target concentrations that are effective for 90% of the isolates. Less than 5% of Klebsiella isolates are susceptible to ampicillin. Coliform organisms are susceptible to first generation cephalosporins 70 to 90% of the time. However, systemic formulations for use in cattle are not available or pharmacologically practical. Thus, in order to achieve potentially high enough concentrations of these drugs for the treatment of coliform mastitis, intramammary therapy would be the preferred route of administration. However, the reality is that intramammary infusions of these products, or any current antimicrobial are not effective against coliform mastitis.

The practical problem when facing a therapeutic decision regarding clinical mastitis is whether it is a mild or severe case. In either situation, intramammary infusions are indicated for severe cases and perhaps non-chronic mild cases. All the labeled products on the market for use as an intramammary infusion in dairy cattle demonstrate good efficacy against Gram-positive bacteria. If there is concern regarding a severe clinical mastitis case caused by coliform bacteria, an antibiotic that may have activity against coliform organisms should be administered systemically.

10. My mastitis therapy program is doing OK even if I don’t keep records. I’ll just do: (choose one or all)
   a) what other farms are doing; b) what I read about in trade magazines; c) use drugs that my veterinarian or local feed mill has in stock; or d) what I used for the last cow that I treated.

This is the most critical problem in most herds. Without knowing the causative agents, the risk factors associated with clinical mastitis cases in a herd (lactation, days in milk, season), and clinical outcomes (SCC, milk production, rate of recurring cases, days out of tank, and culling) after therapy, it is impossible to know if a therapy plan is a good one. A good method to measure success of a clinical mastitis prevention and therapy program is to ask “have we discarded less milk from clinical mastitis cases this year than last year?” How much milk did you discard in your herd last year? These questions can only be answered if good records are maintained so that therapy protocols can be evaluated.

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Herd Health

Biosecurity Starts With Your Feet

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Heightened concerns about foreign animal diseases, such as foot-and-mouth disease, have started many dairy producers thinking about the people visiting the farmstead. Not actually the people, but the things riding along on their shoes. The transfer of pathogens from farm to farm is easily accomplished by their riding in our clothing and on our shoes. The poultry and swine industries already have recognized this and it has become standard practice to place footbaths at the
entrances to housing units, so that everyone passing into the building sanitizes their feet as they enter.

We in the dairy industry are just beginning to realize how dangerous it can be to allow unrestricted access to our facilities. While we cannot yet justify asking everyone who enters the farmyard to change their clothing between each farm visit, we can start by requiring everyone to utilize a sanitizing footbath or wear plastic disposable boots before entering the dairy facility.

A Proper Footbath

The first requirement for using a footbath is to use a suitable container. The container must obviously be watertight and large enough to allow at least one foot at a time to be dipped in the sanitizing solution. The footbath also should be relatively rugged to withstand frequent use. A heavy rubber feed pan or a bus tray that restaurants use for clearing tables work well. Secondly, it’s a good idea to have some method to remove the majority of manure and soil from shoes or boots before using the footbath. Footbaths are much more effective if they aren’t loaded with a lot of organic material. A hose, brush or boot scraper all work well. If boots are relatively clean, the person can proceed directly through the footbath.

The proper solution for sanitizing the shoe or boot must be used. Many farm disinfectants can be used effectively in footbaths. In general, you should avoid disinfectants that are inactivated easily by inorganic material, such as quaternary ammonia compounds. Disinfectants containing phenols or hypochlorite (bleach) work well and are relatively cheap. Select a disinfectant that kills both bacteria (bactericidal) and viruses (viral). Regardless of the disinfectant, be sure to read the label to make sure it is recommended for footbaths. Also, pay close attention to the recommendations for proper mixing, contact time, precautions, and proper disposal. Table 1 lists some disinfectants effective against the foot-and-mouth disease organism.

<table>
<thead>
<tr>
<th>Product</th>
<th>Dilution</th>
<th>Mixing Instructions</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate (soda ash)</td>
<td>4%</td>
<td>1 lb/3 gal water (5.33 oz/gal water)</td>
<td>Available from several manufacturers</td>
</tr>
<tr>
<td>Sodium hydroxide (lye)</td>
<td>2%</td>
<td>2.7 oz/gal water</td>
<td>Available from several manufacturers</td>
</tr>
<tr>
<td>Acetic acid (vinegar)</td>
<td>4 - 5%</td>
<td>Add 6.5 oz of glacial acetic acid to 1 gallon of water and mix thoroughly</td>
<td>Household vinegar is 4% acetic acid</td>
</tr>
<tr>
<td>Oxine chlorine dioxide</td>
<td>500 ppm</td>
<td>3.2 oz/gal water plus citric acid activator 0.32 oz/gal</td>
<td>Bio-cide Int'l, Inc. 2845 Broce Dr. Norman, OK 73072</td>
</tr>
<tr>
<td>Virkon-S (peroxymonosulfate &amp; sodium chloride)</td>
<td>1%</td>
<td>Follow label directions</td>
<td>Farnum Livestock Products U.S. distributor Durvet, Inc. PO Box 279 100 S.E. Agellan Drive Blue Springs, MO 64014 800-720-0032</td>
</tr>
<tr>
<td>Sodium hypochlorite</td>
<td>0.1%</td>
<td>1 oz/gal water</td>
<td>Sodium hypochlorite is found in many household bleach products, including Clorox®</td>
</tr>
<tr>
<td>For heavily contaminated areas</td>
<td>3%</td>
<td>3 oz/gal water Add 2 gallons of bleach (stock solution) to 3 gal of water &amp; mix thoroughly</td>
<td></td>
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Title 9, Code of Federal Regulations, Section 95.26 specifies the following disinfectant is effective against the foot-and-mouth disease virus: Sodium carbonate (4%) mix 1 lb to 3 gallons water, plus sodium silicate (0.1%), 1 lb in 3 gallons of water.
Location, Location, Location

The final consideration is location of footbaths. Ideally, every entrance to every building should have a footbath. However, this may be unrealistic and impractical. Footbaths should be located where the most traffic from outside occurs and at the entrance to the facility housing animals most susceptible to disease. Many visitors when entering a dairy operation enter through the milk house; so placing a footbath outside the milk house door (with a friendly sign urging its use!) is a good first step. Young calves are most susceptible to infectious disease, so placing footbaths at the entrance to calf raising facilities would be another ideal location, especially if there is a lot of cross foot traffic between mature cows and calves.

Once the footbath is in operation the two most important things to remember are:

1. Footbaths require maintenance so they should be cleaned and recharged at least weekly or more frequently depending on how much use they receive; and,

2. Footbaths are useless as a biosecurity tool if they are not used.

Here is Your Michigan Milk Market Update

A price forecast comes with the caveat that it will reflect only the information available at that time. It is only natural that forecasters update their analyses as market conditions change. Milk prices in recent years have reacted with large price changes from relatively small changes in milk production. This reflects the “inelastic” nature of the supply and demand of milk. Often these changes are caused by weather events—droughts or heat waves—which cannot reasonably be forecasted. Further, the location of these weather events is critical in affecting milk prices. For example, a large weather event in California is much more likely to affect milk prices than the same event in Maine. This is the cause of the annoying habit economists have of answering questions with “it depends.” The long-term average Basic Formula Price/Class III price is around $12.50/cwt. That price is often the default starting point. If production is higher than normal and consumption is constant, then prices are forecasted down. If production is lower than normal and consumption is constant, then prices are forecasted up.

At the beginning of 2001, the forecasted prices were low, similar to those of 2000 when prices dipped below support. Instead, production declined slightly in some key states relative to the forecast, and prices climbed throughout the spring and early summer months as processors looked to build butter and cheese stocks (Figure 1). The Class IV price (milk for butter) was the fluid milk price mover for 2000 and continued until June 2001. Class III and IV prices were near or above record levels in June and July. The prices in Figure 1 are actual prices through August. For September through December, the prices are from the Chicago Mercantile Exchange Class III and IV futures contracts settle prices as of Friday, September 14.

