Nutrient Status of Your Fields?

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Soil sampling is the best tool that you have to assess the nutrient status of your fields. There are several steps involved in taking a good soil sample. First, a field should be sampled once every 3 years. In order to spread out costs and labor, you should soil sample one-third of your farm’s fields each year.

Second, a soil sample should represent no more than 20 acres. As many fields are larger than 20 acres, it is necessary to break them into smaller sections. Generally, it is not appropriate to divide a field into equal parts. This is because there can be a lot of soil variability within a field. Soil variability is the result of natural features and human activity. When breaking a larger field into smaller sections, use your knowledge of the field’s history along with soil survey maps, yield maps, or perhaps elevation maps. Different methods of breaking large fields into smaller sections are shown in Figure 1. For example, if there are several soil types within a field, soil sampling by soil type can be quite useful. Additionally, if you have a field in which only a portion of the field was limed in the past, dividing the field between limed and unlimed areas would be appropriate.

Let the Soil Sampling Begin

Once fields are broken into sections that are less than 20 acres, soil sampling can begin. Start by walking through a section in a zig-zag pattern (Figure 2). Collect 20 soil samples and composite (mix) them together. This is now your sample for a section. Soil samples should be taken to the depth of tillage. It is very important to be consistent in the depth to which soil samples are taken. Thus, one should not start sampling a field to 9” deep and finish by sampling to 6”. The inconsistency makes it difficult to provide accurate nutrient recommendations. If sampling a no-till field, two samples can be taken: a 0-2” sample and 0-8” sample. The shallower sample is used for pH and lime recommendations, while the deeper sample is used for nutrients.

Be sure each sample is uniquely labeled and record which field or section of a field each sample came from. After collection, samples should be air-dried and stored in paper bags or boxes prior to submission to a laboratory. Soil samples can be submitted to the Soil and Plant Nutrient Laboratory at Michigan State University. See your county Extension office for details on how to submit samples or visit the lab on the web at http://www.css.msu.edu/soiltesting. You may also choose to use a private laboratory. Be sure to contact private laboratories before sampling so that you understand the procedures they would like you to follow with regard to sample labeling, packaging, and submission.
The analytical laboratory will provide you with a soil test report. In this report, it will tell you the amount of nutrients that are in your soil. The concentration of phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), and micronutrients are reported as parts per million (ppm) or as pounds per acre (lb/a). These two units are related in the following way: ppm \(\times 2 = \text{lb/a}\). Additionally, soil pH is provided. Most soil test reports will also tell you if a given nutrient level is low, optimum, or above optimum. Fertilizer recommendations are then provided. If your soil tests optimum for a nutrient, this means that there is an adequate amount of that nutrient for plant growth. The fertilizer (nutrient) recommendation for optimum P and K levels are equivalent to the estimated crop removal of these nutrients. When a soil tests low in P and K, the nutrient recommendation will be larger than when it tests optimum. This is because the nutrient recommendation will provide enough fertilizer to build the soil test up to a critical level and to accommodate the estimated crop removal. When soils test above optimum, there is more than adequate amounts of a nutrient for crop growth. Because of this, the nutrient recommendation is either very small or zero. MSU Extension will be releasing updated nutrient recommendations this spring. These recommendations will replace Fertilizer Recommendations for Field Crops in Michigan (E-550A). The new bulletin (E-2904), “Nutrient Recommendations for Field Crops in Michigan,” will be available in late May. Ask your county Extension office for more information.

**The Optimum Soil Test Range**

The optimum soil test range for P and K for various crops is provided in Table 1. Most crops do not need more than 60 to 80 lb of P/a on any soil type or more than 230, 260, or 290 lb of K/a to produce good crops on sandy, loamy, and clayey soils, respectively. As a reminder, the Generally Accepted Agricultural and Management Practices (GAAMPs) for Manure Management and Utilization state that when Bray P1 soil test levels are between 150 and 300 lb/a (75 and 150 ppm), manure and additional P fertilizer should be applied at no more than the amount of P removed by up to 4 years of crops. (Note: the Natural Resource and Conservation Service (NRCS) 590 standard recommends P rates at no more than 2 years of crop removal.) When soils test more than 300 lb P/a, all manure and additional P fertilizer application should cease. These P levels in the GAAMPs are well above the agronomic optimum, and were put into place to provide a level of environmental protection while acknowledging that livestock facilities need to be able to apply manure to fields. Please note, that to be in compliance with GAAMPs, one should be applying nutrients based on MSU’s recommendations. Often recommendations made by private laboratories, fertilizer dealers, or co-ops are greater than those of MSU.

Soils with above optimum soil test P levels have adequate P for crop growth. Because of this, it is unlikely that crops grown on these soils will respond to phosphate (P$_2$O$_5$) in starter fertilizers. In this situation, if one were to plant corn with and without starter, side by side, some early season differences between the starter and no starter areas may be seen. The differences may include purpling on the leaves, a sign of P deficiency, and the corn may be shorter. However, these differences typically do not last long and almost never translate into an economic yield gain where starter was applied to high P testing soils. The research results in Table 2 show that corn grain or silage yield was not increased by starter fertilizer application on soils that test in the 90 to 100 lb P/a range. Because there was no yield advantage, this was not an

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**Figure 1. Examples of different ways to break a large field into smaller sections for soil sampling. A soil sample should be taken that is representative of each section.**

**Figure 2. How to take a soil sample in a section of a field. Walk through the section in a zig-zag pattern taking 20 soil cores. Composite the cores for one soil sample.**
Livestock operations need to have adequate land to apply manure; thus, it is important to ensure that soil test P levels are not increased by using P-containing fertilizers when there is no economic advantage. Many producers are uncomfortable with not applying starter fertilizer, even on high P soils. In this situation, using a N only starter would produce adequate yields and provide the crop with some N early in the season. Also, one might consider using ammonium sulfate as a starter. This is the most acidifying fertilizer, so when it is applied in a starter band (2” to the side and 2” below the seed), the soil pH tends to be reduced for a period of time. The lower pH results in P and micronutrients being more available. So there might be some yield advantage to using ammonium sulfate. However, ammonium sulfate is a more expensive N source and thus may not be economical.

**Summary**

Taking good soil samples that are representative of your fields is important to determine the nutrient status of your soil. After the samples have been analyzed, follow MSU nutrient recommendations to insure each crop is fertilized properly. Following these practices will help insure the long term economic and environmental sustainability of your farm.
Manure Nutrient Management

Capture Land-Applied Manure in the Root Zone

Tim Harrigan and Bill Northcott, Dept. of Biosystems and Agricultural Engineering
Dann Bolinger and Natalie Rector, Extension Dairy and Agricultural Agents

Management practices that capture land-applied manure in the root zone will increase nutrient availability, improve soil quality, and prevent manure nutrient and contaminant losses in runoff. The idea of capturing manure in the root zone is quite simple, but in practice it can be quite challenging as weather, soil and site-specific field conditions change.

The single most important tool in preventing manure nutrient and contaminant losses to the environment is your knowledge of your fields. Know which fields are erosive and prone to rapid runoff during snow melt and spring rains. Manure will be lost in runoff water, so soil conservation practices should be employed to stabilize soil and hold land-applied manure in place.

The best manure management plans are custom designed on a field-by-field basis. These plans will be designed within the context of established best management practices and fine-tuned for each field by using a process of application, careful observation, and evaluation of results. Apply manure, observe what happens, and evaluate the effectiveness in capturing manure in the root zone where it will benefit your cropping system rather than be lost in runoff.

