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Northeastern bakers' views on organic and regeneratively certified flours

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Abstract

There is a continued interest in reviving small and midsize grain mills that allow for more differentiated flour offerings, including mills with environmental benefits. This study seeks to assess Northeastern bakers' and distributors' views on U.S. Department of Agriculture–certified organic flour and potential demand for flour with the Regenerative Organic certification by conducting a survey of bakers and distributors. Results provide evidence that, for multiple reasons, many bakers use both conventional and certified organic flours despite the fact that they cannot call the final product organic and, if budgets allowed, would increase organic flour purchases. Bakers and distributors believe customers do not understand the importance of the organic certification, that customers need to be educated on the Regenerative Organic Certified label, and that bakers would switch to flour with a Regenerative Organic certification if quality and price were comparable to organic.

Keywords

conventional flour, organic flour, local agriculture, regional grain, regenerative organic certification

Introduction

There is continued interest in reviving small and midsize grain mills that allow for more differentiated flour offerings as bread and bakery product manufacturing represents the largest slice of a diversifying food manufacturing sector. In 2015, bread and bakery manufacturing represented 36% of food establishments and 67% of start-ups due to relatively low barriers to start-ups (O'Hara et al., 2021; Low et al, 2021). Commonly, specific "values" are conveyed through labeling systems across the agri-food supply chain, including geography (local, origin-specified), production practices (animal welfare, organic), and health and safety (traceability, free-from dietary restrictions; Onozaka & Thilmany 2011). Increasingly, bread and bakery manufacturers are embracing values-based labeling,

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as evidenced by the 51% increase in certified organic flour sales from 2019 to 2020 (Organic Trade Association [OTA], 2022). Sales of organic flours and baked goods grew by 30% in the same period (McNeill, 2021). Total sales of bread and grains using the certified organic label in 2021 amounted to US$6.2 billion, or 10.8% of total certified organic sales (OTA, 2022).

To support trust in values-based labeling schemes, the farming community led a call for a U.S. Department of Agriculture (USDA) Organic label for organic products. The effort dates back to 1990, when a coalition of farmers united in response to the proliferation of industrial farming practices such as the application of pesticides and herbicides to crops and the utilization of antibiotics in livestock production. In 2002, federal legislation formally instituted the USDA Organic labeling standards. As of 2021, products bearing the USDA Organic label made up almost 6% of the total food market in the U.S., worth US$57.5 billion (OTA, 2022). The Regenerative Organic Certified label (ROC), a community-led, values-based label launched in 2020, aims to address perceived deficiencies within the existing USDA Organic framework. Given demand for USDA-certified organic products, farmers and processors are now considering the newer ROC label and the potential market opportunities. This study assesses the views of Northeastern bakers and distributors on USDA Certified Organic flour and the ROC certification.

Conducted in 2022, this research initiative was commissioned by Farmer Ground Flour (FGF), situated in Trumansburg, New York. FGF is a certified organic micro-mill committed to spearheading the development of a sustainable grain economy in its region. FGF buys grain from local organically certified growers who practice regenerative farming principles, mills the grain with pink granite millstones, and sells the organically certified flour through wholesale and retail channels, mainly in the Northeast. FGF is working with their growers to certify under the ROC program. At this time, products with the ROC certification are few but growing in number. Brands such as Patagonia, Happy Family Organics, Tablas Creek Vineyard, and Alexandre Family Farm (their dairy, specifically) sell products with the certification. Currently, there is one farm producing ROC grains, milling and selling flour, according to the Regenerative Organic Alliance product directory (Regenerative Organic Alliance, n.d.-a).

Certifications communicate to buyers that the production practices of the producer follow the production practices defined by the certification program. The USDA organic certification program integrates cultural, biological, and mechanical practices that promote ecological balance and conserve biodiversity. The certification provides consumers with assurance that producers are adhering to specific USDA Organic practices and are not utilizing genetically modified organisms, certain synthetic chemicals, sewage sludge, irradiation, or genetically engineered plants (USDA Agricultural Marketing Service [USDA AMS], 2011).

