



Egg Grading for the Community: A Feasibility Study

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Farms at Work is committed to keeping farmland healthy and active in east central Ontario. As a not-for-profit charitable project, FAW supports the existing farming community and works to attract new farmers to the region by creating economic opportunities for farmers and developing infrastructure for food and farming enterprises. Farms at Work is a project of Tides Canada Initiatives.



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Executive Summary

Consumer demand for eggs and for local food in Ontario currently outstrips supply. The “demand for table eggs has been growing over the last number of years and egg sales are at an all-time high. Even with additional allocation, increased demand for table eggs outpaced the industry’s ability to meet demand with current levels of production, creating a supply crisis.” (Egg Farmers of Ontario, 2015).

According to the 2015 Foodland Ontario survey, eight out of ten Ontario shoppers are likely to purchase fresh, local food (OMAFRA, 2016). While Ontario eggs are readily available in grocery stores due to supply management in Ontario, some consumers are looking for a range of characteristics that go beyond the eggs they can purchase at large retail chains. For example, consumers may want to:

- buy eggs directly from farmers at a local farmers’ market
- buy eggs from hens on pastured systems or
- buy eggs from different breeds of chickens including heritage breeds

However, there are barriers to local niche markets and the innovation they represent in marketing and production. A series of regulatory roadblocks has led to lack of access to affordable custom egg grading services that make it possible to sell eggs at farmers markets, stores and restaurants. Having access to egg grading is one essential building block in the value chain that leads from the farm gate to the consumer in the niche market.

Given the current system that limits small-scale production of eggs in Ontario to flocks of only 100 hens, geographical clusters of demand by farmers would need to be identified that provide the critical mass of eggs for a custom egg grading facility to succeed. Sufficient farmers producing at the 100-layer level (or the 500-layer level, if grandfathered) would need to make a concrete commitment to the concept of a community egg grading station, in order to manage risk. They would need to build the real cost of grading into their financial models, which are highly individual, but usually do not leave much room for additional costs.

This report will be circulated widely, in order to inform the local food community generally, and to see if farmers step forward with an interest in pursuing local egg grading, given the economic challenges of raising small flocks.

Overall, the report identifies a series of opportunities to rebuild the local value chain, providing new economic opportunities:

1. Egg grading facilities could be made available on a custom basis.
2. Producers could be allowed to produce more eggs without quota, allowing small scale, specialty operations to build economically viable business models that would make a significant contribution to net farm income. The Chicken Farmers of Ontario’s Artisanal Chicken Program provides a model for this.
3. The grading levy could be waived or reduced for local grading of non-quota eggs, as it has been for grandfathered grading operations.
4. Egg grading for local direct sale could be altered to exclude size grading, given that direct sales are made to end users who can see what they are buying and are less concerned with exact weights of eggs. The food safety aspects of the grading process would be maintained, but the costs of capital and labour would be reduced, making grading more cost-effective for smaller operations.

It is our hope that these possibilities will foster discussion across Ontario, leading to positive change that will benefit both consumers and producers of eggs. Meeting growing consumer demand for locally-produced, niche market eggs will provide new entrants and existing small to medium farms with additional opportunities for economic growth and stability.

For existing or prospective small flock egg producers interested in understanding business viability, an interactive spreadsheet can be found on our website at <http://www.farmsatwork.ca/library>. Using this tool, farmers can manipulate costs to align with their own production, marketing and human resources plans, and view the impact on the bottom line.

1.0 The Market Opportunity

The purpose of this report is to explore and analyze the feasibility of creating one or more community egg grading stations. The rationale for this investigation is that there is an unmet demand for eggs produced locally and sold directly by farmers to consumers, local retail outlets or restaurants. The demand for local eggs is not being met because there are two major market barriers faced by small-scale farmers: 1) the limitation of being allowed only 100 laying hens (without buying quota), and 2) the requirement for grading eggs before they can be sold at any location other than at the farm gate. These two issues, and possible solutions, will be explored throughout this report.

1.1 Regional Market Demand for Eggs

Statistics provided by the Egg Farmers of Canada confirms that demand for eggs is on the rise:

*“Demand for table eggs has been growing over the last number of years and egg sales are at an all-time high. In fact, 2015 marks the Canadian egg industry’s ninth consecutive year of growth. Even with additional allocation, **increased demand for table eggs outpaced the industry’s ability to meet demand** with current levels of production, creating a supply crisis. Imports of table eggs from the U.S. reached record levels and the situation was further exacerbated when the spring 2015 avian influenza crisis hit.”* (Egg Farmers of Canada, 2015)

While demand for eggs increases with a growing population, the number of eggs consumed per person is also on the rise. In 2015, annual per capita consumption reached 19.4 dozen per person, a 3.7% increase over 2014. This is the equivalent of 233 eggs per person each year. Table 1 projects the total demand for eggs throughout east central Ontario based on the 2015 rate of consumption, and using 2011 Census population data.

Table 1: Overall Market Demand for Eggs in East Central Ontario

	Population in 2011 Census	Eggs Consumed (At average 233 per person)	Number of Dozen Consumed
County and City of Peterborough	134,938	31,440,554	2,620,046
City of Kawartha Lakes	73,214	17,058,862	1,421,572
Durham Region	608,128	141,693,824	11,807,819
Northumberland County	81,657	19,026,081	1,585,507
Hastings County	39,888	9,293,904	774,492
Haliburton County	17,026	3,967,058	330,588
East Central Ontario Total	954,851	222,480,283	18,540,024

Table 2 calculates the total demand for eggs in nearby Toronto and York Region. Based on the average annual consumption of 233 per person there is a demand for approximately 850 million eggs annually.

Table 2: Overall Market Demand for Eggs in City of Toronto and York Region

	Population in 2011 Census	Eggs Consumed (At average 233 per person)	Number of Dozen Consumed
Toronto	2,615,060	609,308,980	50,775,748
York Region	1,024,225	238,644,425	19,887,035
Total	3,639,285	847,953,405	70,662,784

Farmers in east central Ontario have geographical access to both the local market as well as the larger markets in the City of Toronto and York Region.

1.2 Demand for Local “Niche Market” Eggs

Overall, demand for “local” food is increasing. The Ontario Ministry of Agriculture, Food, and Rural Affairs has successfully promoted Ontario-grown food for decades. Ninety-four percent of Ontario shoppers now recognize the Foodland Ontario symbol (OMAFRA 2015). Sixty-five percent of shoppers recognize Ontario eggs thanks to these efforts, as well as those of the Egg Farmers of Ontario and the supply management system.

However, some consumers are looking for a range of characteristics that go beyond the Ontario-produced eggs they can purchase at large retail chains. For example, consumers may want to:

- Buy eggs directly from farmers at a local farmers’ market
- Buy eggs from hens on pastured systems or
- Buy eggs from different breeds of chickens including heritage breeds

In order to meet consumer demand for local food, some farmers sell directly to consumers in a variety of scenarios: at the farm gate, at farmers' markets, or through local stores or restaurants. Some farmers are producing eggs on a smaller scale, requiring higher per unit costs. Others are using specialized production methods, like pasturing laying hens or using breeds that produce fewer eggs per year than standard laying hens.

In 2013, a survey of Peterborough consumers found that 75% of respondents make it a priority to buy local food, while 80% are willing to pay more for local food. The survey confirmed that consumers are motivated to buy local food because they believe buying local maintains the vibrancy of rural communities, supports the local economy, and is a positive choice for the environment (Peterborough Social Planning Council, 2013).

The survey indicated that Peterborough residents prefer to define "local" at a regional, rather than provincial, level. They ranked their preferred definitions as follows, in descending order of preference: grown in my region, grown within 100 km, grown in Ontario, grown in my county, and grown on a family farm. One respondent said: "I try to buy within 100 km, then my region, then in Ontario etc. and make my circle bigger to get what I need as close as possible."

