

Al Rogosin
76 Whitehead Crescent
Brandon, Manitoba
R7B 0W4

SUSTAINABILITY OF THE HOG INDUSTRY IN MANITOBA

A Presentation to the Manitoba Clean Environment Commission

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Thank you Mr. Chairman and Members of the Commission.

My name is Al Rogosin. I am a retired professor of Botany at Brandon University, I have taught Plant Ecology, and maintain a strong interest in Ecology and in environmental issues. I am not a specialist in soils or biochemistry or toxicology - you already have heard or will hear from specialists in these areas.

I have tried to follow and understand the issues concerning the Hog Industry and its relation to the environment, by attending a number of hearings - including CEC and Legislative; by talking to people involved in agriculture (including farmers.), and by reading. So I am familiar with some of the major issues, and **have an ecological perspective on certain important problems..**

I must also observe that a great deal of information on this subject has already been presented in various hearings, some in previous hearings of the CEC, some in legislative hearings, and some in submissions to the Ministers and Departments involved. Some of this important information even appears in Hansard. I think it would be very useful for the CEC to avail itself of this readily available information.

We should not have to go back to Square One every time. One can build and advance on what has already been made known, as is the process in Science and in many other endeavors.

Sustainability

We are talking about Sustainability of the Hog Industry

But we shouldn't look at the Industry in isolation. A more useful definition takes into account other factors associated with the activity and its relation to the environment - soil, water, air, health, etc., to see if it has damaging or other effects in those areas. Then we can be better able to say whether it is truly sustainable.

Satellite photos show large portions of Lake Winnipeg as GREEN, places where there is great proliferation of algae, much of it composed of species which are known to be toxic to humans, to fish, and to the fishing industry. . The photo (cover of the final report of the Lake Winnipeg Stewardship Board, December 2006) SHOWS that there is a serious problem.

This is due to a variety of causes which contribute to the major rivers entering the lake from the south, west and southeast . The waters of the Red River, entering from the States, bring in a major amount (slightly more than half of the total) of nutrients. Some is brought in from Saskatchewan and Alberta, mainly from the Saskatchewan River system, and some from the Qu'Appelle River. Northwestern Ontario contributes largely through the Winnipeg River system.

But of the rest - a large part comes from **within our own borders**, where **we** (the Province of Manitoba)-have jurisdiction. We have to look at what WE are doing to the waters.

What promotes growth of the algae is / are relatively high levels of nutrients, especially of N and P. Those levels have increased in recent years, and this is associated with sewage and other wastes entering into the rivers and streams. The waste comes from a variety of sources, of which the principal categories are:

- Cities, Towns and Villages (which may have malfunctioning or inadequate wastewater treatment facilities);
- Industry
- Agriculture

Of sources originating solely in Manitoba, Agriculture constitutes the largest single category, contributing about 37%, according to an estimate in the Interim Report of the Lake Winnipeg Stewardship Board January, 2005. Some of the Agricultural contribution comes from Cattle and Hog manure. So far, we have only estimates of the actual amounts of N and P derived from the different manures. Much more research needs to be directed toward finding specific answers to these questions.

The Hog population was estimated at about 2 - 2 1/2 Million in 2000 - 2001. It is now estimated at between 9 and 10 Million hogs. This is an approximately 4- to 5-fold increase. While not necessarily corresponding exactly to that ratio, it is reasonable to assume that the proportion of Phosphorus attributable to hogs would be significantly greater as well.

Composition

We know that the manure contains a variety of components which can pose risks to humans and other animals. These include heavy metals, hormones, antibiotics and antibiotic-resistant bacteria. Some of these are incorporated in the feed to accelerate growth. The antibiotics are administered at subtherapeutic levels to inhibit disease in the crowded populations, rather than to treat specific sick individual animals. This leads almost * inevitably to the development of large populations of antibiotic-resistant bacteria, with potentially grave consequences for humans and other animals.

(* Although I say "almost" for theoretical precision, for practical purposes we may consider that it is inevitable.)

A variety of parasites may also be found in the hog manure, at least some of which are transmissible to humans.

Concerning Water Use

Most of the Intensive Hog-Producing facilities (the "Mega-Barns") use what are essentially large-scale plumbing systems to carry off the hog wastes to earthen "lagoons" for storage and later spreading on the fields. Such lagoons have varying degrees of "seepage", depending upon how well they were constructed and maintained. The nature of the surrounding soil influences the rate at which the wastewater and its specific components will move through the soil and toward the water table. Access to the local water table and to the regional aquifer depends largely upon **where** the lagoon was dug and **where** the wastewater is spread. If it is situated over an **open** (unconfined) **aquifer** (sand or other coarse, porous materials), or fractured bedrock, such as in much of the Interlake area, there is direct access to the aquifer. Abandoned, unsealed wells represent another possible source of contamination from surface waters.

Thus, the Industry is using fresh water - **a precious resource** - to mix with Hog feces, forming a slurry, and flush to (often) earthen wastewater storage lagoons and then to spread on fields, where surface water and groundwater may carry it to other watercourses and eventually to Lake Winnipeg.

