

**Livestock and Agricultural Intensification:
Community Perceptions of Environmental, Economic and
Social Impacts as an Impediment to Agricultural Production**

**Research Proposal by
Wayne J. Caldwell, Ph.D., MCIP, RPP**

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**University of Guelph,
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Table of Contents

Schedule 1	3
Executive Summary	4
Rationale / Objectives of Project.....	5
Anticipated Benefits to Agriculture & the Rural Community	6
Literature Review	7
Communications Plan.....	12
Experimental Procedures (Research Methods).....	13
Phase 1	13
Phase 2	14
References	17
Resume of Principal Researcher- Wayne Caldwell.....	19
Letters of support	24

SCHEDULE 1: PROPOSAL TITLE PAGE AND CERTIFICATION

PROJECT TITLE: Livestock & Agricultural Intensification: Community Perceptions of Environmental, Economic & Social Impacts as an Impediment to Agricultural Production

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NAME AND ADDRESS OF RESEARCH ESTABLISHMENT:

University of Guelph
School of Rural Planning and Development
Guelph, Ontario
N1G 2W1

TELEPHONE NUMBER: 519-824-4120 (EXT. 6420) **FAX:** 519-767-1692

EMAIL ADDRESS: waynecaldwell@hurontel.on.ca

ICAR REGISTRATION NUMBER OF ESTABLISHMENT: 306 001

PERSONNEL:

Principal Researcher: Dr. Wayne Caldwell, MCIP, RPP (.3 person year)
Graduate Students (to be determined) (1 person year)

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PLANNED PROJECT TERMINATION DATE: May, 2003

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Executive Summary

In many areas of Ontario livestock production has reached a crossroads. Community antagonism often translates into municipal by-laws which can be an impediment to agricultural production. Interim Control By-laws “halt” new development and zoning by-laws establish previously unthought of regulations, such as caps limiting the size of livestock operations. Moreover, the establishment of new barns is often accompanied by hostility and community unrest. Concerns over air and water quality, along with social and economic concerns are often at the heart of this unrest. Sometimes these concerns are legitimate and sometimes they are perceptions of how bad things will be after the new barn is built. Whether these concerns are real or perceived, there has been no community based, systematic and objective study of environmental, economic and social implications following the establishment of new, modern livestock facilities.

The absence of this information leads to four opportunities.

Opportunity # 1: Municipalities often make decisions on livestock production without having an objective analysis of what large barns means to the rural community. *There is an opportunity for more informed decision making at the local level.*

Opportunity # 2: Residents often oppose modern livestock facilities on the basis of a perception of anticipated issues (“NIMBY” - Not In My Backyard). Residents deserve to know how these facilities fit into the local community. *There is an opportunity for a better understanding of the long-term compatibility of animal agriculture with the rest of the rural community and in turn to have a more informed citizen perspective in the planning process.*

Opportunity # 3: Anecdotally we know what constitutes a “good or bad neighbour policy” – but from the perspective of residents we do not have a systematic analysis of what “works and what doesn’t.” *There is an opportunity to more adequately identify and promote “good neighbour” policies that work at the community level.*

Opportunity # 4: In Ontario, even with probable legislation, municipalities are likely to continue to adopt plans and by-laws that are increasingly restrictive and regulatory towards livestock production. While regulation is necessary it often occurs in the absence of a full range of options. *There is an opportunity to learn from others and to identify new and innovative best practices for municipalities (and the province) in planning for the establishment and management of modern livestock facilities.*

This research has a *basic objective* to develop information and identify approaches that will be of critical importance to farmers, community members and local politicians as they establish policy and make decisions that will determine the future of livestock production in Ontario. The research will document the relationship between livestock operations and

neighbouring residents; it will identify those practices that contribute to a positive or negative relationship; and it will identify best practices used by municipalities in Ontario and elsewhere as they plan for the establishment of new livestock facilities.

Rationale / Objectives of Project

The continued viability of livestock production in rural Ontario is at least partially dependent upon the willingness of the community to accept this industry as it continues to evolve. Municipalities, reflecting demands from their ratepayers, are considering the adoption of by-laws which in one form or another restrict livestock farming. The intensification of the livestock industry has led to much debate. Harrowsmith Magazine, for example, in a recent article (February, 2000) advises “*anyone who lives the rural life...to ...Scream bloody murder if some agri-business proposes to build a 200 sow finishing barn within 10 miles of your place.*” These types of attitudes reflect legitimate interests in air and water quality, but also reflect a paranoia about livestock farming that is not always justified.

