

MINUTES OF BOARD OF HEALTH MEETING
March 2, 2011

Meeting was called to order by Chair Kraft at 6:00 p.m.

Board of Health Members Present: Chair Kraft, Supervisor Peer, Supervisor Bostwick (left at 7:00 p.m.), Dr. Winter, Dr. Peterson, Dr. Best, Ms. Wade, and Mr. Rooney.

Board of Health Members Absent: Supervisor Thompson.

Staff Members Present: Karen Cain – Health Officer; Janet Zoellner – Nursing Director; Tim Banwell – Environmental Health Director; Sancee Siebold – Nursing Supervisor South Office; Deborah Erickson – Nursing Supervisor North Office; Rick Wietersen – Ground Water Program Manager; and Geri Waugh – Account Clerk.

Others Present: Tom Boswell, Ron Noe, Tony Ends, and Cathy Monahan.

Adopt Agenda

Supervisor Bostwick made a motion to approve the agenda. Dr. Winter seconded the motion. MOTION APPROVED.

Approval of Minutes 1/5/11

Chair Kraft stated she had a question about the minutes. Page 2, under Health Department Report, third paragraph 'Books for Babies'. Chair Kraft thought the dollar amount awarded by Alliant Energy was \$1,000, not \$2,000 as stated in the minutes. Ms. Cain stated that \$1,000 is the correct amount of the grant.

Dr. Winter made a motion to approve the minutes of the 1/5/11 Board of Health meeting as amended. Supervisor Peer seconded the motion. MOTION APPROVED.

Citizen Participation

Todd Tuls, a Nebraska dairyman, has requested the necessary permits to build a CAFO for 5,200 dairy cows in Bradford Township, Rock County. Tom Boswell spoke to the Board of Health on behalf of the Friends of Rock Prairie. Mr. Boswell stated they oppose CAFO's (Concentrated Animal Feeding Operations) because of the detrimental effects these operations can have on the health and wellbeing of the community. Ron Noe and Tony Ends also spoke to the Board members regarding their concerns about this CAFO being located in Rock County. They submitted reports to the Board members in support of their concerns. These reports are enclosed with the meeting minutes.

Unfinished Business

None at this time.

New Business

Administrative Division

Approval of Bills/Transfer of Funds

Ms. Wade made a motion to approve the bills for the month of February, 2011 in the amount of \$5,234.56; and bills for the Radon Screening Balance Sheet account in the amount of \$616.75. Supervisor Bostwick seconded the motion. MOTION APPROVED.

There is no transfer of funds this month.

Health Department Report

Consortium funds: Ms. Cain reported that Rock County Health Department will soon be receiving nearly \$25,000 in consortium funds that are being distributed to members of Consortium #10 after the consortium was dissolved.

CDC Infrastructure Money: The health department will be receiving \$3,000 in CDC Infrastructure money to assess our readiness to apply for certification. Health Departments are being encouraged to apply for certification through PHAB (Public Health Accreditation Board), an organization funded by the CDC and Robert Wood Johnson Foundation. PHAB is dedicated to promoting and protecting the health of the public by advancing the quality and performance of public health departments. PHAB also works in pursuit of creating a high-performing public health system that will make the United States a healthier nation. In the future, levels of federal grant funding may be contingent on certification.

Overpayment from Medical Assistance: Ms. Cain stated that Wisconsin Medical Assistance had notified Rock County that the health department had been overpaid by \$150,000 in previous years. Per Phil Boutwell, the repayment will come out of the county's general fund.

Food Operator Training: Ms. Cain reported that the health department's Environmental Health staff held food operator training sessions recently in both Janesville and Beloit. The response from the attendees at these sessions was very favorable.

Posting of Restaurant Scores: Ms. Cain stated that Tim Banwell will be meeting with the Tavern League and the Restaurant Association in the near future concerning the posting of restaurant scores on the health department website, and he will bring the results of these meetings to the Board of Health.

Private Sewage Program: Ms. Cain stated there are 4 private septic systems in Rock County that are failing, and Rick Jacobson has been working with the owners of the properties to try to reach a resolution. The health department would like to add the septic maintenance fee to the property tax bill for \$5.00 per year. There also is some thought to adding an extra \$1.00 fee for a special fund to help property owners who can't afford to repair/replace their septic systems when they fail.

Well Abandonment Program: Ms. Cain reported that a private well in Avon Township needs to be abandoned. The property owner lives in Illinois, and Tim Banwell has contacted the owner to inform them of the need for the well abandonment.

Prescription Drug Roundup: Ms. Cain stated Edgerton is now working toward having a 24/7 drop-off site for old, unneeded prescription drugs; the cities of Janesville and Beloit are also interested in establishing 24/7 drop-off sites. The next community prescription drug collections will be:

Saturday, April 30, 2011
10:00 a.m. – 2:00 p.m.
at these locations:

Janesville Water Utility
123 E. Delavan Drive
Janesville

Beloit Water Utility
2400 Springbrook Court
Beloit

Edgerton City Garage
315 W. High Street
Edgerton

Bring In:

- * Old Pills
- * Vet/Pet Drugs
- * Medical Patches/Creams

Can't Accept

- * Sharps/Needles
- * Chemo/Radioactive Drugs
- * Other Non-Prescription Waste

Open to all households in Rock County (Businesses excluded)

- * Free of charge
- * Drive-thru drop-off
- * No pre-registration
- * Strictly confidential
- * Keep pills in original containers

These collections are being held the same day as the National Drug Enforcement Agency (DEA) effort. A benefit of having these collections on the same day is that the DEA will take care of the disposal costs for the items collected on April 30th.

Monthly Newspaper Health Topic: Ms. Cain stated that the department's health educator, Laura Fadrowski, has been writing a monthly health topic column for Rock County newspapers.

Community Health Needs Assessment: Ms. Cain reported she will be meeting with representatives from the 4 hospitals in Rock County on March 11, 2011 to discuss a collaborative effort concerning the Community Health Needs Assessment required of all hospitals every 3 years. This is a new requirement under the Health Care Reform Act.

2010 Annual Report: Ms. Cain stated she and health department staff are currently working on the 2010 Health Department Annual Report, and hope to have it ready for the Board of Health's review at the April 6, 2011 Board of Health meeting.

Resolution – Accepting Alliant Energy Foundation Community Grant and Amending the 2011 Rock County Health Department Budget

NOW, THEREFORE BE IT RESOLVED, that the Rock County Board of Supervisors duly assembled on this _____ day of _____, 2011 does hereby authorize the Rock County Health Department to accept this \$1,000 Community Grant from the Alliant Energy Foundation and amend the 2011 Rock County Health Department Budget as follows:

<u>Account/Description</u>	<u>Budget</u>	<u>Increase</u>	<u>Amended</u>
<u>Source of Funds</u>	<u>1/10/11</u>	<u>(Decrease)</u>	<u>Budget</u>
31-3000-0000-46000			
Health Department Contributions	-0-	\$1,000	\$1,000
<u>Use of Funds</u>			
31-3000-0000-64904			
Health Department Sundry Expense	-0-	\$1,000	\$1,000

Dr. Peterson made a motion to approve the resolution. Dr. Winter seconded the motion. MOTION APPROVED.

Resolution – Accepting Prescription Drug Collection Grant and Amending the 2011 Rock County Health Department Budget

NOW, THEREFORE BE IT RESOLVED, that the Rock County Board of Supervisors duly assembled on this _____ day of _____, 2011 does hereby authorize the Rock County Health Department to accept the Prescription Drug Collection Grant in the amount of \$6,225 from the Wisconsin Department of Agriculture, Trade and Consumer Protection, and amend the 2011 Rock County Health Department Budget as follows:

<u>Account/Description</u>	<u>Budget</u>	<u>Increase</u>	<u>Amended</u>
<u>Source of Funds</u>	<u>1/11/11</u>	<u>(Decrease)</u>	<u>Budget</u>
31-3000-0000-42200			
State Aid	\$21,260	\$6,225	\$27,485
<u>Use of Funds</u>			
31-3000-0000-64900			
Other Supplies and Expense	\$8,500	\$6,225	\$14,725

Supervisor Peer made a motion to approve the resolution. Dr. Best seconded the motion. MOTION APPROVED.

Environmental Health

Local Emergency Response Planning

Rick Wietersen, Ground Water Program Manager, gave a presentation to the Board members on the Prevention Block Grant that looked at identifying Sensitive Populations that may require special attention during a hazardous chemical incident.

Rock County Health Department staff update emergency plans each year for local farms and companies that store hazardous chemicals onsite. These plans are then used by emergency responders in the event of a hazardous chemical spill. For each farm or company that stores these hazardous chemicals, there is a vulnerability zone in the surrounding area adjacent to where the chemicals are stored. Sensitive populations in these vulnerability zones include: nursing homes, schools, day cares, and hospitals.

