REVIEW DRAFT

Capturing a Value-Added Niche Market:

Articulation of Local Organic Grain

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Consumers are showing a greater awareness about where, how and why their food is grown, as well as showing more active participation in making informed decisions about food purchases. These changes are manifested in the increase in the demand and sales volume of organic food, the strength of other labels such as Fair Trade, Non-GMO, and environmentally friendly. The market for organic food has experienced continuous double digit growth over the past 25 years, both domestically in the US as well as globally (Greene 2013; Willer and Lernoud 2014). The growing local food movement is supported by greater participation in farmers markets, identification of the origin of the food, support for family farms, and a growing interest in traditional artisan foods (Martinez et al. 2010; Feldmann and Hamm 2015). There is evidence of a strong overlap among consumers who prefer both organic and local food (Meas et al. 2014).

Despite the growing demand for organic and local food, there are bottlenecks that indicate that the demand is not being met. Farmers' markets tend to be dominated by fresh produce and other perishable foods, such as eggs. Other local marketing options, such as community supported agriculture (CSA), road-side stands and U-pick operations also tend to sell mostly fresh fruits and vegetables, cut flowers. Grains, dried beans, and value-added products, such as bread and other baked goods, tend to be the exception, with very little interest on the part of producers and few choices available to consumers (Martinez et al. 2010).

Concentration

Locally produced food does not always provide desirable outcomes for consumers or various other urban policy objectives, particularly where economies of scale are involved (Born and Purcell 2006). For these reasons, locally grown will have a more difficult time competing with

nationally and internationally traded products under these conditions. Wheat is a commodity crop that is traded internationally and in the US is mostly handled by large-scale enterprises. In 2013, the number one flour miller, ConAgra and number three flour miller, Cargill, entered into a joint agreement with each other and a third partner, CHS to form Ardent Mills. According to one industry source, the concentration ratio of the four largest flour milling operations (CR-4)—Ardent, ADM, Grain Craft and Miller Milling—was 77% market share in 2014 (B. Allen 2015). That is up from a CR-4 in 1988 of 64%. Grain Craft itself was a relatively recent merger of three milling operations, and ADM and Miller Milling have also been purchasing capacity.

The 2014 CR-4 for bakers of bread and rolls was 57% (Marketline 2015). The Mexican conglomerate, Grupo Bimbo accounted for 28%, owning the Arnold, Orowheat, Entenmann's, Thomas', Canada, and Sara Lee brands, among others. Bimbo also does a significant amount of baking for private labels. This was followed by Flowers Foods, who now owns the Wonder Bread brand. Campbell's Soup, owner of the Pepperidge Farm brand and Gruma, another Mexican-based multinational fill out the top four. In 2001, the statistics did not disaggregate private label sales by various contract bakeries. Excluding private label, which accounted for 27% market share that year, the CR-4 in 2001 for bread and rolls was 31.2% (Marketline 2003). The leading baker at that time was Interstate Bakery, which then owned Wonder Bread and filed for bankruptcy in 2012. The US was seen in the mid-2000s as distinctive from all other countries by the dominance of industrial baking and having no real artisanal baking sector (Marketline 2004). As industrial baking has grown more concentrated and scale has increased, so has demand for artisan baked bread (Fromartz 2014; Halloran 2015).

Economies of Scale

Increased concentration gives the companies greater market power over both farmers and consumers, and also permits economies of scale for the parts of the operation where average and marginal costs decline. Consolidation of the food processing sector has led to numerous structural changes with the farm value chain (Ollinger et al. 2005). With commodity crops, such as wheat and other grains, costs for storage, handling and processing decline significantly with scale. In the case of spelt and other hulled grains, larger capacity dehullers have an economic advantage over smaller, more labor intensive equipment the infrastructure needed to remove the hulls (Baker 2015).

