

## CHAPTER 7

# MANAGEMENT ISSUES

During its travels and discussions, the Panel heard many comments about sustainable livestock management. We simply did not have the time or resources to adequately assess all of them. However, we do wish to comment on five specific issues: manure management, sow housing, riparian management, performance bonds, and demonstration sites.

### Manure Management

At the public hearings, those in favor of large hog operations often expressed the view that manure is a valuable product, capable of replacing expensive inorganic fertilizer and improving the soil, and should not be treated as a waste. They felt that the post-1998 engineered and inspected earthen manure storage was a cost-effective and safe system, and pointed out that the handling and disposal of livestock manure was more ecologically sound than the current practice regarding human sewage.

Those opposed to large hog operations spoke of manure as a stinky environmental hazard, containing parasites, pathogens, and heavy metals, and expressed the view that earthen manure storages were leaking and polluting groundwater. They felt that manure was often being applied to land at excessive rates, and that application rates should be determined by phosphorus content, rather than nitrogen content, as is currently the case. They also felt that the present regulations regarding storage and spreading of manure were not being monitored or enforced. Less concern was heard relating to manure resulting from other ILOs or from extensive cattle grazing.

As mentioned earlier, the Panel convened a research round table to examine the science of manure storage and application, and to discuss problems, alternatives, and additions to the current system, as well as the relationships

between livestock and greenhouse gas emissions. Manure was also a common topic of discussion during the Panel's travels.

These various discussions led the Panel to a number of observations and conclusions.

- Nutrient management (that is, balancing the use of manure and inorganic fertilizers for crop production) is a skill that must be mastered if a farm operation is to be sustainable.
- Newly-broken soils, resulting from the clearing of forest or the breaking of grassland, produce excellent yields for several years, until the N and P levels, which are reduced with each crop produced, decline to levels which limit crop growth. Higher crop yields can be restored by adding sufficient nutrients, chiefly N and P, to the soil to provide for the crop's requirements. Nitrogen is added in the form of anhydrous ammonia, urea, or ammonium nitrate, all of which are provided from fossil fuel sources. The phosphorus requirement is supplied from phosphorus-bearing rock, which is mined. The cost of this commercial or inorganic fertilizer is largely based on the cost of natural gas, and continues to increase, independent of the price of the crop that it produces. The amount of inorganic fertilizer used per acre is unregulated, as is its application relative to the location of groundwater and surface waters.
- The addition of an ILO to a large grain farm can increase its environmental and economic soundness by recycling nutrients, chiefly N and P, that otherwise would be exported in crops, and by providing a local market for feed grain. As well, the additional labor requirement of such operations should have a positive social impact.
- Manure must be managed as a valuable commodity, capable of reducing the requirement of both forage and grain crops for inorganic fertilizer. Management must be

directed toward maximizing the transfer of the nutrient contained in the manure to the crop to which it is applied, while at the same time eliminating any possibility of escape of these nutrients into surface and ground water, and reducing odors and greenhouse gas emissions. Techniques that help accomplish these goals in liquid hog manure systems include an air-impermeable cover for manure storage and spring injection of manure slurry into annual crops and forages. Production systems using dry manure can address these goals through well aerated composting and the immediate incorporation of spread compost.