Actions to Reduce the Risk of Manure Runoff

1. Evaluate your farm on a field-by-field basis and rank the fields based on the potential for manure loss. Ask yourself: “If it rains tomorrow, will runoff leave the field?” Then ask yourself what could be done to minimize this risk.
2. Excessive application rates increase the chance of manure running off the field. Calibrate manure spreaders and verify that the desired rate is the rate that is actually applied to the field. See the January 2004 issue of the Michigan Dairy Review. Based on observation and evaluation, determine the right application rate for your fields.
3. On some fields, the right rate by volume may be considerably less than the agronomic rate. Tile drained land needs special attention, especially with very dilute manures. Macropores and soil cracks can be direct conduits to tile lines. Check tile outlets before and after manure applications. Decrease rates and/or utilize tillage to disrupt flow to tile lines.
4. Inject manure, incorporate manure shortly after application, or loosen the soil with tillage before spreading to create a rough, permeable surface. This will encourage the manure to stay in the root zone and not run off.
5. Use soil and water conservation practices such as crop residue management, grassed waterways, buffer strips, strip crops, or planting on the contour where applicable.
6. Use spreading setbacks to separate manure from streams and from ditches that flow to streams.
7. Establish a cover crop that will be growing during manure applications. Cover crops reduce sediment and nutrient runoff and improve infiltration.
8. Avoid spreading in the rain or when rain is in the forecast.
9. Read, understand and adopt the Generally Accepted Agricultural and Management Practices for Manure Management and Utilization. These will form the foundation of your site-specific manure application plan. These practices include following:
   • Manure should be applied uniformly and the amount applied should be known.
   • Manure should not be applied to soils within 150 feet of surface waters or to areas subject to flooding unless manures are injected or surface-applied with immediate incorporation (i.e., within 48 hours of application) and/or conservation practices are used to protect against runoff and erosion losses to surface waters.
   • Liquid manures should be applied in a manner that will not result in ponding or runoff to adjacent property, drainage ditches, or surface water.
   • As the slope of land increases, the risk of runoff and erosion also increases. Soil and water conservation practices should be used to control runoff and erosion for a particular site.
   • Records should be kept of manure analyses, soil test reports, and rates of manure application for individual fields.

More Information Is Available

Three, one-page fact sheets by Dr. Tim Harrigan, provide excellent background reading on surface application of manure. Collectively called “Capturing Land-applied Manure in the Root Zone”, the individual fact sheets are:
   • Part 1: Sediment and Contaminant Runoff
   • Part 2: Tile-Drained Land
   • Part 3: Spreading on Frozen and Snow-Covered Ground

These fact sheets can be found at: http://www.egr.msu.edu/age/aenewsletter/mainpages/agri_eng_info_series.htm or contact your County Extension office.

A Reminder

In the event of a manure release to surface waters, call the Pollution Emergency Alerting System 1-800-292-4706.
Michigan’s dairy producers and service representatives recently had the opportunity to participate in a very important conference addressing Dairy Manure and Wastewater Management. The conference program, funded partially by a competitive grant awarded from Michigan State University Extension, was developed by members of the MSU Extension Dairy and Manure Management Teams. It was presented in the Thumb, southern, western, central, upper central regions, and the Upper Peninsula in January – March, 2004. Information gathered in an exit survey indicated that about 17,000 dairy cows, 9,000 heifers, and 1,000 feeder steers were represented by the 171 attendees of the conferences.

Specific topics addressed in the program included: Manure Management: Changing Our Viewpoint; The Bottom Line…..Managing Farm Nutrient Cycles; Phosphorus Management from the Front End Minimizes Excretion from the Back End; Fly Control Strategies; Milking Center Wastewater Management Strategies; Capturing Land-Applied Manure in the Root Zone; and, an overview of the Michigan Agriculture Environmental Assurance Program (MAEAP).

Immediate Impact of Program. As a result of the conference, 92% of participants indicated that they felt better equipped to address manure and wastewater management. Eighty-six percent of the dairy producers participating in the program indicated that the conference provided new knowledge and practices that they plan to implement in their farms. Figure 1 (left pie chart) illustrates some of the main changes dairy producers anticipate implementing as a result of the information presented at the conference and the percentage of total farmers attending the conference that indicated they intend to implement that particular change. Field application-related changes were diverse and included practices like manure spreader calibration, soil testing, and buffer strips. Ration phosphorus (P) related to evaluating and in many cases reducing ration phosphorus concentrations; thus, feeding more accurately to cows’ P requirements. Milking center wastewater changes indicate stoppage of discharges or the risk of discharges. The motive for increasing manure storage capacity is likely related to either reducing winter manure application risk or management of milking center wastewater. The right pie chart in Figure 1 shows some of the reasons producers thought some of practices or actions presented during the program will not or cannot be implemented on their specific farms.

In the final portion of the conference program many participants took advantage of the opportunity to learn about and enroll in the newest, Progressive Planning approach in the MAEAP. Participants also received MAEAP Phase I credit which is necessary every 3 years for MAEAP verification or recognition under MAEAP Progressive Planning.

Development of the conference program content and delivery at various sites was by MSU Extension personnel from throughout the state including Dann Bolinger, Ben Bartlett, Mike Erdman, Maurie Kaercher, Dean Ross, Marilyn Thelen, Craig Thomas, Kathy Lee, Ira Krupp, and Natalie Rector, MSUE Dairy, Livestock, Crops and Nutrient Management Agents; Bill Bickert, Tim Harrigan and Bill

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**Intended changes by topic**

- Ration P: 20%
- Field Application: 30%
- Milking Center Waste: 17%
- Fly Control: 2%
- Other: 2%
- Increase Storage: 7%
- Non-Specific: 11%

**Reasons for not changing**

- Already Compliant: 29%
- Cost Prohibitive: 50%
- Other: 21%

Figure 1. Responses of conference participants in the exit survey indicating intent to implement new knowledge and practices (left pie chart); and, reasons for likely not implementing some changes in their farm (right pie chart).
Northcott, Department of Biosystems and Agricultural Engineering; Dave Beede, Department of Animal Science; and, Mike Kaufman, Department of Entomology.

In the exit survey, the overall program was rated very good (4.3 with 5.0 being excellent) by conference participants. Individual presentations of every topic in the program received overall average ratings of good to very good (4.0 to 4.5 of 5.0) by participants.

Ninety-seven percent of the participants indicated they would highly recommend the conference program to other dairy producers and industry service personnel.

**Animal Health**

**Regulations on Feeding Animal Proteins to Ruminants**

Roxanne Pillars
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As of February 9, 2004, the USDA concluded its epidemiological investigation surrounding the Washington state dairy cow diagnosed with bovine spongiform encephalopathy (BSE, also known as “Mad Cow Disease”). A total of 255 “animals of interest” were slaughtered and tested with all test results negative. Currently, no premises remain under quarantine for BSE.

While the trace-back of animals may have ended, USDA and FDA officials are working together to evaluate the U.S. BSE response program and ways they can further ensure domestic and foreign consumers of the safety of American beef. Some of the changes include modifications to the FDA’s 1997 BSE feed rule. This article discusses why the BSE feed rule was implemented originally as well as the new changes and how they may affect Michigan dairy producers.

**BSE and the Origins of the BSE Feed Rule**

Bovine spongiform encephalopathy is a progressive degenerative, fatal disease affecting the central nervous system of adult cattle. While the exact cause of BSE is not known, it is accepted generally by the scientific community that the disease is caused by a type of infectious protein called a prion, an aberration or mutation of a protein normally found in cattle. The disease is not contagious, meaning there is no direct transmission from cow to cow, although there is some possibility of vertical transmission from an infected cow to its offspring. Evidence suggests BSE can infect humans resulting in the fatal neurological disease called variant Creutzfeldt-Jacob Disease (vCJD). Transmission from cow to cow or from cow to human is believed to occur mainly by eating infected

**MSU Air Quality and Agriculture Seminar Planned**

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Air emissions from agricultural operations are an important environmental challenge facing Michigan farmers. The general public is concerned about the negative impacts of air emissions as related to the environment and to public health. Overall, these concerns are about odors, noxious and toxic gases, pathogens and particulates and their impact on air quality.

Decision-makers and others in agriculture will have an opportunity to better understand the concerns about air emissions from agricultural operations by attending a seminar “Air Quality and Agriculture: Challenges and Opportunities” that will be held Tuesday and Wednesday, May 25 and 26, 2004, in Dewitt, MI. The seminar is being sponsored by the Michigan State University Manure Management Team.