2011 Project Goals for the Prevention Block Grant:

1. Define Sensitive Populations not living at ‘facilities’
 - Home Health Care Agencies
 - Life Line
 - Rock County Specialized Transit
 - Meals on Wheels
 - Social Worker clients
2. Develop a Contact List for this population
 - Phone call-in system?
 - E-mail sign-up
 - Agency Lists
3. Investigate methods to make contact in an Emergency
 - Reverse 911
 - Automated Phone Tree System
 - Volunteer List Calling
4. Update Vulnerability Zones
5. Update Existing Sensitive Population Databases

Public Health Nursing

Home Visiting Network Roadmap for Rock County

Ms. Zoellner stated the mission of the Rock County Home Visit Network is to increase community capacity, to empower Rock County families to achieve wellbeing, social competence and connectedness.

Agencies included in this network are:

Rock County Health Department
 (608)757-5440 or (608)364-2010
 Support and home visitation to families from pregnancy through infancy
 Home visits for elimination of safety hazards
 Resource and referral services
 Agency & community immunization clinics

Exchange Family Resource Center
 Children’s Service Society of WI (608)314-9006
 In-home Parent Education
 Developmental Screenings
 Information and Referral
 Playgroups, Workshops, Family Events
 Parenting classes
 Lending Library

Supportive Parenting Program
 Catholic Charities (608)752-4993
 Information & assistance for parents who struggle due to a developmental disability
 Daily living skills
 Case Management
 Access resources
 Budgeting

Positive Parenting Program
 Lutheran Social Services (608)752-7660
 Parent education & support topics including:
 Communication
 Family rules
 Stress & anger
 Expectations

Family Skills/Reuniting Families

Rock County Human Services Department
(608)757-5124

Family Skills Specialists provide support and Education to help parents keep their children safe and to gain family self-sufficiency.

Time for Parents

University of Wisconsin Extension
(608)363-6272

Parent Educators share proven 'how-to's' on:
Giving up the bottle, Tantrums, Bedtime battles,
Toilet training, Breastfeeding, Saying 'no',
Good eating habits, Accessing resources,
Budgeting.

Teen Parent Connections

Community Action, Inc. (608)364-9884
Support for pregnant or parenting teens in Beloit

Birth to 3 CESA 2 TLC

Therapeutic Learning Center (608)756-3147
Early intervention & support for infants & toddlers
with developmental delays & disabilities:
Assessments, Individualized service,
Family involvement, Team-based decisions,
Info & Referral, Community activities

Janesville Even Start Family Literacy (608)757-7620

Parents & children learn together:
Adult Education (GED/HSED or learn English)
Early Childhood Education
Parenting Information
Interactive Literacy Activities

Beloit Even Start Family Literacy (608)361-4146

Parents & children learn together:
Adult English language classes
Information on job seeking & parenting

Head Start/Early Head Start

Rock-Walworth Comprehensive Family Services (608)299-1500

Serving pregnant mothers, infants and toddlers

Early Head Start: Wrap around center & Home based education,
health/mental health, nutrition, parent involvement,
special needs, family services & respite care.

Head Start: Center-based education for children, socialization, parent
involvement, health/nutrition, special needs, transportation,
and family services.

Communications and Announcements

Ms. Cain stated the Board of Health terms of service for the non-County Board Supervisors expire in April, 2011. She asked those Board of Health members to let her know if they will accept reappointment for another two-year term.

Adjournment

Dr. Peterson made a motion to adjourn the meeting. Dr. Best seconded the motion. MOTION APPROVED.
Meeting adjourned at 7:45 p.m.

Respectfully submitted,

Geri Waugh, Recorder

Not Official Until Approved by the Board of Health

Comments for Rock County Board of Health – 3/2/11
Presented by Tom Boswell, Friends of Rock Prairie

We have no quarrel with family farms. Friends of Rock Prairie wants to promote & protect our family farms. But we are not talking about family farms; we are not even talking about farms.

A CAFO is a special type of industrial-scale agricultural facility, not a farm! It stands for *Concentrated Animal Feeding Operation*, first identified as a source of pollution in the 1972 Clean Water Act, and defined by the EPA in 1976 as requiring a waste discharge permit.

A CAFO has 1,000 “animal units” (not animals), equal to 700 or more dairy cows. It is not a farm!

The main problem with CAFOs, plain & simple, is too much manure produced in too small an area, with no place to put it all. It is a serious health threat. An average cow produces as much waste as 20 humans, so this facility of 5,200 dairy cows will generate waste equal to 104,000 people. That’s 3,500 more than the combined population of Janesville & Beloit.

Rock County experiences the highest level of nitrate pollution of wells in the state, with studies recording from 32 to 46 percent of private wells exceeding safe levels of nitrates (10 ppm). Microbes break down ammonia and nitrogen in manure into nitrate, which prevents red blood cells from carrying oxygen.

High nitrate levels in drinking water are particularly harmful to infants, potentially leading to blue baby syndrome and death. Studies have linked long-term ingestion of nitrates to certain forms of cancer in adults and diabetes in children.

CAFOs also impact air quality in all sorts of ways. CAFOs can produce over 160 volatile organic compounds (VOCs) and gases, most notably ammonia, hydrogen sulfide, methane and particulate matter.

Children take in 20 to 50 % more air than adults, making them more susceptible to lung disease & other health effects. Research has shown that the closer children live to factory farms, the greater their risk of asthma. CAFOs emit particulate matter & suspended dust, which is linked to asthma and bronchitis.

CAFOs also emit greenhouse gases and thus contribute to climate change. While carbon dioxide is often considered the primary greenhouse gas, manure emits methane and nitrous oxide, which are 23 and 300 times more potent as greenhouse gases than carbon dioxide.

The odors that CAFOs emit are a complex mixture of ammonia, hydrogen sulfide and carbon dioxide, as well as volatile and semi-volatile organic compounds. CAFO odors can be smelled up to 5 or 6 miles from the site, although 3 miles is the common distance. This odor can cause negative mood states such as tension, depression and anger, as well as other neurological problems such as impaired balance or memory.

Manure generated by a CAFO is also a major source of pathogens that can cause disease or infections in animals or humans. There are over 150 pathogens in manure that can impact human health. They can cause severe diarrhea, and people with weakened immune systems are at increased risk for severe illness or death.

There is strong evidence that the high use of antibiotics in animal feed is contributing to an increase in antibiotic-resistant microbes and causing antibiotics to be less effective for humans. 70% of all antibiotics & related drugs used in the US each year are given to cattle, hogs & chickens. If manure pollutes a water system, antibiotics can also leach into groundwater or surface water. In 2001, the American Medical Association approved a resolution to ban all low-level use of antibiotics.

**Understanding
Concentrated Animal Feeding Operations
and Their Impact on Communities**

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soil with macronutrients like nitrogen and phosphorous and micronutrients that have been added to animal feed like heavy metals (Burkholder et al., 2007). Other manure management strategies include pumping liquefied manure onto spray fields, trucking it off-site, or storing it until it can be used or treated. Manure can be stored in deep pits under the buildings that hold animals, in clay or concrete pits, treatment lagoons, or holding ponds.

Animal feeding operations are developing in close proximity in some states, and fields where manure is applied have become clustered. When manure is applied too frequently or in too large a quantity to an area, nutrients overwhelm the absorptive capacity of the soil, and either run off or are leached into the groundwater. Storage units can break or become faulty, or rainwater can cause holding lagoons to overflow. While CAFOs are required to have permits that limit the levels of manure discharge, handling the large amounts of manure inevitably causes accidental releases which have the ability to potentially impact humans.

The increased clustering and growth of CAFOs has led to growing environmental problems in many communities. The excess production of manure and problems with storage or manure management can affect ground and surface water quality. Emissions from degrading manure and livestock digestive processes produce air pollutants that often affect ambient air quality in communities surrounding CAFOs. CAFOs can also be the source of greenhouse gases, which contribute to global climate change.

All of the environmental problems with CAFOs have direct impact on human health and welfare for communities that contain large industrial farms. As the following sections demonstrate, human health can suffer because of contaminated air and degraded water quality, or from diseases spread from farms. Quality of life can suffer because of odors or insect vectors surrounding farms, and property values can drop, affecting the financial stability of a community. One study found that 82.8% of those living near and 89.5% of those living far from CAFOs believed that their property values decreased, and 92.2% of those living near and 78.9% of those living far from CAFOs believed the odor from manure was a problem. The study found that real estate values had not dropped and odor infestations were not validated by local governmental staff in the areas. However, the concerns show that CAFOs remain contentious in communities (Schmalzried and Fallon, 2007). CAFOs are an excellent example of how environmental problems can directly impact human and community well-being.

Groundwater

Groundwater can be contaminated by CAFOs through runoff from land application of manure, leaching from manure that has been improperly spread on land, or through leaks or breaks in storage or containment units. The EPA's 2000 National Water Quality Inventory found that 29 states specifically identified animal feeding operations, not just concentrated animal feeding operations, as contributing to water quality impairment (Congressional Research Service, 2008). A study of private water wells in Idaho detected levels of veterinary antibiotics, as well as elevated levels of nitrates (Batt, Snow, & Alga, 2006). Groundwater is a major source of drinking water in the United States. The EPA estimates that 53% of the population relies on groundwater for drinking water, often at much higher rates in rural areas (EPA, 2004). Unlike surface water, groundwater contamination sources are more difficult to monitor. The extent and source of contamination are often harder to pinpoint in groundwater than surface water contamination. Regular testing of household water wells for total and fecal coliform bacteria is a crucial element in monitoring groundwater quality, and can be the first step in discovering contamination issues related to CAFO discharge. Groundwater contamination can also affect surface water (Spellman &

Whiting, 2007). Contaminated groundwater can move laterally and eventually enter surface water, such as rivers or streams.