Peterborough residents are most likely to buy local food at the Peterborough farmers' market and at local grocery stores. Their likelihood and frequency of buying local food would increase if there was greater availability in local stores (Peterborough Social Planning Council, 2013).

Farmers' markets have been a preferred method for consumers to access local food for more than two hundred years in Ontario. Ontario's first farmers' market started in Kingston in 1780. The number of farmers' markets has increased continuously until the 1970s when the development of large malls and box stores began to attract market share. In the past three decades, the number of farmers' markets has increased from approximately 60 in the 1980s to three times that number today, with aggregated sales of \$600 million (Farmers' Markets Ontario, 2017). There are also an estimated 1,200 on-farm markets, roadside stalls, pick-your-own programs, and community supported agriculture (CSA) initiatives across the province that are bringing local food to Ontarians.

In support of regional and local food economies, the Ontario government consulted with consumers, farmers, processors, retailers, food service providers and not-for-profit organizations to create a Local Food Strategy in 2014. The strategy outlines three main objectives:

1. **Consumer awareness and education:** Ontario consumers are aware of, value and choose more local foods.
2. **Access to local food:** Local food is identifiable and widely available through a range of distribution channels.
3. **Sufficient supply:** Ontario's agri-food sector is competitive, productive and responsive to consumer demand.

Businesses such as Yorkshire Valley Farms are recognizing the demand for unique egg products. In the summer of 2016, they introduced a “special seasonal offering: pasture-raised organic eggs.” Their website describes the production practices they are using to respond to consumer demand (Yorkshire Valley Farms, 2017):

“In addition to following organic practices, our pasture egg growers are able to offer the hens an enhanced pasture environment, with more space for the hens to roam outdoors to forage and enhance their diet with grasses, insects, and other natural matter.”

Demand for pastured eggs is growing locally in other regions and farmers are responding. In Vermont, pastured eggs have more market demand than supply and there are currently ten local farmers with 1,000 birds each in the Burlington area (Sam Smith, Personal Communication, 2016). In order to keep up with consumer demand for new products and experiences, new approaches to marketing eggs in Ontario may be possible that will create economic opportunities for more farmers.

1.3 Retail Value of the Regional Niche Market for Eggs

Table 3 below provides an analysis of the range of retail prices for eggs in Peterborough grocery stores in the summer of 2016. The percent premium that some eggs receive over basic conventional eggs is calculated.

Table 3: Retail Egg Prices in Peterborough Stores, 2016

Type / Brand of Eggs	2016	% Premium
Conventional (battery caged) - Large	\$3.69	-
Burnbrae Organic	\$5.49	48.8%
Gray Ridge Free Run	\$5.89	59.6%
Small Flock (Pasture)	\$6.99	89.4%
Organic Meadow	\$7.99	116.5%

Table 4 below estimates the value of a small “niche market” for eggs, assuming sales are made directly from farmers to consumers, at an average price of \$5.49 per dozen in east central Ontario and \$5.99 per dozen in Toronto and York Region. Three very conservative scenarios are presented, growing from 1% to 1.5% and 2% market share in east central Ontario and 0.2%, 0.4%, and 0.6% in Toronto and York Region.

Table 4: Estimated Value of the Niche Market for Direct Sales of Eggs

	Annual # dozen eggs	Av direct-sale price	Value of 1% of market	Value 1.5% of market	Value 2% of market
County and City of Peterborough	2,620,046	\$5.49	\$143,841	\$215,761	\$287,681
City of Kawartha Lakes	1,421,572	\$5.49	\$78,044	\$117,066	\$156,089
Durham Region	11,807,819	\$5.49	\$648,249	\$972,374	\$1,296,498
Northumberland County	1,585,507	\$5.49	\$87,044	\$130,566	\$174,089
Hasting County	774,492	\$5.49	\$42,520	\$63,779	\$85,039
Haliburton County	330,588	\$5.49	\$18,149	\$27,224	\$36,299
East Central Ontario sub-total	18,540,024		\$1,017,847	\$1,526,771	\$2,035,695
			Value of 0.2% of Market	Value of 0.4% of Market	Value of 0.6% of Market
City of Toronto	50,775,748	\$5.99	\$608,293	\$1,216,587	\$1,824,880
York Region	19,887,035	\$5.99	\$238,247	\$476,493	\$714,740
Toronto + York Region sub-total	70,662,784		\$846,540	\$1,693,080	\$2,539,620
Grand Total	89,202,807		\$1,864,387	\$3,219,851	\$4,575,315

Niche market sales may also include sales from farmers made directly to stores and restaurants at lower wholesale prices. If these types of purchasers can “tell the story” behind the eggs to the consumer, then they may be able to pass on higher costs of small scale production where necessary.

Farms at Work surveyed twenty-five Peterborough restaurants regarding demand for local food in the fall of 2014, and this was followed-up in early 2015 with a survey of twenty restaurants to specifically determine their demand for locally produced eggs. (Farms at Work, 2015)

The first survey found that more than half (56%) of the local restaurants surveyed purchased local food frequently and a quarter (24%) purchase local food occasionally. Of these, 85% are motivated by a combination of supporting local farmers, keeping money in the community, taste, variety, and freshness of food. Among the establishments that never purchased local food, 50% cited price and convenience as limiting factors, 25% cited price alone, and 25% cited issues with quantity and quality of the food.

The follow-up survey, focused on local eggs, found that more than 25% of those surveyed said they already buy eggs from a local farmer, and another 55% said they were interested in doing so. Importantly, 85% said that if they bought local eggs, they would advertise them on their menu as local, and 70% said they would be willing to pay more for local eggs.

The value of sales of eggs through restaurants and local stores is difficult to estimate, because the sales can be made at a range of wholesale prices. The price at which each farmer can afford to sell eggs is dependent on the costs of production in the business. In the niche market, these can vary significantly.

Some quota farms, with high volumes and lower costs of production, do grade their own eggs and sell locally. To do so they have to incur additional marketing costs, but they also receive a significantly higher price (even at wholesale to small restaurants and stores) than they receive if they ship their eggs to a grader. In order to compete, smaller producers must differentiate their product in some way.