The definition of local can be arbitrary at times and can result in different outcomes. In open economies where local and non-local foods compete, consumer loyalty to local brands and markets depends on a variety of factors (Seyfang et al. 2007; Thilmany, Bond, and Bond 2008; Farmer 2014; Hemmerling, Hamm, and Spiller 2015; Feldmann and Hamm 2015). Some see interest in local agriculture as a response to increased corporate power and concentration related to economies of scale , with a strong social justice component (P. Allen 2010). However, the vagueness of the term 'local', lack of consistent rules, and limited enforcement make local agriculture's claims of sustainability and social justice questionable (Bradshaw 2012). Even the largest agribusinesses are local to somewhere.

The Northeastern US—including New England and the Mid-Atlantic states—and Eastern Canada—including Ontario, Quebec and the Maritime Provinces—are at a disadvantage for the production of wheat compared with the Plains states in the US, the Prairie provinces in Canada

and the Pacific Northwest of both counties. Contributing factors include high humidity, relatively high land costs, smaller field sizes in general, and the loss of grain handling infrastructure in the Northeast. Buffalo and Rochester NY were once major grain processing hubs, but have since been displaced by Kansas City, Minneapolis and Winnipeg. New York and other Northeast farmers do have a transportation advantage over the Midwest and Canada (Berry 2011).

The high humidity makes wheat more susceptible to various mycotoxin producing fungi, such as *Fusarium* spp. The number of rainy days during the summer harvest window often makes it difficult to combine wheat. Yields in the Northeast are generally lower than what is found in the Plains and Prairies. Average cropland prices in 2015 in the Northeast region were $5,330 per acre. The Northern Plains had an average price per acre of $3,300 (USDA NASS 2015b). While land prices in Western New York are comparable to the Midwest, much of that part of the state is not considered 'local' to the New York City market. Areas in close proximity to New York City, such as the Hudson Valley, New Jersey and Eastern Pennsylvania have high purchase prices for land due to development pressure. Rental prices reflect the returns to high-value perishable crops sold to urban markets. According to the 2012 Agricultural Census, average farm size in New York was approximately 106 acres; in North Dakota, for example, average farm size was 1,268 (USDA NASS 2015a). More relevant to extensive crops, such as grains, is the median farm size, where half the farms are larger and half are smaller. Median farm sizes in the wheat belt has been increasing more rapidly than in the Northeastern US (MacDonald, Korb, and Hoppe 2013).

With the decline in wheat production in the region and the subsequent dismantling of of handling and processing capacity, crop rotations have gotten shorter. The growth in demand for locally

grown products has extended to small grains, including commodity wheat for bread, barley for beer and rye for whiskey. These new markets have created demand at the farm level for locally grown commodity grains. Organic farmers see value of introducing small grains in rotation, such as improving weed management, breaking certain pest and disease cycles, and in the case of winter grains, allowing crops to be planted in a way that is seasonally complimentary to their other crops.

However, organic grains pose additional challenges for the region's farmers compared with conventional grains. The supply chain for inputs is minimal. Public and private research, education, services and product development are limited. Price premiums can't be counted on to continue, and tools to mitigate price risks, such as futures markets, are not established (Berry 2011). Product storage and transportation requires additional attention to product segregation of what is ordinarily treated as a fungible commodity.

However, even with the growth in demand at the consumer end and the recognized benefits at the farm end, the value chain still needs to be rebuilt. Value added enterprises are needed for farmers and consumers to take advantage of this economic development opportunity. To overcome competitive disadvantages and meet these market needs, producers, handlers and processors are experimenting with innovative business models in the form of partnerships and working with consumers. We look at a case study of one such innovative value chain. Three different enterprises have interconnected to meet the demand of consumers for bread made from locally grown grains, as well as for whole grains and flour. These enterprises are Oeschner Farm, Farmer Ground Flour and Wide Awake Bakery.

