Dairy Research, Teaching, and Extension
UNIVERSITY OF DELAWARE

November 2017

DELAWARE DAIRY NEWSLETTER

Delmarva Dairy Day

February 22, 2018

Delmarva Dairy Day returns to Hartly Fire Hall in Hartly, Delaware this year on Thursday February 22, 2018 from 9:30 am- 2:10 pm. This educational program features experts from across the region speaking on current issues facing the industry.

In the morning session, Dr. Billy Smith from Penn Vet New Bolton Center will cover Dairy Hoof Health Care and Management. This unique learning opportunity will also include cadaver hooves from previously lactating cows. Dr. Robert James, Professor Emeritus from Virginia Tech, will discuss Goals for Calf Management: Develop the Calf or Develop the Rumen? What is the Priority? A hot lunch will be served by the Ladies Auxiliary along with UD Creamery ice cream. The afternoon will begin with Dr. Robert James talking about Group Housing Management Systems for Preweaned Calves. What Have we Learned? Rounding out the program will be Dr. Limin Kung from the University of Delaware speaking on Corn Silage Updates.

Participants will have the opportunity to visit with dairy industry vendors throughout the day and the University of Delaware will be offering ice cream manufactured at the UDairy Creamery on campus from milk produced by the UD dairy herd located in Newark.

Program registration is free and open to any producer or industry professional on the eastern shore, however attendees are asked to RSVP to Dan Severson, at (302) 831-2506 or severson@udel.edu by February 6th so that they can be included in the count for setup and lunches. If you have any special needs in accessing this program, please notify Dan two weeks in advance so that your needs can be accommodated.

Manure Gas Dangers

Farm Safety Association Inc.
Woodlawn Road West, Guelph, Ontario

Since the increased use of manure storage facilities in agriculture there have been numerous instances where a farmer, family member, or employee has asphyxiated or succumbed to toxic gases from the storage. Cases have been documented where several individuals have died while attempting to rescue a coworker or family member from an underground pit or a spreader tank.

What toxic gases are present around such storage facilities? The four main gases produced from decomposing manure are Hydrogen Sulfide, Methane, Ammonia, and Carbon Dioxide. In high concentrations, each of these gases may pose a health threat to humans and livestock.

In animal housing facilities, where the manure pit is often located below the facility floor, manure gases are generally detectable in low concentrations throughout the year. When pits are agitated for pumping, some or all of these gases are rapidly released from the manure and may reach toxic levels or displace oxygen, increasing the risk to humans and livestock.

THE PRIMARY HAZARDS OF THESE GASES ARE:

Toxic or poisonous reactions in people or animals, oxygen depletion which can result in asphyxiation and explosions that can occur when oxygen mixes with the gases such as methane.

CHARACTERISTICS OF HYDROGEN SULFIDE (H2S)

Hydrogen sulfide is considered the most dangerous of the byproducts of manure decomposition. It has a distinct rotten egg smell and is heavier than air. After breathing this gas for a short time, your sense of smell becomes fatigued and you can no longer detect an odor.

At low concentrations H2S irritates the eyes and respiratory tract while at moderate levels exposure causes headache, nausea, and dizziness. At high concentrations H2S paralyzes the nerve cells of the nose to the point where the person can no longer smell the gas. Both carbon dioxide and hydrogen sulfide are heavier than air, and will tend to settle to the lower areas of the storage facility and remain in high concentrations even after ventilation.

CHARACTERISTICS OF AMMONIA (NH3)

Ammonia has a distinct, sharp, penetrating odor detectable at very low concentrations. It is heavier than air, and at moderate levels of concentration, it can irritate the eyes and respiratory tract. At high concentrations it can cause ulceration to the eyes and severe irritation to the respiratory tract. Flushing irritated skin or eyes with water is the best first-aid treatment

CHARACTERISTICS OF CARBON DIOXIDE (CO2)

Carbon Dioxide is heavier than air and difficult to detect. It replaces Oxygen in air and acts as an asphyxiate. At moderate concentrations it causes shortness of breath and dizziness.

It is a major contributing factor to animal deaths by asphyxiation in confinement buildings with faulty ventilation. In addition to manure decomposition, carbon dioxide is also a byproduct of livestock respiration.

CHARACTERISTICS OF METHANE (CH4)

Methane is odorless and lighter than air, so it tends to accumulate at the top of manure pits. It is considered an asphyxiate at extremely high concentrations. The main hazard is its flammable, explosive nature. Methane is extremely difficult to detect without gas detection instruments because it is odorless, but it should be anticipated as being present in all manure storage areas.