Prices, Income Tax Management

The large increase in milk prices in the spring and early summer months of 2001 was not accompanied by an increase in feed prices. The milk-to-feed price ratio increased steeply in April and May (milk prices beyond May were not available at press time) (Figure 2). With corn prices remaining around $2/bushel, the high milk prices through August may
produce a relatively high income year on most dairy farms for 2001. While 2000 was not terrible as measured by milk-to-feed price ratio, this was primarily driven by the presence of $1.50/bu corn and $55/ton hay last summer. However, milk prices were abysmal. In contrast, 1999 and 1998 were generally good income years.

With the potential for increased income this year, it is time to start thinking about income tax management. Mike Kelsey, a retired MSU Agricultural Economics Professor, compiles a set of tax management tips for farmers each year. Because Michigan dairy farmers may be looking to “reduce” tax income this year, we shall concentrate on tips of that type. First, farmers may consider purchasing supplies such as fertilizer, seed, and farm supplies this year. These prepaid expenses cannot exceed 50% of total Schedule F expenses this year. Second, farmers may pay 2002 real estate taxes. Third, watch the timing of sales of livestock and crops ready for market near year-end. Possibly, these crops and livestock can be held for sale next year at little cost. Finally, use the $24,000 direct expense deduction for 2001 as needed. Many other potential strategies exist. MSU Extension Farm Management Agents or Specialists, or industry personnel should be consulted in the near future to allow for proper planning.

Managing Extra 2001 Taxable Income

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<tr>
<th>Name</th>
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<th>Counties</th>
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<tbody>
<tr>
<td>Phil Taylor</td>
<td>Extension Dairy Agent</td>
<td>Barry, Calhoun, and Eaton Counties</td>
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<tr>
<td>Rebecca Mitchell</td>
<td>Extension Dairy Agent</td>
<td>Ionia, Kent, and Montcalm Counties</td>
</tr>
<tr>
<td>Roger Betz</td>
<td>MSUE Farm Management Agent</td>
<td>Southwest Michigan</td>
</tr>
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The average milk price for 2001 will be one of the highest on record. This will greatly increase income this year over 2000 for dairy operations that have maintained or increased milk production. Although milk prices may drop at any time, 2001 already has presented dairy producers with more net income than was anticipated. This will give many producers an opportunity for reinvesting cash into the farm business to ensure future profit while reducing tax liability for 2001. Planning now, rather than in late December, to manage this income situation will result in wiser decisions about managing the extra income. Better outcomes will result from having more time to make and implement decisions.

Where should dairy producers begin when making these important decisions about spending the money wisely? A good place to start would be the most recent farm business analysis. Hopefully, the dairy has one, and it is less than a year old. Why the analysis? It can help determine where improvements could be made in the operation that would benefit the farm’s financial situation most. Is the farm highly leveraged? Are costs of production high? Are capital purchases and improvements needed? The business analysis can help direct the strategy used to manage the extra income this year to improve the dairy’s financial standing. Use up-to-date accounting records for 2001 to estimate how much cash will be available to reinvest.

Tax Management. With higher net incomes in 2001, there is a potential problem of higher income and social security tax payments to Federal and State governments. It should not necessarily be the farm’s goal to simply pay the fewest taxes possible. Multiple year tax management may dictate different, and possibly better strategies, including the use of farm income averaging. There is no doubt, however, that reducing the current year tax liability is usually beneficial. We suggest meeting with a tax preparer or consultant to help navigate the choices and options for spending and investing the extra income to potentially reduce a high tax burden. A few hours spent with a tax planner may significantly influence your tax situation, not only for 2001, but for future years as well. The MSU TELFARM system helps producers with income tax management by offering an individual and confidential tax strategy meeting during November and December. This session provides an opportunity for the farm business to plan for the most beneficial long-term income tax management plan.

Following are several ways to use extra cash. Most of the ideas deal with spending the extra income on business expenses that reduce taxable income for the producer. Keeping more money in the local economy helps the financial condition of many supporting businesses that make up the greater dairy industry in the state and region. The extra income dairy farms receive this year hopefully will make its way into the accounts of input suppliers, equipment dealers and other businesses in the local area that support the dairy industry.

Best Return Investments. Investing some of the extra income back into the dairy operation to make capital improvements should bring financial rewards in the future. Dairy businesses should create a list of items that need improving and updating. This list might include building improvements or new machinery investments. Regular maintenance of buildings and equipment that went undone while milk prices were depressed can be rectified during this time of added income. An example would be a “physical” performed on the milking system by the milking equipment dealer. New investments in production enhancing technology are also possible with added income. Employee input into this list can be very beneficial. Their ideas may prove to be crucial. Once the list is made, prioritize the items starting with those that have the largest
potential return on the investment. Next, rank the list based on the likelihood that each item actually would be completed in the remainder of 2001. Those items that remain near the top of both lists are the ones on which to start working. Keep in mind that capital items are depreciated over several years and only the current year’s depreciation will be deductible this year. However, the direct expense deduction (section 179) increases to $24,000 in 2001, compared with $20,000 in 2000. Here is a list of investment possibilities:

- Send a key employee to a training school or workshop.
- Purchase a hoof trimming chute to reduce foot problems that limit cow performance. Then, train an employee to use it.
- Install additional ventilation in your tie-stall barn.
- Purchase new farm accounting computer software to better manage your finances. Learn to use it.
- Pay consultants to scrutinize your farm and come up with their “top ten” or “top five” list of improvements that would benefit the farm most.

Pay Down Debt. A portion of extra income in 2001 should be applied to retiring debt. Of particular concern ought to be high interest debt like credit cards. The best money spent on debt reduction may be to re-finance high interest loans to reduce monthly payments and lower interest rates. The business analysis will show if this is an area that needs to be addressed. It is important to understand that the principal portion of debt payments is not tax deductible. It is still a good management decision to use the cash to reduce debt. One idea is to reduce debt by at least the same amount as one year’s depreciation. Unpaid bills at the feed dealer, the vet clinic, or the local hardware can be paid off. These will likely be operating expenses, not principal payments.

Fall Feed Inventory and Feed Purchases. The drought situation throughout Michigan has created scattered feed shortages. Some locations will find yields of corn grain and silage, soybeans, and alfalfa considerably less than average yields. Now is the time to complete a feed inventory for the next 12 months. If feed is going to be short, then buying feed this fall will create more feed expenses in 2001. If it’s necessary to purchase forage, spend time looking around for good deals on quality forage. The Michigan Hay Seller’s list is an outlet for Michigan produced hay crops and can be accessed on the internet at http://www.msue.msu.edu/hay. Emphasis should be put on purchasing high quality feeds, both forage and concentrate.

Prepay Expenses for 2002. This is often done to use extra income. However, it is usually handled the last week of December when it’s too late to consider other options that exist for spending the money. Prepay on expense items that provide the best savings for ordering and paying early. Usually, planting supplies such as seed, fertilizer, and chemicals offer some of the best savings. Feed and semen purchases also can be made ahead with substantial savings. Not all of next year’s needs have to be purchased in 2001. However, buying a portion of projected needs can lower income taxes as well as lower purchase prices. Check with your tax consultant on limits of forward purchases.

Employee Bonuses. The long days asked of dairy farm workers and the opportunities that exist for off-farm employment make it difficult to retain good employees on the farm. Thus, the problem of finding, hiring, and keeping good quality employees is a constant stress on dairy farms today. With some extra income this year, maybe it’s time to give some credit where credit is due. There are employees on dairy operations worthy of extra recognition. Offering special bonuses to certain key employees shows them the owner realizes the important part they play in the success of the dairy and is willing to share the success with employees. Money is not the sole driving force behind employee loyalty to a dairy farm, but it sure helps. Involving the employee’s family while presenting the bonus will add a special touch. A lunch or dinner out with an employee and spouse or family to award the bonus will show appreciation to the employee’s whole family.

