A CITIZEN'S GUIDE
To The Regional Economic and Environmental Effects of Large Concentrated Dairy Operations

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HOW TO USE THIS DOCUMENT

The rapid proliferation of large dairies across the United States has made it difficult for citizens' groups and permitting agencies alike to intelligently review the growing number of applications for concentrated dairy operations. Often, residents of an area are not notified of an application in a timely manner and, when they are notified, they are provided with only a limited amount of time to review an application that has had months of intensive preparation. Further, since most members of permitting agencies and local groups are not associated with the dairy industry, just locating sources of data to confirm or contradict a claim made in a permit is a major task. This paper has been assembled to assist in this process.

The first section of this paper is a general overview of the dairy industry and of the context in which large concentrated animal operations interact with a host area. This section also contains information on health issues, property valuation issues, and other general regional impacts that will affect the economic and social life of the region. Sources are carefully cited so the interested reader can use the facts and figures presented in an appropriate way.

The second section contains most of the current data pertaining to dairies from the most respected and unbiased sources of information about dairy operations. As a result, this document draws heavily on research done by the States of Minnesota and Ohio and by the US Department of Agriculture. Each table or chart is carefully cited to allow the user to refer to the original document. In the case of health-related issues, a large number of current sources on this area are provided at the end of the health section. Tables in the second half of the document allow the reader to determine the impact from manure, milk waste, nutrients, and other outputs of dairy operations on the local environment. In each section, examples and descriptive text are provided to allow each reader to make his/her own calculations of every aspect of dairy operations. These calculations will change based on the crop yields of the land used to spread manure. For this reason, local crop yield data along with its nutrient requirements should be used to "customize" calculations of the amount of land required for nutrient spreading.

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Introduction

The economic model that became capitalism is based on efficiencies from standardization, specialization and concentration of productive resources. As capitalism developed and this model was applied to production activities, social and environmental problems such as child labor, unhealthy working conditions, unfair labor practices, and polluting activities often occurred. Over time, these issues were dealt with in the industrial sector through a framework of laws and regulations.

Recently, the dairy industry has joined an agriculture trend toward industrial production--Concentrated Animal Feeding Operations (CAFOs)--that exceeds the capacity of the land on which it is located to naturally process animal waste. In a fundamental sense, the ability of the land to naturally process animal waste defines the limits of sustainable agriculture. Agriculture can only be environmentally sustainable if it produces no more waste than the land available for waste application can absorb. Waste produced in excess of this amount must, at some point, be transferred off land used by the CAFO in the form of air- or water-borne pollution and when this occurs, the costs of this waste are shifted away from the land where the waste is generated.

Unfortunately, the dairy industry's shift to industrial CAFOs outpaced laws and regulations governing agricultural activities--laws and regulations that were meant for a non-industrial sector. This occurred partly because agriculture is viewed by the state and by society in general through a lens colored by the assumption that the enterprise of agriculture is a "closed system" where the density of animals is compatible with the land's ability to recycle animal waste.

One central rationale of laws to regulate industrial waste was the recognition that the assumption of a closed system did not apply to industries. Industrial waste often polluted the environment of those who lived around (or many miles from) the industry and laws were necessary to prevent the harm to society that might come from contact with this pollution. The laws governing industrial waste forced industry and the consumers of its products to "internalize" (pay for) the costs of dealing with this pollution.

The assumption of a closed system is usually no more applicable to dairy CAFOs than it is to any other industrial operation, but dairy CAFOs, masquerading as agricultural enterprises, have used the absence of laws governing agricultural pollution to avoid paying the costs of the waste generated by their operations. The reason dairy CAFOs must shift the costs of their waste to someone else is that they are faced with significant diminishing returns in their operations. This has become the central issue in the debate about the two contracts under which dairy CAFOs operate--the explicit contract that governs their relationships within the financial organization in which they exist, and the implicit contract between the CAFO and the region or community in which it is located.

This section is organized in several parts to deal with these issues:

Section I:

1. A brief explanation of some of the industrial organization issues involved in operating large, corporate dairy farms, a brief explanation of the two contracts that govern the behavior of corporate dairy firms--the business contract and the contract with the community that hosts the firm, and the implications of these issues for the community.

2. An examination of the question of efficiency of production--whether large dairy farms are more efficient than smaller, conventional dairy farms.