The USDA is responsible for developing and writing the organic certification standards and is guided by the National Organics Standards Board (NOSB). The NOSB is a federal advisory board formed in 1992 with 15 volunteer members from organic businesses and interest groups. Because of the diverse advisory board, the USDA definition of organic has been subject to debate and lobbying pressure. The rules have become broader over time and more controversial. For example, hydroponically produced foods can now be certified as organic (USDA AMS, 2016) despite the organic movement's original focus on soil health. The organic program resides in the USDA AMS (n.d.). The explicit objective of AMS is to create domestic and international marketing opportunities for farmers. AMS' objectives do not include health, fair labor, animal welfare, or environmental concerns, concerns that have become a major focus for some consumers. However, to address some of the animal welfare concerns, the USDA recently published a new rule for organic livestock production (USDA, 2023).

In 2017, a group of farmers, business leaders, and other stakeholders focused on regenerative agriculture formed the Regenerative Organic Alliance and worked to develop the ROC program to address issues and limitations with the USDA organic certification. The ROC program, launched in 2020, uses the USDA organic certification as a baseline certification and additionally prioritizes

soil health, biodiversity, and carbon sequestration. The ROC also has holistic standards not addressed in the USDA organic certification, such as ensuring the highest possible standards for treating animals and farm workers (Regenerative Organic Alliance, n.d.-b). This certification also gave a definition and a process to the term "regenerative agriculture," which, unlike "organic agriculture," did not have a comprehensively agreed upon and regulated definition. The definition of "regenerative" has been subject to considerable academic and public debate (Schreefel et al., 2020) due to the complexity of defining regenerative production processes and desired outcomes.

Prior to the ROC, producers who wanted to communicate beyond organic or regenerative production techniques often certified with multiple certifiers to legitimize their claim. With each certification (USDA Organic, Demeter, Animal Welfare Approved, Certified Humane, Fair Trade Certified, etc.), producers had to abide by separate certifying processes, keep separate records, and meet with separate certifiers, involving significant time and expense. With the ROC, a single certification process incorporates the principles of many existing certifications. The Regenerative Organic Alliance has many professionals on its board from the previously mentioned certifying entities, making them well suited to develop and administer the ROC.

Background and Literature Review

According to the Organic Trade Organization, the demand for certified organic flours is currently outstripping supply (McNeill, 2021). One research study found that demand for certified organic wheat and wheat products is driven by a variety of factors that include health and environmental concerns as well as a desire to support sustainable agriculture practices (Curtis et al., 2018). This study found that organic buyers consider the organic label very important in their flour purchasing decision because consumers view labels as providing assurances about the production process (Janssen & Hamm, 2012). This finding is not surprising given that studies have found that the presence of labeling affects consumer perception and buying behavior (Bauer et al., 2013; Meyerding & Merz, 2018).

Demand for certified organic wheat and wheat products is high despite the fact that the products are more expensive than conventional. Research on organic food purchasing has generally found that consumers who value organic production methods are willing to pay a premium for organic products, although the size of the premium varies depending on consumer knowledge and the specific product. A meta-analysis by Li and Kallas (2021) found that the average price for organic foods ranges from 28.2% to 48% more than conventional foods.

Organic food ingredients, as part of manufactured foods, may face a different level of demand than less-processed products, although there is evidence that local food manufacturing patterns seem to match those seen for regions with high levels of local and organic markets (Low et al, 2021). Curtis et al. (2018), in a study of U.S. northwestern consumers, found that some consumers who were very likely to purchase organic were willing to pay almost twice as much for organic bread as other consumers. While there is willingness among some consumers to pay a premium, most consumers find the price of organic food to be the primary barrier to purchasing it (Aschemann-Witzel & Zielke 2017). Similarly, the price of organic wheat flour has been found to be a barrier for bakers (Drugova & Curtis, 2022; Hills et al., 2013). However, bakers, like consumers, are also driven by more than price.

In a small study of 45 bakers in the western U.S., Drugova and Curtis (2022) found that bakers view organic flour as higher quality than conventional flour, although the study concludes that the viewpoint could not be explained by factors examined in the study. Other studies have reviewed the technical aspects of conventional versus organic flour to determine whether there were quality differences. Gallagher et al. (2005) looked at the chemical and baking characteristics of flour from four different organic mills in the U.K. versus an Irish conventional flour and found the flours were of comparable quality with small technical differences that did not affect sensory aspects. Similarly, comparing four organic flours from U.K. mills to a conventional Irish flour, Gonzales-Barron and Butler (2008) found that there were textural differences in organic and conventional bread crumbs. They did not assess which bread flour produced a

higher-quality bread. Toader et al. (2019) found organic wheat flour produced in Romania to be of higher quality than conventional based on a variety of technical factors. Annett et al. (2007) found no difference on 14 sensory attributes, though the organic bread was found to be more dense. Drugova and Curtis (2022) determined that bakers cared most about the final baked product, baking properties, and flour freshness when purchasing organic flour, while other studies (Hills et al., 2013; Torres et al., 2020) found that the most important factors in purchasing organic flour were quality and consistency.