When groundwater is contaminated by pathogenic organisms, a serious threat to drinking water can occur. Pathogens survive longer in groundwater than surface water due to lower temperatures and protection from the sun. Even if the contamination appears to be a single episode, viruses could become attached to sediment near groundwater and continue to leach slowly into groundwater. One pollution event by a CAFO could become a lingering source of viral contamination for groundwater (EPA, 2005).

Groundwater can still be at risk for contamination after a CAFO has closed and its lagoons are empty. When given increased air exposure, ammonia in soil transforms into nitrates. Nitrates are highly mobile in soil, and will reach groundwater quicker than ammonia. It can be dangerous to ignore contaminated soil. The amount of pollution found in groundwater after contamination depends on the proximity of the aquifer to the CAFO, the size of the CAFO, whether storage units or pits are lined, the type of subsoil, and the depth of the groundwater.

If a CAFO has contaminated a water system, community members should be concerned about nitrates and nitrate poisoning. Elevated nitrates in drinking water can be especially harmful to infants, leading to blue baby syndrome and possible death. Nitrates oxidize iron in hemoglobin in red blood cells to methemoglobin. Most people convert methemoglobin back to hemoglobin fairly quickly, but infants do not convert back as fast. This hinders the ability of the infant's blood to carry oxygen, leading to a blue or purple appearance in affected infants. However, infants are not the only ones who can be affected by excess nitrates in water. Low blood oxygen in adults can lead to birth defects, miscarriages, and poor general health. Nitrates have also been speculated to be linked to higher rates of stomach and esophageal cancer (Bowman, Mueller, & Smith, 2000). In general, private water wells are at higher risk of nitrate contamination than public water supplies.

Surface Water

The agriculture sector, including CAFOs, is the leading contributor of pollutants to lakes, rivers, and reservoirs. It has been found that states with high concentrations of CAFOs experience on average 20 to 30 serious water quality problems per year as a result of manure management problems (EPA, 2001). This pollution can be caused by surface discharges or other types of discharges. Surface discharges can be caused by heavy storms or floods that cause storage lagoons to overflow, running off into nearby bodies of water. Pollutants can also travel over land or through surface drainage systems to nearby bodies of water, be discharged through manmade ditches or flushing systems found in CAFOs, or come into contact with surface water that passes directly through the farming area. Soil erosion can contribute to water pollution, as some pollutants can bond to eroded soil and travel to watersheds (EPA, 2001). Other types of discharges occur when pollutants travel to surface water through other mediums, such as groundwater or air.

Contamination in surface water can cause nitrates and other nutrients to build up. Ammonia is often found in surface waters surrounding CAFOs. Ammonia causes oxygen depletion from water, which itself can kill aquatic life. Ammonia also converts into nitrates, which can cause nutrient overloads in surface waters (EPA, 1998). Excessive nutrient concentrations, such as nitrogen or phosphorus, can lead to eutrophication and make water inhabitable to fish or indigenous aquatic life (Sierra Club Michigan Chapter, n.d.). Nutrient over-enrichment causes algal blooms, or a rapid increase of algae growth in an aquatic environment (Science Daily, n.d.). Algal blooms can cause a spiral of environmental problems to an aquatic system. Large groups of algae can block sunlight from underwater plant life, which are

habitats for much aquatic life. When algae growth increases in surface water, it can also dominate other resources and cause plants to die. The dead plants provide fuel for bacteria to grow and increased bacteria use more of the water's oxygen supply. Oxygen depletion once again causes indigenous aquatic life to die. Some algal blooms can contain toxic algae and other microorganisms, including *Pfiesteria*, which has caused large fish kills in North Carolina, Maryland, and the Chesapeake Bay area (Spellman & Whiting, 2007). Eutrophication can cause serious problems in surface waters and disrupt the ecological balance.

Water tests have also uncovered hormones in surface waters around CAFOs (Burkholder et al., 2007). Studies show that these hormones alter the reproductive habits of aquatic species living in these waters, including a significant decrease in the fertility of female fish. CAFO runoff can also lead to the presence of fecal bacteria or pathogens in surface water. One study showed that protozoa such as *Cryptosporidium parvum* and *Giardia* were found in over 80% of surface water sites tested (Spellman & Whiting, 2007). Fecal bacteria pollution in water from manure land application is also responsible for many beach closures and shellfish restrictions.

Air Quality

In addition to polluting ground and surface water, CAFOs also contribute to the reduction of air quality in areas surrounding industrial farms. Animal feeding operations produce several types of air emissions, including gaseous and particulate substances, and CAFOs produce even more emissions due to their size. The primary cause of gaseous emissions is the decomposition of animal manure, while particulate substances are caused by the movement of animals. The type, amount, and rate of emissions created depends on what state the manure is in (solid, slurry, or liquid), and how it is treated or contained after it is excreted. Sometimes manure is "stabilized" in anaerobic lagoons, which reduces volatile solids and controls odor before land application.

The most typical pollutants found in air surrounding CAFOs are ammonia, hydrogen sulfide, methane, and particulate matter, all of which have varying human health risks. Table 1 on page 6 provides information on these pollutants.

Most manure produced by CAFOs is applied to land eventually and this land application can result in air emissions (Merkel, 2002). The primary cause of emission through land application is the volatilization of ammonia when the manure is applied to land. However, nitrous oxide is also created when nitrogen that has been applied to land undergoes nitrification and denitrification. Emissions caused by land application occur in two phases: one immediately following land application and one that occurs later and over a longer period as substances in the soil break down. Land application is not the only way CAFOs can emit harmful air emissions—ventilation systems in CAFO buildings can also release dangerous contaminants. A study by Iowa State University, which was a result of a lawsuit settlement between the Sierra Club and Tyson Chicken, found that two chicken houses in western Kentucky emitted over 10 tons of ammonia in the year they were monitored (Burns et al., 2007).

Most studies that examine the health effects of CAFO air emissions focus on farm workers, however some have studied the effect on area schools and children. While all community members are at risk from lowered air quality, children take in 20-50% more air than adults, making them more susceptible to lung disease and health effects (Kleinman, 2000). Researchers in North Carolina found that the closer children live to a CAFO, the greater the risk of asthma symptoms (Barrett, 2006). Of the 226 schools that were included in the study, 26% stated that there were noticeable odors from CAFOs outdoors, while 8% stated

Table 1 Typical pollutants found in air surrounding CAFOs.

CAFO Emissions	Source	Traits	Health Risks
Ammonia	Formed when microbes decompose undigested organic nitrogen compounds in manure	Colorless, sharp pungent odor	Respiratory irritant, chemical burns to the respiratory tract, skin, and eyes, severe cough, chronic lung disease
Hydrogen Sulfide	Anaerobic bacterial decomposition of protein and other sulfur containing organic matter	Odor of rotten eggs	Inflammation of the moist membranes of eye and respiratory tract, olfactory neuron loss, death
Methane	Microbial degradation of organic matter under anaerobic conditions	Colorless, odorless, highly flammable	No health risks. Is a greenhouse gas and contributes to climate change.
Particulate Matter	Feed, bedding materials, dry manure, unpaved soil surfaces, animal dander, poultry feathers	Comprised of fecal matter, feed materials, pollen, bacteria, fungi, skin cells, silicates	Chronic bronchitis, chronic respiratory symptoms, declines in lung function, organic dust toxic syndrome

they experience odors from CAFOs inside the schools. Schools that were closer to CAFOs were often attended by students of lower socioeconomic status (Mirabelli, Wing, Marshall, & Wilcosky, 2006).

There is consistent evidence suggesting that factory farms increase asthma in neighboring communities, as indicated by children having higher rates of asthma (Sigurdarson & Kline, 2006; Mirabelli et al., 2006). CAFOs emit particulate matter and suspended dust, which is linked to asthma and bronchitis. Smaller particles can actually be absorbed by the body and can have systemic effects, including cardiac arrest. If people are exposed to particulate matter over a long time, it can lead to decreased lung function (Michigan Department of Environmental Quality [MDEQ] Toxics Steering Group [TSG], 2006). CAFOs also emit ammonia, which is rapidly absorbed by the upper airways in the body. This can cause severe coughing and mucous build-up, and if severe enough, scarring of the airways. Particulate matter may lead to more severe health consequences for those exposed by their occupation. Farm workers can develop acute and chronic bronchitis, chronic obstructive airways disease, and interstitial lung disease. Repeated exposure to CAFO emissions can increase the likelihood of respiratory diseases. Occupational asthma, acute and chronic bronchitis, and organic dust toxic syndrome can be as high as 30% in factory farm workers

(Horrigan, Lawrence, & Walker, 2002). Other health effects of CAFO air emissions can be headaches, respiratory problems, eye irritation, nausea, weakness, and chest tightness.