3. An examination of the impacts of large diary CAFOs on regional economic development.

4. A description of the various costs associated with dairy production that may be shifted to the region in which the dairy is located.

Section I

I. THE INDUSTRIAL ORGANIZATION AND CONTRACT ISSUES INVOLVED IN OPERATING LARGE, CORPORATE DAIRY CAFOs AND THE IMPLICATIONS OF THESE ISSUES FOR THE COMMUNITY.

Price is the mechanism by which any market conveys basic information about supply and demand for a good. But the markets in which dairy Concentrated Animal Feeding Operations (CAFOs) compete are very different from the old perfect competition-based models of agricultural production. As a result, the effects of these markets on the life and economies of local communities have changed significantly.

Conlin has identified ten major trends underway in the dairy industry:

1. Dairy farms are restructuring to larger, more specialized farms that are multi-person owned and operated, on a relatively smaller land base with greater vertical integration with the market and input sectors, and more diversity in size and production processes.
2. Higher priority given to management goals: efficiency, profitability and life quality with higher productivity per unit of labor, feed, and asset, more emphasis on effective management of people, adoption of cost effective technologies, use of outside expertise and greater systemization, routinization and specialization of production tasks.
3. Implementation of quality management concepts such as management information systems, strategic and tactical business plans and action protocols, team work, and monitoring and control systems.
4. Increased business networking and collaboration through joint ownership, creative financing and risk sharing, leasing arrangements, closer linkages between production and consumption, more outsourcing operational phases, and greater use of external advisors.
5. Greater price volatility with less government involvement in regulating prices of feed and milk, and expanding potential for export pressures and greater use of price risk tools such as futures, options, and contracts.

6. Stronger consumer driven markets with more emphasis on quality defined in human health/safety risks, consumer tastes, packaging and product preferences, with growing competitive opportunities in international markets and niche markets and product differentiation.
7. Restructuring of the dairy industry business/service sector with mergers, and consolidations having fewer processing plants, greater privatization of information, globalization of technology and services, with a feed industry becoming more price driven with greater use of commodities, and separation of consulting services from product sales.
8. Changing public policy with markets being more driven by supply/demand and quality, less regulation of pricing policies, broader public input on agricultural policy, particularly issues related to the environment, food safety, and animal care. The dairy business will be more sensitive to broad government policies related to taxes, interest rate, environment, health, trade, crop programs, etc.
9. Stricter environmental protection policies related to protection of ground water and air quality that will bring greater integration of manure application with the cropping and land characteristics.
10. Cow numbers will shift to regions that have dairy friendly communities with plentiful supplies, cost competitive feed and services, with a desirable climate, infrastructure of dairy support services and markets, and where there is access to capital.[1]

Initially, the issue of dairy CAFOs seems simply to be one of price and efficiency. However, to a large extent it is really an issue of information. As Jones has noted, in agriculture

> [t]he critical emphasis is changing from resource allocation based on price to allocation based on strategic advantage...Until greater transparency of information in economic signals between industry levels occurs, there is a strong incentive for producers to develop formal partnerships through cooperatives, joint ventures, or vertical arrangements.[2]

These partnerships usually create two contracts of interest when a dairy CAFO enters a region:

1. the contract with the CAFO's organization where information is equally shared and where the motives of all players are a consistent and singular search for profit, and
2. the contract between the community and the CAFO where asymmetrical information exists.

When a dairy CAFO enters a rural region, it strikes a bargain with the rural community in that region. This implicit contract is usually formed around stated, not written, promises of jobs and economic growth for the region that the dairy CAFO will provide in return for land, water, access, power and the other factors that are required for the dairy CAFO to operate. This implicit contract also implies a certain physical relationship with the region that manifests itself in the presence (or lack) of pollution, traffic, resource consumption, etc., that arise from the operation of the dairy.

The dairy CAFO organization is typically well informed about the implied contract with the region because it extended the verbal offers on which the contract is based, but the citizens of the region are privy to very little information about the dairy's explicit contract with its organization. As a result, there is an incentive on the part of the dairy CAFO to shift costs between the contracts based on each party's access to information about those costs. The party with the least information about costs is most likely to have those costs shifted in its direction.

