Wheat Hound:
The Pancake Queen Stalks the Perfect Ingredient from Seed to Loaf

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Overview

Local eating is wildly popular. While shoppers swoon over heirloom vegetables and pastured pigs at farmers markets, grains and flour are not a common sight. My love for baking sent me into the field to see why.

Part memoir, part food tour with recipe pit stops, *Wheat Hound* begins and ends at the griddle. I first stood at the stove, spatula ready like a fly swatter, guarding creamy circles of Aunt Jemima batter. I loved that pancake mix. Now I love how its history tells the story of the industrialization of farming and food production.

One of the first packaged foods, the mix was invented when advances in harvesting machinery created a glut in the wheat market. Americans fell hard for the mix at the 1893 Chicago World's Fair, charmed by the product and its pusher, a former slave named Nancy Green. Hundreds of people waited in line to hear this Aunt Jemima tell stories and serve pancakes, proving a lasting truth that producers from Betty Crocker to every farmers market vendor exploits: we want food with a face.

I love knowing who grew the wheat that became my flour because I care about sustainable agriculture and workers rights, but

this knowledge also matters on a deeper level. Bread is communion in church, and glues us together at the dinner table, too. Wheat was one of the first seeds domesticated as hunter-gatherers adopted the habit of agriculture. The stored energy of wheat and bread freed our time from all day nut and berry scavenges and allowed us, in a sense, to build community. In two years of research and exploration, I've discovered that bread and beer are building community again as people reinvent local grain systems.

Wheat Hound introduces the farmers, millers, maltsters, bakers and brewers who are putting grains in the ground, in artisan loaves, and in our glasses. Growing and processing wheat and other grains requires a lot of land and equipment. Milling and marketing take tools and cooperation. In essence, there is a village behind every loaf of local bread. The human muscle pushing these regional grain revivals is different in each area. In central Maine, a group interested in local food founded a mill in the former county jail. In Western Washington State, wheat researchers and retired software entrepreneurs are working to build a barley industry in an area whose climate compares to the fabled malt lands in Great Britain. An organic grain farmer is co-owner in a mill and bakery in upstate New York, and this model shows how the shared enterprise of wheat and bread joins lives.

While broad swaths of Americans question the healthiness of gluten, others are diving wholeheartedly into wheat. Their enthusiasm and work are curious and engaging, especially to a baker who romanticizes the past. I didn't know anyone near me was growing and milling grains until my husband brought me a chocolate oatmeal bar from a bakery in the Hudson Valley. The oats and wheat in the cookie were as different from what I used as a backyard tomato is from its supermarket cousin.

That single sweet sent me down a bunny hole chasing grains. It put me in bakeries and bread labs, and made me study the histories of baking, milling, malting and grain farming. It was my ticket to sit in the cab of a combine at wheat harvest, and watch that harvest get cleaned and stored. When I heard that a family of four could make bread for a year on a tenth of an acre, my kids planted wheat with a plastic lawn seeder. We harvested the crop with garden shears. Every day I make pancakes and bread with flours from New York, Oregon, Maine and my backyard.

My pancakes taste like the whole grains that make them. One baker who sampled local flour said the flour tasted more like flour. Bakers will buy the best chocolate they can afford, but the influence of flour is overlooked because taste-wise, most flours behave like a blank

slate. I let the flours live loud in my pancakes and crepes. The flavors of cornmeal, wheat and rye stand front and center.

The farmers, researchers and producers I've met are as distinct and articulate as these flours. I am excited to let them speak for themselves and their work in the pages of a book.

About the Market

Wheat Hound: The Pancake Queen Stalks the Perfect Ingredient speaks to people interested in food, farms and the economics of food production.

Farmers are becoming rock stars, appreciated at farmers markets and applauded on menus. People want to know how food is made, from M&Ms in the factory to the perfect loaf of homemade bread. Even if we feel too time-crunched to cook, watching other people prepare food is entertainment. Personal and professional blogs funnel readers to YouTube channels focusing on everything from brewing beer to five-minute dinners. TV series snuggle us up to champion eaters and tour the best eats in obscure spots.

All of this virtual attention is paralleled by real interest in food gardening and sourcing local food. Farmers markets and other direct marketing outlets have soared in popularity. In 1994, when the USDA started collecting statistics, there were fewer than 2000 farmers markets; in 2012, there were almost 8000 across the country. Community supported agriculture (CSA) offers consumers the chance to buy shares in a season's produce, and nearly 13,000 farms use this model to sell vegetables, meats, eggs and bread.

More than nostalgia is driving people to close the gap between consumer and producer in the food system. The recession, food safety concerns, and interests in nutrition and the environment drive people to garden, join CSAs, and shop at farmers markets, or their seeming equivalents, like Whole Foods.

Wheat Hound brings readers right next to the people who are rebuilding the last piece of the locavore puzzle, regional grain systems. Since the dollar return on an acre of rye will never approach the value of a field of arugula, people have to pool their talent and time to grow and handle grains on a small scale. Such cooperation echoes the ways wheat has brought people together over time.

The collaborations around local grains make great portraits of individuals and communities. Getting to know the people who carry our daily loaf from seed to table, and who bring our beer from ground to glass, opens a window on passion, tradition, and change. As influential chefs like Dan Barber encourage other chefs to experiment with heritage grains, an audience for the stories of farmers and grain producers is growing.

The Competition

Books about people who make food are popular. While the flood of memoirs based on food blogs may have slowed to a steady river, many nonfiction food books feature narrators with a personal interest in the subject.

Both staple food and handy metaphor, bread is explored in cookbooks, memoirs, and histories. My book is a hybrid that uses my love of baking to present food history, and portraits of the people who are changing the way food is grown and made.

1. *Eat the City: A Tale of the Fishers, Foragers, Butchers, Farmers, Poultry Minders, Sugar Refiners, Cane Cutters, Beekeepers, Winemakers and Brewers Who Built New York* by Robin Shulman (2012, Crown Publishing, NY) This book uses people from New York City's past and present to tell the story of the city and its foods. My book also focuses on food and history, but uses a more personal narrative to dive into a single subject, grains.
2. *Deeply Rooted: Unconventional Farmers in the Age of Agribusiness* by Lisa Hamilton (2009 Counterpoint, CA) The author explains the basics of agriculture to a lay audience by looking at the lives of a dairy farmer, rancher and wheat grower.

The farmers and millers in my book also describe agriculture, but move the story closer to the consumer by framing their work in the context of farmers, maltsters and brewers.

3. *White Bread: A Social History of the Store-Bought Loaf* by Aaron Bobrow-Strain (2012, Beacon Press) This is a book that uses the history of bread in America since the mid-1800s to suggest parallels between food-based social movements and current dialogues about eating. Chapters in my book use history as a tool to help readers understand changes in agriculture, baking technology, and the manufacture of alcohol.
4. *52 Loaves: One Man's Relentless Pursuit of Truth, Meaning, and a Perfect Crust* by William Alexander (2010, Workman) The author keeps the reader close as he seeks perfection in a loaf of bread for a full year. While he meets bakers and farmers en route, the story he seeks to tell is primarily his, not theirs. My curiosity about baking and flour also lends my book its shape, but the producers I meet play a more central role in the narrative.
5. *The American Way of Eating: Undercover at Walmart, Applebee's, Farm Fields and The Dinner Table* by Tracie McMillan (2012 Scribner) Following the tradition of *Nickel and Dimed*, the author works at low paying jobs to show how labor is treated on

the lowest rungs of the food system. McMillan draws readers in with her personal experiences, and offers data to frame what she sees as an anonymous part of our food production. As a storyteller, rather than an investigative journalist, I bring readers close to the experiences of farmers and producers without staging an argument.