The seminar audience is envisioned as decision-makers in agriculture including agriculture association and organization representatives, regulatory personnel, agribusiness representatives, consultants, advisers and technicians, and, university faculty and staff. Interested producers are welcome to attend, and hopefully, will attend as representatives of associations or organizations.

Besides the concerns about air emissions from agricultural operations regarding the environment and public health, attendees will develop an understanding of the terminology used in defining air quality. In addition, coverage will be given to current regulations, measurement methods and mitigation techniques.

The first day of the seminar, May 25, will be for the broader audience and will consist of gaining a heightened awareness on the subject and developing a foundation of knowledge for impending discussions and developments. The second day will be for a smaller audience, adding to the first day and allowing for in-depth discussions on a variety of subjects. In addition, hands-on experience will be offered on measurement instruments and devices. Other topics will include mitigation techniques and methods, community relations, and conflict resolution.

Registration information and further details on the Air Quality Seminar are available at www.MAEAP.org or by contacting your County Extension office.
material. It is believed traditional rendering and cooking of infected protein sources does not inactivate the infectious agent.

With this information, the FDA implemented the BSE feed rule in 1997 prohibiting the use of most mammalian protein in the manufacture of animal feeds for ruminants. Since the implementation of the feed ban, the FDA has continued to assess the rule to ensure its integrity as a firewall against the potential spread of BSE. This process included public hearings and solicitation of information and views from affected industries and the public regarding changes to its current feed regulation. While the present changes may appear to be in response to the confirmation of BSE found in the Washington state cow, many changes have been under discussion for some time. The changes will be published as an “interim final rule” in the Federal Register with a public comment period to follow.

Changes to the FDA's BSE Feed Rule

On January 26, 2004, the FDA announced four changes to the BSE feed rule to further close potential risk for the spread of BSE.

1. Mammalian blood and blood products will be prohibited from feed for ruminants. The previous exemption for pure porcine or equine products will be maintained, so porcine and equine blood meal collected at single species slaughter operations and processed using dedicated equipment can still be fed to ruminants.

2. Poultry litter will be prohibited from ruminant feed. Poultry litter is made from bedding, spilled feed, feathers, and fecal matter collected in poultry houses. The major concern is that poultry feed containing prohibited material for cattle can spill into the litter and then be consumed by cattle. Therefore, all poultry litter will be banned from cattle feed.

3. Plate waste will be prohibited. Plate waste is excess meat prepared for human consumption and collected from restaurants then processed into a livestock feed ingredient. Currently inspectors are not able to determine whether processed meat in livestock feeds came from plate waste or other sources. Prohibiting plate waste makes enforcement of the feed rule more effective.

4. Feed production facilities must have separate equipment, facilities, or production lines if they use prohibited protein in the manufacture of non-ruminant feed and also process feed for ruminants. This rule change is meant to prevent cross-contamination during feed processing.

What Do These Changes Mean To Producers?

Livestock producers who have been feeding any of the now prohibited blood products, poultry litter or plate waste will now have to find alternative protein sources to feed. The new changes also may impact calf health on some farms. Prohibition of products derived from ruminant blood and blood products will include colostrum replacers and supplements and milk replacer supplements made from bovine serum or plasma. While colostrum supplements derived from milk or colostrum will still be available, there is evidence that the IgG absorption from these products is less than that from supplements derived from bovine plasma. Some of the products that will no longer be available include Lifeline™, Acquire™, Secure™, NutraPro B™, and Gammulin™. Producers using these products will need to find alternative products and focus more attention on quality colostrum management to ensure healthy calves.

It is important to note that tallow and animal fat are not prohibited under the new BSE feed rule. The rendering process effectively separates fat from protein, and since the prion believed to cause BSE is a protein, feeding tallow is not considered a risk for spreading BSE.

Importance of the BSE Feed Rule

While it is up to the FDA to enforce the BSE feed rule, it is important that everyone, from producer to feed manufacturer, involved in the cattle industry comply with the rules to ensure the public that the beef they are eating is a safe and wholesome product. Public confidence is what drives the market and the industry must conform to their expectations. In a recent study by the Harvard Center for Risk Analysis evaluating the potential for BSE in the U.S., it was determined, “the feed ban greatly reduces the chance that BSE will spread from an infected animal back to other cattle.” It also stated that noncompliance with the BSE feed rule would contribute the most to the spread of BSE in the U.S.

References


Rift Valley Fever (RVF) is an acute viral disease of sheep, cattle, and goats that is spread primarily by mosquitoes. The disease is characterized by high abortion rates, high mortality in young animals, and necrosis of the liver. Humans also are highly susceptible to Rift Valley Fever. Rift Valley Fever occurs almost exclusively in Africa. The only epizootic outbreaks of RVF outside sub-Saharan Africa were recorded in animals and humans in Egypt, Mauritania and Saudi Arabia.

Although not found in the United States, RVF is considered a high consequence bioterrorism agent capable of affecting both animals and humans.

Rift Valley Fever is caused by a virus, which can remain viable for up to 4 months at 40°F. The virus has a half-life in excess of 77 minutes in aerosols at room temperature. Humans have become infected while slaughtering affected animals, by handling aborted fetuses, during necropsies, and while conducting laboratory procedures.

RVF Infects Animals and Humans, Too

Rift Valley Fever virus infects many species of animals and humans. Neonatal lambs, kids, calves, and puppies are highly susceptible and have a high death rate. Other species that can become infected with RVF include buffalo, wildebeast, camels and other wild ruminants. Sheep and cattle are the primary species affected and the primary amplifiers of the virus. Humans are highly susceptible to RVF virus infection and are readily infected by mosquitoes and aerosols. Humans develop a sufficient viremia to be a source of infection for mosquitoes and thus could introduce the disease into uninfected areas such as the United States.

Explosive outbreaks of RVF have occurred simultaneously over a wide area of Africa at 5- to 15-year intervals. The outbreaks generally have occurred in otherwise dry areas following periods of heavy rainfall. The long interval between outbreaks in animals allows for development of a susceptible population. During dry periods, RVF virus remains present in dormant eggs of the mosquito Aedes lineatopinnis located in the soil of grassland depressions. When these depressions become full of water, the eggs hatch, and infected mosquitoes develop. These mosquitoes infect an amplifying host, such as cattle or sheep, which serves as a source of infection for many other mosquitoes that then rapidly spread the disease. If the area of infected mosquitoes extends into areas of susceptible animals, there are many clinical cases. In Africa, many species of mosquitoes can transmit RFV. In North America, mosquitoes in the genera Aedes, Anopheles, and Culex experimentally are capable vectors of RFV.

Clinical Signs Vary, Depending on Species

Clinical signs depend on the species affected and physiological conditions such as age and pregnancy. The incubation period in newborn lambs, kids, calves, and puppies, is about 12 hours. In adult sheep, cattle, goats, and dogs the incubation period may be as long as 3 days. In humans, the incubation period is 4 to 6 days. Calves develop a fever of 104-106°F and become depressed. Death rates can range from 10 to 70 percent. Adult cattle develop a fever of 104-106°F, have excessive salivation, anorexia (suppressed appetite), weakness, and occasionally severe diarrhea. If animals are pregnant, abortion will be the most prominent sign. Death occurs less than 10 percent of the time in adults. Humans develop influenza-like symptoms with fever of 100-104°F, headache, muscular pain, weakness, nausea, and intolerance to light (photophobia). Most people recover in 4 to 7 days; however, a small percentage of infected individuals will develop potentially fatal complications including a hemorrhagic syndrome, meningitis and (or) encephalitis and blindness.

The primary lesion in RVF is liver necrosis. In aborted fetuses and in young animals, particularly lambs and calves, liver damage can be massive. The liver may be enlarged and yellowish, have hemorrhages, and be fragile. In both neonatal and older animals that die, there may be widespread hemorrhage in the skin and abdominal organs.

Rift Valley Fever should be considered in the differential diagnosis whenever the following observations are made in a disease outbreak:

1. high abortion rates approaching 100 percent in ewes, cows, and bitches but lower rates in goats and in other ruminants;
2. high mortality in lambs and calves less than 7 days of age and lower rates of disease and mortality in older animals;
3. extensive liver lesions in aborted fetuses and neonatal animals;
4. an influenza-like disease in people — particularly in individuals associated with livestock;
5. occurrence of the disease during a period of high insect activity; and,
6. rapid spread.