The size and complexity of dairy CAFO organizations is significant. In 1998, the top fifty milk cooperatives in the U.S. ranked on volume of milk accounted for 120 billion pounds of the national production of 157 billion pounds in 1998. They claimed 70,820 member dairy farmers. The ranking of

the largest cooperatives continue to shift as more mergers occur. As Table I-1 shows, just ten milk cooperatives accounted for half of total 1998 U.S. milk production:[3]

Table I-1. Dairy consolidation—top ten cooperatives

Dairy Cooperative	Member Milk (bil. pounds)	Number Members
Dairy Farmers of America, Springfield, MO	31,500	18,453
Land O Lakes Inc., St. Paul, MN	7,988	6,400
California Milk Producers, Artesia, CA	6,750	336
Foremost Farms USA, Barb, WI	5,400	5,850
Family Dairies, Madison, WI	5,256	7,625
Darigold Farms, Seattle, WA	5,050	878
Dairylea Cooperative Inc., Syracuse, NY	4,886	2,369
North Central AMPI, New Ulm, MN	4,400	5,000
Dairymans Cooperative Creamery Assn., Tulare, CA	4,212	245
Manitowoc Milk Producers Cooperative, Manitowoc, WI	3,540	3,230

The second-ranked cooperative, Land O Lakes, has merged with ninth-ranked Dairymans Cooperative Creamery Association since these 1998 figures were compiled.
Source: Jacobson, Larry D., et al., Generic Environmental Impact Statement on Animal Agriculture, University of Minnesota, College of Agriculture, Food, and Environmental Sciences, http://www.mnplan.state.mn.us/eqb/scoping.html, September, 1999, p. D/E-32.

Local, county, state, and national laws and policies on the environment and on zoning are important determinants of the location of dairy CAFO facilities.[4] Further, these laws and policies affect the ability of dairy CAFOs to control information about their operations and they are major determinants of the role the dairy will play in the physical, social and economic environment of a region. Thus, the physical relationship between the dairy CAFO and the region is essentially predetermined by the rules and policies that are already in place in the region--and this set of rules and policies is based on the pivotal assumptions that

1. All agricultural operations are similar to the conventional, closed systems that previously dominated agriculture.
2. Animal waste is a natural product that, while annoying, is essentially harmless.
3. The waste of ruminate animals is essentially benign where environmental safety is concerned.

As a result of these assumptions, when a CAFO enters a region it encounters a set of rules that have generally been structured to control a kind of agricultural production whose inputs and waste byproducts are not representative--either in quantity or chemical composition--of the Concentrated Animal Feeding Industry.

The question here is not whether the dairy CAFO can make an implied contract with the region. Instead, the issue is that in addition to this contract being physically defined around incorrect assumptions, it will also be based on asymmetrical information that heavily favors the dairy. Such a contract is likely to work in only one direction--it is likely to increase the profits of the dairy CAFO by shifting the operating costs of the CAFO either to the region in which it is situated or, through some mechanism of pollution migration, to another region further removed from the CAFO. The certainty of this outcome follows directly from existence of asymmetrical information about the operation of the dairy CAFO and from the motivation of the operators of the dairy.

The term asymmetrical information refers to a situation where one of two individuals in an agreement or contract possesses more information than the other individual about the nature of the bargain. If one individual possesses critical additional information about the contract, this individual can use his proprietary information to gain an advantage in the bargain.[5] In theory, the permitting process used to evaluate dairy CAFO applications should insure that the citizens of a region are fully informed about all aspects of the dairy's proposed operation. If this was indeed the case, there would be no asymmetrical information. However, a permitting process based on the incorrect assumption that all agricultural projects are conventional in nature allows the dairy CAFO operator to withhold significant amounts of information from the residents of the region in the following ways:

