

# OAT MILLING FEASIBILITY STUDY

**An Evaluation to Determine the Feasibility of an  
Oat Milling Facility at Kohler Company  
January, 2016**

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Research Center

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## Table of Contents

<b>Executive Summary</b> .....	<b>3</b>
<b>Overview</b> .....	<b>4</b>
<b>Conclusions</b> .....	<b>4</b>
<b>Findings - Breakeven Analysis</b> .....	<b>6</b>
Scenario 1.....	6
Scenario 2.....	10
Scenario 3.....	13
Scenario 4.....	14
<b>Value Chain</b> .....	<b>15</b>
<b>Production Costs</b> .....	<b>157</b>
<b>The Mill</b> .....	<b>18</b>
<b>Capital Costs</b> .....	<b>18</b>
<b>Building and Storage</b> .....	<b>20</b>
<b>Labor</b> .....	<b>21</b>
<b>Transportation</b> .....	<b>210</b>
<b>Utilities</b> .....	<b>21</b>
<b>Price</b> .....	<b>22</b>
<b>Target Market</b> .....	<b>22</b>
<b>Market Assessment Executive Summary</b> .....	<b>24</b>
<b>Summary of Business Interviews</b> .....	<b>26</b>
Purchasers.....	26
<b>Competitive Analysis</b> .....	<b>36</b>
<b>Market and Industry Analysis</b> .....	<b>37</b>
Industry Analysis Table: Key Metrics .....	37
Bakery .....	38
Bakery Products .....	39
Breweries/Alcohol.....	39
Cereal .....	40
Gluten/Wheat Free & Global Oats Market .....	41
Global Oat Flakes Market.....	42
Milling .....	42
<b>References</b> .....	<b>44</b>
<b>Appendix</b> .....	<b>52</b>

## Executive Summary

- The study found the market size for milled oats within a 150-mile radius of the Kohler Company appears to be between 1,200 and 1,500 tons annually. The Wisconsin oat market is somewhat saturated with high quality oats being produced from established providers with a loyal customer base. There is no expected increase in future demand in the study area.
- Commercial buyers have access to high quality oats for as low as \$440 per ton with a 30% variance based on 18 years of data.
- Oat milling equipment including packaging equipment, will cost \$135,277 and will process 5 tons of oats per hour.
- Total Capital Costs for facility build out for the Oat Milling Operation would be \$1,110,522
- Milling Operation EBIDTA (earnings before interest, depreciation, taxes, and amortization) Breakeven: **will not be reached** after using commercial milling equipment and farming existing Kohler Company farmland (700 acres). Capturing the entire Wisconsin oat market within a 150-mile radius of Kohler Company **will not be reached as well**. While obtaining 100% of the market is not achievable, it provides the ‘best case’ scenario. However, it should be noted, that even in this scenario, the project is not profitable. It is simply less unprofitable.
- In Scenario 4, a positive return on investment (ROI) would be reached once the facility is completely depreciated in 20 years, according to the Generally Accepted Accounting Principles (GAAP) Depreciation schedule.
- FERC recommends Kohler Company not expand into the production and milling of oats because the market is already saturated and current demand is being met from established milling operations with a loyal customer base that would be difficult to attract. In addition, market research shows no incremental forecasted increase in demand in the foreseeable future.
- Other factors influencing this recommendation include substantial capital costs associated with purchasing the equipment, building the facility and unfavorable timelines to breakeven points. Oat pricing elasticity and variances factor into this equation as well.

## Overview

The objective of this feasibility study is to provide an overview of the oat milling infrastructure needs and challenges for the Kohler Company, and to offer potential options and practical advice. It provides an example of the investment and infrastructure required to build an oat mill sized and scaled appropriately for the Kohler Company, make recommendations for the equipment required and the costs for build out of a new facility, estimate what it might cost to operate such a milling operation including pricing and markets, and establish whether there would be a market for the milling operation, and the financial feasibility of such a venture.

Market research was conducted to assess the feasibility of the Kohler Company providing milling services to oat growers and selling milled oat products to buyers in the Wisconsin area. This research identifies target markets and potential clients for Kohler, and provides a market assessment of the projected growth of various markets, including oats and oat products, gluten free oat products, craft breweries, bakeries, and specialty stores.

The study was completed through extensive interviews with existing milling operations, mill suppliers, grain growers, and buyers from craft breweries, commercial bakeries, and specialty stores, as well as by reviewing third party research.

## Conclusions

### Market Size and Saturation

The study found that the Wisconsin oat market is somewhat saturated with high quality oats being produced from established providers with a loyal customer following. Commercial buyers have access to high quality milled oats, for as little as \$440 per ton. The study found the market size for oats in the Kohler Region is between 1,200 and 1,500 tons per year. It was also found that the overall perception in the market is one of satisfaction with current suppliers and no strong evidence of market growth.

Market research confirmed that the largest market for oats in the 150-mile region surrounding Kohler, Wisconsin is in commercial baked goods (estimated 800 tons of oats annually). However, a substantial number of commercial bakeries do not source oats at all. Specialty food stores — including food cooperatives and health stores with an interest in a new line of gluten free oats — account for approximately 80 tons of oats annually. If all grocery stores, excluding convenience stores, were counted, the market demand would equate to approximately 500 tons of oats sold within the 150-mile radius, however, this demand is already being supplied. Breweries, in contrast, source approximately 225 tons of oats annually, to produce stout beers, where oats are used as a main ingredient.

### Milling Operation EBIDTA Breakeven: Kohler Company's 700 acres

A commercial scale oat milling operation located at the Kohler Company, and milling 700 acres of oat production, **will not breakeven on an EBIDTA cash flow basis** (earnings before

interest, depreciation, taxes, and amortization), selling milled oats at \$440 per ton, based on the calculated total revenue, variable costs and capital costs.

	Median Price	Price Variance (+30%)	Price Variance (-30%)
<b>Total Revenue</b>	\$93,278	\$121,261	\$65,295
<b>Final Total Capital Costs</b>	\$674,465	\$674,465	\$674,465
<b>Total Variable Costs</b>	\$124,728	\$124,728	\$124,728
<b>Total Revenue Less Variable Costs (EBTIDA)</b>	-\$31,450	-\$3,467	-\$59,433
<b>Breakeven Point (years)</b>	<b>Never</b>	<b>Never</b>	<b>Never</b>

Note: In Wisconsin, oats can be harvested once a year.

### **Milling Operation EBIDTA Breakeven: Capturing Entire Wisconsin Oat Market within 150-mile radius of Kohler Company**

The market demand for milled oats within a 150-mile radius of Kohler Company is between 1,200 and 1,500 tons of oats annually. A median of 1,350 tons was used for this study.

A commercial Oat milling operation located at the Kohler Company, milling 1,350 tons of oats, **will not breakeven on an EBIDTA cash flow basis, selling oats at \$440 per ton**, based on the calculated total revenue, variable costs and capital costs. Kohler Company can only produce 379 tons of oats and would need to make up the difference by purchasing 971 tons of oats to meet market demand.

#### **Scenario 2: Breakeven**

	Median Price	Price Variance (+30%)	Price Variance (-30%)
<b>Total Revenue</b>	\$332,736	\$432,556	\$232,915
<b>Final Capital Costs</b>	\$1,110,522	\$1,110,522	\$1,110,522
<b>Total Variable Costs</b>	\$351,976	\$351,976	\$351,976
<b>Total Revenue Less Variable Costs (EBTIDA)</b>	-\$19,240	\$80,580	-\$119,061
<b>Breakeven Point (years)</b>	<b>Never</b>	<b>12.53</b>	<b>Never</b>

Note: In Wisconsin, oats can be harvested once a year.

#### **Start Up Capital**

Gaining traction in a saturated market is the most difficult type of product entry, requiring a prolonged market adoption rate, and increased marketing efforts and investment. This, in addition to the price being too low, is the main obstacle from entering the market.

Market research found the cost of oat milling equipment is \$135,277, for the scale Kohler Co would be operating. Utilizing a selling price of \$440 per ton for oat flakes with a 30% variance and oat yields from the past five years, a breakeven point will not be reached from 700 acres Kohler already owns. In order to capture the entire market within a 150-mile radius, Kohler Company would need 2,497 acres of oats to meet market demand. Breakeven will not be reached

#### Start Up Capital for Small-scale Operations

	Small-scale Capital
Total Storage of Oats & Equipment	\$ 550,834
Cost of New Facility	\$ 323,504
Oat Milling and Packaging Equipment Costs	\$ 135,227
Sub Total Capital Costs	\$ 1,009,565
Contingency Cost (10%)	\$ 100,957
Total Capital Costs	\$1,110,522

Note: Contingency Cost is the cost of permits, licenses and other startup costs.

#### Recommendation

FERC recommends Kohler Company not to use its financial resources to expand into the production and milling of oats, due to the fact that the market is already saturated and current demand is being met with satisfaction from established milling operations with loyal customers. In addition, the market research showed no incremental forecasted increase in demand in the foreseeable future. Other factors for this recommendation include substantial capital costs associated with purchasing the equipment, building the facility and unfavorable timelines to breakeven points. Oat pricing elasticity and variances favor this recommendation as well.

## Findings - Breakeven Analysis

#### Scenario 1: Small Scale milling Operation - Kohler Company's 700 acres

In this Scenario, Kohler Company expends the capital necessary to start and launch the small scale oat mill. The company uses their 700 acres of farmland to grow oats. After harvest, the oats will be transported to a mill which will also be owned by Kohler Company. Here the oats will be processed and packaged to be shipped to customers. The price for oats over the past 18 years has reflected a 30% price variance. In this scenario, Kohler Company will only be purchasing small scale oat milling equipment due to the small volume of oats being harvested off their 700 acres of production. The following table reflects the revenue and pricing of this scenario:

Revenue	Median Price	Price Variance (+30%)	Price Variance (-30%)
<b>Selling Price of Processed Oats per Ton</b>	440	572	308
<b>Amount of Farming Land (acres)</b>	700	700	700
<b>Amount of Raw Oats Produced (Tons)</b>	379	379	379
<b>Amount of Processed Oats (Tons)</b>	212	212	212
<b>Total Revenue</b>	\$93,278	\$121,261	\$65,295

Note: The amount of raw oats produced in this Scenario is 379 tons. After processing, 379 tons is reduced to 212 tons of oats. Ref: [15]

### Storage Costs

After the oats are harvested they must be stored. The storage costs associated with the 379 tons of raw oats, the estimated production from 700 acres, are indicated below.

	Median Price
<b>Storage per ton</b>	\$407
<b>Total Storage</b>	\$ 154,418

Reference: [18]

### Facility Costs

The cost of building a new facility, based on constructing a 4,928 square foot building, for the oat milling operation are estimated below.

	Costs
<b>Facility Electrical Costs</b>	\$ 50,000
<b>Facility Price per square foot</b>	\$50
<b>Square Footage needed</b>	4,928
<b>Cost of New Facility</b>	\$ 323,504

### Packaging Equipment

The Oat Milling and Packaging Equipment Costs are indicated below for the small scale equipment capable of milling 5 tons of oats per hour. A more in-depth analysis of the list of equipment needed to mill oats can be found in the milling section of this study.

	Median Price
<b>Oat Milling &amp; Packaging Equipment Costs</b>	\$ 135,227

Note: This equipment can mill and package oats at 11 tons per hour, derived from the processing time of each piece of equipment. This can be seen in the mill section of this study. Reference: [19]



### Total Capital Costs for Oat Milling Operation

Costs	
Total Storage	\$ 154,418
Cost of New Facility	\$ 323,504
Oat Milling and Packaging Equipment Costs	\$ 135,227
Total Capital Costs	\$ 613,150
Contingency Cost (10%)	\$ 61,315
Final Total Capital Costs	\$ 674,465

Note: Contingency Cost is the cost of permits, licenses and other startup costs.

### Variable Costs

Median Price	
Amount of Farming area (acres)	700
Amount of Raw Oats Produced (Tons)	379
Processing Capacities (Tons Per Hour)	5
Time to complete Oat Milling and packaging (hours)	76

Reference: [15] [16]

### Equipment power costs

Median Price	
Equipment Power Costs per hour	\$ 12.66
Total Equipment Power Costs	\$ 959

Reference: [19]

### Planting Costs based on 700 acres of Oats

Median Price	
Cost of Planting Oats per acre	\$133
Total Cost of Planting Oats	\$93,548

Note: A further breakdown of how the \$133.64 was found can be seen in the production cost section of the report.

Reference: [15]

### Labor Costs

Median Price	
Labor Costs per hour	\$ 261
Total Labor Costs	\$ 19,758

Note: A further breakdown of how the \$261 was found can be seen in the labor subsection within the mill section of the report.

Reference: [10]

## Transportation Costs

The cost to transport grain from the farm to the mill was estimated at five miles for this scenario.

