Farms, Factories, and the Future Forum
First Session Notes - Discussion
Steve Oberle, Ph.D.

Good Afternoon everyone and thanks very much Forest for your very insightful introduction.

I'd like to take also take a minute to thank the other organizers (Sarah and Jessica) and the Crawford Stewardship Board and Staff for inviting me to participate.

By way of additional introduction, as Forest mentioned, we have been monitoring Mr. Roth's current hog operation, and in particular, his nutrient management practices in Crawford County WI for 10+ years now (or the equivalent of two permit terms).

And I think it's safe to say that our main (environmental and public health) concerns all along (and reasons for monitoring his operations, in the first place) are nitrates, e-coli, and/or raw manure + wastewater in groundwater and local drinking water supplies, as well as soil erosion, direct manure + wastewater runoff, and phosphorus discharges/loading to surface water and groundwater.

For additional context, although we've been monitoring Mr. Roth's hog operation for 10+ years, I can share with you that (without a doubt) the issues we are dealing with here, are not exclusive to Mr. Roth's facility. To be clear, these issues are the very same issues (and threats) we face every day with CAFOs and other large-scale and concentrated livestock operations across all our watersheds here in WI and the country.

Further, unless and until we take the necessary actions to protect our land, watersheds, drinking water, and people; the surface water and groundwater quality of this State and country will continue to deteriorate, and public health and safety will continue to be threatened and/or directly impacted.

And as a side note, a key issue that changed everything (as far as I am concerned) with regards to potential environmental and economic impacts of Mr. Roth's and similar operations, was the transition from a more-or-less, semi-solid manure, to strictly liquid systems of manure and process wastewater transfer, storage, and landspreading. We are especially coming to grips with this currently in our more sensitive and vulnerable karst and sand/gravel aquifers.

So if I may, let me start my formal comments by sharing a few observations about large-scale livestock farming and CAFOs in general, in the context of today's theme of Farms, Factories, and the Future.....and my general response...”it's a matter of choice.” From my research and work experience, it seems we are at a crossroads here in WI and across the country with respect to our livestock industry. We have chosen and

seen farm consolidations and the concentration of livestock in different regions and watersheds around the country, across all major sectors of the industry, for over 40 years.

And so by continuing to choose to permit (and try and regulate) these excessively large operations, we will continue to see (by choice) not only the predictable ecological and economic decline of our communities, watersheds, and way of life, but also the very predictable public health consequences....This being one future.

Or, and in contrast, we can choose a different road; and what I am proposing is a more diverse, resilient, and sustainable path. Either way, as I see it, it's a matter of our choice as Citizens, Communities, Towns, Tribes, Counties, States, and a Country. You see, from my research and work experience on these issues, there are direct relationships between diversity, resiliency, and sustainability. And this is the alternative choice we must make.

To put it in more technical terms, as an ecology or economy (at any scale) trend towards increased diversity, sustainability and resiliency of the ecosystem is enhanced. In contrast, as the diversity of our cropping and livestock systems is diminished or reduced, these agroecosystems (if you will) become less sustainable and resilient. And from my research and experience, nowhere is this more apparent than in our modern production systems.

From my perspective, the use of livestock manure and process wastewater to enhance soil fertility and to promote plant health and proper plant nutrition are sustainable agricultural practices. However, the use of our watersheds as dumping grounds for excess livestock waste and nutrients, and our lands as a means of livestock waste disposal, is not only unsustainable, it is a direct threat to the groundwater, surface water, and the public health/safety of everyone downstream.

With respect to Mr. Roth's operation (and others like his), from review of his nutrient management, we have known even prior to Mr. Roth obtaining his first permit that he has too many animals on too few spreadable acres, and over his past two permit terms, it has only gotten worse.

So please let me explain...

Here in WI, we have known for quite some time that it requires about 3 to 4+ spreadable acres per AU for a livestock operation to be environmentally and economically sustainable – good evidence for this would be in the NMPs of the smaller livestock farmers that County Conservation Departments have worked with over the years, and the Century Farms here in WI.

To be more specific, and using soil test P as an environmental indicator, we have also known for even longer here in WI that there are direct relationships between soil test P and the associated impacts to surface water and groundwater quality – in other words - "the P issue" - also known and characterized as agricultural non-point source pollution.

And from my and others research on this issue, we know for certain that the fields we are finding with the highest soil P levels are the same fields leaching the greatest amounts of nitrate to our groundwater and drinking water supplies.

In Mr. Roth's case, his animal unit densities over the last permit term have been between approximately 0.4 spreadable acres/AU and less than 0.2 spreadable acres/AU, well below the more sustainable number of at least 3 to 4+ spreadable acres per animal unit.

