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CFOs

Confined Feeding Operations

CFO Emissions and the National Air Emission Monitoring Study

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Concerns over CFO emissions and their potential impact on human health are often voiced by neighbors of CFOs. These concerns can lead to conflict when a new CFO is proposed or an existing CFO wishes to expand. There are numerous compounds in CFO emissions (mainly generated from manure) that at very high concentrations can be very detrimental to health and even dangerous. These are the same compounds which may be generated from a human waste water treatment facility, such as ammonia, hydrogen sulfide, and particulate matters. As such, there are occupational hazards to working inside a CFO or in close proximity to the manure storage, especially with those who may be more sensitive to these compounds. The levels of these compounds at neighboring residences, however, are always much lower due to basic dilution. Therefore, it is not appropriate to use data collected from CFO occupational health studies to infer or predict potential impact on CFO neighbors.

Since the publication of the associated article, there have been a handful of additional studies examining the impact of CFO emissions on neighbors. Taking all studies into account, there is still little consensus on the association between CFO emissions and health of residences living in proximity to a CFO (Donham 2010; O'Connor 2010). This is especially true when looking at emissions and objective clinical measurements. One Dutch surveillance study compared the medical records of 119,036 individuals living in high CFO density regions to 78,060 individuals living in low CFO density regions. This study showed that living in areas with higher numbers of swine, cattle, and poultry CFOs was not associated with higher prevalence of respiratory, allergic, or gastrointestinal diseases (O'Connor 2010). Studies using self-reported symptoms, such as headache, sneezing, coughing, shortness of breath, and acute eye irritation, tended to find more consistent association with proximity to CFOs. For example, one study (Schinasi 2011) showed that higher

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incidences of acute irritation and respiratory symptoms were observed as the levels of odor and hydrogen sulfide increased and higher incidence of wheezing as the level of particular matter increased. While most of the CFO emission studies collected data from healthy individuals, some hypothesized that children, elderly, and immuno-compromised individuals may be more susceptible to the effects of emissions (O'Connor 2010; Hooiveld 2016). For example, the aforementioned Dutch study (Hooiveld 2016) showed that the association between the incidence of respiratory symptoms and the number of CFOs in the neighborhood was stronger among individuals age 65 years old or older.

The National Air Emissions Monitoring Study (NAEMS). The US Environmental Protection Agency (EPA) is currently investigating whether to regulate CFO emissions based on a precautionary principle (Follow this link for definition of precautionary principle). In 2006, the EPA started a two-year, National Air Emissions Monitoring Study (NAEMS) through the negotiation of a voluntary Air Compliance Agreement with pork, dairy, and poultry industries, allowing the EPA to monitor air emissions from their facilities. By conducting NAEMS, EPA expected to develop Emissions Estimating Methodologies (EEM) which could be used by Animal Feeding Operations (AFOs) (Follow this link for definition of AFO/CFO) as standards to estimate air emissions and determine regulatory responsibilities. In 2012, EPA published draft EEMs for: 1) broiler operations; and 2) lagoons and basins at swine and dairy AFOs based on the data collected through NAEMS. However, the EPA science advisory board commented that the current EEMs have limited ability to predict emission at facilities other than those in the dataset (EPA 2013). Meanwhile, both the EPA science advisory board and groups from pork and dairy industries indicated that the combination of data from swine and dairy into one EEM was likely not appropriate as these types of farms generally use very different types of feeds and manure management practices. At the time of this article, EPA does not have a timeline for revised EEMs or AFO air emission compliance. (Both of the EPA draft EEMs are available through link: https://www.epa.gov/afos-air/draft-air-emissions-estimating-methodologies-animal-feeding-operations).

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