Enterprises in the Case Study

Oechsner Farm

Value chain originates with Oechsner Farms, which is a 1,200-acre owner-operated farm in the Finger Lakes region of New York, near Ithaca. The farming enterprise began operation on 15 acres about 10 miles south of Ithaca in 1993. Through the 1990s, the farm mainly produced organic vegetables for local markets. As of December 2014, Oechsner owned 40 acres, with the balance of land rented by various agreements. He was in the process of purchasing additional acreage at the time of the interview, so historical data reflects a farm size of closer to 900 acres.

As the demand for organic feed grade grains increased with the growth of the organic dairy sector in the late 1990s and early 2000s, Oechsner expanded acreage and began producing corn, oats and soybeans. Over time, he began to specialize in field crops and dropped vegetables from his rotation. Annual capital investment ranges between $250,000 and 300,000. Oechsner has older equipment and tractors imported from Europe. These are more appropriately scaled for the size of fields that he works, compared with newer US and Canadian equipment, which is designed for larger scale operations. Most of his field operations are carried out by two Deutz tractors, one 130 Hp and the other 150 Hp. Much of the equipment for small grain production was purchased used.

By the mid-2000s, the demand for food grade grains led him to begin growing food grade spelt, wheat, emmer, buckwheat and rye. These crops fit in well with his rotation. The transition to grain production involved a reduction in labor intensive crops and increased mechanization.

Spelt and emmer were dropped from the rotation in 2009, and Red Fife, a heritage spring wheat, was dropped from the rotation after the 2010 crop was harvested. These crops were difficult to manage, and the price premium diminished. Table 1 shows the harvested acres, yields and seeding rates for various field crops grown in 2011 and 2012.

Table 1

Acreage, Seeding Rates and Yields

Crop	Average Acres 2012-14	Seeding rate (lb/A)	2012-14 Average Yield (bu/A)	2013 Price ¢/lb
Barley (Malting)	24	120	48.4	25
Buckwheat	165	35	25.0	23
Corn	129	20*	92	29
Oats	98	90	45.7	20
Rye	40	90	26.0	30
Hard Red Winter	68	180	39.5	30
Soft white winter wheat	47	180	37.8	30

*Corn is planted at a rate of 32,000 seeds per acre, conversion is based on a 50 pound bag.

The major field equipment used for small grain production is included in Table 2. Soil preparation involves primary tillage, secondary tillage and spreading manure. Two Deutz tractors rated at 130 hp and 150 hp account for 95% of the tillage operations. Most primary tillage is performed by moldboard plows. Chisel plows are also used sometimes if the condition of the

fields require or permit it. Secondary tillage is mainly done with disking. Fuel use and time spent plowing varies widely by field, season-by-season, and by what tractor and tillage tool is used. Fields can be plowed at about 4 acres per hour, give or take an hour. Other planting preparation involves the use of a rock picker attached to a skid steer.

Poultry litter from laying hens is purchased at $44/ton delivered and is the only purchased fertilizer. It is applied by a manure spreader. Rates applied before planting small grains range from 0 to 2 tons per acre, depending on the previous crop and the results of the soil tests. An average of one ton a year is used for cost estimation. Soil tests are done by Dairy One and are performed once every three years. Limestone is not applied or needed because of the high levels of calcium in the poultry manure. Seeds are then planted using a drill followed by a cultipacker. The planting process uses about ½ gal / A of diesel fuel. At the time of the interview, Oeschner had purchased a drill that was three times wider, which is expected to reduce time and fuel expenses.