1. The CAFO uses claims that its methods of handling waste are technologically advanced and thus, proprietary, to block release of information about the specifications and performance of its waste handling systems.
2. The usual position of the CAFO as a contract operator or coop member associated with larger, out-of-area corporate interests may limit even the dairy CAFO operator's knowledge of the source of inputs (feeds, hormones, antibiotics, etc.), the rationale behind the amounts and types of inputs selected, and the actual value of the product (the milk) to the owner.
3. Out-of-area ownership and the use of Limited Liability Partnerships (LLPs) severely limits the ability of regional residents to determine the motivation, trustworthiness, and credibility of those who own and operate the dairy CAFO.
4. The practice of building dairy CAFOs as turn-key operations limits the ability of regions to establish any reliable record of CAFO performance before committing to a fully-constructed operation.
5. The legal protection extended to the CAFO by permitting authorities may insulate the CAFO from disclosures that may provide the only source of information about out-of-state operations. For example, an Idaho law specifically exempts from disclosure "records gathered by a local agency or the Idaho Department of Commerce...for the specific purpose of assisting a person [e.g. a corporation] to locate, invest in or expand business operations in the state of Idaho."[6] And manure management plans in Iowa can be changed on site without notifying the Iowa Department of Natural Resources of the changes. The working copy of the plan is held by the CAFO operator is not available for public scrutiny.[7]
6. And finally, the dairy CAFO permit approval process is often so rushed that residents of the region have insufficient time to learn enough about the proposal to ask intelligent questions or to do relevant research on the proposal.

In combination, these factors create an agreement (contract) between a dairy CAFO and a region that is based on verbal promises of jobs and economic development, but for which the actual information needed to validly assess the impact of the CAFO on the physical, social and economic environment is withheld from the public and is available only to the owners/operators of the diary. The result is that the county or other permitting agency has inadvertently created what economists call a moral hazard, a process that occurs when one party is better informed than the other about the characteristics of the transaction. By definition, a moral hazard leads to lower efficiency and to higher costs to the party that is least informed (in this case, a higher cost to the region that hosts the dairy CAFO.)

Having created a moral hazard, the region is now faced with a second economic condition called adverse selection. This provides an incentive for additional producers who also want to shift costs to the residents of the region to migrate to the area. Thus, additional CAFOs of all kinds are likely to be

attracted to the region. As Milgrom and Roberts note, adverse selection is "a kind of precontractual opportunism that arises when one party to a bargain has private information about something that affects the other's net benefit from the contract and when those whose private information implies that the contract will be especially disadvantageous for the other party to agree to a contract."[8]

Casson has laid out the general outlines of the relationship that develops between the region and the dairy CAFO as a result of these factors by noting that:

> the crucial question... is whether the other party to the transaction can be trusted. There are two fundamental approaches to engineering or creating trust. The one most commonly used in much of the Western world is to monitor performance through the institutional and legal system and penalize those parties that do not fulfill their negotiated commitments. The alternative approach to engineering trust is to manipulate the incentive structure so that individuals fulfill their commitments based on rewards they receive rather than penalties they incur.[9]

For dairy CAFOs, the issue of trust is directly tied to out-of-area ownership and the asymmetrical information in the agreement between the dairy and the community. Since the motivation of the dairy is to create profit, not to control pollution or engage in any of the other social benefits the region may desire, a dairy CAFO can only be trusted to act in its own self interest. The interests of the region could initially be protected by disclosure of full information concerning the operations of the dairy during permitting. However, due to the factors already discussed, the dairy CAFO usually controls the information in this part of the process. The only recourse for the region is monitoring by knowledgeable regulators.

Unfortunately, monitoring measures compliance with laws that are often crippled by the same underlying assumptions about the nature of agriculture listed earlier in this section. Dairy CAFOs are often able to use laws based on loose, conventional agricultural standards to avoid pollution controls that would more fully assign the costs of waste to the dairies. In addition, most of the factors that made it difficult to get information on proposed dairy CAFO operations during the permitting process also complicate attempts to monitor CAFO operation. This leads to a condition called low separability. Separability is "...the feasibility to see who has done the work. With low separability, the principal [in this case, the region] will face either high control costs or intense cheating."[10]

So far, the history of dairy CAFO operations shows that cheating is likely. And it is made even more likely by the decision on the part of many regulating agencies to rely on citizen complaints instead of more costly professional monitoring. If monitoring fails or is not effectively implemented, the only other option for controlling the behavior of the dairy is through economic incentives. But, as previously noted, a powerful economic incentive structure is already in place and this incentive structure has been formalized in the explicit contract between the CAFO, its own organization, and its investors. This contract directs the CAFO to operate in such a way as to maximize profit, and if it can do this by shifting the costs of its waste to its neighbors in the region, that is how it will operate.

