

New England as a Jurisdiction for Supporting Continuity of Dairy Operations: A Reassessment

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SUMMARY

Since 2008, the New England states have been working together with public- and private-sector partners to support continuity of dairy operations in the event of an animal disease emergency, such as an outbreak of Foot-and-Mouth Disease (FMD). Key steps in those preparations include a [charter](#) for the New England Animal Agricultural Security Alliance ([NESAASA](#)), annual cooperative agreements with the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture (USDA-APHIS), a vulnerability assessment ([Foot-and-Mouth Disease \(FMD\) as a Hazard for New England Dairies](#)), a draft [New England Secure Milk Supply \(SMS\) Plan](#), and annual exercises of the plan, with [on-line documentation](#). This work has advanced a “regional approach” to emergency preparedness, with the “region” defined as the six New England states. This paper is a reassessment of that jurisdiction for SMS preparation.

The original vulnerability assessment stressed that, in a FMD outbreak, continuity of business for dairy farmers and processors as well as fortunes for consumers, taxpayers and the environment would be much less vulnerable if milk movement restrictions were applied at the border of the region than at the border of each state. That conclusion relied heavily on a snapshot of the dairy industry in New England, centered on data current as of January, 2010. This reassessment is based on longer-term, more detailed, comprehensive, and up-to-date information.

Over the past five years, from 2008 to 2013, New England dairy farms have (a) declined in number and (b) grown in size, but also c) produced about the same total amount of milk. New England farmers are still shipping nearly all their milk to market within the region. Despite rising costs, the volatility of milk prices, and increases in the size and productivity of farms, processors are still depending on a supply of milk from producers distributed in and around the region in 2013 much as they were in 2010. In short, the scale, structure, and geography of the New England dairy industry as a whole and the implications for its vulnerability seem basically unchanged. So, better information supports the conclusions of the original vulnerability assessment. The case remains strong for a six-state approach to supporting continuity of dairy operations in an animal-disease emergency.

A larger jurisdiction – the “Northeast” or AMS “Federal Order 1” – is conceivable but so far unattractive to New England for reasons of regional biosecurity, readiness, and representation. Especially from a producers’ point of view, New England is a market unto itself.

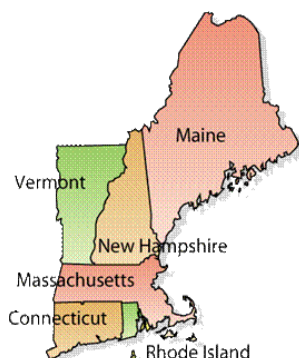
New England dairy processors are more dependent on traffic to and from farms outside the region, but to-date SMS plans have not much addressed how to regulate that traffic in an emergency.

The consequences of such benign neglect would depend chiefly on the location and severity of an outbreak. If FMD remained well removed from both New England and its outside milk suppliers, traffic should be able to continue as normal.

The more challenging circumstance would be if the outbreak occurred much closer, especially if there were Control Areas on one side or the other of the bounds of the region. A closer look at the size, source, and destination of normal inter-regional milk traffic suggests that it is, in fact, very important to continuity of operation of New England dairies. It is also sufficiently discrete – mainly between specific clusters of farms in New York and a half-dozen plants in Connecticut, Massachusetts, and Vermont – to warrant special attention in New England SMS planning.

This assessment closes with suggestions for sustaining the movement of milk from New York farms to New England plants during an animal-disease emergency.

BACKGROUND: FOCUS ON DAIRY COMMERCE IN NEW ENGLAND



Among the highest priorities for agriculture and animal-health officials is the viability of farms in their jurisdiction. Farms that supply fresh, fluid milk to processing plants – for pasteurization and bottling, cheese, butter, powder, yogurt, ice cream, etc. – are by far the largest sector of agriculture in New England. There are, of course, also others important sectors. For example, the six New England states lead the nation in agritourism and farm sales direct to consumers. But most of the region’s food production, farm income and acreage as well as its livestock and their caretakers still depend on the continuity of commercial dairy operations, with a steady flow of tanker traffic between farms and processing plants.

These were among the key findings of a vulnerability assessment that encouraged the [New England States Animal Agricultural Security Alliance \(NESAASA\)](#) to focus on continuity of dairy operations as a priority in the event of an animal-disease emergency, such as an outbreak of Foot-and-Mouth Disease (FMD).¹ Readyng a [New England Secure Milk Supply \(SMS\) Plan](#) was recommended to improve the sustainability of regional agriculture, with its great economic, environmental, and cultural importance. Among the bases of that conclusion was a detailed analysis of the status and vulnerability of milk production, processing and transport in the region: [Foot-and-Mouth Disease \(FMD\) as a Hazard for New England Dairies](#) (2011).

This original assessment was made possible through a series of Cooperative Agreements between the U.S. Department of Agriculture, Animal and Plant Inspection Service (USDA-APHIS) and state Departments of Agriculture (first Maine, then Rhode Island) on behalf of NESAASA as well as data-sharing agreements between USDA-APHIS and the Agricultural Marketing Service (USDA-AMS).

STATISTICAL SNAPSHOT

Summary statistics from the assessment provide a rough overview of the importance of New England dairying and its vulnerability in an animal-disease emergency.

When the region as a whole is compared to the rest of the American states, its dairy operations rank respectably, even among “farm states” of the Midwest. Contrary to some common impressions, New England dairies measure well up to national norms.

¹ Richard P. Horwitz, [Foot-and-Mouth Disease \(FMD\) as a Hazard for New England Dairies](#) (June 30, 2011) and [Dairy Farms That Touch the Public and Plans for Coping with FMD in New England](#) (January 18, 2013). [NESAASA](#) was [chartered](#) by the the six state Governors in July, 2010.

New England Dairy Farms, Cows, Production and Sales, 2010²

	CT	ME	MA	NH	RI	VT	New England
Number of Dairy Farms	130	317	147	128	16	995	1,733
Inventory of Milk Cows	19,000	33,000	13,000	15,000	1,100	134,000	215,100
Production per Cow (pounds)	18,684	18,061	17,571	19,533	17,818	18,289	18,328
Total production (million pounds)	355	596	246	293	20	2,469	3,979
Dairy Product Sales (million \$)	72.3	126.4	50.5	59.1	4.6	493.9	806.8
Sales Rank in U.S.	35	32	41	38	49	15	12

Representation of the various roles in the New England dairy industry varies from state to state, much as it does among counties in similar-sized states. Milk production is concentrated in the rural north (in Maine, New Hampshire, and especially Vermont), while processing and consumption are concentrated in the more urban and suburban south (in Connecticut, Massachusetts, and Rhode Island). So, northern New England is a net exporter of unpasteurized milk, while southern New England is a net importer, in about equal measure.

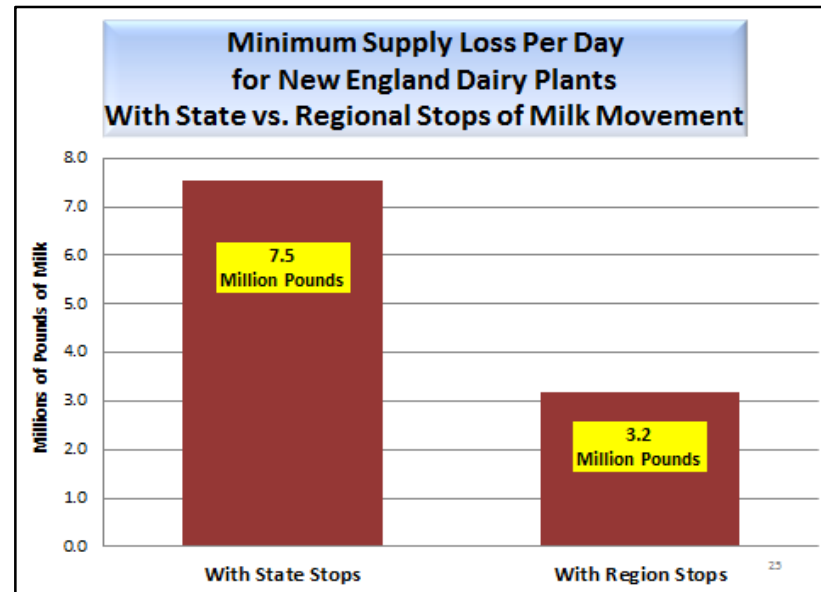
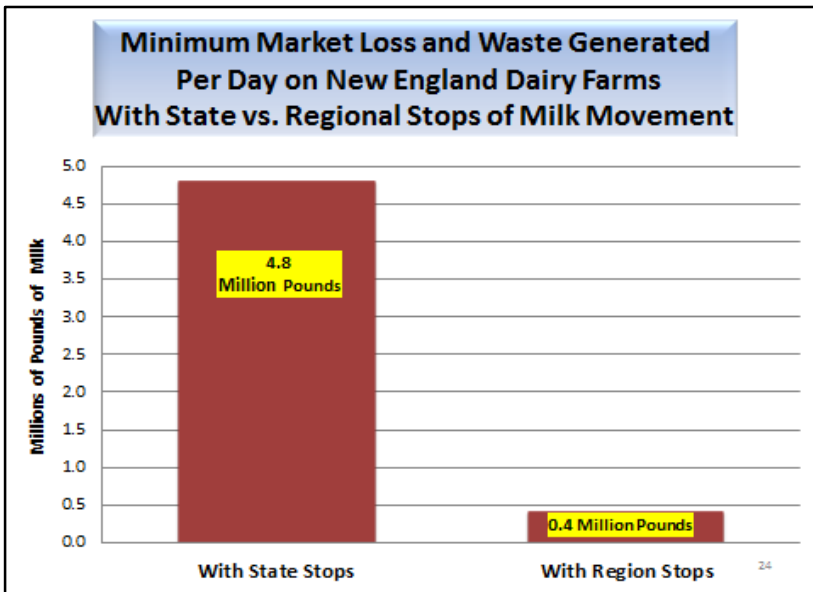
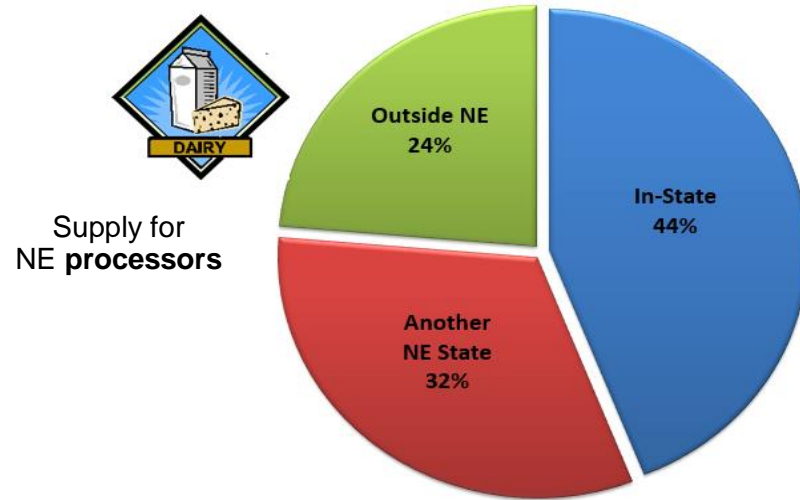
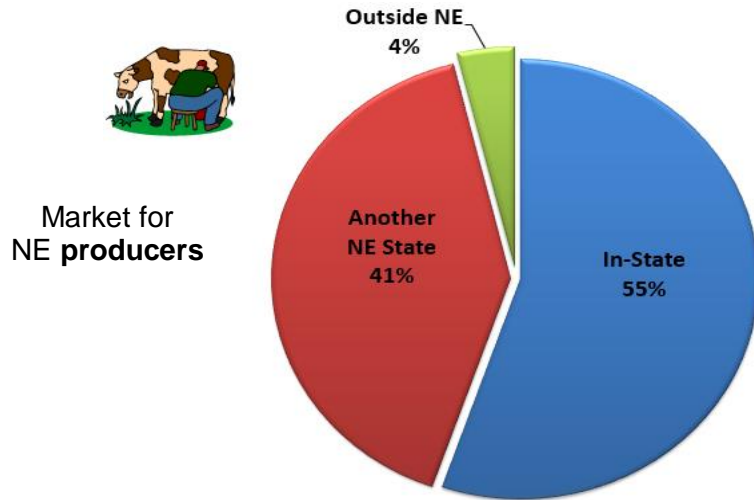
In this way, the states within the region depend on each other. They encompass a single, coherent dairy market. Of course, dairy inputs and outputs remain hitched to much larger, national and global commodity, service, and financial systems as well as distinctly local ones. But the fluid milk market remains overwhelmingly regional. New England dairy processing plants account for just short of 100% of the market for New England dairy farms.