Give Some Away. For charities, communities, and religious groups, we have a tax system that gives taxpayers deductions or credits for supporting and helping these organizations. Dairy farms can support these groups in the form of cash or non-cash gifts. By giving a commodity, rather than cash, the farm can gain an advantage. The commodity is not considered income to the farm. However, this strategy saves taxes by reducing taxable income. No self-employment taxes (social security, medicaid) are paid on the amount of profit the sale of the commodity would have generated. It can work regardless of whether personal deductions are itemized. Conceivably, dairy producers could give a few tons of hay to a charitable organization. It’s often a win-win situation. The group receives the gift. The dairy farm gets the benefit of an income reducing contribution. The farm may also receive recognition from the benefactors greatly enhancing the reputation of
the dairy farm within the community. Dairy producers need to discuss with a tax preparer the intricacies that may be involved with donating commodities to qualified organizations.

Make Maximum Contributions to Retirement Accounts. The flexibility of retirement plans available today makes it easy to contribute, whether on a regular basis or when conditions and money allow. This appears to be one of those years when making maximum contributions to your tax deferred retirement account(s) will be a wise decision. Discuss this option with your tax consultant.

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**PA 116 Farmland and Open Space Preservation Program**

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On January 8, 2001, Governor John Engler signed SB 763, which enhances Michigan’s Farmland and Open Space Act, more commonly known as PA 116. Farmers enrolled in the current PA 116 program receive a tax credit equal to any property taxes in excess of 7 percent of household income. The legislation, beginning in tax year 2001, changes the program’s threshold from 7 percent to 3.5 percent.

The Farmland and Open Space Preservation Act enables a farm owner to voluntarily enter into a development rights Agreement with the State. The Agreement is designed to ensure that the land remains in agricultural use for a minimum of 10 years and may be enrolled for a maximum of 90 years. Agreements may be extended in 7-year increments after the initial term. In return for maintaining the land in an agricultural use, the land owner may be entitled to certain income tax benefits, and the land is not subject to special assessments for sanitary sewer, water, lights, or non-farm drain projects. Public access is not a requirement for participation in the program.

**The Farmland Agreement**

The state of Michigan currently holds more than 50,000 farmland agreements, preserving over 4.3 million acres of farmland – about 40 percent of Michigan’s agricultural production land. The benefits under a Farmland Agreement will depend upon the property tax assessed against the property and the income of the landowner. The landowner is entitled to claim as a Michigan Income Tax credit the amount by which the property taxes on the farmland covered by the Agreement exceed 3.5% of the household income in 2001. This tax credit is in addition to the Homestead Property Tax Credit for which the landowner already may qualify.

**When Expiration Nears**

When the PA 116 agreement nears its expiration, the agreement holder will be notified. Agreement holders may extend the option 7 to 90 years. If the agreement holder chooses to let the agreement expire, then repayment of tax credits received during the last 7 years under the agreement is required. Repayment is due when the land use changes or when the deed changes. If credits were not taken during the last 7 years in the agreement, then no lien will be placed. The landowner may re-enroll the same parcel in PA 116; however, if the contract expires and a lien placed, the agreement holder will pay the greater of the first lien or the last 7 years of the new expired agreement.

Landowners are free to sell or buy land enrolled in PA 116. The agreement remains with the land. Therefore, the new landowner will comply with the provisions in the agreement. When land and its PA 116 agreement are transferred, the Farmland Preservation Office needs a copy of the deed or land contract, a $25 fee per transfer, and the name, address and social security number(s) of the new owner(s).

Releasing land in PA116 agreements is possible where conditions warrant removal of all or part of the land from the agreement. All of the land in a Farmland Agreement, or a parcel of up to 2 acres containing existing buildings, may be released when the landowner dies or becomes disabled. A request to release the Agreement must be made within 3 years from the date of death or disability. Up to 2 acres may be released from a Farmland Agreement when buildings were present prior to the start of the agreement. A release option for an “essential person” is available. An entire Farmland Agreement may be released prior to the expiration date of the Agreement if approved by the local unit of government and the State and when one of the following criteria are met: when the farmland is not economically viable; when surrounding land uses restrict farming; when a natural irreversible change has occurred to the land which restricts farming; when a court order restricts farming; or when a public interest is served by the release. (Note: Portions of Agreements may be released due to public interest.) Required repayment formulas are based on the reason for early release.

**A Management Tool**

PA116 agreements should be viewed as a management tool for agriculture landowners. Landowners are encouraged to seek additional information when making decisions to enroll land. Contract holders also will want to understand the options available when choosing to extend agreements, allow agreements to terminate at completion, or if changes in the agreements are needed.

Landowners will find helpful information at the Michigan Department of Agriculture website: [http://www.mda.state.mi.us/prodag/farm-land/index.html](http://www.mda.state.mi.us/prodag/farm-land/index.html).
Finding Employees – Improving the Odds

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They are out there. We all know of at least one of them. Those dairy producers who are never short of help. Whenever an employee quits, another seems to sprout from the earth to take their place. What is it about the way they do business that makes it so easy for them to find help? We might even call them “preferred employers”. Preferred employers as a group, fill open job positions more easily, keep employees longer, and have employees with greater job satisfaction. In this article we shall consider some aspects of filling an open job.

Plan Ahead

The first step in filling a job is to be prepared to fill it at all times or put more simply, to plan ahead. Unforeseen circumstances might cause openings. Management changes or expansion plans might require replacement or addition of employees. The preferred employer has a plan realizing that any employee could quit tomorrow. The plan identifies specific tasks that fit into a job profile or job description. While each job description applies to a specific employee, keep in mind we are not hiring employees and creating jobs for them. We are creating positions and filling them with the person with the best skills for that position and the best fit with the team. Whenever a position opens, the employer already has identified the job skills needed for that position and can proceed quickly to fill that job opening. Having a job description at hand provides employers with flexibility. As businesses grow or change over time, job descriptions might need to change or the job requirements may change. Developing a method for updating will allow you to tailor job descriptions to the employees once they are part of the team.

But how does that preferred employer find prospective employees so quickly? They almost seem to have people waiting for jobs to open up. Well, actually some do. Don’t underestimate the people applying for work on your farm. Those first quality applicants we would love to have working for us already know what types of employers they want to work for. They quickly discover what types of employers are the “good” employers and also what types of employers are less desirable to work for. This goes a long way in explaining why some employers usually have a larger pool of applicants to choose from.

What other strategies do these preferred employers use to increase the odds of finding better quality applicants? They use more than word of mouth and luck to attract potential employees. They spend time “getting the word out” that they are hiring, plus they use several methods of getting that word out. Let’s look at a few.

Get the Word Out

While word of mouth is an old and still useful way to recruit workers in the community, its success depends on the local availability of potential employees. Several things can be done to improve the chances of hiring good employees using word of mouth. First, potential employees need to have a positive image of you as an employer and a place to work. Do you have a good reputation as an employer? Are you someone known to have a positive attitude? Do you always have a smile and nod for neighbors or do people avoid you because all you have to say is negative and sour?

Is the work site inviting? Put yourself in their place. If you drove into the yard for the first time what conclusion might you draw about the people who owned the farm? What benefits or perks are available to the employee? In the middle of January the boss can have a “meeting” with Oprah every afternoon in the house, but where can those faithful employees warm up or take a break from the cold? This type of situation can lead to increased employee turnover. All these things are part of what makes some employers more successful than others. What else can be done to improve the odds of landing that special employee?

Advertising is a tool that many prospective employers use to attract potential employees. Think of it as a personal ad for your farm. The more information included about the position itself and the skills needed by the applicant, the better the chances are that an applicant with those skills and an interest in the job will apply. But be careful, some ads work better than others; some attract more applicants.

The following are examples of some good and bad employment advertising.

Not so attractive ad: Help wanted. Farmwork. Call 517-555-4545

Why is this a bad ad? It does no screening; that is, who should apply and who should not; required skills are not listed. It does not say anything about the work to be done; Farmwork can mean very different things from one farm to another.

An Attractive Ad

What are we looking for in a good ad? Say something about you and your dairy: “Happy Cows Dairy Farms is a 1000-cow dairy with 3000 tillable acres in the Saginaw area.”

Specify the position you want to fill: “Our expanding team is looking for an experienced HERDSMAN or HERDSWOMAN.”

