

## **Comparative Standards for Intensive Livestock Operations in Canada, Mexico and the United States**

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Over the past 20 years, livestock farming in North America has been transformed from an industry characterized by relatively small producers to one dominated by large facilities raising thousands of animals. This growth has led to a new set of environmental impacts and concerns unique to the livestock industry. While the regulation of livestock agriculture has historically been a state/provincial and local matter, governments from the municipal to the federal levels have grappled with the environmental side effects of these new, concentrated facilities. This report surveys the current environmental requirements for “intensive livestock operations” (ILOs) in the US, Mexico and Canada and makes recommendations on how the environmental impacts of ILOs in North America might be mitigated.

### **ILOs and the Production of Livestock**

The acronym “ILO” generally refers to a facility that has a large number of livestock in confined conditions. In the US, the preferred term is “concentrated animal feeding operation,” or “CAFO.” For decades, the poultry industry has operated ILOs in large, enclosed facilities, a trend that has now been transferred to the pork industry. This increased prevalence of ILOs can be attributed to a small number of companies who dominate the market, and are integrating their meat processing vertically to include owning the animals, the feed mills and the brand names of the products. Where these vertically integrated companies are meat processors, livestock production facilities tend to cluster around them. One report states that hogs produced under contract in the US went from 10 per cent in 1993 to over 50 per cent in 1999.

Along with the increase in the size of feedcattle and hog operations, the actual number of producers in Canada, Mexico and the US has decreased. According to industry reports, the eight largest commercial pork producers in Canada owned 275,800 sows in 2001, the three largest in Mexico owned 131,500, and the 25 largest in the US owned 2,485,075. In 2000, operations with 5000 hogs or more comprised 50 per cent of the US hog inventory, while currently in the US, 110 operations control 47 per cent of it. It has also been estimated that 50 per cent of Mexico’s pork production comes from intensive operations.

### **ILOs, Public Health and the Environment**

The proper disposal by ILOs of their manure and wastewater, which can release significant levels of pollutants into the air (such as ammonia, hydrogen sulfide, carbon dioxide, particulate matter and methane), is critical to protecting human health and the environment. These byproducts can also contain harmful pathogens, antibiotics and hormones.

Currently, in Canada, Mexico and, the US, livestock operations are prohibited from discharging untreated manure and wastewater directly into waterbodies (with some leverage given for extraordinary storm events). However, the volume of these byproducts from the largest farms can rival the sewage output of a sizable city, and can contaminate surface and ground water, including drinking water supplies. Although ILOs dispose of most of their manure on land as fertilizer, the amount produced by their operations can exceed the options for beneficial re-use. Excessive application of manure can create soils that are over-enriched with nutrients, threatening local

watersheds with runoff leading to algal blooms, loss of habitat, changes in aquatic biodiversity and the depletion of dissolved oxygen.

The extensive use of antibiotics to control diseases in food-producing animals may also lead to certain drug resistance problems in humans. In response to this concern, the American Medical Association passed a resolution urging the termination or phase-out of the prophylactic use of antibiotics in livestock operations. The World Health Organization has also mandated that antibiotic use in food-producing animals must be curtailed to prevent the increase of drug-resistant diseases. In addition to these efforts, there has been increased public attention on the lack of regulations governing ILO facilities throughout North America that aim to protect human health and the environment.

### **Environmental Regulation and ILOs**

In North America, ILOs are not subject to uniform regulations or standards. Instead, each country relies on its own mix of local, state/provincial and/or federal regulations. In Canada, ILO regulation is almost exclusively a provincial matter, with some regulatory authority delegated to local municipalities. Federal attention on these matters is generally limited to agricultural research instead of regulation, with the exception of federal fisheries legislation that aims to protect fish habitats from pollution.

In Mexico, regulatory control, although minimal, is primarily a matter of federal law, with oversight and enforcement issues usually managed at the local levels. Federal law currently regulates discharges into waterways, but a federal regulatory system for addressing environmental concerns in general has not yet been developed. While Mexico's federal water law could be applied to ILOs, its environmental agency, Semarnat, has not developed the technical standards specific to waste discharges from ILOs into waterways.

In the US, a recent revision of federal regulations has led to new national requirements for ILO or CAFO nutrient management plans, manure and soil testing, and record-keeping. The US has also mandated that all facilities meeting the definition of a CAFO must apply for a federal water permit or for a "no potential to discharge" determination.

Numerous data gaps complicate the regulation of ILOs, due to limited on-site monitoring for environmental parameters and a general lack of data on ILOs' specific impacts on air, surface- and groundwater quality. Very little information also exists on the long-term effects of the land-application of manure on soil biota, as well as data on ILO compliance rates and enforcement actions. Where it exists at a local level, this information is often not aggregated at the state, provincial or national levels.

### **Environmental Regulations and the Siting of ILOs**

There is little conclusive evidence as to whether federal, provincial/state or local variations in environmental regulations influence siting decisions for livestock operations, i.e., there is no evidence of a "pollution haven." Some of the many costs that operators consider when making siting decisions include proximity to feed sources and processors, distance to markets, climate, political support within the particular jurisdiction, local financial incentives, tax consequences and labor costs. To determine whether less stringent environmental standards alone or in combination with other factors would generate enough savings to attract new ILOs, the relative cost of environmental requirements—including local land-use restrictions and design requirements—would need to be considered in relation to these other costs. US industry sources,

however, report that that they feel “stymied by a myriad of new laws and regulations in the US” and are looking to Canada and Mexico for new growth opportunities.