Table 2
Field Equipment Used for Small Grain Production
2014 Season

Tool	Description
Tractors / Skid Steers	
Deutz DX 160	150 hp
Deutz DX 130	130 hp
Deutz 6275	75 hp
Deutz DAE-8006	80 hp
New Holland NH8785	Stone fork and basket
Tillage	
Keverneland moldboard plow	Four bottom
Keverneland moldboard plow	Six bottom
White / Case 588 moldboard plow	Four bottom
Glenco Soil Saver chisel plow	Seven shank
Sunflower Field Disk	18 foot
Manure Spreader	
BBI Litter Spreader	16 foot
Seeders and Drills	
Case IH 5300 Drill	10 foot
John Deere Folding Drill	30 foot
Vicon 403 Broadcast Seeder	Clover seeding
Cultivators	
Wil-Rich Field Cultivator	18 foot
Wil-Rich Field Cultivator	20 foot
Brillion Cultipacker	19 foot
Kovar Tine Weeder	Custom
Harvest	
Hesstine 6450 Swather	15 foot draper
John Deere 9500 Combine	212 Belt Pickup Head, 915 Grain Head
Allis Chalmers Gleaner F3	Factory heads
Unverferth Gravity Boxes (4)	250 bu capacity
Kilbros Gravity Box	350(?) bu capacity
John Deere 346 Baler	40 lb square bales

Cultivation and Post-emergence Operations

Field cultivation is done with pull-behind cultivators. A cultipacker is pulled behind the disk under cloudy conditions. Time and fuel costs vary by field conditions and weed density. Usually two passes are made with a tine weeder that has a customized tool bar. Food grade grains are hand weeded for vetch, corn cockle, and wild radish. The amount of time spent on hand weeding will vary depending on the weather and the extent of the infestation. Sometimes with heavy weed pressure or when there are time constraints he will hire additional labor to hand weed problem weeds.

Clover is broadcast before the second tine weeding at a rate of 18 lb / A. The clover helps with reducing weed pressure and also fixes nitrogen for subsequent crops. Clover seed produced after combining the wheat may also be harvested and sold as a cash crop, as well as planted back for subsequent crops. The cost of the seed planted is the opportunity cost of seed not sold.

Harvest

When weather permits, the crop is swathed prior to combining. Unlike conventional farmers, who can apply herbicides and desiccants such as glyphosate prior to harvest, organic farmers will have to deal with weeds and green growth on the wheat in many years. Swathing has several advantages over straight combining a standing crop. The weeds are less of a problem to deal with after the swathed wheat dries down. As long as it doesn't rain, swathed wheat will ripen and dry faster. However, if it does rain on swathed wheat, it will take longer to dry and may have

additional sprouting damage and risk of mycotoxin producing fungi. It is an extra pass, so the time, machinery wear and fuel are thought by Oeschner to be worth it.

The swathed grain is picked up with a combine and put in gravity boxes. The grain is cleaned, dried, and stored in bins on the Oeschner farm or transported by truck to FGF. The straw is then baled, which at present is mostly sold to the horse market. After harvest, Oeschner will usually mow to prevent weeds from going to seed.

Grain Cleaning

Grain is cleaned with a two-screen barrel cleaner that has a bin fan before being moved by auger and stored in a bin. Cleaning is performed every time the grain is moved. When the grain is taken out of the bin, it goes into the seed cleaning room. The cleaner includes a gravity box and is fanned and screened, up auger. Oeschner just purchased a larger cleaner and gravity table, along with a new hopper bin that will probably be installed and used at FGF.

Storage

Bins are used for Oeschner's own harvest and for grain that is temporarily stored for transfer to FGF. FGF is a completely separate operation, but Oechsner stores grain for FGF. Storage capacity is sufficient for Oechsner Farms. At peak harvest, all storage will be used, but not everything to capacity for every year.

Operating Expenses

Oechsner has one full-time worker who is paid $18/hr. His hired worker performs a broad range of farming activities, including tillage, planting, cultivation and harvesting. The hired worker is employed during the off season to work on post-harvest handling that supplies the mill. Before the partnership with FGF, Oechsner did not have full-time hired labor. He has recently hired a second worker for the coming season at a lower wage that has not yet been set. Custom work is sometimes hired to perform needed operations. This seldom happens, but should be included as a contingency item.