Median Price	
Price per Bushel	\$0.19
Number of bushels to transport	22740
Base fee	\$ 350
Transportation cost	\$4,671

## Total Variable Costs

Median Price	
Total Machine Power Costs	\$ 959
Total Cost of Planting Oats	\$93,548
Total Labor Costs	\$19,758
Transportation cost	\$4,671
Maintenance Costs (2%)	\$ 5,792
Total Variable Costs	\$ 124,728

Note: Maintenance costs est. at 2% of the total equipment cost.

## Opportunity cost

Opportunity cost is the loss of potential gain from other alternatives when one alternative is chosen. This cost is not actually paid but rather is a logical exercise in allocating resources. The opportunity cost of expending the capital on farming and milling oats is shown below.

Median Price	
Risk Free Assets Return (2%)	\$ 13,489
Total Opportunity Cost	\$ 13,489

Note: The risk free asset used is the average of 5, 7, and 10-year U.S. treasury bond.

## Breakeven Point – Oat Milling Operation

	Median Price	Price Variance (+30%)	Price Variance (-30%)
Total Revenue	\$93,278	\$121,261	\$65,295
Final Total Capital Costs	\$674,465	\$674,465	\$674,465
Total Variable Costs	\$124,728	\$124,728	\$124,728
Total Revenue Less Variable Costs (EBTIDA)	-\$31,450	-\$3,467	-\$59,433
Breakeven Point (years)	Never	Never	Never

Note: In Wisconsin, oats can be harvested once a year.

## **Scenario 2: Small-scale Milling Operation Capturing Entire Wisconsin Oat Market within 150-mile radius of Kohler Company**

Scenario 2 is similar to Scenario 1, but instead of using just the 700 acres of land Kohler Company has available to grow oats, it will also mill oats from other farms to meet market demand. The market demand, determined through market research, is between 1200 and 1500 tons of oats. An estimate of 1,350 tons was used in the study calculations.

Revenue	Median Price	Price Variance	Price Variance
Selling Price of Processed Oats	440	572	308
Amount of Farm Land (Acres)	2497	2497	2497
Amount of Raw Oats Produced	1350	1350	1350
Amount of Processed Oats (Tons)	756	756	756
Total Revenue	\$332,736	\$432,556	\$232,915

Note: The amount of raw oats that will be produced with 2497 acres of land will be 1350 tons. When processed, the 1350 tons is reduced to 756 tons of oats. Reference: [15]

### **Storage Costs**

Storage costs are based on 1,350 tons of raw oats, produced from 2,497 acres of land. [18]

Storage per ton	\$407
Total Storage	\$550,834

### **Capital Costs**

The cost of constructing a new facility in this scenario would require 7,145 square feet.

	Small Scale
New Facility Electrical Cost	\$50,000
New Facility Price per square foot	\$56.50
New Facility square feet needed	4,928
Cost of New Facility	\$323,504

### **Packaging Equipment Costs**

The equipment necessary to process oats can do so at a rate of 5 tons per hour. A more in-depth analysis of the list of equipment needed to mill oats can be found in the milling section of this study.

	Small Scale
Oat Milling and Packaging Equipment Cost	\$135,227

Note: The small-scale equipment can process 43 tons per hour vs. small scale at 11 tons per hour. This can be seen in the mill section of this study. [19]

## Scenario 2: Total capital costs

<b>Total Storage</b>	\$550,834
<b>Cost of New Facility</b>	\$323,504
<b>Oat Milling and Packaging Equipment Cost</b>	\$135,227
<b>Total Capital Costs</b>	\$1,009,565
<b>Contingency Cost (10%)</b>	\$100,956
<b>Final Capital Fixed Costs</b>	\$1,110,522

Note: Contingency Cost is the cost of permits, licenses and other startup costs.

## Variable Costs

The estimates used in this scenario are based on the amount of oats, in tons, that would be produced on 2,497 acres of farmland to meet market demand.

<b>Amount of Farming area (acres)</b>	2,497
<b>Amt. of Raw Oats Produced (Tons)</b>	1,350
<b>Processing Capacities (Tons Per Hour)</b>	5
<b>Amount of Running Time (hours)</b>	270

Reference: [15] [16]

## Equipment Power Costs

<b>Machine Power Costs per hour</b>	\$12.66
<b>Total Machine Power Costs</b>	\$3,420

Reference: [19]

## Planting Costs

	<b>Costs</b>
<b>Cost of Planting Oats per acres</b>	\$133
<b>Total Cost of Planting Oats</b>	\$93,548

Reference: [15]

## Labor Costs

Note: Productivity on the small-scale equipment is higher, resulting in reduced labor costs.

<b>Labor Costs per hour</b>	\$261
<b>Total Labor Costs</b>	\$70,479

Note: A breakdown of the \$261, can be found in the labor subsection within the mill section of the report. Reference: [10]

### Transportation Costs

A price of \$0.19 per bushel was estimated in the calculations to transport the oats to the milling facility, based on a quote from Duffy Grain Inc. transportation company. [20]

Median Price	
Price per Bushel	\$0.19
Number of bushels to transport	22,740
Base fee	\$ 350
Transportation cost	\$4,671

### Purchasing of Additional Oats

Because Kohler Co can only produce 379 tons of oats they need to make up the difference by purchasing the oats. The difference in this scenario is 971 tons.

Additional Amount of Oats	971
Number of Bushels per Acre	58
Total Number of Bushels	56,318
Price per Bushel of Oats	\$2.95
Total Cost of Additional Oats	\$166,138

### Total Variable Costs

Total Machine Power Costs	\$3,420
Total Cost of Planting Oats	\$93,548
Total Labor Costs	\$70,479
Transportation cost	\$4,671
Total Cost of Additional Oats	\$166,138
Maintenance Costs (2%)	\$13,721
Total Variable Costs	\$351,976

Note: Maintenance costs is 2% of the total equipment cost.

### Opportunity cost

Opportunity Cost	
Risk Free Assets Return (2%)	\$20,191
Total Opportunity Cost	\$20,191

Note: The risk free asset used is the average of 5, 7, and 10-year U.S. treasury bond.

## Scenario 2: Breakeven

	Median Price	Price Variance (+30%)	Price Variance (-30%)
<b>Total Revenue</b>	\$332,736	\$432,556	\$232,915
<b>Final Capital Costs</b>	\$1,110,522	\$1,110,522	\$1,110,522
<b>Total Variable Costs</b>	\$351,976	\$351,976	\$351,976
<b>Total Revenue Less Variable Costs (EBTIDA)</b>	-\$19,240	\$80,580	-\$119,061
<b>Breakeven Point (years)</b>	<b>Never</b>	<b>12.53</b>	<b>Never</b>

Note: In Wisconsin, oats can be harvested once a year.

## Scenario 3: Depreciation Model – Mill (Kohler Company 700 Acres)

In this Scenario, IRS Depreciation schedules for the equipment and the cost of the new facility are applied. For equipment, a seven-year depreciation period is used and 20 years depreciation schedule is used for the building<sup>[14]</sup>. This table shows that Kohler Company will not break even due to the price not being high enough.

### Breakeven Analysis – Depreciation Model – Mill (Kohler Company 700 Acres)

	First 7 Years	Next 13 Years	After 20 years
<b>Total Revenue</b>	93,278	93,278	93,278
<b>Capital Costs</b>			
<b>Machinery Depreciated Over 7 yr Period</b>	45,516	45,516	45,516
<b>Farming Facility Depreciated Over 20 yr Period</b>	17,793	17,793	-
<b>Total Capital Costs</b>	63,309	63,309	45,516
<b>Variable Costs</b>			
<b>Planting Oats</b>	93,548	93,548	93,548
<b>Maintenance</b>	5,793	5,793	5,793
<b>Machine Power</b>	959	959	959
<b>Labor</b>	19,758	19,758	19,758
<b>Transportation</b>	4,671	4,671	4,671
<b>Total Variable Costs</b>	124,728	124,728	124,728
<b>Profit</b>	(94,758)	(94,758)	(31,450)
<b>ROI</b>	-149.68%	-149.68%	-69.10%

#### **Scenario 4: Depreciation Model – Kohler Captures Entire Market Demand**

Scenario 4 uses the IRS depreciation schedules as the Kohler Company positions to capture the entire 150-mile radius area market study area. Using the depreciation schedules show breakeven would be reached after the building was completely depreciated in 20 years.

#### **Breakeven Analysis – Depreciation – Capturing Entire Oat Production Market**

	First 7 Years	Next 14 Years	After 20 years
<b>Total Revenue</b>	332,736	332,736	332,736
<b>Fixed Costs</b>			
<b>Machinery Depreciated Over 7 yr Period</b>	107,810	107,810	107,810
<b>Farming Facility Depreciated Over 20 yr Period</b>	17,793	17,793	-
<b>Total Fixed Costs</b>	125,602	125,602	107,810
<b>Variable Costs</b>			
<b>Planting Oats</b>	93,548	93,548	93,548
<b>Maintenance</b>	13,721	13,721	13,721
<b>Total Costs of Additional Oats</b>	166,138	166,138	166,138
<b>Machine Power</b>	3,420	436	436
<b>Labor</b>	32,036	32,036	32,036
<b>Transportation</b>	4,671	4,671	4,671
<b>Total Variable Costs</b>	313,533	310,549	310,549
<b>Profit</b>	(106,400)	(103,416)	22,186
<b>ROI</b>	-84.71%	-82.34%	20.58%

#### **Conclusion**

The standard when it comes to businesses investing capital into new projects is an expected payback of 5 to 7 years. In Scenario 1, 'never' is not acceptable period returns. Scenario 3, in which the depreciation model is used shows breakeven can never be reached. That is when Kohler Company will start to see a return on investment. In Scenario 4, a positive return on investment can be seen once the facility is completely depreciated in 20 years. This is due to the cost of capital being depreciated over time. Within Scenario 2, breakeven points are not much more favorable. Breakeven points of 12.53 years and 'never' are not acceptable returns. The caution here is also the market is mature and somewhat saturated, with no new entries to the existing market as well as market demand already being satisfied. While obtaining 100% of the market is not achievable, it provides the 'best case' scenario. However, it should be noted, that even in this scenario, the **project is not profitable**. It is simply less unprofitable.

## Value Chain

Oats are grown in temperate regions where there is a low summer heat and great rainfall. Typically they are grown in northwest Europe, Central Canada, and the Midwest United States. Oats are an annual plant, which, in Wisconsin, can be planted from mid-April to early August. During the early Wisconsin spring, the late thaw may present a challenge when planting oats. The challenge is in drilling the land to plant the seeds. The ground has to be thawed enough to use the no-till drill and other farming equipment, but still firm enough to support the weight of such equipment. To decrease the difficulty of this problem, it is important not to till the ground in the fall prior to planting oats. Growers also need to pay close attention to spring weather patterns; looking for spring mornings in which the ground is firm enough to hold the equipment but soft enough to drill. <sup>[7][13][8]</sup>

Growing oats with other crops involves a degree of uncertainty. Relevant factors include weather, insects and weeds. Some of these can be insured through the USDA, which has varying rates based on planting and harvest dates and yield history. To protect the farmer from this uncertainty, a contracted price is determined between the producer and the processor. The processor agrees to buy the harvest at the price if it meets the specified standards. At harvest, the oats are stored in grain elevators with the producer until the processor calls for delivery. Once sold, the oats are transported by bulk truck or railcars to cleaners who process the oats for buyers. <sup>[11]</sup>

In some cases, the processor does the cleaning and hulling; in other cases it is contracted to a third party. Cleaned oats are sampled to ensure quality, and are inspected for weather damage, insects, disease and mold. Cleaning also removes unsuitable oats for milling. These are doubled, pin, light, and hulled oats. Materials such as dust, stems and weed seeds are also removed. Doubled oats are oats with two groats, which are not well developed. Pin oats contain thin groats, while light oats contain a high percentage of hulls. <sup>[6]</sup>

After cleaning, oats are heated to allow the oat hulls to brittle, which facilitates de-hulling. Heating also gives them a roasted flavor and partially deactivates lipase enzymes. The temperature of the heating ranges from 190 to 208 degrees Fahrenheit and moisture content is reduced from 12% to 7-10% during the process. <sup>[10]</sup>

Oat processing is the conversion of raw oats into oat flakes. The initial step is to clean, grade and de-hull the raw oats. This requires the uneatable outer shell of the oat to be separated from the inner oat groat. Centrifugal acceleration is used in this process. The oats are fed by gravity onto the center of a horizontally spinning stone, which accelerates them towards the outer ring. Groats and hulls are separated on impact with this ring. The oat groats are steamed, softened and rolled to make flattened oats, called rolled oats. They acquire a flake type structure of varying thickness. The oat hulls are used as feed, processed further into insoluble oat fiber, or used as a biomass fuel. In the processing operations, the dehulling efforts face conflicting controls. For example, dehulling efficiency and groat breakage both increase with rotor speed. Groat yield increases with efficiency and decreases with breakage. However, these results are optimal depending upon genotypes and the external environment. Yield varies from 50% at a low rotor speed and specific genotypes to just above 70% for faster speeds and alternative genotypes. As a result, this report will focus on a yield



of 60% of tonnage. In addition, with an anticipated loss of 4% of tonnage being lost during the cleaning, steaming and flaking of the rolled oats, the remaining 36% is converted to husks and hulls.