In some respects, especially from a processor's (versus producer's) point of view, the supply side is less purely regional. Some large plants are affiliated with or owned by national corporations, and some plants significantly rely on out-of-region suppliers. Collectively, however, New England plants regulated under the Federal Milk Order still get about three quarters of their fluid-milk supply from New England producers. (See "Milk Supply to New England Plants from Farms outside New England" below.)

From both processors' and producer's points view, any interruption of tanker traffic within the region – as in locally administered stop-movement orders to control the spread of disease – could yield huge, potentially unrecoverable losses for farms, processors, consumers, and the environment without a proportionate increase in biosecurity. State-level stops could be as harmful to the New England economy, culture, and environment as any livestock disease.

² The Region's national rank (12) represents a simulation, comparing total dairy product sales of New England farms with the remaining 44 states in 2009-2010. USDA-AMS, Federal Milk Order No. 1, Northeast Marketing Area, [2009 Annual Statistical Bulletin](#) (2010), p. 12; USDA-NASS, [Milk Cow Inventory – All States](#) (2011); USDA-NASS, New England Field Office, State Agriculture Overviews, [New England Statistics](#) (2011); USDA, Economic Research Service (ERS), [Milk Cows and Production by State and Region](#) (September 28, 2010); USDA-NASS, [Milk Production, Disposition, and Income, 2009 Summary](#) (April 29, 2010).

Vulnerability in Regional vs. State Interruption of Dairy Commerce, January 2010³



³ [Foot-and-Mouth Disease \(FMD\) as a Hazard for New England Dairies](#) (June 30, 2011), pp. 56-56.

Hence, the main lesson of the original vulnerability assessment is that the New England states should collaborate in support of continuity of dairy operations. Insofar as possible in an animal-disease emergency, the states should work with Incident Command and the dairy industry to keep milk moving safely from farm to market, across as well as within their borders.

In a FMD outbreak, continuity of business for dairy farmers and processors as well as fortunes for consumers, taxpayers and the environment would be much less vulnerable if milk movement restrictions were applied at the border of the region than at the border of each state.⁴

NESAASA has concluded that the six New England states can, in fact, share a single SMS plan, with common criteria for permitting milk movement in an emergency. Since 2008, developing such a plan and preparing for its implementation have been high priorities for NESAASA as well as the New England Area Office of USDA-APHIS.

These priorities owe much to the vulnerability assessment that, in turn, owes much to data that deserve a second look. Their main source was a single pair of well-respected agencies: the National Agricultural Statistical Service (USDA-NASS) and the Agricultural Marketing Service (USDA-AMS). In fact, since NASS relies on AMS records for key dairy statistics, some counts have a single source, with parameters that reflect the distinct, regulatory requirements of the Federal Milk Order. (See appended “Caveat on USDA-AMS Data.”) Moreover, most of the analyzed data were collected over a short period, the best available at the time: 2006-7 for the NASS [Agricultural Census](#) and 2009-10 for the USDA-AMS [Bulletins of the Market Administrator of the Northeast Marketing Area - Federal Order 1](#). NESAASA has supplemented these data with state and co-op statistics as well as ongoing surveys of farmers, haulers, and processors in the region. But the bulk of the best data for the vulnerability assessment came from just these two, arguably independent sources over a relatively short, increasingly distant period of time. Given those constraints, there is good reason to check how the assessment would fare in light of more complete and up-to-date information.

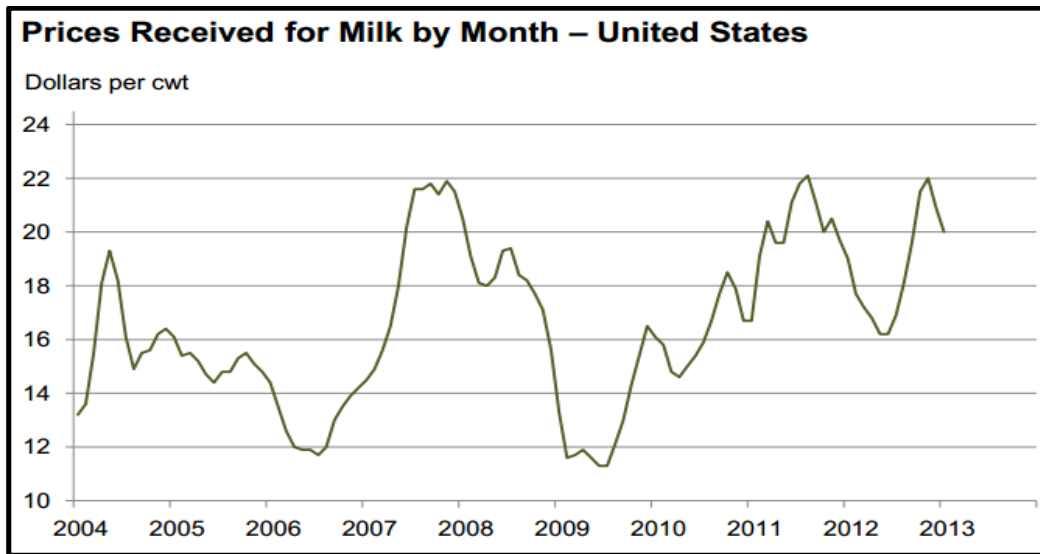
CONTINUITY AND CHANGE IN NEW ENGLAND DAIRY COMMERCE

The dairy business is infamously tough. The availability and cost of an appropriate site, supplies and equipment, breeding stock, feed, fuel, capital, veterinary care, etc. and the market price for milk are all difficult for a farmer to affect, much less control. In general, expenses trend upward, with little relationship to the price that milk can fetch. Unlike other sorts of inventory, acres of pasture and herds of cattle cannot be warehoused or their number adjusted at the pace that input and output markets reward.

New England dairy operations also face distinct impacts from nearby population centers and associated pressure from second-home seekers and commuters, real-estate developers, and property-tax assessors. For those who tend cows on their own land (as nearly all farmers do), lost-opportunity costs increase and nuisance complaints rise as urban and suburban fortunes grow. With each downturn in milk prices, the option to sell off the herd becomes tougher to resist. And those prices have been notoriously volatile, despite the intent of market regulations.

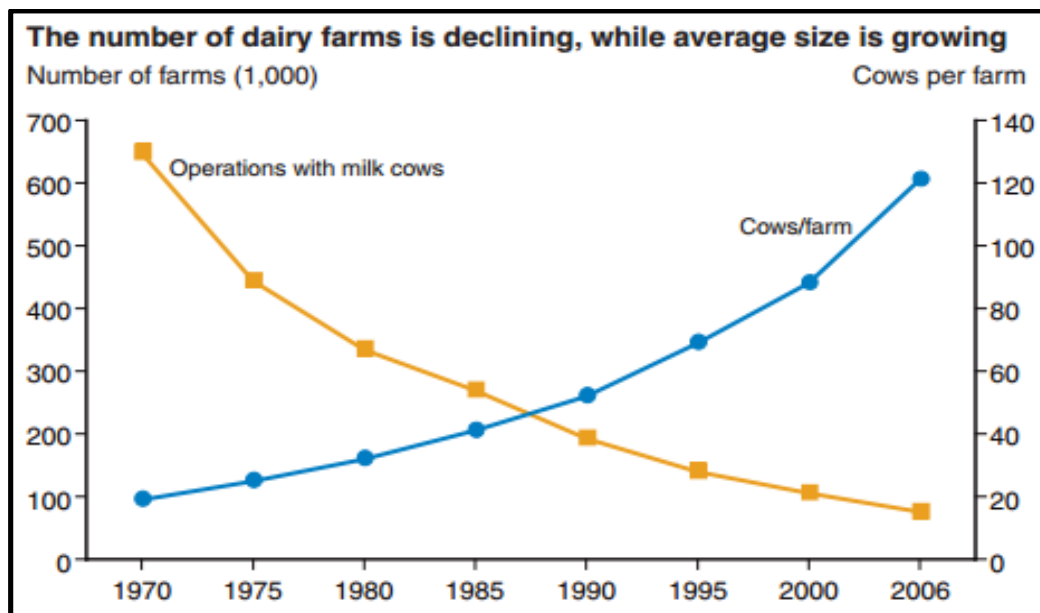
⁴ [Foot-and-Mouth Disease \(FMD\) as a Hazard for New England Dairies](#) (June 30, 2011), p. 58.