There is evidence that CAFOs affect the ambient air quality of a community. There are three laws that potentially govern CAFO air emissions—the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund Act), the Emergency Planning & Community Right to Know Act (EPCRA), and the Clean Air Act (CAA). However, the EPA passed a rule that exempts all CAFOs from reporting emissions under CERCLA. Only CAFOs that are classified as large are required to report any emission event of 100 pounds of ammonia or hydrogen sulfide or more during a 24-hour period locally or to the state under EPCRA (Michigan State University Extension, n.d.). The EPA has also instituted a voluntary Air Quality Compliance Agreement in which they will monitor some CAFO air emissions, and will not sue offenders but instead charge a small civil penalty. These changes have attracted criticism from environmental and community leaders who state that the EPA has yielded to influence from the livestock industry. The changes also leave ambiguity as to whether emission standards and air quality near CAFOs are being monitored.

Greenhouse Gas and Climate Change

Aside from the possibility of lowering air quality in the areas around them, CAFOs also emit greenhouse gases, and therefore contribute to climate change. Globally, livestock operations are responsible for approximately 18% of greenhouse gas production and over 7% of U.S. greenhouse gas emissions (Massey & Ulmer, 2008). While carbon dioxide is often considered the primary greenhouse gas of concern, manure emits methane and nitrous oxide which are 23 and 300 times more potent as greenhouse gases than carbon dioxide, respectively. The EPA attributes manure management as the fourth leading source of nitrous oxide emissions and the fifth leading source of methane emissions (EPA, 2009).

The type of manure storage system used contributes to the production of greenhouse gases. Many CAFOs store their excess manure in lagoons or pits, where they break down anaerobically (in the absence of oxygen), which exacerbates methane production. Manure that is applied to land or soil has more exposure to oxygen and therefore does not produce as much methane. Ruminant livestock, such as cows, sheep, or goats, also contribute to methane production through their digestive processes. These livestock have a special stomach called a rumen that allows them to digest tough grains or plants that would otherwise be unusable. It is during this process, called enteric fermentation, that methane is produced. The U.S. cattle industry is one of the primary methane producers. Livestock production and meat and dairy consumption has been increasing in the United States, so it can only be assumed that these greenhouse gas emissions will also rise and continue to contribute to climate change.

Odors

One of the most common complaints associated with CAFOs are the odors produced. The odors that CAFOs emit are a complex mixture of ammonia, hydrogen sulfide, and carbon dioxide, as well as volatile and semi-volatile organic compounds (Heederik et al., 2007). These odors are worse than smells formerly associated with smaller livestock farms. The anaerobic reaction that occurs when manure is stored in pits or lagoons for long amounts of time is the primary cause of the smells. Odors from waste are carried away from farm areas on dust and other air particles. Depending on things like weather conditions and farming techniques, CAFO odors can be smelled from as much as 5 or 6 miles away, although 3 miles is a more common distance (State Environmental Resource Center, 2004).

Because CAFOs typically produce malodors, many communities want to monitor emissions and odors. Quantifying odor from industrial farming can be challenging because it is a mixture of free and particle-bound compounds, which can make it hard to identify what specifically is causing the odor. Collecting data on specific gases, such as hydrogen sulfide, can be used as a proxy for odor levels.

CAFO odors can cause severe lifestyle changes for individuals in the surrounding communities and can alter many daily activities. When odors are severe, people may choose to keep their windows closed, even in high temperatures when there is no air conditioning. People also may choose to not let their children play outside and may even keep them home from school. Mental health deterioration and an increased sensitization to smells can also result from living in close proximity to odors from CAFOs. Odor can cause negative mood states, such as tension, depression, or anger, and possibly neuropsychiatric abnormalities, such as impaired balance or memory. People who live close to factory farms can develop CAFO-related post traumatic stress disorder, including anxiety about declining quality of life (Donham et al., 2007).

Ten states use direct regulations to control odors emitted by CAFOs. They prohibit odor emissions greater than a set standard. States with direct regulations use scentometers, which measure how many times an odor has to be doused with clean air before the smell is undetectable. An additional 34 states have indirect methods to reduce CAFO odors. These include: setbacks, which specify how far CAFO structures have to be from other buildings; permits, which are the most typical way of regulating CAFOs; public comment or involvement periods; and operator or manure placement training.

Insect Vectors

CAFOs and their waste can be breeding grounds for insect vectors. Houseflies, stable flies, and mosquitoes are the most common insects associated with CAFOs. Houseflies breed in manure, while stable and other flies breed in decaying organic material, such as livestock bedding. Mosquitoes breed in standing water, and water on the edges of manure lagoons can cause mosquito infestations to rise. Flies can change from eggs to adults in only 10 days, which means that substances in which flies breed need to be cleaned up regularly.

Flies are typically considered only nuisances, although insects can agitate livestock and decrease animal health. The John Hopkins Bloomberg School of Public Health found evidence that houseflies near poultry operations may contribute to the dispersion of drug-resistant bacteria (Center for Livable Future, 2009). Since flies are attracted to and eat human food, there is a potential for spreading bacteria or pathogens to humans, including microbes that can cause dysentery and diarrhea (Bowman et al., 2000). Mosquitoes spread zoonotic diseases, such as West Nile virus, St. Louis encephalitis, and equine encephalitis.

Residences closest to the feeding operations experience a much higher fly population than average homes. To lower the rates of insects and any accompanying disease threats, standing water should be cleaned or emptied weekly, and manure or decaying organic matter should be removed twice weekly (Purdue Extension, 2007). For more specific insect vector information, please refer to NALBOH's vector guide (*Vector Control Strategies for Local Boards of Health*).

Pathogens

Pathogens are parasites, bacterium, or viruses that are capable of causing disease or infection in animals or humans. The major source of pathogens from CAFOs is in animal manure. There are over 150 pathogens in manure that could impact human health. Many of these pathogens are concerning because

they can cause severe diarrhea. Healthy people who are exposed to pathogens can generally recover quickly, but those who have weakened immune systems are at increased risk for severe illness or death. Those at higher risk include infants or young children, pregnant women, the elderly, and those who are immunosuppressed, HIV positive, or have had chemotherapy. This risk group now roughly compromises 20% of the U.S. population.

Table 2 Select pathogens found in animal manure.

Pathogen	Disease	Symptoms
<i>Bacillus anthracis</i>	Anthrax	Skin sores, headache, fever, chills, nausea, vomiting
<i>Escherichia coli</i>	Colibacillosis, Coliform mastitis-metris	Diarrhea, abdominal gas
<i>Leptospira pomona</i>	Leptospirosis	Abdominal pain, muscle pain, vomiting, fever
<i>Listeria monocytogenes</i>	Listeriosis	Fever, fatigue, nausea, vomiting, diarrhea
<i>Salmonella</i> species	Salmonellosis	Abdominal pain, diarrhea, nausea, chills, fever, headache
<i>Clostridium tetani</i>	Tetanus	Violent muscle spasms, lockjaw, difficulty breathing
<i>Histoplasma capsulatum</i>	Histoplasmosis	Fever, chills, muscle ache, cough rash, joint pain and stiffness
<i>Microsporum</i> and <i>Trichophyton</i>	Ringworm	Itching, rash
<i>Giardia lamblia</i>	Giardiasis	Diarrhea, abdominal pain, abdominal gas, nausea, vomiting, fever
<i>Cryptosporidium</i> species	Cryptosporidiosis	Diarrhea, dehydration, weakness, abdominal cramping

Sources of infection from pathogens include fecal-oral transmission, inhalation, drinking water, or incidental water consumption during recreational water activities. The potential for transfer of pathogens among animals is higher in confinement, as there are more animals in a smaller amount of space. Healthy or asymptomatic animals may carry microbial agents that can infect humans, who can then spread that infection throughout a community, before the infection is discovered among animals.

When water is contaminated by pathogens, it can lead to widespread outbreaks of illness. Salmonellosis, cryptosporidiosis, and giardiasis can cause nausea, vomiting, fever, diarrhea, muscle pain, and death, among other symptoms. *E.coli* is another serious pathogen, and can be life-threatening for the young, elderly, and immunocompromised. It can cause bloody diarrhea and kidney failure. Since many CAFO use sub-therapeutic antibiotics with their animals, there is also the possibility that disease-resistant bacteria can emerge in areas surrounding CAFOs. Bacteria that cannot be treated by antibiotics can have very serious effects on human health, potentially even causing death (Pew Charitable Trusts, n.d.).

There is also the possibility of novel (or new) viruses developing. These viruses generate through mutation or recombinant events that can result in more efficient human-to-human transmission. There has been some speculation that the novel H1N1 virus outbreak in 2009 originated in swine CAFOs in Mexico. However, that claim has never been substantiated. CAFOs are not required to test for novel viruses, since they are not on the list of mandatory reportable illness to the World Organization for Animal Health.