Provide some detail and career outlook: “A successful applicant will be responsible for managing reproduc-
Husbandry: The Foundation for Dairy Management

Roy Fogwell
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To construct a solid building the first step is to establish a proper foundation. Husbandry is the foundation of your dairy herd. Dairy husbandry is basic attention to the well-being of your cattle. A goal of this article is to remind you of the basics of husbandry and to encourage you to review whether your herd and your technology are based upon a solid foundation.

The foundations for traditional husbandry were affection for animals, close observation, and intuition. From trial and error, successful experiences were shared among generations of people and became tradition. Consequently, traditional dairy husbandry was very intuitive and was not highly informed. For modern dairy husbandry, people should apply scientific knowledge and use technology but not at the exclusion of an intuitive sense for the well-being of the animals.

Husbandry is an issue for all people who are responsible for cattle in your herd. Greater attention to husbandry means a higher quality of care for your cattle. However, in many dairy herds, the current situation and trends for the future may reduce attention to and erode quality of husbandry.

Over the history of the dairy industry respected pundits have commented on the fundamental importance of husbandry.

Some quotations from these experts will be shared throughout this discussion.

“If cows could talk, they would be heard all over this country calling for an improved breed of dairymen.” ........ W.D. Hoard.

Scientific research in dairy has been used to evaluate traditional practices with the conclusion that some practices were good and that some were not well founded. In addition, research has expanded basic knowledge of biology to support development of technology and to improve or create management practices for many aspects of a dairy herd.

What is technology? In general, technology is a method derived from scientific research that is applied to achieve a practical purpose. Because of the real and perceived benefits, technology can be powerful and seductive. However, with the tremendous influx of technology into dairy management, managers should review whether husbandry is neglected or devalued. By analogy, has the manager of the Renaissance Center in Detroit gotten so attentive to utilities, security systems, and esthetics of the building to be unaware that the building is sinking into the Detroit River? If this hypothetical situation was true, this is a definite failure of husbandry!

More Places to Look

Employers can improve their pool of applicants by considering broader sources of candidates. For example, dairy producers have found that women can succeed in virtually all jobs on a modern dairy farm. Minority employees also are an emerging source of dairy farm labor and management personnel. It might be time to consider these options the next time a position opens in your dairy operation.

Another way to look for candidates is through radio advertising. This is not only a good way to be heard outside the farm community, but it also can be tailored for specific groups, such as Hispanic employees listening to a local Spanish language station. If you are willing to give it a try, get professional help with your ad.

Finally, preferred employers are not afraid to look outside the immediate vicinity for potential employees. In the case of a search for key skilled labor such as a herdsperson or feeder, looking beyond the range of the local newspaper might be needed. There are resources available through the Michigan Department of Career Development for helping employers to identify and meet prospective employees. The starting point for exploring this option is a trip to the Department’s website at www.Michaglabor.org. From here, information is available for both prospective employees and employers. The Department of Career Development also can serve as a link to out-of-state applicants. A variety of opportunities are available for dairy producers to work toward increasing their pool of job applicants for the next available opening.
“The most important part of any dairy operation is the person or persons involved in management and care of the herd.” . . . C.E. Meadows.

Why worry about husbandry? Isn’t husbandry just a fancy way to say old-fashioned and out-dated? Think about any technology that you use on your farm such as flow of air in a building, total mixed rations, vaccinations, or synchronization of estrus (heat). For most technology, success depends heavily on the quality of your basic attention to your cattle or husbandry. Importantly, technology will not correct the consequences of bad husbandry. Rather most technology is developed to enhance, not to replace good husbandry.

“Because a man is well-schooled in techniques of dairy production and financial management does not necessarily make him a dairyman.” . . . L.P. Longo.

Is the husbandry from you and your employees good enough for your cows? Is your husbandry good enough for the technology available currently or that which will be developed in the future?

“Treat your cows as you would want to be treated if you were a cow.” . . . W.D. Hoard.

What is Dairy Husbandry?

Effective and successful dairy husbandry depends on a positive attitude and caring attentiveness of people toward their cattle. Firstly, there must be willingness, skill, and actual effort to observe animals. This means a visual inspection of individual animals so you are informed about: well-being and welfare; health; appetite; and, social behavior and status. Secondly, to practice good husbandry people must be knowledgeable about the biology and behavior of cattle. Observation and experience are valuable teachers and will build a perception based on trial and error. However, observational “knowledge” is not objective and can be a very expensive basis to adopt or to reject different practices for dairy cattle. There should be informed understanding of why certain methods are successful and should be performed or why some methods fail and should be avoided. A purpose of controlled and replicated scientific research is to provide confidence for the information and practices that you use. However, in addition to informed opinions, successful husbandry must also include your experienced skills to perform tasks and to observe animals. You should be certain that your opinions and the information that you use in your herd are objective and maximally credible.

For all types and styles of dairy management, your husbandry should make your cows maximally responsive to your management. To achieve this your management should be a positive combination of art, experience, and science. In addition, a consistent characteristic of people who are progressive and highly effective dairy managers is that their favorite activity is to work with cattle. The passion and commitment of these people to animal husbandry are evident through the care that they extend to their cattle.

“The successful dairyman must be a gentle man.” . . . . H. VanPelt.

What are some features of managers who practice effective basic husbandry?

1. They are informed and attentive to the appearance and behavior of animals. This will allow people to determine that the animals are thriving or to determine that adjustments are needed.
2. They are very diligent in their attention to the comfort and well-being of their animals.
3. They do no harm! Compared to if you did nothing, the status of animals should not be worse because of your efforts.
4. They walk before they run. The complexity and size of your enterprise should stay within your comfort zone so that you have proactive control and actually manage most events. However, if you are panicked frequently or reacting to uncontrolled events, husbandry in your herd probably is not ideal.
5. They make thoughtful decisions with full consideration to animals. Are your decisions made primarily for your cattle or primarily for people?
6. Good husbandry is based on objective knowledge that has been tested in research. In contrast, trial and error and uninformed opinions are not a solid foundation for husbandry or for management:

- Developments on progressive dairy farms need not distract or compete against husbandry. For example:
  - always observe your animals closely to assess welfare, even when you are performing other chores;
  - teach and encourage husbandry to all employees; and,
  - use results of current research to reinforce and to direct husbandry in the future.

Measures of Good Husbandry

Husbandry is the foundation for management and for technology in good times and especially during challenges. To measure quality of your husbandry, you must evaluate objectively the performance of people who care for the cattle in your herd.

1. Involuntary Culls.

Decreasing the involuntary culls will allow profitable cows to stay in the herd longer. A high involuntary culling rate suggests that one or more aspects of husbandry could be improved.

2. Calves.

Among calves, high (greater than 2%) mortality (death) or high (greater than 5%) morbidity (illness) signals a likely husbandry problem. Abortion (greater than 2%) is a husbandry problem due largely to uncontrolled infectious disease in cows. Dystocia (difficult birth) and stillbirths (born dead) indicate a
husbandry problem when combined incidence is greater than 2%. Poor husbandry with calving and calves will reduce reproductive success, reduce available replacements, and reduce genetic progress.

3. Calving interval.

Assume that your goal is a calving interval of 12 to 13 months. Several types of deviations from this goal could indicate problems with husbandry. For example, an average calving interval longer than the goal usually means that heat detection and service rate are low. Alternatively, there may be large variation around the average calving interval and low calving rate. This could mean high culling, low enforcement of the voluntary waiting period or both. Compared to your goal for calving interval, what are the average and the variation around the average? Poor reproductive husbandry will decrease your control over length of lactation, length of dry periods, nutrition for transition cows, and season for calving.

Husbandry is a fundamental and defines the quality of the relationship between people and cattle in your herd. All success and progress of a herd depends first on a foundation of vigilant and caring husbandry. Husbandry is old but is not old fashioned. Husbandry is the simple and detailed activities but is certainly not trivial, insignificant, or unimportant. However, husbandry alone will not insure economic vitality of a dairy farm now or in the future. Dairy managers must be informed about basic biological aspects of cattle and the associated technological developments. Like the foundation for a building, husbandry should be quite stable over time. The challenge across time is to insure that husbandry does not decline. However, the base of knowledge and technology evolve and change continuously. Therefore, managers must practice continuous education to remain current and to adopt progressive but reliable practices to embellish the foundation of husbandry for each herd.