Price Volatility in the U.S., 2004-2013⁵



With prospects ranging wildly from month to month for many decades, a share of U.S. dairy farmers have been steadily retiring, and neighbors have been buying up their herds and then some. In fact, for a very long time across America, the number of dairy operations has been declining and their size increasing.

Number and Size of U.S. Dairy Farms, 1970-2006⁶

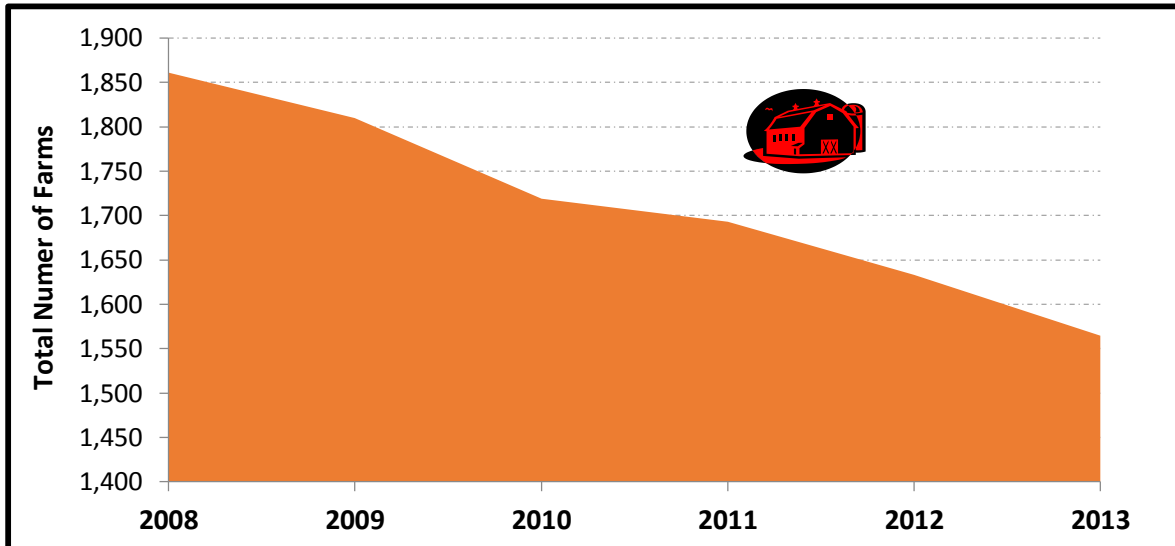


⁵ USDA-NASS, [Agricultural Prices](#) (January 2013), p. 14.

⁶ [Changes in the Size and Location of U.S. Dairy Farms](#) in James M. MacDonald, Erik J. O'Donoghue, William D. McBride, Richard F. Nehring, Carmen L. Sandretto, and Roberto Mosheim, [Profits, Costs, and the Changing Structure of Dairy Farming](#), USDA-ERS, Economic Research Report (ERR) 47 (September 1, 2007), p. 2.

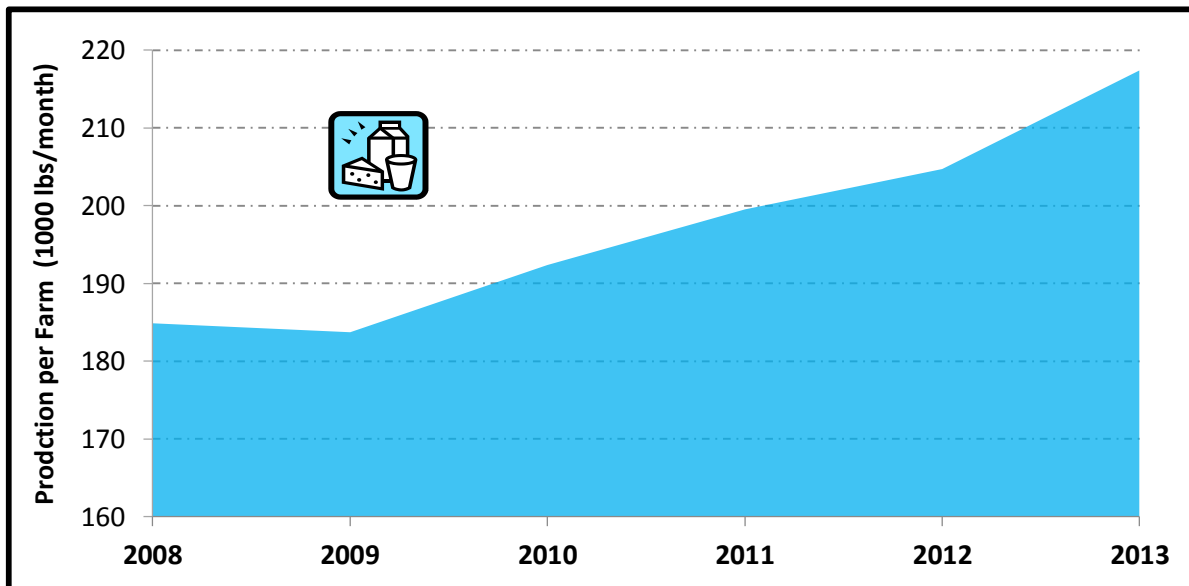
The recent trend in New England has been much the same.⁷ Over the past five years, the number of commercial dairy farms in the region fell by 16%, a net loss of about 300 farms (from 1,861 to 1,565).

Number of Dairy Farms in New England, 2008-2013



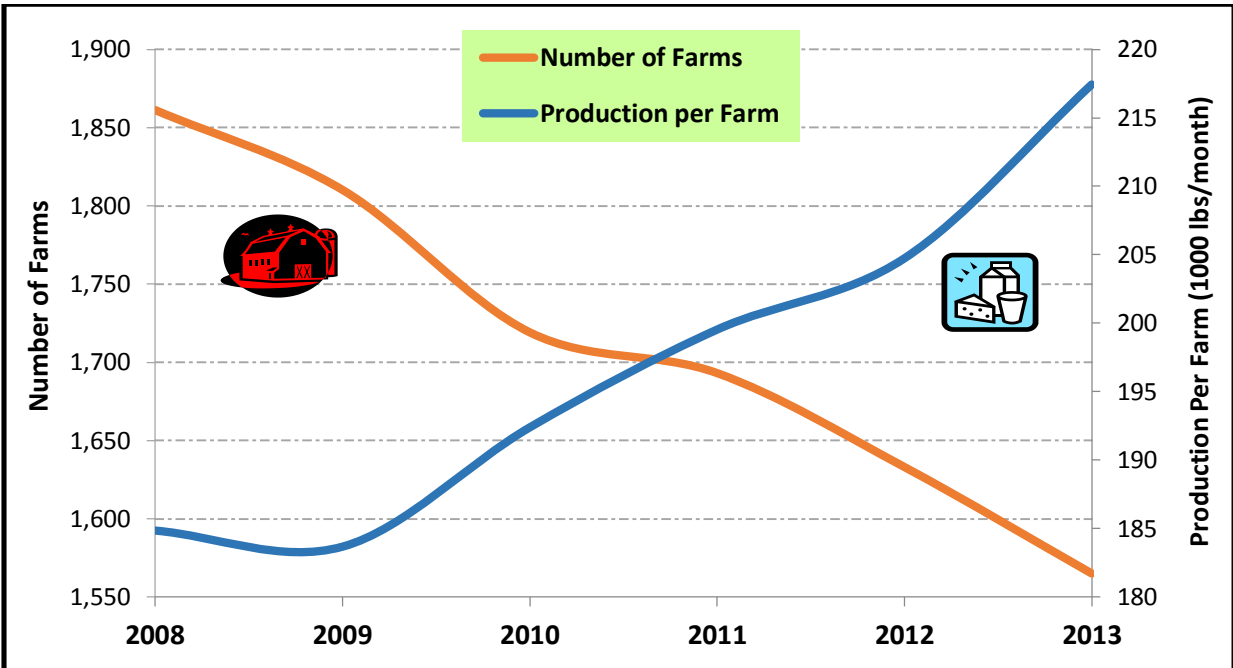
During the same period, the average production of each commercial dairy farm in the region rose by 18% (up from about 6,000 to 7,000 pounds per day). That is the equivalent of adding about twenty milk cows to each and every surviving farm.