II. THE ISSUE OF ECONOMIC EFFICIENCY.

General Attributes of Efficiency

The economic issue of efficiency in production is central to the rationale for all Concentrated Animal Feeding Operations. In this argument, the economic issue usually discussed is the concept of increasing returns to scale where the efficiencies are realized when more capital is brought to a production process. The resulting capital intensive process has a much higher reliance on machines and technology and is less reliant on labor. In the dairy CAFO process, raw materials (feed, water. etc) are submitted to cows in concentrated dairy facilities and the output is milk.

In so far as the cows and their confinement facilities can be treated as machines, the CAFO philosophy is that they can be "improved" through the addition of capital to the production process. This "improvement" comes through standardization of breeds and sizes, use of hormones and antibiotics, control of growth rates and animal disease, and increased specialization of workers, managers, and animal handling facilities.

If this was all there was to the CAFO process, one would expect efficiency of operations to continue to increase as more capital in the form of cows and buildings was added to the process. In other words, the maximum efficient size of dairy CAFOs would be extremely large. Further, this concentration would bring other benefits. For example, a former Agriculture Commissioner in Minnesota has stated that

> As farms and feedlot operations get larger, there will be opportunities for important land and resource restoration to occur. Greater production of crops on fewer acres will make land available for important resource restoration activities. The prairies of the state have been mostly eliminated, and some of our most important biodiversity issues must be approached by restoring grassland habitats.... The larger farming operations will also provide greater opportunities for better management of wastes and capital intensive management methods for improved air and water quality".

The Commissioner's point can only be valid if the efficiency of farm and feedlot operations continually increases as they get larger and larger. In this sense, efficiency means that average costs continue to drop. However, this is not the case. Efficiency peaks as concentration rises because the cost of waste disposal for a concentrated animal operation increases sharply after one surpasses the ability of the land to absorb the waste. The fact that dairy CAFOs may be able to avoid this cost by shifting the cost of their waste to the surrounding region makes no difference--the confined operation is still less efficient in an economic sense.

The Commissioner's statement also contains an unstated assumption--that the waste generated by concentrated operations stays on the site and that the land is capable of absorbing an unlimited amount of waste material. Carried to its (il)logical conclusion, the Commissioner's statement would lead one to concentrate all dairy cows on a single feedlot.

We already have a large body of law that regulates similar problems for industry that arose from a similar condition to the one the Commissioner proposes: a point source of pollution from some concentrated industrial activity was damaging the health of the surrounding environment. Theoretically,

this concentration of industry in various locations should have, in the Commissioner's words, "[made] land available for important resource restoration activities" (because it was not covered by factories.) Instead, the waste flows from those concentrated activities ruined the surrounding environment and, in the case of acid rain, the environment thousands of miles away.

Further, the switch to dairy CAFO's only confines the animals in less space, it does nothing to reduce the amount of land needed to raise feed for the animals and it does nothing to reduce the amount of land that ultimately is needed to recycle the animal waste. For this reason, the switch back to conventional farming simply places the animals on the land that is also used to grow their feed and uses the animal manure responsibly to fertilize that land so that feed can continue to be grown in a more-or-less closed system. In addition, spreading the animals out in this manner reduces the need for antibiotics.

The Efficient Size of Dairy CAFOs—General Theories

If all the economic costs of dairy CAFO operation are considered, two economic concepts--diseconomies of scale and diminishing marginal returns--both mandate that the efficient size of most dairies should be relatively small. To understand why smaller and medium sized dairies have lost market share to the CAFO giants in spite of this expectation, it is necessary to investigate how the expected effect of these two economic concepts has been altered by the actions of the dairy CAFO industry.

The first economic concept--diseconomy of scale—usually comes into play when problems associated with some element of a production process increase much faster than the size of the process itself increases. With dairy cows, such a situation occurs with attempts to control the disease and stress that occur when animals are kept in a concentrated setting. This situation is further complicated by the use of the growth hormone rBGH to boost milk production—a hormone that has significant physiological effects on the cows.

The second, more powerful economic concept called diminishing returns also ought to act to limit the size of efficient dairy CAFO operations. Under this concept, when units of a variable resource (such as cows) are added to a fixed resource (such as land) one reaches a point where the marginal product (the amount of milk from the last cow added to the operation) of the variable resource begins to decline. Because of the costs of handling animal waste responsibly, the point at which this decline occurs is closely related to the ability of the land on which the dairy CAFO is located, and the land over which the CAFO will apply its waste effluent, to absorb and recycle the manure. If diminishing returns to a dairy CAFO did not exist, all the dairy cows in the world could be raised on a single, small plot of land. This is clearly the becoming the philosophy of some in the dairy industry who recognize no limits to dairy herd growth. Such a view completely disregards the costs associated with diminishing returns from dairy waste and concentrated living.