MANURE STORAGE

Some systems for storing the manure are more dangerous than others. Below ground storage facilities, or pits, are more hazardous than above ground structures. Systems that are covered by lids, caps or slotted floors are more hazardous than uncovered systems. Pump-out pits or caps can also be very hazardous. Leaks from storage structures may also cause significant losses of fish and other aquatic species if near streams or lakes.

- Construct manure storage pits outside confinement buildings, above or below ground, and in a way that gases cannot move back into the building.
- Make sure that pumping equipment can be quickly and easily removed for repairs or adjustment.
- Attach a hinge or chain to covers or lids on storage areas to prevent them from falling into the storage pit.

Covered or enclosed tank facilities present the greatest danger, especially when manure is being agitated or pumped out of the structure. Little gas is produced or accumulates when the manure is still and natural air movement or ventilation from fans prevents gas buildup.

The primary advantages of liquid manure storage facilities are that they make the waste handling process less demanding on your time and allow for applications of manure on croplands at more convenient or appropriate times. In general, there are three types of liquid manure storage systems being used.

a) Large manure storage tanks located directly underneath the livestock housing area.
b) Manure storage located away from the livestock housing areas in open lagoons or ponds.
c) Above ground, silo-type, manure storage structures.

In all three types, the manure is flushed from the livestock housing area with added water and then agitated by various means to form liquid slurry. This slurry is then pumped periodically from the storage area into applicator tank wagons or through irrigation systems for application on crop land as a valuable fertilizer and soil conditioner.

When animal waste of any type is being stored in large quantities, a number of hazards are present for both man and animal. The most obvious hazard is the potential danger of falling into one of the large open storage areas and drowning.

There is also the danger from manure gases, which are produced as the manure is decomposed by bacterial action. During the decomposition process, a variety of gases are released which can be hazardous to both people and livestock.

Knowing the nature of these gases and the effects they might have on you should reduce the potential risk of working around manure storage areas.

In addition to adhering to proper construction and maintenance procedures for liquid manure storage facilities, owners should be encouraged to follow a few precautionary measures to protect both workers and livestock from harmful manure gases.

They are as follows:

- Know the physical effects of the various gases released during manure decomposition. If at any time these effects are detected, it is critically important that both workers and livestock are evacuated from the area or ample ventilation provided.
- Maintain adequate ventilation in all confined areas where livestock are housed or livestock waste is stored. This is especially true if the manure is being agitated, since agitation causes a rapid release of gases. Even with the facility's ventilation system operating, high levels of toxic gases can accumulate quickly. Ventilation recommendations are available from a number of sources.
- If the power fails, open all windows and doors and remove livestock if possible. Many farmers with livestock confinement operations have invested in portable or emergency power generating units to insure livestock housing areas have continuous power for ventilation.

Since a methane/air mixture can be highly explosive, prohibit smoking or other open flames in confined housing or manure storage areas.
Concerning open storage of liquid manure in ponds or lagoons, precautionary measures should also be taken to reduce the risks to people and livestock.

- Manure ponds or lagoons should, if at all possible, be fenced in to prevent access by children or livestock. Open lagoons can appear deceptively solid during warm weather and lure the curious out onto the surface.
- Signs should be posted around the perimeter of the lagoon providing a clear warning of the existing hazards.
- Remind children, visitors and any nonessential workers to stay away from manure pits and transfer/holding tanks, especially during agitation and pumping.
- Do not allow people to enter livestock buildings during agitation and pumping of manure pits under the building floor.

Full respiratory protection, in the form of self-contained breathing units, should be utilized at all times. No one should ever enter a manure storage pit - even to rescue a victim overcome by gases - without a supply of air and assistance from a backup crew using a lifeline.

MANURE STORAGE ENTRY PROCEDURES

- Avoid entering manure storage areas if at all possible. Many deaths have occurred when people entered manure storage areas without proper safety precautions.
- If you must enter a manure storage area, the following confined space entry procedures will minimize, but not eliminate, the risks.

Never enter a manure pit during or just after agitation because there is always the possibility of deadly concentration of this gas. Plumbing and pumping equipment should be installed so that it can be easily removed for repairs.
Before agitation, take steps to ensure the welfare of the animals and people working in the area.