Dairy Output per Farm in New England, 2008-2013



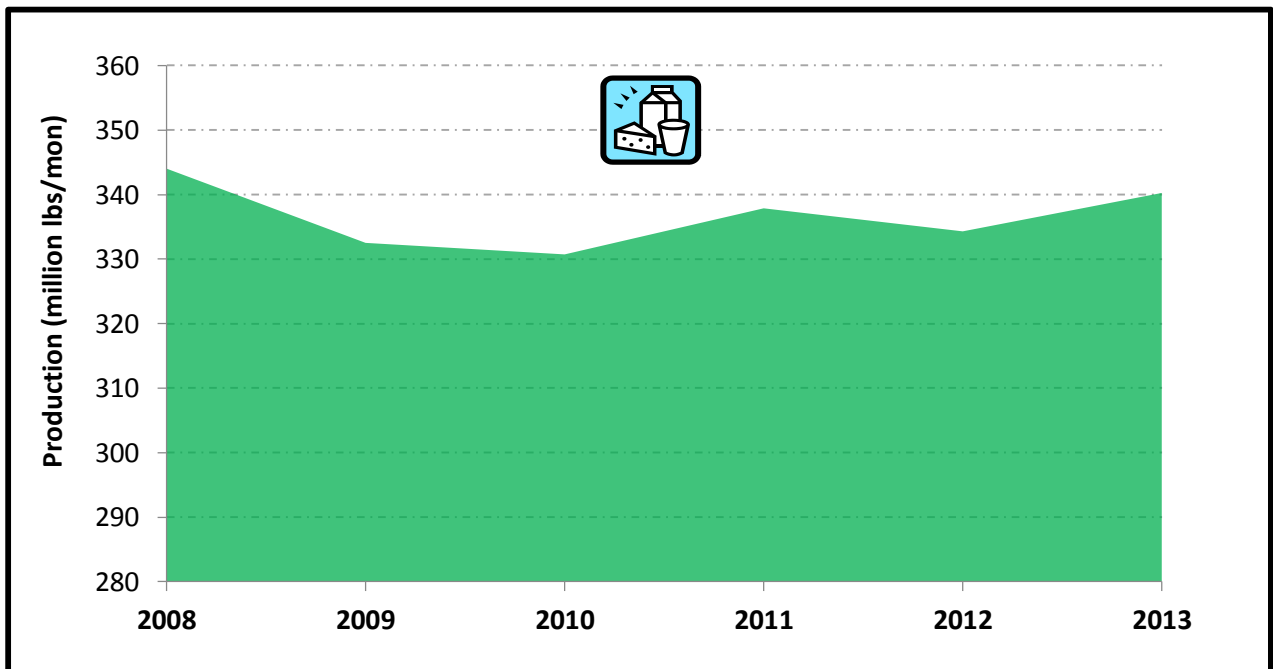
⁷ January [Market Administrator's Bulletins of the NE Marketing Area - Federal Order 1](#), (2008-2013) and [Northeast Marketing Area Statistical Handbook](#) (2013). Data for the following charts were supplied by USDA-AMS in September, 2013 for the most recent month with full quality controls, January, 2013.

Number and Size of New England Dairy Farms, 2008-2013



Since these two trends roughly balance each other, total dairy production in New England has changed very little. Over the most recent five years, it dropped about 1%, well within range of normal monthly, seasonal, and yearly variation.

Total Dairy Production in New England, 2008-2013

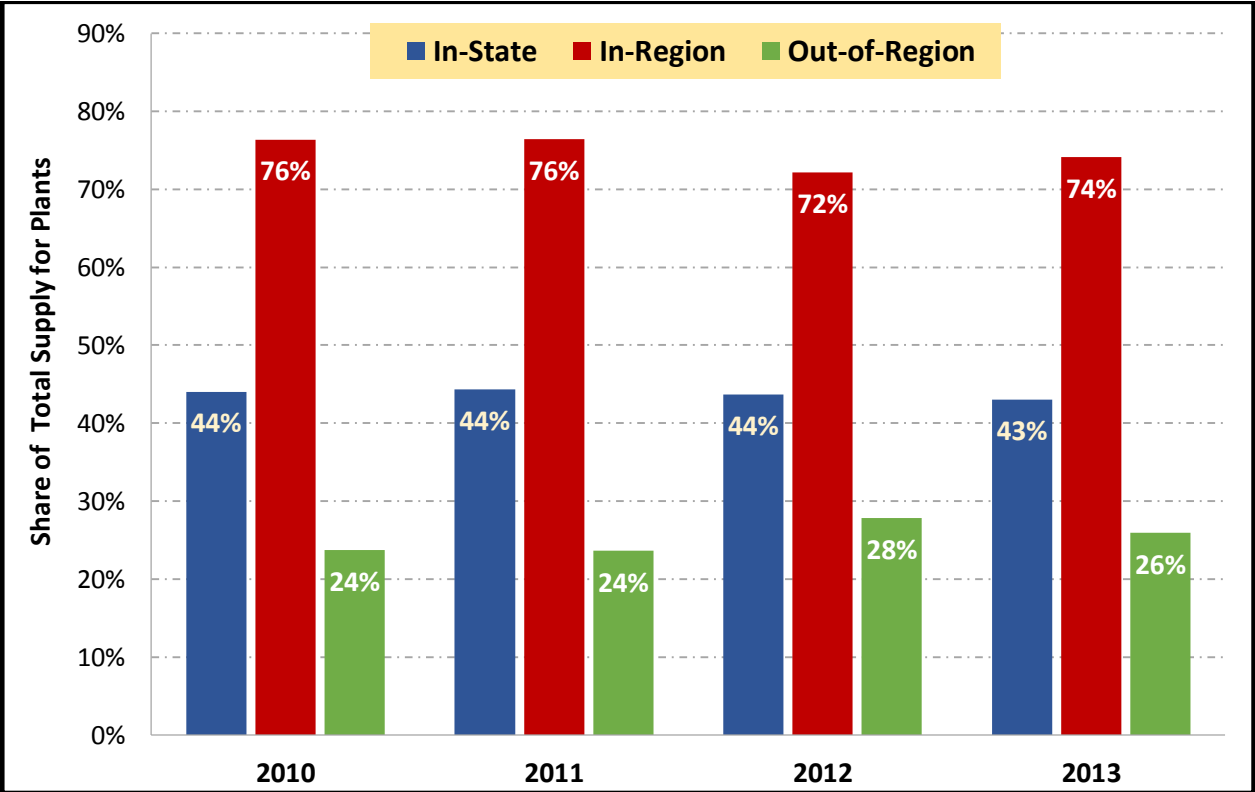


Over the past five years, from 2008 to 2013, New England dairy farms:

- Have declined in number,
- Have grown in size,
- Produced about the same total amount of milk.

The geography of the New England dairy industry has also changed very little. New England farmers are still shipping nearly all their milk to market within the region. Despite rising costs, the volatility of milk prices, and increases in the size and productivity of farms, processors are still depending on a supply of milk from producers distributed in and around the region in 2013 much as they were in 2010.

Source of Supply of Milk for New England Dairy Processing Plants, 2010-2013⁸



In short, the scale, structure, and geography of the New England dairy industry as a whole and the implications for its vulnerability seem basically unchanged.

More comprehensive and up-to-date statistics support the conclusions of the original vulnerability assessment. The case remains strong for a six-state approach to supporting continuity of dairy operations in an animal-disease emergency.

⁸ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013.

NEW ENGLAND VERSUS THE NORTHEAST IN SMS PREPARATION

Among the challenges of a SMS Plan is defining the area – the spatial and regulatory entity – where the plan can best be advanced under dynamic emergency conditions.

The regulations that ordinarily most affect the workaday experience of farmers, processors, and haulers are administered at the state level. That is where most of the legal authority to regulate dairy commerce resides. So, officials and the public tend to look toward state government for animal-disease emergency management. The vulnerability assessment and updated data, however, suggest that in New England the state would not be ideal for supporting continuity of dairy operations in an animal-disease emergency. Despite its value in implementing controls on commercial traffic, independent, state-level administration of commerce could actually increase risks to farm survival. So what jurisdiction would be better?

There are a range of alternatives. On the one hand, most of the milk produced in the U.S. is processed by affiliates of a handful of marketing companies and supplied by a similarly small number of producer cooperatives. Both the companies and the co-ops that handle the largest share of the milk tend to be national organizations as, of course, is USDA-APHIS, the lead federal agency in a Foreign Animal Disease emergency (FAD, such as FMD). Although each of these business and governmental organization has its own way of defining its divisions and their powers, a sketch of their scope would begin with a map of the whole U.S. At the other extreme are the milking operations themselves, the vast majority of which (about 90%) are owned by families who live on a parcel of land abutting their cattle. A map of milk production would resemble a stack of plat books. Incident Command would welcome an intermediary.

Given the designation of “marketing areas” in federal dairy regulations, a sensible compromise (a geographic unit larger than the farm or the state but smaller and hence more manageable than the nation) might be “the Northeast,” known within the Agricultural Marketing Service as “Federal Order 1.” It encompasses not only the New England states but also some are all of seven others (Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia) and the District of Columbia ([7 CFR §1001.2](#)).

Northeast vs. New England as a Region



Despite the integrity of the Federal Order, there are a number of reasons why New England can be considered more appropriate than the Northeast for organizing SMS preparations.

1. **Biosecurity.** As explained in [FMD as a Hazard for New England Dairies](#), established patterns of commercial dairy traffic (particularly from farm to plant, where there is the greatest risk of spreading infection among herds) is largely confined to the six states. In an outbreak, if New England could maintain a perimeter to protect its dairy traffic from cross-contamination with the rest of the Northeast, both sides would gain disease protections, with minimized interruption of farm-to-market commerce. That aim is central to all SMS preparations.
2. **Readiness.** New England has proven a leader in SMS planning largely because the New England Area Office of USDA-APHIS and animal-health and agriculture officials in the six states have lots of experience working together. They have been accustomed to providing mutual aid in emergencies, large and small, for many years. They communicate regularly and have been conducting FMD-response exercises together since 2008. Although they also regularly coordinate animal-health issues with their counterparts in the rest of the Northeast, those relationships have not been as regular or close. New England animal-health and agriculture officials have developed extraordinary readiness for coordinated response in an animal-disease emergency.
3. **Representation.** If planning organization were to proportionately represent production, New England interests could be overwhelmed by the rest of the Northeast. New York and Pennsylvania each hosts more than four times more dairy production than New England's largest producer, Vermont, and more than three times more than all six states combined.⁹ As an emergency planning body, the Northeast might better represent distinctly Mid-Atlantic than New England agricultural interests. New England state officials are eager to collaborate with Mid-Atlantic states, but they are also understandably eager to protect the interests of their constituents. Insofar as New England's stakes in dairy business continuity could diverge from the rest of the Northeast, maintaining a separate capacity for SMS administration could be essential for sustaining agriculture in the six states.