“That part of the holding of a farmer or landowner which pays best for cultivation is the small estate within the ring-fence of his skull.” . . . . Charles Dickens.

In the year 2001, managers who are not informed about current technical knowledge have failed to “cultivate” their brain. Husbandry without progressive management is a building that has a solid foundation but no indoor plumbing. With technology, husbandry must be extraordinary or there will be reduced chances for success. As you continue to learn and progress, you must insure that husbandry is a foundation for your herd that is informed, planned and managed. For success of a modern dairy farm, there is a critical need to mix husbandry, objective knowledge, and technology for you and your employees. However, for good husbandry that mixture must be balanced in favor of your cows. Performance of your cows and the quality of your management can never be better than the quality and strength of your foundation in husbandry. Be sure that you and your employees provide a foundation of husbandry that is good enough for your cows!

It’s Not Pretty Being Out-Smartered By a Cow

Ben Bartlett
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To get cattle to do what you want takes a knowledge of animal behavior, good facilities and proper handling techniques. Good facilities will not make up for poor technique. Not understanding how cattle perceive their world can make cattle handling stressful for both you and the cattle. For the dairy cow, stress can be created by a new person with a bad attitude in the milking parlor and will be seen as a decrease in milk production. In a chute aversion trial where cattle were hit as they went by, shocked with a hot shot, had their tail twisted or were shouted at, being shouted at caused the most stress (Figure 1). The following paper is a brief overview of some of the components involved in proper cattle handling. Remember, cattle handling is a skill that can be learned over time. Few people are born thinking like a cow.

From a Cow’s Perspective

To fully understand why cattle react as they do, it is important to know that they interpret sights and sounds differently than humans (1). One of the major differences between cattle and humans is the way they see. Cattle have panoramic vision of 360 degrees and only have a blind spot directly in the back of their heads (Figure 2). This ability to see almost 360 degrees without moving their heads comes at a price. Cattle have poor depth perception and cannot focus quickly on close objects. This means that a wet spot on the floor may appear to be a bottomless hole or a shadow across an alley may look like a pipe, blocking movement. When cattle lower their heads to look at something, it is because they only have about 60 degrees of vertical vision, compared with 140 degrees for humans. This is another reason why cattle want to go slow in unfamiliar conditions. Cattle have good distance vision, see color (although not as well as humans), and see up and down better than cross-wise. One other vision consideration important to remember is that cattle prefer to move toward the light. A cow really does see the world differently. She sees more and is often distracted by motion off to the side. However, she doesn’t see it as clearly as humans and it takes her more time to process what she has seen.

Cattle also hear differently than humans. They can hear both low volume and higher frequency sounds better than we
do. If you want to get on a cow’s nerves, just try moving them 
when small, screeching children are around or by getting their 
attention with a whistle. Cattle hear extremely well, but the 
trade-off is that they have less ability to locate the source of a 
sound. People can pinpoint where a sound came from within 
5 degrees, whereas cattle can only isolate the source within 
about 30 degrees.

Another major difference between cattle and people is that 
cattle are “prey” and people are “predators”. This differentia-
tion between “who is who” on the food chain is critical to 
understanding why cattle do some of the things they do. Cattle 
gain protection by being part of a herd and feel safer in a 
crowd. When danger approaches, and 
this could be you, cattle will try to run away. If cornered, they will form a circle 
and put their heads to the middle so as 
not to become an “easy meal”. Because 
of this safety in numbers feeling, cattle are very nervous when left alone and have 
a tendency to follow one another. Cattle 
have limited ability to fight back, and 
when threatened will follow their in-
stincts. We shall discuss how to use these 
instinctive behaviors to our advantage 
when handling techniques are described.

Cattle Handling Facilities

There are five key components in a 
good cattle-handling facility. The com-
ponents will vary in actual size depend-
ing on herd size, but all five components 
should be present whether a facility is de-
signed for five cows or 500.

1. Holding pen(s): a place to gather 
and hold up to 100 head per pen.
2. Crowding pen: this pen is used to 
fill a single file working chute and strong 
enough to withstand considerable animal 
pressure. Solid sides are preferred.
3. Single file working chute: solid 
sides to reduce distractions, ideally a 
minimum of two cow body lengths long 
(20 ft.). Correct width is critical to pre-
vent cattle from turning around.
4. Head gate or squeeze chute: used 
to immobilize the animal for any needed 
action. It should be strong and operate 
quietly. It can have self-catch or scissors 
action.
5. Capacity to sort after exiting the 
head gate: allows cattle to be grouped 
in a manner that is not stressful to you or 
the cattle.

Site considerations should include:

• good water drainage to prevent mud accumulation;
• non-slip surface for all solid floors;
• ease of cleaning after use;
• easy access for various groups of cattle;
• adequate lighting and protection in inclimate weather; and,
• access to the road for semi-truck loading.

Special Considerations for Dairy Producers

While many dairy cattle are used to being handled by 
people, there are often situations where either an individual 
cow or a group of cows requires restraint. A special area that 
can be used to restrain a cow for a dystocia problem, a foot/
leg examination, or other treatment needs is critical. Head gates used for mature cows should open wide both top and bottom to allow for a safe and easy exit. The milking parlor is made for milking and not for restraint. Avoid stressful procedures in the parlor as this could impact future cow flow and milk letdown. When large numbers of cows need to be held for a short procedure, such as a single injection or AI, a her-ringbone rail or an alley and chute are the best options. Fac-
cilities for heifers can include either an alley and chute system or lockup feeding gates depending on what age the various vac-
cinations and surgical procedures are performed. Facilities need to fit the farm and be appropriate for the size and num-
ber of animals to be handled.

More ideas and sample facilities are available in the Dairy Freestall Housing and Equipment Handbook available from Midwest Plan Service. This information and other information are available from your local Extension Office or Extension Dairy Agent.

Handling Techniques

Good handling techniques take advantage of cattle behav-
ior and are the most important ingredient in working cattle. Good technique can make poor facilities work, but good fa-
cilities cannot make up for poor technique. Good cattle han-
dling isn’t complicated, but it does require knowledge and practice.

Proper cattle handling technique is built around the flight zone concept (Figure 2). Cattle have a personal space, or flight zone, around them. When this space is violated, cattle be-
come uncomfortable and will move away to try and regain this personal space. Dairy cows and cattle that are handled frequently may have a very small flight zone. Cattle that are handled less often tend to have larger flight zones and will move away before you can get very close to them. The point of balance is the spot at which animals will move forward or backward to move away from you. Most everyone has walked up to a cow and had her back away or walked up on the side and had the cow stay just out of reaching, roping or seeing distance, depending on the size of her flight zone.

The concept is simple. By gradually moving into the cow’s flight zone, the cow will move away. If you stop or back up, the cow will usually stop. An important principle is to avoid the blind spot right behind the cow. If the cow can’t see you, she will turn around to see what you are doing. Don’t walk directly behind an animal, but off to the side so you can be seen. If you practice these simple guidelines, you can calmly walk cattle almost anywhere. Obviously, there are special situ-
atations that you need to consider. Heifers that have been in a small pen all winter and turned out to pasture will just run for the fun of it. A protective cow with a newborn calf will fight rather than leave her calf to you, the predator. Cattle are slow to adjust to new or novel situations. Heifers need to be trained to the parlor in a slow and patient way so as to not associate the milking parlor with pain and fear. If things aren’t going right, try looking at the situation from the cow’s perspective. There is often a shadow or a flopping shirt on a post or some other distraction preventing smooth cattle flow. Areas where cattle cannot avoid you entering their flight zone, such as crowding pens and single file working chutes, can get ani-
mals very excited. Never push cattle unless they have somewhere to go. When ani-
mals become agitated, they will jump fences, rear up, and may even charge. Other cattle in the group can sense this stress and can become excited even if they are not pressured. When you push cattle and they try to run back by you, you are too close. If cattle escape is com-
mon or if you have more people than cattle when moving stock or if cattle handling is always stressful for you and the cattle, a small time investment to correct the situation will pay back many fold in the future.