This research has a *basic objective* to develop information and identify approaches that will be of critical importance to farmers, community members and local politicians as they establish policy and make decisions that will determine the future of livestock production in Ontario. More specifically this research has the following objectives:

- To document issues of compatibility and to better understand the relationship between livestock facilities and rural residents.
- To allow for more informed decision making – by the livestock industry, by rural residents (farm and non-farm) and by local and provincial policy makers
- To identify, from the community’s perspective, those practices that contribute positively or negatively to the relationship between livestock production and neighbouring uses
- To identify best practices for municipalities into how land use planning can more effectively respond to the animosity towards livestock production that is most evident with the establishment of new large barns.

Anticipated Benefits to Agriculture and the Rural Community

The research will provide a number of benefits for agriculture and rural communities:

- 1) It will establish a better understand of the long-term relationship (environmental, economic and social) between large livestock operations and the balance of the rural community.
- 2a) If the research demonstrates that large established barns (3-5 years) are relatively “good neighbours”, residents and decision makers can look past the initial objections to the favourable experience of others. This is a critical factor as new barns are increasingly subject to political and public review. Or...
- 2b) Conversely, if the research demonstrates that large established barns (3-5 years) are a source of antagonism to neighbours the research will have identified components of a good neighbour policy that are likely to minimize conflict. In turn, this information can be used to improve the acceptance of animal agriculture in rural communities.
- 3) It will provide the basis for education that promotes practices that help to create harmony between livestock producers and other rural residents.
- 4) It will identify planning practices from municipalities in Ontario and elsewhere (Canada, U.S. and Europe) that minimize conflict and facilitates the proper planning and community acceptance of new livestock operations.
- 5) It will provide information that will contribute to a provincial review of existing land use policy as it relates to agriculture.
- 6) It will allow municipalities to identify their approach relative to other areas within the province (allowing them to make appropriate adjustments to their own planning documents).
- 7) In summary, the research will develop information and identify approaches that will provide a critical input into the local political dynamic which will determine the future of livestock production in the province of Ontario.

Literature Review

The Evolution of Livestock Agriculture

The intensification of agriculture often leads to conflict within the rural community. Recent developments in the livestock sector have been a particular catalyst for debate and action within many rural communities. As livestock facilities have gotten larger, become more geographically concentrated, and more reliant upon technology (for example liquid manure systems) many people living in proximity to these facilities have expressed concerns related to odour and water quality. In response to this conflict provincial and municipal governments are thrust into the midst of the issue and are often pressured to develop criteria to assist with the establishment of new facilities and to regulate existing situations. The resulting approaches include a mix of legislation, policy, local by-laws and recommendations concerning management.

In an attempt to find efficiencies in production and in response to the cost-price squeeze, farmers find that net returns per unit of production are decreasing - dictating larger and larger operations. For example, between 1976 and 1996, the number of Ontario farms with hogs dropped from 18,622 to 6,777 and at the same time the average number of pigs per farm increased from 103 to 418 (Yeager, 2000). Likewise, the total number of dairy farmers in Ontario dropped from 40,000 to 8,320 (Caldwell and Toombs, 1999). In the United States, the numbers are even more drastic with the total number of pork producers having dropped from three million farms to 150,000 – a 95 % drop (Henderson, 1998). Moreover, according to the Center for Rural Affairs, just 50 producers now farrow 40 percent of U.S. hogs (Caldwell and Toombs, 1999). This move towards fewer, but larger farms is also repeated in the dairy, and poultry sector.

Real and Perceived Impacts of Intensive Livestock Operations

While there has been much discussion regarding the negative impacts of intensive livestock operations, it is not clear to what extent that these impacts are real or perceptions on the part of the broader rural community. These impacts on the community can be further divided into three main categories for further analysis.

Economic Impacts

The preservation of an active agricultural industry dictates the need to recognize the importance of agriculture -maintaining its ability to compete in the local and global market. By-laws and regulations that unduly restrict the ability of agriculture to evolve, or establish unrealistic financial impediments are likely to contribute to a stagnant agricultural sector, with the potential for broader economic impacts (Caldwell and Toombs, 1999). Agriculture can also have an impact on the rural community. Concern over large livestock facilities and related environmental concerns has the potential to impact real estate values. While the issue can be exacerbated by significant non-farm development it is not exclusively a farm vs. non-farm issue. In southwestern Ontario, for example, significant debate has occurred in recent years and has involved farmers, non-farmers, cottagers and

urbanites. Property value issues, while notoriously difficult to prove can be exceedingly emotional and challenging to respond to. As a result, in many instances municipalities have been lobbied to restrict the establishment and operation of livestock operations (Caldwell and Toombs, 1999).