With such reasoning, NESAASA has to-date treated New England as the more appropriate jurisdiction for SMS preparedness. Regulators in the six states are already working together with their dairy industries to meet SMS Performance Standards as befits regional commerce.

The vulnerability assessment – the original as well as this update – credits the view that continuity of dairy operations in an animal disease emergency could best be supported through a SMS project based in New England.

⁹ USDA-AMS, [Northeast Marketing Area Statistical Handbook](#) (2013), A32-A33.

MILK SUPPLY TO NEW ENGLAND PLANTS FROM FARMS OUTSIDE NEW ENGLAND

Since their states have appropriate regulatory authority and the regional market could suffice for their farms, NESAAASA advocates that the collaborating six states constitute a proper jurisdiction for SMS preparedness. Insofar as the dairy farmers, processors, and haulers who ordinarily operate within the region are ready to work with the states, Incident Command and the [New England SMS Plan](#), the regional project could be considered a success.

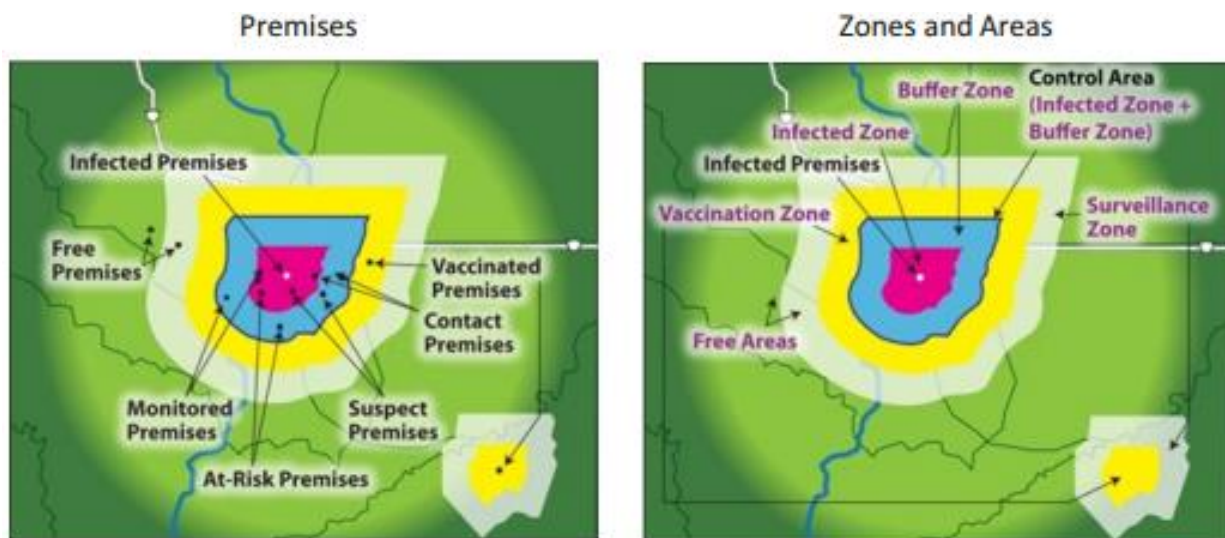
But what would be the fate of in-region plants that ordinarily depend on out-of-region supply? The New England SMS project has engaged neighboring officials but not neighboring suppliers themselves. So far, there are no data, plans or preparations for New England to issue emergency permits to out-of-region farms to ship unpasteurized milk to New England plants. Such benign neglect may, in effect, increase risks to continuity of out-of-region supply in an emergency. How grave might such a supply loss be for New England, and what should be done about it?

FOCUS ON THE SEVERITY OF THE INCIDENT

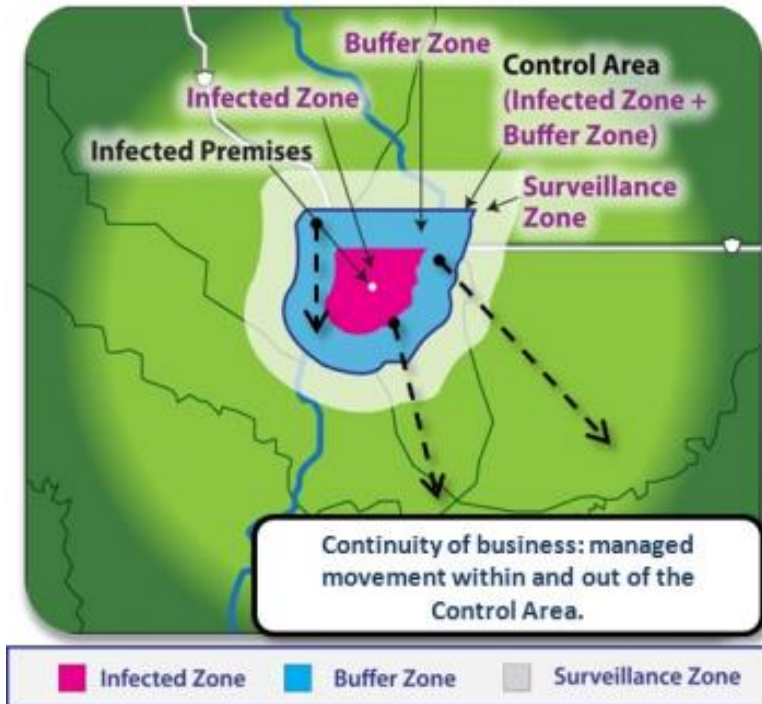
The degree of interruption in dairy commerce is likely to depend chiefly on the severity of the incident, especially, the size and location of the disease Control Area. That is the terrain identified by Incident Command in which milk movement is restricted to reduce risks of spreading infection. The **Control Area** normally encompasses Infected, At-Risk, Contact, and Suspect Premises within an Infected and Buffer Zone (as opposed to a surrounding Surveillance Zone and outlying **Free Area**, where risks of infection and restrictions are lower).

A Control Area may range in size from a few square miles within a single state to a whole state, parts of several states or even the entirety of the U.S. Ideally, disease could be detected and contained so quickly that the Control Area would be smaller than a single county. By rule of thumb, it could be as small as a circle, about six miles in radius around a single Infected Premises.

Premises, Zones, and Areas in Continuity of Business Planning¹⁰



¹⁰ USDA-APHIS Veterinary Services, [Foreign Animal Disease \(FAD\) Response Ready Reference Guide—Zones, Areas, and Premises in an FAD Outbreak](#) (August 2013), p. 1; and [Foot-and-Mouth](#)



Some livestock diseases, however, spread extremely fast and far along routes of commerce, and days or even weeks may pass before infection is confirmed. FMD, in particular, can spread with extraordinary ease and may escape early detection. Given the intensity of dairy traffic in New England, a local outbreak could be very tough to corral, and estimates of the severity of the incident may change rapidly. By necessity, then, SMS Plans are designed to shift strategies for business continuity as Incident Command reassesses and adjusts the shape and size of Control Areas. Flexibility is required to stay ahead of infection on the ground.

According to current national [SMS Performance Standards](#) and the [New England SMS Plan](#), dairy commerce outside any Control Area should be allowed to continue, with no specific, additional SMS permitting required. Regardless of location, farms and processors in Free Zones can move milk as usual (though Incident Command may recommend or mandate other emergency measures).

So, if disease happens to break in the U.S. but far from New England – where there is no regular, direct contact with dairy farms or plants in the six states – milk shipments should continue normally. Even in a FMD outbreak, farms that are outside the Control Area – whatever their state – should not need SMS permits to ship milk to processors in a Free Area in New England.

When milk shipments are routed entirely outside a Control Area (within a Free Area) out-of-region farms could supply New England plants, just as in-region farms, without special permits.

[Disease \(FMD\) Response Ready Reference Guide -- Quarantine, Movement Control, and Continuity of Business](#) (August 2013), p. 2. See also “Designating Zones and Premises,” Chapter 3 in [USDA-APHIS Foreign Animal Disease Framework Response Strategies](#) (May 2012)

On the other hand, if FMD broke in the Northeast, Incident Command would be likely to require more restrictive measures, as would the states themselves.

If the disease actually broke in New England (in any one of the six states), Incident Command may decide, at least initially, to treat all of New England as a Control Area. Given the density of farm-to-plant traffic in the region, by the time FMD was detected, most commercial dairy operations would have been visited several times by a tanker with few degrees of separation from a contaminated site. New England SMS preparations have presumed just such a possibility.

Under such conditions, disease-free states outside New England could be expected to suspend dairy traffic to and from the region, anyway. For them, the trade-off between biosecurity (stopping movement to protect their own herds) and business continuity (encouraging commerce) would favor bans on inter-regional milk movement. Disease-free states outside New England could reduce potential exposure to infection without risking great, immediate harm to the continuity of their own dairy industry.

If, on the other hand, FMD broke near but not inside New England, the regional SMS Plan would not necessarily be activated. With the forbearance of Incident Command, each state could act on its own. A “disease-free state” may well bar shipments from an “infected state” (i.e., one with a FAD Control Area), even if it included major disease-free suppliers to its processing plants or a market for its farms. The biosecurity gains might seem great and the total loss of supply minor, especially given the likely drop in milk demand, as consumers first react to breaking news of pathogens (albeit livestock vs. human) in the supply chain.¹¹

In short, if the Control Area included either New England or a neighboring state, states on both sides of the regional border would be inclined to stop tanker traffic across it. That strategy is, in effect, sanctioned in current SMS preparations. New England states are focused on their own dairy operations, progressing rapidly to sustain farms, haulers, and processors that are “Ready” (i.e., prepared to meet elevated biosecurity requirements) within New England, but with no specific procedure for supporting dairy commerce outside the region, beyond prompt notification of relevant regulatory officials.

Given such a role of incident severity in SMS planning and its strategic implications, the scope of questions about inter-regional dependence can be narrowed considerably. In particular, might states better prepare to sustain dairy traffic across the regional border? For example,

- When a disease-free farm that normally supplies a New England processing plant is in a Control Area outside the region but the plant is in a Free Area inside New England?
- When that farm is in a Free Area outside New England but the plant is in a Control Area inside New England?