A comment on bulls and bull handling. There is only one golden rule when working around something that weights 5 to 10 times as much as you do and can move at least twice as fast. Put safety first. Don’t take chances, don’t work alone, don’t trust, don’t assume, and don’t think you will know when he is having a bad day. Most injuries caused by female cattle are either accidental or done due to fear (protecting herself or her offspring). A bull’s nature is to be the dominant creature in any situation. This dominant nature combined with the normal bovine concerns of: fear of people, the desire to be with other cattle, and reproductive urges make bull handling a safety-first activity. One reason dairy bulls tend to be more challenging may be because they have been hand raised by people instead of raised by their dam. Research has shown that people are treated as peers when hand raised, and the inno-
cent head scratching you did to a calf is a “challenge” to the bull calf as he grows older. Safety first is required when handling bulls.

The two cardinal rules for working cattle are slow and quiet. When you understand how cattle see and hear, it’s easy to see that slow and quiet is the quickest way to get the job done with the least amount of stress to you and the cattle. Proper cattle handling involves thinking like a cow, having properly designed facilities, and use of smart handling tech-
iques.

Reference

Manure Management

What Level of Manure Management Is Right for You?

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There has been a great deal of visibility and a strong suggestion by the Michigan Agricultural Environmental Assurance Program (MAEAP) during the past year that dairy and livestock producers should prepare Comprehensive Nutrient Management Plans (CNMP) for their operations. A MAEAP CNMP is one option that producers can choose to use and then obtain third party verification that their dairy operation has achieved a level of management worthy of environmental assurance certification. The foundation of a CNMP is to begin by following practices that will comply with the Michigan Right to Farm Act.

Michigan has had Right to Farm Generally Accepted Agricultural and Management Practices (GAAMPs) for Manure Management and Utilization since 1988. These GAAMPs provide guidance on recommended practices that producers should follow to obtain protection under the Right To Farm Act and to operate in an environmentally-responsible manner. While following the GAAMPs will not attain the higher level of management that is required by a CNMP, the GAAMPs level of management is a good goal to achieve on your farm first. If a dairy producer then wants to further improve or raise the level of management on his/her farm, the MAEAP CNMP is a logical, next step to take. Going directly to a CNMP may be a “giant step” that could require a producer to make too many changes too fast, causing him/her to become discouraged and quit.

In addition, the US Environmental Protection Agency (USEPA) has changed their proposed federal regulations (December, 2000) which would now require that CAFOs (Concentrated Animal Feeding Operations) prepare a PNP (Permit Nutrient Plan) rather than a CNMP. The PNP is defined as a subcomponent of a Natural Resource Conservation Service CNMP and is closer to the type of plan that has been recommended for many years in the Manure Management and Utilization GAAMPs. Whether or not CAFO regulations become a reality under the new federal administration, or whether the proposed PNP changes to something else, the manure management GAAMPs will continue to provide guidance on recommended practices that all producers can follow.

Another aspect of manure management that needs emphasis is that developing a manure nutrient management plan is only part of what is needed for adopting recommended management practices. The more important part is implementation of the plan! Having a nutrient management plan, but never using or following it, does little to ensure that a dairy operation will be successful and environmentally sustainable.

Therefore, my recommendation is that dairy producers start out by first adopting and implementing GAAMPs on their farm. Develop a plan that addresses manure nutrient and odor management on your farm and then implement that plan. Once this has been accomplished, if you want to continue improving management practices on your farm, then developing a MAEAP CNMP is a logical progression that I would encourage producers to consider. Efforts put into implementing the manure management GAAMPs will not be wasted, but instead, will become an important part of a MAEAP CNMP.

A new management tool is now available from MSU to assist you with developing and implementing a manure nutrient management plan. The MSU Nutrient Management (MSUNM) computer program has been converted into a Windows version (WinMSUNM) and was released in February, 2001. This program can assist crop and livestock producers with fertilizer and manure nutrient management and pesticide application recordkeeping. The program is being further improved during 2001 to assist users with following a step-by-step process to develop a manure nutrient management plan. WinMSUNM is a user-friendly program that will allow most producers to develop a plan and implement the manure management or site selection GAAMPs themselves. WinMSUNM is available at a nominal cost ($150).

Calendar of Events

MSU Shines at the American Dairy Science Association

Ranging in areas from extension to nutrition to genetics and growth and development, Michigan State University dairy programs were well represented at the first combined meeting of the American Dairy Science Association (ADSA), American Meat Science Association, American Society of Animal Science, and Poultry Science Association held in July in Indianapolis.

More than 2 dozen MSU faculty, academic specialists, graduate students, and research assistants were among attendees who presented their research in symposia, oral presentations, and posters during the joint annual meeting.

In addition, several faculty and one graduate student in the Animal Science Department received awards during the international event, which attracted some 4,400 scientists, researchers, and producers with varied interests.

Awards

MSU faculty and staff receiving awards included:

- **Professor Emeritus H. Allen Tucker**, who was named a Fellow of the American Dairy Science Association. This award is given by the ADSA to recognize members of the ADSA who have “rendered distinguished service” to the dairy industry for 20 years or more. **Professor Mike Allen** was recipient of the Nutrition Professionals, Inc. Applied Dairy Nutrition Award. The purpose of this award is to stimulate and recognize outstanding achievement in research, teaching, extension and/or industry in applied dairy nutrition. **Professor David Beede**, received the Merial Dairy Management Research Award to recognize his “outstanding research” in management of dairy cattle and dairy farms. **Roy Radcliff**, a recent MSU doctoral student graduate and currently a post-doctoral research associate at the University of Missouri, received the National Milk Producers Federation Richard M. Hoyt Award for outstanding graduate research efforts with direct application to problems of the U.S. dairy industry.

Presentations

MSU representatives gave talks or poster presentations in scientific sessions in nutrition, extension, education, production, growth physiology, and genetics.

In the area of ruminant nutrition, the following presentations with an MSU connection were:

- “Effect of pretrial milk yield on feed intake, digestion, and production responses to high- and low-fiber diets by dairy cows,” Jennifer Voelker, a master’s student; Gabriele Burato, a doctoral student and visiting scholar, and Professor Allen.
- “Digestible fiber from forages for lactating cows,” Allen, Oba, and Voelker.
- “Effects of pretrial milk yield on feed intake, production, and feeding behavior responses to forage particle size by lactating cows,” Burato, Voelker, and Allen.
- “Peripartum responses of Holstein cows and heifers fed graded concentrations of calcium (calcium carbonate) and anion (chloride) 3 weeks before calving.” Professor Beede; Tom Pilbeam, research assistant; Sue Puffenbarger, and Associate Professor Robert Tempelman.

In the area of extension and teaching graduate and undergraduate students, the following abstracts were given by MSU staff.

- “The dairy employee education program of the MSU extension dairy team,” Dann Bolinger, MSU Extension Dairy Agent; Steve Mooney, a doctoral student; Beede, and Professor Herb Bucholtz.
- “Dairy Challenge: A competitive and educational experience in evaluation of dairy herd management,” Laurie Davis, a master’s student; Fred Martzolf, nutritionist, Cargill; Dairy Specialist Joe Domezq, and Assistant Professor Miriam Weber.

In the ADSA graduate student paper competition, Jill Davidson, a doctoral student, presented the paper, “Programmed exercise altered carbohydrate and lipid metabolism of nonlactating, pregnant and non-pregnant dairy cows,” with Beede.

In the area of production, management, and environment, Davidson also presented, “Programmed exercise improved physical fitness of non-lactating, pregnant and non-pregnant dairy cows with Rebekah Devins, student research assistant, and Beede. Also, in that area Corey Risch, a master’s student, with Assistant Professor Chris Wolf presented, “Profit maximizing calving interval with limited labor resources.”