This study adds to the research by delving into how bakers view organic flour and why bakers buy organic flours despite the barriers. The research is specific to the U.S. Northeast, but similar views of organic flour may be found among other bakers across the U.S.

Methodology

Two surveys were developed for phone interviews, one for bakers and an educational culinary institution, and one for distributors. The surveys included both open- and closed-ended questions. The 28 questions asked about basic business characteristics, market channels, flour purchasing habits, purchasing volumes, viewpoints on USDA certified organic flour, and knowledge of the ROC.

Surveys were administered to bakery owners or, in the case of larger bakers and distributors, to the head baker or senior management. Thirty-five bakers were targeted, with 28 ultimately participating. The participants were selected from an extensive database of bakers, distributors, and educational institutions located in the Northeast. The database was developed from organic professional association memberships and industry contacts and through online searches for bakeries and distributors whose websites stated they used certified organic flour. Bakeries considered for the survey were either 100% organic operations or, alternatively, used organic flour in their operations. Bakeries were then categorized by size, and bakeries were randomly selected for interviews from each size category. Targeted bakers were contacted through email and phone calls, with 80% of bakers agreeing to participate in the survey. Results were summarized and analyzed using both Survey Monkey and Microsoft Excel data analysis tools.

Results and Analysis

Representatives from 28 bakeries and three distribution companies and the head baker at an educational culinary institution participated in one-on-one telephone surveys over the first quarter of 2022. Nine of the bakeries surveyed were 100% organic, two bakeries used transitional flours, 16 bakeries used certified organic flour as an ingredient in their nonorganic products, and one bakery was testing organic flour for an organic product line. The geographic composition of the bakeries was as follows: one in Connecticut and one in Maine; two in Massachusetts, Rhode Island, and Vermont; three in New Hampshire and New Jersey, 10 in New York; and four in Pennsylvania. The bakeries varied in the number of employees, years in business, and revenue. Nine bakeries were classified as large with revenues over US$5 million, five were classified as medium-sized bakeries with revenues between US$1 and US$5 million, and 14 bakeries were classified as small with revenues below US$1 million. Of the nine bakeries that used only organic flour, six were small, two were medium, and one was large. All but one bakery sold bread as the primary product, and all but one offered other products, such as cakes, pastries, and cookies. Five bakeries were wholesale only, 11 sold retail and wholesale, and 12 were retail only, including the two in-house bakeries for grocers.

Bakers bought flour from wholesalers, directly from the flour mill, or from farmers (Table 1). Of the 28 bakers interviewed, 29% purchased only from a wholesale distributor, 36% only from a mill, and 25% from both, and 11% bought grain directly from the farmer and milled their own. Four bakeries bought grain from a mill and milled their own. Of the large bakeries, three bought directly from a mill or a farmer, two bought wholesale only, and four bought from a mill and wholesale. Two of the nine large bakeries milled their own flour. Two medium bakeries bought directly from a mill, and three bought directly from a mill and wholesalers. Two of the five medium bakeries milled their own flour. Small bakeries bought from distributors (six) or local mills (six) or direct from the farmer (two).

Three small bakeries milled their own flour. See Table 1 for a complete summary of bakery flour purchasing.

The survey asked bakers about the types of flour they purchased and purchasing volume.[1] All purchased white flour and whole-wheat flour. White bread flour with less than 13% protein was the highest volume of flour purchased by far, with 60% of the bakeries purchasing conventional white bread flour with less than 13% protein and 40% purchasing sustainable/organic.[2] Whole-wheat was the second-highest flour purchased by volume but significantly less than white bread flour, at roughly 30% of the volume. Of the whole-wheat flour purchases, 79% of the bakeries purchased sustainable/organic whole-wheat flour rather than conventional, a significant difference in conventional versus sustainable/organic purchasing when compared to white bread flour purchasing. Total high-extraction (whole-grain flour that contains a high level of bran and germ) flour volume was slightly less than whole-wheat volume, and 64% of the purchasing was for sustainable/organic high-extraction flour. Survey results for high-extraction flour volume may be misleading as one bakery accounted for almost all the sustainable/organic high-extraction volume and 51% of the total high-extraction volume.