- The current monitoring and enforcement procedures regarding manure storage and application are insufficient to give the public confidence that manure from ILOs is being handled according to the principles of sustainable development. A recent study (DGH Engineering 2000) indicated that the level of knowledge regarding manure management among hog barn operators needs improvement, as does compliance with manure management plans. Procedures concerning the reporting of inspections of manure storage sites and soil testing of fields to which manure has been or will be applied are inadequate. It has been suggested that only about 10 percent of the land is tested regularly, and that custom manure applicators do not routinely have the capability to apply manure on a soil test or nutrient basis. This is because commonly used equipment has no mechanism to effectively control flow rates. (PFRA 2000).
- Livestock operations of over 400 AUs must comply with manure management regulations that require testing the manure slurry and the fields to which it is to be applied for nitrogen and phosphorus. The manure must then be applied at agronomic rates according to field nutrient levels and the projected nitrogen uptake by the next crop. Regulation of manure application according to nitrogen means that phosphorus in excess of crop requirement may be applied. There is concern that this excess phosphorus could enter surface water and groundwater and lead to eutrophication of rivers and lakes. Manitoba soils have a large capacity to bind extra phosphorus to soil particles, and, for the present, as long as soil erosion is controlled, the excess phosphorus from manure application should not cause eutrophication. However, the capacity of our soils to bind extra phosphorus is not limitless, and the regulation of manure spread according to nitrogen content only is not considered to be sustainable.
- Long-term studies to determine the impact of the use of manure and inorganic fertilizers on the sustainability of our current system of agriculture (including field crops, livestock production, and irrigated agriculture) are essential, and are not currently being done. These would include measurements of the extent of nitrogen and phosphorus in surface water and groundwater. Without such studies, it is difficult to place the impact of livestock production within the context of the impacts of other types of agriculture, and the impacts of human society (e.g. leaking private septic fields and municipal lagoons, and urban run-off) on the Manitoba environment.
- The anaerobic digestion of manure to extract methane, the chief constituent of natural gas, is practiced in some countries, such as Denmark and Germany. Methane represents an energy source, and its conversion to carbon dioxide by burning has benefits concerning greenhouse gas emissions. Unfortunately, an efficient methane production process requires winter temperatures in excess of those found in Manitoba. Research into a lower temperature process is ongoing, and hopefully, methane extraction can be added to current methods of manure processing.
- The liquid manure system found in all new, large hog barns can be designed and operated to provide efficient transfer of nutrients from hogs to cropland, while at the same time reducing odors. But it is based on the continuous availability of large volumes of water. Prairie Canada regularly suffers from drought and growing demand for water.

Consideration must be given to adapting a liquid manure system to times when the available water supply may be insufficient.

- Land settlement patterns led to many cattle operations being located along water bodies, with the resulting potential for manure pack seepage into surface water, and subsequent nutrient enrichment of lakes and rivers. Further, many pasture operations permit cattle to have summer access to streams, rivers, and lakes. The efforts of organizations such as the Manitoba Habitat Heritage Corporation (MHHC) and Ducks Unlimited (DU), and enlightened cattle producers, to trap manure pack run-off in catchment basins, and restrict or eliminate the access of cattle to natural waters, are applauded and encouraged.

The understanding of manure management and the long term impact of manure as a nutrient, as well as the skilled application of nutrients, is of vital importance to sustainable livestock development in Manitoba.

#### Recommendations:

- **Educational institutions, in cooperation with industry and government, should re-assess the training requirements for professionals and technicians in the nutrient management field.**
- **The Provincial government should move towards the formal certification of commercial nutrient applicators.**
- **For reasons of odor control, reducing greenhouse gas emissions, and maximizing nutrient capture, ILOs should be encouraged to implement covered manure storage and injection.**

## Sow Housing

Attention to the welfare of livestock, especially those raised in confined quarters, is growing for several reasons. As society becomes more urban, it becomes less familiar with modern farming practices and how food gets to the table. These modern practices have likely resulted in the

decline of animal welfare relative to earlier “free range” conditions. Animal welfare organizations have responded by addressing the well-being of the animal while it is alive. One of the more controversial practices in hog production has been the confinement of pregnant sows in gestation stalls. The media have helped to make this a “hot button” urban issue.

Considerable research has been concentrated on maintaining productivity at least cost by the improvement of genetics, nutrition and pathology. Considerably less research has been focused on animal behavior and housing. It has yet to be shown conclusively that reproductive performance and weight gains are better in alternative housing arrangements. One popular and economical answer to the confinement housing traditionally seen in hog operations is the group housing systems referred to as biotech or hoop barns. A more detailed description of these systems is provided in the Panel’s separate technical document.

The Panel is not equipped to make definitive recommendations on these points except to emphasize the very real need to accelerate research to discover how to house livestock for maximum well-being, especially in confined birthing and rearing systems. We take the view that the industry cannot afford to relax, and must continually consider alternatives and test new approaches. There are at least three reasons for this view:

- There are pressures from consumers for pork raised under what they consider to be circumstances “friendly to animals”. This has led to the banning of gestation stalls in the UK, the Netherlands, and Sweden, and restrictions on their use in Denmark, with a harder look at other standards, such as freedom of movement.
- A growing number of consumers are searching the market for pork that is certified as being raised under conditions “friendly to animals”. This is not inconsistent with the notion that HACCP (Hazard Analysis Critical Control Points) programs for food safety could be expanded to include standards for animal welfare.

- There are national campaigns mounted against “factory farming”. One example is the Campaign Against Factory Farming organized by the Humane Farming Association in the United States, the country that is the largest importer of Canadian hogs. The recent decision by a major US fast food outlet to source eggs from higher animal welfare production systems may be an indicator of the challenges awaiting intensive livestock operations.