Four presentations that had a MSU association were given in the area of growth and development. They were:

- “Thyrotropin releasing hormone (TRH) mediates serotonin-induced release of growth hormone,” Radcliff; Larry Chapin, research assistant; Professors Keith Lookingland, and Tucker.
- “Leptin receptor expression in the bovine mammary gland and other tissues,” Luis Silva, a doctoral student, and Professors Mike VandeHaar, Weber, and Assistant Professor George Smith.
- “Regulation of extracellular matrix remodeling during the ovarian cycle: Implications for the control of growth, differentiation and resorption of specific ovarian structures,” Smith; Mark Dow, a doctoral student; Leanne J. Bakke, a doctoral student; Carolyn Cassar, research assistant; Michael Pe-
tors, a doctoral student; Assistant Professor Richard Pursley and other research associates from the University of Missouri-Columbia.

- “Economics of dairy heifer growth programs,” Wolf and VandeHaar.

Six abstracts relating to genetics given by MSU staff included:

- “Immunogenomics and the periparturient dairy cow: letting leukocytes tell us their own story about disease susceptibility,” Assistant Professor Jeanne Burton.
- “Genetics and genomics of susceptibility to mycobacterial infection in cattle,” Professor Paul Coussens, Brian Tooker, graduate student; William Nobis and Matt Coussens, both undergraduate students.
- “Evidence for an association between Hind III PCR-RFLP at the bovine insulin-like growth factor binding protein-2 (IGFBP-2) locus and growth and carcass traits in beef cattle,” Melvin Pagan, a doctoral student; Joel Cowley, academic specialist; Nancy Raney, research assistant, and Assistant Professor Cathy Ernst.

- “Establish confidence intervals for daily milk yield measures by robust bootstrap,” Peter Saama; research assistant; and Professor Emeritus Ivan Mao.

In animal health – dairy, the paper, “Serum antibody responses in Holstein cows immunized five times with J5 Bacterin,” was presented by Karen Smith, research assistant; Chris Phipps, research technician; Burton, and Professor Ron Erskine.

There was one presentation, “Salmonella isolation on 12 Midwest and Northeast dairy farms,” given in dairy food safety involving MSU Professor John Kaneene along with other collaborators from the University of Wisconsin and the University of Minnesota.

**MSU Student Interns in Northern Ireland**

Pam Jahnke and Joe Domecq
Dept. of Animal Science

Even when Michigan State University Animal Science student Gabriel Papoi was sitting in a stopped train full of angry rugby players, the train tracks being searched for bombs, he harbored no regrets about studying in Northern Ireland.

That was just one of the unusual twists surrounding Gabriel’s recent stay in Northern Ireland to fulfill his internship requirements. Papoi was a student in the Michigan State University Ag Tech Dairy Management Program, and he is the first to complete an internship in Northern Ireland.

Gabriel traveled to Greenmount University in January, an all-agricultural college nestled in rural Northern Ireland, 30 minutes south of Belfast, to take classes and work on the campus farm. The campus geographically is located in an area where agriculture is the primary industry and the daily newspaper has a whole section devoted to farming. His internship, however, was cut short after the foot-and-mouth disease (FMD) broke out in several European countries.

“I knew what foot-and-mouth disease was. I didn’t know how fast it would spread. It was an interesting time to be there,” said Gabriel.

**Getting Settled**

After arriving in Northern Ireland, he soon settled into a routine of attending classes and milking 30 Holsteins on the student-operated, 400-acre farm located on campus. Papoi said the students and professors were surprised to learn how many students attend MSU compared with the Greenmount campus, which serves about 400 students. Only three non-farm buildings are located on campus, including a small dormitory where he lived. He took classes in arable (cultivated) crop production, business management, beef and dairy management and the Cream Project, which is a hands-on endeavor where students work on and manage the university dairy. He helped oversee the “show herd,” part of a larger 190-cow herd. “We had to keep everything neat and tidy,” Gabriel said.

Initially, he was scheduled to work 1 week every 6 weeks. He milked 3 times a day, watched for heats, scraped stalls, mixed feed and cleaned out straw-bedded pens. The campus farm as well as the other farms in Northern Ireland utilize freestalls in their housing systems. He observed many differences and similarities between United States and European farming during his internship, but what he learned the most could have not been anticipated.

“It (the internship experience) really opened my eyes to disease control,” he said.

About 6 weeks into his internship, the farm manager announced that a suspected case of FMD had been found in Scotland. Following his announcement, all of the United Kingdom including Northern Ireland, was quarantined. Agricultural and many primary schools were temporarily shut down. Farm shows were suspended. The transportation of livestock was halted. Neighbors would not visit neighbors. Gabriel and the other student workers were given the option to leave the farm, but were told that if they left they could not return for fear of spreading the disease. Gabriel remained and set up vehicle and boot wash stations.

“Every truck that came onto the
**MSU Ag Tech Dairy Program**

In the 2-year Ag Tech Dairy Management Program, students learn various aspects of dairy management and receive a certificate of completion.

The Ag Tech Dairy Program consists of two, 15-week semesters and one, 9-week semester on campus. An internship also is required to complete the program. The program provides a foundation of practical dairy and business knowledge and skills. This program is part of the Institute of Agricultural Technology at MSU.

“The internship is the most important part of the program because it gives students first-hand experience about what they have learned, or will learn in the classroom, and exposes them to successful dairy producers or agriculture organizations,” said Joe Domecq, program coordinator.

Domecq said he consider’s Gabriel Papoi’s internship to be a success despite the breakout of foot-and-mouth disease. In fact, during this academic year, he is planning an overseas study program, to include visiting production agriculture in the United Kingdom. This program is run through the Institute of Agricultural Technology and is 2-to 3-weeks long. For many of the students in the Ag Tech Program, this may be their first opportunity to go overseas for an international experience, Domecq said.

For more information about the Ag Tech Dairy Program, contact Domecq at (517) 353-7855 or domecqjo@msu.edu.

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farm was washed. No visitors were allowed,” he said. About a week later, a case of FMD was discovered along the border of Northern Ireland and the Republic of Ireland. Greenmount University was shut down, but Gabriel remained on the farm with another student and the farm manager. They would work 5:30 a.m. to 1 a.m. shifts, with brief breaks in between. When it was apparent classes would not continue, about 3 weeks later, he returned to the United States. “I was disappointed about leaving, but I enjoyed the experience,” he said.

During the FMD crisis, he said the farmers in Northern Ireland worried that they would lose their share of exports on the global market. Gabriel said within the past 3 years, Europe has coped with Mad Cow Disease, bovine tuberculosis, brucellosis and finally, FMD. As a result, the UK requires each animal to be tagged shortly after birth so every animal can be tracked. The tagging system was just one difference, he noted, between farming in Northern Ireland and here in the States.

**Differences and Similarities**

Another difference was the length of time that a newborn calf would remain with a cow, which was about 1 week after birth, instead of being separated shortly after calving, as is done here in the United States. Another difference is that the ration is grass-based, because corn and alfalfa are not grown in the cooler climate of Northern Ireland. The only domestic grain grown in Northern Ireland is barley. The average size dairy farm has 60 to 70 cows, Gabriel explained. In addition, most dairy farmers do not harvest their own silage, but instead hire non-farm employees to do it.

“They really make use of their grass,” he said.

There were similarities between U.S. and European farming as well. Gabriel noted, such as the routine use of artificial insemination (AI). In fact, some of the cows he worked with at Greenmount University shared some of the same genetics as those on his family farm in Charlotte, or ones he evaluated with the MSU Dairy Judging Teams, because some of the same bulls had been used for AI breeding in both countries. As a result, he could tell his Irish counterparts what kind of off-spring the bulls had produced. The Holsteins he was milking in Northern Ireland were of American, Canadian and German ancestry.

Although Gabriel was interning, he had the opportunity to share his knowledge of animal reproduction with the workers at Greenmount’s student-run farm. He said the farm was experiencing a low rate of conception due to poor heat detection accuracy. He talked to the staff about heat detection and synchronization of estrus, clean AI technique for those responsible for breeding the cows, subjects he had learned about through the Ag Tech Dairy Program and on his family farm.