During the off-season, a lot of time will be spent on tractor maintenance and repair, such as greasing. For example, greasing a disk will take about 45 minutes. Most repairs and maintenance are done in-house. Tillage, fertilization, and planting were estimated to take slightly over an hour per acre on average of tractor operation time. However, actual tractor time is misleading. A lot of time will be spent with setup. Cornell estimates of tractor time spent on various operations were found to underestimate his time by about 10%. In addition, Oechsner estimated about 10% of tractor time is spent on transportation of equipment between fields and major maintenance, and an additional 5% of time in the field is spent on minor repairs and equipment adjustment. Large fields with larger scale equipment will go a lot faster. Odd shaped fields and smaller fields slow down the operations. Tractor speeds will average about 4 mph, and may vary between 3 and 5 mph.

Time is spent cultivating and hand-weeding represent expenses that conventional small grain growers who use herbicides don’t often incur. On the other hand, no insect or disease control expenses are incurred in the field. Diatomaceous earth (DE) and pheromone traps are used in the

bins for post-harvest handling, but are counted as post-harvest handling and are not factored into per acre production costs. Estimated average costs per acre are included in Table 3.

Table 3

Oeschner Farms Selected Operating Expenses

Per Acre of Wheat

Expense	Amount	Notes
Land Expenses	$120.00	Rent and property taxes
Seed	94.50	30¢/lb for certified seed
Fertilizer	44.00	Chicken manure, delivered to farm
Electricity	9.08	65% of total bill, divided by total acres
Fuel	19.24	Mostly tractor, some farm truck
Certification	.62	Net of cost share. Without cost share it is $1.
Financial Expenses	5.00	Debt Service, Insurance, Accounting
Utilities	2.20	Electricity, Phone
Parts and repairs	20.54	For tractors and machinery, including post-harvest
Baling twine	.36	For straw
Custom Work	1.50	Operations hired as needed
Subtotal not including Labor	*$317.04*	
Hired Labor	23.77	Paid at $18/hr
Operator Labor	63.00	Field operations only, estimated at $18/hr
Subtotal Labor Costs	*86.77*	
Total Including Labor	**$403.81**	

Feed and food grade grains were being sold to different milling operations in the region. The food grade grain operation Oechsner was selling to was not willing to meet the burgeoning demand for locally grown grains in the Northeast. In the late 2000s, markets were opening up for organic and locally grown whole grains, flour and malt for beverages. Feed production and various co-products helped to stabilize fluctuations by providing outlet markets if supply were to outstrip demand.

Most of Oeschner's food-grade grains are marketed through Farmer Ground Flour (FGF), an food-grade mill he partly owns. Some wheat is sold for malting, and rye is sold for distilling into organic whiskey. Grains that do not meet food grade are sold to a feed mill. Organic dairy farms are a ready market for organic straw for bedding.

Farmer Ground Flour

In 2008 Oechsner started a milling enterprise called Farmer Ground Flour, together with Erick Smith of Cayuga Pure Organic, another grain farmer located near Ithaca, and Greg Mol, who had experience working with Community Supported Agriculture and with soybean producers,. The milling operation is structured as a Limited Liability Corporation (LLC) that is now owned by Oeschner, Mol and Neal Johnson. The mill was originally housed in a warehouse that was a former Agway, owned by Regional Access, a distributor that specializes in carrying local farm products from Upstate New York to New York City.

The startup was financed through equity provided by Oechsner, a loan obtained by Mol, and sweat equity from Mol and Johnson. A small enterprise development grant helped with the

startup phase mainly to help with marketing. Some of the funding also helped the operation comply with state food processing standards and to get access to markets.