2.0 Egg Grading for the Niche Market

2.1 The Impact of Egg Grading Requirements on the Direct Sale of Eggs

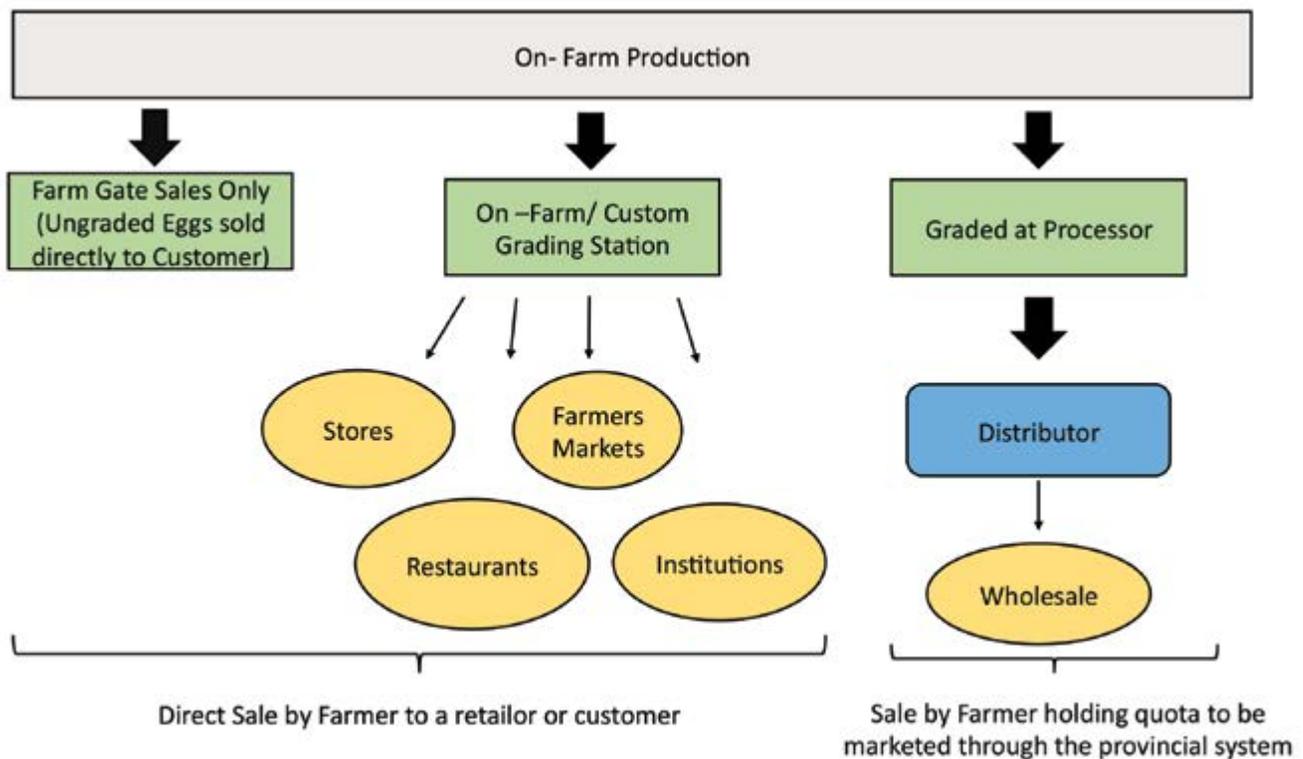
Ontario farmers who do not have access to an egg- grading station are prevented by law from selling their eggs from anywhere other than their own farm gate. This means that farmers are unable to sell their eggs at a farmers’ market, to a restaurant or store.

The egg grading system is standardized across Canada and regulated by Agriculture and Agri-Food Canada to meet food safety requirements. Egg Regulations under the Canada Agricultural Products Act dictate the laws regarding egg grading, packing, marking, and inspection. Under the regulations, any egg that is sold from a location other than the farm gate must be graded at a federally registered egg grading station that is inspected by the Canadian Food Inspection Agency (CFIA). In 2015, there were 201 federally registered egg-grading stations in Canada (Agriculture and Agri-Food Canada, 2016).

Generally, egg producers in Ontario are part of the supply-managed system. They generate very large numbers of eggs and sell them at a set, regulated price to a grading station. In 2015, the price was \$1.90 per dozen for large eggs (Egg Farmers of Ontario, 2015). Three large companies in Ontario buy eggs from the majority of quota-holding farms in the province: Burnbrae, Grey Ridge, and Ontario Pride. Burnbrae operates three facilities (in Mississauga, Lyn and Strathroy), Grey Ridge has two (Strathroy and Listowel), and Ontario Pride is located in Monkland. None of these facilities are in east central Ontario.

After being graded, table eggs are generally re-sold to a retailer or distributor at a price negotiated between the grader and retailer. It is not practical in very large facilities for eggs from individual farms to be traced and returned to the original farmers for direct sale. If a farmer wants to sell eggs other than through this system, then the eggs must be sold directly to the purchaser on the farm at the “farm-gate” or graded, either on the farm or using a custom egg-grading service. Selling eggs directly eliminates the middle man, and allows farmers to sell eggs at a much higher price per dozen than would be obtained by selling at the regulated price to a grading station.

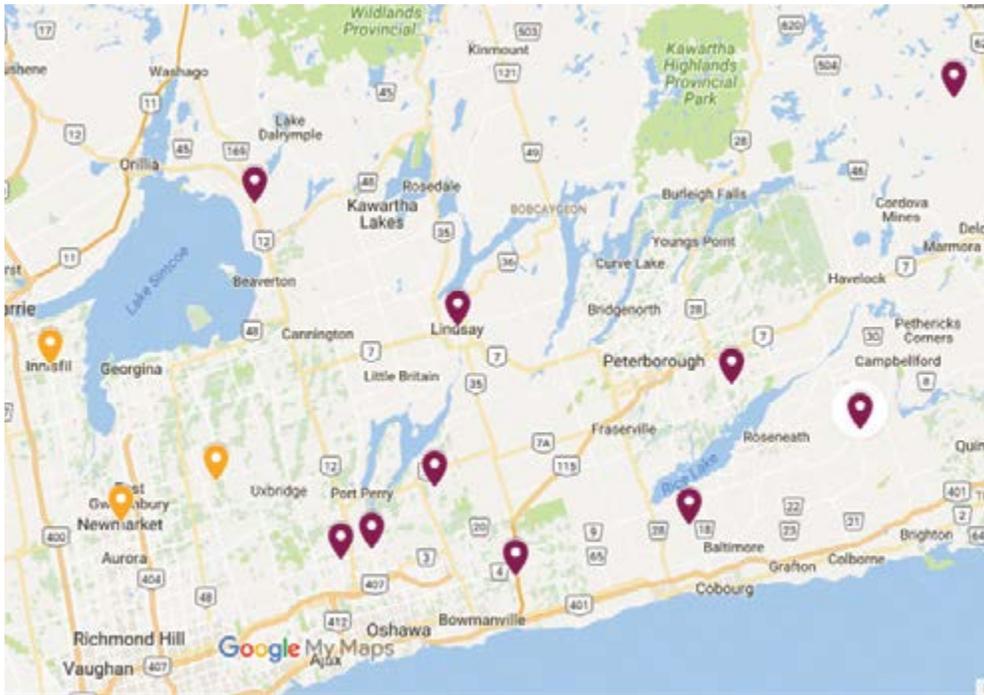
Figure 1: Representation of the Methods in Which Eggs Can Be Sold



2.2 Custom Egg Grading

There are very few options for east central Ontario farmers who would like to custom grade and market their own eggs. The map below illustrates the location of egg grading stations in east central Ontario, based on a current list posted on the CFIA website (CFIA, 2016).

Figure 2: Representation of the of egg grading operations in East Central Ontario. Orange markers represent custom egg grading operations.



For every egg that is graded and sold in Ontario, a levy fee is paid to the Egg Farmers of Ontario. In the last 5 years, the levy has ranged between 25.5 and 39.25 cents per dozen, and is currently (2016) at 32.25 cents (Egg Farmers of Ontario, 2016). The levy fees collected are used to subsidize a surplus removal program, whereby eggs produced in excess of table needs are sold into the processing market stream at fluctuating world prices.

There is an exception to the requirement to pay the grading levy. Small farmers who were grandfathered into the system in the 1980's and grade only their own eggs are exempt from paying levy fees and following current egg grading regulations. However, if a farm decides to custom grade eggs from other farmers, they lose the exemption and must pay levy fees on all of the eggs that are graded at their station, including their own eggs. This would reduce the profit margin for the farmer on all of their own eggs, creating a significant disincentive for custom grading other farmers' eggs.

Over the course of this research, several regional on-farm egg grading stations were interviewed about their willingness to provide custom egg grading services. Several stations were grandfathered into the grading system. These grading stations would not consider offering custom grading because they are currently exempt from paying levy fees. When speaking with these farmers they were hesitant to stop grading or change their operation at all. This was because if a grandfathered grading station were to be inactive for twelve consecutive months, they would lose their license and would then have to meet all of the newest grading regulations when they resumed grading.