References and Web Resources

Bad Boys!

You Can’t Be Too Careful When Working with Dairy Bulls

Ben Bartlett
Extension Dairy Agent
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Breeding with bulls in dairy farms was suppose to be a thing of the past. Most farmers and almost all researchers agree that artificial insemination is a better way to go for numerous reasons. But, the reality is that we still have a lot of dairy farms with dairy bulls doing at least some of the breeding chores. The successful dairy farm has to have pregnant cows and sometimes the most efficient way to get this accomplished is with a bull. One downside of using a bull is that dairy bulls are not safe to be around. There were 68 deaths related to cattle in the US in the period of 1992-1994. Fifty four of the deaths were farm workers who were attacked, mauled, rammed, gored, trampled or pinned against some surface. While bulls account for only 2% of the cattle population, they accounted for more than half of the fatalities (1). Dairy bulls in particular have a reputation for being dangerous to people but some things can be done to decrease this danger.

The first and most important thing is to never trust a bull. As the old saying goes, “it’s the tame ones that will get you”. The following suggestions can decrease the chance of human injury. However, when working with an animal that weighs 1000 to 2500 lb., can move extremely fast, and makes decisions based on experience and instinct, there are no guarantees.

Your common sense, knowledge, and thinking ahead are the bottom line to the safety of you, your family, and your employees.

Learn about Cattle Behavior and Bull Behavior

Knowledge of cattle behavior and bull behavior can increase your safety. Cattle are prey animals and want to be in the herd, not by themselves. Being alone increases their anxiety, fearfulness and their willingness to “fight back” in situations that we may not see as threatening. Bulls react differently to people than cows do. Cows are protective of their calves and themselves and when scared or threatened, will usually act defensively. When you move away and are not a threat, a cow will usually go back to her calf and not chase you. Bulls are territorial and can be possessive of their space and their cows. If you invade a bull’s space or take away his cows, in his mind, he is responsible for regaining his cows or moving you out of his territory. While bull attacks can occur without warning, most often, the bull will send out a warning message by various postures and displays. You need to “hear” these messages by keeping an eye on the bull and respond to them. Bulls will show a threat by giving a broadside view with an arched back. Roaring or loud low bellowing may also occur. An increase in the threat would be dropping the head with the chin tucked in and head shaking side to side with protrusion of the eyeballs and erections of the hairs on the back. Pawing the earth and head rubbing on the ground are also threats and marking of his territory. If a bull makes these threats to you, you need to either reaffirm your dominance over the bull or move slowly away keeping an eye on the bull. If you don’t know the bull, or are alone, or have any second thoughts about your safety, moving away, usually 20 feet is the best way to defuse the situation (2).

Raise Bulls With Other Cattle

We often have to handle bulls, such as sorting them into or away from a group of cows. Safe bull handling starts with the way a bull was raised. Research has shown that bulls raised in individual pens are most likely to attack, bulls that are dam raised are least likely to attack, and bulls hand raised in group pens are intermediate. In a trial with Hereford bulls, 75% of individual pen-raised bulls and 11% of group-pen raised bulls threatened or attacked their handlers, while only 1 bull of 1000 dam-reared bulls attacked a handler (3). Bulls raised as individuals see people as rivals and not as a dominate power. Bulls need to be raised with other cattle so they grow up thinking they are cattle. This identity complex is made worse when people rub the “cute” bull calves on the poll area of the head. The calf learns to see you as a competitor, like two calves butting heads, and when he grows up, he wants to try this again to see if you are still stronger. If you do touch a bull calf, stroke the underside of the neck much the way a cow would lick a calf. Size and confidence when handling bulls is very important. By carrying a cattle handling paddle, a stick with a widened plastic end that contains noise makers, it can be raised to make yourself appear bigger. You can rattle it so the bull knows you are around, and you can touch the bull without being so close to him. Work around a bull slowly but confidently. You don’t want to get into a bluffing contest with something that weighs 10 times as much as you do, and if you approach timidly and retreat at the slightest bull movement, the bull will learn that he is more dominate. When moving a bull, talk to him to make sure he knows you are around, leave one or two cows with the bull if at all possible, and provide a positive reward such as special feed in a pen when the bull responds as desired. Don’t keep bulls past 2.5 years of age because most aggression problems occur with bulls at about 3 years of age or with mature bulls, 7 to 10 years of age. If a
bull becomes aggressive and attacks, SHIP HIM, carefully and soon. It is your responsibility as a farm owner to provide a safe working environment. Seventy-seven percent of bulls that attack will do so again, especially the same person (2).

In a perfect world, everyone would use AI and all dairy bulls would be in studs where professional handlers and facilities are available. Until that day, three parts to a safe plan for using dairy bulls for breeding service are:

1. Buy only young bulls that have been raised and handled properly – no head rubbing and raised with groups of other cattle.

2. Bull handlers are properly trained and experienced, have facilities that allow and aid safe handling, and are smart about not working alone.

3. Bulls are only kept until about 2.5 years of age and ANY aggressive bull is shipped without delay.

A bull just wants to do his job, breed cows, and that is what you want him to do. A little knowledge and planning can go a long way to keeping your bull, your employees, and you safe and happy.

References

Ovsynch: Common Questions Answered

Richard Pursley
Dept. of Animal Science

Development of the Ovsynch protocol has allowed producers and veterinarians the opportunity to have more control over reproduction of dairy cows. Ovsynch enables producers to pre-schedule cows for artificial insemination (AI). It gives producers control over first and subsequent inseminations. With Ovsynch, there are no more missed heats! However, as Ovsynch is implemented it is common for questions to arise regarding its use. Below are commonly asked questions about Ovsynch. If you have others, please send them to me at the address at the end of this article.

Question 1: What is the purpose of each injection of Ovsynch (Figure 1)?

Ovsynch is designed to mimic the physiological processes of a cow in heat. Ovsynch does this by controlling follicle and corpora lutea (CL) growth on the ovaries. Remember, it is the follicle that houses the “egg,” which, when fertilized by sperm, becomes a growing embryo. In order to ensure that a follicle will be large enough and mature enough to ovulate after the final GnRH (GnRH 2), an initial injection of GnRH (GnRH 1) is needed to induce growth of a new group of small follicles. During the next 9 days one of these small follicles will outgrow its counterparts and become the eventual ovulatory follicle. Two days prior to the final GnRH, it is critical that PGF$_{2\alpha}$ be injected to regress any CL that are on the ovaries. This mimics the natural process of CL regression that happens around day 18 of a normal cycle. Once this happens, the final GnRH can be injected to start the process of ovulation of the newly formed ovulatory follicle. Ovulation of this follicle generally happens between 24 and 32 hours after the injection. It is best to AI at least 8 hours before ovulation.

Question 2: Do the injections and AI have to occur at the suggested times?

Yes and no. There are parts of the Ovsynch protocol that cannot be deviated from and there are parts that have flexibility. There is not much flexibility in the time from the 1st GnRH to the PGF$_{2\alpha}$ injection. If this time is shortened to 6 days, the likelihood of regressing the CL is substantially reduced. This process has to happen to mimic a cow in heat. If the time between the 1st GnRH and the PGF$_{2\alpha}$ is lengthened to 8 or 9 days, the likelihood is greater that the newly formed ovulatory follicle will not survive. Follicles generally only live for 8 to 10 days.

Similarly, there is not much flexibility in the time from the PGF$_{2\alpha}$ injection and the final GnRH injection. In a recent study, our laboratory tested the timing of the final GnRH at specific times after the PGF$_{2\alpha}$ injection. Our results indicate that fertility is compromised when GnRH is administered too soon after the PGF$_{2\alpha}$ injection. It appears at least 36 hours must lapse between injections before acceptable fertility can be obtained. Forty-eight hours appears to be the maximal time between

Figure 1: Timing and purpose of hormonal injections of the Ovsynch protocol.
these two injections because this is generally when cows will begin to show signs of standing heat. When cows show signs of standing heat they have most likely already released their own GnRH. Once this happens, the ovulation clock begins ticking resulting in the possibility of a mis-timed AI, which reduces chances of a pregnancy.