If the lagoons and spreadfields are situated over **open aquifers**, as described above, these will be the source of the water which is used. So we would gradually be contaminating the aquifer from which we draw the water in the first place. Ecologically, this makes no sense at all. Even if the lagoons and spreadfields are **not** situated over **open** aquifers, people and animals - and algae - may be affected by contaminants and nutrients introduced via surface and groundwater. In whatever way the contamination occurs, the process and its results are contrary to - make a mockery of - the idea (or pretense) of sustainability.

Why is it done that way? (Producing large numbers of hogs in very confined individual spaces, with a plumbing system to carry off wastes.) The process is so mechanized that it greatly facilitates mass production and requires relatively few people (lower labor costs) to deal with hundreds or thousands of hogs.

Are there other systems available which have a much smaller environmental impact, and which use much less water? Yes. The traditional use of STRAW-BASED COMPOSTING SYSTEMS is one. It takes more labor, but is much more environment-friendly, allows the animals more space and freedom to move, and is, in the long run, more sustainable.

Is technology the answer?

Let's look at an argument often used to defend this system.

"There is **technology** developed, or being developed, which will eliminate the problems of pollution and odor."

I don't doubt that this CAN be done, and is being done, at least to a small degree. But this is NOW - and it will be some time before it can be put into widespread use - IF it achieves widespread use. Nor do the current "solutions" deal with the problem of fresh water use as a carrier for the manure. In the meantime, the problems continue, and the use of fresh water continues.

If such technology is developed, can we believe that the developers will give it away for free? They'll want to SELL it, and not all producers will buy

Let's look at what happened in the U.S., where the Intensive production of Hogs began years before it moved in a big way to Manitoba. The problems in the States, very well known in North Carolina, in terms of water pollution and odor, became so acute that legislative restrictions became more widespread and severe.

In fact, despite the Manitoba Government's (of whatever Party) pronouncements about tough regulations, the monitoring and enforcement have been so inadequate that it seems likely that the Hog Industry recognized that our Bark was worse than our Bite. The number of staff available in the relevant Departments was heavily cut during the 1990s, and has not been fully replaced. Fewer personnel and resources are available for carrying out monitoring and enforcement, even if the political will were present. I think it is highly dubious that such a will exists or existed on the part of the Government (of whatever Party). The political emphasis has been on the promotion of the intensive production of Hogs as the economic "salvation" of Agriculture.

The Hog Industry certainly knew of the problems of water and soil contamination and of nuisance odors. But they didn't require, in Manitoba, even relatively simple technology - like plastic covers for the wastewater lagoons - to reduce odor

problems. It would cost more money.

Some barns and earthen lagoons were / are established in inappropriate places, such as on floodplains, or over open aquifers, over fractured bedrock, or close to or draining into rivers and other bodies of water. **They knew the dangers, but went ahead.** And Governments, of whatever party, gave their consent or had regulations permitting this, or turned a blind eye, in spite of being informed of the problems.

In some instances in Manitoba, earthen lagoons were dug in places where Bulrushes and Cattails were growing. These plants normally grow in soils where water is at, over, or very close to the ground surface. Seepage, leaks or spills have immediate access to the ground or surface water. There are pictures of flooded lagoons at times of heavy rains. These have been shown to the Government and at previous hearings.

So, where was the vaunted technology in all that time? The actions described do not demonstrate common sense or care for the environment : in the location and construction of the wastewater lagoons, and often in the location of the spread fields, and sometimes in the timing of the spreading (i.e., when the ground is still frozen).

Phosphorus concentrations in manure, and relation to crop plant thresholds

Crop plants can take up P from soils within a certain range of concentrations. These vary from 20 to 60 parts per million (ppm), depending upon the crop. Concentrations higher than that are not taken up by plants and are therefore ineffective for agronomic purposes. The portion not taken up remains in the soils and may be flushed away by surface water and by erosion and through movement of ground water. For many years, the "proper" application of manure to agricultural soils was calculated based upon the N concentration of the manure and of the soil. This is not adequate for estimating the P contribution of the manure.

The current threshold for P has recently been set by the Government at about 260 ppm. This is about four times the maximum concentration effective for agronomic use. Why was such a high threshold chosen? Since there is no apparent scientific or agronomic justification for it, I conclude that economic and political factors must have entered the equation.

There are pork producers who do not have sufficient land to serve as spreadfields for all of the hog manure produced. It is uneconomic to truck the slurry more than about 2 miles from where it is produced. If the threshold for Phosphorus is raised from 60 ppm to 260 ppm, they can spread the amount of manure that would be satisfactory for four times their land area. This leaves an "oversupply" of Phosphorus in the soil, which can then contribute to the elevated nutrient levels in the water.

I believe that it is political pressure from the Hog Industry, and not science or agronomic reasons which led the Government to capitulate on this issue.

Final Words

Excerpts from the Conclusion of the Final Report of the Lake Winnipeg Stewardship Commission (December 2006, p. 73) :

"What we have seen in Lake Winnipeg in recent years **demands our immediate attention**....[my emphasis]

"....While there are gaps in the scientific information that must be filled, **we have enough information and knowledge to begin the task immediately.** [my emphasis]

We cannot afford to wait. "

Thank you for your attention.

Al Rogosin

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