After the groats are separated from the hull they are passed through a steamer. This is done to bring the moisture content up from 7-10% to 10-12%. It also increases the temperature of groats to between 210 and 220 degrees Fahrenheit, which ensures lipolytic enzymes are inactive. They are again cooled to produce quality flakes. To increase taste, gum, sugar, salt or other malt and syrups can be added. <sup>[10][12][9][6][5]</sup>

Finally, the regular and quick oat flakes are rolled to uniform thickness and specifications based on the final product they will become an ingredient in. They are then packed and distributed for the next step in the process.

Between the producers and processors are grain companies or commission brokers. The grain company connects buyers and sellers by buying the oats from the producer and selling to the processors. Commission brokers also connect buyers and sellers but, instead of taking ownership of the oats, they charge a commission for their services.

Once the processors have purchased the oats, they can use them as an ingredient in the creation of another product or treat and process them for human consumption. When they are processed, oats go through several steps to be edible. They are dry heated and steamed with enzymes to give them a nutty flavor. The small and large groats are separated with the large groats entering the groat steam and the smaller groats into the cutting system. They then pass through a steel cutter turning them into flakes. Then they are bed dried before being packaged. They also can be rolled into hammer mills where they are ground to create flour or bran. Once the processors have completed the processing of the oats, distributors connect the processors with retailers. The distributor takes ownership of the oat product and takes care of storage and transportation to retailers. The retailers are the final stage of the oat supply chain. They are responsible for selling the final good that was produced by the farmer and processed by food processors. <sup>[4]</sup>

Throughout the oat supply chain, regulatory bodies are involved, such as the Food and Drug Administration (FDA) and United States Department of Agriculture (USDA). Regulations often add costs to production. There are also transportation costs when transporting the oats from the producers to the cleaners and then to processors and the distributors. <sup>[13]</sup>

## Production Costs

The following table breaks down the potential production costs of farming oats in dollars per acre. It also compares Wisconsin averages to United States averages.

### Production Costs <sup>[16]</sup>

	United States		Wisconsin	
	2013	2014	2013	2014
<b>Operating costs:</b>				
Seed	15.47	16.28	15.295	15.585
Fertilizer	46.02	46.19	57.21	54.95
Chemicals	2.8	2.76	1.58	1.61
Custom operations	9.04	10.14	8.54	8.785
Fuel, lube, and electricity	23.35	24.09	20.405	20.405
Repairs	14.35	14.57	12.45	12.685
Straw baling	3.01	3.38	3.78	3.925
Interest on operating inputs	0.05	0.04	0.05	0.035
<b>Total, operating costs</b>	<b>114.09</b>	<b>117.45</b>	<b>119.31</b>	<b>117.98</b>
<b>Allocated overhead:</b>				
Hired labor	0.79	0.87	0.33	0.34
Opportunity cost of unpaid labor	36.53	38.83	34.315	34.96
Capital recovery of equipment and equipment	81.49	84.08	72.39	75.07
Opportunity cost of land	101.02	108.31	102.28	106.04
Taxes and insurance	6.08	6.29	6.775	6.91
General farm overhead	9.6	9.99	8.585	8.75
<b>Total, allocated overhead</b>	<b>235.51</b>	<b>248.37</b>	<b>224.675</b>	<b>232.07</b>
<b>Actual Costs paid</b>	<b>15.68</b>	<b>16.28</b>	<b>15.36</b>	<b>15.66</b>
<b>Total costs</b>	<b>129.77</b>	<b>365.82</b>	<b>134.67</b>	<b>133.64</b>
<b>Percent change from previous year</b>		<b>3%</b>		<b>1%</b>

## The Oat Mill

### Capital Costs

The capital costs of the equipment needed to transform the raw oats into finished oat products can range from \$135,288.33 to \$1,932,083.33 depending on the scale of the equipment. The equipment needed, power required to operate them, the low and high range price are broken down in the following table.

#### Equipment Costs

Machine Name	Price
Professional Oat Dehuller Machine	\$7,500
Pre Cleaning Machine	3,300
Oats Boiling Machine	550
Oat Kiln Machine	1,050
Sieving Machine	833
Color Sorting Machine	16,250
Grain Magnet	100
Dicing Cutter Machine	1,767
Dust Separator Machine	917
Sorting Machine	22,945
Twill Steamer	7,500
Roller Mill	3,267
Drying Machine	60,000
Plan sifter Machine	3,500
Oat Packaging Machine	5,750
Total	<b>\$135,228.33</b>

### Capacity Breakdown [19]

Note: The grain magnet and dust separator do not have capacity figures as they are parts within the mill that do not process oats, but contribute to the overall process.

Machine Name	Capacity - Low (Tons/Hour)
Professional Oat Dehuller Machine	0.83
Pre Cleaning Machine	15.00
Oats Boiling Machine	0.55
Oat Kiln Machine	83.20
Sieving Machine	1.75
Color Sorting Machine	2.70
Grain Magnet	-
Dicing Cutter Machine	0.22
Dust Separator Machine	-
Sorting Machine	3.75
Twill Steamer	2.00
Roller Mill	10.30
Drying Machine	22.40
Plan sifter Machine	0.46
Oat Packaging Machine	1.00
Average	5

### Power Breakdown [19]

Note: The grain magnet does not have power figures as it is a part within the mill that does not process oats, but contributes to the overall process.

Machine Name	Power - Low (Kw/Hour)
Professional Oat Dehuller Machine	14.38
Pre Cleaning Machine	2.20
Oats Boiling Machine	16.10
Oat Kiln Machine	15.00
Sieving Machine	0.47
Color Sorting Machine	3.25
Grain Magnet	-
Dicing Cutter Machine	1.63
Dust Separator Machine	6.82
Sorting Machine	2.75
Twill Steamer	4.00
Roller Mill	1.10
Drying Machine	17.50
Plan sifter Machine	10.00
Oat Packaging Machine	2.20
Total	97

## Building and Storage

Kohler Company will need a facility to house the equipment listed above. For the smaller sized equipment, a minimum of 4,928 square feet of space would be required. The estimated cost is \$56 per square foot. <sup>[3][17]</sup>

Before and after oats are processed they need to be stored. Storage unit sizes range from 5 to 15,000 tons and range in price from \$75,077 to \$261,807. The average cost per ton is \$407.98 per ton. If Kohler were to use its own land, this would result in storage costs of \$154,418.91. If Kohler were to capture the entire market, that cost would rise to \$905,706.71. <sup>[18]</sup>

## Transportation

A common question in business is whether to do it yourself or outsource to a company already in the market. Thus far there are substantial upfront capital costs, and hiring a grain transportation company to transport the oats from the farm to the mill would be less expensive and a more efficient use of capital resources. Relevant companies, some located in Wisconsin, have an average base fee of \$350 plus, for the amount to be transported. The cost of transportation can be based on distance needed to travel or the amount of the grain in bushels. In the Kohler Co case the we use the amount of bushels because grain transportation companies that go by distance are unlikely to transport at such a small

distance. There are roughly 60 bushels of oats in a ton leading to 22,740 bushel in total that need to be transported. This multiplied by the market price for transporting a bushel of oats which is \$0.19 gives us a total transportation cost of \$4,670. If Kohler were to capture the whole market, while still farming themselves, the cost would be the same, as other producers will pay to transport their grain to the mill.  
[20]

## Labor

Below is an estimate of the labor needed to operate and maintain the machines needed to process oats, which would not vary in terms of whether the small or small-level equipment is used.<sup>[10]</sup> These numbers are derived from industry research on oats milling facilities with the recommended operators per machine. The following numbers are based on running the equipment at 100% efficiency.

Note: Kohler Company could hire fewer people, but efficiency would be sacrificed. For example, Kohler Company could hire a machinist and an unskilled laborer costing them \$27 an hour, \$15 for the machinist, \$12 for the unskilled labor. Within this hour of work, two man hours of tasks are being done efficiently and to standards. Now instead, Kohler Company attempts to cut costs by hiring one laborer at \$15 an hour to do both the job of the machinist and the unskilled laborer. Now the machinist, who will only work for \$15 an hour because of his skills, has to do the work of a machinist, which takes an hour, and the work of an unskilled laborer, which also takes an hour. The machinist will have to take two hours to do the work assigned and be paid \$30 for his work, thus costing Kohler Co. more money for the same amount of work.

### Labor Costs

Position	Number in Position	Salary (\$/hr)	Total Cost Per Hour
Plant Manager	1	20	20
Administrative Assistant	1	10	10
Technician Operator	8	15	120
Unskilled Workers	8	12	96
Janitor	1	15	15
Total	19		\$ 261

## Utilities

**Power Costs [19]** Estimated power costs based on the price of electricity being \$0.13 per kWh.

Machine Name	Price of Power - Low (\$)
Professional Oat Dehuller Machine	1.87
Pre Cleaning Machine	0.29
Oats Boiling Machine	2.09
Oat Kiln Machine	1.95
Sieving Machine	0.06
Color Sorting Machine	0.42

Machine Name	Price of Power - Low (\$)
Grain Magnet	-
Dicing Cutter Machine	0.21
Machine Name	Price of Power - Low (\$)
Dust Separator Machine	0.89
Sorting Machine	0.36
Twill Steamer	0.52
Roller Mill	0.14
Drying Machine	2.28
Plan sifter Machine	1.30
Oat Packaging Machine	0.29
<b>Total</b>	<b>12.66</b>

## Price

The average price received for selling processed oat flakes in the year 2013/14 is \$259 per ton and in year 2014/15 is \$364 per ton. The average price received in the last 18 years is \$443 per ton adjusted for inflation. This figure, weighted with the average in the last three years gives us a price of \$440 per ton. Over this 18-year period, the maximum fluctuation in the next year's price is 30% above or below the current year's price. <sup>[17]</sup>

## Target Market

Food To Market obtained the market research through conversations with two oat producers within a 150-mile radius of Kohler Company Farms Department, along with 15 interviews with potential customers and end users for milled oat products. In addition, Food To Market confirmed production volumes for three oat mills. This information is meant to help the Kohler Company learn about milling service preferences and market trends in Wisconsin, as well as the market need and preferences for milled oat products in the region. In order to gather the necessary information, the following questions were asked of milled oat purchasers:

- Do you Purchase milled oats products?
- Which of the following milled oats products do you purchase?
  - Rolled oats
  - Steel cut thick rolled oats
  - Quick cooking rolled oats
  - Oat Flour
  - Gluten free rolled oats (reg)
  - Gluten free rolled oats (thick)
  - Gluten free rolled oats (quick)
  - Gluten free oat flour
  - Other (please indicate)
- What quantity of each do you purchase in a given year?

- Who are the leading suppliers of milled oats products in the region? What about in the US?
- What do you think causes them to be considered market leaders?
- How satisfied are you with your current milled oats product supplier? (scale of 1 to 5)
- What do you like best about your current milled oats products supplier?
- Are there any products that it is difficult or impossible to find a supplier for? (If yes, how much demand is there or would there be for that product in an average year?)
- If you could quickly and easily acquire regionally milled fresh oat products, would that influence your decision to use or carry such products?
- When would you choose oats over other grains?
- Typically, how important is proximity of the supplier to your company when purchasing milled oats products?
- How important is price to your company when purchasing milled oats products?
- How important is quality to your company when purchasing milled oats products?
- Within the next 18 months, do you think that your company will be increasing, decreasing, or maintaining the amount of milled oat products you purchase?
- What criteria does your company use to select suppliers of milled oats products?
- What are two trends or issues that are going to affect the way you do business within the next 18 months?
- Would you be open to considering a new source for milled oat products?

In addition, the following questions were asked of milled oat producers:

- Do you produce gluten free oats? (If yes, exclusively or in addition to regular oats?)
- In the past three years what market trends have you noticed for oats?
- In particular, is demand for oats increasing, remaining the same, or decreasing? (Also ask about GF oats if they produce them).
- What do you think is driving the demand for oats and milled oats products at this time?
- In your opinion, what are the most popular milled oats products?
- What are some emerging markets for oats?
- In your opinion, is there a shortage of mills for oats in the area?
- Is there room in the market to increase oat production?
- Is Wisconsin and the nearby states a good place to grow oats? Why or why not?
- Do you contract with a miller to have the oats you produce milled?
- If yes, which mill or mills do you use?
- What criteria do you use when selecting a mill? (location, reputation, equipment, gluten free, price turn around, other?)
- Do you grow other crops in addition to oats?
- If yes, what percentage of sales would you say is oats?
- What companies would you consider the main source of milling services for oats in the region? (GF oats?)
- In terms of quantity, about how much oats does a farm your size produce on average in a year?



## Market Assessment Executive Summary

The fifteen oat users within a 150 mile radius of Kohler who were interviewed by Food To Market can be separated into four groups by industry: breweries, bakeries, specialty food stores, and cooperatives.

