RESPONSIBLE WASTE MANAGEMENT by Sarah Pender

Under the current administration, the Environmental Protection Agency has been softening regulations designed to protect land, water, animals and people from harm. Rolling back vehicle emissions standards and opening up millions of acres of pristine federal land to fossil fuel industries are stories that make the newspapers. Less popular, but just as important is the environmental impact of animal waste from concentrated animal feeding operations (CAFOs).

The USDA describes a CAFO as any poultry or livestock operation with concentrated numbers of animals confined for at least 45 days a year within a building or outdoor pen, without access to grass or other foraging vegetation within the confinement area. The threshold is approximately 1,000 beef cattle, 2,500 hogs, or 125,000 broiler chickens kept in rows of huge concrete and aluminum barns.

American CAFOs raise unbelievable amounts of meat to supply consumer demands. One of the largest CAFOs in Utah, Circle Four Farms, sends over 1.2 million pigs to the slaughterhouse each year. (Greenberg, Andy, "To Be an Animal," WIRED Magazine, January 2020, pg 94.) By concentrating livestock, agribusiness uses economies of scale to negotiate input costs, and the automated feeding operations makes meat, eggs and milk affordable for consumers.

Meat producers say that the animals are better off being confined to protect them from predators, weather and disease, and allows consumers access to cheap, reliable products. However, this economic analysis does not tell the whole story. The affordability of CAFO products relies in part on cheap feed and grain that is paid for by taxpayers in the form of farm subsidies. Also, there are environmental costs that are not factored into the price tag on the grocery shelf. (Scanes, Colin G., Animals and Society, Chapter 18 Summary, 2018.)

Pasture-raised livestock randomly distribute manure as they graze, slowly returning nutrients to the land from which they came. In CAFOs, the grain and silage are grown far away and what is not used by the animal to make protein is excreted, flushed or bulldozed into huge retention ponds. There is a LOT of poo. A single cow can produce 120 pounds of raw manure each day. The amount of daily waste generated by a typical 5,000 hog operation is equivalent to the raw sewage of twenty thousand people. As of 2018, US livestock and poultry produces 120 million metric tons of manure in dry weight. (EPA Pacific Southwest, "Animal Feeding Operations in Region 9," Notes from Underground, Fall 2001, 3.) (Scanes, 2018.)

Besides reduced property values for communities near CAFOs, health care costs from pollution and the cost of environmental rehabilitation after disasters, residents grapple with the direct effects of air and water pollution caused by the acres of open-air lagoons of animal urine and feces. It is the poorly dissemination of that waste that causes pollution. A dairy lagoon can leak one million gallons of waste a year. (Weida, William J., "A Citizens Guide to the Regional Economic and Environmental Effects of Large Concentrated Dairy Operations," GRACE Factory Farm Project, November 19, 2000.) Operators argue that lagoons are safe because they are lined with compacted clay to prevent leakage into groundwater. However, a lagoon does not have to leak in order to be dangerous.

The fecal waste, uncovered, invites swarms of flies that spread bacteria and disease. Besides greenhouse gases such as carbon dioxide and methane, open pits emit odors that are far worse than what country folks call "fresh country air." According to the USDA Agricultural Air Quality Task Force, those odors contain some 170 separate chemicals. Half of the particles that come from lagoon-and-spray field systems and dusty, dried feedlot manure are small enough to be inhaled by humans. Some of the particles are pathogens and viruses that cause respiratory and gastrointestinal ailments, while others are undesirable endotoxins and steroids. (Kirby, David. Animal Factory: The Looming Threat of Industrial Pig, Dairy, and Poultry Farms to Humans and the Environment: (New York: St. Martin's Press, 2010), 70-72.

Residents' quality of life decreases when they must shut themselves away from noxious smells and aerosolized sewage. It violates a person's autonomy and defies the freedoms associated with home ownership

Typically, the lagoon slurry is transported to local fields where it is sprayed or spread out onto hay fields after harvesting. Even though hog manure contains 10 - 100 times more concentrated pathogens than human waste, it is applied as fertilizer because of its high concentration of nitrogen and phosphorus, both soil chemicals which are necessary for plant life. (US Environmental Protection Agency, "Detecting and Mitigating the Environmental Impact of Fecal Pathogens Originating from Confined Animal Feeding Operations: Review," September 2005.) However, the fields become saturated beyond the soil's ability to absorb the liquid slurry, and the excess runs off into ditches and creeks, polluting waterways. Nitrogen and phosphorus cause algae growth, huge algal blooms sometimes miles long, deoxygenating the water and forming toxins, ultimately poisoning fish and wildlife. Contact with E. Coli bacteria and other pathogens in creeks and rivers threaten human health.

Even soil that adequately absorbs the liquid cannot hold onto such high doses of the chemicals which are readily leached from the poor soil and flushed into watersheds. (Yoder, Jr., Raymond. "Nutrient Management for High Quality Crops," Acres USA; October 2018, 34.)

CAFOs are subject to laws under the Clean Water Act and Clean Air Act, among others. Advocates of reform have pushed the EPA to crack down on CAFOs which violate the law by enforcing current regulations and implementing new laws designed to hold operators accountable for disposing of the toxic waste responsibly. A 2008 Pew Commission report titled, "Putting Meat on the Table: Industrial Farm Animal Production in America," made the recommendation to improve regulations to mandate "sustainable waste handling and treatment systems that can utilize the beneficial components, but render the less desirable components benign."

CAFOs argue that additional regulations of waste would drive up operating costs, rendering the products less affordable to the average consumer, but biodigesters present a possible solution. Biodigesters are closed tanks that use anaerobic bacteria to convert animal waste into methane, a combustible gas. This process reduces the amount of greenhouse gases that are released into the atmosphere by burning it to generate electricity that can either be used to power on-site operations, or sold back to the power grid at a fair market or premium price. Once digested, manure gets aerated to remove ammonia and VOCs, so that the result is "sludgy organic matter" that is a nutrient-rich fertilizer without the rancid smell. (Henderson, Jill. "Black Gold: The Power of Poo," Acres USA, October 2018, 81.)

Once digested, the manure must be composted in order to kill off pathogens and make the resultant fertilizer safe to apply to food crops. Selling commercial fertilizer could add a diversified and reliable income stream for farmers while redistributing nutrients back into depleted, poor soils. Traditional composting in outdoor windrows takes about five months to complete, is labor intensive, requires additional inputs, and would add significant costs to consumers. However, a farmer from North Carolina named Don Lloyd invented a system to replace the lagoon and sprayfield practice with one that recycles wastewater after killing off microorganisms and separating the particulate matter before feeding the solids to worms in a process called vermicomposting. The worms break down the manure so quickly and effectively that Lloyd reports his net cost at a penny and a half per pound of meat produced. (Kirby, pg 260-262.)

State and federal agencies should offer financial incentives for CAFOs to convert to cleaner, sustainable waste management systems and away from lagoon and sprayfield practices. Subsidizing the initial investment of technology and infrastructure would reduce the unseen price we pay in air and water pollution, greenhouse gas emissions, poor soils and health costs. For a few cents per pound, cleaner manure management is pragmatic and necessary.

There is endless debate about the morality and ethics of concentrated animal feeding operations. No matter our personal position, CAFOs are a reality. From a purely environmental standpoint, the lagoons pose an environmental hazard that needs to be ameliorated. How we manage to accomplish that task is limited only by our willingness to implement current technology and change the status quo.