The large bakeries in this study were least likely to purchase sustainable/organic flour. Only 17% of the white bread flour purchased by large bakeries was sustainable/organic, while 50% of the white bread flour purchased by small and midsized bakeries was sustainable/organic. Distributors felt that the significant difference in sustainable/organic flour purchasing by bakery size might in part be due to small and midsize bakeries' tendency to have a larger percentage of retail customers. Baker-

Table 1. Bakery Flour Purchasing

	Large (US$5+ Million)		Medium (US$1–5 Million)		Small (>US$1 Million)	All Bakeries		% All Bakeries
Bakeries by Size	9		5		14	28		100%
Flour by Production Method								
Organic Only	1	11%	2	40%	6	43%	9	32%
Organic and Conventional	3	33%	1	20%	6	43%	10	36%
Sustainable and Conventional	2	22%	1	20%	0	0%	3	11%
Sustainable Only	2	22%	0	0%	1	7%	3	11%
Conventional Only	1	11%	1	20%	1	7%	3	11%
Sales Channels								
Wholesale	2	22%	1	20%	2	14%	5	18%
Retail	2	22%	0	0%	10	71%	12	43%
Wholesale and Retail	5	56%	4	80%	2	14%	11	39%
Purchasing Channels								
Wholesale Distributor	2	22%	0	0%	6	43%	8	29%
Flour Mill	2	22%	2	40%	6	43%	10	36%
Distributor & Mill	4	44%	3	60%	0	0%	7	25%
Farmer	1	11%	0	0%	2	14%	3	11%
Mill Flour	2	22%	2	20%	3	36%	7	25%

[1] Some bakers shared exact volumes, while others gave ranges or did not answer the question, making total purchasing volume calculations unreliable. A conservative estimate of the total monthly volume for all flour types purchased by all the bakers that answered the question exceeded 1.7 million pounds.

[2] "Sustainable" is defined as flour bought from transitional suppliers or local farms that were not certified but used organic production practices known by the baker.

Table 2. Organic and Conventional Flour Purchase Patterns[a]

Flour Type	# Bakeries Purchasing Flour Type	% Purchasing Conventional	% Purchasing Sustainable/Organic[b]
White bread flour <13% protein	20	60%	40%
White bread flour >13% protein	9	67%	33%
Whole-wheat flour	28	21%	79%
Whole-wheat all purpose	6	17%	83%
Whole-wheat pastry	3	0%	100%
High-extraction (half-white, sifted bread flour)	14	36%	64%
All-purpose flour	8	50%	50%
White pastry flour	5	60%	40%

[a] Not all bakeries disclosed flour types.
[b] "Sustainable" is defined as flour bought from transitional suppliers or local farms that were not certified but had organic production practices known by the baker.

ies selling to retail customers could charge customers more for bread, thereby covering the higher cost of organic flour, as they could communicate directly to customers the value of certified organic flours. Table 2 reports the number of bakeries purchasing a specific type of flour and whether the flours were conventional or sustainable/organic.

When bakers using conventional flour were asked if they wanted to use more certified organic flour, 82% of the bakers responded that they wanted to use more. Many bakers stated they did not use certified organic because of the cost. At the time of the research, the cost of certified organic white bread flour was significantly more expensive than conventional. For example, conventional high-protein white bread flour cost US$20.55 for a 50 lb. (23 kg) bag, compared to US$38.13 for organic high-protein white bread flour.[3] Certified organic whole-wheat flour was also more expensive than conventional but less so. Conventional whole-wheat flour cost US$26.13 for a 50 lb. (23 kg) bag, while certified organic whole-wheat cost US$38.14 for a 50 lb. (23g) bag.[4] Certified organic white bread flour was 86% more than conventional white pricing, while certified organic whole-wheat was only 46% more than conventional pricing. See Figure 1 for an example of the price differential between a bushel (approximately 42 lbs., or 19 kg) of conventional versus organic whole-wheat.