6. *Artisan Baking Across America* by Maggie Glezer (2000, Workman) A cookbook with some profiles of the farmers, millers and bakers involved in the artisan baking movement in America Primarily a cookbook, her book has a decided interest in the baking side of the equation, and mine focuses on the relationships and work lives of community scale producers, and how they intersect.

About the Author

I have been following the revival of the regional grain movement in the Northeast for two years, and writing about and working in the local food movement since 2001. My cover story for Edible Finger Lakes about grains and milling in Central New York features Oechsner Farms, Wide Awake Bakery, and Farmer Ground Flour. The article starts and ends with my love for flour, and is a model for the kind of storytelling I want to do in the book, drawing readers in to the world of grain production through my personal experience.

My story about bread building community around the world is a feature for a 2013 issue of *The Intelligent Optimist*, formerly *Ode Magazine*. The article shows how community ovens, bread baking businesses, and specialized wheat farming is bringing people together in Europe and the Middle East, as well as Toronto, New York and Massachusetts.

I wrote the feature for the summer issue of the Northeast Organic Farming Association of New York's newsletter, illustrating the details of high quality organic wheat production for the organization's audience of organic food consumers and farmers. This article focused on organic grain farmer Thor Oechsner. I have visited Oechsner Farms

many times, and am very familiar with the mill and bakery that he partially owns. Access to this particular farmer-baker-miller partnership gives me a window on the intersecting relationships required as regional grain systems are rebuilt from scratch.

I write about food and agriculture for farming newspapers, cooking websites and regional magazines such as Culinate and Food Safety News. My involvement in local food systems began with the Troy Waterfront Farmers Market in upstate New York, which bloomed under my care to a fifty-vendor year-round marketplace with more than a thousand weekly shoppers. I now teach food justice at Russell Sage College, and my students partner with Capital District Community Gardens' youth powered urban farm, The Produce Project.

I have been interviewed about my frugal lifestyle and its gardening and cooking centered pursuits for articles on MSN.com, and national radio programs. I cook compulsively for crowds, catering community fundraisers and meals at workshops. I teach cooking and baking classes to draw people together over food, and show how easy basic cooking can be.

Through blogging, I have developed a conversational yet informative style of writing that I will use in *Wheat Hound.* I report on my family's adventures in homegrown, homemade food on my blog, Home Economics. I've embarked on a new grain project, Grain Brains.

NY Times Bestselling cookbook author Alan Richardson, Hello, Cupcake!, and I are challenging each other to put more grains into your meals, not just your cupboards.

Promotion

To help spread the word about my book, I plan to tap into the network of food advocates and professionals who are promoting the revival of regional grain systems in the Northeast and Northwest. This network includes people who are already familiar with my writing because they support the grain and flour projects that are my subjects.

I will also promote the book on my blog, Home Economics, a family album of our adventures in growing, saving, and cooking food. I write regularly about grains for the From Scratch Club blog and am connected to other bloggers, like Kate Payne, author of *The Hip Girl's Guide to Homemaking* so that when the time comes I can go on a blog tour. Alan Richardson's considerable network of cupcake fans will lend me an audience, too.

I am primed to speak about the book in bookstores, on the radio, on TV, in food co-ops, or for community groups. My frugal, DIY lifestyle has been featured in interviews for MSN.com and PRI's The Takeaway. As a cooking and writing instructor, I'm comfortable with public speaking, and adept at flipping flapjacks while chatting. Where

appropriate, I will push the book with a pancake sampling, since pancakes are the perfect vehicle for local flours.

Potential readers can be drawn locally and across the country from the Slow Food and Transition Town movements. Partnering with groups that advocate for local foods and farmland preservation, such as American Farmland Trust is a natural connection for the book.

A freelance food and agricultural writer, I have audiences at the places where my nonfiction is published – Culinate, Food Safety News and regional outlets such as Metroland, The Valley Table and The Times Union. I wrote for The Seattle Weekly and The Stranger, too. I can tap into readers and the subjects of the stories I write. I also have access to readers at literary outlets where my fiction has been run McSweeney's, Tarpaulin Sky and Alimentum: The Literature of Food. This last publication bridges the literary and food worlds, and offers further avenues for promotion in print and online.

I plan also to work with publicity to reach out to food cooperatives, local and slow food organizations, independent bookstores and cooking stores with teaching kitchens. Locally my name is recognized as a writer, community food organizer, and cooking instructor. I have access to colleges and bookstores. I have connections at New York City's Greenmarket, which promotes regional grains at its farmers markets and food events throughout the city. I know people at Seattle

Tilth, an urban gardening organization, and can seek guidance from my editors at Culinate in planning events in the Pacific Northwest.

Wheat Hound

Chapter Summaries

Introduction

Ever since my mother taught me math on measuring cups, I've been a fiend for the alchemy of flour. Take this powder and it becomes the gold that fills your belly and feeds your sweet tooth. The most magical power, though, was that flour made me. Standing at the counter facing cookbooks and bowls, I began to be the person I am.

As an adult I have stitched myself to friends and lovers with birthday cakes and pies. I wanted people to taste my feelings for them. I bought good ingredients, but I didn't think much about flour until I was in my forties, when I had a certain cookie made with oats and wheat grown and milled near me in New York State.

Now, I spend much of my time considering wheat. Where it grew and who milled it, how it will bake in bread or pancakes. I wonder when the seeds of each particular flour was developed – 50 years ago, 11,000? I wonder about the healthiness of bread, too. Is gluten at the root of my insomnia? If I buy sourdough loaves from an artisan bakery will I be a better human and help the planet limp away from climate change?

Each loaf of bread I see at the supermarket, in the store, and on my kitchen counter seems to ask more questions than the hunger it can answer. These questions come from the wonder I felt when my husband brought me an oatmeal ganache cookie bar. Even against a

buttery chocolate backdrop, the grains screamed for and got my attention. Where is that flour from? I had no clue my curiosity would launch a tour backwards through time and across the country through fields and mills and breweries.

The Farmer, The Miller & The Baker

"This is the kind of day that fucks me up as a farmer," says Thor Oechsner. He should be harvesting corn, but he's busy getting grains for his flourmill. He looks down at the line of cars stopped in front of his grain truck, waiting as a construction crew repairs a bridge.

The October sky is wide open and a ring of perfectly exhaled clouds offset the pale oranges and bleached yellows of the trees. Fields are green with alfalfa or tan with ripening corn.

My love for flour landed me in the cab of Thor's truck, and in the middle of the regional grain revival that's happening in the United States. While millions of Americans shun gluten, others are rebuilding their lives around bread, like this farmer, and the miller and baker he works with outside of Ithaca, New York.

Thor used to grow organic grains for animal feed and now feeds humans. His friend and business partner Greg Mol is a recent Cornell grad who thought he'd farm vegetables, but built a flourmill instead. Anthropologist Stefan Senders made such great bread from Thor and

Greg's flour that he left academia, designed a wood fired oven, and opened a bakery.