Table 4
Equipment Used for Small Grain Milling

Equipment	**Description**
Mills	
Meadows Stone Mill	20 inch
Ostiroller Horizontal Mill	7.5 hp
Hammer Mill	10 hp, 400 lb / hr
Conveyance	
Airlock	
Augers	
Cleaner	
Hoppers	
Kongskilde Grain Vacuum	Rotary DPC 40 6”
Preparation	
Sifter	0.75 hp
Mixer	0.75 hp, 400 lb capacity
Bagger	
Stitcher	

Table 4 has a list of the major pieces of equipment used for processing. The first piece of equipment was a 20” Meadows stone mill. FGF quickly outgrew the first facility and began construction of a new mill in 2012. The new structure has a footprint of about 2,500 square feet and began operation in the summer of 2013. FGF obtained both new and used equipment for their operation. A horizontal Austrian-built Ostiroller 7.5 Hp horizontal stonemill was a key investment in new equipment and appropriate scaled technology for the milling of small batches of specialty flours. The horizontal mill is also used to grind corn meal and polenta. Buckwheat is

milled by a hammer mill. A used sifter was purchased at auction, and a pre-1920s vintage ribbon mixer is used for blending flours. Other new investments included electronic control systems that helped to automate various procedures, and a grain vacuum for moving grain from storage into processing. The mill has capacity for processing about 400 to 450 pounds of grain per hour.

FGF began with sales direct to retail and consumers in the local area. However, most growth took place in the metropolitan New York City market. In 2009 Cayuga Pure Organics, Erick Smith's primary farm enterprise started selling at several Greenmarkets and brought FGF products to New York City. Cayuga Pure Organic initially carried FGF products and sold direct to consumers. The exposure at Greenmarket helped to generate wholesale accounts in NYC and CPO managed distribution in years one and two. As the business began to scale, Regional Access provided transportation and distribution services.

Regional retail markets are continuing to grow and FGF maintains a loyal direct-sale customer base through Community Supported Agriculture (CSA) subscriptions. FGF is recognized for making flour with unique qualities. Primarily; fresh, stone ground, local. While it is more variable than flour milled on an industrial scale, artisan bakers have learned to work with the variability and see that as a marketing advantage (Halloran 2015).

Over 80% of sales are business-to-business wholesale to different bakeries and other processors. Marketing has relied on social media, an on-line presence, and exposure to wholesale buyers at the Union Square Greenmarket Farmer Ground Flour has also benefitted from grant funded

marketing and education programing conducted by Greenmarket, NOFA-NY and OGRIN in support of developing a local grains economy.

Staff from the mill have given demonstrations at retailers, such as Whole Foods Market and Wegmans. Another important market is through a partnership with Wide Awake Bakery.

Wide Awake Bakery

Stefan Senders—a neighbor and friend of Thor Oechnsner's—was also an avid home baker. When Stefan started to use Farmer Ground Flour in his home baked breads and noticed a difference in the flavor and quality of the breads. Thor suggested that Stefan start a commercial bakery using FGF and Wide Awake Bakery began operation on April 1, 2011, following about a year of planning and construction. Stefan Senders, the head baker and co-owner, had another job and was working nights and weekends to start the enterprise. Senders approached Thor Oechsner as a partner. Thor is the owner of Oeschner Farm and part-owner of Farmer Ground Flour. While the businesses are interlocking due to Thor's ownership, they are also independently operated. (At the time of the startup, Erick Smith of Cayuga Pure Organic was still involved as a partner with Farmer Ground Flour)

There were a lot of unknowns when the business first began . While there were plenty of community supported agriculture (CSA) farms that served as models, none were specifically structured around baking bread. Senders was convinced that a community supported bakery would succeed. Senders approached Sweetland Farms—a CSA farm located in Trumansburg, NY—to help with the startup and to be an anchor customer of the bread shares. Without the

guaranteed market of the Sweetland Farms CSA, Senders and his wife Liz Brown would not have started planning and construction.

Oechsner provided $20,000 in startup equity. Another $230,000 was raised through crowdsourcing directly from small investors. Loans made on relatively favorable terms given the historic low interest rates and the community interest in seeing the project succeed. No bank loans were involved. Crowdsourcing was done through Facebook and personal contacts.