These pressures are not unique to Manitoba, but we have an opportunity to lead the continent in developing alternatives. These alternatives could also advance our market opportunities.

## Riparian Management

A riparian area refers to the transition zone between upland vegetation and lakes, streams, potholes and marshes – the shoreline or river bank, for example. A matter of growing concern regarding the raising of cattle on pasture is the management of these riparian areas. In essence, the concern relates to cattle having unrestricted access to riparian areas and the impact this has on water quality and wildlife habitat.

A healthy riparian zone will be well vegetated with a diverse group of plants having a variety of age classes. This vegetation protects water quality and maintains an ecological balance in the water. Riparian vegetation helps reduce stream velocity during high flow periods, thereby slowing down natural erosion. Other benefits of a healthy riparian area include: higher forage yields and improved livestock gains, improved animal health, shelter to livestock from extreme weather, recharge of underground aquifers, reduced siltation by filtering sediment, and provision of cover, food and cool water for fish and wildlife.

Improper riparian management reduces the amount of forage produced. Overuse of riparian areas can also mean that the uplands are being under-utilized. Cattle lingering in water tend to develop foot rot. Excrement in the water may expose the animals to pathogens, bacteria and viruses that would impact health and weight gain.

Some algae species are known to produce toxins that are fatal to livestock if ingested. On the other hand, studies have shown that animals that have access to good quality water are more likely to drink more and graze more. This improves overall weight gain

Degraded riparian areas mean loss of wildlife and fish habitat, degraded water quality, increased presence of weeds and/or undesirable forages and reduced property values. This all translates into lower returns to livestock producers. In addition, with the recent health problems in Walkerton, livestock producers must become increasingly aware of the issue of water-borne diseases migrating to surface water or groundwater. Managing the access of livestock to riparian areas can minimize the impact of these problems.

Organizations like MHC and the Little Saskatchewan River Conservation District have been holding field days and tours to educate and encourage cattle producers to arrange their operations to reduce or eliminate damage to riparian areas. This approach, combined with some incentive funding, is producing results. The involvement of the Manitoba Cattle Producers Association (MCPA) in coordinating and promoting better riparian management would increase the effectiveness of this programming.

Riparian areas can be rehabilitated and maintained when proper management principles are applied. These are well articulated by organizations promoting riparian management, and need not be repeated here. These suggested management practices are indicative that it isn't necessary to ban cattle from riparian areas. However, the challenge is for cattle producers to take the initiative to improve riparian management.

### Recommendation:

- **The MCPA should take the lead in developing a strategic initiative for riparian management in Manitoba. This should be done in partnership with groups such as MHC, DU, Conservation Districts, and PFRA, as well as Manitoba Agriculture and Food and Manitoba Conservation.**

## Performance Bonds

Some presenters at the hearings felt that the public should not have to bear the expense of clean-up should ILO facilities, and manure storages in particular, be abandoned. Decommissioning, also, should not be at public cost. It seemed necessary to ensure that the potential environmental effects of large spills be addressed properly. If ILOs were licensed under *The Environment Act*, conditions could be built into the operating license. It is the view of the Panel that consideration be given to requiring proponents to provide evidence of financial responsibility to the province as a condition of site approval for an ILO.

In the hazardous waste industry in Manitoba, a licensed operator must file a copy of his insurance instrument with Manitoba Conservation, keeping the department informed that it is current. In the United States the EPA provides an insurance service where it is satisfied that the applicant has already diligently sought and failed to obtain private coverage against spills.

In the fast evolving intensive livestock industry, with vulnerability to major market setbacks, it is reasonable to expect some protection against sudden threats to the environment. The Panel believes a responsible operator will find this “cost of doing business” reasonable.

### Recommendations:

- **Industry representatives and government should explore sources of performance bond insurance, the levels that are appropriate, and the regulations that are required to provide the public with assurance that costs of environmental problems with a specific ILO are not borne by the public.**
- **Performance bonding should be a condition of approval for new ILOs, and that such a condition for all ILOs over 300 AU be phased in over a reasonable time period.**

## Demonstration Sites

Many rural councils and residents are unfamiliar with the structure and functioning of modern, large hog barns. This unfamiliarity often leads to unease and fear regarding the environmental consequences of such a barn locating in their area.

### Recommendation:

- **Manitoba Pork should coordinate the development of a state of the art hog production site and manure handling facility that can test the latest techniques to improve sustainability of the hog industry and improve the in-barn environment. Such a site would play a vital role in technology transfer to current and prospective hog producers, as well as have a primary function in education of municipal councils and the general public.**