When speaking to farmers operating on-farm grading stations in the Peterborough area, the majority believed that there is no money to be made in custom egg grading. Some of the feedback that was provided included the opinion that custom grading is "too much of a hassle", and that there is "enough paperwork to keep track of as it is".

The scale of feasible custom grading was another theme commonly addressed by grading stations in the region. More than one grader suggested that to make custom grading feasible, the grader must process thousands of eggs at a time. It would not be economically viable to start up the grading station for fifty dozen eggs a week from a farmer who has approximately one hundred hens. However, this is not to say that there is no demand for custom grading in the area; one quota-holding farmer with a grading station receives regular inquiries about custom grading from producers as far away as Milton.

2.3 Regional Custom Grading Options

Of the grading stations that were contacted, there were three that offered custom grading. As seen on Figure 2, the orange markers represent the custom grading stations. All three are located in south western Ontario, close to the larger population of the greater Toronto area. Location is an issue for farmers in other parts of the region that would like to have their eggs custom graded. Table 5 below shows the current prices charged by each grading station.

Table 5: Custom grading operations close to east central Ontario and their prices

	Location	Price
Homestead Specialty Foods	Newmarket, Ontario	\$0.32 per dozen plus packaging
Ontario Egg Master Ltd	Mount Albert, Ontario	Organic - \$5.67 per dozen Non-Organic - \$3.00 per dozen
Bee's Universe	Innisfill, Ontario	\$1.90 per dozen

Clearly, the options for farmers who do not own an on-farm grading station are extremely limited. As a result, eggs are only legally sold from the farm gate in the vast majority of cases. Consumers visiting farmers' markets, local grocery stores, and restaurants, who are looking for eggs produced "locally" within the region, are faced with very limited choices.

3.0 Meeting Demand in the Niche Market

Given the market demand, there is an opportunity for increased direct marketing of eggs in local markets beyond the farm gate, if barriers in relation to egg grading can be overcome. The following sections will explore the business side of operating an egg grading facility, and also whether there are additional constraints that affect the business viability.

In section 1.2 above, the niche market sector was essentially defined as the market for eggs that are sold directly from farms to consumers, restaurants or storefronts, rather than through the mainstream distribution system, in which eggs are first sold to a grading station and then re-sold to other intermediaries before reaching the final customer.

The niche market can be satisfied in theory through several channels:

- By any producer selling from the farm gate, where grading is not required.
- By producers selling eggs directly to the consumer, after grading them on farm in volumes that justify operating a private egg grading facility. As Figure 2 illustrates, there is one farm in close proximity to Peterborough that has egg grading capability and sells eggs locally.

- By producers who raise large or small flocks, using conventional or alternative (e.g. organic, pasture-raised) production methods, if they can access an affordable custom egg grading station.

The niche market can be attractive for a wide range of farms in size, production practices, and underlying cost structures. However, not all farmers are interested in participating in the direct to consumer market, as it entails additional labour and direct costs. In order to understand the underlying structure of Ontario's egg production system, and why there are different types of producers in the province, the following section provides an overview of supply management of eggs in Ontario.

3.1 Supply Management of Eggs

Dairy, eggs, chicken, and turkeys are the agricultural commodities that currently operate under a supply management system. The system functions by matching the total supply, both domestic and imported product in Canada, with total demand, and dividing up the rights of production which is referred to as quota between producers (Agriculture and Agri- Food Canada, 1999). The Egg Farmers of Canada administers the national system for eggs by determining the annual domestic egg supply and dividing it among the provinces. It uses disincentives to prevent producers from producing in excess of their quotas, and high tariff rates to control imports (OMAFRA, 2014).

Supply management of eggs was introduced in 1972 in order to provide a more orderly market, give producers a fair return and stabilize prices to consumers. Egg Farmers of Ontario allocates Ontario's share of domestic egg production to farmers based on the quota they own, and sets the prices paid by graders to producers for their eggs. Retailers and distributors then buy the graded eggs from graders at prices they negotiate with the graders.

Egg production levels vary across the country, with the majority of eggs being produced in Ontario (37%) and Quebec. In 2014, the cost of quota, which represents the right to produce eggs from a single laying hen, was \$295 (Better Farming, 2014). The economics of the system encourages large-scale laying operations and requires significant capital investment to generate a profit. Ontario has 333 egg farmers that hold quota, each has an average of 25,400 hens (Egg Farmers of Ontario, 2015).

One central Ontario farmer who was interviewed for this project holds quota for 30,000 hens. This farmer pointed out that they have to operate at this scale because it is impossible to make money at a smaller scale within the supply-management system. The supply management system has ensured that Ontarians eat eggs produced in the province, in accordance with Ontario's high standards for food safety.

Grandfathered Flocks and the Small Flock Exemption

As an egg producer in Canada, the only alternative to buying quota is to raise a small flock that is exempt from the supply management system. In Ontario, non-quota egg producers fall into one of two categories.

Anyone may keep up to 100 laying hens without quota. "Grandfathered" flocks, of up to 500 hens, are legal but only under specific circumstances. To qualify for a grandfathered flock exemption, a farmer must meet the following criteria (Egg Farmers of Ontario, 2014):

“A producer who can establish to the satisfaction of the local Board that the producer was in possession of 500 fowl or less on or before the 5th day of July, 1983 and who has since then been in continuous possession of fowl for bona fide commercial purposes as determined by the local Board on said premises, the beneficial ownership of which has not changed, and on which premises no other fowl are possessed, may apply to the local Board for an exemption from the quota requirements.”

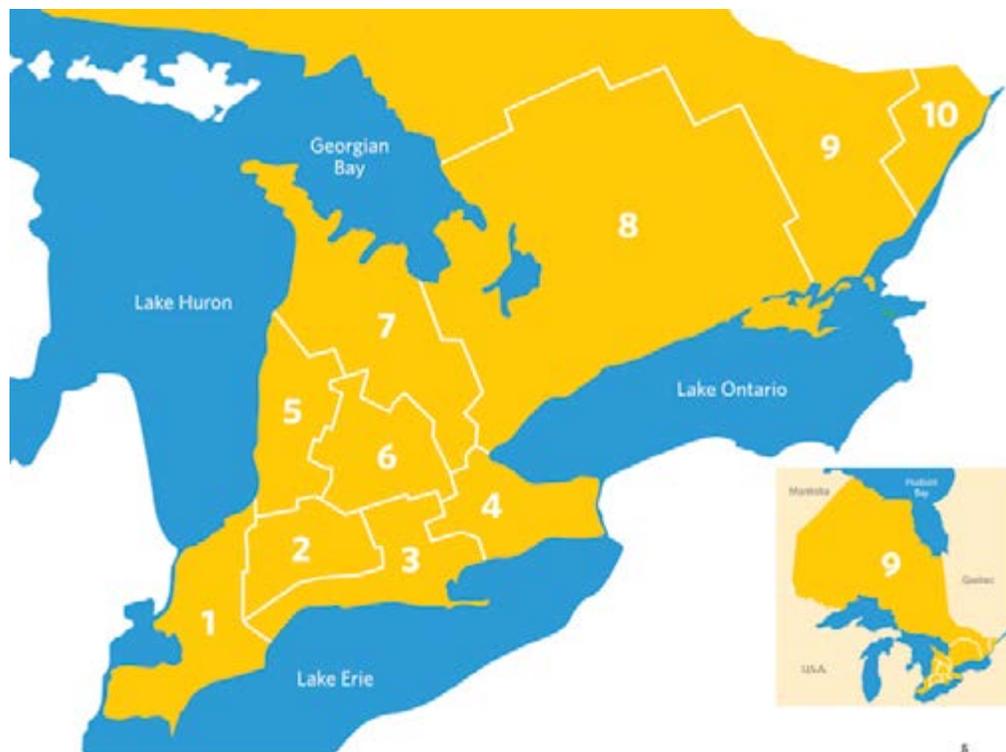
The right to a grandfathered flock cannot be sold and is only transferable through intergenerational succession within the same family, on the same property (Egg Farmers of Ontario, 2014).