The price differential partially explains why bakers purchased certified organic whole-wheat at a higher rate than white bread flour. Bakers stated they were blending certified organic whole-wheat flour with conventional flour, despite the fact that they could not call the bread organic and receive the price premium organic brings. The survey found that bakers were blending certified organic flour with conventional flour for the following reasons:

1. Bakers stated that whole-wheat flours add flavor to bread and felt the flavor and baking properties of certified organic whole-wheat flours, especially organic whole-wheat flours from local mills, were superior to conventional. These views align with findings by Drugova and Curtis (2022). Similarly, a consumer survey conducted by Annett et al. (2008) found that bread made from organic wheat flour was preferred by consumers in both blind and labeled taste tests.
2. Bakers explained that by blending the less expensive conventional white flour with the more expensive, preferred certified organic whole-wheat flour, they were able to main-

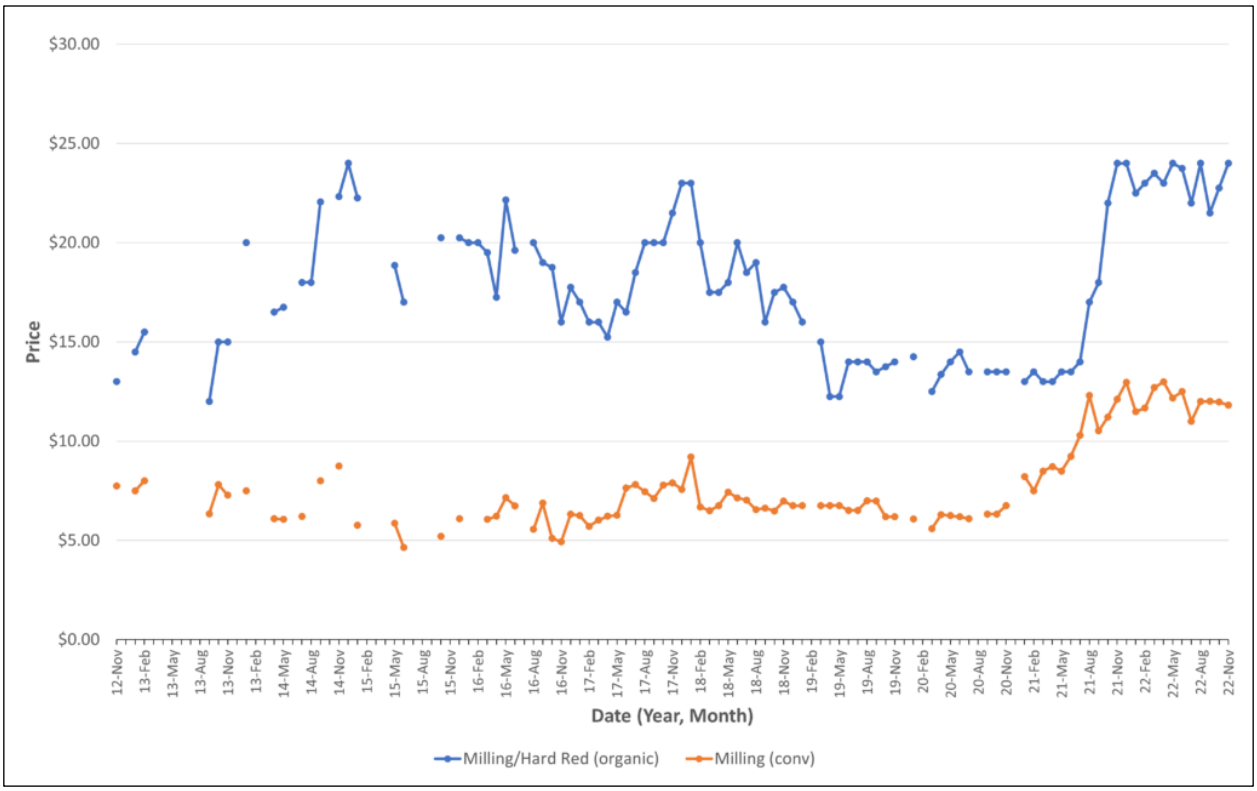
[3] Interview with distributor, March 1, 2022.
[4] Interview with distributor, March 1, 2022.

tain an acceptable price point for the bread while achieving the flavors and other attributes the bakers sought.
3. The price differential between conventional and organic was smaller for whole-wheat than for white flour.
4. Bakers felt it was easier to justify spending slightly more for the certified organic whole-wheat as whole-wheat constituted a small volume ingredient in the bread.
5. Bakers preferred certified organic because they felt it was better for people's health and the planet.
6. Bakers, especially at small bakeries, placed emphasis on their own value system when making purchasing decisions and believed their customers bought bread from them because of those values.