Despite the unanticipated circumstances of his internship, Gabriel successfully completed his requirements for the 2-year Ag Tech Dairy Program and has begun studies toward a Bachelor of Science degree in the agri-business management program, with a dairy specialization. His goal is to return to his family farm and be in charge of the dairy herd and eventually expand the operation.

**MAEAP Sponsors Series of Workshops**

Livestock producers interested in learning more about the state’s efforts to raise awareness of practices that reduce legal and environmental risks may attend one of a series of workshops being held this winter.

The workshops, sponsored by the Michigan Agricultural Environmental Assurance Program (MAEAP), will help producers evaluate current farm practices and discover the impact certain practices may have on the environment. These educational workshops, being held between November 5 and January 9, 2002, are the first phase of a three-phase program, beginning with livestock production.

A team of MAEAP representatives will travel the state to conduct the workshops. Producers will receive important information and materials needed to begin developing their own Comprehensive Nutrient Management Plans. For more details, contact your local Farm Bureau Office, MSU Extension Office, or the MAEAP office at 517-353-1758.
Objectives of the Conference
The purpose of the Tri-State Dairy Management Conference is to facilitate the delivery of state-of-the-art technology and information pertaining to the management of competitive dairy herds in Indiana, Michigan, and Ohio.

Intended Audience
Dairy producers in Michigan, Indiana, and Ohio, and dairy industry personnel.

Location
Grand Wayne Center
120 West Jefferson Boulevard
Fort Wayne, Indiana 46802
Telephone: (219) 426-4100
Fax: (219) 426-9080

Registration Fee
$99 per person, including refreshments during breaks, one breakfast, one lunch, and one copy of the proceedings. Deadline: October 19, 2001

Accommodations
Please make hotel reservations directly with area hotels. Participants are encouraged to check-in prior to the start of the conference.

The preferred hotels are:
Fort Wayne Hilton
1020 S. Calhoun Street
PO Box 12049
Ft. Wayne, IN 46862-2049
219-420-1100

Holiday Inn-Downtown
300 E. Washington Blvd.
Ft Wayne, IN 46802
219-422-5511

The Fort Wayne Hilton is connected to the Grand Wayne Center and has a block of rooms reserved for the Conference. The rooms are $85.00 plus tax for single or double occupancy. There are rooms reserved at the Holiday Inn Downtown at the rate of $75.00 plus tax for single or double occupancy.

Rooms must be reserved by OCTOBER 6, 2001 to receive the discounted rate. Reservations received after this date may be confirmed at the regular rate based on availability. When making reservations, mention the Tri-State Dairy Management Conference.

Other Area Hotels:
Courtyard Marriott
1619 W. Washington Center Road
1-800-321-2211

Signature Inn
1734 W. Washington Center Road
1-800-822-5252

Days Inn North Hotel
5250 Distribution Drive
1-800-329-7466

Information
For more information about the conference contact: Amanda Hargett at (614) 688-3143, email: hargett.5@osu.edu or Dr. Normand St-Pierre at (614) 292-6507, The Ohio State University; Dr. David Beede at (517) 432-5400, Michigan State University; Dr Michael Schutz at (765) 494-9478, Purdue University.

Visit our website at www.ag.osu.edu/~ansci/tristatetristate.htm

Sponsored by:

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## Agenda

All Times are Eastern Standard Time

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**Marketing the Tri-State Advantage Globally**

*Moderator: Dr. David Beede*

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<td>“How Do These Environmental Rules Affect My Operation?”</td>
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<td>Dr. Maurice Eastridge</td>
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<td>Dr. Maynard Hogberg</td>
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<td></td>
<td>Dr. Larry Hamm</td>
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<td>The New Dairy Landscape</td>
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<td>Mr. Rick Smith</td>
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<td>Pick Your Curriculum!!</td>
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**Optimizing Reproductive Performance with Emerging (New) Technologies**

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**Breakout 2:** Managing Reproduction Effectively in Small and Medium-Sized Herds

*Dr. Richard Pursley*

**Breakout 3:** Sexing Bovine Semen: When, How, How Much

*Dr. Karol Fike*

**Breakout 4:** Reproduction in High Producing Cows

*Dr. Bruce Clark*

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**The Comfortable Cow and Her Environment**

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**Breakout 10:** Feed Intake: Should the Cow Be in Charge?

*Dr. Steve Loerch*

**Breakout 11:** Are They Sleeping? Labor Benchmarks for Today’s Milking Parlors

*Dr. Normand St-Pierre*

**Breakout 12:** Impact of Facility and Technology Choices in Small and Medium-Sized Dairy Farms

*Dr. William Bickert*

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**Transition Cow Management**

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**Breakout 14:** Feed Additives for Transition Cows

*Dr. Randy Shaver*

**Breakout 15:** Milking Heifers Before Calving: Does it Work?

*Dr. Michael Schutz*

**Breakout 16:** Grade A Transition Cow Management in Small Herds

*Dr. David Beede*

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<td>Adjourn - Have a Safe Trip Home!!</td>
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*All breakouts are 50 minutes with 10 minutes between breakouts. Each participant may participate in two of the four breakouts in each session.*
Name: 

Farm/Company Name: 

Address: 

City State: Zip: Telephone: 

Number Attending: email: 

Amount Enclosed 

$ Registration ($99/person) 

$ Extra Proceedings ($15/copy) 

$ Shipping ($2.75/copy; only if mailed) 

$ Total 

Pre-Registration is required: Please include an additional charge of $20 per registration for registrations mailed after the registration deadline. **No refunds are permitted.** Registration deadline is **October 19, 2001.** Make checks payable to “The Ohio State University.” We are unable to accept credit cards at this time. Mail registration form and fee to: Mrs. Michelle Milligan, 221 Animal Science Bldg., 2029 Fyffe Rd., Columbus, OH 43210.

Program Participants

Dr. David Beede, Professor, Dept. of Animal Science, Michigan State University  
Dr. William Bickert, Professor, Dept. of Agricultural Engineering, Michigan State University  
Mr. Bob Buhl, Pennsylvania Dairy Producer  
Dr. Bruce Clark, Monsanto Dairy Business  
Dr. Maurice Eastridge, Professor, Dept. of Animal Sciences, The Ohio State University  
Mr. Jorge Estrada, MS, PAS, President, LCI, Inc. Puyallup, Washington  
Dr. Karol Fike, Assistant Professor, Dept. of Animal Sciences, The Ohio State University  
Dr. Larry Hamm, Professor and Chair, Dept. of Agricultural Economics, Michigan State University  
Dr. Maynard Hogberg, Professor and Chair, Dept. of Animal Science, Michigan State University  
Dr. Steve Loerch, Professor, Dept. of Animal Sciences, OARDC/The Ohio State University  
Dr. Richard Meiring, Assistant Professor, Clinical and Veterinary Preventative Medicine, Large Animal Sciences, The Ohio State University  
Dr. Ray Nebel, Professor, Dept. of Dairy Science, Virginia Polytechnic Institute and State University  
Dr. Ed Pajor, Assistant Professor, Dept. of Animal Sciences, Purdue University  
Dr. Richard Pursley, Assistant Professor, Dept. of Animal Science, Michigan State University  
Dr. Normand St-Pierre, Associate Professor, Dept. of Animal Sciences, The Ohio State University  
Dr. Michael Schutz, Assistant Professor, Extension Dairy Specialist, Purdue University  
Dr. Randy Shaver, Professor, Dept. of Dairy Science, University of Wisconsin  
Ms. Dianne Shoemaker, NE District Extension Dairy Specialist, The Ohio State University  
Mr. Rick Smith, Dairylea Cooperative, Syracuse, NY  
Mr. George Wilcox, Extension Dairy Agent, The Pennsylvania State University  
Mr. Dan Woods, Pennsylvania Dairy Producer
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- Milk Prices: Impact of Policy Changes, C. Wolf: July, 3 - 17
- Michigan Milk Market Update: Milk Prices and Income Tax Considerations, C. Wolf: October, 3 - 5
- PA 116 Farmland and Open Space Preservation Program, V. Varner: October, 3 - 8

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