At the end of 2016 there were 320 grandfathered flocks in Ontario and 11 in east and central Ontario. (Mitchell, EFO, Personal Communication, 2017)

3.2 East Central Ontario Egg Production

The Egg Farmers of Ontario organizes egg production into ten zones as shown in Figure 3 below. East central Ontario’s production is included within Zone 8 (Egg Farmers of Ontario, 2015). The six counties that are part of east central Ontario for the purposes of this report are Peterborough County, Hastings County, Haliburton County, Northumberland County, Durham Region and the City of Kawartha Lakes. Zone 8 also includes Peel, Halton, York Region, Muskoka, Prince Edward County, and Simcoe County.

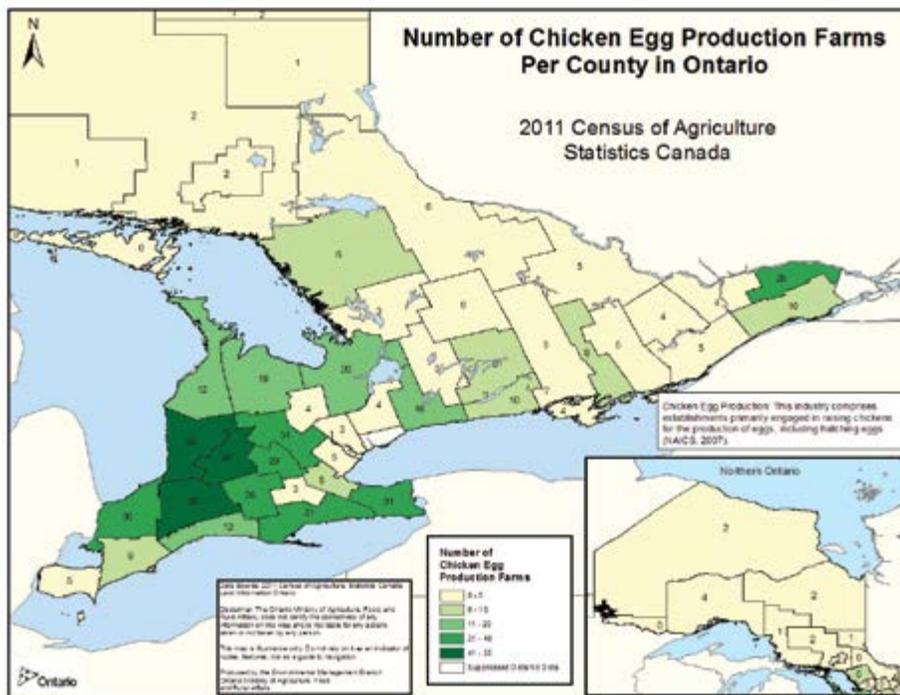
Figure 3: Egg Farmers of Ontario Production Zones



As of 2015, Zone 8 had 21 quota-holding egg farmers with approximately 445,000 hens (Egg Farmers of Ontario, 2015). This represents less than 5% of the total egg farms and eggs produced in the province (Egg Farmers of Ontario, 2015). With the exception of Zone 9 – Northern Ontario, all other EFO zones comprise smaller geographical areas with greater numbers of egg farmers.

Figure 4 shows the numbers of egg producers using data from the 2011 Census of Agriculture, and shows a concentration of egg farmers in southwestern Ontario. Only eight farms in Peterborough County self-described as producing primarily eggs in the last Census. Due to the restrictions placed on the number of hens that may be kept by non-quota holding farms, many other farmers with small or grandfathered flocks are not making their primary income from eggs. They are diversified farms with more than one enterprise, and would not likely be represented in Figure 4.

Figure 4: The Number of Chicken Egg Production Farms per County in Ontario (Statistics Canada, 2011)



3.3 Survey of Regional Egg Producers 2015

In February 2015, Farms at Work performed an online survey of local farmers with the objective of understanding the marketing channels they currently use and their interest in custom egg grading. A total of 68 east central Ontario farmers took part in the survey. (Farms at Work, 2015) Participation was distributed as follows: Peterborough (28), Kawartha Lakes (15), Hastings (6), Durham (7), Northumberland (8), and Haliburton (4).

Twenty-one respondents produced eggs, of whom twenty used the small flock exemption of 100 or fewer layers. One was a quota-holding farm that graded its own eggs. None of the small flock farmers graded their eggs. However, seventeen said they would consider having some or all of their eggs graded at a community egg grading station if an affordable option existed though they had less than a 100 hens. Twelve said having access to a grading station would encourage them to scale up their production. The majority of these farmers would like a grading station in a rural area, ideally less than ten kilometers from their farm however nine farmers said they would travel up to fifty kilometers. Thirteen said they would pay up to \$1.00 per dozen for a grading service. Of the remaining farmers who did not produce eggs, the reasons they gave were regulations, the quota system and the economics.

This survey, completed over a short period of time and promoted through limited channels, illustrates that there is interest in small-scale egg production in the farming community, and that many egg producers are not currently being captured in statistics.

3.4 Volume of Demand for Eggs in the Niche Market

In Section 1.3 above, we analyzed the potential dollar value of various regional markets accessible to farmers in east central Ontario. Table 6 uses the same assumptions about potential market share to calculate the number of dozen eggs that could potentially be sold by farmers into those markets.

Table 6: Forecasted Market Share Volume for Niche Market Eggs

	Annual # dozen eggs consumed	Size of 1% of market (dozens)	Size of 1.5% of market (dozens)	Size of 2% of market (dozens)
Peterborough County	2,620,046	26,200	39,301	52,401
City of Kawartha Lakes	1,421,572	14,216	21,324	28,431
Durham Region	11,807,819	118,078	177,117	236,156
Northumberland County	1,585,507	15,855	23,783	31,710
Hasting County	774,492	7,745	11,617	15,490
Haliburton County	330,588	3,306	4,959	6,612
East Central Ontario Total	18,540,024	185,400	278,100	370,800
		Size of .2% of market (dozens)	Size of .4% of market (dozens)	Size of .6% of market (dozens)
City of Toronto	50,775,748	101,551	203,103	304,654
York Region	19,887,035	39,774	79,548	119,322
Toronto + York Region Total	70,662,784	141,326	282,651	423,977
Grand Total	89,202,807	326,726	560,751	794,777

Some of this demand will be met at the farm gate and through pre-existing on-farm egg grading stations. The remaining unmet demand could be addressed if one or more community grading stations were feasible.

4.0 Egg Grading Station Financial Forecasts

The following is a summary of some of the CFIA requirements for a registered grading station (Government of Canada, 2015):

- Be separate from living quarters and retail outlets
- Have no room that opens to a room with anything that emits an odor
- Have sloped floors for drainage
- Have dressing rooms, lunch rooms and lavatories (separate from and not leading into any room used for grading)
- Have rooms with specific temperature and humidity for the storage of eggs
- Have separate storage spaces for ungraded and graded eggs
- Have separate storage rooms for eggs of different grades
- Have access to potable water and provide a certificate of microbiological analysis

There is a wide variety of grading station operations, from the very labour intensive (including small-scale do-it-yourself on-farm or community grading) to highly automated, digital systems. When we interviewed a number of farmers who set up their own on-farm grading stations in 2010 to 2011 (with the help of a grant from Farmers' Markets Ontario), they all said they found the grading too labour intensive and they would add more automated systems to their operations.