- Remove all people and animals if possible. If animals cannot be removed, maximize ventilation and agitate slurry very slowly at first. Monitor the condition of the animals. If the animals act restless or agitated or abnormal, stop the agitation immediately and ventilate the area.
- Always keep at least one foot of space between the highest manure level and the slats. This protects animals who lie on the slats and inhale the gases that accumulate at the surface of the pit.
- **Do not enter manure pits without either:**
  - ◊ A self-contained air supply like those fire fighters use. (Dust masks or other cartridge respirators will not filter out the toxic gases nor will they provide the oxygen requirement to work in confined spaces such as manure pits.)
  - ◊ **OR** Test before entering. Test the oxygen level to make sure that adequate oxygen is available. Also test for hydrogen sulfide, a particularly toxic gas, to be sure that concentrations are safe (less than 10 ppm).
- Provide additional forced ventilation. Additional ventilation will increase oxygen and decrease hydrogen sulfide and other toxic gases.
- Monitor conditions. Agitation from working can increase the toxic gas levels. Monitor conditions while working.
- When someone collapses in a pit, gases are so concentrated that it is suicidal for anyone else to enter without a self-contained breathing apparatus.
- The only reasonable immediate action is to ventilate the storage area and notify rescue personnel who can bring the proper equipment.
- Barn fans may be activated to provide ventilation, but do not lower fans into the pit because this could cause methane explosion.
- Use a safety line. A worker in a confined space or manure storage area should wear a body harness with a safety line.
- The safety line should be held by enough people and/or a winch so that the worker can be pulled out of the area if a problem develops.
- Wear a supplied air respirator. Never enter a pit without one.

- The person using a respirator should be trained on the use of the mask. It is particularly important that the mask form a tight seal around the face.
- Provide a clear escape path. Make it as easy as possible for the worker to exit the manure storage area quickly. Don't block the path with tools or objects.
- Keep fire away. Methane gas is a byproduct of manure degradation, and it is flammable. Keep fire and other ignition sources such as electrical tools away from the manure storage area. Test the methane level with an explosion meter.
- Know first aid. Someone on the site should be trained in CPR and first aid.
- Recognize that conditions are of greatest risk when manure is agitated or moved. Movement and agitation increase the release of dangerous gases, sometimes several fold. When agitating, pumping, or moving manure, take precautions to be sure that extra ventilation is provided to nearby areas (e.g., buildings over or near the manure storage).

Due to the equipment requirements and inherent risks associated with entering an area where there may be toxic gases or insufficient oxygen, you should consider hiring a professional trained in working in these areas to perform maintenance tasks. If hiring a professional or using a SCBA is not possible, the best advice is to stay out of the pit.

How to Properly Discipline and Terminate Dairy Employees

Paul Goeringer, Extension Legal Specialist
Department of Agricultural and Resource Economics, University of Maryland

Introduction

Once your dairy takes on employees, it is inevitable that at some point you will have to discipline or terminate one of them. Disciplining and terminating, like hiring, requires the employer to keep records. Dairy operators must keep in mind that anti-discrimination laws, public policy, and employment contracts may limit an employer's ability to terminate dairy workers.

Evaluations

One of the most important duties you will have as an employer is to evaluate employee performance. Letting an employee know how he or she is performing can encourage the employee to perform at a high level, and letting the employee know he or she has fallen short can help reinforce expectations. You should attempt to do evaluations in a positive manner, and keep a written record of the evaluations to help document job performance.

Useful tools in handling evaluations will be developing job descriptions for employees and developing an employee handbook with expectations for positions. This provides you and the employee with a reference point to strengths and weaknesses in performing job duties and clearly lays out expectations.

Disciplining

If the evaluation does not improve performance or if the situation necessitates, an employer may need to discipline poorly performing employees before terminating anyone. Letting the employee know early on how his or her performance is inappropriate or inadequate, both verbally and in writing, gives the employee an opportunity to correct unacceptable behavior. If the employee's performance does not improve, then the employer can consider suspending the employee without pay or even termination.

For example, a dairy has an employee, Steve, who is habitually late to work every morning. Pete, the dairy owner, should document that Steve is late and explain to Steve that he cannot arrive late to work anymore. If Steve arrives to work late the next day, then Pete could send Steve home for the day without pay. If Steve arrives late again, then Pete could terminate Steve.

When disciplining an employee, keep written records in the employee's file. Good records on all matters related to your employees will help prove that terminating an employee was warranted.