### Breweries

Food To Market interviewed five different breweries, the majority of whom said they purchase rolled oats exclusively, in quantities ranging from 500 to under 2,600 pounds. There are 317 breweries located within a 150 mile radius of Kohler, 161 of which are located in Wisconsin. Food To Market estimates the total demand from breweries to be approximately 160,000 to 450,000 pounds annually. (This is a rough estimate based on the average quantity of oat product purchased by respondents multiplied by the number of breweries in a 150 mile radius of Kohler.)

The main qualities that breweries seem to value in a supplier varied; however, there was a common desire expressed by respondents to remain with suppliers with whom they had already formed business relationships. All representatives from this industry expressed satisfaction with current suppliers, although a majority said they would be open to considering a new supplier. It appears that the primary use of oats in this industry is for oatmeal stouts, which are not made by all breweries and are often made in small quantities for a single product, making this industry in general a low-volume purchaser of oat products. The majority of respondents said their businesses would most likely be increasing the amount of oat products they would be purchasing in the next 18 months, which makes sense considering one of the major trends brought up by respondents was an increase in the size of breweries, as well as the quantity of new breweries cropping up in the area. This may lead to consolidation of beer distributorships.

### Bakeries

Like the businesses in the brewing industry which generally purchased only a single oat product, businesses in the bakery industry interviewed by Food To Market usually said they purchased only rolled oats, in quantities ranging from 1,200 to 12,500 pounds annually, with the exception of one bakery who said they purchased around 75,000 pounds a year. Food To Market included manufacturers of baked goods within a 150 mile radius of the Kohler Company and found about 1,300 companies. Based on this, Food To Market estimates the total demand from bakeries within 150 miles of Kohler to be approximately 1.6 million pounds of oats annually. This is rough estimate based on the number of baked goods manufacturers located within 150 miles of Kohler, multiplied by the lowest quantity purchased by an average-sized bakery interviewed. The lowest quantity was picked in order to account for the number of bakeries contacted who said they did not purchase any oat product at all. Bakeries were more likely than breweries to purchase gluten free oats, especially since there are many bakeries that specialize in gluten free products. Reasons for choosing a supplier varied greatly in this industry, as did the suppliers perceived as being market leaders, though product availability and convenience seemed to be prevailing criteria. Bakeries also seemed to be satisfied with their current suppliers but, once again, seemed open to new suppliers as well. When asked about the quantity of oat products they predicted to be purchasing in the next 18 months, all respondents said their businesses would most likely be maintaining their current quantities.

## Specialty Food Stores

According to respondents from this industry, specialty food stores, unlike the previous two industries, on average purchase multiple different oat products from millers, including gluten free products. Respondents said they purchased around 200 to 600 pounds of each oat product per year. Using SIC codes for cooperative food stores, independent grocery stores and health food stores, Food To Market located about 800 companies within 150 miles of Kohler. Based on an estimate of 200 pounds a year per store, that would be about 160,000 pounds sold annually through those types of stores. If the industry category “other specialty food stores” NAICS code is used, there are just above 2,400 companies which would result in 480,000 pounds of oats sold per year. If all grocery stores (but not convenience stores) are included, then the market size is nearly 1 million pounds. This is an estimate based on the number of each type of retail store located within 150 miles of Kohler, multiplied by the lowest total quantity of all oat products purchased by those interviewed. The lowest quantity was used in order to account for the number of stores contacted who said they did not purchase any oat product at all. It was also difficult to get an idea of the demand for oats from this market because some answered in cases rather than pounds or were unable to give an estimate at all. Quaker and Bob’s Red Mill were by far the most popular suppliers among businesses in the specialty foods industry, mainly due to their production capacity and reputation. Bob’s Red Mill, in particular, seems to have the reputation of being the place to go for gluten free products. Neither have locations in Kohler’s target area, however. Availability of certain products was very important in choosing a supplier for businesses in this industry, which suggests many specialty food stores have particular needs driven by a particular customer demand. Like the other two industries, the specialty food industry, as well, seemed to be satisfied with current suppliers, yet open to the idea of choosing a new supplier with the proper motivations. Representatives spoke of the growing demand for products that are gluten free, as well as products that are organic, non-GMO, and whole grain. The majority predicted their stores would be maintaining the amount of oat products purchased within the next 18 months.

## Summary of Business Interviews

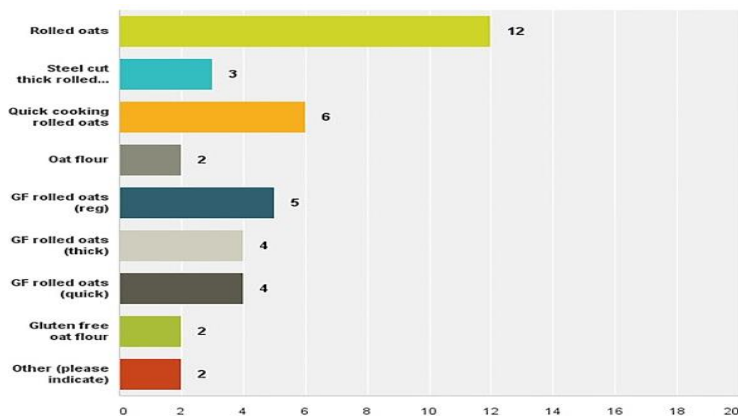
### Purchasers

Food To Market was able to contact 15 oat purchasers within 150 miles of Kohler, Wisconsin. Those interviewed include representatives from the brewery, bakery, and specialty food store markets.

#### *Do you Purchase milled oats products?*

Every respondent cited in this analysis answered yes to this question as a prerequisite to being interviewed.

#### *Which of the following milled oats products do you purchase?*

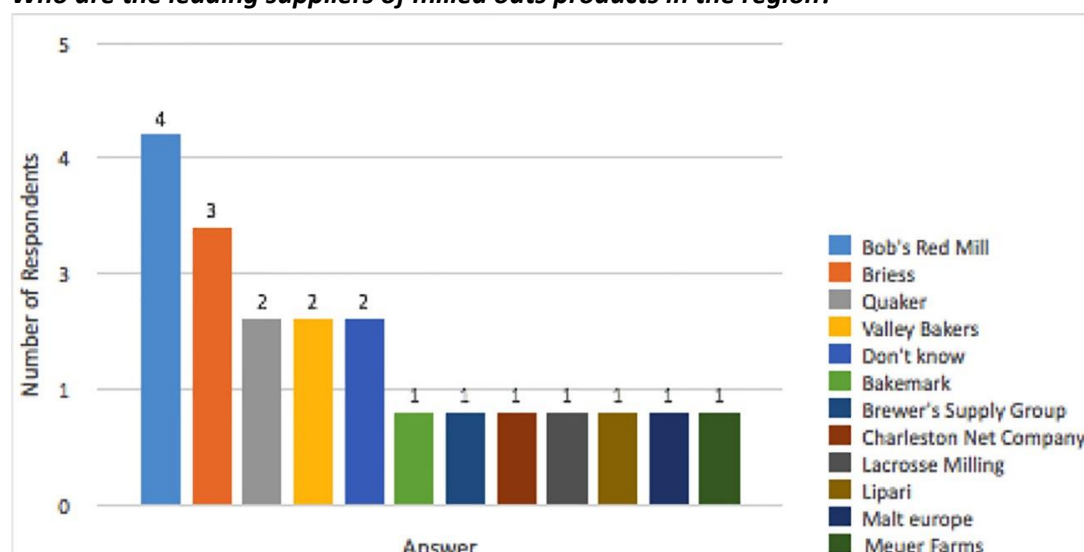


Rolled oats were by far the most commonly purchased by those interviewed, and were often the only type of oats respondents said they purchase. Gluten free rolled oats were not as commonly purchased as regular rolled oats, however, gluten free oat products were either more common or nearly as common as all other regular oat product categories, suggesting there is a substantial demand for these products.

#### *What quantity of each do you purchase in a given year?*

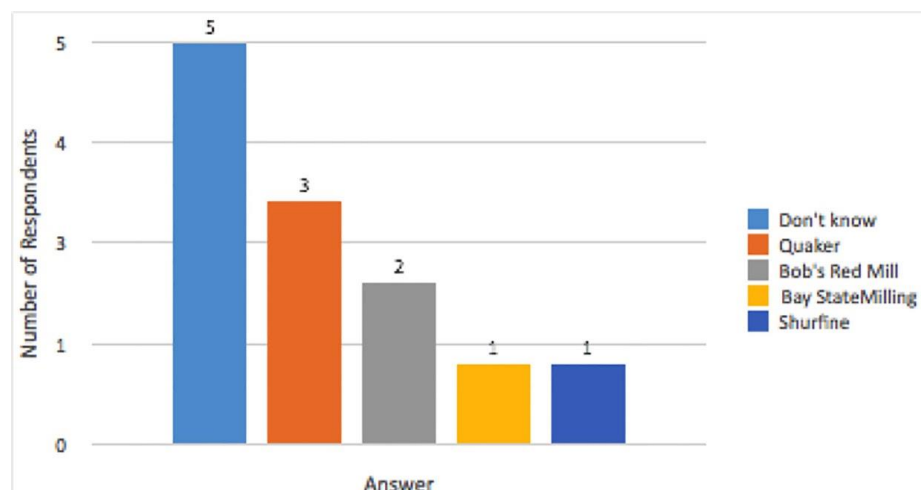
Responses to this question varied greatly, ranging from 100 pounds to 300,000 pounds for some products. In addition, it is difficult to compare quantities given in cases to those given in pounds, since the size and weight of a “case” is never specified and may be different depending on the company. Nevertheless, it can be concluded that the largest quantities purchased by respondents come from the rolled oats category. Individual responses can be found in the Interview Planning and Execution file of this report.

### Who are the leading suppliers of milled oats products in the region?



Bob's Red Mill was considered to be a leading supplier among respondents, particularly those in the baking industry. This may be in part due to their reputation for producing a large variety of gluten free products. Briess was also mentioned frequently, but only by respondents from the brewing industry. This suggests that each industry has their own perception of which oat products suppliers are market leaders.

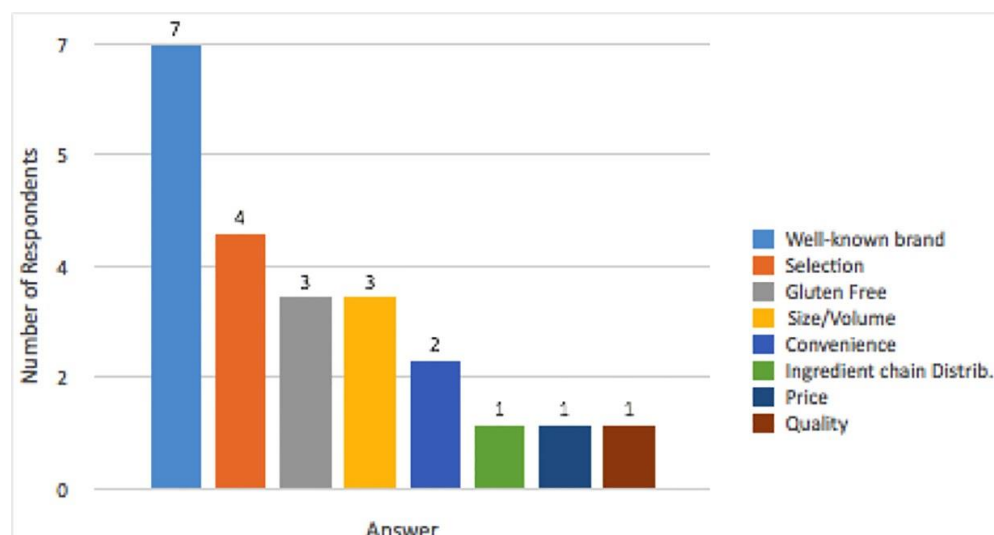
### What about in the US?



Almost half of the respondents who answered this question did not know enough about suppliers on a national scale to give a sufficient answer to this question. This tells us that a large percentage of those purchasing oat products in the state of Wisconsin most likely have a limited knowledge of oat production outside of the Wisconsin area, and probably do not look too far beyond those located in a close proximity when selecting a supplier. Of those who did know enough to give an answer, almost half said that Quaker was a leading supplier in the US, closely followed by Bob's Red Mill. These two

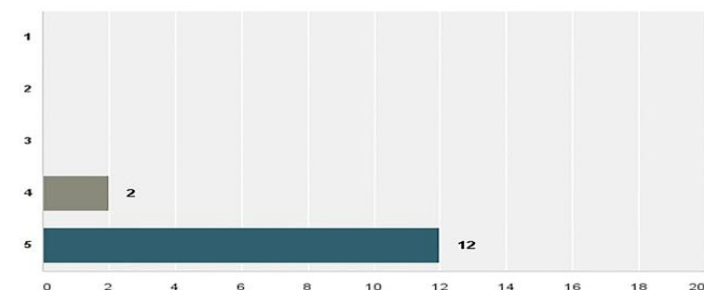
companies were also commonly said to be market leaders on a regional scale, which suggests that they are well known both regionally and nationally. Bay State Milling and Shurfine, however, were only mentioned when respondents were asked about the US as a whole, and therefore may not be as much of a threat to the client as companies like Quaker and Bob's Red Mill, or the companies said to be leaders only on a regional level. This is due to the fact that the majority of Kohler's potential customers seem to prefer suppliers located nearby.