To overcome these costs, dairy CAFOs have been designed to take full, economic advantage of the assumptions about the nature of modern agriculture were listed in the previous section—assumptions that not only form the basis for dairy CAFO permitting and regulating but also establish the tax and subsidy policies that create the economic environment in which dairy CAFOs operate. These assumptions allow important costs of dairy CAFO operations to be either omitted or understated in the profit and loss calculations of the dairy. They also allow a dairy CAFO to take advantage of important

tax and investment opportunities that, in effect, subsidize its operation. All these factors artificially inflate the amount of profit available from dairy CAFO operations and generate short term gains for developers and investors. While this would be significant in itself, artificially inflated profits also act to draw more investment into dairy CAFO operations, contribute to the proliferation of dairy CAFOs, and provide an economic incentive for an organizational model that gives rise to the four common attributes of every dairy CAFO:

(1) The use of capital intensive production methods. Dairy CAFOs use less labor and more machinery to achieve production output.
(2) Employment of a production methodology that maximizes the tax benefits of the corporation.
(3) The use of vertically integrated operations where separate divisions of the same company or co-op produce the different stages of a product and market their output to one another.
(4) The use of cost shifting to reduce the costs of production. Cost shifting occurs when the costs of health problems, traffic, social problems and pollution (odors, chemical and particulate air pollution; chemical, pathogen, and particulate water pollution) are transferred to the residents of a region and are neither paid by the company responsible for the costs nor included in the price of the products they market.

In summary, arguments about the efficient size of dairy operations assume that the purpose of the organization and hence, the output of its operations, are both known and clearly specified; i.e., the purpose of a dairy CAFO may be assumed to be milk production. Further, these arguments also assume that the dairy CAFO and the smaller, more conventional dairy to which the CAFO is compared both have the same fundamental production objectives. However, as the above-listed attributes demonstrate, it is not clear that milk production is the primary objective of a typical dairy CAFO. Indeed, because a typical CAFO is designed to

1. maximize tax benefits in both industrial and agricultural categories, and
2. maximize subsidies for both industrial and agricultural operations, and
3. shift as many costs as possible to the local region while
4. producing an agricultural commodity--milk,

it is not clear what weight if any, one should give to efficient sizes for milk production when discussing a dairy CAFO operation. Any discussion of efficiency is further complicated by the fact that the price of milk is likely to be set either by law or by large compacts and organizations instead of being set by the need to directly compete with other producers of milk.

Specific Research On Dairy Efficiency

The Economic Environment in which the Dairy Industry Operates

The recently implemented federal order reform has made milk pricing more transparent and competitive. Higher quality producers now receive higher milk prices than lower quality suppliers. Further, milk prices are now dependent on component values, which are linked to dairy commodity prices for cheese, butter, nonfat dry milk and whey and pricing information is available on the internet. This links component prices and the amounts producers see in their milk checks and mean that no one is isolated from market forces. The 50-100 cow family dairy farm must now compete directly with large-scale dairy operations. [11]

Milk processors have undergone significant consolidation, and some dairy cooperatives have changed from regional cooperatives into national cooperatives. Consolidation has also accelerated at the farm level as large-scale, western dairy operations have expanded first in Idaho, New Mexico and California and then Nebraska, Kansas and Indiana. These dairies are expanding further and using their marketing power to extract premiums for high-quality milk. [12]

Meanwhile, cow numbers on farms continue to increase in response to high milk prices and low feed costs. Monthly milk production per cow increased in 2000 while demand for milk and dairy products hwas stable. Growth in milk supply in the face of stable demand depressed milk prices and should result in a future decline in cow numbers. Beyond the number of cows, three other factors predict future milk prices: health of the U.S. economy, feed prices and summer weather. All these factors make it likely that the dairy expansion will slow and that cow numbers will continue to decline. [13]

Dairy Industry Consolidation

Since 1990, the US dairy industry has become increasingly consolidated—both in terms of the number of dairy farms and in terms of the states in which significant growth of dairies has occurred. [14] Table I-2 shows how dairy farm concentration has changed in new and old dairy production states.