There appears to be a greater amount of flexibility in the time from the final GnRH until AI. Our data suggest that greatest fertility is obtained when AI occurs at 16 hours following the final GnRH. Expect conception rates of 6 percentage points less when inseminating at the same time as the final GnRH and 3 percentage points less when inseminating 24 hours after the final GnRH when compared with the 16-hour time point. Fertility begins to decrease at a greater rate when AI occurs after ovulation (28 hours after final GnRH). It is more forgiving to AI too early than too late.

**Question 3: Why do very few cows show heat when treated with Ovsynch? Is that good or bad?**

The reasons why most cows don’t show heat just prior to AI compared with a normal cycle is because the final GnRH injection causes the process of ovulation to begin earlier, thus reducing the follicle’s ability to produce estrogen. It is the estrogen produced from the ovulatory follicle that causes the cow to show signs of heat.

In about 2/3 of the cows on Ovsynch, the ovulatory follicle will not be mature enough to produce enough estrogen to cause the cow to show signs of heat. And, that is OK. Even though the ovulatory follicle is probably slightly less mature, most of these cows should have as good of a chance to become pregnant as the cows showing signs of heat. However, about 10% of the cows that start on Ovsynch won’t synchronize and will not have a chance to become pregnant. These cows are difficult to identify. So, the bottom line is: If you don’t see cows in heat just prior to AI don’t worry. Just breed ’em anyway.

Two big advantages for cows not showing heat from Ovsynch is that 1) It reduces the number of cows that may become injured or injure other cows during expression of standing heat; and 2) It may attenuate potential milk production losses that may occur with cows in heat and their herdmates.

**Question 4: Should I breed cows if they come in heat around the time of PGF$_{2\alpha}$ injection?**

Yes! Many of the cows that do not synchronize to Ovsynch will be in heat between the day before and the day after the PGF$_{2\alpha}$ injection. It is okay to go ahead and breed them and remove them from the remainder of the protocol. In fact, to be as aggressive as possible with Ovsynch, I recommend using tail paint, chalk, or other tail head devices at the start of Ovsynch to help detect heat in these non-synchronized cows.

It also is possible for non-synchronized cows to be in heat a few days after the timed-AI. If these cows are definitely standing for other cows at this time it is OK to breed them.

**Question 5: Conception rates have been very poor lately for only my cows that were treated with Ovsynch. What could be the problem?**

A number of factors may influence fertility from Ovsynch breedings. These factors include protocol compliance, voluntary waiting period, estrous cycling status, only using Ovsynch on problem cows, season, and numbers of cows in the data set.

It is critical to administer injections at the proper times with the proper amount of GnRH and PGF$_{2\alpha}$. Failure to do so could dramatically influence percent cows pregnant following Ovsynch. Enough said.

Voluntary waiting period (VWP) seems to influence conception rate outcome following Ovsynch. Cows that receive AI following Ovsynch that are greater than 75 to 85 days in lactation have a greater chance of becoming pregnant compared with cows that were less than 75 to 85 days in lactation when started on Ovsynch.

Also, cows administered Ovsynch that are cycling have a much greater chance of a pregnancy than cows that are not cycling. Overall conception rates can be influenced if the breeding group is going through a stressful period that results in a greater number of cows that are not cycling by the 1st day following VWP. Our data suggest that insertion of a CIDR between the 1st GnRH and the PGF$_{2\alpha}$ injection may help to improve fertility in the non-cycling cows. One way to identify these non-cycling cows is to administer two injections of PGF$_{2\alpha}$ 14 days apart and 2 weeks prior to Ovsynch (Pre-Synch) and watch for heats and breed. Any cows that were not detected in heat would have a greater chance of being one of those non-cycling cows. This group would then receive the CIDR with Ovsynch.

Don’t be fooled by the effect of summer heat stress on fertility. Conception rates can easily be less in Ovsynch treated cows versus cows detected for heats. But!! Since summer heat stress can decrease heat detection rates, the overall number of pregnancies (pregnancy rate) will be greater in the Ovsynch group.

Lastly, be sure that numbers of cows in your data set are sufficient to analyze conception rates. Interpretation of a small data set (less than 150 breedings) can be very difficult and sometimes very misleading.

**Send other questions to:**
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Barn Ventilation Rate Impacts Animal Comfort

William G. Bickert
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Attention dairy producers with curtain-sided freestall barns (and anyone else with curtain-walled barns). Now is the time to increase ventilation rates to the maximum by opening sidewall and endwall curtains and other openings. Increasing the ventilation rate is necessary to accommodate increasing outside temperatures and maximizing animal comfort.

In Summer
Maximum air exchange is the goal. With good air movement through the barn, animals are more comfortable because ventilation removes the heat the animals produce. Plus, air movement over the bodies of the animals helps them dissipate body heat more readily. In fact, with good air exchange caused by the wind, a cooling effect sometimes occurs because of moisture present on the floors, on the animals and on other surfaces. The barn interior actually acts as a natural evaporative cooler, and inside temperatures a few degrees lower than outside air temperature are common.

In Winter
An ideal barn environment for dairy cattle housed in cold housing has barn temperatures following outside temperatures. Inside temperature should never be more than 3 to 5 degrees above outside air temperature. Periodic adjustments to ventilation openings in the sidewalls are essential to satisfy this requirement during mild winter weather and in the spring and fall. The open ridge and eaves of a cold barn supply sufficient air movement only during the most severe winter weather—very cold days, windy and blowing snow.

Sufficient ventilation in winter is necessary to remove excess moisture produced by the animals. In addition, levels of toxic gases, pathogens and other air contaminants are minimized by good ventilation. To be sure that you have good ventilation in winter, hang thermometers both inside the barn and outside in a shaded place. Compare temperature readings. On a winter day, when the temperature inside is more than 3 to 5 degrees F above outside, make adjustments to ventilation openings. Open doors and curtains as necessary.

In Summary
Here are the simple guidelines for managing curtain-walled barns.

• Open more curtains as the weather warms in late winter and the spring.
• Aim for fully open sidewalls by the time the forsythia blooms—before you plant corn!
• Begin closing curtains in the fall, around the time of deer season (mid-November).
• Manage endwall doors and curtains in winter so as to keep temperatures in the barn within 3 to 5 degrees above outside air, no more.

If you have any questions ventilating your curtain-sided barn contact your local Extension Dairy Agent for additional information.
every Michigan employer needs to act accordingly.

I am hiring only family members. Do I still need to fill out I-9 forms?

Employers are required to have an I-9 form on file for every employee hired after November 6, 1986. 'Employee' includes short-term employees, employees who are citizens, and employees who work for just food and lodging or similar remuneration. This also includes family member employees. I-9s need to be kept for 3 years after the day of hire or 1 year after termination, whichever is longer (see Michigan Dairy Review, January 2003 for more information on I-9 forms). The newly created Department of Homeland Security considers agriculture as one of “quality of life areas” and will enforce legislation.

When hiring employees that do not speak English very well, I always ask to see their green card before I offer them a job. What's wrong with that?

All employment related procedures need to be fair and equal for each employee. Michigan Civil Rights legislation has no small business exemption. Hiring, training, promotion, compensation, termination, and other employment related decisions must provide equal opportunity regardless of race, color, religion, sex, and national origin, and in Michigan also age, weight, height, and marital status. In practice, this means that differential treatment should be avoided at all times, except when warranted by the requirements of the job as listed in the job description. Certain questions (e.g., Are you married? How old are you? What is your native language?) must not be asked, because they could be construed as discriminatory. Farm employers need to ask themselves whether their workforce reflects a discriminatory practice. For example, if all employees are of a certain ethnicity or race or all milkers share a protected characteristic (e.g., Hispanic) but their supervisors are different, there is prima facie evidence of discrimination.