***What do you think causes them to be considered market leaders?***



The main criteria used to identify a company as a market leader was brand awareness. Other common reasons cited were that the company has a wide selection of products, or sells certain products that are in high demand, including selling gluten free products, which was mentioned by three different respondents as being a reason a company was considered to be a market leader. The size and capacity of a supplier in regard to volume and production capabilities were also a common reason, as was convenience or ease working with the company.

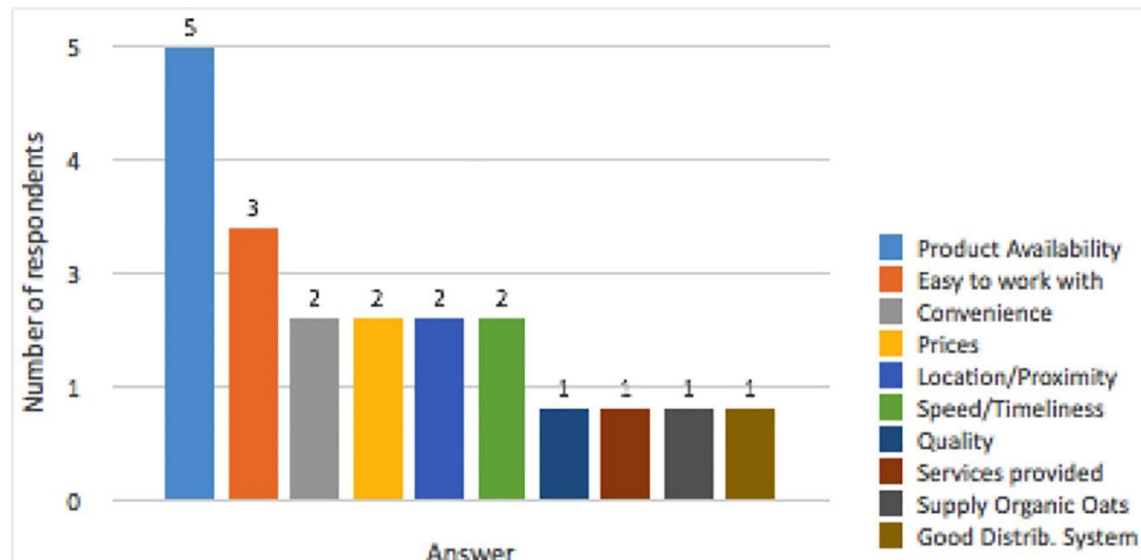
***How satisfied are you with your current milled oats product supplier? (scale of 1 to 5)***



Almost every respondent who answered this question said their level of satisfaction with their current supplier was a 5, meaning they were very satisfied. Only two respondents gave their current supplier a 4, which is still a high score. It can therefore be concluded that overall, based on responses, purchasers of oat products in this region have a high level of satisfaction with current suppliers. Though it can be

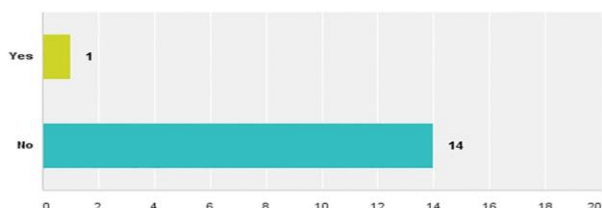
concluded based on these findings that oat purchasers in the region do not currently have much reason to be actively seeking out new suppliers, customers may still be willing to switch suppliers if given a large enough incentive to do so.

***What do you like best about your current milled oats products supplier?***



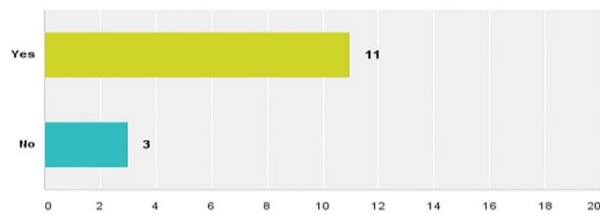
The main answer respondents gave when asked what they liked most about their current supplier dealt with their supplier's product availability, such as their ability to have the products in stock when they need them and in the desired quantities. Another common answer was that their suppliers are easy to work with. This answer is a bit vague but can be interpreted to mean that the supplier is accommodating to the needs of the customer or at least does not cause any problems for the customer. Other repeat answers include convenience, pricing, location, and timeliness of deliveries. A business relationship may be considered convenient for the customer if they already buy other products from the supplier.

***Are there any products that it is difficult or impossible to find a supplier for? (If yes, how much demand is there or would there be for that product in an average year?)***



Almost every respondent said they had no problems finding a supplier for any of their products. Mike Zamzow from Bull Falls Brewery said his company had problems finding a supplier for hops, but since this is not an oat product it does not relate to this study.

***If you could quickly and easily acquire regionally milled fresh oat products, would that influence your decision to use or carry such products?***

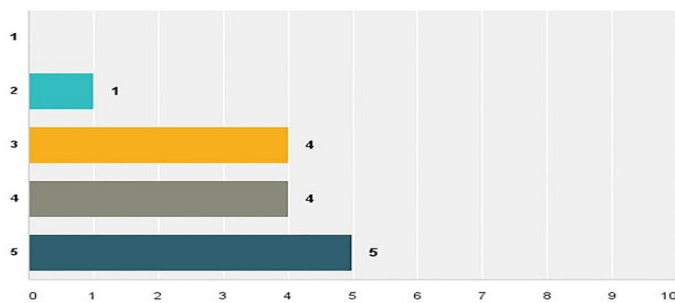


The majority of respondents thought that being able to quickly and easily acquire regionally milled fresh oat products would influence their decision to use or carry them. Those who did not said they either did not care as much about the proximity of their supplier, or had the intention of staying with their current supplier due to a pre-existing relationship, making this perceived benefit irrelevant. All three respondents who replied no to this question were from specialty food stores, which suggests that buyers in this industry are more influenced by factors other than speed and ease of access when choosing suppliers.

***When would you choose oats over other grains?***

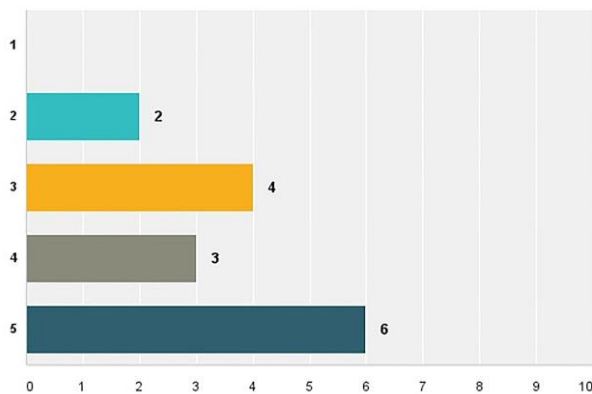
Answers to this question varied based on the industry to which the respondent belonged, as well as among members of the same industry. Individual responses can be found in the Interview Planning and Execution file of this report.

***Typically, how important is proximity of the supplier to your company when purchasing milled oats products?***



Overall, respondents seem to think that proximity is an important factor when choosing a supplier. One third of respondents gave proximity a 5, and almost all respondents gave it at least a 3 or above. This shows that being located near potential customers could possibly give Kohler a competitive edge, especially since the majority of companies comparable in size to Kohler are located farther away.

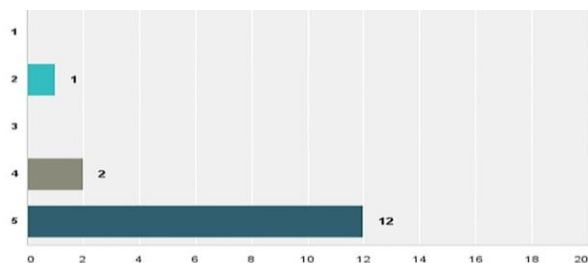
***How important is price to your company when purchasing milled oats products?***



Even more respondents thought that price was an important factor, suggesting they may be willing to sacrifice proximity for lower priced products. There were two respondents, however, who gave price a lower score of 2, mainly because they saw oats as a fairly inexpensive product that did not have much of an impact on their company's expenditures one way or the other.

Both of these respondents were from breweries, which makes sense considering that many brewery respondents said that they used only a small percentage of their beers were made with oats. Among those companies who considered price to be their main or one of their main criteria in choosing a supplier, it was a common opinion that oats and oat products are extremely similar no matter where they are purchased, making price the only real differentiating factor from supplier to supplier.

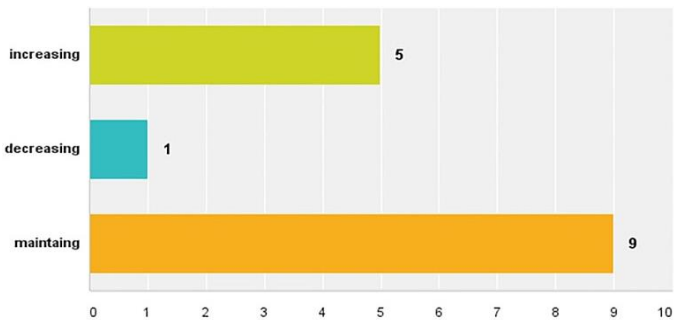
***How important is quality to your company when purchasing milled oats products?***



Quality was the criteria that was most commonly considered by respondents to be very important. The majority of respondents gave this criteria a 5, and only one gave it a low score. The one low score can be attributed to the opinion that oats are of the same or similar quality regardless of the supplier, making any differences in quality a minimal concern.

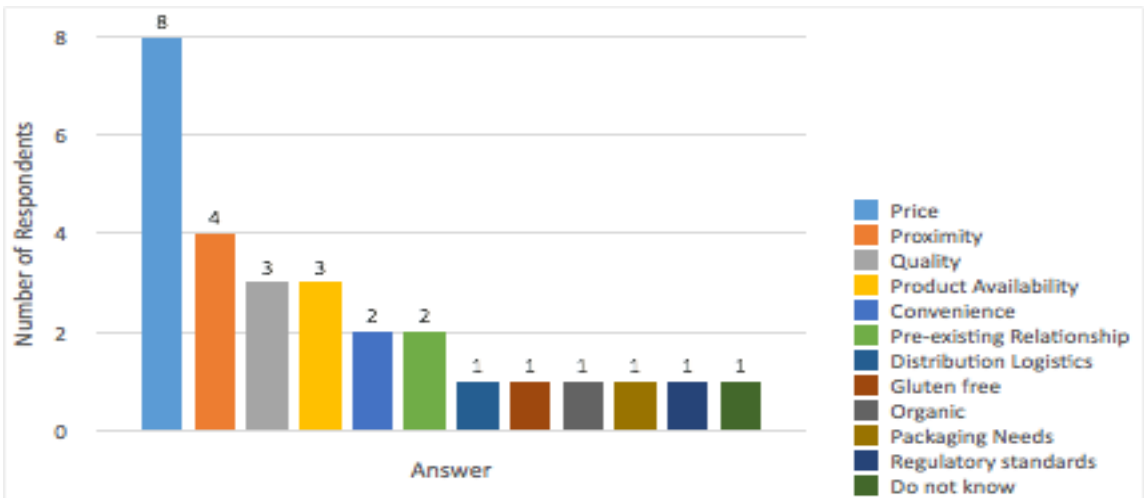


***Within the next 18 months, do you think that your company will be increasing, decreasing, or maintaining the amount of milled oat products you purchase?***



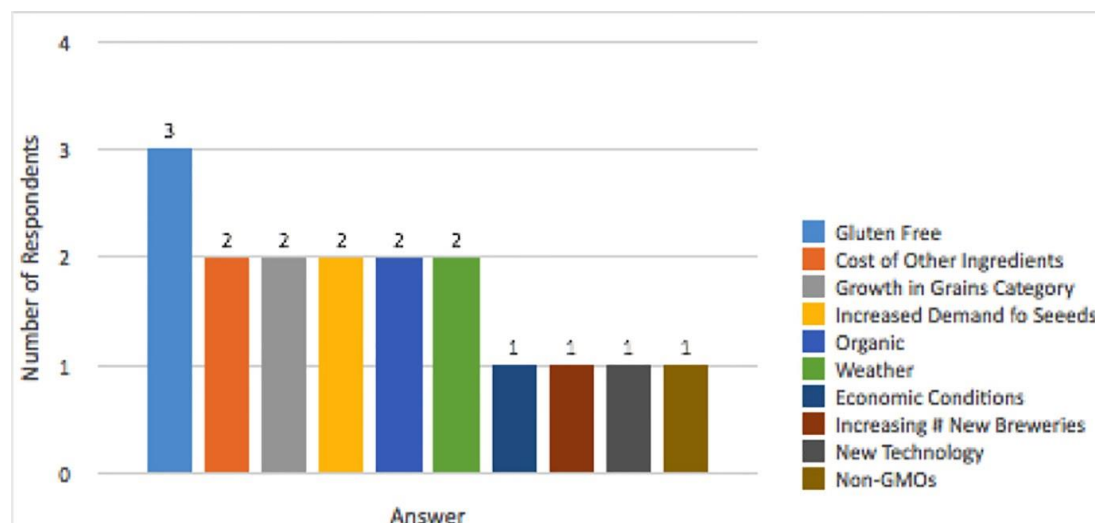
A majority of respondents said that their companies were most likely planning on maintaining the amount of oat products purchased within the next 18 months, suggesting that most did not foresee any major changes in purchasing activities one way or the other. A third of respondents did, however, say their companies were planning on increasing the amount of oat products they purchased, and only one said their company planned on decreasing. This suggests that there may be a greater demand for oats and oat products in the Wisconsin region in the near future.