What can or should be done in an emergency to keep moving milk moving, insofar as possible, between farms and processing plants on different sides of the New England border?

What is at stake?

¹¹ Richard P. Horwitz, [How to Communicate with Dairy Consumers about FMD](#) (December 2012).

FOCUS ON THE SIZE OF THE SUPPLY

Currently (in 2013 as in 2009-2012), FMO-regulated plants in New England receive about a quarter of their total supply of unpasteurized milk from farms outside New England. Suspension of that supply could be considered tolerable, if its effect included sufficient disease-control gains and support of business continuity to benefit livestock, consumers, the environment, and the dairy industry as a whole.

At least in the abstract, 25% may not seem like much, especially in an emergency where much more would be at-risk. Furthermore, the actual share of supply from outside may be lower than AMS figures suggest.

The six states license a total of more than 300 dairy processing plants within their borders, but AMS tracks the supply to fewer than 60 (the ones that are required to report, under the FMO). Since the states are still surveying those 250+ plants that need not report to AMS, information about their supply is less well-known, but it could be more local. Their number would include small operations that purchase goat or sheep milk or produce artisan cheese from a neighbor's cows (although, maybe too, Class II or III fluid from elsewhere). So, if those non-FMO plants were taken into account, the actual out-of-region share of total dairy supply could well be even smaller.

Also, consumer demand is apt to fall in a FMD outbreak, at least at the outset and maybe for weeks or even months thereafter. New England is preparing to help reduce consumer panic (in part, by keeping fresh, local milk stocked on store shelves), but market research suggests that consumers may reduce their dairy purchases by as much as 40-50%.¹²

If processing must be reduced accordingly, it would make sense for disease-emergency-response managers to favor biosecurity measures that reduce the distance that milk travels (e.g., stop ordinary milk imports to New England) and thereby the span of potential cross-contamination. Such a strategy would be compatible with the current [New England SMS Plan](#).

On the other hand, considered less abstractly, the normal out-of-region supply is a lot of milk: more than 115 million pounds per month. That is an average of about 3.7 million pounds per day, enough to fill at least fifty tanker trailers or more than a hundred straight trucks every day.¹³

For plants that rely on those shipments, being denied them would, indeed, be serious. They may have to cut back or even stop normal operations. Cascading economic effects could certainly strike farmers and consumers, too.

New, higher-resolution statistics from AMS add a good deal of clarification to what is at stake.

¹² [How to Communicate with Dairy Consumers about FMD](#) (December 2012); Dairy Management Inc. (DMI), *Communicating Dairy Safety during an FMD Outbreak: Best Practices Based on Dairy Industry Crisis Messaging Research* (2011), p. 1.

¹³ The number of truckloads is estimated with the assumptions that a "truckload" ranges from 4,000 gallons (straight-truck) to 8,000 gallons (trailer) and milk averages 8.6 pounds per gallon.

FOCUS ON ORIGIN

It is worth emphasizing that nearly all of the out-of-region supply comes from just one state: New York, which shares its eastern border with three of the six New England states.

Every year from 2010 to 2013, New York farms accounted for 99-100% of the total out-of-region supply to New England FMO plants. Furthermore, shipments have mainly come from distinct clusters of New York farms. (The Northeast office of AMS is preparing more precise data on those locations for NESASA.) Only a tiny share (1% or less) of the unpasteurized milk supply to New England plants comes from farther away, generally as needed, inconsistently from Pennsylvania, New Jersey, and occasionally Maryland, Ohio, or Indiana (chiefly from organic producers). So, the scope of the main jurisdictional anomaly in New England SMS planning can be narrowed to traffic with specific clusters of dairy farms in New York.¹⁴

Gauging the significance of that anomaly is inherently contestable. Clearly, given a sufficiently severe outbreak, the omission of New York farms from New England SMS preparations and permitting procedures could reduce the total supply to New England plants. But how severe a problem would that be?

For New York, the aggregate loss would probably be tolerable. Presumably, New York farmers and co-ops could find a home for the milk that would otherwise go to an eastern, out-of-state market. No more than about 4% of New York's normal total production would be displaced, and New York processors could welcome an increase in local supply to meet demand for products from Free-Area farms and plants.¹⁵ So, an emergency order stopping raw-milk shipments to New England could be expected to have a relatively minor effect on New York dairy markets as a whole.

Effects in New England would certainly be larger, albeit varying substantially with perspectives and circumstances on the ground.

FOCUS ON DESTINATION

Any change in New England's access to New York milk (as in an emergency stop-movement order) could have wide-ranging effects. For example, New York is a source of at least some of the supply to plants that together handle a total of more than 90% of the milk processed in New England's FMO plants. In other words, at the regional level, less than 10% of the milk normally in the supply chain would be entirely free of some direct impact.

But effects would also vary greatly from plant to plant. In general, larger plants are more dependent on a New York supply of unpasteurized milk, but some of the smallest plants are greatly or even entirely dependent on it. An individual large or small plant might have a great deal of difficulty maintaining operations in an emergency, but effects on the regional market for milk (and hence continuity of farm operations and herd health) may be negligible. (See "Distribution of Supply to Processors, Grouped by Plant Size, January 2013" in the Appendix below.)

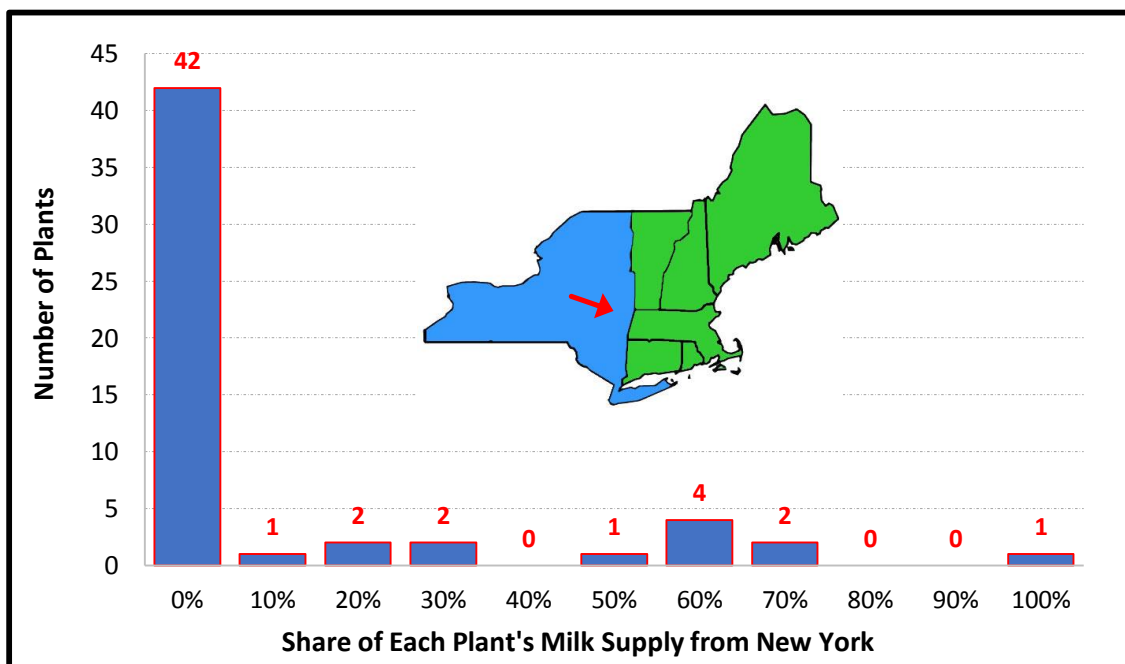
¹⁴ In January 2013, farms outside New England, excluding New York, provided 0.2% of the total supply to New England FMO plants. USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013.

¹⁵ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013; and [Northeast Marketing Area Statistical Handbook](#) (2013), A32.

In fact, an interruption in New York deliveries would have very little direct effect on the vast majority of New England processing plants. For example, in all of January 2013, AMS reported that 36 of the region's 55 FMO-regulated plants received not a single New York milk shipment. Fully 75% of the plants (42 of 55) got less than 10% of their supply from New York. Presumably, they could survive without it, at least for a while in an emergency, amidst a drop in local consumer demand.

A small number of FMO-plants in New England, though, greatly depend on New York shipments. At the beginning of 2013, a dozen New England plants relied on New York for more than 20% of their milk supply. For eight plants (all in CT, MA, or VT), New York was their main supplier.

Number of FMO Plants in New England by the Share of Their Milk Supply from New York¹⁶



Furthermore in assessing potential impacts on regional markets, aggregate percentages can be deceiving. Similar shares of milk supply (percent of the total for individual plants) may represent hugely different amounts of milk itself (actual gallons or pounds), and vice versa.

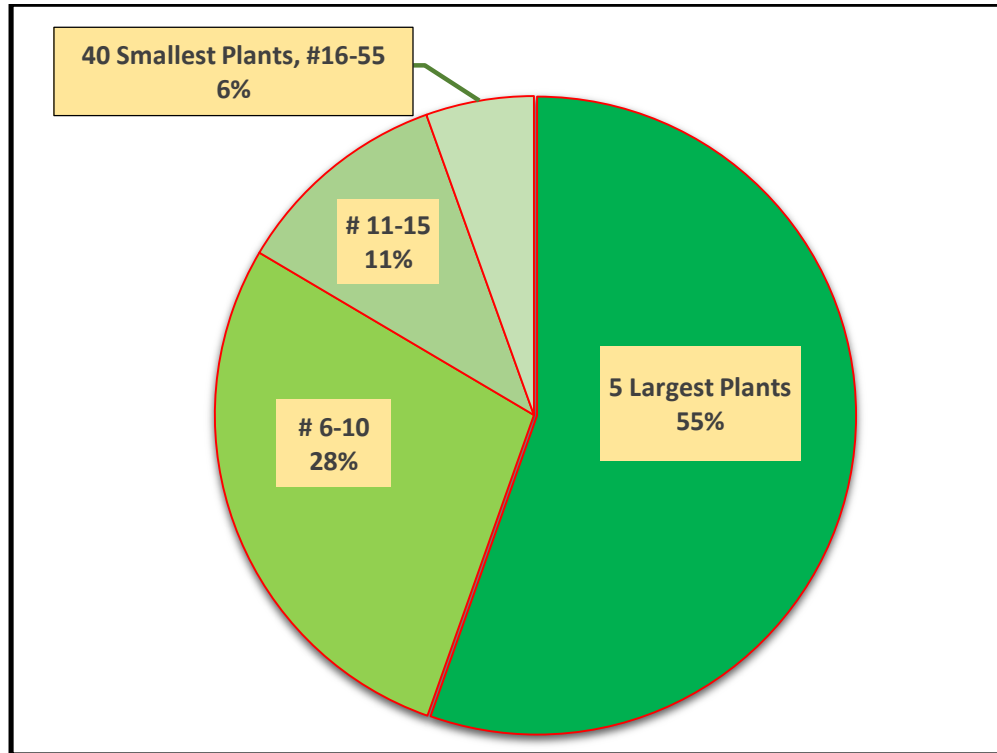
It is worth emphasizing that dairy processing in New England features many operations that process very small amounts of milk and a few that process a lot. Some of the plants that most depend on deliveries from New York are also among the most important for New England dairying as a whole. Fortunes for just about everyone in the industry depend on the continuity of operation of those key plants.