The intersections of this farmer, miller and baker demonstrate the kinds of partnerships that this movement is making. The three men collaborate as they learn and perfect skills that were industrialized and delocalized over the course of the 20th century, figuring out how to grow, store, mill and bake wheat.

The details of their lives introduce me to the intricate basics of grain farming, flour milling and artisan baking. I see combines shimmy over golden stalks, eating the harvest like giant bugs. I marvel at the mill's maze of Rube Goldberg like tubes, coated with a dust of flour. At the bakery, when I turn the ciabatta dough in a plastic tub, it feels very much alive to the touch. I've read that bread is a living thing, but never felt it until I handled this dough. Warm and smooth and firm, it reminds me of bathing my sons when they were babies.

Bread Builds Community

Barley and wheat were the first plants people domesticated in the Fertile Crescent 11,000 years ago. The stored energy of these seeds allowed early humans to transition from hunter gatherers to a more settled existence. In a sense, these edible seeds built civilization, and they are helping create great social changes again.

For instance, under Soviet rule, Georgian farmers couldn't grow traditional crops. Now, the scent of breads made from certain wheats is reminding people of their heritage. In the Netherlands, chefs who use native foods are praising Oland wheat. French farmer bakers are growing the ancient wheats emmer and einkorn, and milling and baking them on farms.

In Maine, 300 people immerse themselves in workshops on oven building and artisan baking each July at The Kneading Conference. The energy of the event continues throughout the year at the Somerset Grist Mill, built in the former county jail. The mill is contracting with farmers to grow wheat and oats, rebuilding an agriculture that made the state one of the breadbaskets of the Union Army.

People at the conference take notes and ask serious questions. Some of them want to bake the perfect loaf at home. Others are thinking of starting small bakeries. These people love flour too – are they my tribe?

Perfecting the homemade loaf seems a lonely pursuit, earthy cousin of the cupcake craze. Cake should be an occasion for people to celebrate, not an individual treat to help manage stressful lives. I've seen camaraderie at bread bakeries, and I've also seen how little I know about making bread. I'm hesitant to dive in and learn, because I'm dubious that making our own bread is the best way to feed us.

At home, I can't duplicate the processes whose results I admire. Wood fired baking is beyond my reach, and also, my hands on the dough are just that – my hands on the dough. I think bread baking should be a community event. There is something important about bakers working together, shaping loaves. They are giving themselves to the bread, and their energy travels with the food into people's homes.

I grew up hippie Catholic, and even though I don't follow the religion, some of the symbolism follows me. Every Sunday we stood still and quiet while the priest broke small loaves over a silver platter. I can still hear him declare, "Take this and eat it, this is my body." Bread, leavened or unleavened, in church or out, is communion.

But sometimes, baking bread for my own family feels shallow. Sure I can feed them, but the act feels mostly functional. I believe that bread means more than calories and nutrients, and I want to eat what it means. I want its making to reflect my connection to other people, something bigger than the household ties of blood and love.

This ideal vanishes when I get tempted to try a new bread recipe, or my son decides to make his first loaf. The scent of bread baking is the best. Eating that first loaf your nine year old made? Magic. Maybe I shouldn't undervalue the power of our hands on dough.

The Village Baker

When Philadelphia baker Charles Freihofer passed through Troy, New York, he saw a sea of women factory workers, and a great place to set up his sons in business.

Freihofer's opened its block long bakery in 1913, wooing customers with free loaves, and offering home delivery by horse and cart. By the time I was born, home delivery was all done, but the great perfume of baking bread lingered. Passing the factory, I felt like Charlie Bucket staring beyond Wonka's gates.

That mysterious building is now gone, but in my mind it still stands, emblem of a moment when baking technology advanced to perform a social service, almost a favor. Women worked 10 and 12-hour days in factories making collars and cuffs. Sundays they baked bread for the week. Whether time or money prevented them from getting to the neighborhood bakery, Freihofer's filled a need. The conveyor belt ovens and other technology that allowed them to offer and deliver cheap bread suited the household economies of the working class. Arguably, both people and bread dough didn't and don't deserve factory treatment. Freihofer's Bakery makes me wonder just how much technology is enough, and how much is too much?

Brick oven builder and artisan baker Alan Scott believed that an oven should be just large enough to suit both the baker and the people that the baker will feed. Is the concept of the village baker a romantic ideal, or something romantic that serves a practical purpose, the way falling in love can help people form partnerships to last their lives?

That big bakery in my childhood made me fantasy plan an entire life around baking. I picked out a little blue house with bay windows, and decided that my great Aunt Juliette and I would open a bakery. Her husband George had been a baker; I figured something of the work rubbed off on her. I made up recipes for us to follow, and pictured us making cookies, cakes and bread, selling them from glass cases in the revised living room.

Riding my bike, I pass that house, and the mega-pharmacy on the spot where Freihofer's stood, and think about how food used to be our fuel and medicine, too.

Applying factory principles to the process of bread baking, and understanding how to manipulate the science of dough led to the invention of Wonder Bread in 1921. Some blame baking techniques used in factories, such as abbreviating rise times with dough conditioners, for digestive problems and even allergies to wheat.

This chapter looks at how the process of baking was industrialized in the early 20th century, and opens discussions about the issue of size and scale in food production, and the healthiness of bread.

Wheat Belly?

I've been wondering about whether to eat wheat for almost 20 years, long before avoiding gluten was fashionable. In 1995 the eczema I'd had since I was a baby spread all over my body. I didn't want to believe my diet was responsible, but eventually I quit eating wheat and a lot of other things. I got ridiculously skinny and I stopped itching. I stayed on the no food diet for a few months, until I got pregnant and wicked hungry.

Quitting baking was the hardest part of quitting wheat. I felt detached from others because I couldn't cook for them anymore, and I couldn't break bread with them either. I lost the self I knew.

For years I stayed away from wheat, even as I added back dairy products, sugar and nuts. I was never sure what, if any foods made my skin miserable, but something I did made it better. My eczema is pretty nonexistent now, but I always feel like I might have to quit eating wheat again.

I adore bread and flour, but wheat worries me, and I am not alone in my ambivalence. We're so in love with artisan bread that chain supermarkets apply the term to frozen loaves they finish baking in store ovens. Yet the market for gluten-free products is huge, accounting for 43% of sales for Bob's Red Mill, a leader in whole grain products.

Not everyone who buys gluten-free foods has a medical problem, perceived or diagnosed. Many are just suspicious of the newest food to hate. Fat, eggs, high fructose corn syrup: something is responsible for all our dietary woes. The Atkins Diet has been maligning carbs since the early 1970s, and in the 1990s helped spawn a low-carbohydrate craze that was fully embraced by the packaged food industry. More recently, the meat-based Paleo diet has added another twist to the grain hating habit. William Davis' book Wheat Belly is another attack.

Interpreting these quarrels are nutritionists like Julie Miller Jones, who has been refuting Davis' claims. Jones advises the Whole Grains Council, an industry advocacy group, serves on The National Health Policy Forum, and otherwise applies scientific data to steer nutritional guidance on whole grains. The book strikes her as a fad diet that makes a number of false claims, linking obesity to our presumed addiction to wheat, and stating we don't need cereal fiber, only fiber from fruits and vegetables. Where the book isn't wrong, it's

misleading; she says that the idea that schizophrenics can reverse their diagnosis by avoiding wheat borders on unethical.