***What criteria does your company use to select suppliers of milled oats products?***



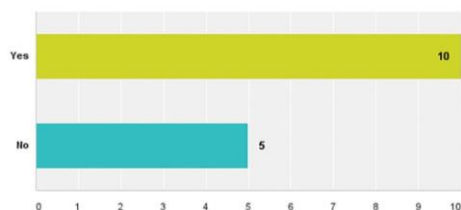
Price was by far the most common criteria listed for selecting suppliers of milled oats products. Once again, because oats are perceived by many purchasers as a product that is pretty standard no matter where they are purchased, price is often their primary differentiating factor. No other criteria was mentioned as frequently by respondents, but proximity, quality, and product availability each were mentioned various times. Two other criteria listed on multiple occasions were convenience and pre-existing relationships with suppliers who they were already using for other products.

***What are two trends that will affect the way you do business within the next 18 months?***



Answers to this question varied greatly. The gluten free trend was most commonly listed by respondents as a trend that will be affecting their business within the next 18 months. Other common trends listed include increasing costs of other ingredients or products, growth of the grains category, increased demand for seeds, the demand for organic products, and changes in weather patterns. Another interesting trend specific to the brewing industry is the rapid increase in the number of new breweries starting up. This will lead to increased competition for breweries in the region who will have to concentrate more on local sales to get business.

***Would you be open to considering a new source for milled oat products?***



The majority of respondents were open to considering a new source for milled oat products, even if they expressed high satisfaction with their current suppliers. This was usually due to a commonly held attitude among purchasers in various industries of always being open to new opportunities to enhance business processes and create value. A third of the respondents, however, said they would not be open to a new supplier, mainly because of pre-established, long-standing relationships with current suppliers. It is also a possibility that some of the respondents who answered yes to this question were more open than others, and that some were simply saying yes because they did not want to rule out any possibilities, whereas only a few were seriously considering finding a new supplier.

## Producers

Food To Market was able to speak with two oat producers within a 150 mile radius of Kohler. Below is a conversation held with a representative from Steinray Farm of Manawa, Wisconsin. The other interviewee declined to share contact information, but his responses were consistent with those of Steinray Farm.

***Do you produce gluten free oats? (If yes, exclusively or in addition to regular oats?)***

No.

***In the past three years what market trends have you noticed for oats?***

Not much, they've gone kind of down (in production). They're an easy crop to grow but we've gone away from planting too many.

***In particular, is demand for oats increasing, remaining the same, or decreasing? (Also ask about GF oats if they produce them).***

Decreasing.

***What do you think is driving the demand for oats and milled oats products at this time?***

We don't use it in feed as much now that we've decreased our herd sizes. We don't use it in cereal, just in feed.

***In your opinion, what are the most popular milled oats products?***

Oatmeal.

***What are some emerging markets for oats?***

Besides as a cereal grain, maybe health benefits like in shampoos and hand lotions.

***In your opinion, is there a shortage of mills for oats in the area?***

Probably.

***Is there room in the market to increase oat production?***

It depends. Oatmeal is cheap anyway you look at it. I don't know if there's ever going to be a growing demand for it.

***Is Wisconsin and the nearby states a good place to grow oats? Why or why not?***

I would think so! We're in the Midwest so that's a pretty popular place, it's the right climate. Oats are usually a late-summer crop.

***Do you contract with a miller to have the oats you produce milled?***

No, there isn't anything around us. We could go to Indiana, but most is shipped out to Michigan or all the way to Mississippi.

***Do you grow other crops in addition to oats?***

Yes, corn and alfalfa.

***If yes, what percentage of sales would you say is oats?***

Zero. (Don't sell, use for feeding own livestock.)

***What companies would you consider the main source of milling services for oats in the region? (GF oats?)***

CHS, which is a division of Cenex.

***In terms of quantity, about how much oats does a farm your size produce on average in a year?***

We have a 1,000 acre farm and about 10 percent is in oats.

It was clear in this conversation that Steinray Farm does not grow oats with the purpose of selling them to wholesalers, but rather as a means of feeding their livestock. Nevertheless, they still offer useful information regarding the demand for oats in the region as well as other related trends. From a producer's perspective, they see the demand for oats as decreasing, which conflicts with answers given by the majority of oat purchasers interviewed who predicted that their companies would be maintaining or increasing the amount of oat products they purchase in the next 18 months. This inconsistency may be the result of the fact that Steinray is not directly involved in oat selling and purchasing activities, and may therefore be getting information from different sources. Steinray has observed that oats have gone down in production, at least at their farm, which they attribute to a decrease in their herd sizes. It may very well be that other farmers in the region are indeed decreasing herd sizes as well, but this would not necessarily have an impact on the milling industry if these farmers too are producing their own oats and not purchasing or selling to wholesalers and mills.

When asked whether there is room in the market to increase oat production, the respondent from Steinray answered, "It depends. Oatmeal is cheap anyway you look at it. I don't know if there's ever going to be a growing demand for it." This suggests that, from a producer's perspective, oats are a product that is associated with stagnant growth, and will likely remain this way from some time. The other farmer interviewed shared the same negative opinion of oats as a profit crop. He also only grew them as a cover crop for alfalfa and to feed his cattle, not to sell for human consumption.

In terms of appropriateness of location, Steinray stated that Wisconsin, along with the entire Midwest, is a good place to grow oats, since the climate in this region is ideal for oat production. This has led to the Midwest region being a popular location for oat producers. As mentioned earlier, however, Steinray farms themselves do not do any contracting with a miller, and our respondent is quoted saying that if they were to contract with a miller, their closest option would be in Indiana. In addition, they said most oats in the area if shipped elsewhere are shipped out to Michigan or all the way to Mississippi. They do, however, list CHS, a division of Cenex, as being the main source of milling located within the region, which suggests there is still some competition for Kohler that is closer to home.

## Competitive Analysis

### Grain Milling Companies in Wisconsin

Company	Location	Phone Number	Revenue(\$)	Total Employees
Lacrosse Milling Company	Cochrane, WI	608-248-2222		
Boyd Feed & Supply	Boyd, WI	715-667-3898		
S & S Custom Roasting	Beaver Dam, WI	920-960-9118		
Lonesome Stone Milling, LLC	Lone Rock, WI	608-583-2100	200,000	3
Podgorski Grain Farms	Merrill, WI	608-583-2100	120,000	2
Ardent Mills, LLC	Kenosha, WI	262-652-6756		31

Food To Market was able to speak with Lacrosse Milling, Boyd Feed & Supply, S & S Custom Roasting, and Lonesome Stone Milling, all of whom confirmed that they did indeed mill oats. Lacrosse Milling said they milled on average just under 10 million bushels of oats a year, which multiplied by 32 pounds a bushel is close to 160 thousand tons per year. Oats make up 95 percent of the products they mill. Boyd Feed & Supply, on the other hand, only mills 4,000 bushels, or 64 tons of oats a year, and oats account for 100 percent of what they mill. S & S Custom Roasting owner Craig Shoemaker said that S & S is the only certified organic full-service feed mill in the southeast region of Wisconsin, but stressed that they do not steam-roll oats as they only mill oats for animal and not human consumption. Lonesome Stone confirmed that they mill oats but could not comment as to the quantity milled.

## Market and Industry Analysis

This industry analysis provides information and trends in five industries targeted by the Whitewater University Technology Park. The fifteen interviewed companies fall into one or more of these industries.

### Industry Analysis Table: Key Metrics

The industry analysis below depicts the revenue, profit, annual growth rate (2010-2015), projected annual growth rate (2015-2020), exports, and number of businesses for the researched industries as reported by IBISWorld.

Industry	Revenue	Profit	Annual Growth 2010-15	Projected Growth 2015-20	Exports	# of Businesses
<b>Bakery</b>						
<b>Bakery Café Industry</b>	\$8.1 billion	\$446.9 million	7.4%	2.4%	n/a	1,387
<b>Bakery Product Manufacturing</b>	n/a	n/a	n/a	3%	n/a	2,700
<b>Breweries</b>						
<b>Breweries</b>	\$32.6 billion	\$2.6 billion	3.0%	2.3%	\$3.5 billion	1,037
<b>Craft Beer</b>	\$5 billion	\$408	18.8%	5.5%	\$124.6 million	3,794
<b>Cereal</b>						
<b>Cereal (IBIS World)</b>	\$11 billion	\$1.4 billion	-1.0%	0.9%	\$708.4 million	33
<b>Cereal (First Research)</b>						
<b>Gluten-Free (retrieved from other)</b>	\$2.34 billion	n/a	34%	19.2%	n/a	n/a
<b>Milling – Grain (First Research)</b>	\$20 billion	n/a	n/a	4%	n/a	240
<b>Oats</b>	n/a	n/a	-0.9%	3.5%	n/a	n/a
<b>Oat Flakes</b>	n/a	n/a	4.8%	5%	n/a	n/a
<b>Wholesaling - Grain</b>	\$1.33.5 billion	\$3.5 billion	2.0%	1.3%	n/a	2,137

## Bakery

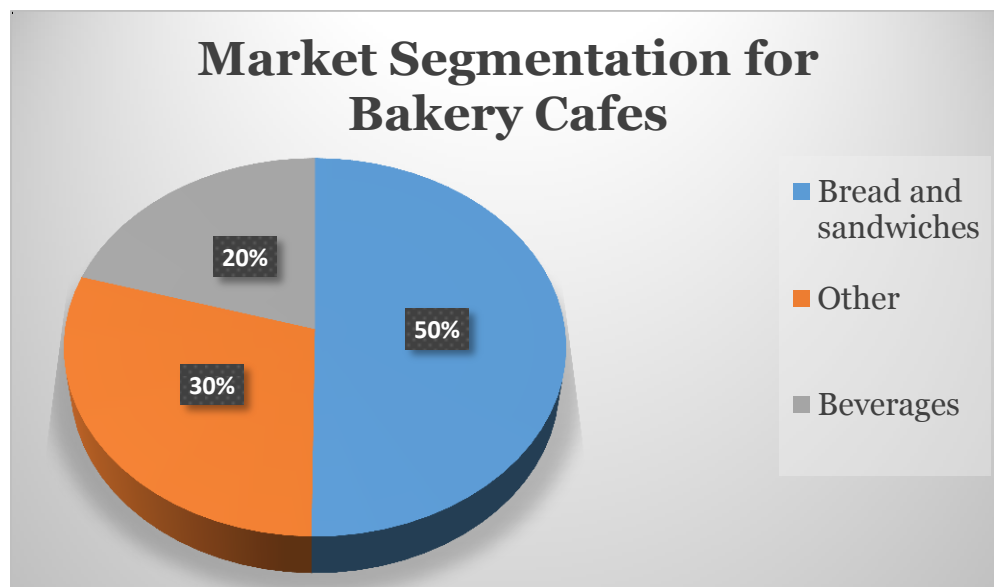
Quick Facts for Bakery Café Industry	
Revenue: \$8.1-billion	Growth rate: <b>Increase</b> 2.4%
Profit: \$446.9-million	Wisconsin's % of U.S. market: 1.3%
Quick Facts for Bakery Product Manufacturing	
Revenue: n/a	Growth rate: <b>Increase</b> 3%

The Bakery Cafes industry is primarily comprised of companies that produce products that are flour-based and baked in an on-site oven and meant for immediate consumption either on-site or to go. There are a variety of products, including bread, cakes, pastries, pies and bagels; some bakeries offer complementary products, such as soups, salads and sandwiches.

Wisconsin holds roughly 1.3 percent of all United States bakery cafe industry establishments. The Great Lakes region, which includes Wisconsin, Illinois, Indiana, Michigan and Ohio, holds a cumulative 12.6 percent of the industry's establishments.

Key external drivers for the bakery café industry include consumer spending, the healthy eating index, per-capita coffee consumption and the consumer confidence index.

