

*Draft Only*  
**Bakery Organic Wheat Flour Quality and Quantity Requirements**

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**Introduction**

Organic wheat acreage represented 1.2% of all wheat acreage in the U.S. in 2019 (USDA NASS, 2020a; USDA NASS, 2020b). The Intermountain West states of Montana, Wyoming, Utah, and Colorado have been among the top five organic wheat producing states in terms of organic wheat acreage consistently since 2010, accounting jointly for 54% of all U.S. organic wheat acreage in in 2019 (USDA NASS, 2020a). At the same time, consumer demand for organic foods experiences annual double-digit growth. Sales in the organic breads and grains category has grown steadily and was the fifth largest category of organic products sold by 2014, accounting for 9% of total U.S organic food sales (USDA-ERS, 2017). However, the market for organic grains continues to be constrained by lack of supply (Koory, 2018). Organic grain acreage increased by only 20% between 2008 and 2016 while the organic meat industry tripled production during the same period (McNeil, 2019). In 2019, organic food-grade wheat averaged \$12.20/bushel, significantly higher than conventionally grown wheat selling at \$5.35/bushel (USDA-AMS, 2019). Hence, the market for organic wheat is promising if growers can maintain profitability. Given the significant contribution of the Intermountain West’s production to domestic organic wheat supply, it’s important that growers and millers understand the needs of organic wheat users.

The objective of this fact sheet is to summarize the findings of a survey conducted with bakery owners and managers to assess their organic wheat flour quality and sourcing needs. We examine the importance of various quality measures in bakery decisions to purchase organic flour, as well as baker perceptions of organic and conventional wheat flour quality. We also discuss the hurdles and issues that bakeries face when purchasing organic flour, and what prevents them from using organic flour if not currently doing so. The information in this factsheet will be important to organic wheat millers, growers, and breeders.

**Bakery Survey Overview**

The bakery survey data were collected between December 2020 and February 2021 using an online platform. A total of 45 bakeries responded to the survey. The majority are located in western U.S. states (93%), most frequently in California (20%), Colorado (18%), Oregon (16%), Utah (9%), and Washington (9%). Of the 45 bakeries, 37 use organic wheat flour currently or have used it in the past and eight bakeries have never used organic wheat flour. The majority of the bakeries using organic wheat flour are artisan bakeries selling directly to consumers (57%) through their store (54%). They vary in size in terms of number of employees, years in business, and monthly gross sales. Bakeries that have not used organic wheat flour are primarily privately owned wholesale bakeries (50%), selling to restaurants and cafes (50%). They also tend to have a large number of employees (50% over 20 employees), have been in business longer (63% over 20 years), and have larger monthly gross sales (63% report \$70,000 or more). Regardless of organic wheat flour use, the vast majority of bakeries surveyed sell bread. Other products sold by more than 60% of the bakeries include cookies, croissants, and pastries.

Table 1 provides details related to baker current and past use of organic wheat flour. Overall, the bakeries indicated that they use or used organic whole wheat bread flour (86%), followed by organic white bread flour (70%) and organic all-purpose flour (49%) regularly. Organic white bread flour is used most 49% often followed by organic whole wheat bread flour. The bakeries source organic wheat flour from millers (67%) and distributors, wholesalers, and brokers (64%) and utilize between 1 to 2 suppliers (73%). Among surveyed bakeries, 54% have used organic wheat flour for five years or less.

Table 1. Specifics related to organic flour use (N=37)

Characteristic	Category	N	Percentage
Organic wheat flour used regularly/monthly <sup>a</sup>	Organic white, bread	26	70%
	Organic white, cake/pastry	9	24%
	Organic whole wheat, bread	32	86%
	Organic whole wheat, cake/pastry	8	22%
	Organic all purpose	18	49%
Organic wheat flour used most	Organic white, bread	18	49%
	Organic white, cake/pastry	1	3%
	Organic whole wheat, bread	8	22%
	Organic whole wheat, cake/pastry	0	0%
	Organic all purpose	3	8%
	Other	3	8%
Organic wheat flour source <sup>a</sup>	All/many	4	11%
	Own milling facility	4	11%
	Millers	24	67%
	Distributors, wholesales, brokers	23	64%
	Number of regular organic wheat flour suppliers	None (own mill)	3
1-2 suppliers		27	73%
3-4 suppliers		6	16%
5-8 suppliers		1	3%
More than 8 suppliers		0	0%
Years using organic wheat flour	1-2 years	6	16%
	3-5 years	14	38%
	6-10 years	6	16%
	11-20 years	7	19%
	More than 20 years	4	11%

<sup>a</sup> Respondents could select multiple options, so percentages do not add up to 100%.

### Importance of Organic Wheat Flour Quality

The bakeries that use organic wheat flour were asked to rank the importance of various factors when making organic flour purchase decisions on a scale of 1=“not at all important” to 5=“extremely important.” We calculated the average ranking for each factor and ordered them from most important (highest average ranking) to least important (lowest average ranking). Results in Table 2 show that attributes of the final baked product is the most important factor, followed by baking properties and flour freshness. Quality aspects of flour and consistent quality between shipments are among the top five most important factors, while price is the least important factor overall.