Antibiotics

Antibiotics are commonly administered in animal feed in the United States. Antibiotics are included at low levels in animal feed to reduce the chance for infection and to eliminate the need for animals to expend energy fighting off bacteria, with the assumption that saved energy will be translated into growth. The main purposes of using non-therapeutic doses of antimicrobials in animal feed is so that animals will grow faster, produce more meat, and avoid illnesses. Supporters of antibiotic use say that it allows animals to digest their food more efficiently, get the most benefit from it, and grow into strong and healthy animals.

The trend of using antibiotics in feed has increased with the greater numbers of animals held in confinement. The more animals that are kept in close quarters, the more likely it is that infection or bacteria can spread among the animals. Seventy percent of all antibiotics and related drugs used in the U.S. each year are given to beef cattle, hogs, and chickens as feed additives. Nearly half of the antibiotics used are nearly identical to ones given to humans (Kaufman, 2000).

There is strong evidence that the use of antibiotics in animal feed is contributing to an increase in antibiotic-resistant microbes and causing antibiotics to be less effective for humans (Kaufman, 2000). Resistant strains of pathogenic bacteria in animals, which can be transferred to humans through the handling or eating of meat, have increased recently. This is a serious threat to human health because fewer options exist to help people overcome disease when infected with antibiotic-resistant pathogens. The antibiotics often are not fully metabolized by animals, and can be present in their manure. If manure pollutes a water supply, antibiotics can also leech into groundwater or surface water.

Because of this concern for human health, there is a growing movement to eliminate the non-therapeutic use of antibiotics with animals. In 2001, the American Medical Association approved a resolution to ban all low-level use of antibiotics. The USDA has developed guidelines to limit low-level use, and some major meat buyers (such as McDonald's) have stopped using meat that was given antibiotics that are also used for humans. The World Health Organization is also widely opposed to the use of antibiotics, calling for a cease of their low-level use in 2003. Some U.S. legislators are seeking to ban the routine use of antibiotics with livestock, and there has been legislation proposed to solidify a ban. The Preservation of Antibiotics for Medical Treatment Act (PAMTA), which was introduced in 2009, has the support of over 350 health,

**For Immediate Release:
January 8, 2004**

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PUBLIC HEALTH ASSOCIATION CALLS FOR MORATORIUM ON FACTORY FARMS; CITES HEALTH ISSUES, POLLUTION

Policy Statement Puts APHA on Record in Ongoing CAFO Debate

WASHINGTON -- In an important step toward addressing the dangers of industrial-scale livestock farming, the American Public Health Association (APHA) has issued a resolution calling for a moratorium on new Concentrated Animal Feed Operations (CAFOs), sometimes called "factory farms." APHA cited a number of problems with CAFOs, including the contamination of drinking water with pathogens from animal waste runoff; growing antibiotic resistance resulting from the millions of pounds of antibiotics routinely fed to animals; severe respiratory problems in CAFO workers; and illnesses among people living near CAFO operations.

"The Center for a Livable Future is in full support of this new policy statement from APHA. The rise of the corporate industrial livestock operation is a deplorable development in modern agriculture," said Dr. Robert Lawrence, Director of the Center. "Factory farms make their workers sick, pollute the environment, and pose serious public health risks to people living nearby."

"With this new statement, the world's largest public health organization has now weighed in," said Lawrence. "We have enough science now to call for a moratorium on building more CAFOs."

The Center for a Livable Future is an interdisciplinary center at the Johns Hopkins University that focuses attention on equity, health, and the Earth's resources. The Center supports study of the complex connections among diet, food production, health, and the environment. The Center supports scientific research in these areas, sponsors seminars and conferences, and supports projects focusing on urban food security, intensive farm animal production, estuary water quality, and nutrition transitions in the developing world.

An estimated 54 percent of livestock in the U.S. are now confined to just 5 percent of livestock farms. These CAFOs generate an estimated 575 billion pounds of animal waste each year. This animal waste contains pathogen bacteria, including *Salmonella*, *Campylobacter*, *Cryptosporidium*, and *E. Coli* 0157:H7; heavy metals; nitrogen and phosphorus, which seriously degrade rivers and estuaries like the Chesapeake Bay; and an estimated 13 million pounds of antibiotics. The routine feeding of antibiotics to animals in CAFOs is helping fuel the growing public health problem of antibiotic resistance among pathogens.

These billions of pounds of animal waste is typically stored in storage pits or lagoons, which can leak millions of gallons of liquid manure. These lagoons are frequently sited on floodplains on alluvial aquifers, contaminating drinking water supplies.

Many studies of CAFOs have documented respiratory problems, including chronic bronchitis and non-allergic asthma, in approximately 25 percent of CAFO workers. Workers at CAFOs are also exposed to the potent neurotoxin hydrogen sulfide at levels that have accelerated deterioration of neurobehavioral function. Studies of people living near CAFOs report eye and respiratory symptoms associated with CAFO air emissions.

Finally, CAFOs are notoriously inhumane to animals. Life for an animal in a factory farm is characterized by acute deprivation, stress, and disease. Farm animals are forced to live in cages or crates just barely larger than their own bodies, and typically they spend their entire lives without seeing daylight.

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ORDINANCE NO. 97-01, AS AMENDED BY ORDINANCE 97-02

AN ORDINANCE ESTABLISHING HEALTH REGULATIONS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS; PROVIDING STANDARDS FOR THE PERMITTING OF CONCENTRATED ANIMAL FEEDING OPERATIONS; PROVIDING DEFINITIONS; PROVIDING AN EFFECTIVE DATE; AND PROVIDING FOR SEVERABILITY.

WHEREAS, § 192.300, RSMo, provides that the County Commission may make and promulgate Ordinances as will tend to enhance the public health and prevent the entrance of infectious, contagious, communicable or dangerous diseases into such county; and

WHEREAS, § 192.300, RSMo, provides that the County Commission may establish reasonable fees to pay for any costs incurred in carrying out such Ordinances and that any such fees generated shall be deposited in the county treasury and shall be used to support the public health activities for which they were generated; and

WHEREAS, § 192.300, RSMo, provides that any person, firm, corporation or association which violates any such Ordinance adopted, promulgated and published by the County Commission is guilty of a misdemeanor and shall be prosecuted, tried and fined as otherwise provided by law; and

WHEREAS, the County Commission or County Health Board has full power and authority to initiate the prosecution of any action under § 192.300, RSMO; and

WHEREAS, H.B. No. 1207, 1288, 1408 & 1409 of the Missouri 88th General Assembly, § 640.710.5, RSMo, recognizes that local controls may be used to regulate concentrated animal feeding operations; and

WHEREAS, health standards and criteria for concentrated animal feeding operations consistent with state law have been prepared based upon state law and professional studies presented to and considered by the Linn County Commission; and

WHEREAS, the adoption and enforcement of said standards is hereby found to be necessary in order to enhance the public health and prevent the entrance of infectious, contagious, communicable or dangerous diseases into Linn County;

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF LINN COUNTY, MISSOURI, AS FOLLOWS:

1 DEFINITIONS

Unless the context clearly indicates to the contrary, words used in the present tense include the future tense and words used in the plural include the singular. For purposes of

this Ordinance, the following words, terms and phrases shall have the following meanings unless otherwise indicated:

- 1.1 **ANIMAL UNIT ("AU")**. A unit of measurement to compare various animal types at a concentrated animal feeding operation. One animal unit equals the following: 1.0 beef feeder or slaughter animal; 0.5 horse; 0.7 dairy cow; 2.5 swine weighing over 55 pounds; 15 swine under 55 pounds; 10 sheep; 30 laying hens; 55 turkeys; 100 broiler chickens or an equivalent animal unit. The total animal units at each operating location shall be determined by adding the animal units for each animal type.
- 1.2 **ANIMAL UNIT EQUIVALENT**. An equivalent animal type and weight that has a similar amount of manure produced as one of the animal unit categories set forth in the definition of "animal unit" herein. This also applies to other animal types which are not specifically listed.
- 1.3 **ANIMAL WASTE**: Any animal excrement, animal carcass, feed waste, animal water waste, or any other waste associated with animals.
- 1.4 **ANIMAL WASTE WATER**: Any animal excreta, any liquid which comes into contact with any manure, litter, bedding or other raw material or intermediate or final material or product used in or resulting from the production of animals or products directly or indirectly used in the operation of a CAFO, or any spillage or overflow from animal watering systems, or any liquid used in washing, cleaning or flushing pens, barns, or manure pits, or any liquid used in washing or spraying to clean animals, or any liquid used for dust control on the premises of a CAFO.
- 1.5 **APPLICATION**: The injection of animal waste or animal waste water into the land.
- 1.6 **CONCENTRATED ANIMAL FEEDING OPERATION ("CAFO")** all land and/or a lot, facility, parcel, or operating location in which animals have been, are or will be stabled or confined and fed or maintained for a total of forty-five (45) days or more in any twelve (12) month period and a ground cover of vegetation is not sustained over at least fifty percent (50%) of the animal confinement area. A "concentrated animal feeding operation" shall not include any land area, structure, lot, yard, or corral or other area which does not meet the numerical threshold for animals as set forth in the classification system of § 2 of this Ordinance. For purposes of this definition, the Concentrated Animal Feeding Operation means and refers collectively to an animal production facility which includes at least one Feedlot, Livestock Lagoon, and a Plant Filter Area. For purposes of this definition, "animal confinement area" includes the buildings or structures, including Feedlots, in which animals are confined, but does not include contiguous land used as plant filter areas over which liquid waste is applied and/or other areas upon

which grass or crops are used for waste disposal, landscaping, or land upon which crops or other vegetation are raised independent from the animal feeding operations. A CAFO does not include a feeding operation that has a capacity of less than three-hundred (300) AU.