Senders found that some distance from investors was an advantage. Close friends wanted to be more directly involved in running the business. Distant investors have been less likely to attempt to interfere with management decisions than closer friends. The timing of the startup swas interesting. Due to the subprime crisis, people had lost confidence in the banks and considered regular bank accounts to be unsafe investments, even after the bail out. Interest rates were at historic lows.

Other key individuals involved in the startup besides Oechsner included Erick Smith of Cayuga Pure Organic, who, in 2011 was still a partner with FGF. Gary Redmond of Regional Access provided help with the development of marketing plans and with pricing. Angel bread share members paid $1,000 for 250 loaves of bread in the future.

Senders had events where he was handing out bread samples and doing “stealth” marketing. Senders participated in a Small Business Administration (SBA) mentorship program, which provided some interesting connections but was not helpful for starting his business.

With the help of a local person who builds wood-fired kilns, he was able to design and build a wood-fired European style circular deck oven. Wood-fired has lower fuel costs and fuel is locally sourced. Using wood has higher labor and labor and management costs.

During the startup phase, the risk was not financial so much as it was operational. His family's financial situation was exposed. During that phase he continued to work as a researcher in the University of Rochester Anthropology Department, as well as had a part-time teaching job at Cornell.

At present, Wide Awake has four employees, more or less full time. The first employee, David McGuinness was more like a partner, and was originally paid as an independent contractor. David helped in developing the recipes and establishing production at the bakery. Initially, making payroll was top priority and Senders would go through several pay periods without taking a draw. The first employee hired worked through the initial phase of getting the enterprise stable at a relatively low wage with the understanding it was a new startup based on a business model that had never been tested. Employee compensation has risen over time.

The CSB (Community Supported Bakery) is set up so that people purchase a set number of loaves in advance. The current rate is $100 for 20 loaves of bread with a retail value of $5.50. Their web platform is managed by another e-commerce company called Farmigo. People enjoy the flexibility of the platform and can sign up at any time and can suspend their accounts if they are on vacation.

The business model causes some confusion among the customers. People think they are buying bread, but instead, they are buying the services of an artisan baker. Education is a large part of their program, but not the core of Wide Awake Bakery's business.

Having the money in advance from subscriptions is helpful, but also results in an uneven cash flow and changed expectations on the part of the customer. When they first started up, there were large amplitude swings in the customer base and cash flow. Small wholesale, slightly out of phase in terms of cash flow, evening it out so that it rolls like a wheel. These alternative outlets have reduced the risk and anxiety of running a CSB.

At present they have about 545 shares, with approximately 500 paying members. Some of the members are buying clubs of several families that get bulk orders.

The bakery annually purchases about 30,000 pounds of flour from FGF. With that, they produce about 45,000 loaves a year. Senders sees the market as far from saturated for artisan baked breads from micro-bakeries. There is a lot of demand for top-end high quality bread.

Senders described Wide Awake Bakery as a family-run enterprise that has a farmer as a partner. All partners are committed to the success of each other, and have a sense of responsibility. The partnership has shortened the pipeline from farm to loaf. Members' participation in the CSB provides a steady economic base.

The partnerships have enabled the farm and mill to compete in what is otherwise a commodity market. However, the commodity market, with cheaper bread mass produced from lower cost ingredients puts pressure on them to be efficient and keeps their margins slim.

Stefan drew on his community in a variety of ways in order to fund and establish the bakery. The equipment would have been expensive to cost out at new full market price. The wood-fired oven was custom built with the help of a kiln-maker, so costing that piece of equipment is not truly possible. Similarly, Senders has had to learn how to do much of his own maintenance and repairs, which has saved him money from hiring specialists.

New York City Greenmarket

The New York City Greenmarket is operated by GrowNYC, a non-profit organization with a mission to improve New York City and its environment. Greenmarket promotes regional agriculture by providing small family farms the opportunity to sell their locally grown products directly to consumers by operating farmers' markets at fifty-four locations. New Yorkers are thus given access to fresh, high quality, and nutritious locally grown food. In the case of bread and other baked goods however, the market had to make a compromise out of recognition that wheat is largely produced outside what is considered the local region for New York City.