Three small bakeries purchased flour from farmers or mills that followed organic production practices but were not certified. These bakers felt customers trusted the bakery's values, and the bakers could communicate the story of the farm or mill's sustainable production practices to customers. Furthermore, the bakers felt sustainable flours were a good substitute for the more expensive certified organic option. Two large bakeries purchased sustainable flour from mills working with growers transitioning to certified organic. In these two cases, the bakeries communicated the value of sustainable production practices through advertising and touted their support in helping to transform the industry.

The cost of certified organic flours was the biggest barrier, but several other barriers also kept bakers from using more certified organic flour. Recent supply chain price increases created a significant barrier to increasing certified organic flour purchasing. Bakers reported the costs of all supplies had increased substantially and had forced many bakers to raise their bread prices. Many

Figure 1. Price per Bushel for Milling of Conventional versus Organic Wheat, November 2012 – November 2022



Source: Pivot and Grow (n.d.).

stated it would be difficult to increase prices any further to cover the higher cost of certified organic flour.

Bakers stated that the market channel they sold into also dictated whether they purchased certified organic or conventional flours. Most bakers said customers were price-sensitive and demand was based on affordability. Bakers selling into wholesale channels felt wholesale buyers were much more price-sensitive than retail buyers and wholesale cared less about certified organic. Bakers serving retail markets were more likely to sell bread made with certified organic flour as they felt they could charge more for the loaf by explaining to the customer why the price of the bread was higher. Bakers also said customers wanted to feel good about spending more money and felt customers would buy the product if there was a farm-based story or certification to justify the higher price.

Distributors agreed the most significant barrier to bakers buying more certified organic flours was the price. However, distributors felt that given disrupted supply chains, multiple years of weather-related poor harvest, and the war in Ukraine, the price differential between conventional flours and organic was narrowing, and certified organic flours, especially locally produced organic flours, might become competitive with conventional. Distributors felt that certified organic flours were a growing category, with new bakers taking the lead in purchasing.

Lack of supply was the next stated barrier to bakers using more certified organic flours. Fifty percent of the bakers stated that certified organic flours were difficult to source. However, when asked which certified organic flours were difficult to source, the answers ranged widely, with bakers mentioning high-extraction, whole-wheat, specialty flours or, even, all flours. Supply issues may stem from the habit of bakers purchasing most of their flour needs from one supplier, and perhaps from minimum order sizes from distributors. If the bakery's supplier did not carry the flour type, some bakers felt that the product was in short supply. A few bakers, mostly the smaller operations, stated they did not have time to research new flour suppliers. If they found a new supplier, they were concerned the new supplier would be unaffordable due to shipping fees. Distributors believed there was a sufficient supply of all organic flours but that there were occasional shortages of specific brands.

Three bakeries and two distributors mentioned that certified organic flours had inconsistent attributes or quality issues. Quality primarily referred to the attributes of the flour across batches. At smaller mills, flour batches vary slightly in attributes as the mills are blending from fewer and smaller farms than the larger mills. Flour with varying attributes across batches requires skilled bakers or a production system that can easily implement recipe changes to accommodate the varying attributes. Distributors felt that few certified organic flour brands were as consistent as conventional commodity flours. Small and midsize bakeries identified King Arthur as having the most consistent certified organic flour, and many bakers purchased the brand's flour. Distributors perceived "old-school" bakers as less likely to buy certified organic as they may not have been trained to work with organic flours. One baker and all the distributors mentioned that bakers needed technical assistance from smaller flour mills due to the variations in flour attributes.

When asked what the most important market labels or certifications for bread were, 89% of bakers felt local was the most important label to their customers. Bakers believed the local label was important prior to the pandemic and became even more important during the pandemic as more consumers learned the importance of local businesses and local food supply chains. Seventy-nine percent of the bakeries used the local label to market their products. When asked the definition of "local," the answer varied widely, similar to findings in a wheat and flour study in western Washington state (Hills et al., 2013). Baker definitions appeared to be based on two main concepts: the baker's values and their perceptions of key drivers or labeling claims for customers. "Local" could mean that the bread came from the community or town, from within 40 to 250 miles, or from the state, New England, the Northeast, or the Eastern Seaboard. The term "regional" was substituted for "local" if local flour was unavailable within the bakers' definition of local. Interestingly, 75% of the bakers said they were willing to pay more for local flour, although

how much more was not indicated.