- 1.7 **CONSTRUCTION PERMIT**: A construction permit/letter of approval required of a CAFO by the Missouri Department of Natural Resources pursuant to the Missouri Clean Water Law.
- 1.8 **COUNTY HEALTH PERMIT**: Written authorization issued by the Linn County Commission to construct, modify or operate a CAFO.
- 1.9 **DRY HANDLING WASTE**: Manure (urine or feces), litter, bedding, or feedwaste from animal feeding operations.
- 1.10 **FEEDLOT**. Any land area, structure, lot, yard, or corral or other area, whether enclosed with a roof or unenclosed, wherein livestock are confined in close quarters for the purpose of fattening, feeding, growing, raising, or birthing such livestock for final shipment to market or slaughter. Without limiting the generality of the foregoing definition, a lot or structure which contains three hundred (300) AU's per acre for the foregoing purposes shall be considered a Feedlot. A "Feedlot" does not include unenclosed pasture areas which are used for the raising of crops or other vegetation upon which livestock are allowed to graze or feed.
- 1.11 **LAND**: Any plot, parcel, lot or other area of land owned or leased by the CAFO to qualify for the capacity of "1 acre per 4 AU" formula for wet handling or "1 acre per 8 AU" formula for dry handling.
- 1.12 **LEASE**: A written contract for the exclusive use of real property, which contract specifically grants unto the lessee the right to apply animal waste and animal waste water to the leased premises.
- 1.13 **LIVESTOCK**. Cattle, sheep, swine, poultry, and other animals or fowl, which are being produced primarily for use as food or food products for human consumption.
- 1.14 **LIVESTOCK LAGOON** : An excavated, diked, or walled area designed for the biological stabilization, treatment and/or storage of liquid wastes generated by a Feedlot.
- 1.15 **NUTRIENT APPLICATION LEVELS**: The levels of nutrients applied to the Plant Filter Area.

- 1.16 **OCCUPIED DWELLING**: Any residence, or any church, school or business which has been in use at any time during the 12 month period immediately prior to the date upon which a permit is issued by the Department of Natural Resources for the construction of a CAFO. In regards to "setback" distance cemeteries, conservation areas and public use areas will be treated the same as occupied dwellings.
- 1.17 **OPERATING PERMIT**: An operating permit and/or letter of approval required of a CAFO by the Missouri Department of Natural Resources pursuant to the Missouri Clean Water Law.
- 1.18 **OWNER**: Anyone who owns, either individually and/or with any other persons, any of the following interests in the real property upon which a CAFO is situated:
- 1.18.1 Fee simple title,
 - 1.18.2 A leasehold interest,
 - 1.18.3 Any interest in an entity which holds fee simple title; or
 - 1.18.4 Any interest in any entity which has a leasehold interest.
- 1.19 **PERSON**: Includes natural persons and also includes corporations, partnerships, associations and any other business or charitable entities, including a natural person who has supervisory authority over the operation of a CAFO, whether or not such person is an owner of the CAFO, and a natural person who applies animal waste or animal waste water originating from the CAFO.
- 1.20 **PLANT FILTER AREA**: Land used or reserved for the application of liquid wastes from a Livestock Lagoon.
- 1.21 **POPULATED AREA**: An area having at least 10 occupied dwellings not on CAFO property, as measured in a straight line from the occupied dwelling to the nearest CAFO confinement building, confinement lot, or other confinement area, or waste handling facility.
- 1.22 **SETBACK**: The distance for the CAFO facility to the nearest occupied dwelling not on CAFO property, as measured in a straight line from the occupied dwelling to the nearest CAFO confinement building, confinement lot, other confinement area, or water handling facility.
- 1.23 **SLOPE**: The vertical drop divided by the horizontal distance of a land area multiplied by one-hundred, and expressed as a percentage.
- 1.24 **WET HANDLING WASTEWATER**: Water containing waste or contaminated by waste contact, including process-generated and contaminated rainfall runoff.

2 CLASSIFICATION OF CONCENTRATED ANIMAL FEEDING OPERATIONS

- 2.1 A Class I CAFO is one that has capacity of 2,000 or more AU.
- 2.2 A Class II CAFO is one that has a capacity of 1,500 to less than 2,000 AU.
- 2.3 A Class III CAFO is one that has a capacity of 1,000 to less than 1,500 AU.
- 2.4 A Class IV CAFO is one that has a capacity of 300 to less than 1,000 AU.

3 PERMIT REQUIREMENTS FOR ALL CAFOS

- 3.1 No CAFO shall be constructed, operated, used, or established within Linn County unless a County Health Permit has been issued by the Linn County Commission. To apply for a County Health Permit the proposed CAFO shall submit to the County Commission all of the application materials submitted to the Department of Natural Resources for an operating permit and an application fee as established by the Linn County Commission pursuant to Section 11 of this Ordinance. If the CAFO is issued an Operating Permit and if the proposed CAFO meets the requirements of this Ordinance, then the County Commission shall also issue a County Health Permit. If the proposed CAFO is not subject to regulation by the Missouri Department of Natural Resources ("DNR"), then to apply for a County Health Permit the proposed CAFO shall submit a plan to the County Commission showing the location of the proposed facility, the number of proposed animal units, the proposed method and location of animal waste disposal and the name and address of the owner of the proposed CAFO as well as the name and address of the owner of the land on which the CAFO will be located, if different from the owner of the CAFO. In such case, if the County Commission determines that the proposed CAFO complies in every respect with the terms of this Ordinance, then the County Commission shall issue a County Health Permit.
- 3.2 An application for a County Health Permit shall be submitted to the County Commission for approval. The County Commission may refer the application to the Linn County Health Department for its review and recommendations. The recommendation of the Linn County Health Department may be reported to the County Commission at the public hearing prescribed in Section 3.3 of this Ordinance. The recommendation of the County Health Department may be considered as evidence at such hearing, but shall not be considered binding on the Linn County Commission. [Amended by Ordinance 97-02]
- 3.3 At least one public hearing shall be held by the County Commission before approving any County Health Permit. Such public hearing may be continued from time to time and additional hearings may be held. The receipt and consideration of

evidence at said hearings shall comply with the requirements of § 536.070, RSMo.

- 3.4 Once a CAFO has received a County Health Permit, the CAFO must apply for a renewal of said permit each calendar year. All applications for renewal permits shall be submitted, along with the applicable renewal fee, at least thirty (30) days prior to the anniversary date of the issuance of the initial County Health Permit. If the County Commission determines that the CAFO has complied in all respects with the permit previously issued, then the County Commission may issue the renewal permit. Otherwise, the County Commission shall not issue a renewal permit and the CAFO immediately shall cease operation.
- 3.5 It shall be a violation of this Ordinance and unlawful for any person to operate a CAFO without first obtaining a County Health Permit from the County Commission.
- 3.6 It shall be a violation of this Ordinance and unlawful for any person to operate a CAFO with a number of Animal Units in excess of the number specified in the permit issued by the County Commission.
- 3.7 It shall be a violation of this Ordinance and unlawful for any person to apply animal waste or animal waste water in a manner inconsistent with the requirements of this Ordinance.

4 RULES APPLICABLE TO ALL CAFOS

Prior to issuance of a County Health Permit, the County Commission shall make findings of fact and conclusions of law as to the following:

- 4.1 The proposed CAFO shall be in compliance with the provisions of Sections 4 through 7 of this Ordinance, as applicable.
- 4.2 All Livestock Feedlots and Livestock Lagoons shall be designed in such a manner as to avoid the degradation the quality of surface or subsurface waters, water courses or other bodies of water.
- 4.3 All Livestock Feedlots and Livestock Lagoons shall be designed in such a manner as to avoid the degradation of air quality. In no event shall the concentration of gases at the boundary of the land resulting from the operation of a Livestock Lagoon or Livestock Feedlot exceed the following levels:

Gas	Maximum Allowable Concentration ¹	Exposure Period ²
Carbon Dioxide (CO ₂)	5000	not applicable
Ammonia (NH ₃)	5	not applicable
Hydrogen Sulfide (H ₂ S)	10	2 hours
Methane (CH ₄)	1000	not applicable
Carbon Monoxide (CO)	50	One hour

¹ In parts of pure gas per million parts of atmospheric air.
² The time during which the effects of the noxious gas are felt by an adult human or a 150-pound livestock.