Table 7 shows a comparison between a number of types of grading equipment and an overall rating (on a scale from 1 to 10) based on the functionality, efficiency and cost of the equipment.

Table 7: Egg Grading Equipment Evaluation

	Candling	Washing	Drying	Grading	# Workers	Egg/hour capacity	Dozens per Hour	Equip. Cost (new w/o HST)	Rating (1 to 10)	Why?
Private shared system	x	x	x	x	3 to 7	180	15	\$3,000 to \$10,000	3	Labour intensive, quality issues, inefficient
National Poultry Co.										
5S		x	x		1	2,520	210	\$9,000 to \$15,000	3	Very reliable and proven equipment
5CSG	x	x	x	x	2	2,520	210	\$47,056	7	Modular, including automated 'dry' washing
10CSG	x	x	x	x	3	5,400	450	\$76,277	6	Higher capacity, more automated
20CSG	x	x	x	x	4	8,640	720	\$81,884	6	Low incremental cost for increased capacity
Kuhl - Egomatic 160	x			x	2	2,160	180	\$9,000 to \$10,500	5	Most commonly used small grader in Ontario
Moba										
Mobanette	x			x	1	1,600	134	\$7,200	5	Very small table top, affordable, no washing
Moba 68	x			x	2	3,000	250	\$20,890	4	Similar capacity to 5CSG, no washing/drying
Riva Selegg S21	x			x	2	2,220	185	\$7,115	5	UK equipment, parts and service?

The National Poultry Company equipment is from a small company in the United States with decades of experience with small scale egg farmers. It is the company that was recommended by the Intervale Centre in Vermont. The Intervale Centre is a non-profit organization in Vermont which works towards improving farm viability, promoting sustainable land use and engaging the surrounding community in regards to food systems (Intervale Centre, 2017). Its 5CSG system provides all of the important grading functions with a relatively high capacity and appropriate level of automation, at a reasonable cost. While other grading equipment (Kuhl, Moba, and Riva) provides a similar capacity at a lower cost, none of this equipment offers automated egg washing and drying.

4.1 Grading Station Start-up Capital Estimates

Table 8 shows the start-up capital requirements for the four egg grading station scenarios. The shared system is based on the experience of the FMO farmers who set up their grading operations up in 2010-11. An evaluation was completed on various manufacturers and models of grading equipment, and for this feasibility study, National Poultry Company’s equipment was chosen. It may be possible to source used equipment, which would bring the capital cost down. The Mobile, Medium and High scenarios in this study use new equipment from the National Poultry Company (5CSG, 10CSG, and 20CSG grading equipment respectively).

Table 8: Start-up Capital Requirements

Scenario:	Shared	Mobile –Low 5CSG	Medium 10CSG	High 20CSG
Grading Equipment – US\$	1,333	33,955	55,512	59,557
Freight – US\$		1,500	1,960	2,140
Total Equipment Cost - US \$		35,455	57,472	61,697
Total Equipment Cost - CAN \$	1,333	47,056	76,277	81,884
Installation		5,000	5,000	5,000
Building/Container	7,460	12,000	15,000	15,000
Truck		25,000		
Water/septic	5,483		5,483	5,483
Fixtures	1,000		2,000	3,000
Refrigeration	1,400	5,000	8,000	10,000
Total Capital Costs	\$16,677	\$94,056	\$111,760	\$120,368

The shared scenario would have the shared grading station on a farm property, with an existing building that could be upgraded, in a location that would be easily accessible by the participating farmers. Due to the lower volumes of eggs, the shared scenario would likely use a less automated system and may purchase used grading equipment. It is not really a custom egg grading facility model, because it would be owned by a small group of farmers and they would be the only users.

The mobile unit would use the National Poultry Equipment Model 5CSG with a maximum capacity of 2,520 (210 dozen) eggs per hour. The medium and high scenarios would have the community grading stations on a separate property or at a shared space with, for example, a farm supply store, with an existing building that could be upgraded, in a location that would be easily accessible by the participating farmers. The medium scenario would use a Model 10CSG with a maximum capacity of 5,400 (450 dozen) eggs per hour, and the high scenario would use a Model 20CSG with a maximum capacity of 8,640 (720 dozen) eggs per hour.

4.2 Grading Station Revenue and Expense Forecasts

Table 9 shows the financial forecasts for four grading station scenarios in Peterborough County. The financial forecasts for grading stations created for this feasibility study are based on:

- Using demand in the Peterborough County market as the geographic example driving the volume of eggs to be graded.
- \$15 per hour wage for grading labour.
- All grading operation scenarios are based on a break-even model. Higher volumes of eggs would result in more efficient use of the equipment capacity and a lower per unit cost.
- Ongoing management costs are not explicitly built in to the forecasts, but would likely be required.

Note that the columns containing percentages illustrate the percentage each expense item represents of the total costs (and therefore also the total revenues in a break-even scenario).

Table 9: Financial Forecasts (Peterborough County)

	Shared	Mobile	Medium	High
Number of eggs graded & sold/year	157,203	314,406	471,608	628,811
Dozens of eggs graded & sold/year	13,100	26,200	39,301	52,401
% of Market Share (Peterborough County)	0.5%	1.0%	1.5%	2.0%
Grading cost/dozen eggs	\$1.01	\$1.32	\$0.85	\$0.66
Grading cost/dozen eggs with EFO levy	\$1.33	\$1.64	\$1.17	\$0.98
Number of farmers needed for break-even (100 layers)	5	10	15	20

Forecasted Break-even Income Statement - Egg Grading Station (Peterborough Area)

	Shared \$	Mobile \$	Medium \$	High \$	Shared%	Mobile%	Medium%	High%
Revenue								
Egg Grading	\$13,250	\$34,600	\$33,500	\$34,400				
Operating Costs								
Labour	\$6,750	\$6,750	\$7,125	\$6,000	50.9%	19.5%	21.3%	17.4%
Bookkeeping	\$500	\$1,000	\$1,000	\$1,000	3.8%	2.9%	3.0%	2.9%
Rent & Utilities	\$1,200	0	\$3,600	\$3,600	9.1%	0.0%	10.7%	10.5%
Materials & supplies	\$830	\$1,659	\$2,489	\$3,319	6.3%	4.8%	7.4%	9.6%
Fuel and repairs	\$600	\$8,000	\$1,200	\$1,200	4.5%	23.1%	3.6%	3.5%
Insurance	\$500	\$4,000	\$2,500	\$2,500	3.8%	11.6%	7.5%	7.3%
Office	\$100	\$0	\$500	\$500	0.8%	0.0%	1.5%	1.5%
Telephone & Internet	\$600	\$1,200	\$1,200	\$1,200	4.5%	3.5%	3.6%	3.5%
Depreciation	\$1,668	\$9,406	\$11,176	\$12,037	12.6%	27.2%	33.4%	35.0%
Contingency	\$500	\$2,500	\$2,700	\$3,000	3.8%	7.2%	8.1%	8.7%
Total Expenses	\$13,247	\$34,515	\$33,490	\$34,355	100.0%	99.8%	100.0%	99.9%
Net Income	\$3	\$85	\$10	\$45	0.0%	0.2%	0.0%	0.1%

Scenario 1: Private Shared Grading Stations

The Shared grading station is an on-farm, small-scale station based on the actual six operations set up in 2010/11 as part of the Farmers' Markets Ontario (FMO) grant program. Here is a summary of the responses to the questions for these interviews for the farmer interviews):