A few artisan bakers see their customers settling the question with personal evidence. Celiac disease and wheat allergies aside, some people who otherwise avoid wheat eat bread from Wide Awake Bakery; baker Stefan Senders believes that long fermentations break down the supposedly offending glutens in the flour.

Framed by eloquent musings on bread and baking from Senders, this chapter looks at the science behind the many claims being made about bread and grains.

Wheat Breeders

I can think about the flavor of a particular flour for days. Months even. I made shortbread with spelt for New Year's, and a part of my brain is still begging for one last taste of that sugarless, nutless cookie that was both nutty tasting and sweet from the spelt. I made biscuits with emmer flour more than a week ago, and ever since I finished them, all I can think about is more.

Tasting nonindustrial varieties of wheat made me want to know what stole these great flavors. Was it the milling process, or something else? Freshly milled flour is more flavorful, but I've learned that you don't get something for nothing in plant breeding. In roses

and tulips, selecting for color tends to remove fragrance. In wheat, as breeders have increased crop yields, they've inadvertently sacrificed flavor and, some suggest, nutritional density. Think of the difference between a garden tomato and its supermarket cousin.

Wheat and barley breeders work to make new types that perform well for farmers, bakers and brewers. The research station at Washington State University in Mount Vernon tests 40,000 varieties every year. Plant breeding for agribusiness is geared to hit specifications for protein levels, dough elasticity and extensibility, and other predictable characteristics that the baking and brewing industries rely upon. Breeding for regional needs, however, is undefined territory. Just what can come from a field? Even the flavors are unnamed. Plant breeders, bakers and other end users are developing a vocabulary of flavor adjectives that sound like the way wine is described: grassy, oaky, bitter.

Plant breeding is a misunderstood enterprise, especially given the limited information the public has on genetically modified organisms. William Davis claims that mutation breeding techniques are at the root of the addictive properties he sees in modern wheats.

However, much of this modern wheat comes from the work of Nobel Prize winning wheat breeder, Norman Borlaug, who used very standard methods to create high-yielding dwarf hybrids as he tried to

eradicate global hunger. In the 1940s he crossed plants same as wheat breeders did in the 19th century, when hybridization was first explored. Cereal chemist Andrew Ross studies flour in his bread lab at Oregon State University, and finds flaws in Davis' arguments, particularly in the matter of hybridization.

Plants began crossing strains and perfecting themselves hundreds of thousands of years ago, and this is how the genetic ancestors of the first wheats evolved. Non-GMO plant breeding is very similar to the custom of farmers studying plants in the field to see what grows best. When early humans chose the plumpest seed heads from stands of wild wheat and barley, they were selecting the seeds of plants whose traits they desired. They wanted fat seeds that clung to the heads and didn't drop to the ground, where they would feed the plant's need to grow another generation, instead of people.

Long before anyone sold seed, people saved seed, and brought it with them as they moved. Favored varieties of wheat left a trail around the world as the people who loved and relied on them migrated, like Mennonite immigrants to Kansas who brought Turkey Red from Russia in the 1870s. This type of hard red winter wheat helped transform the prairie into the Wheat State. By 1920, Turkey Red was the gold standard for bread across the country, but it almost

vanished as other varieties came into favor, selected to meet the needs of an industrialized food supply.

Now Turkey Red is a poster child for Slow Food's Ark of Taste, a status the organization grants heritage foods to draw attention to them and help encourage production and use. The irony that this variety helped centralize wheat production and now is helping regionalize grain production is not lost on baker Thom Leonard, a native of Kansas who discovered Turkey Red as his state celebrated its centennial in 1974. Leonard works with Heartland Mills, a small organic Mennonite run mill, to get this identity preserved wheat to market.

Mills and Mixes

I began my life at the stove armed with a spatula, standing guard over Saturday morning pancakes as the smiling eye of Aunt Jemima looked on from the box of pancake mix. I loved the tang of that batter almost more than the pancakes. Now, I make my own mixes and I have another admiration for Aunt Jemima, because her beginning marks such a turning point in food production.

Aunt Jemima was dubbed The Pancake Queen by the Chicago World's Fair, where she made her debut in 1893. The first packaged mix was just flour and baking soda, but emancipated slave Nancy Green played a real live Aunt Jemima and convinced people they

needed this product. Making pancakes and telling stories about plantation life, Aunt Jemima attracted such crowds that extra security was hired to keep the lines in order. No matter that people still had to add eggs and buttermilk at home – The Davis Milling Company had seized upon the power of story when, rather suddenly, America had too much food.

By the late 1800s, mechanized planting and harvesting equipment created a glut in the wheat market. A leap forward in milling technology helped create a glut in the flour market, too. Roller mills ran more quickly than stone mills, and allowed millers to easily produce white flour, long an emblem of social status. In ancient Rome, only the richest could afford to leave behind the brown bits of bran and germ that taint wheat's starchy white endosperm. Roller mills gave all but the poorest people access to the preferred flours of royalty.

Pairs of round stone mills were the norm until roller mills came around in the 1870s. These mills are the tool of choice for modern small-scale mills, and even some relative behemoths, like Bob's Red Mill, which uses 24 Danish mills in its gluten-free facility alone. These mills make true whole grain flours, leaving the bran and germ intact with the endosperm.

I love the taste of freshly milled flours. One of the reasons whole grain flours fell out of favor was because some of those flavors are

attached to oils in the germ, and those oils spoil quickly, making flour rancid. White flour has a longer shelf life, but fat equals flavor, even if the fat is not from a burly pig but a little kernel of grain.

The USDA and others define the merits and mystique of whole grains quite differently. My Plate, the latest U.S. dietary guidelines, says that at least half the grains you eat should be whole grains. Like the lapsed Catholic I am, I embrace a variety of grain dogmas, seeking a true religious experience that will fold me back into faith. I eschew white flour altogether, except for the occasional birthday cake. If I'm believing the ideas of dentist Weston A. Price, I soak my grains and flours overnight in water mixed with a little yogurt, hoping to break down the phytic acids in whole grains that apparently block the absorption of nutrients. Sometimes I wonder whether I should eat flour at all; Dr. Andrew Weil says that white and whole wheat flours act the same in the body, in terms of spiking blood sugar. This thought really knocks at my door since I now have hypoglycemia.

I met a baker who has developed a formula for bread using 100% sprouted grains, and no flour whatsoever.

"I hate flour," he said, "because of what it does to people's health." Persuaded by his passion, I went on a little fling with sprouting wheat and tried to make bread from it. The learning curve was too tough and

I went back to eating bread from home or my local sourdough bakery. I only doubt every other bite.

I feel no doubt about pancakes. We eat them nearly every morning – not fluffy white stacks drowned in maple syrup, but dense and tasty multigrain combos like cornmeal rye studded with add-ins like salami and cheese. I am the Pancake Queen, still guarding the griddle with the spatula, and guiding each day in the right direction with a quick hot breakfast.

The Harvest

If my friend Howard didn't tell me my wheat was ready, it might still be in the field. I couldn't see the empty lot behind our house, but Howard took the time to walk by and put some kernels between his teeth. Having grown up on an Iowa farm, he knows that wheat is ready when it passes the crack test.

In the thick, wet heat of early July, we meet at the field after the dew burns off. I'm glad for his knowledge and enthusiasm. Fresh home from a tour of Thor's combines and drying equipment, I'm full of doubt about self-sufficiency. What exactly is wrong with someone sitting on a tractor to feed me?