- 4.4 The applicant shall demonstrate that the soils on the premises, including an soil-plant filter area, are suitable for and compatible with the proposed Livestock Feedlot operations with respect to the location of Livestock Lagoons and the application of liquid, slurry or solid animal waste onto or into the soil on the premises. Further, no animal waste from a Livestock Lagoon shall be applied when soils are water saturated, frozen, or covered with snow, or when other soil conditions would result in waste runoff.
- 4.5 The Livestock Feedlot or Livestock Lagoon shall demonstrate that it shall at all times be operated in compliance with any required local, state or federal permits, licenses or other approvals, and in compliance with all applicable state and local laws and regulations.
- 4.6 The CAFO shall own or lease one acre of land for each 4 AU of capacity for wet handling systems or must own or lease one acre for each 8 AU of capacity for a dry waste handling system as specified in the County Health Permit. The land must be in a contiguous tract for all wet handling systems. The Nutrient Application Levels for the CAFO shall comply with Appendix A hereto, which Appendix A is hereby incorporated by reference as if set forth in its entirety herein.
- 4.7 Animal waste and animal waste water shall not be applied to land with a slope greater than 10%.
- 4.8 Animal waste water injected or knifed into the soil shall not be applied within one-thousand (1,000) feet of an occupied dwelling which existed prior to the date the CAFO is constructed. Dry animal waste shall not be applied within five-hundred (500) feet of an occupied dwelling which existed prior to the date the CAFO is constructed. This rule shall not apply to occupied dwellings owned by the CAFO.

The owner of an occupied dwelling may apply for a variance from this rule as part of the application for a County Health Permit.

- 4.9 Animal waste and animal waste water shall not be applied within one-thousand (1,000) feet of any sink hole or well or spring or other water supply or one-hundred (100) feet from any stream (including intermittent streams) or strip pits. This rule shall not apply to waste lagoons on the CAFO property, but shall apply to all other wells, water supplies, streams, ponds, strip pits, lakes, springs and sink holes on the CAFO property.
- 4.10 No County Health Permit shall be issued for a livestock and/or poultry manure storage system or other system of manure storage that is of like and similar nature that prevents feedlot runoff unless such manure storage system is in compliance with all Missouri Department of Natural Resources ("DNR") regulations for the control of wastes from livestock feedlots, poultry lots and other animal lots and said manure storage system has obtained a permit from DNR, if necessary, for the pollution control devices to be installed. Such manure storage systems shall be located at least two-thousand (2,000) feet from an existing residence.

5 SETBACK REQUIREMENTS

- 5.1 No CAFO shall be located within one mile of any Class I CAFO and no Class I CAFO will be located within one mile of any other CAFO. No Class II, III or IV CAFO shall be located within three-fourths (3/4) mile of any Class II CAFO. No Class III or IV CAFO shall be located within one-half (1/2) mile of any Class III CAFO. No Class IV CAFO shall be located within one-fourth (1/4) mile of any Class IV CAFO. This distance shall be measured from the nearest point of one CAFO's confinement or waste containment system to the nearest point of another CAFO's confinement or waste containment system.

Setback Distances	Class I	Class II	Class III	Class IV
Class I	1 mile	1 mile	1 mile	1 mile
Class II	1 mile	3/4 mile	3/4 mile	3/4 mile
Class III	1 mile	3/4 mile	1/2 mile	1/2 mile
Class IV	1 mile	3/4 mile	1/2 mile	1/4 mile

5.2 No Class IV CAFO shall be located within 1,000 feet of an occupied dwelling. No Class III CAFO shall be located within one-fourth mile of an occupied dwelling. No Class II CAFO shall be located within one-half mile of an occupied dwelling. No Class I CAFO shall be located within three-fourths of a mile of an occupied dwelling, and this setback requirement shall increase by one-fourth of a mile for each 500 AU (or fractional portion thereof) of capacity in excess of 2,000 AU. This rule shall not apply to occupied dwellings owned by the CAFO or to dwellings not in existence at the time of issuance of the County Health Permit.

Size of Concentrated Animal Feeding Operation	Minimum Distances From Occupied Dwellings
CLASS I	3/4 mile
CLASS II	1/2 mile
CLASS III	1/4 mile
CLASS IV	1,000 feet

No Class I CAFO shall be located within two miles of a populated area. This setback shall increase one-fourth (1/4) mile for each 500 AU (or fractional portion thereof) of authorized capacity in excess of 2,000 AU.

6 FINANCIAL SECURITY

6.1 No health permit shall be issued unless adequate security has been furnished to ensure proper cleanup and disposal as required by sections 6.2 and 6.3 hereto.

6.2 A cash or surety bond shall be furnished to the Linn County Treasurer for any manure storage system. A manure storage system may include one or more lagoons at any single CAFO. If the bond is a surety bond, the surety shall be

approved by the County Commission and found to be of reputable character and financially sound with respect to the obligation incurred. The bond shall be furnished before construction and during the operating period. The bond shall remain with the County Treasurer until the operator has complied with all Federal, State and Local laws in operation of the facility and until the prompt clean up and proper disposal of any waste improperly handled or disposed of at the facility and restoration of the premises upon which the facility is operated. If a cash bond is posted, all interest earned thereon shall become part of the bond subject to terms and conditions, including the condition of release. The County Commission shall give approval before release of the bond.

6.3 The case or surety bond schedule is as follows:

6.3.1	Class III	-	\$30,000.00
6.3.2	Class II	-	\$50,000.00
6.3.3	Class I	-	\$70,000.00 and \$20,000.00 for each additional 500 AU over the 2,000 AU

7 VARIANCE TO SETBACK RULES

Where, due to an extraordinary or exceptional situation or condition of a specific piece of property, the strict application of this Ordinance would result in peculiar and exceptional difficulties to, or an exceptional and demonstrable undue hardship upon, the owner of the property as an unreasonable deprivation of use as distinguished from the mere grant of a privilege, the County Commission may authorize, as part of the application for a County Health Permit, a variance from the strict application so as to relieve said demonstrable difficulties or hardships, provided the relief can be granted without substantial detriment to the public good and without substantially impairing the intent, purpose, and integrity of the regulations, standards and criteria established in this Ordinance.

8 APPLICATION OF ORDINANCE

A CAFO in existence at the time of the enactment of this Ordinance is exempt from its terms and conditions; provided, however, that before a CAFO in existence at the time of the enactment of this Ordinance may expand or change its operation in terms of a change of classification or amount or manner in which animal waste or animal waste water is applied or disposed of, the CAFO shall be in compliance with this Ordinance in every respect and shall obtain a new County Health Permit.

9 DISPOSAL OF DEAD ANIMALS AND AFTER BIRTHING MATERIAL

The proper disposal of dead animals and after birthing material shall be completed within twenty-four (24) hours from the time of occurrence.

10 ADMINISTRATIVE FEES

- 10.1 No application for approval of a County Health Permit shall be accepted until the applicant has paid all processing fees as set forth below. Fees paid shall be non-refundable except as provided in Section 11.4 below.
- 10.2 The fee amount shall not exceed the amount needed to recover the cost of inspection, investigation and review of the proposed application, which fee amounts are based upon the anticipated costs of review, inspection and investigation, and which fee amounts have taken into consideration the need for special investigative services including geologic inspections, hydrologic inspections, groundwater monitoring, soils evaluation, and other unique costs of a scientific or technical nature associated with the processing of the application. For purposes of this Ordinance, the administrative fee amounts shall be as follows:

Classification of CAFO	Fee
Class I	\$10,000
Class II	\$5,000
Class III	\$1,000
Class IV	\$1,000

- 10.3 There shall be established with the County Treasurer an escrow fund, for each application for a County Health Permit, for the purposes of reimbursing the County Commission and the County Board of Health for services rendered in connection with administration of this Ordinance. Said escrow account shall include the proceeds of project review fees established pursuant to this Section. The funds contained in said escrow account shall be used solely to reimburse the County Commission or County Board of Health for actual costs associated with administration of this Ordinance, for actual services rendered for investigation, administration and processing of a County Health Permit including costs associated with the retaining and compensation of experts on scientific and technical issues associated with the application, and costs associated with public hearings. The County Treasurer shall disburse payments based upon billings supplied by the County Commission or the County Board of Health and approved by the County Commission.
- 10.4 The applicant for a County Health Permit may apply to the County Commission for a credit against the fee previously paid in the event that a portion of the costs of review and processing is duplicative, pursuant to the standards of applicable case law or statutes then in effect. After the approval, conditional approval or

denial of a county health permit, the County Treasurer shall refund to the applicant any unexpended or unencumbered balance of the escrow account established pursuant to this Section for said application.

11 VIOLATION OF ORDINANCE

Any person violating this Ordinance shall be subject to punishment by imprisonment or fine as provided by law. Each day a person operates a CAFO in violation of this Ordinance, and each time a person applies animal waste or animal waste water in a manner inconsistent with the requirements of this Ordinance, shall be considered a separate offense.

12 SEVERABILITY

The chapters, sections, paragraphs, sentences, clauses, and phrases of this ordinance are severable, and if any phrase, clause, sentence, paragraph, or section of this ordinance shall be declared unconstitutional or otherwise invalid by the valid judgment or decree of any Court of competent jurisdictions, such unconstitutionality or invalidity shall not affect any of the remaining phrases, clauses, sentences, paragraphs, or sections of this ordinance since the same would have been enacted by the Board of County Commissioners without the incorporation in this ordinance of any such unconstitutional or invalid phrase, clause, sentence, paragraph, or section.