Table 2. Importance of factors when purchasing organic wheat

<b>Factor</b>	<b>Mean</b>
Attributes of the final baked product	4.65
Baking properties	4.41
Flour freshness	4.38
Quality aspects of flour	4.19
Consistent quality/performance between shipments	4.19
Flour origin	4.08
Interaction/relationship with the supplier or miller	3.95
Wheat origin	3.95
Quality aspects of resulting dough	3.94
Consumer demand for organic/healthier bakery products	3.92
On-time delivery	3.70
Services provided by supplier	3.70
Price	3.27

### Perceptions of Organic Wheat Flour Quality

The bakeries were also asked to rate the overall quality of organic and conventional wheat flour on a scale from 1=“very low quality” to 5=“very high quality.” The average ranking of organic flour quality (4.25) was higher than the ranking of conventional flour quality (3.69), and the difference is statistically significant. Eight six percent of the bakeries consider organic flour to be high or very high quality, while only 59% feel conventional flour is high quality.

We also asked the bakeries which characteristics they view as important indicators of organic wheat flour quality, and for the important characteristics, whether they perceive organic flour to be inferior to conventional flour. Table 3 shows that protein quality and content, nutritional content, water absorption, flour texture, and ash content are important to more than half of the bakeries, but at most 11% perceive organic flour to be inferior in these characteristics. The remaining characteristics were considered important by less than half of the bakeries, and again only a few considered organic flour to be inferior.

Table 3. Important indicators of organic wheat flour quality

<b>Quality characteristic</b>	<b>Important<sup>a</sup></b>	<b>Organic inferior<sup>b</sup></b>
Protein quality	27 (73%)	3 (11%)
Protein content	25 (68%)	2 (8%)
Nutritional content	23 (62%)	1 (4%)
Water absorption	22 (59%)	2 (9%)
Flour texture	21 (57%)	2 (10%)
Ash content	19 (51%)	0 (0%)
Dough strength/alveograph values (P, L, W)	18 (49%)	2 (11%)
Dough stability time	17 (46%)	2 (12%)
Wet gluten test/gluten content and quality	17 (46%)	1 (6%)
Dough development time/peak time	16 (43%)	3 (19%)
Mixing tolerance index	15 (41%)	1 (7%)
Flour color	15 (41%)	0 (0%)
Dough extensibility and resistance/extensigraph values (E, R)	14 (38%)	2 (14%)
Enzyme activity/flour falling number	14 (38%)	1 (7%)
Viscosity/flour starch properties	9 (24%)	1 (11%)

<sup>a</sup> Percentages represent the share of those who viewed the characteristic as important among those who use organic flour currently or in the past.

<sup>b</sup> Percentages represent the share of those who indicated that organic flour is inferior to conventional among those who viewed the characteristic as important.

### Hurdles Impacting Organic Wheat Flour Use

We also examined the hurdles bakeries face when securing their desired organic wheat flour quality or quantity, as well as issues preventing those who have not used organic flour from using it. Those who have experience using organic flour (currently or in the past) were asked whether they perceive certain issues to be hurdles on a scale from 1=“not a hurdle” to 3=“definitely a hurdle.” Averages reported in Table 4 show that the price of organic wheat berries or flour is perceived as the biggest hurdle, with 61% viewing price as a hurdle. Difficulty finding organic flour suppliers and not enough interaction with suppliers are considered hurdles by at least one third of respondents.

Table 4. Hurdles to securing desired quality or quantity of organic wheat flour

Hurdle	Mean	Not a hurdle	Somewhat of a hurdle	Definitely a hurdle
Cost/price of organic wheat berries/flour	1.81	39%	42%	19%
Difficulty finding organic wheat berries/flour suppliers	1.49	60%	31%	9%
Not enough interaction with wheat berries/flour suppliers	1.48	67%	18%	15%
Complexity of handling and transporting organic wheat berries/flour	1.36	73%	18%	9%
Suppliers do not understand our quality requirements	1.31	75%	19%	6%
Suppliers are unable to verify some of the quality requirements	1.30	73%	24%	3%
Contamination of organic wheat berries/flour during handling and transportation	1.09	91%	9%	0%

Only a minority of the bakeries had issues sourcing organic flour (20% agree that they need more organic wheat berries/flour than their suppliers can provide) or finding quality organic flour (23% agree that they need organic wheat berries/flour of higher quality than their suppliers currently provide). However, since bakeries see organic wheat pricing as a primary hurdle, they may require additional organic wheat if the price was lower. Of the bakeries who had stopped using organic wheat flour (N=6), two selected flour price as the reason. Two others selected lack of consumer interest in organic bakery products (of which one hinted that the higher price is the issue), although 76% of those who have experience using organic wheat flour agree that the consumer demand for healthier/organic bakery products is strong.

Price is also the major reason that bakeries who haven’t used organic flour don’t plan to do so in the future (6 out of 8 respondents). Other selected issues include concerns related to supply, consumer demand, difficulty complying with USDA organic standards, and concerns related to final bakery products (2 out of 8 respondents for each).

### Conclusions

While the bakery survey results show that quality and consistency are not the most important factors when bakeries purchase organic wheat flour, they are among the top five. Overall, organic wheat flour is perceived to be of higher quality than conventional flour. Protein quality

and content are viewed as important quality characteristics most frequently, and very few bakeries perceive organic flour to be inferior to conventional flour. More important than organic flour quality are the attributes of the final baked product and flour baking performance, but these are certainly affected by flour quality.

While price is viewed by bakeries as the least important factor when purchasing organic wheat flour, it was viewed as a major hurdle to securing organic flour among those who have previously purchased it. Price is also the most frequently selected issue among those who have never used organic wheat flour. Hence, lower pricing may likely increase bakery use of organic wheat flour. Interestingly, bakeries stated that consumer interest in organic bakery products was strong, but it seems their customers are not willing to pay the prices needed to justify the use of organic flour for some bakeries. Understanding customer needs and the factors which impact their demand for organic bakery products will be essential to product choice and pricing, as well as the decision to provide organic options.

## References

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