1. When did you set-up your on-farm egg grading operation? *2010-11, one in 2014*
2. Did you build new or retrofit an existing structure? *Retrofit, new septic bed (2)*
3. How much did it cost to set it up? *\$10,000 to \$32,000*
4. How long did it take, from start to finish, including CFIA approval? *6 to 14 months*
5. What kind/brand of egg grading equipment do you use? *No answer*
What did it cost? *Used: \$100 to \$500; New: \$8,000 (Dutch)*
6. How many laying hens do you have? *100; 500 (one farm, grandfathered)*
7. What is the volume (lay rate) of eggs in your grading operation per year? *80-90%*
8. Do you grade other farmers' eggs? *No.*
If so, what do you do for them and what do you charge? *\$0.75/dozen (one farm)*
9. Where do you market your eggs? *Farmers' markets, farm gate, retailers*
10. What is your production method? *Free Range, organic (one)*
11. What is your retail selling price per dozen? *XL - \$4.60 to \$6.50; L - \$3.60 to \$5.50; M - \$3.00 to \$4.50*
12. What is your total cost per dozen? *\$2 before labour and overhead*
13. Do you pay the EFO levy (\$0.3225/dozen)? *No (3), Yes (2)*
14. Do you make money doing this? *No (3), Yes (2), Not sure (1)*
15. Knowing what you know now, would you do it again? *Yes (4), No (2)*
16. What would you do differently? *Mechanize, more efficient*

For our Shared forecasts, we are assuming five farms with 100 layers each who share one small-scale grading station in geographic proximity to their farms. For this more labour intensive grading operation there is one paid person working nine hours per week; labour costs represent 51% of grading station revenue. For this scenario, we are using an estimated grading cost of \$1.01 per dozen, or \$1.33 with the EFO levy included. If each of the five farmers agreed, the investment per farmer would be \$3,330, for a total of \$16,700 (the average capital cost for the six FMO farmers interviewed who set up grading stations on their own farms).

Scenario 2: Mobile Community Grading Station

The mobile grading station has the highest estimated grading cost per dozen eggs at \$1.32 (before the \$0.3225 EFO levy) or 25% of the retail price. This higher cost is due to the estimated cost of operating a mobile grading station, a retrofitted used motorhome or cube van, including \$8,000 per year in fuel and repairs, and \$4,000 per year in insurance. The useful life of the mobile grading station will likely be shorter than a more standard grading station in a building; however, for the purposes of these forecasts, we are using the same ten year straight line depreciation period. Depreciation is a non-cash expense on the income statement and is a significant expense which is 27% of sales revenue. It may be possible to decrease the start-up capital and depreciation expense by finding good used grading equipment, volunteer retrofitting labour, or finding a great deal on a used vehicle.

The estimated labour expense for the mobile station includes one paid driver/grader working nine hours per week, supplemented by volunteer grading labour from the participating farmers. The driving labour may be underestimated if the mobile station needs to be moved to a new location three or four times a week. This scenario includes more automation than the Shared scenario; however, the co-ordination of the labour may be a challenge.

The potential advantage of the mobile grading station is the ability to park at various locations including farms, farmers' markets, farm supply stores that are close to the participating farms. Ten producers with 100 layer flocks, within reasonable driving distance of the egg grading station, would be needed to break even using this model. The advantage of the mobile station would be that it would be much easier to attract those ten farmers because the station would move from place to place.

However, the added expense of retrofitting and maintaining the vehicle combined with the shorter useful life makes this scenario riskier than a more conventional grading station located in a fixed location in a building.

Scenario 3: Community Grading Station (Medium Sales)

As the volume of eggs graded increases, the economy of scale improves and the grading cost per dozen decreases. In Scenario 3, the estimated grading cost per dozen is \$0.85 or 16% of the retail price. The community grading stations require a similar level of revenue to break even as the mobile station, but require a higher volume of eggs to reach this revenue level. The lower grading cost per egg could potentially attract more farmers.

Due to the speed of the grading equipment, the estimated labour required includes three part-time people - one loader, one candler, and one packer – working a two to three hour shift per week. The estimated labour expense is 21% of revenue or \$0.18/dozen, compared to \$0.52/dozen in the shared station and \$0.26 per dozen for labour in the mobile station.

Fifteen farmers with 100 layer flocks, within reasonable driving distance of the egg grading station would be needed to break even using this model.

Scenario 4: Community Grading Station (High Sales)

In Scenario 4, the estimated grading cost per dozen is \$0.66, because of increasing economies of scale from the automated equipment. This community grading station uses the highest speed of grading equipment (20CSG). While four part-time workers are required (1 loader, 1 candler, and 1 or 2 packers) to keep up with the equipment speed, the volume could be handled in a single two or three hour shift per week. The process could also be done in stages with fewer people working a higher number of hours. The estimated labour expense is 17% of revenue or \$0.11/dozen.

Twenty farmers with 100 layer flocks, within reasonable driving distance of the egg grading station, would be needed to break even using this model.

4.3 Focus Group Feedback

In December 2016, a focus group was conducted with small local egg producers and the research and financial scenarios were presented.

Participants in previous surveys had indicated that they would pay up to \$1 per dozen for grading, and all the financial scenarios involve costs that exceed \$1 if the grading levy is included. Given the costs of production for a small flock, focus group participants were concerned that the extra cost of grading would be burdensome. However, if the levy was waived, as it is for grandfathered grading stations, the numbers for grading become much more manageable.

Nevertheless, there was concern about the lack of egg grading facilities and a desire to grade eggs and sell them legally away from the farm.

Participants also felt a more automated system made the most sense, as compared to a small shared facility. They thought that a local feed mill or farm store would be the best location because it would act as a “one stop shop” for farmers.

The focus group participants believed that there is potential in the idea of a custom egg grading stations, and were interested in continuing the conversation.

At the same time, participants expressed their concerns regarding the 100 layer limitation. They stated that even though they were not advertising their eggs, during certain times of the year they have had to turn customers away because they cannot meet demand. At other times of the year, they have trouble reaching consumers because of being restricted to farm-gate sales.

They realized that the economics of 100 layer flocks were not very good, and some were selling eggs as a complement to other activities. Location of the farm gate was identified as a key concern because customers needed to see signage and get to the farm.

In discussing solutions, there was dialogue regarding the Artisanal Chicken Program implemented by the Chicken Farmers of Ontario. The program helps to leverage a farm’s economic capabilities and, while still in its early stages, it has attracted a lot of interest and many successful applicants across the province. Participants believed if a similar program could be implemented for egg producers, it would make a significant difference in meeting consumer demand for local fresh eggs.

They felt a key step would be raising the quota exemption beyond 100 laying hens. This would allow producers to meet local demand, learn about the business, produce more local economic opportunities and make eggs a reasonable contributor to the net income of a diversified farm.

Appendix A contains financial forecasts for small-scale egg production at a variety of scales in Ontario, for discussion purposes.

5.0 Key Elements for Success and Next Steps

Five key elements for success were identified during the course of this feasibility study for the community egg grading station:

1. **Location:** A fixed location grading station would have to be within reasonable (30 to 40 km.) proximity of enough local farmers to support it. If space were shared, a suitable arrangement with the owner would need to be negotiated and infrastructure would be required to meet CFIA requirements
2. **Capitalization:** The necessary capital will need to be raised at the outset and the initial setup phase would require considerable management to ensure a successful launch.
3. **Quality and Service:** Consistently top quality egg production by local farmers and excellent service at the grading station will be required to meet the demands of discriminating consumers who will pay a premium price for niche market eggs.
4. **Pricing:** The organization will have to be vigilant in its pricing strategy. The cost of grading must be reasonable and allow local farmers to make a profit on their eggs within the constraints of costs of production that will usually exceed those of large quota-holding farms. Quota holders would also be welcome customers.
5. **Management:** The business will need to be professionally managed to ensure its financial viability. Management costs would need to be built into final forecasts at some level.