Howard swipes his scythe across the stalks and I squat with a pair of garden shears. We stack bundles by the thresher he made from a

garden cart and a drape of plastic. I look at the golden stalks. It is strange to harvest something that is already dried – usually what I bring inside is green. My wheat won't cooperate with Howard's scythe, so he resorts to squatting with shears, too. Three sweaty two-hour stints yield two buckets of uncleaned grain that still need winnowing and milling. I am not psyched.

The hard labor of grain harvesting has inspired many inventions. From the scythe and flail to the John Deere combine with a thirty-foot cutter bar, harvesting technology has traveled far. As small scale grain projects pop up, people are trying to figure out what tools to use. Farms planting a few acres of wheat might use a thresher to cut the wheat green and leave the shocks in the field to ripen, like a Brueghel painting. Or they might get together with neighbors and buy a community combine. Urban homesteaders like me wield shears and Amish farmers guide draft horses and drag tow behind combines. Starting in Texas, custom combine crews follow the harvest north. Again, I wonder what level of technology is the right level.

People have been asking this all along. Cyrus McCormick's mechanical reaper could do the work of six men, but the machine was not readily adopted, partly because the people whose jobs it could replace objected.

I don't want to be the Little Red Hen, but I do like knowing what is in my mixing bowl. I like being able to imagine where the seeds were planted, and how they were harvested. I like knowing my miller, but I eat plenty of things whose exact history I can't picture – apples, milk, rice, and supermarket vegetables in winter. Do these things offer me less nutrition or just less story? Is knowing who feeds you a necessity? Right now it is a luxury, because the commoditization of food has made it difficult or impossible to trace the product back to the person who grows it. You need time and money to follow your food back to its source.

Commodity System

Thanks to the writings of Michael Pollan and movies like Food, Inc., many people know the word commodity. They know of the subsidies the U.S. government pays American farmers for corn, soy, wheat and other crops. The commodity system is less understood, and has its roots in the 1840s, when people needed a way to describe bulk quantities of grain they were buying and selling.

The term is shorthand for farmers not having control of their prices. Prices for grains are set by boards of trade in Kansas City, Minneapolis and Chicago, and subject to swings that have little to do with the way a crop is growing in the field. As grain trading becomes

more of a global game, what's happening in Argentina and Russia affects prices in the United States. When the USDA releases its crop forecasts, pit traders respond to information that may or may not reflect the harvest. Using the commodity price of wheat as a speculative instrument is crop gambling, and that causes stress in the market. Even in organics, pricing is subject to boom and bust cycles. Recreating local grain systems can make prices more stable for farmers, and reflect what it actually costs to produce food.

Farmers in the Pacific Northwest are primed to switch out of the commodity system. The Salish Coast runs from Oregon's Willamette Valley to British Columbia, and has farms that grow cash crops like turf seed, potatoes and tulip bulbs. Farmers also grow grains to break up disease cycles and build organic matter into the soil, but lose money when they sell grains overseas.

Tom Hunton of Camas Country Mills grows grass seed and sells fertilizers. When the recession hit his county, aka The Grass Seed Capital of the World, he was ready to try something new – a flourmill. He grows Emmer, Red Fife, and Teff – the grain used to make the Ethiopian bread, injera.

Wheat breeder Stephen Jones advises the mill, and Hunton also benefits from the work of barley researcher Pat Hayes. Hayes is 25 years deep into barley varieties, seeking types that are easier to grow

and process, better for blood sugar control, and best for malting. This last matters to a number of people – including Stephen Jones – who believe the Salish Coast an optimum place to grow malting barley, and see its growing conditions paralleling those of Great Britain.

The Skagit Valley Malting Company is building a malting operation to take advantage of this opportunity. Former pilot and software mogul Wayne Carpenter has recruited peers out of retirement and into business, and they're designing and fabricating equipment that can be monitored with cellphones.

Whether these models of milling and malting have longevity remains to be seen. Compared to what I've seen in the Northeast, these projects seem further along; developing the markets is the main challenge. Still, I wonder, is this boutique farming, or the new old way we will feed ourselves? I want everyone to know how tasty these grains, and other foods made outside of the dominant food system are. Yet how can that happen? Real food costs real money, and even people who intellectually understand the value of eating outside of the norms have a hard time paying for that idea.

I'm a part of this problem. I keep my income low to be able to spend my time writing. I can't always afford milk or cheese of known origin, or even the bread that I idealize.

Proportionally, other countries pay far more for food than Americans do. Subsidies, volume sales, and other elements make our food cheap. In countries without such highly developed infrastructure, there is no insulation from costs. One study put American food costs at 6% of an annual $32,000 income, and found people in India of the same means spending 35% of their money on food. How this will ever change in America, I'm not sure, but malting might have something to do with it, as customers are willing to pay more for a truly local pint than they are for a loaf of bread.

The Village Malthouse

"It takes a village to raise a pint," says farmer, maltster and all-around powerhouse Andrea Stanley after a day in the field with University of Massachusetts agronomists, sussing out the condition of her barley.

That imaginary village includes some very real people: those scientists, plus farmers willing to let Andrea and her husband Christian plant on their land. Other people behind the pint are brewers who buy a season's worth of grain long before the barley is malted, allowing the Stanleys to buy the fertilizer the agronomists suggest their barley needs. Surrounding that proverbial village is the thirsty masses

frequenting small breweries and brewing beer in their kitchens, eager for craft brews with tastes bigger than Budweiser.

Andrea and Christian Stanley run Valley Malt in an old potato barn, malting 4 tons of grains a week for craft brewers in the Northeast. Their headlong dive into malting has led them to malthouses in Great Britain, and deep into history looking for information on a process that in America is performed by a few large corporations.

The couple recently held a farmer brewer conference to share what they've learned about the lost art of malting. The two-day workshop quickly filled to capacity with brewers, distillers and farmers, thanks in part to New York State's farm brewery law, which is tempting some home brewers to turn their hobby into careers – and inspiring a lot of farmers to plant malting barley.

The craft beer industry is distinctly collaborative, growing from a home brewing craze in the 1970s. This chapter opens a window on this recent history and goes a little deeper, illustrating how state and federal taxes on alcohol after the end of prohibition led to consolidations in the beer and malting industries that still exist. Micro malting pioneers Valley Malt, along with demand from craft distillers and breweries, are fueling the revival of provincial grain production.

Aside from serving an eager audience of craft brewers, malting has another advantage for grains: states love alcohol revenue. New York

and Washington States have recent and new laws that are encouraging small scale brewing and distilling, and require these businesses to use state grown goods. I'm amazed to see the force gathering around such projects. Attending meetings of farmers and millers, I never saw politicians, but I see plenty of politicos declare their support for these alcohol related ventures. This will help develop the infrastructure, knowledge and tools needed for all grain production. In effect, beer grows bread.

To Market, To Market

Before I fell in love with grains, the history of highways and how they shaped cities stole my imagination. I live near the Collar City Bridge. The name is all that's left of the industry. Troy made 90% of the world's collars and cuffs in 1900. How did that business walk away and somehow land an eight-lane bridge on my neighborhood? I made a comic book to hold the research I did to answer that question.