Asking for documentation of any form before extending an employment offer also is considered discriminatory. Documentation is required for filling out section 2 of the I-9 form, which is supposed to happen after hiring within 3 business days. However, asking for specific documentation is not allowed. A manager should accept any document from list A (documents that establish both identity and employment eligibility) or any combination of documents from list B (documents that establish identity), and list C (documents that establish employment eligibility) of the I-9 form.

A former employee approached me about documenting the time he worked for me. How do I deal with this? Why would he want that?

While there are many reasons an employee might need documentation of times worked, legislation has been introduced concerning the adjustment of undocumented agricultural workers and the H2A program (agricultural guestworker program). The name of the bill is AgJobs, the Agricultural Job Opportunity, Benefits, and Security Act of 2003, H.R.3142 and S.1645. Should this legislation be passed, many undocumented farmworkers would have the opportunity to apply for adjustment of status through proving that they worked in agriculture at least 100 or more days in the U.S. during a 12-month period within the 18-month period ending August 31, 2003. In addition to employment records, other forms of evidence such as affidavits of former employers or co-workers may substantiate claims.

On Tuesday, September 23, 2003, Sen. Edward Kennedy (D.-Mass.), Rep. Howard Berman (D.-Calif.), Sen. Larry Craig (R.-Idaho), Rep. Chris Cannon (R.-Utah), and Rep. Ciro Rodriguez (chair of the Congressional Hispanic Caucus) held a press conference to announce their introduction of legislation containing a compromise among them and between the United Farm Workers of America (AFL-CIO) and major agribusiness employer organizations. The Farm Labor Organizing Committee (AFL-CIO) and many other farmworker advocacy organizations are taking steps to ensure swift passage of this compromise. Currently, AgJobs seems to be held up in the House.

A good starting point for additional information is http://www.fwjustice.org/LEGISLAT.HTM, the legislative news page of the Farmworker Justice Fund, Inc. If you would like to support this legislation, the UFW (United Farm Workers) has posted an automatic email system to tell members of Congress to support the compromise (www.ufw.org).

Early last year my wife and I received information of my wife’s health plan—she works for the State of Michigan—about the privacy of our medical information and we had to sign consent forms. We cannot afford a health plan for our employees but we do reimburse them for part of their medical bills. Does the new privacy regulation concern us at all?

The privacy rule of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) is important for all employers that provide any sort of health insurance or contribute to employees’ health care costs. General compliance date was April 14, 2003. At that time health plans must have mailed a notice to their members regarding the use of personal medical information and their rights under the new privacy regulation.

April 14, 2004 is the compliance date for small health plans. A small health plan has annual receipts of $5 million or less. An employer, who provides health benefits only through an insurance contract with a health insurance issuer or HMO, needs not comply if he or she does not create, receive, or maintain protected health information. If an employer provides a self-funded group health plan, including health care reimbursement arrangements, they need to comply and make changes before the compliance date. Required changes include developing a consent document, designating a privacy
officer, and devising handling procedures to protect employees’ files. For more information go to http://www.hhs.gov/ocr/hipaa/smallbusiness.html.

Before I hire a new employee, I require him or her to take a physical. I want to protect the farm against compensation claims based on preexisting conditions. It seems that HIPAA protects an employee’s medical information against an employer’s inquiries.

On an application form and during a job interview any questions regarding a potential employee’s health or preexisting conditions must be avoided. Such questions are in violation of the Americans with Disabilities Act of 1990. Employers may only ask, “Will you be able to carry out the essential job functions with or without accommodation?” As a side note: It helps to have a job description that outlines what these essential job functions are.

While the HIPAA typically does not permit the disclosure of protected health information to employers without authorization, nothing in the privacy rule prohibits an employer from conditioning employment on a pre-employment physical and that prospective hire giving authorization for the disclosure of such information.

Suggested Additional Resources

Disclaimer
This information has been compiled from reliable sources as of February, 2004. It is a reference for general educational use. It does not constitute legal advice and the author and publisher assume no liability for actions taken based on the information provided. It is the employer’s responsibility to keep abreast of current laws and changes.

Milk Marketing

Sky High Milk—and Feed Prices

Christopher Wolf
Dept. of Agricultural Economics

If you have attended a milk marketing meeting, you may have been quizzed on the highest historical Class III price (or Basic Formula Price). We now have a new answer to that question. The April Class III price likely will be announced at more than $19/cwt and it will be the highest base price ever (not adjusted for inflation) — at least until the May Class III price possibly passes it. In fact, Class III prices for the months of April and projected through December, 2004 were averaging $16.63/cwt as of this writing (April 8). These prices are the highest on record for most of the next 6 months. The decline in milk production facilitated by many factors including economic stress from 2 years of low milk prices, the Cooperatives Working Together (CWT) program, bovine spongiform encephalopathy (BSE) scare and consequent closing of Canadian border (and loss of heifer replacements from Canada), reduced recombinant bovine somatotopin (rBST) supplies, and high feed prices, led to a concern about the availability of milk supplies by large cheese, butter, and ice cream manufacturers.

With the April Class I price at $15.64/cwt and the April Class III price at more than $19/cwt, negative producer price differentials (PPD) are back. This will lead to depooling by Class III plants and less pool-riding by organizations outside the Mideast Order. Recall that ‘depooling’ is when a non-Class I plant withdraws its milk from the pool while ‘pool riding’ refers to milk from other Orders being attached to this Order to receive the PPD. Revenue pooling rules have become a point of contention in many areas of the country, including Michigan. Disagreements on pooling helped facilitate the demise of the Western Order (Utah and parts of Idaho, Oregon, Nevada and Wyoming). Also, California recently passed a rule that a plant that depools is out of the pool for 12 months. The Mideast, which includes virtually all of Michigan, and Northeast Orders

![Figure 1. Michigan Milk and Feed Prices, 1998 - February 2004.](image-url)
have been two attractive targets for pool riding as the PPD is larger than some other Orders with small Class I utilization rates.

The high milk prices do not translate directly to profit. Farmers that are purchasing feed know that a large portion of the milk price increase will go toward the expensive feed energy and protein costs. High milk prices in 1998, 1999 and 2001 were accompanied by low feed prices (Figure 1). The low milk prices of late 2002 and into 2003 were accompanied by increasing feed costs, which further stressed dairy farms. Even the current projections of $19 per hundredweight Class III milk do not look great when weighed against $9.88 per bushel soybeans ($320/ton of soybean meal) and $3.30 per bushel corn. Farmers purchasing feed are not realizing the high profits that the milk price might imply under more typical feed prices. Even a $19/cwt milk price at the current corn and soybean prices translates to a milk-to-feed price ratio of 2.97. Generally, ratios of 3 or more are considered conducive to expanding milk production.

How Quickly Can Supply React?

The $64,000 question is how quickly can milk supply respond? The flip side is how high will retail milk, cheese, butter, and ice cream prices get? And how will consumers react? The milk supply response question depends on prices of feed, replacements, and technology (that is, BST and new facilities). Recent years with high milk prices (1998, 1999, and 2001) were accompanied by low feed prices (Figure 1) that encouraged expanded milk production. If the current high milk prices are accompanied by high feed prices, the result likely will be less encouragement to expand. Meanwhile, the timeline for an open Canadian border or increased rBST sales are indeterminate. The short to intermediate term (six months to a year) conditions support continued high milk prices.

In the longer term, the CWT program did not need to spend all the collected money last year to subsidize cheese and butter exports as supplies tightened. Further, the program was recently extended, meaning that the cooperatives will have a substantial sum of money to prop-up milk prices should a large supply expansion materialize.

Industry and University

MSU Hosts Annual Animal Welfare Judging Competition

Adroaldo Zanella
Dept. of Animal Science

Animal welfare became a recognized scientific discipline in 1986 when the Cambridge University Veterinary School hired Professor Donald Broom to fill the endowed chair in Animal Welfare. Veterinary schools and animal science departments worldwide began following the Cambridge example, and strong programs were established throughout Europe by the early 1990s. In North America, U.S. and Canadian universities developed animal welfare programs in the 1990s. These programs have grown tremendously in recent years. The Animal Behavior and Welfare Program was initiated in 1997 at MSU with support from the Michigan Animal Agriculture Initiative. For the last 7 years, the MSU research team has focused on development and validation of objective, non-invasive indicators of animal welfare.