Given the current system that limits small-scale production of eggs in Ontario to flocks of only 100 hens, geographical clusters of demand by farmers would need to be identified that provide the critical mass of eggs for the egg grading facility to succeed. Sufficient farmers producing at the 100-layer level (or the 500-layer level, if grandfathered) would need to make a concrete commitment to the concept of a community egg grading station, in order to manage risk. They would need to build the real cost of grading into their financial models, which are highly individual, but usually do not leave much room for additional costs.

This report will be circulated widely, in order to inform the local food community generally, and to see if farmers step forward with an interest in pursuing local egg grading, given the economic challenges of raising small flocks.

Overall, the report identifies a series of opportunities to rebuild the local value chain, providing new economic opportunities:

1. Egg grading facilities could be made available on a custom basis.
2. Producers could be allowed to produce more eggs without quota, allowing small scale, specialty operations to build economically viable business models that would make a significant contribution to net farm income. The Chicken Farmers of Ontario's Artisanal Chicken Program provides a model for this.
3. The grading levy could be waived or reduced for local grading of non-quota eggs, as it has been for grandfathered grading operations.
4. Egg grading for local direct sale could be altered to exclude size grading, given that direct sales are made to end users who can see what they are buying and are less concerned with exact weights of eggs. The food safety aspects of the grading process would be maintained, but the costs of capital and labour would be reduced, making grading more cost-effective for smaller operations.

For existing or prospective small flock egg producers interested in understanding business viability, an interactive spreadsheet can be found on our website at <http://www.farmsatwork.ca/library>. Using this tool, farmers can manipulate costs to align with their own production, marketing and human resources plans, and view the impact on the bottom line.

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Appendix A: Laying Operation Financial Forecasts

The supply management context for egg production in Ontario is described in Section 3 of the Report. The following financial scenarios forecast the viability of producing eggs at various scales. Every operation is different, and these forecasts should only be used to provide a framework for discussion. They are, however, based on consultation with the Intervale Center in Vermont, which has extensive experience with small scale egg production. Detailed forecast numbers have been prepared as background to these summaries.

Table 1A explores the financial viability of 100 layer operations in four possible scenarios.

Assumptions are:

1. 83% laying rate
2. 5% hen mortality
3. \$5.50 per dozen direct sale price direct to consumers and non-GMO feed
4. Sales of eggs throughout the year (not just the six month farmers' market season)
5. Grading cost of \$1.00 per dozen
6. EFO levy \$0.3225 per dozen

Table 1A: Four financial scenarios for 100 layer operations

Summary Financial Forecasts for 100 Layer Operations	Forecasted revenue and costs per annum			
	Full Cost	No Wage	Low Wage	No Grading Cost
Sales of eggs	\$13,191	\$13,191	\$13,191	\$13,191
Less: Grading Cost	(\$2,398)	(\$2,426)	(\$2,426)	
Less: EFO levy	(\$773)	(\$773)	(\$773)	
Total Revenue	\$10,019	\$9,992	\$9,992	\$13,191
Hourly wage rate	\$15.00	\$0	\$10.00	\$15.00
Hours of work/annum	313	313	313	313
Wages	\$4,688		\$3,125	\$4,688
Total Variable Expenses	\$11,060	\$6,357	\$9,482	\$11,044
Total Fixed Expenses	\$679	\$679	\$679	\$679
Total Expenses	\$11,739	\$7,036	\$10,161	\$11,723
Net Income	(\$1,719)	\$2,956	(\$169)	\$1,468
Break-even sales point (\$ per dozen)	\$6.22	\$4.27	\$5.57	\$4.89

The “Full Cost” scenario shows the results if a wage of \$15 per hour is paid to the farmer, for annual wages of \$4,688. The variable expenses include the cost of pullets, feed, electricity, labour, labels, cartons, and distribution costs. The fixed costs include a share of the farm’s insurance, taxes and mortgage. In this scenario, with sales of \$13,191 less the EFO levy and grading cost, total revenue is \$10,019, resulting in a loss of \$1,719 per annum. To break even, the sales price per dozen would have to be \$6.22. If the operation was only run six months of the year (to coincide with seasonal farmers’ markets), and the layers were sold live at the six month point for \$7.00 each, the operation would still lose money (\$533 for the six month period).

In the next scenario, no wages are paid, while every other expense is the same. The result is a net income of \$2,956, which would equate to an hourly wage of \$9.46 for the farmer. To break even, with no wages being charged, the price of a dozen eggs could be dropped to \$4.27. In other words, any price per dozen below that, given the consistent assumptions across the forecasts, would result in a negative cash flow and return nothing to the farmer.

The “Low Wage” scenario (\$10 per hour) results in a break even operation, with a small loss of \$169.

In the fourth scenario, “No Grading Cost”, if all of the eggs could be sold at the farm gate, the grading cost and EFO levy could be avoided and the operation would make a \$1,468 profit, while also paying a \$15 per hour wage. The break-even point would require a price per dozen of only \$4.89.

The marketing challenge for most small laying operations is their inability to sell all of their eggs at the farm gate and over the course of the winter months. To open up their marketing opportunities, they would have to pay for the extra transportation, grading cost and EFO levy that allows more market access, but also makes the operation less financially viable.

For existing or prospective small flock egg producers interested in understanding business viability, an interactive spreadsheet can be found on our website at <http://www.farmsatwork.ca/local-food-resources>. Using this tool, farmers can manipulate costs to align with their own production, marketing and human resources plans, and view the impact on the bottom line.

Currently, 100 layers is the non-quota limit for farms in Ontario, unless they are grandfathered at up to 500 layers. Table 1B looks at the possible economies of scale and impact of producing beyond the 100 layer limit, but at a scale intended to feed the niche market.

In Table 1B, the assumptions are as follows:

1. 83% layer rate
2. 5% hen mortality
3. \$5.50 per dozen direct sale price direct to consumers and non-GMO feed
4. Sales of eggs throughout the year (not just the six month farmers’ market season)
5. Grading cost of \$1.00 per dozen
6. EFO levy \$0.3225 per dozen
7. \$1 income per spent hen for 500, 1000 and 3000 hen scenarios

Table 1B: Summary Forecasts for 100, 500, 1000 and 3000 layer operations

	100	500	1,000	3,000
Lay rate	83%	83%	83%	83%
Eggs sold per annum (dozens)	2,398	11,992	23,984	71,951
Sales revenue (eggs, spent hens)	\$13,191	\$66,430	\$132,859	\$398,578
Less: Grading cost	(\$2,426)	(\$10,222)	(\$20,444)	(\$47,234)
Less: EFO levy	(\$773)	(\$3,867)	(\$7,735)	(\$23,204)
Net sales revenue	\$9,992	\$52,341	\$104,681	\$328,140
Total expenses	\$11,700	\$43,785	\$76,672	\$209,643
Net Income	(\$1,708)	\$8,555	\$28,009	\$118,497
Estimated capital Investment	\$4,621	\$29,193	\$62,056	\$155,730
Break-even sales point (\$ per dozen)	\$6.22	\$4.90	\$4.70	\$4.52

The 500 layer operation provides a wage and a small profit for the farmer, assuming no investment in quota which could cost an additional \$175,000 if it was available.

As the farms scale up, the economies of scale begin to pay off and the break-even point per dozen eggs declines (from \$4.90 for 500 layer operation to \$4.70 for the 1,000 layer operation, and \$4.52 for a 3,000 layer operation).

However, if some portion of the eggs must be sold at a wholesale price to retailers or restaurants, a 20% retail margin (\$1.10 per dozen) would likely need to be deducted from the \$5.50 retail selling price, resulting in a wholesale price of \$4.40. In other words, if the farmers sold all of their eggs at a wholesale price of \$4.40, they would lose money except at the 3,000 layer size.