There are only two major companies who hold a significant percentage of market share. Panera holds a majority of the market, with 54.2 percent of the shares. Einstein Noah Restaurant Group holds 6.1 percent, but has seen a decline in locations since 2009. The remaining 39.7 percent of the market contains a number of other businesses throughout the country including Au Bon Pain, Corner Bakery Café, Brueggers, and small business type locations. Bakery cafes split their products into three overarching categories: bread and sandwiches, which accounts for 50.2 percent of the segmentation, other with 29.4 percent, and beverages with 20.4 percent. Below is a graph showing the segmentation breakdown. (Crompton, 2015)



## Bakery Products

Bakery Product manufacturing consists of all companies that make fresh and frozen products, including bread, cakes, pies and doughnuts. The market is expected to increase in revenue by three percent between 2015 and 2019 according to First Research. Though the market revenue is expected to increase, the growth of the industry is low due to the cost of raw materials and energy costs. The two key external drivers for the Bakery Product manufacturing industry are energy prices and commodity prices. Both have been a concern over the years due to price fluctuation. (Bakery Product manufacturing, 2015)

## Breweries/Alcohol

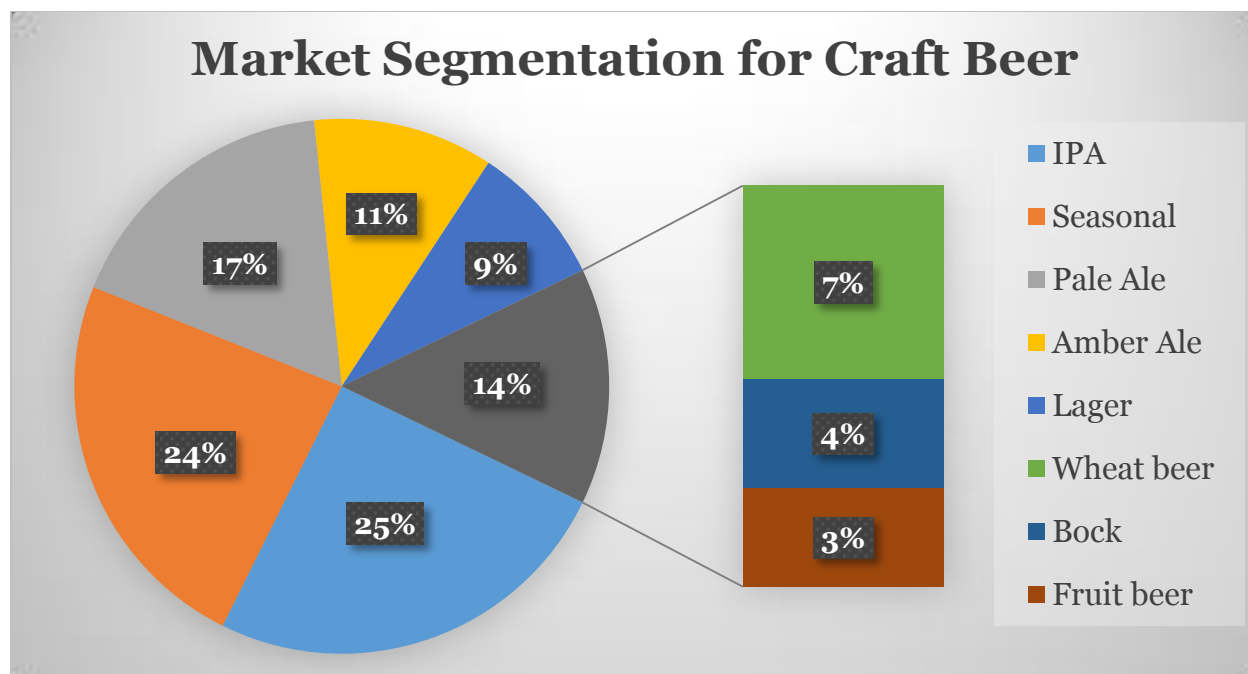
The most commonly known beer made from oats is the British specialty known as oatmeal stout. Though more common in Europe, it has a growing popularity in the United States because of the increased mouthfeel of the beer. Oatmeal adds a rich, smooth texture and increases the body (Reis, 2013). Oats, along with corn and sugar are cheaper than the usual malted barley. But they are rarely used as the base of the beer. Though they can be, oats are rarely malted, and most often it is coupled with a barley base instead. Oats are more commonly used in craft beer as many of the larger commercial brewers do not find the increased brewing profitable. (Galante, 1997)

Quick Facts for Breweries	
Revenue: \$ 32.6 billion	Growth rate: <b>Increase</b> 2.3%
Profit: \$2.6 billion	Wisconsin's % of U.S. market: 4.3 %
Quick Facts for Craft Beer	
Revenue: \$5 billion	Growth rate: <b>Increase</b> 5.5%
Profit: \$2.6 billion	Wisconsin's % of U.S. market: 4.3 %

The breweries industry is the production of alcoholic beverages using malted barley and hops. This industry excludes wine, brandy, cider, distilled beverages and malt. The market has revenue of \$32.6 billion and is expected to grow 2.3 percent annually from 2015 to 2020. Wisconsin holds roughly 4.3 percent of the United States Breweries industry establishments. The Great Lakes region, which includes Wisconsin, Illinois, Indiana, Michigan and Ohio, holds a cumulative 15.4 percent of the industry's establishments. (Petrillo, 2015)

The craft beer industry consists of microbreweries and brewpubs that brew on the premises for resale or consumption. A microbrewery is defined as a location that produces a limited amount of beer, usually around six million barrels per year. A brewpub offers a selection of food along with their drinks, and produces a selection of beer on site. Stout beer - along with wheat beers, fruit beers and porter - has been growing steadily in popularity over the last five years and is expected to continue to grow for the next five years. The craft beer market is segmented into eight major product types: IPA with 25.2 percent, seasonal with 23.7 percent, pale ale with 17.3 percent, amber ale with 10.9 percent, lager with 8.6 percent, wheat with 6.9 percent, bock with 3.9 percent and fruit beer with 3.5 percent (Petrillo, 2015). Below is a graph showing the segmentation breakdown.





## Cereal

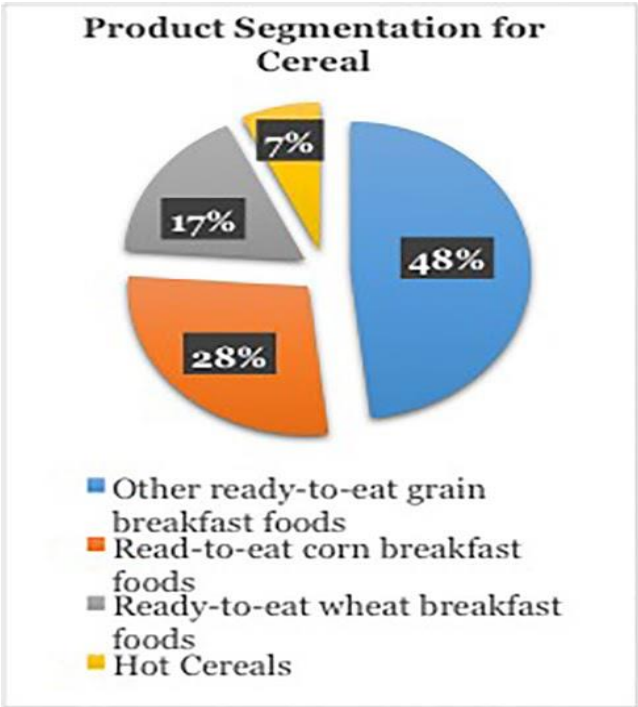
According to IBIS world, the cereal production industry manufacture ready-to-eat and hot cereals by acquiring raw materials such as corn, wheat, oats, flour, sugar, malt extract and rice. The industry includes the purchase of packaging materials such as plastic and paperboard containers.

Quick Facts for Cereal (IBIS World)	
Revenue: \$11 billion	Growth rate: <b>increase</b> 0.9%
Quick Facts for Cereal (First Research)	
Revenue: \$11 billion	Growth rate: <b>increase</b> 3%

According to IBIS world, the market has revenue of \$11 billion and is expected to increase 0.9 percent annually from 2015 through 2020. This is in contrast to the decrease of one percent from 2010 to 2015. The industry is split into four different product segments: Other ready-to-eat grain breakfast foods at 48.2 percent, ready-to-eat corn breakfast foods at 27.9 percent, ready-to-eat wheat breakfast foods at 16.8 percent and hot cereals at 7.1 percent. To the right is a graph showing the segmentation of the market. Oats and rice account for the majority of other ready-to-eat grain breakfast foods. This segment is expected to face an increase as people continue to purchase health foods and gluten-free products. Cereal makers are turning to more healthful and convenient options as the competition in the market increases. Cereal production has two companies that hold a majority of the market shares. Kellogg Company holds 31.5 percent and General Mills holds 21.8 percent of the market. Post holdings Inc. and PepsiCo Inc. follow with 9.6 percent and 6.6percent respectively (Carter, 2015).

First Research shows similar trends in the cereal manufacturing market. According to them, health consideration is a growing driver in the market. Though the market is highly concentrated, small

companies are able to emphasize organic and healthful ingredients, thereby creating a niche in the market. First Research forecasts the industry to grow at an annual rate of three percent between 2015 and 2019. First Research emphasizes the increase of competition from breakfast alternatives, including products that are easily consumed on-the-go, such as bagels, yogurt and breakfast bars. There is also danger in volatile commodity prices, given the price of products such as oats routinely swing 10 percent or more from year-to-year (Breakfast Cereal Manufacturing, 2015).



### Gluten/Wheat Free

Quick Facts for Gluten Free	
Sales: \$2.34 billion	Growth rate: <b>Increase</b> 19.2%

Oats are a popular substitute for people with wheat allergies but they are not used much for gluten-free meals, as they are not recommended for those with Celiac disease. Only in recent years have researchers announced it is safe for a majority of those with Celiac disease to eat oats in moderation. Oats themselves are gluten-free but because of cross-contamination when grown or processed near wheat, most assume it is not safe to eat unless it is certified as gluten-free (Burns, 2015). People with wheat allergies face a serious issue with cross contamination with other products (Fletton).

Food To Market located a study on the growth and future expected market for gluten-free products. The study, from the Packaged Facts’ Gluten-Free Foods in the U.S. and released in January 2015, predicts gluten-free products will grow 19.2 percent annually through 2019, with total annual sales rising to \$2.34 billion. The growth is a decrease from the annual rate of 34 percent between 2010 through 2014, reaching sales of \$973 million. The article explained that approximately one in 133 people in the U.S. have celiac disease, where the only treatment is a gluten-free diet. There is a growing interest and need for gluten-free options as more people self-diagnose themselves as gluten sensitive or choose a gluten-

free lifestyle for its perceived health benefits. It is estimated that only 6 percent of the U.S. population (or 18 million people) are completely non-celiac gluten sensitive. (Crawford).

### Global Oats Market

Currently, the global oats market is mainly composed of the feed market, which accounts for 70 percent of total consumption. However, human consumption of oats is expected to grow, and the overall consumption of oats is expected to shift away from livestock feed to human consumption in future years. The global oats market is expected to increase due to a 3.4 percent increase in production from 2015 to 2020. This growth is higher than in previous years; from 2007 to 2014, oats production was declining by 0.9 percent. North America accounts for roughly 16.8 percent of global oats production (IMARC, 2015).

### Global Oat Flakes Market

Oat flakes are the most popular type of oats for human food consumption, with 70 percent of the market share. The global oat flakes market is expected to increase due to a production increase of 4.8 percent from 2015 to 2020. This projected growth is a decline from the 5 percent growth in production from 2007 to 2014. North America accounts for 28 percent of the global oat flakes production market.

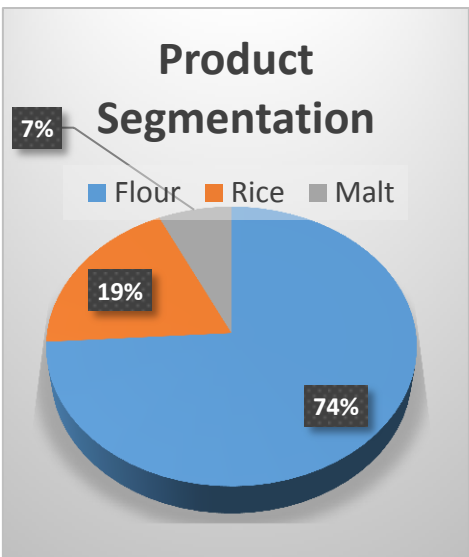
Key success factors for the oat flakes industry include rising incomes, changing lifestyles, manufacturing plant location, quality standards and brand recognition, efficiency of manufacturing, assured supplies of raw materials, and access to suitable and quality human resources.

Key risk factors for this industry include raw material and utility prices, industry entry risks, government regulations, adequate distribution, changes in foreign exchange, and adverse economic conditions (IMARC, 2015).