13 REPEAL OF ORDINANCES NOT TO AFFECT LIABILITIES, ETC.

Whenever any part of this ordinance shall be repealed or modified, either expressly or by implication, by a subsequent ordinance, that part of the ordinance thus repealed or modified shall continue in force until the subsequent ordinance repealing or modifying the ordinance shall go into effect unless therein otherwise expressly provided; but no suit, prosecution, proceeding, right, fine or penalty instituted, created, given, secured or accrued under this ordinance previous to its repeal shall not be affected, released, or discharged but may be prosecuted, enjoined, and recovered as fully as if this ordinance or provisions had continued in force, unless it shall be therein otherwise expressly provided.

14 EFFECTIVE DATE

This Ordinance shall be in full force and effect from and after its passage by the Board of County Commissioners, except as provided above.

APPENDIX "A"

PLANT AVAILABLE NITROGEN (PAN) APPROACH FOR ANIMAL FEEDING OPERATIONS

INTRODUCTION

The Department of Natural Resources recommends using a "Plant Available Nitrogen" (PAN) approach to determine the nitrogen application rates for animal manure and wastewaters. Other cookbook methods, such as the "Conservative" and "Intensive" management approaches are based on average textbook numbers. The actual nitrogen content of any individual operation may vary significantly from the textbook average numbers; thus, actual testing results from each operation should be used.

PLANT AVAILABLE NITROGEN APPROACH

The PAN method uses actual on-site testing results as a basis to develop and implement a specific land application plan that is tailored to each individual operation. The land application rates are based on the amount of nitrogen that will be available for crop uptake during the growing season. This requires testing applied wastes and soils; predicting and recording crop yields; and calculating nitrogen removal for each specific operation. Predicted nitrogen volatilization, denitrification and mineralization rates are used to determine the plant available nitrogen. Thus, the organic wastes from the animal feeding operations are utilized as a "nutrient resource." The recommended nitrogen availability rates for the Pan approach are shown below. Alternative nitrogen availability rates on a site-specific basis may be considered by the department upon submittal of adequate documentation. See Reference #1 and #3.

PAN Formula: $wPAN = CNR - sPAN$

CNR = pounds per acre of nitrogen utilized by harvested crop:
[crop yield unit/acre] x [lbs N/yield unit] x [% crop removal]

sPAN = soil PAN in pounds per acre:
[% organic matter in soil] x [OR rate]

OR = nitrogen availability rate for soil organic matter based on soil CEC and crop season (See Reference #2 and #5):

Summer crops: 10 for CEC \geq 18; 20 for CEC 10-18; 40 for CEC \leq 10.

Winter crops: 5 for CEC \geq 18; 10 for CEC 10-18; 20 for CEC \leq 10.

wPAN = wastewater PAN application rate in pounds per acre:
[(TKN-ammonia N) x MR] + [ammonia N x VR] x [nitrate N x .9]

MR = nitrogen availability rate for mineralization: Mineralization of organic nitrogen in animal manure is slowly raised over the first five years but reaches a constant by the fifth year when animal wastes are added every year. See Reference #3.

Waste Type	Year 1	Year 2	Year 3	Year 4	Year 5+
Lagoons: all animal types	.35	.53	.62	.66	.70
Poultry: slurry/dry litter	.60	.70	.75	.80	.85

VR = nitrogen availability rate for volatilization + denitrification: Ammonia nitrogen availability varies depending on weather conditions and application method. Department recommends factors (See Reference #3):

VR = .60 for sprinkler irrigation or surface application; and
VR = .90 for surface application followed by incorporation.

CROP YIELDS:

Crop yields should be based on actual measured yields for each field. Crop uptake of nitrogen should be based on nitrogen uptake per actual unit (ton or bushel) of crop removed from the field. Annual crop nitrogen rates for pasture land and for land in the USDA Conservation Reserve Program (CRP) should not exceed a PAN of 65 pounds/acre/year. See Reference #2 and #5.

SOIL TESTING:

Soil testing should be conducted in the spring of each year as near as possible to the start of water application for the year. Soil PAN (sPAN) is predicted based on soil testing for percent (%) Organic Matter times the nitrogen availability factor. This method predicts nitrogen availability from plant residues but does not predict original matter added by animal wastes. New predictive methods such as the pre-sidedress soil nitrate test (PSNT) may also be considered.

MANURE AND WASTEWATER TESTING:

Material to be land applied should be tested for Nitrogen as follows:

Total Kjeldahl Nitrogen (TKN) as N;
Ammonia Nitrogen (NH₃) as N; and
Nitrate/Nitrite Nitrogen (NO₃/NO₂) as N.

Wastewater, sludge and biosolids should be sampled and tested separately if each is to be land applied. Anaerobic lagoon wastewater samples must be collected at lagoon depths and locations which represent the range of lagoon water levels to be removed. Samples should be collected at the same relative depth as the irrigation pump intake level. If a lagoon is to be stirred or mixed to facilitate removal, the sample should be collected immediately after stirring and again near the completion of pumping.

Plant Available Nitrogen from applied wastes (wPAN) should be based on testing as near as possible to when wastes will be land applied. Testing should be conducted once every two to three months during land application periods. Nitrogen content may vary significantly throughout the year due to differences in moisture content, animal diet, stocking rates, rainfall amounts, temperature, and other factors. For example the nitrogen content in a swine lagoon varies by as much as 30 percent depending upon the season of the year. See Reference #4, Table 37.

NUTRIENT MANAGEMENT PLAN

Nitrogen is only one of the nutrient factors that should be considered when developing a nutrient management plan for each field. Contact the Natural Resources Conservation Service (NRCS) concerning how to develop a complete Nutrient Management Plan. See Reference #5.

REFERENCES:

1. Agricultural Waste Management Field Handbook, USDA, Natural Resources Conservation Service (NRCS), April 1992.
2. Soil Test Interpretations and Recommendations Handbook, University of Missouri Department of Agronomy, December 1992.
3. Livestock Waste Facilities Handbook, MWFS-18, Midwest Plan Service, Iowa State University, Ames, Iowa, Second Edition, 1985.

4. Missouri Approach to Animal Waste Management, Manual 115, University of Missouri Extension, 1979.
5. Nutrient Management, Missouri Conservation Practice Standard 590, USDA, Natural Resources conservation Service (NRCS), July 1993.

DEPARTMENT CONTACT FOR QUESTIONS ARE:

If you have any questions regarding this publication, please contact Frank Miller or Ken Arnold at (573) 751-1300.

This information was revised January 23, 1997 by the Missouri Department of Natural Resources, Water Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.

March 2, 2011
Board of Health Meeting
6:00PM

Dwight S. Brass
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Beloit, WI 53512
ph 608-346-3382
email:
Janicen2@FastMail.fm

Rock County Board of Health
3328 N U.S. Highway 51
Janesville, WI 53545
(608-757-5442)

Honorable Board of Health Members:

Re: **Public health threat; manure spreading on cropland**

Background:

A recent proposal by a Nebraska dairyman to build and operate a mega-dairy (over 5,000 milk cows) in Bradford Township, Rock County, Wisconsin, has citizens alarmed.

One major concern, from a health and safety standpoint, is the plan to apply raw sewage/manure on nearby cropland, as outlined in permit applications to Rock County, Wisconsin DNR, Bradford Township, and the Wisconsin Department of Agriculture.

The method of application is possibly the absolute worst from an environmental standpoint, namely the use of center-pivot irrigators. Sprinkling, or "dribbling" the waste greatly enhances the wind-carried odor and pathogen carrying particulates throughout the community. Neighbors are shocked at how this might affect family health, not to mention the drastic effect on the value of tax-paying homes.

To add insult to injury, according to the DNR, sewage/manure will be stockpiled, perhaps throughout the winter. The DNR was certain that this manure lagoon would turn **anaerobic** during that quiescent period. The odor, while gut-wrenching during hot summer days, would be mind-boggling when this lagoon is pumped out after this period. The DNR, in their questionable judgement, has chosen NOT to require aerators or other lagoon management practices that are

universal in most wastewater treatment facilities. In fact, they do not intend to even require a licensed wastewater treatment operator. The Nebraska dairyman intends to have his 18 year old son operate this entire facility. He is not even old enough to get a license under Wisconsin Statutes.

Action suggested:

1. In meeting with the DNR, I suggested they take two steps:
2. Require a licensed wastewater operator
3. Use aeration or other techniques to avoid anaerobic conditions
4. Use methods that meet WIS STAT requirements for "**Best Available Methods**" that could easily be "knifing" in the sewage rather than the planned "dribbling".

Board action:

- A. Prohibit outright the use of center-pivot irrigators in applying untreated sewage or manure
- B. Notify the permit applicant that pre-emptive enforcement action will be taken unless a minimum of abatement strategies are taken, as outlined in the action suggested above.

Your careful and favorable consideration of this request is strongly urged.

Sincerely,

Dwight S. Brass