The next big question about my city came on walks at the Poestenkill Gorge, where slate was ground for battleship gray paint, and other mills were powered, too – wool and flour. Walking the steep edge of the gorge, I climbed on millstones and rocks. How come, I wondered, and when did flour stop getting ground in Troy? When I

learned that another highway, albeit one made of water, not road – the Erie Canal, played a key role in changing how and where grain was produced, it seemed the fact was built to fit my curiosity. Or that my curiosity was primed to eat the fact, especially when my husband brought me that cookie made from flour that *was* grown and milled nearby.

Another serendipitous piece of history is that flour helped make the Erie Canal a reality. Merchant Jesse Hawley ran up a huge debt shipping flour from Western New York to New York City in the early 1800s. While serving twenty months in debtor's prison, he took up a pen name and wrote essays advocating for an artificial river to join the Hudson River with Lake Erie. "Hercules" wrote so passionately and articulately that he convinced governor-to-be DeWitt Clinton to adopt the idea as his cause, which was soon dubbed Clinton's Ditch.

Farmers and speculators snapped up land in the Genesee Valley for growing grain long before the Erie Canal opened in 1823. Within a short time, flour mills throughout the state closed as Rochester bloomed into the Flour City, milling 25,000 pounds of flour a day. By the late 1800s, another canal opened up Buffalo as a port, and shifted milling 60 miles west.

This history forecasts factors that are influencing the regional grain revival: rising fuel costs, unpredictable commodity prices, and an appetite for local foods.

This final element is maybe the most powerful. Wheat is the last food to be relocalized for the locavore customer. Developing processing infrastructure for meats is complicated and expensive, but a loaf of bread can't sell for $30 a pound. A grass-fed Ribeye can. Small scale meat and poultry producers still feel the pinch of limited processing options.

Consumers started asking bakers about the source of their flour later in the locavore game. Questions, however, don't build mills or buy combines. A few farmers and millers in New York and Pennsylvania were primed to meet the challenge, so when New York City's Greenmarket set a rule in 2010 requiring their farmers market bakers to use 15% local flour, they could meet the demand. By 2012, Greenmarket bakers reported using 60,000 pounds of this flour a month.

Agronomist Elizabeth Dyck loves that consumers are driving this movement. It isn't often, she says, that farming moments have such support. The revival of regional grain systems is gaining momentum from the diligence and inspiration of people like Dyck, and Stephen Jones. Their enthusiasm for the agricultural and community value of

local grain projects verges on the evangelical, and is helping save and reestablish small farms. This isn't just because 'local' is a feel good brand, but because certain kinds of production make better economic and ecologic sense than the current agro-industrial model.

Chef interest is also driving consumer interest. At a conference in Denmark last summer, Chef Dan Barber urged 350 of his peers to not think of grains and flour as foods with flavors to accent and employ, just as any other ingredient. Chefs and bakers play an important role in the grains renaissance, pushing farmers to deliver specific ingredients and educating consumers about novel foods.

The nutritional value of these novel foods is also a selling point. Even though wheat and gluten are the current dietary suspects, as the suspicion matures, more information is circulating, and posing more solutions. One restaurant in New York City is making pizza only from low-gluten flours.

From the Ground Up

Soil scientists see a strong relationship between soil health and plant health, and the most radical ones believe modern diseases are connected to damage from aggressive tillage. Other research shows that nutrient density is related to seed variety. Is gluten sensitivity

related to growing certain types of wheat over and over again in the same, overused soils? If so, wheat's redemption may start in the dirt.

While change won't happen on a large scale until crisis demands, looking at another dirt crisis might be useful. The Dust Bowl was caused by the swift adoption of the tractor and other farming practices, like monocropping wheat. Planting a single crop year after year stripped the soil of its structure and caused massive erosion on ground that used to be prairie, a dense biological system woven of creatures and plants. The Dust Bowl forced people to abandon the spent land; eventually, contour plowing and windbreaks helped address erosion and put land back into production.

Some people think of crop rotation and low and no tillage farming as ways to skirt such devastation in the future. Still others see the system of growing plants annually, as opposed to perennially, as simply flawed. Wes Jackson looks at the domestication of wild plants as the 10,000-year-old problem of agriculture, one that works nature beyond its capacity to balance its own systems. His Land Institute in Kansas is trying to reconstruct the prairie by developing a perennial wheat grass called Kernza.

Kernza has roots with ten times the mass of other wheats. These roots dig deep because they have more than one growing season to fetch and hold water. While perennial grasses are used for growing hay

and pasturing animals, his is a radical premise. Yet, if our current system of feeding ourselves can't adjust to climate change and the limitations of fossil fuels, perhaps this work will take hold.

I wonder just how far we should rewind agricultural time. Should we go back 100 years, when states like Iowa were filled with drought resistant wheat instead of drought succeptible corn and soy? Are the people who are starting regional grain systems just reinventing the wheel? Maybe we should retreat to a perfect, pre-Industrial Revolution farming moment, and I could spend pretty much all of my life working for food.

I used to think people should skip processed foods entirely, and become their own food factories. Make no-knead bread and their own yogurt. Turn Sundays into cook days so they had food ready for the week.

But trying to do everything for yourself is what burned out back-to-the-landers in the seventies. A sense that you can get your food from local farms and other sustainable sources, and produce some of it on your own, prevails in the current do-it-yourself food craze. Still, I am tempted to make everything myself, from grape nuts to mustard. Tempted, but not pressured enough to try anymore, or even feel guilty that I can't.

I look at the 30 pounds of wheat we grew and wonder who the heck is going to sit on a bicycle and mill that for our pancakes and bread. And if authenticity and knowledge matter in food, when am I ever going to participate in a chicken slaughter in my backyard?

I don't know what is the best way to eat, or cook, or grow food. Should I build a community oven and get my neighbors to gather for weekly bread bakes? Should there be a malthouse in every village, and a mill on every stream? This seems both quaint and impossible. It also seems unlikely because efficiencies matter, and so do economies of scale. Long ago, Romans ate wheat grown in North Africa, not Italy.

Another agriculture is in order. We have fewer farmers than we have people in prison, and a youth that's facing shorter life spans than their elders, thanks to diet-related disease. At some point we're going to connect the dots between how our food is produced, and how our bodies receive it. Maybe that will be soon, forced by collapse of an agriculture based on fossil fuels.

I know I don't need to grow my own grains yet, and for this I am glad. I am content knowing where my flour is from, and picturing the mill where it was ground. When I eat bread baked from a bakery I admire, I feel fed in my heart and mind.

But this is more than romance. This is practical. Dairies and poultry operations need feed grown close to home. Farmers, millers and

bakers should talk to each other and know something about each other's challenges and work. If people love their brewers, they should love their maltsters and farmers too.

The people and projects I've seen as I've dug into flour are carving new economic paths, and paving those paths with lots of intersections. There really is a village in every pint and every loaf. Agricultural change happens because of collaborations. Meeting the human muscle behind these emerging regional grain systems gives me hope that the full potential of our food can be realized. That food can taste great, think right, and help foster soil and human health, nourishing not just our cells, but our communities, too.

There really is a village in every pint, and another in every loaf. Meeting the human muscle behind regional grain systems, the farmers, researchers, community activists, millers, maltsters, bakers and brewers, gives me hope that the full potential of our food can be realized. That food can nourish more than our cells, but our communities, too.

Sample Chapter

The Farmer, The Miller & The Baker

"This is the kind of day that fucks me up as a farmer," says Thor Oechsner. He should be harvesting corn, but he's busy getting grains for his flourmill. He looks down at the line of cars stopped in front of his grain truck, waiting as a construction crew repairs a bridge.