Discrimination Issues

When terminating an employee, it is important to remember that anti-discrimination laws still apply. State anti-discrimination laws can vary as to classifications (examples: race, sex, religion, etc.) which are protected traits. "Discrimination" is an action that confers "privileges on a certain class or that denies privileges to a certain class because of race, age, sex, nationality, religion, or disability" (Black's Law Dictionary, 2004). The federal Civil Rights Act of 1964 and typically state employment laws will protect against discrimination based on race, color, national origin, age, sex, disability, pregnancy, citizenship, familial status, veteran, genetic information and religion during hiring, employment, and termination.

For the most part, you cannot terminate an employee based on race, age, sex, disability, and religion. This is why documentation and being consistent in disciplinary actions are important and help to verify you are terminating an employee for reasons other than discrimination. For example, Pete could not terminate Steve based on his race, but Pete could terminate Steve for violating the terms of employment.

Contract vs. At-Will Employment

When terminating an employee, the next issue to consider is at-will employment versus contract employment. At-will employment is employment usually "undertaken without a contract and that may be terminated at any time, by either the employer or the employee, without cause" (*Black's Law Dictionary*, 2004). At-will employment is the default rule in all 50 states except Montana. At-will employment is just what it means: at the will of the employee or the employer. One exception to the rule of at-will employment is termination for a discriminatory purpose. As discussed earlier, you may not terminate at-will employees for a discriminatory purpose. You may terminate an at-will employee for any reason but his or her race, color, national origin, age, sex, disability, pregnancy, citizenship, familial status, veteran, genetic information and religion.

Another exception to the at-will rule would be when termination violates public policy (such as performing an action supported by public policy or refusing to do something which violates public policy). For example, an employee, Marcia, videotapes Steve, another employee, abusing dairy cattle during milking, and turns that video over to local law enforcement. The dairy operator promptly fires both Marcia and Steve. Terminating Marcia may violate public policy since many states have animal welfare statutes.

Another exception is termination which violates the terms of the employment contract. If you use an employment contract when hiring an employee, this contract can potentially limit when you can discharge employees. Employment contracts can be useful in retaining valued dairy employees, such as a farm manager, but you need to keep in mind that your ability to terminate those employees will be limited. If the employment contract states, for example, that an employee can only be fired for violations of the contract, then that employee cannot be terminated for any reason other than violations of the employment contract.

Terminating the Employee

We have probably all heard Donald Trump utter the words, "You're fired!" on *The Apprentice* at some point. Trump may have made termination seem easier than it actually is for some employers. As you are seeing, properly terminating an employee is not always as simple as saying "you're fired."

After you have documented the problems with an employee, and given the employee an opportunity to correct the problems, then you can consider termination. You should terminate the employee in a way that will not cause embarrassment or distractions. Be clear with the employee as to why he or she is being terminated.

Once terminated, the employee will be entitled to unpaid wages and retaining unpaid wages is illegal in a majority of states. Although you may want to retain those wages, doing so is never advisable. If the employee having damaged

equipment, buildings, etc. is a reason for his or her termination, then consult an attorney on how best to collect damages. The other issue to consider is vacation and other accrued leave. Many states have laws requiring you to pay the terminated employee for unused leave unless the company has a policy or a contract term which does not require paying for unused leave. While many hourly employees on your dairies may not earn leave, this can be an issue if the terminated employee is a manager.

You also need to take steps to get property returned to you. If the terminated employee has company equipment such as a phone or truck, it is important to regain possession of these items at the time of termination. Remove the employee from any bank accounts he or she may have signing authority on. Have the employee return any keys. Change any passwords for bank accounts and/or social media accounts to which the employee may have had access. Doing this will restrict the terminated employee's ability to retaliate. Do you want to see your social media accounts showing statements against you or your family? Do you want to be locked out of bank accounts? Taking steps to protect your dairy when terminating employees can save you trouble down the road.

Special Note on Housing

Many of you may allow an employee to live in a house/trailer/living quarters located on the farm. Often little attention is paid to the employee's status while using the housing and this can lead to an issue when terminating the employee. With employee housing on the farm, consider talking to an attorney and an accountant on the proper way to set up the arrangement to save yourself problems if you have to terminate the employee. Getting the proper agreements early on can help save you heartache down the road.

If the housing is considered a part of employment, this may lead to problems, such as the cost of the housing being calculated as a part of the employee's wages and increasing overtime pay. When terminating the employee, contact an attorney to make sure the proper process is followed in evicting the former employee from the dairy's housing. This process may not always be as quick and painless as you hope it would be.

The other option is to treat the employee as a tenant who pays rent for a set period. Treating the employee as a tenant could cause issues when terminating the employee, you would need to follow state law to evict the employee, which could take anywhere from 30 to 90 days.