Background

In 1965, the Brambell Report (Brambell, 1965) offered the concept of freedoms to animals in order to guarantee their welfare. Since that time, scientists have worked to develop objective criteria to assess animal welfare. The Brambell Report listed five freedoms as essential for the maintenance of high levels of animal welfare (Table 1).

One of the challenges experienced by scientists in this new and emerging field has been the multidisciplinary approach required to integrate behavior, physiological, health, and production indicators to effectively and objectively assess welfare. The knowledge acquired by animal scientists of the basic needs of domestic animals is essential for normal health and performance and to the development of animal welfare assessment protocols. However, the topic of animal welfare

<table>
<thead>
<tr>
<th>Table 1. The five freedoms for animals (Brambell, 1965).</th>
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<tr>
<td>1 Freedom from hunger and thirst</td>
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<td>- by ready access to fresh water and a diet to maintain full health and vigor.</td>
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<tr>
<td>2 Freedom from discomfort</td>
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<tr>
<td>- by providing an appropriate environment including shelter and a comfortable resting area.</td>
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<tr>
<td>3 Freedom from pain, injury or disease</td>
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<td>- by prevention or rapid diagnosis and treatment.</td>
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<tr>
<td>4 Freedom to express normal behavior</td>
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<tr>
<td>- by providing sufficient space, proper facilities and company of the animal's own kind.</td>
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<tr>
<td>5 Freedom from fear and distress</td>
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<td>- by ensuring conditions and treatment which avoid mental suffering.</td>
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Where they compete against each other for the best score, as students must do both individual assessments of scenarios, come to agreement on the scoring appropriate for each scenario. The judges review the same scenarios and a short oral presentation explaining how and why they ranked the scenarios. The flexible nature of the competition allows for new developments. For example in 2005, on-farm animal welfare assessment protocols may be used to test the students’ ability to carry out animal welfare evaluations. Additionally, scenarios have incorporated different housing systems, management strategies, and health and husbandry practices for different species each year the competition has been held. Eventually, scenarios involving laboratory, zoo, and companion animals also will be included in the competition.

For the 2004 MSU Animal Welfare Judging Competition significant support from the U.S. food system was provided by McDonald’s Corporation, United Egg Producers, and Humane Farm Animal Care. Acceptance of animal welfare assurance programs is growing at a rapid rate worldwide. Fast food chains, livestock producer groups, and animal protection organizations are being engaged to offer welfare certification programs. It is our goal to engage fully our students and people in U.S. animal food system in the Animal Welfare Judging Competition to show proactive responses and solutions to the contemporary challenges facing animal production agriculture.

**References**


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**2004 MSU Team Wins Annual Animal Welfare Judging and Assessment Competition**

On March 5, 2004, the 3rd annual Animal Welfare Judging and Assessment Competition was hosted by Michigan State University with teams competing from MSU, Purdue University, University of Wisconsin, University of Guelph, Oregon State University, University of Vermont, Cornell University, and Penn State University (along with observers from Ohio State University). The high placing team was MSU, 2nd place team was Purdue, and 3rd place team was the University of Vermont. In a very close scoring section of the contest, Purdue won the Team Assessment Problem followed by the University of Guelph. Dr. Kirsty Laughlin was the coordinator of this year’s competition. Members of the 2004 MSU Animal Welfare Judging Team were: Katie Belsito, junior, Animal Science major; Jodi Crossgrove, junior, Veterinary Technology major; Mike Davison, senior, Zoology major; Becky Lockman, freshman, Animal Science major; Jamie Perry, sophomore, Animal Science major and graduate of the Dairy Management Program; and, Nikki Stamas, junior, Animal Science major. The team was coached by Camie Heleski. Katie Belsito was the high placing individual and Jamie Perry was the reserve high placing individual of this year’s contest.
Helping to Develop the Dairy Industry in Armenia

Phil Durst
Extension Dairy Agent
Northeast Lower Michigan

The Armenian dairy industry is in its infancy and struggling to grow. Armenia, located east of Turkey and north of Iran, is one of the many countries to come out of the Soviet block into a world economy. With the assistance of USDA, the dairy industry in Armenia is developing.

As the Soviet Union began its collapse and through the first several years after independence in 1991, dairy cow numbers in Armenia dropped sharply. Collective farms were broken up and cows were divvied out to all workers whether they knew anything about cows or not. Many cows were slaughtered for meat. Milk production per cow dropped markedly.

In 1992, at the request of Armenian officials, USDA helped establish the Extension Service in Armenia. Since the mid-1990’s dairy cow numbers began to climb as well as milk production per cow. However, dairy was, and still is in many cases, subsistence farming where the cow provides the needs for a family and is not a business.

Part of the reason that dairy was subsistence agriculture was that marketing channels were unavailable for milk as well as other agricultural products. With grants, loans and leasing through the USDA Marketing Assistance Project (MAP), the milk processing industry was gradually developed. Cheese producers were helped to grow, adopt pasteurization, and develop critical quality controls. Milk marketing cooperatives were formed and milk collection centers were established. Marketing support was provided to develop new products, packaging, labels, and market research.

Industry Growth and Status

The Dustr Melanya cheese plant is just one of many, but it serves as a good example of cheese plants assisted by USDA. The company was formed in 1997. They began buying milk from a cooperative. This meant that farmers could sell milk for cash, an option not previously available to them. In that first year Dustr Melanya processed 30 metric tonnes of milk. Their year-end projections are that they will have purchased and processed 1,200 tonnes of milk in 2003. Consider the impact of that on the villages. The milk purchased equates to a value more than $170,000. In addition, the number of employees at the plant grew from 3 in 1997 to 15 in 2003.

The increased cheese volume is principally being exported to Armenian communities in the US and Russia. Russia purchased 77 tonnes of cheese in 2003 while 57 tonnes of Lori cheese were imported by Armenians in the Pasadena, California area.

Through the development of the Armenian dairy industry, economic development is occurring in rural villages and towns, thereby helping a very poor nation to feed themselves.

One of the benchmarks of an industry is whether price responds to supply and demand. Under the Soviet system price was totally separated from supply and demand. However, Artavazd Hakobyan, an economist who served as my translator, presented data that showed prices in the past 2 years have moved inversely to supply. This is good news in the development of an industry.

Recently, Dustr Melanya began offering quality incentives for milk with three price levels. The response of producers to price signals is again a benchmark of industry progress.

Milk collection centers, located in villages, provide a place for people to bring their milk for sale. Using dollies to haul milk cans, or carrying milk in plastic jugs, they come twice a day to deliver milk. The collection stations conduct component and quality testing and keep records of milk delivered. Milk is stored in refrigerated tanks where it is picked up daily or every other day by the cheese plant.

Fluid Milk Market

Cheese is the primary dairy product. Most meals include cheese in one or more forms. The market for fluid milk is small and underdeveloped. It was explained to me that milk is only given to babies and the sick. No flavored products were available.

I was able to buy pasteurized milk in one-liter cartons as well as ultra-high temperature (UHT) pasteurized milk in unrefrigerated cartons of 250 ml and 1 liter sizes. However, the quality and taste of that milk were not good.

One of the continued problems for the Armenian dairy industry is lack of basic quality measuring capacity. They do not test for somatic cells or bacteria counts. The only quality testing done is for acidity level, which has a limited relation to quality.

Dairy Nutrition Help

I served as a USDA consultant to train Armenian professors, Extension personnel, veterinarians, and key producers in dairy nutrition. Cows are traditionally fed a diet of pasture for half the year with wheat straw and barley supplemented. During the winter, meadow hay took the place of grazed forages. The lush pasture growth is limited to June and July. This results in milk production being highly seasonal.

Good supplemental feeding could extend production beyond the end of the grass flush and increase production for months. In late October the mountainsides were sparse and brown. Cows were moved along by shepherds. Water was not often available, and cows walk up to 5 miles a day.