The October sky is wide open and a ring of perfectly exhaled clouds offset the pale oranges and bleached yellows of the trees. Fields are green with alfalfa or tan with ripening corn.

My love for flour landed me in the cab of Thor's truck, and in the middle of the regional grain revival that's happening in the United States. While millions of Americans shun gluten, others are rebuilding their lives around bread, like this farmer, and the miller and baker he works with outside of Ithaca, New York.

A chatty, generous fellow, Thor invited me to visit after we met at a conference. He's shown me wheat sprouts fingery green in the fall, and stalky tall and golden, ready for summer harvest. I've sat in the cab of his combine and watched the machine munch that harvest like a greedy bug, skittering over the field and filling its great metal belly with grain, spitting straw out the back.

I also have front row seats at a bakery and mill because Thor is part owner of Farmer Ground Flour and Wide Awake Bakery. I've

marveled at the Rube Goldberg-esque mesh of tubes and machines Greg Mol uses to grind flour. Bakers Stefan Senders and David McInnis let me wear an apron and stare into the oven's mouth.

All the while, I look at the wheat in the field and in the bins, and I think, you are going to feed me?

That any little seed fills our bellies is stunning, but the people and processes that add up to bread really shine. The six thousand year old habit of leavened bread fosters all sorts of communion. Break down a loaf of the bread that Stefan and David make, and you'll see the human glue that binds together the famer, the miller and the baker.

Real bread takes time. As I sit in the red grain truck, waiting for a construction worker to flag us forward, next year's bread is green blankets made of fine hairs. The hairs will thicken into little clumps that go dormant in winter, ready to spring high when the weather warms. The mill that will take that wheat and make it into flour is under construction. The sourdough starter that will build the bread is under construction, too, sitting in a ceramic pot on the stainless steel counter at the bakery. In other words, the toast I ate on an October morning was planted in September the year before.

When I first figured that out, the thought boggled me. I've been a baker forever, but I didn't start thinking about flour until a few years ago. Sure, I knew to buy quality flour, going for King Arthur

exclusively, but I didn't think back to those characteristic amber waves of grain and how and where they grew. I sure didn't think about the length of time between seed and loaf.

I love that I get to see every step of the process. This is all new to me, even as it grows familiar. One of the most stunning days I had with Thor was at a farm auction, where I saw the tools and equipment of a dairy that ran for 80 years laid out in a field.

Hay wagons. Grain boxes. Tractors and plows. These are things dairy farmers need to feed their herds. The auction fanned out pieces to other farms in an efficient distribution of parts, almost like an organ transplant. The farm and farmers are dead, but the heart and lungs will be stitched to another operation.

What struck me most about the auction was how those of us who don't grow food have no clue about farming. The more I see of fields and machines, the more farmers let me in on their vernaculars, each language specific to each type of farming, the more I know we eaters don't understand. How will we close the gap between our mouths and the people who feed us?

We know how Olympians train. How Ponzi schemes bilk us. How American Idol makes a star. How come we don't know the first thing about the flour that makes our bread?

Whole villages used to leave their tasks for the grain harvest. Now we have more people in prison than working farms. This farmer-miller-baker collaboration is putting people back in agriculture, and letting curious people like me see the mesh of their intersections.

"Thor was right there at the very beginning, sitting around the dinner table eating bread," Stefan remembers. "He said, 'this rocks, let's make it happen.'"

The anthropologist and home bread baker was flattered by the idea of making a bakery, but convinced that baking wouldn't pay. Still, his life was taking a turn, and he was passionate enough about baking to explore the reality of a fantasy he'd idly entertained for years. He sat up all night crunching numbers, and by morning, found that running a bakery could possibly work.

"I went to Thor and said 'let's do it,' and he wrote me a check right there," Stefan says. Thor was not alone in supporting the vision, but his backing was critical in leveraging others to help finance the project of building the bakery and its huge brick oven from scratch.

Some people invested without expectation of return. Others bought bread futures, purchasing 250 loaves for $1000. Others, like David McInnis, bought into the project body and soul, carrying bags of

mortar and sweeping the floor while Stefan built the oven with a mason, Billy O'Brien.

Wide Awake Bakery opened in April 2011, selling bread on a CSA or Community Supported Agriculture model. People pay the bakery in advance for the bread, and get their loaves at weekly pickups. Members number about 250. Stefan and David have mix days and bake days, and interns help with shaping, baking and selling the bread. They also make cookies and pasta.

Not all the flour used at the bakery comes from grain Thor grows, or Greg mills. Working with local flours is tricky business at each point in the operation, and the adage of not putting all your eggs in one basket applies. The farmer needs to sell to a variety of markets to strengthen and diversify his income, so Thor also sells the barley, wheats, corn and buckwheat he grows to maltsters, brewers, distillers, and organic dairies for feed.

The mill needs more than Thor's grain to meet demand. So Thor coordinates with other farmers, contracting with them to grow soft wheat for pastry flour and hard wheat for bread flour. If his rye crop doesn't yield what he anticipated, he has to get on the phone and find people who have good, food grade rye to sell.

Like the bakery, Farmer Ground Flour began in conversations. Thor heard that another farmer, Eric Smith, was also interested in milling

grains. The two decided to work together instead of compete. Thor bought a 24-inch stone mill from the back of a farming newspaper, but the farmers didn't have time to start the mill on their own. Once Greg Mol entered the picture, the project began.

"The flour was a niche waiting to be filled," Greg says. He's a recent Cornell grad who worked on vegetable farms and never thought he'd be a miller. "It seemed like an interesting challenge. I knew enough to know there would be interest."

Greg was working for Thor on the farm as he started building Farmer Ground Flour inside an old Agway feed building. Once the mill was installed, and the space licensed by the New York State Department of Ag & Markets for commercial food production, Greg brought 50 pound sacks of wheat from the farm in his pickup truck.

Now the grain travels in one-ton totes, and augers move the grain from these totes into the hopper that feeds the mill. Grain and flour travel up and downstairs through the old building, lacing through a network of tubes, puffing out the white sack of a sifter. Farmer Ground Flour mills 10,000 pounds of bread wheat a month, and makes polenta, rye flour, and cornmeal in addition to a range of pastry and all-purpose flours. A new mill is under construction nearby. Greg and fellow miller Neal Johnston are using what they've learned at the first setup to streamline operations.

As Thor, Greg and Stefan go through their days, they have a lot of connections in person and over the phone. Greg knows what it takes to get the crop from the field. He and Thor discuss the agronomic aspects of different varieties, such as disease resistance, yield, and harvest ease. They talk about moisture rates of kernels, trying to find an optimum balance between what the grain needs for storage and what milling requires. The bakery is a test kitchen. With Stefan and David acting as flour interpreters, Greg and Thor's jobs make more sense.

Stefan helps Greg know what customers and suppliers need from the flour. That these three guys, all of them hardworking smarties, like each other and have fun as they work is obvious. But even if they weren't friends, such business relationships would be more intertwined in localized food systems.