Environmental Impacts

While Yeager (2000) has identified a number of environmental benefits associated with intensive hog operations (such as waste reduction from the more efficient use of feeds) there is generally more attention paid to the real and perceived negative environmental impacts. The most commonly cited negative impact of intensive livestock operations is the impact on water quality in rural communities. While the magnitude of the problem is a point of debate, issues related to manure spills and the occurrence of non-point source contamination is clear evidence of the negative impact agriculture can have. More research is required on the impact of livestock production on the environment, especially the impact on water quality (Vavra, 1996). Surface water can be impacted by the wastes' oxygen demand and ammonia which can result in fish kills and reduced biodiversity (Yeager, 2000). Human health can also be impacted by pathogens and nitrogen from animal wastes (Yeager, 2000). These pathogens and nitrates can also contaminate groundwater and contaminate wells. In fact, nitrate is the most common contaminant found in drinking water wells (Yeager, 2000). While the cause of an e-coli outbreak at Walkerton, Ontario in 2000 and the associated loss of human life has not been firmly established many are placing the blame on livestock farming. In the U.S. earthen manure lagoons and a number of recorded "catastrophic spills" has placed the livestock industry under intense public scrutiny (Henderson, 1998).

Concerns over air quality is another common complaint related to intensive livestock operations. The emissions from the associated anaerobic waste decomposition are particularly offensive, and these gases may in fact contribute to global warming (Yeager, 2000). One particularly extreme case in south-central Michigan resulted in reports of an "horrific stench that caused nausea, burned eyes, nose and throat, caused headaches, prevented sleep, and could be detected as far as five miles away" (DeLind, 1995; p. 35). While odour is an expected by-product of livestock - the concentrations of livestock and the ability to single out individual farms or livestock types, such as hogs, in combination with community trends such as non-farm growth contribute to the prominence of this issue (Caldwell and Toombs, 1999).

Society has also become increasingly aware and concerned with issues that contribute to the degradation of the environment. This environmental awareness contributes to the public being much less accepting and tolerant of issues related to agriculture and the environment (Caldwell, 1998). Related to increased environmental awareness is an increasing liability that potentially exists as a result of air or water contamination from agricultural practices. The potential for nuisance suits, and accidents or poor management that contaminate surface or ground water are likely to lead farmers and their insurance companies to be increasingly careful in the establishment and maintenance of livestock facilities. Issues related to environmental liability will likely lead municipalities to more

rigorously enforce and develop by-law provisions that pertain to the establishment and management of livestock facilities (Caldwell, 2000).

Socio-political Impacts

Opposition to large livestock barns often sounds like “NIMBYSIM” (not in my back yard) and can lead to intense emotional debate and conflict. The debate can pit one sector of the community against another, raises fundamental questions about how we want our communities to evolve and can lead to questions concerning the role of agriculture. This emotion can complicate the best intentions of involving the community in policy development, implementation and on-going monitoring.

Jurisdictional Responses

The development of a response to “Intensive Livestock Operations” reflects the respective powers and responsibilities held by the province and municipalities. Both, to a certain degree, are constrained in the types of actions that may be taken. Not only are there legal impediments, but there are also philosophical differences on how the issue should be approached. There are, for example, differing views on the merits of a regulatory vs. voluntary approach. From a regulatory perspective both municipalities and provincial staff are constrained by the legislative authority that they have to respond to this issue (Caldwell and Toombs, 1999). However, there is also a strong role for voluntary and community actions in response to issues arising out of the operation of intensive livestock facilities.

The Provincial Response

In most provinces the Department or Ministry of Agriculture is the key provincial department involved with this issue. There are however, interesting anomalies in Quebec and to a lesser extent in Manitoba and British Columbia where the Environment Department has a much greater role. Discussions with some individuals suggest that to a certain extent Departments of the Environment are perceived to be more accountable to environmental issues. While all provinces have adopted assorted legislation that potentially has an impact on siting and management of livestock production (example Planning Act, Building Codes, Environmental Protection, etc.) only a few have adopted specific legislation in response to the intensification of the livestock industry (New Brunswick, Quebec, Saskatchewan). This legislation (or lack thereof) also establishes the framework for a provincial lead approach such as Quebec, or a municipal lead approach such as Manitoba (Caldwell and Toombs, 2000).