And again, herein lies a core issue or problem with trying to sustain this type of operation (too few spreadable acres for the number of AU permitted).

Relevant to this discussion, it's important to note that for the agronomic crops grown on these farms, the excessively high level of soil P is about 35 ppm, with a corresponding UW recommendation for additional P of O. You see in the view of the science and economics behind UW recommendations, "Optimum" soil P levels are considered (and interpreted) by UWEX as "economically and environmentally the most desirable soil test category." Further, "if the supply (of nutrients) exceeds the critical level, there is an increased risk of mobile nutrients moving into the groundwater and surface water. In addition, there is no profit in applying nutrients that will not be used."

However, according to DNR regulations, it isn't until a field reaches 200 ppm P that additional landspreading on the field is prohibited without written DNR approval. And for reference, at a soil P level of 200 ppm, without any additional P, it would take over 50 years, under WI conditions, to drawdown the "excessively high" level of 200 ppm P, to the UW recommended "optimum" level of about 20 ppm P.

We also know from Mr. Roth's history that he doesn't spread on all of his spreadable acres, which in the long run, only serves to exacerbate phosphorus and nitrate issues, with the associated water quality and public health risks.

In summary:

We know the relationships between soil test P, nitrate leaching and the resulting impacts to surface water, groundwater, and public health/safety. We also know that, since prior to his first WPDES permit being issued, Mr. Roth has had too many animals with too few spreadable acres.

Mr. Roth's nutrient management history and soil testing data demonstrates an insufficient land base for the amount of nutrients produced on this operation. Rapid buildup of soil test P beyond excessively high levels and levels requiring DNR approval for continued landspreading is Mr. Roth's history.

Soil test results show the lack of sufficient acres to efficiently and effectively utilize all of the nutrients generated from this facility; Mr. Roth has consistently demonstrated an inability to manage nutrients generated on the farm in such a way as to ensure efficient plant utilization and to avoid rapid soil test P increases to excessively high levels, and the associated water quality and public health impacts.

This, in turn, has ultimately resulted in less spreadable acres over time and the associated increased environmental and public health risks. We have seen rapid rises to excessive levels of soil test P on most of Mr. Roth's fields and acres over a few short years, and in most cases, continued landspreading well beyond the allowable level of 200 ppm P (in some cases, to 300+ ppm P and increasing).

In view of the fact that there are no economic or environmental benefits to continued landspreading manure and process wastewater on fields once they reach soil test P levels defined by UWEX as "excessively high," one can only conclude that Mr. Roth and others like him are using our watersheds as their manure/wastewater dumping grounds and our lands as their means of waste disposal; jeopardizing (threatening) the health and environmental/economic well-being of local citizens and communities. in the process.

Last couple of points, in my view, unless and until WDNR and the State of Wisconsin sets aside (for a time) and re-calibrates the P Index to incorporate the excessively high soil P levels we're seeing on CAFO fields and farms, and in turn, refocuses on the core issue of excessive P loading to soils, fields, and watersheds; surface water and groundwater quality in this State will continue to decline with continued and additional acute, chronic, and costly impacts to public health and safety.

Moreover, and I must in good conscience add that for the exact reasons I have presented today, I predict that we will never see a CAFO-sized livestock facility become a Century Farm in Wisconsin. The CAFO model of livestock production, aka "bigger is better," is environmentally and economically unsustainable. So, why do we keep permitting more CAFOs, when we can't effectively and efficiently manage the ones we have?

And last, it is hard to overemphasize the importance of diversity in terms of a healthy and sustainable agriculture, ecology, economy, and society, in general. If our ultimate goals are resiliency and sustainability, I believe the the first and primary component is diversity. And if building a more sustainable agriculture and society are still goals worth

pursuing as individuals and communities (if not for ourselves, for posterity), then diversity must be a cornerstone.

From my perspective and research, CAFOs and similar modes of large-scale livestock production are a failing economic model when one considers the increasing production costs over time (ie. incorporating the diseconomies of scale) associated with land and water inputs, the predictable impacts and costs to environmental quality and public health, and the inherent economic stability and sustainability of a more "diversified portfolio."

This is also, non-coincidentally, the main reason why CAFOs and monoculture cropping systems are not only bad for neighbors, communities, and the environment; they are, from my perspective, the antithesis of a more sustainable, resilient, and regenerative agriculture.

Suffice it to say that in these cases, the actual (real) social, economic, and/or environmental costs of these production systems over the longer-term are a better indicator of sustainability (or the lack thereof) than production.