In 2003 the organization began discussions on how to require bakers who participate in the market to be more mission supportive and implemented changes to the rules. In 2004 a rule was created that required bakers to use local flour. Although well intentioned, the rule was not realistic and was not enforced. There was no readily available supply of locally grown wheat

and flour and the rule was not enforced. In 2007 the organization began a review of the rule, as well as research on the availability of local flour. Over the course of several years, sources were identified and staff partnered with researchers and other farm advocacy organizations on several grant projects that worked to facilitate the production and marketing of local grains. These included grants from the USDA's Agricultural Marketing Service, National Institute for Food and Agriculture, and Risk Management Agency, as well as NY State Department of Agriculture and Markets.

In 2009, when Greenmarket required that baked goods sold at the market have a minimum of 15% grains grown within the region, it established that consumers had a demand for flour from locally grown wheat. The new demand created a marketing opportunity that enabled local farmers to diversify into small grains. However, the farmers in the region were not prepared to meet this consumer demand because of the lack of experience with the crop; scarcity of varieties suited for the region's growing conditions, insufficient infrastructure for storage, processing and transportation; and reluctance of bakers to purchase and work with regional grains. To stimulate the supply needed to meet this growing demand, Greenmarket started the Regional Grains Project. Greenmarket became a key part of Oeschner / FGF's marketing strategy. <June, please expand if possible>.

Innovative strategies

Oechsner has an innovative approach that has involved creative partnerships with other actors in the value chain. By partnering with a mill, the farm has a guaranteed outlet for food grade product and can capture some of the profits generated by milling. The partners in the mill were

able to build equity through their labor. By having a reliable source of grain and storage capacity, the milling partners are able to meet orders from bakers and other customers who want locally grown grains.

FGF's branding message is simple: the farmer is involved with the milling in partnership with a worker-owned mill. The grain is grown in Upstate New York and is local to the New York market.

Wide Awake Bakery's business model of selling bread shares through a Community Supported Bakery is also innovative. Subscribers provide a stable and predictable outlet that enables the bakery to plan and schedule production. While most CSA subscription programs are for perishable food, Wide Awake Bakery provides the farmer an outlet for non-perishable items. The home baking market is relatively small. More consumers will buy bread than will buy flour and make their own bread.

The economics of scale continue to be a challenge for the enterprises. Demand has continued to grow and capacity is being stretched. The relatively smaller equipment has the advantage of being able to do small runs of specialty products. They have flexibility in production options that larger scale enterprises do not have.

Conventional grain prices had been at relatively high historic levels for much of the study period. Now that conventional grain prices are falling, there is downward pressure on organic grain prices, and growing interest among farmers who are interested in transitioning as the organic

premium looks more attractive. While organic small grains might be profitable as a specialty niche, there is evidence that organic wheat is unprofitable when grown on a commodity basis (McBride et al. 2015).

The current shortage of wheat, rye, barley and small grain products such as flour, malt and distillery mash is exacerbated by a continued lack of processing capacity. The size of the niche market is not clear, and consumer willingness to continue to pay premium prices for artisan breads made from locally grown grains has not been researched. If the phenomenon is short-lived or the market becomes saturated, then margins will fall. On the other hand, consumers are being educated about the taste, quality and other different properties of local grains.

Conclusions

Thor Oeschner found a niche specialty market for what is otherwise marketed as a commodity. That niche was created by consumer demand for locally grown baked goods, and by institutional support to fill that consumer demand. By following the market signals and adjusting his production, Oeschner was able to take advantage of the opening that was created. To do so, he had to partner with other actors in the value chain, specifically a milling enterprise and an artisan bakery. It remains to be seen whether the demand for bread and other baked goods made from locally grown flour will continue to increase. However, for the present time, the demand seems solid. As the demand grows, other farmers, millers and bakers are expected to enter the market.

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