One of the ways that a plant can be so pivotal is by helping buffer the effect of a temporary drop in consumer demand or a disruption in the supply chain. Instead of bottling fluid with a short shelf life, fresh milk can be converted into products such as powder, butter, or cheese that can be stored, shipped longer distances, or sold over an extended period, as consumer demand and supply chains recover from an emergency.

¹⁶Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013.

Another way a plant can be pivotal is by the sheer size of its capacity.¹⁷ In particular, the ten largest plants together handle more than 80% of all the milk processed in New England. Most of the rest of the region's FMO plants handle less than a 0.1% each.

Share of Regional Processing by FMO Plants, Grouped by Size¹⁸



In this way, whatever the specific split of the supply to each plant, the largest plants generally handle a huge amount of milk from both New England and New York. (See “Distribution of Supply to New England, Grouped by Plant Size, January 2013” in the Appendix below.)

For example, by USDA-AMS tabulations, the five largest plants together handle:

- 55% of the milk processed in New England,
- 52% of the milk produced on New England dairy farms, and
- 66% of the milk shipped to New England from New York.

The ten largest plants together handle:

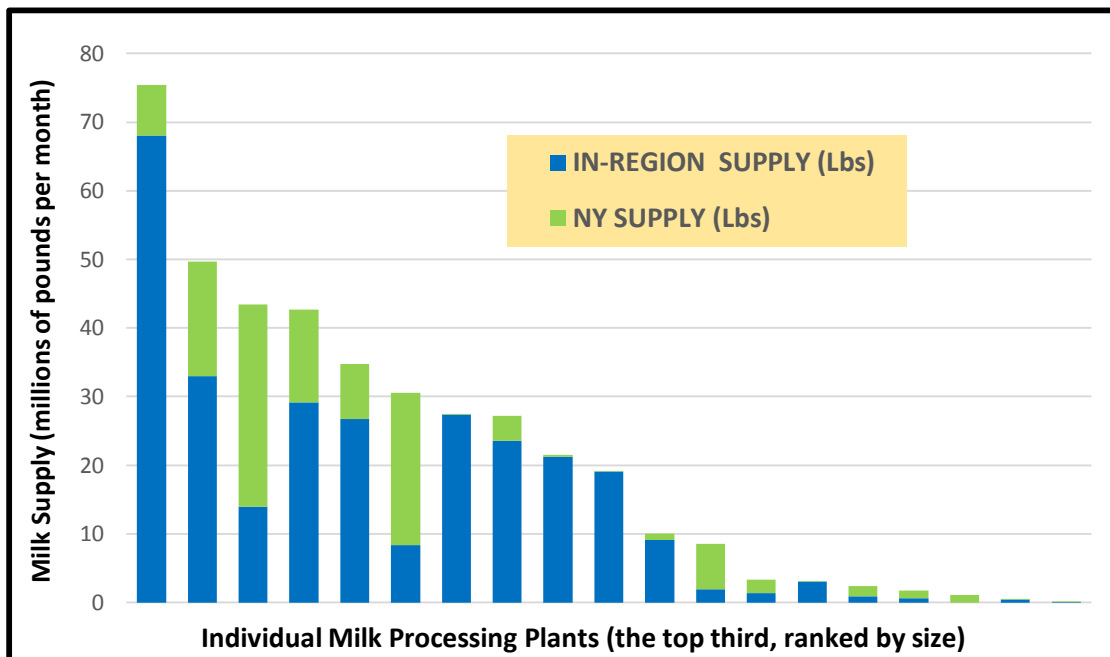
- 80% of the milk processed in New England,
- 82% of the milk produced on New England dairy farms, and
- 87% of the milk shipped to New England from New York.

¹⁷Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013. Note that market share also appears to be about as concentrated among dairy farmers as processing plants. According to the [2007 Census of Agriculture](#), fewer than 10 percent of the farms in New England produced half the total milk and its value in the region. See “Concentration of Market Share among Dairy Farms in New England, 2007” in the appendix below.

¹⁸ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013.

By comparison, the smallest forty plants together handle a total of only 5-6% of the milk produced, processed, and shipped into the region. (See also “Distribution of Supply to New England, Grouped by Plant Size, January 2013” in the Appendix below.)

Milk Supply for the Largest Dairy Processing Plants in New England, Ranked by Size¹⁹



So, plant size greatly matters in targeting priorities for support of business continuity. Though many small plants may be most vulnerable individually to a disruption of New York supply, the largest plants represent the largest vulnerability both for themselves and for the regional dairy market as a whole.

If the largest plants were to suspend operation because they were cut off from New York supply, most New England farmers would also lose a major market for their milk and thereby the checks that buy groceries for their families and feed for their cows. Stops on milk movement designed to control infection to or from New York could, in effect, make it impossible for New England herdsmen to afford veterinary care for their animals, hardly a welcome outcome in an animal-disease emergency.

This analysis supports the conclusion that inter-regional dairy commerce with New England is sufficiently valuable and discrete – chiefly between clusters of farms in NY and about a half-dozen plants in CT, MA, and VT – to warrant special attention in New England SMS planning.

Shipment of unpasteurized milk into New England is sufficiently valuable and discrete – chiefly between specific clusters of farms in NY and a half-dozen plants in CT, MA, and VT – to warrant special attention in New England SMS planning.

¹⁹ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013

OPTIONS FOR SUSTAINING NEW YORK SUPPLY TO NEW ENGLAND PROCESSORS

This reassessment provides evidence that New England remains an appropriate jurisdiction for support of continuity of dairy operations in an animal-disease emergency, but it also identifies an important anomaly. The six states encompass a well-bound milk shed for farmers, but it is more porous for processors. Key plants (and hence the market for producers) rely on regular shipments of unpasteurized milk into New England from farms in New York.

Normal traffic between those particular farms and plants flows through a gap in SMS preparations. If a FAD outbreak were epidemiologically isolated from the Northeast, maintaining that flow may be easy, but it would be tougher if FAD broke in one or more of these seven northeastern states (the six in New England plus New York). Acting on their own, individual states are apt to stop movement, and regional SMS preparations so far have focused closer to home, centered on in-region producers.

How, then, could SMS preparations best address this gap? The short answer is procedural: With the coordinated support of the regulatory officials in each and all of the specific states where the milk normally is produced and delivered and through which it is shipped.

Since chief animal-health and dairy officials in the seven states have been engaged in the [New England SMS Project](#) since its start, and since they are the ones with much of the authority and responsibility to implement plans at the state level, the right people are already engaged. Any solution for this jurisdictional problem would “just” have to promise the “right” balance of biosecurity and business continuity to allow them to endorse it.

Ideally, SMS plans in the various regions of the U.S. will eventually be so championed and uniform that reciprocity could be the norm. New York and the New England states, then, would share a single procedure for issuing permits to producers, processors, and haulers. Each state could simply agree to recognize every other state-issued emergency permit to ship milk. Unfortunately that ideal is now only a distant possibility. There is very little uniformity or coordination among states across the nation beyond endorsement of performance standards for which standard procedures, presumably someday, will be developed, proven feasible, and implemented.

The region could, however, help movement toward that goal incrementally. New England is among the most advanced of regions in developing procedures to issue emergency permits (e.g., surveying farms for Readiness, building a secure but sharable on-line database, conducting exercises, etc.) So, maybe New York could be convinced to prepare in parallel, as if it were part of NESAASA. Then, each of the six states might agree to recognize a permit issued in New York and vice versa, much as the New England states have already agreed to recognize each other's.

For better or worse, such uniformity and reciprocity may be worse than tough to achieve. The dairy industry in New York is much larger than in New England, and it has barely begun SMS preparations. By tethering its progress to yet another, much larger state, New England would be handicapped. Furthermore, increasing the scope of existing plans from six to seven states would sacrifice some of the advantages of treating New England as a region in the first place. For example, judging from normal milk traffic, New York encompasses several abutting milk sheds. While some clusters of New York farms are tied to plants in Connecticut, Massachusetts and Vermont, others are tied to Pennsylvania, and yet others to New Jersey, and those farm-to-market routes crisscross each other. In this way, expanding the jurisdiction to deal with one set of anomalies would introduce yet more of them as well as administrative burdens and greater risks of cross-contamination during an outbreak.

An alternative would be to work on an understanding between New York and New England that would, in effect, extend the New England plan to cover only the specific set of New York farms or locations that regularly ship to New England plants. New England might, for example, ask New York milk inspectors to administer surveys and maintain compatible data on the specific set of farms and haulers that service the New-York-to-New-England routes (the Adirondack-channeled roads between the largest New England plants and their New York suppliers).

A simpler solution might be to agree to implement special, elevated biosecurity measures as needed along those particular routes. Such a remedy might be particularly useful when shipments originate from a Free Premises in a Control Area on one side of the regional border and their destination is in a Free Area on the other side of the border or vice versa.