The Municipal Response

In some provinces, municipalities are the key institution involved in regulating the siting of livestock facilities. While municipalities do not exist in all parts of the country, where they do exist, they have on occasion assumed a leadership role or alternatively are proceeding in partnership with provincial agencies to deliver the provincial strategy or guidelines. Key components of this approach tend to include building permits, compliance with zoning provisions, minimum distance separations, and in some instances nutrient management plans, mandatory public meetings, land base requirements and protected water quality

zones (Caldwell and Toombs, 1999). In addition to a municipal focus on water there are increasing provincial initiatives aimed at protecting water quality resources.

The Voluntary/Community Response

Voluntary programs and approaches provide an opportunity to overcome many of the limitations associated with the sole reliance on regulatory initiatives. Many of the problems that exist within the agricultural community are historical in nature and difficult to regulate. Rates of manure application, over-fertilization, livestock access to streams, and application of manure in less than optimal conditions are examples of troublesome activities that tend to go beyond the jurisdictional and practical abilities of the municipality to regulate. While the position of Surgeoner and Dalrymple (1995, p. 27) that "it is wrong to equate big with environmental damage" and that "large farms with proper manure and nutrient management can be less destructive to the environment than a cluster of small, poorly managed farms" is probably accurate, the rural community is not likely to be tolerant of activities that degrade property value and quality of life. Therefore if the livestock sector wishes to co-exist in any but the most sparsely populated areas, it must be prepared to work with and help develop appropriate criteria (Caldwell, 1998).

There are numerous farm organizations and provincial (or state) programs that concern themselves with promoting high standards of farm management. In Ontario the Environmental Farm Plan has been very successful at enlisting farmers on a voluntary basis to adopt agricultural environmental planning. Likewise the program "Healthy Futures for Ontario Agriculture, 1999," offers the promise of co-operation between the farm community, municipalities and the province in an attempt to address these types of issues. Similar examples exist in the United States (Bellows, 1996).

Related to voluntary approaches are programs of education and research. A clear understanding of the issues can be facilitated through municipal involvement – both in terms of research and also through the dissemination of information. Helping to ensure community based dialogue and through the public development of policy - information can be shared between farm and non-farm interests. Moreover, even though the requirement for a nutrient management plan might be thought of as a regulatory initiative, the benefits are largely educational- making sure that the farmer of a new large operation is fully conversant with the issues, opportunities and risks associated with a large operation. In a similar fashion voluntary programs associated with "watershed planning" are largely educational. As a tool to help citizens within a community understand the dynamics between human activity, and the environment in the context of a watershed can be a useful awareness building initiative.

In the majority of provinces there is no public involvement in the review of proposals to establish intensive livestock operations. In Ontario, for example, the producer will need to obtain a building permit, comply with all applicable zone provisions, and complete a Nutrient Management Plan (where required locally). Once this has occurred, however, the producer is essentially guaranteed a building permit. In contrast there is an interesting mix

of public participation at the local level within Manitoba, and to a certain extent Alberta. In Lethbridge County in Alberta, for example, adjacent land owners are notified of a completed application for an intensive livestock operation and in Manitoba public meetings are routinely held as part of the “conditional use permit” process.

Conclusions

As we move into the next century it is clear that both rural communities and the livestock industry will continue to evolve and change. Current and anticipated future trends suggest that the rural community, as it becomes less farm oriented, more urbanized and more environmentally conscious will increasingly come into conflict with a livestock industry that seems to be committed to an ever increasing scale of production (Caldwell, 1998). This research will aim to provide an objective analysis of this complex issue facing rural municipalities and the livestock industry.

Communications Plan

The purpose of the Communications Plan is to ensure that the research is made available and communicated to all interested parties. In addition those with an interest in the research should have an opportunity to discuss the results with the researchers. The formation of an advisory committee will help to see that the research is disseminated as it proceeds. The following key components of the Communication Plan are identified:

Annual Interim Reports – These will be submitted to OMAFRA and the advisory committee.

Final Report – The final report will be given to those who contributed to the project, OMAFRA, the Ministry of Municipal Affairs, planning departments and agricultural organizations. A copy will also be available at the University of Guelph School of Rural Planning and Development, and the University of Guelph library .