Bottom Line

Terminating an employee is not a simple process and may not be something you ever grow comfortable doing. You need to keep records showing how you evaluated employee performance and how you disciplined poorly performing employees. Doing this will help limit claims that the termination was for a discriminatory reason. If it becomes necessary to terminate an employee, remember to pay them for any unpaid wages and unpaid leave (depending on company policy and your state), get keys and equipment returned to you, and change all applicable employee passwords.

Herman "Hap" Wallace Cook, Jr.

The extended Delaware Dairy family lost a keystone member earlier this fall. Herman Wallace Cook, Jr., known affectionately by most as Hap, passed away on Wednesday, September 20, 2017 at the age of 83 after a short illness. Born in 1934, he was the son of the late Frances and Herman Wallace Cook, Sr. and the owner and operator of H.W. Cook and Sons, a more than century old family dairy operation in Newark, Delaware. He came home from the hospital as an infant to the same home in which he later raised his own family.

Hap was a 1952 graduate of Middletown High School. He graduated from the University of Delaware in 1956 where he played lacrosse, ran cross-country and was the radio host of the UD Farm and Home News Hour. He was a Chester County, PA 4-H Extension Agent prior to coming home to the family farm in 1958 and continued his close association with the 4-H program throughout his life.

Hap gave of his time to his community and was a member of many local agriculture organizations including Pencader 4-H Club, Delaware Farm Bureau, Delaware State Grange, Delaware Holstein Association and Farm Service Agency.

He was a past director of Atlantic Dairy Cooperative, Land O' Lakes Cooperative, Delaware Farm Credit, the National Dairy Board and a 40 year director of the Delaware State Fair. He was also a past member of the Appoquinimink School Board. He also retired as a major in the Delaware National Guard after 20 years of service.

His accolades were many including 1967 Delaware Outstanding Young Farmer, 2007 recipient of the University of Delaware George Worrilow Award, 2014 Century Farm Award Winner and 2014 Delaware 4-H Hall of Fame.

Hap was an avid supporter of 4-H and FFA and the Delaware Junior Dairy Leasing program, offering the opportunity for many youth to experience the learning that occurs when caring for and exhibiting a dairy animal and creating friends of the agricultural industry in the process. He enjoyed following the 4-H and FFA activities of his children and grandchildren, the fourth generations of Cook's to have a close association with the youth development program and Cooperative Extension at the University of Delaware. The H.W. Cook and Sons family farm has also provided hands on learning opportunities for the UD College of Agriculture and Natural Resources Animal Science club students for many years.

Active and involved in his farming operation until his passing, Hap was well known for being dedicated, hard-working and loving his farm and chosen way of life. He had high expectations for himself as well as his family members, employees and acquaintances. He was quick to smile and laugh, always with a mischievous twinkle in his eye. He loved his family dearly and if you stopped to talk to him, it wouldn't take long before he would proudly share the recent achievements of his family members.

Hap is survived by his wife of 59 years, Martha Gruwell Cook, his sons Herman W. Cook III (Jayne), Stephen (Rhonda), daughters Betsy Morris (Richard), Linda Somers (Brian), his grandchildren Jordan Cook (Kristen), Caitlin Perdue (Roger), Jenna Morris (Joshua), Tara Yerkes (Brandon), Jason Morris, Benjamin and Sara Somers, Mindy and Madison Cook, six great-grandchildren, nieces and nephews. He was predeceased by his brother, Major General Boyd M. Cook, his sister Caroline C. Hisey and nephew, Wallace Hisey.

Contributions in Hap's memory may be given to the Delaware 4-H Foundation to support youth dairy programs: 531 South College Avenue 113 Townsend Hall, Newark, DE 19716.

Department of Animal & Food Sciences
Cooperative Extension
University of Delaware
Newark, DE 19716

Contacts:
Dan Severson, Agriculture Agent:
302-831-8860
severson@udel.edu

Limin Kung, Jr., Professor:
302-831-2524
lksilage@udel.edu

We're on the Web!
Dairy Research - http://bit.ly/29eoVZb
Department of Anim. & Food Sci. - http://ag.udel.edu/anfs
UD Animal Science Extension Blog—http://extension.udel.edu/animalscienceblog/
UD Creamery - http://ag.udel.edu/creamery
UD Dairy Publication Resources - http://bit.ly/29nIcLv
twitter @DanSeversonUD

College of Agriculture and Natural Resources
Department of Animal and Food Sciences
531 S. College Avenue
044 Townsend Hall
Newark, DE 19716