States on either side of the border might require that shipments stop for cleaning and disinfection (C&D) near the border (e.g., hire the services of a designated, pre-certified commercial truck wash) and require the tanker to present evidence of proper C&D before being allowed to enter the premises at its destination. This procedure would help protect the disease-free status of the state that it is entering or leaving, while sustaining commerce. Such targeted risk remediation would also lighten the burden of data collection and management in advance of an outbreak and spare New York farmers from potential subjection to two sets of SMS standards (one for NESAASA and one for New York).

Ideally, yet more remedies may occur to government- and private-sector stakeholders, but this reassessment suggests that effort along these lines now could be helpful later in an emergency. It is recommended for consideration by NESAASA, New York, and others with a stake in sustaining New England dairies.

APPENDIX

Caveat on USDA-AMS Data²⁰

Data for [FMD as a Hazard for New England Dairies](#) (2011) were provided by the USDA Agricultural Marketing Services (AMS) Office of the Northeast Market Administrator through an inter-agency memorandum of understanding with USDA APHIS Veterinary Services (# 10-9623-1087MU). AMS supplied summary counts from confidential producer payroll reports submitted to the Market Administrator by handlers regulated under the Provisions of the Milk Marketing Order during one sample month (January 2010) and later added data through 2013.

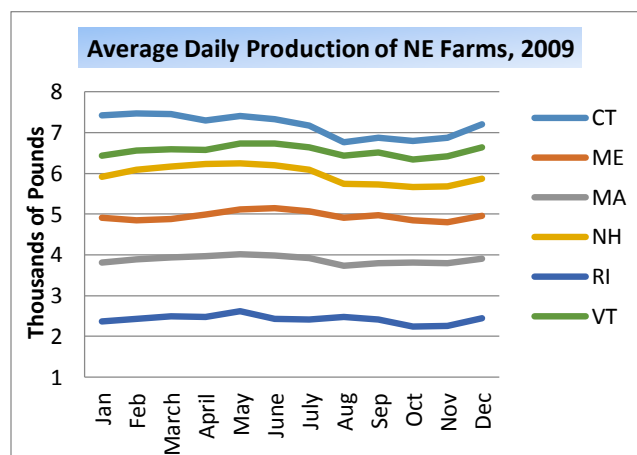
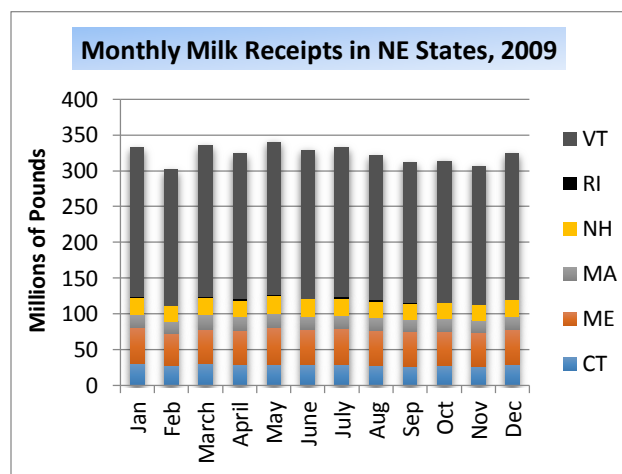
Data coverage is remarkably comprehensive, but limitations must be acknowledged.

The terms of the Northeast Order require that regulated handlers provide monthly reports of all farm-level production, milk receipts, and utilization. Hence, in the absence of sales to regulated handlers (e.g., when farmers feed raw unpasteurized milk to livestock or sell it directly to consumers), commercial production escapes AMS reporting.

The General Provisions of Milk Marketing Orders also include reporting requirements only for Grade-A milk. However, since nearly all of the dairy farms in New England produce Grade-A milk, these AMS data are reasonably even if short of perfectly comprehensive.

Geographically, the regulated Northeast Milk Marketing Area includes all of the six states in New England with the exception of Maine. Nevertheless, nearly all Maine farms are covered on the basis of the sale of their raw milk to handlers who are in the marketing area and therefore regulated under the rules of the Northeast Order.

January 2010 was selected because, at the time of this study, it was the most recent month with data-quality controls completed and because January can be considered reasonably representative of normal dairy activity. As the charts below suggest, variation in total production and processing varies little month-to-month, and state as well as farm shares of production vary even less. The volume of milk produced and pooled in the Northeast Order tends to be a bit higher in the spring (April to May) and lower in the fall (September to October), but January 2010 totals were close to the 2009-2010 mean. State and farm-level contributions remain a fairly consistent, year-round proportion of the whole.



²⁰ Appended to the original vulnerability assessment, [Foot-and-Mouth Disease \(FMD\) as a Hazard for New England Dairies](#) (June 30, 2011), pp. 89-90. U.S. Department of Agriculture, Agricultural Marketing Service (USDA-AMS), Northeast Marketing Area, Federal Order 1, [The Market Administrator's Annual Statistical Bulletin](#), Volume 10 (2009), p. 11-13.

Farms and Daily Output by State and Region, 2008-2013²¹

Year	Number of Farms (average in Jan.)	Daily Output (average lbs per farm in Jan.)
2008		
CT	136	7,164
ME	333	4,750
MA	166	3,873
NH	134	5,835
RI	15	2,546
VT	1,077	6,572
New England	1,861	5,963
2009		
CT	131	7,432
ME	329	4,904
MA	159	3,814
NH	128	5,923
RI	17	2,365
VT	1,046	6,437
New England	1,810	5,925
2010		
CT	129	7,394
ME	314	5,120
MA	143	4,142
NH	129	6,034
RI	16	2,379
VT	988	6,818
New England	1,719	6,228
2011		
CT	124	7,855
ME	314	5,000
MA	138	4,004
NH	128	6,153
RI	16	2,561
VT	973	7,127
New England	1,693	6,414
2012		
CT	123	7,878
ME	304	5,380
MA	130	3,977
NH	121	6,047
RI	16	2,510
VT	939	7,340
New England	1,633	6,605
2013		
CT	117	8,248
ME	294	5,593
MA	129	4,410
NH	114	6,314
RI	13	2,555
VT	898	7,846
New England	1,565	7,014

²¹ USDA-AMS, Northeast Marketing Area – Federal Order 1, [Market Administrator's Monthly Statistical Reports](#) (2008-13).

Amount and Source of Milk Shipped to New England Dairy Plants, 2010-2013²²

Year	Total Processed in January (lbs)	In-State Share of Supply	In-Region Share of Supply	Out-of-Region Share of Supply	NY Share of Out-of-Region Supply
2010	417,730,309	44.02%	76.34%	23.70%	99.70%
2011	432,150,453	44.33%	76.39%	23.61%	98.66%
2012	452,086,092	43.64%	72.19%	27.81%	98.80%
2013	447,397,944	43.01%	74.10%	25.90%	99.18%

Amount and Source of Milk Received in FMO Plants, Grouped by Plant Size, January 2013²³

Plant Size (rank in NE by milk processed)	Total Supply (lbs)	Supply from NE (lbs)	Supply from Out-of-NE (lbs)	Supply from NY (lbs)
# 1-5 (5 largest)	246,683,561	170,782,237	75,901,324	75,158,733
# 6-10	126,091,268	99,879,278	26,211,990	26,205,321
# 11-15	49,511,950	41,976,356	7,535,594	7,487,643
# 16-55 (40 smallest)	24,569,243	18,727,420	5,841,823	5,823,377
Total	446,856,022	331,365,291	115,490,731	114,675,074

Distribution of Supply to Processors, Grouped by Plant Size, January 2013²⁴

Plant Size (rank in NE by total milk processed)	Share of Total Supply to NE Plants	Share of Plant Supply from Farms Out-of-NE	Share of Plant Supply from NY Farms
# 1-5 (5 largest)	69.23%	30.77%	30.47%
# 6-10	79.21%	20.79%	20.78%
# 11-15	84.78%	15.22%	15.12%
# 16-55 (40 smallest)	76.22%	23.78%	23.70%

²² Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013. Totals include milk "Dumped" and "Lost in Transit."

²³ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013. Totals exclude milk "Dumped" and "Lost in Transit."

²⁴ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013. Totals exclude milk "Dumped" and "Lost in Transit."

Distribution of Supply to New England, Grouped by Plant Size, January 2013²⁵

Plant Size (rank in NE by total milk processed)	Share of All Processing in NE	Share of Milk from NE Farms	Share of Milk from Farms Outside NE	Share of Milk from NY Farms
# 1-5 (5 largest)	55.20%	51.54%	65.72%	65.54%
# 6-10	28.22%	30.14%	22.70%	22.85%
# 11-15	11.08%	12.67%	6.52%	6.53%
# 16-55 (40 smallest)	5.50%	5.65%	5.06%	5.08%

Concentration of Market Share among Dairy Farms in New England, 2007²⁶

	Fewest number of farms accounting for . . .				
	Total	10 percent of sales	25 percent of sales	50 percent of sales	75 percent of sales
Number of farms	2,518	0	16	170	750
Share of farms	100%	0	0.64%	6.75%	29.79%
Value (\$1,000)	806,872	0	93,979	368,603	653,469
Share of sales	100%	0	11.65%	45.68%	80.99%

²⁵ Data Source: USDA-AMS, Northeast Marketing Area, Federal Order 1, September 2013. Totals exclude milk "Dumped" and "Lost in Transit."

²⁶ U.S. Department of Agriculture, National Agricultural Statistics Service (USDA/NASS), [2007 Census of Agriculture, Volume 1, Chapter 1: State Level Data](#), "Table 40. Farms by Concentration of Market Value of Agricultural Products Sold" (2007) and Robert Hood of Data Lab Section of USDA/NASS, special tabulation of "Farms by Concentration of Market Value" in "Table 40. Farms by Concentration of Market Value of Agricultural Products Sold: 2007" combined for the six New England States (March 17, 2011). Farms are sorted by their market value of agricultural products sold, from largest to smallest. Break points are then established where the smallest number accounts for 10%, 25%, 50% and 75% of the total value of agricultural products sold. "(D)" indicates a count "withheld to avoid disclosing data for individual farms."