Nutrient needs in the Soviet system were described in terms of feed units where a feed unit was the nutritional equivalent of 1 kg (2.2 lb) of oats. Forage analysis available at the Armenian Agricultural Academy reports moisture, dry
matter, ash, crude fiber, protein, calcium, phosphorus, lipids, and non-nitrogenous material. However, the nutrients are not reported on a dry matter basis.

I presented information on forage quality as defined by neutral-detergent fiber (NDF) and acid-detergent fiber (ADF) and the relation of those factors to cow performance. Encouraging increased dry matter intake and developing rations with nutrient amounts to meet changing needs of cows was taught. The Michigan State Spartan Ration program was used to show the results of specific feed changes in rations. A group of Extension Specialists and Agents were trained to use the Spartan program.

While some individuals were resistant to change, many seemed to be hungry for the information. They will be the leaders of the new dairy industry in Armenia. Demonstration projects in feeding and open-air housing have helped to convince some people of the validity of recommendations from the west.

I was impressed with the effectiveness of USDA-MAP in Armenia where they are working with agricultural enterprises ranging from fruit production, wine and cheese making, meat slaughter, to cow and goat milk production.

Alumni Profile

Where Are They Now? ...A Visit with Jason Fligger

Pam Jahnke
Dept. of Animal Science

When Jason Fligger was studying Animal Science at MSU there is no doubt that he nor his professors, nor his Farm House Fraternity brothers, nor his parents, could imagine that some years later he would be teaching pregnant teenagers how to build a barn in downtown Detroit.

Never mind that Fligger hailed from a rural background, having been raised in Huron County near Bad Axe, working on his uncle’s dairy, beef and cash crop farm during weekends and summers from his childhood through his early twenties. Never mind that he earned his B.S. in Animal Science from MSU in 1991; his M.S. in Animal Science from Purdue University in 1994; and his Ph.D. in Dairy and Animal Science from Penn State University in 1998.

“I was in the process of finding myself when I started at Michigan State. I wanted to go back to the farm. I wanted to milk cows; my parents were dead set against it,” he said.

Fligger Begins His Academic Journey at MSU

At MSU, he worked at the university dairy barn and also in two Animal Science laboratories helping with feed analysis and culturing muscle cells. These experiences eventually led him to Purdue University to study meat science and muscle biology. From there, he went to Penn State and studied the impact of dietary L-arginine supplementation on growth and immune function in newborn calves. Some studies related to his dissertation were performed during a 1-year stay in Switzerland. There, the seed of urban agriculture was planted.

While in Switzerland, Fligger was impressed by how closely linked the urban Swiss were with their rural landscape and their farmers. It was inspiring to see how much the urban residents knew and cared about their rural counterparts and how open the Swiss farmers were in allowing hikers and tourists to enjoy their land.

He was further impressed with a crowd attending a meat-tasting competition at an agricultural experiment station in Switzerland, comparing Swiss beef with beef imported from various other countries, including the U.S. What he found unusual was the interest among the Swiss regarding the meat’s origins and the environment in which it was raised. “This was occurring at the height of the mad cow disease outbreak in Switzerland and from what I observed, the Swiss were trying to understand the problem and wanted to support their farmers,” Fligger said.

Those impressions stayed with Fligger, who returned to Penn State to finish his doctorate. However, Fligger found himself less content with his career path. After receiving his doctorate, he attended a scientific meeting and discussed with a MSU Animal Science professor his growing discontent with laboratory work. The professor advised him: “If you hate data, get out of research.” “I listened”, Fligger said. “I had worked hard and enjoyed my graduate studies, I loved science, while certainly this effort represents a demand for US taxpayer dollars, the extent to which the economy has been developed by Armenians with American help is tremendous and enables that country to develop more self-sufficiency.

Without development of the rural economy, Armenia would be dependent on food and relief assistance on a regular basis. Instability would be common and other powers might seek to exploit that.

Michigan State University’s Involvement

MSU Extension has been involved for almost the entire time that USDA has been in Armenia. Four MSU Extension Agents have served there to help develop expertise among our Armenian counterparts.

MSU and our clientele in Michigan can be proud of this type of effort. It builds bridges, improves lives and livelihoods, and meets critical needs through education. That sounds a lot like our Mission Statement!

References

but I just couldn’t see myself working in a laboratory for the rest of my life”.

An Introduction to Urban Agriculture

Fligger decided to take a temporary job as a laboratory technician at Wayne State University. About 2 weeks after moving to Detroit, an article appeared in the newspaper. The article featured a group of Detroiters known as the Detroit Agriculture Network. With the help of the Hunger Action Coalition of Michigan (a local non-profit anti-hunger/anti-poverty advocacy agency), and Wayne County MSU Extension, this group had established a number of small gardens and two small urban farms to educate young people about agriculture and environmental issues. After 1 year, he was hired for a full-time job as Urban Agriculture Coordinator with the coalition, a position he held for 3 years. Under his leadership, the group secured $200,000 grant funds to create and operate gardening projects, including $23,000 to construct a barn at the Catherine Ferguson Academy, a school for pregnant teenagers. The school is located north of Tiger Stadium in the Briggs neighborhood of Detroit, which has its share of gang violence and drug-related activities. The girls and some of their boyfriends actually dug the footings and built the two-story 24-by-36-foot gambrel-roof barn and painted it bright red. The barn is used to store hay for the school’s horse, dairy goats, rabbits and Holstein steer. The school also has ducks and a flock of laying hens.

Despite the barn’s geographical location, Fligger recalled only one instance of gang-related crime and that occurred when gang members broke into the barn and painted graffiti on the head of an otherwise unhurt white-faced calf.

Overall, Detroiters have been supportive of his agricultural efforts. When he drove a 1960 Ford Diesel Tractor, hauling piles of hay across Woodward Avenue and through the campus of Wayne State University on his way to the academy, many onlookers waved. The coalition was harvesting grass hay from a 6-acre vacant lot (a former school site) on Detroit’s east side to feed the animals housed on the west side. By providing city dwellers insight into agriculture, Fligger hopes more people will get involved with their food system and develop relationships across the urban-rural boundary.

“Sometimes I think our vast space, lack of roots and our high mobility in the U.S. allows us to trash a place and then move on. When you no longer view local farms as an important source of sustenance, when food simply comes from the grocery store and you have no interest in where or how it was produced, only economic parameters govern whether farms in a particular area stay or go.”

To further educate the public, Fligger, believes that exposure to agriculture for all undergraduate students at MSU—not just those studying animal science — would increase the understanding of rural life among city residents. “Why not have one agriculture course be a general education requirement for students?”

“Our (current) attitude is harmful, neither food nor hard manual work are really valued. Although a lot of the kids I worked with are capable of competing academically, for one reason or another, many kids from an impoverished background simply cannot. We need to give more value to manual labor and to encourage them to take these jobs.”

From Urban Farming to Urban Landscaping

Working and residing in the city piqued his interest in urban landscape. Now, Fligger is pursuing a Masters degree in architecture at Lawrence Technological University in Southfield, and he plans to become an architect. He views architecture as a way of connecting to the past and looking to the future the same way he views farming.

He reconnected with his past and completed an ancestral full circle when he and his wife, Joanne, married in the historic Detroit church where his great-grandparents were married. The couple has bought and is in the process of rehabbing a 1929 Arts and Crafts-styled house. Joanne is a chemistry teacher at Wayne County Community College.

Those architectural skills may continue to prove valuable as he and his cousin aspire to design a family farm into an agri-tourism enterprise that will offer relaxing farm stays for families. Fligger envisions building cabins, designing hiking trails, harvesting maple syrup and honey, and having beef cattle pastured on the 160-acre farm located between Bad Axe and Ubly.

Thus, Fligger is on a path that will allow him to meld his love of the farm, Detroit, architecture and science into a package that will provide him and his family with more than a single lifetime of meaningful work.

Editor’s Note: If you know of a MSU animal/dairy-related alumni who you would like to see featured in our column, please e-mail Pam Jahnke at jahnkep@msu.edu and include contact information.

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