Bakers and distributors believed that most customers prioritized local, followed by sustainable and then organic when evaluating product labels. Bakers who had 100% certified-organic operations thought their customers valued baked goods made from certified organic flour. However, bakers were uncertain if the customers cared about the actual organic certification. In other words, these bakers thought that when some customers heard the word "organic," they did not fully understand the importance of the certification. Almost all the bakers and all the distributors believed that only some customers understood the significance of the organic certification or the meaning of certified organic. This belief aligns with research on consumer awareness of certified organic production standards (Drugova & Curtis, 2019; Meas et al., 2015). Nevertheless, extensive academic research has shown that consumers place trust in the certification and that the certification plays a crucial role in food choices (Annunziata & Vecchio, 2016; Bauer et al., 2013; Meyerding & Merz, 2018).

Notwithstanding the belief that consumers don't understand the role of the certification, bakers appeared to be committed to using certified organic flours because of flavor, health, personal values, and environmental concerns. Certification was seen as more important when the ultimate consumer bought bread through a third party. Bakers selling directly to consumers felt they were able to tell a story of sustainability and, therefore, the certification mattered less. See Table 3 for a summary of bakery opinions of customer views on certified organic flours.

Despite the stated barriers to using certified organic flour and the bakery marketing emphasis on local, 90% of the bakers believed that the retail and wholesale markets were moving toward sustainable or certified organic baked goods. While distributors viewed large bakeries and "old-school" bakers as less open to changing formulas or flour brands, they stated that the market was moving toward organically certified flours for health reasons and concerns for the planet.

Distributors felt the organic market was growing 10–15% a year and would grow faster if the price between conventional and organic flours narrowed. They noted that young bakers were setting the trends on bread and interest in protecting the planet and health reasons were increasing the demand. Distributors thought organic was more important to younger consumers but that all customers had learned to appreciate high-quality bread in the last two years. The largest distributor noted that bakeries were their strongest growth area, with many bakers looking to add an organic product line and some potentially looking to become certified organic bakeries. The same distributor stated that when restaurants figure out how to convey the certified-organic value proposition to their customers, demand for certified organic flour would increase.

In addition to buying more certified organic flour, bakers wanted to bake more bread with whole grains and whole-wheat flour but did not, as they felt customer demand was insufficient. Specifically, 79% of bakers were interested in offering more bread with higher whole-grain content. Bakers explained retail customers came in looking for whole-grain bread and then migrated to the white or whiter breads. As to why customers purchased white bread over whole-wheat, bakers provided anecdotal evidence such as customers like comfort food, other items look more appealing once the customer walks into the store, bread with a high percentage of whole grains is too heavy, the taste is not appealing, and white bread is cheaper. Several bakers believed that whole-grain products needed

Table 3. Bakery Perceptions of Customer Values on Certified Organic Flour by Grain Production Method

	Do customers care about organic certification?			Do customers value breads made from certified organic flour?		
	Yes	Maybe	No	Yes	Maybe	No
100% organic bakeries	4	4	1	7	1	1
Conventional bakeries	5	7	7	10	5	4
Total	**9**	**11**	**8**	**17**	**6**	**5**

to taste similar to white. Despite these impressions, bakers reported selling more whole-grain products through their retail channels than wholesale channels.

All bakers and distributors interviewed felt that as customers became more educated on the attributes of higher-quality bread, they would move toward whole-grain content in bread and felt that younger people appeared to be more open to eating higher whole-grain content. Distributors felt that some consumers had already shifted from white toward darker bread for health reasons and believed that it would take a decade for the rest of the market to move in that direction. One distributor noted that farmers markets were driving the demand for good bread made from whole grains.

The culinary institution felt strongly about bread being marketed as whole-wheat. In Europe, whole-wheat bread must use 90–100% whole grains, as the definition of what qualifies as whole-wheat bread is regulated. The U.S. has no such regulation. However, the Whole Grains Council has a whole-grain stamp for bread that contains at least 51% whole grain. The culinary institution in this research wanted whole-wheat definitions to be regulated in the U.S., similar to countries in Europe, so consumers would have a clearer understanding of what is actually in a whole-grain product.