### **Standard North American Environmental Requirements**

Regulations governing ILOs in Canada, Mexico and the US have several similarities:

- **Permits** – In each of the three countries, some form of permit is required for livestock operations above a certain size. This may simply be construction permits or operating permits with little or no environmental content beyond the restrictions that may be imposed on siting, such as the operation’s distance from urban areas. To the extent that they are environmental permits, they are almost exclusively concerned with water pollution issues in all three countries.
- **Nutrient Management Plans (NMPs) or Manure Management Plans (MMPs)** – Most commonly, manure from ILOs is applied to land as fertilizer. A detailed NMP would include liner requirements for storage facilities, testing of the manure and the land where it is to be applied. At a minimum, NMPs enforce a systematic accounting for an operation’s manure handling practices.
- **Setback or Minimum Distance Separation (MDS) Requirements** – Issues of odor have been dealt with primarily through setback requirements. Setbacks may also protect waterbodies and may be applied to production facilities and/or to the land where manure is applied.
- **Public Information and Public Notice Requirements** – While the disclosure of information to the public about the potential environmental impacts of ILOs is improving, efforts are still minimal in all three countries.
- **Professional Certification** – A minority of US states and Canadian provinces has mandated that NMPs (or MMPs) for ILOs be approved by certified professionals. While the certification process lacks standards (or sufficient history for critique), it does suggest how a professional cadre can supplement the work of under-staffed environmental agencies.
- **Financial Guarantees** – A few US and Canadian jurisdictions require that bonds (or some other form of financial guarantee) be posted to ensure the proper closure of manure management facilities, should a livestock operation go out of business.
- **Technical Assistance** – In all three countries, agriculture has traditionally operated as a favoured sector that is strategically important to each nation’s economy. Numerous government programs have provided advice and technical support to this industry. Technical assistance has frequently been in the area of reducing environmental impacts.

### **The Future**

The environmental impacts of ILOs will likely remain a significant public health and environmental concern among Canada, Mexico and the US. Given the decentralized nature of the current regulatory setting in North America, it is unlikely that environmental requirements and incentives will become uniform among any of the three countries. Future technical innovations, driven in part by litigation in the US, may help governments understand the best technologies and practices for managing large concentrations of animal manure and wastewater.

## **Conclusions**

As outlined in the report, the livestock industry, and in particular the swine industry, has undergone dramatic concentration and integration in the past twenty years, expanding in Canada, Mexico, and the US.

Related to the growth of ILOs, the recognition of the importance of addressing the human health and environmental impacts of these operations has also gained public support. This report highlights the inability of environmental policymakers to keep pace with the growth of North America's meat production. Though regulation has generally focused on water pollution to this point, and not always comprehensively, air and soil pollution are also significant side effects of ILOs, as is the industry's extensive use of hormones and antibiotics. Research is currently underway that could reduce the impact of manure and wastewaters from ILOs, though the efficacy and costs of these new technologies are yet to be determined.

While it is recognized that environmental regulation varies significantly across jurisdictions, NMPs and setbacks are becoming common regulatory tools throughout North America. The enforcement of environmental regulations at livestock operations varies widely, and is further hampered by agencies that are under-staffed, untrained in livestock issues, or both. In some cases, jurisdictional issues arise among environmental agencies and agricultural agencies.

As joint ventures increase between US, Mexican and Canadian livestock producers, it is still unclear what production factors (for instance, transportation, labor or environmental regulations) will contribute to producer's decisions on where to operate. Though variations in regulations can provide incentives to site new facilities in jurisdictions with the least stringent regulations, evidence that disparities in regulations influence those decisions is only anecdotal. Data for tracking foreign investment in livestock operations is difficult, if not impossible, to obtain.

## **Recommendations**

1. Greater uniformity in the coverage of regulations within (and among) NAFTA countries could minimize incentives to site ILOs in the least-regulated jurisdictions. Variations from "state of the art" environmental standards should be based on a meaningful assessment of risks in the context of other economic, social and geological concerns.
2. Greater uniformity is needed in requirements for nutrient management plans, setbacks, public information and public participation. Also, ILO certification schemes need to be standardized by a professional certification authority.
3. Where governments have both agricultural and environmental agencies, they should carefully consider the division of responsibilities among those agencies in relation to ILOs.
4. The development and implementation of new manure and wastewater treatment and pollution prevention technologies that consider the lifecycle of these byproducts should be encouraged, especially in areas with excess nutrients.
5. Environmental responsibility needs to be assigned to both livestock producers and integrators (animal owners or contractors) and all other stakeholders participating in the meat production sector.

6. Improved systems should be developed in each of the three countries to collect information on the environmental conditions associated with ILOs and to periodically survey environmental regulation and enforcement in each country.

7. Better data collection systems should be implemented for tracking foreign direct investment in ILOs in Canada, Mexico and the US in order to help determine whether investors are relocating to meet that country's domestic demand or whether they are relocating to export back to the country from which they moved and thereby avoid regulatory costs.

8. Worker health, antibiotic, hormone and specific pathogen issues are beyond the bounds of current environmental regulation and, therefore, of this study. Each deserves improved data collection and significant public attention.