Article for the Popular Press - The intent of the research is to support agricultural communities through the identification of issues and the development of best management planning approaches in response to the establishment of new livestock facilities. Consequently, a summary of results will be circulated to appropriate magazines and journals. (A press release will be issued). These potentially include:

- Municipal World
- Ontario Planning Journal
- Ontario Farmer
- Summary for local newspapers
- Summary for Farm and Country Magazine

Published Results in Scientific Literature - It is also important to submit the report to appropriate scientific and academic journals. A relevant paper will be submitted to one of the following:

- Plan Canada
- Canadian Geographer
- Journal of Soil and Water Conservation
- Canadian Journal of Agriculture Economics

Communication with Farm Sector – It is expected that the agricultural community will be keenly interested in the results of this research. Summaries of the results/ press releases will be made available to media that serve rural Ontario. Among others these include:

- Ontario Farmer
- Summary for local newspapers
- Farm and Country Magazine

We will also work with the Pork, Dairy, Chicken and Beef Producers to see that the information is in a format that can be circulated to their respective memberships. We also look forward to the opportunity to present this information at respective commodity group meetings.

Additional Outreach - In addition to submitting the report to the press and journals, abstracts will be prepared and submitted to one or more conferences offering to make a presentation (e.g. Ontario Planning Conference, the Rural Ontario Conference, Canadian Institute of Planners Conference, Commodity Group Annual Meetings).

An advisory committee will be established to evaluate, track and monitor the research as it proceeds. This committee will be invited to meet every three to four months for a briefing of the research. Here, concerns and new directions will be discussed and worked into the research. The committee will include representatives from the Ministry of Agriculture, Food and Rural Affairs, municipal planning departments (upper and lower tier), a representative of a farm group, principle researcher and a graduate student.

Experimental Design

General Principles:

There are certain general principles which guide this research:

- Applied – The research will be of benefit to farmers, the community and municipalities.
- Confidentiality – Individual findings will be maintained in the strictest confidence.
- Communications – The research will be clearly communicated to participants, the “Research Advisory Committee” and the general public.
- Consultation – A “Research Advisory Committee” will be established to provide information, suggestions and insight.
- Objectivity – The researchers will strive to maintain objectivity.

Research Advisory Committee

A research advisory committee will be established as outlined under the “Communications Plan.” This committee will review the research proposal, the research findings and offer comments on any difficulties or opportunities that may occur while the research is being conducted.

The research will proceed in two phases over two years.

Phase 1: Community Perception of Impacts- Introduction

Phase I (year 1) is entitled “Community Perception of Impacts”. During this phase, research will be conducted that provides a detailed understanding of the community dynamic that exists in proximity to established large livestock facilities. In particular, issues of land use compatibility will be reviewed from the perspective of both producers and neighbours. This information will be collected, analyzed and a summary report prepared. This phase of the research is predicated on the belief that to allow for more informed decision making – by the livestock industry, by rural residents (farm and non-farm) and by local and provincial policy makers it is essential that we have a better understanding of the long-term compatibility of livestock barns with their neighbours.

Phase 1: Community Perception of Impacts - Details

This phase of the research will include the following steps:

1) Site Identification and Interviews:

- During this phase of the research at least 50 large livestock facilities, built within the last 3-5 years will be identified for inclusion in the study. (the sites will reflect

different livestock types; the barns will have been built within the last 3-5 years; they will be located throughout Ontario and while the sites should be randomly selected they will be identified in consultation with municipalities and producer groups).

- Individual Farm operators will be interviewed to obtain general details of their operation (for example: size, manure handling equipment, etc.). Confidentiality will be assured. We will work with local producer groups, farm organizations, and municipalities to ensure a representative sample. The Research Advisory Committee will be consulted concerning appropriate protocols (i.e. we will need to monitor the circumstances that leads any producer to decline to participate in the study to ensure that a representative sample is maintained).
- Individual neighbours will be interviewed to determine how they perceive the neighbouring livestock facility (at least 200 neighbouring residents will be surveyed). They will be asked to identify those practices which are both positive and negative on the neighbouring farm. Confidentiality will be assured. A questionnaire will be administered through direct on-site interviews.

This information will be collected during the summer of 2001 and a summary of results prepared by December 2001.

1) *Analysis of results:*

- The survey results will be tabulated and practices which improve or hinder the relationship between producers and neighbours will be identified. The report authored at this stage will be self-contained and will identify the public's reaction to established livestock facilities; it will identify "best practices" that create a positive neighbour/ producer relationship and it will identify those practices which neighbours find to be offensive. To maintain confidentiality, individual situations/ data will not be part of any published material.