When bakers were asked if they were familiar with the term "regenerative" and the ROC, 90% of the bakers were not. Once learning about ROC and its principles, 87% of the bakers said regeneratively produced flours would be of value to their customers, and 97% of the bakers were interested in purchasing regeneratively certified flours if the price was similar to certified organic. Bakers felt strongly that the public needed to be educated about the meaning of regenerative if they were to use ROC flour. Bakers felt many customers were already confused about the meaning of the terms "local," "sustainable," and "certified organic" and that adding yet another term without marketing support would increase confusion. Distributors were also unfamiliar with the ROC but said they would carry regeneratively produced flours if there was demand. They also stated customers would need to be educated on the term and the price point would have to be competitive.

Summary and Conclusion

This study assessed Northeastern bakers' and distributors' views on USDA Certified Organic flour and potential demand for Regenerative Organic Certified flour. The study established a bakery preference for certified organic whole-wheat flour over conventional whole-wheat, especially organic whole-wheat flour from local mills. The study also revealed that bakers would purchase more certified organic flour if budgets allowed, even though the local label resonated more with customers. Bakers wanted to use more certified organic despite believing that while customers valued the term "organic," the importance of the certification might not be fully appreciated or valued by customers. They felt only a minority of customers understood the meaning and importance of the USDA organic certification. The perceived lack of customer understanding and appreciation created hesitancy among bakers to purchase flour with a new certification. Bakers did not know the term "regenerative" or about the Regenerative Organic Certified label. However, once they learned that the ROC used the USDA Organic Certification as a basis and also focused on soil health, biodiversity, carbon sequestration, and worker and animal rights, bakers were very interested in purchasing ROC flour if the price point was competitive with certified organic.

According to the Organic Trade Association, the certified organic flour and bread market accounted for 10.8% of the total US$6.2 billion organic market in 2021, and a growing segment of consumer organic purchases (OTA, 2022). The availability of ROC flour may increase the overall market demand for certified organic flours or cause a shift to ROC flour once the term "regenerative" and the regenerative certification is better known and promoted. Consumers and bakers who already understand the principles behind the ROC or are closely aligned with the regenerative movement may be the early adopters of ROC flour. However, before demand increases substantially for goods produced with a Regenerative Organic Certification, bakers and the public will need to be educated. Without education, and the assumed increase in demand that education would drive, it will be difficult for millers to persuade farmers to

adopt regenerative practices or the Regenerative Organic certification.

The study also uncovered previously unreported bakery behavior in blending conventional and USDA certified organic flour even though the bakery could not label the final product as organic. Blending conventional white and organic whole-wheat flours allowed the bakery to achieve a perceived superior flavor and texture over using 100% conventional flours while maintaining an acceptable price point for the bread. Using organic flour also allowed bakers to bring their concerns for people's health and the planet into their practice. Although this study focused on northeastern bakers, the findings of blending and the viewpoints on organic whole-wheat flour, organic certification, and the ROC are unlikely to be unique to the region.

Research, Policy, and Practice Recommendations

This study was small and limited to the U.S. Northeast but provides insight into baker behavior and the use of organic flour and potential for ROC flour. Further research into understanding baker preferences and barriers to utilizing more certified organic flour would support growth in the organic and regenerative grain and flour industry. A literature review revealed baker organic flour preferences are understudied, as is household-level demand for organic versus conventional flour and other aspects of the organic and regenerative supply chain. Increasing the use of regenerative and soil health–focused organic grains and flours has the potential to address many environmental challenges facing agriculture, such as climate change, soil degradation, and loss of biodiversity. As such, further research, supportive policies, and practical implementation are needed to promote the industry. Research policy and practice recommendations arising from the research are as follows:

- Research factors driving the price difference between conventional, organic, and regeneratively produced grains and flour and the price premiums bakers and consumers are willing to pay for organic and ROC grains and flours.
- Research the quality and attributes of conventional versus organic versus regeneratively produced flours, including small or regional mills versus large mills.
- Undertake a larger study to understand baker and consumer preferences and barriers to using more certified organic flour and develop practices and policies that address these barriers.
- Develop robust national and regional sales data for USDA Certified Organic and ROC grains and flour.
- Research and develop effective communication strategies that educate on food labeling, the importance of USDA Organic certification, and the difference between the terms "local," "sustainable," "certified organic," "ROC," and so forth.

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