In a commodity system, the farmer, miller and baker might never talk to each other. Farmers who grow for the commodity market sell their grains by the truckload. These loads travel to grain elevators, and are mixed with grains from lots of other fields. Each of those fields are tested for diseases, protein content, and moisture, but these numbers matter most to the large mills that buy the grains. Mills and bakeries have formulas and specifications, and they don't need to talk to farmers about the numbers they need, or what these numbers mean

to flour or bread. Millers and bakers just seek the figures they want to get the product they need, and the cycle works without a lot of interpersonal communication.

As the tools for growing and processing local grains are being rebuilt, people are like Thor, Greg and Stefan also work with others who are invested in reviving regional grain production. Cornell University, and groups like NOFA-NY, the Organic Growers Research and Information-Sharing Network (OGRIN), Pennsylvania Association for Sustainable Agriculture (PASA), and Greenmarket, which runs farmers markets in NYC, are involved. People are trialing seed varieties and testing crop management practices, developing mobile equipment for post harvest handling, and building markets for local grains and flours. A lot of talk and action are urging this last piece of the locavore puzzle into place.

Staples like grains are latecomers in the local food movement because they take such land, labor and capital to grow, harvest and process. Meats and vegetables need infrastructure and markets too, but the return on a field of wheat can hardly compare to the net profit a farmer can make from a grass fed rib eye. Plus, as grain production was centralized in the early 20th century, local knowledge of seed varieties and growing conditions, and local equipment like combines and silos, were lost.

Farmers like Thor are primed to redevelop the local grain trade. He's been an organic grain farmer for twenty years, selling commodity crops to dairies. When real estate values started to squeeze him out of land he leased to farm, he realized he needed to add value to his crops. Since his grandfather was a German trained pastry baker, flour had a certain appeal.

Growing food grade grains for local markets is entirely different, but has enough in common with what he used to do, in terms of farming practices and equipment, to be a logical and manageable step. His life is more complicated, but more rewarding. The cows he fed did not articulate much appreciation of what he grew. People who eat bread from Wide Awake Bakery are effusive, thrilled to meet the person who grew the wheat that made the flour that made their bread.

"Flour is a very challenging material, and it changes all the time," says Stefan.

Large mills subdue these challenges and changes in a number of ways, blending oceans of grain to create a consistent product, and using roller mills. These mills make a very clean cut between the fiber rich exterior of a wheat kernel and its starchy center, producing white flour. Roller mills make whole wheat flours by selectively adding back bits of bran. By contrast, stone mills such as Farmer Ground Flour,

grind whole grains, leaving the germ, bran, and all the minerals they contain in the final product.

Factory baking requires flour that will behave exactly the same, batch after batch, so flours are treated with additives, and doughs are conditioned with extra ingredients to produce uniform vats of dough that will yield miles and miles of loaves.

Artisan baking has room to accommodate variations, such as local wheat that reflects the nuances of soils, microclimates, and the farmer's know-how in harvest and handling. Wide Awake Bakery uses roller milled flours in addition to Farmer Ground Flour, building bread on the strengths of each kind, and working more by feel than by formula.

"Part of being a local flour baker is embracing the responsibility of being more sensitive to your dough," Stefan says. "To respect what is great about local flour requires you to transform your practice."

Stefan is working on a baking guide for using local flours. The information won't reinvent the practice of baking, but will suggest ways that commercial and home bakers can get feedback from the dough and best understand how these very unique flours are performing.

My performance trick is to skip making bread, for the most part, and stick to pancakes, which I adore. And which work really well with local flour.

Still, I want to understand more. I can bake a loaf of yeasted bread at home in a morning, which suits my temperament, but not my taste buds, so I come to the bakery for tutorials.

When I asked Stefan if I could bake with him, I meant observe, but he took me at my word, not my intent. Tying on an apron, I feel nervous about my hands on point of view – the sidelines were so safe! I've baked with Stefan and David a few times and I know only that I know nearly nothing.

The bakery is mostly oven, but the baking area comfortably holds a few workers elbow to elbow in dough. There are two stainless steel tables for weighing and shaping, shelves of ingredients, a sink, a mixer, and of course, bakers racks. A couple of pasta machines hug another corner of the building, and a big dishwashing station.

The bakers welcome me into their work, especially on mixing days when extra hands are useful shaping loaves. The room is always warm or hot, as the wood fired oven prepares for the next day's bake. Stefan and David ignore my fretting as I try to follow their directions and shape loaves without squishing them. I roll them on a moist towel, and into a mixture of poppy and sesame seeds. Soon enough my

inadequacies are not too glaring, and the talk shifts from technique to our big topic: bread. The practicalities of sourdough and flour. The you, me and history, metaphysics of it. Bread over time. Bread in time, in church and in day-to-day communion.

I love how the conversation drifts to this stuff, gets kind of woo-woo in mental gymnastics. People who bake bread, especially artisan breads, are thinky types. Stefan left a life in academics. He wanted his days to be filled with something more real than thoughts and suppositions. Still, bakers like him, like David, think more about their work than your average worker does – or at least that is how it seems as we dive deep into bread and its rich history. Bread's capacity to hold human symbols attracts a philosophical sort of person. You may not be able to have your cake and eat it, but you sure can have your bread, and all of your social, cultural and religious ideas about bread, while devouring the loaf.

I'm quite caught up in the thought that the staff of life is the stuff of us. Bread glued us together as we started to settle from hunter gatherers to an agricultural society. No wonder bread carries such freight. What other food has such spiritual muscle?

One day at the bakery, I get to feel this heft, turning the ciabatta dough as it rises slowly in the walk-in cooler. The dough is white and puffy, filling two large plastic tubs on racks. I remember a Pillsbury

Dough Boy toy I had. I remember the way the foam took the press of my finger, then sprang back to its original form.

But nothing about this dough is like that. It isn't cute, it is just amazing. And the tubs, they're the size of incubators at a hospital nursery. This fits, because I feel a big responsibility, as if I'm holding someone else's baby.

I've read more than once that dough is a living thing. I've seen it rise above the lip of a bowl in my kitchen. Crest over the rim of a pan. Sure, dough is living.

Touching that dough in that cooler, I understand those words on another level. Dough is living, not like a carrot, pushing its way down and up as it grows, but like people. This stuff has substance and resistance. Dough has presence. It is. I'm not certain I have enough words to describe it.

I am handling 20 pounds of dough. Pulling it toward me and folding it away. The surface is slick and shiny. Pull a carrot from the ground and its potential crunch and taste can thrill you. Touch dough, however, and a whole other world of anticipation touches you. There is a whole lot of something going on in. Another level of almost.

This is visceral. I feel a connection between my hands and my gut, like I am touching something that matters. That matters deeply, and differently than anything else I'd ever touched. This isn't like tree work

or landscaping, when I dragged branches to trucks, and weeds to tarps. That was manual labor, and it felt good, but it never registered inside me. It just felt good to use my body.

Hands in dough is something else, taking me out of my body and putting me into it. How long does it take before bakers grow inured to this magic? Does the sense of wonder ever dissipate? Even if it does fade on a baker's bad day, I am sure it must come back.

Recipe

Mighty Malted Pancakes

1 cup whole wheat pastry flour
2 TBSP malted barley flour
1 tsp baking powder
¼ tsp baking soda
½ tsp salt
2 eggs
1 cup milk
1 TBSP yogurt

Whisk together the dry ingredients, and add the liquids to the same bowl. Combine thoroughly and let rest for 10 minutes.

Heat a griddle until water dances on the surface. Spoon small rounds of batter on the buttered griddle. When bubbles form, flip and cook briefly on the other side.