This interim report will be completed by May 2002.

Phase 2: Land Use Planning, Innovation and Best Practices - Introduction

Phase 2 (year 2) is entitled "Land Use Planning, Innovation and Best Practices." During this phase of the research the successes and failures of Ontario's municipalities in responding to the issue of agricultural intensification will be identified. In addition, Best Practices from other Canadian Provinces, the United States and Europe will be identified and reviewed for their applicability in an Ontario context. In Ontario and in many other jurisdictions the key involvement in planning for the establishment of new livestock facilities occurs at the municipal level (Caldwell and Toombs, 1999, 2000). While the framework established at a provincial or state level sets the context for siting livestock operations it is the actual decisions of individual municipalities which control and regulate how and where livestock expansion occurs. In Ontario, for example, when Huron County developed a by-law which established the first requirement for the completion of a Nutrient Management

Plan there were requests from municipalities from across the Province for a copy of this by-law.

Phase 2: Land Use Planning, Innovation and Best Practices - Details

Anticipated Completion – May 2003. This phase of the research will include the following steps:

1. *Municipal Planning, Innovation and Best Practices: Ontario Examples.*
 - Based on the results from the on-site interviews (Phase 1) those municipalities where municipal involvement has contributed positively or negatively to the relationship between producers and neighbours will be identified (The use of separation distances, various approaches to public consultation, zoning standards and nutrient management plans are examples of tools that municipalities are currently using). Specific questions will be included in the questionnaire (Phase 1) to help identify appropriate municipalities. It is anticipated that 20 municipalities will be identified for further review.
 - In-depth interviews and surveys of municipal officials will be conducted in those municipalities where both good and poor examples of municipal practices are identified (anticipated sample size- 20). Both planning tools and processes which contributed positively or negatively will be identified.

This information will be collected during the summer of 2002 and a summary of results prepared by December 2002.

1. *Municipal Planning, Innovation and Best Practices: Other Jurisdictions.*

This research will identify best practices at the Municipal level in several jurisdictions. Although approaches in other states or countries have been documented, there is little reference to the approaches used at the individual municipal level where ordinances, by-laws and other tools are used to plan for the establishment of livestock facilities.

 - In Canada, the research will focus on Alberta and Manitoba. Innovative approaches are being pursued by municipalities in both provinces (Caldwell and Toombs, 1999) and based on consultations with farm and provincial leaders individual case studies of innovative planning approaches in key municipalities will be identified and documented.
 - In the United States two case studies will be selected. These will be chosen based on literature and discussions with “key informants.” Although subject to change, North Carolina and Iowa are identified as two locations where livestock intensification has been a particularly sensitive issue.
 - One case study from Europe will also be selected (without prejudging the final selection the Netherlands or Denmark are identified as key locations where government has been forced to deal with this issue in an aggressive way).

- In Canada, the United States and Europe the case studies will be researched, contacts established and interviews planned. Farm leaders, planners, and other government officials will be consulted. Field work will have a specific goal of developing specific case studies of the regulatory environment / planning approach that is used locally. The essential question will focus on how planning regulations have balanced the legitimate interest of the community, with the needs of the agricultural industry.
- These results will be reviewed and presented in a format that offers insight into new ways for farmers, Ontario municipalities and the Provincial Government to work cooperatively to minimize concerns that often occur in the community as new livestock facilities are established.

Case Study Selection Criteria: Phase 2 includes proposed Case Studies of 2 provinces in Canada; two States in the U.S. and one country in Europe. It is acknowledged that this issue continues to evolve and that the final selection of study areas will need to meet the following criteria:

- i) a significant “issue” exists within the jurisdiction concerning the intensification of animal agriculture.
- ii) There is evidence of an “innovative” response to the issue (new legislation, innovative municipal approaches, etc.)
- iii) The final selection will be reviewed with OMAFRA staff and determined in consultation with the Research Advisory Committee.

This information will be collected during the summer of 2002 and a summary of results prepared by December 2002.

Final Report

The final report will be prepared by May, 2003. It will include the materials from Phase 1 and Phase 2 and will include a review and analysis of the research results. It will also include *Indicators of Successful Policy* (bench-marks for municipalities in developing appropriate planning policy) and *Recommendations* related to Good Neighbour Policy (how Livestock Farmers and Neighbours can coexist) and Municipal Planning Best Practices (what should municipalities do and how successful can they be in establishing a framework that supports agriculture and minimizes conflict).

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