### Milling

Quick Facts for Milling - Grain	
Revenue: \$ 20 billion	Growth rate: Increase 4%

The grain milling industry include companies that mill oat and other flours, rice, malt grains (primarily barley), and mix prepared flour mixes and dough. The milling market has revenue of \$20 billion. The industry is expected to grow four percent annually from 2015 through 2019. This follows a sudden drop between 2014 and 2015 when the market growth went from four percent to two percent. Key drivers for the industry include energy prices, such as the cost of crude oil, government regulations, and the price of commodities, including crops, metals and other raw materials. According to First Research, the industry is split up into three major products: Oat and other flours (74 percent), rice (19 percent), and malt (7 percent). (Grain Milling, 2015)



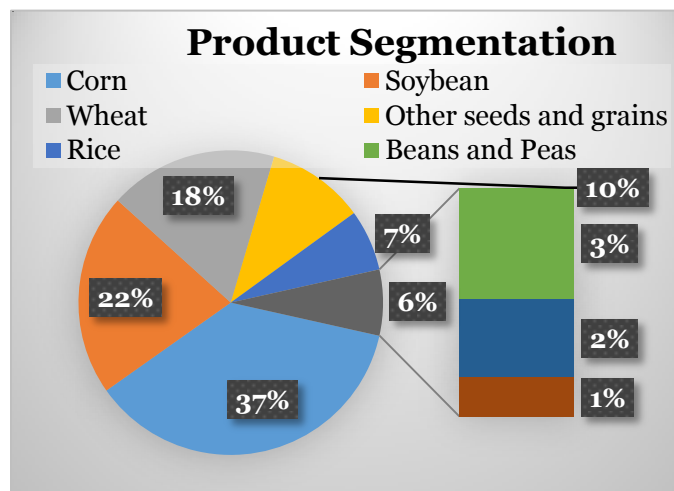
## Wholesale Grain

### Quick Facts for Corn, Wheat & Soybean Wholesaling

**Revenue: \$ 133.5 billion**

Growth rate: **Increase** 1.3 %

The wholesale grain industry purchase and distribute grains like corn, rice, wheat, oats, dry beans, soybeans and other edible beans. The market is expected to grow 1.3 percent annually from 2015 through 2020. This is a decrease from the annual growth rate of two percent from 2010 through 2015. The current revenue for the market is \$133.5 billion and it has a profit estimated at \$3.5 billion. Key drivers for the market include, demand from animal food production, the price of corn, demand from bread production, the price of coarse grains, the world price of soybeans, and the world price of wheat. There are eight product and service segments which comprise the wholesale grain industry: corn (36.7 percent), soybean (21.5 percent), wheat (17.9 percent), other seeds and grains (10.4 percent), rice (6.5 percent), beans and peas (3.4 percent), sorghum (2.4 percent), and oats and barley (1.2 percent). As depicted on the graph to the right. According to IBIS World, about half of the output in the oats and barley segment is used for animal feed. Only a small amount of this market is used in food manufacturing industries for human consumption. IBIS World points out that many of the minor industry segments are expected to shrink as the prices for corn and wheat are expected to continue to increase.



The industry has three major players that hold a large portion of the market share. Archer Daniels Midland Company, an Illinois based company, holds 24.3 percent of the market. It focuses on processing oilseeds, grains and other crops for use by food and energy manufactures. ADM also operates an extensive grain elevator and transportation network for a wide verity of grains. Cargill Inc. holds the second largest market share with 23.9 percent. They are a privately owned, Minnesota based company. Operating five divisions: agriculture services, food ingredients and applications, origination and processing, industrial and risk management and financial. Though they are based in the Midwest, ADM and Cargill Inc. are international companies spanning various countries. The remaining key player in the industry is CHS Inc., which holds 9.1 percent of the market share. They too are a Minnesota based company, formerly known as the Cenex Harvest States Cooperatives. CHS has three business segments: energy, agriculture and corporative, and other. The wholesale grain business is a part of the agriculture segment. Unlike the previous companies, CHS is primarily focused in the Great Lakes Region to the Pacific, though they have recently expanded into buying and selling internationally, resulting in significant market growth. Other companies include ConAgra Foods Inc. and Growmark Inc., neither of which hold more than 1 percent of the market share individually. Growmark markets primarily within the Midwestern U.S. and Ontario, Canada (Neville, 2015).

## References

- Bakery Product Manufacturing - quarterly update 7/6/2015. (2015). (). Austin: Hoover's Inc. Retrieved from <http://search.proquest.com/docview/1694538218?accountid=14791>
- Breakfast cereal manufacturing - quarterly update 8/31/2015. (2015). (). Austin: Hoover's Inc. Retrieved from <http://search.proquest.com/docview/1708605695?accountid=14791>
- Breweries - quarterly update 8/31/2015. (2015). (). Austin: Hoover's Inc. Retrieved from <http://search.proquest.com/docview/1708604898?accountid=14791>
- Burns, J. (2015, Jan 21). In season: Oats. McClatchy - Tribune Business News Retrieved from <http://search.proquest.com/docview/1647098453?accountid=14791>
- Carter, B. (2015, January). Cereal Production in the US. Retrieved from IBISworld
- Crawford, E. (2015, January). Sales of gluten-free products continue to grow double digits on quality, selection. Reprrieved from [www.Foodnavigator-usa.com](http://www.Foodnavigator-usa.com)
- Fletton, H. (). Oats. Retrieved from <http://www.wheat-free.org/oat-food-fact.html>
- Galante, S. (1997, October). Oatmeal Stout: Style. Retrieved from <http://byo.com/hops/item/1189-oatmeal-stout-style>
- Grain farming - quarterly update 9/21/2015. (2015). (). Austin: Hoover's Inc. Retrieved from <http://search.proquest.com/docview/1714340150?accountid=14791>
- Grain milling - quarterly update 8/3/2015. (2015). (). Austin: Hoover's Inc. Retrieved from <http://search.proquest.com/docview/1701146977?accountid=14791>
- International Market Analysis Research and Consulting (IMARC). (2015). Oats processing plant project report: Industry trends, manufacturing process, equipment, raw materials, cost and revenue.
- Neville, A. (2015, May). Corn, Wheat & Soybean Wholesaling in the U.S. Retrieved from IBISworld
- Petrillo, N. (2015, July). Breweries in the US. Retrieved from IBISworld.
- Petrillo, N. (2015, August) Craft Beer Production in the US. Retrieved from IBISworld.
- Reis, M. (2013, January). How to Identify Oats, Rye, Wheat, Corn, and Rice in Your Beer. Retrieved from <http://drinks.seriousseats.com/2013/01/how-to-identify-adjunct-grains-in-your-beer-oats-wheat-rye-beer.html>
- <sup>1</sup> Coblentz, Wayne, and Mike Bertram. "Fall-Grown Oat Forages: Cultivars, Planting Dates, and Expected Yields." *Focus on Forage* 14.3 (2012): 1-3. *Wisconsin Team Forage*. University of Wisconsin Extension. Web.

- <sup>2</sup> "The Common Agricultural Policy and the Food Chain: Entering A New Era of Cooperation." *Research Handbook on EU Agriculture Law* (n.d.): 267-68. KPMG International. Web.
- <sup>3</sup> "ConAgra Oat Milling Facility." *ConAgra Oat Milling Facility*. YoungLove, n.d. Web. 05 Jan. 2016.
- <sup>4</sup> Darby, Heather, and Rosalie J. Wilson. *Mill Feasibility Study*. Tech. UVM Extension, n.d. Web.
- <sup>5</sup> Doehlert, D. C., D. P. Wiesenborn, M. S. McMullen, J. B. Ohm, and N. R. Riveland. "Effects of Impact Dehuller Rotor Speed on Dehulling Characteristics of Diverse Oat Genotypes Grown in Different Environments." *Cereal Chemistry* 86.6 (2009): 653-60. Print.
- <sup>6</sup> Doehlert, D. C., M. S. McMillen, and J. L. Jannink. "Oat Grain/Groat Size Ratios: A Physical Basis for Test Weight." *Cereal Chemistry Journal*. AACC International, n.d. Web.
- <sup>7</sup> Ferguson, Shon, Simon Weseen, and Gary Storey. "Project on African Agriculture." *Anthropology News* 28.5 (1987): 13-15. *University of Saskatchewan Department of Agricultural Economics*. University of Saskatchewan. Web.
- <sup>8</sup> Ferguson, Shon, Simon Weseen, and Gary Storey. "University of Saskatchewan --- Organic Information Website --- Reports." *Costs in the Organic Grain Supply Chain*. University of Saskatchewan, n.d. Web. 05 Jan. 2016.
- <sup>9</sup> *Oat Dehulling and Separating System*. Tech. Henan Win Tone Equipment Manufacture Co., Ltd., n.d. Web.
- <sup>10</sup> *Oats Processing Plant Project Report: Industry Trends, Manufacturing Process, Equipment, Raw Materials, Cost and Revenue*. Rep. Imarc Group, 2015. Web.
- <sup>11</sup> "Oats:Wisconsin." *Journal of Arachnology* 43.2 (2015): 229-30. *United States Department of Agriculture*. Web.
- <sup>12</sup> Peltonen-Sainio, P., M. Kontturi, and A. Rajala. *Impact Dehulling Oat Grain to Improve Quality of On-farm Produced Feed : 1.Hullability and Associated Changes in Nutritive Value and Energy Content*. Publication. Agricultural and Food Science, n.d. Web.
- <sup>13</sup> Stute, J. K., J. L. Posner, and J. L. Hedtcke. "Wisconsin Integrated Cropping Systems Trial Project." *Wisconsin Integrated Cropping Systems Trial Project RSS*. Wisconsin Integrated Cropping System Trial Project, n.d. Web. 05 Jan. 2016.
- <sup>14</sup> United States. Department of The Treasury. Internal Revenue Service. *How to Depreciate Property*. Internal Revenue Service, n.d. Web.
- <sup>15</sup> 18 years of oat production and prices. N.d. Raw data. United States Department of Agriculture, Washington D.C.

<sup>16</sup> Oat Farming Overhead. N.d. Raw data. United States Department of Agriculture, Washington D.C. Oat Farming Overhead. N.d. Raw data. United States Department of Agriculture, Washington D.C.

<sup>17</sup> Facility resource: [http://www.alibaba.com/product-detail/Industrial-Prefab-Poultry-House-Poultry-Barn\\_60321431897.html?spm=a2700.7724838.8.31.h72LYF](http://www.alibaba.com/product-detail/Industrial-Prefab-Poultry-House-Poultry-Barn_60321431897.html?spm=a2700.7724838.8.31.h72LYF)

<sup>18</sup> Storage resources: [http://www.alibaba.com/product-detail/Galvanized-Oat-Bran-Storage-Steel-Silo\\_60104467283.html?spm=a2700.7724857.29.46.KrZUyV](http://www.alibaba.com/product-detail/Galvanized-Oat-Bran-Storage-Steel-Silo_60104467283.html?spm=a2700.7724857.29.46.KrZUyV)

[http://wholesaler.alibaba.com/product-detail/Oats-Bran-Storage-Steel-Silo-Grain\\_60246963470.html?spm=a2700.7724857.29.55.KrZUyV](http://wholesaler.alibaba.com/product-detail/Oats-Bran-Storage-Steel-Silo-Grain_60246963470.html?spm=a2700.7724857.29.55.KrZUyV)

[http://www.alibaba.com/product-detail/durable-low-price-100-1000-ton\\_60332866237.html?spm=a2700.7724857.29.64.KrZUyV](http://www.alibaba.com/product-detail/durable-low-price-100-1000-ton_60332866237.html?spm=a2700.7724857.29.64.KrZUyV)

[http://www.alibaba.com/product-detail/Galvanized-steel-bin-tank-raw-oat\\_1078554930.html?spm=a2700.7724857.29.73.KrZUyV](http://www.alibaba.com/product-detail/Galvanized-steel-bin-tank-raw-oat_1078554930.html?spm=a2700.7724857.29.73.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2013828046.html?spm=a2700.7724857.29.82.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2013828046.html?spm=a2700.7724857.29.82.KrZUyV)

[http://www.alibaba.com/product-detail/Grain-Oats-used-storage-Stock-Bin\\_60236676373.html?spm=a2700.7724857.29.91.KrZUyV](http://www.alibaba.com/product-detail/Grain-Oats-used-storage-Stock-Bin_60236676373.html?spm=a2700.7724857.29.91.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-bulk\\_2014924938.html?spm=a2700.7724857.29.100.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-bulk_2014924938.html?spm=a2700.7724857.29.100.KrZUyV)

[http://www.alibaba.com/product-detail/100tons-storage-bin-for-flour-mill\\_737136757.html?spm=a2700.7724857.29.109.KrZUyV](http://www.alibaba.com/product-detail/100tons-storage-bin-for-flour-mill_737136757.html?spm=a2700.7724857.29.109.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2013906257.html?spm=a2700.7724857.29.118.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2013906257.html?spm=a2700.7724857.29.118.KrZUyV)

[http://www.alibaba.com/product-detail/Bulk-Oats-Steel-Storage-Silo-for\\_60370603471.html?spm=a2700.7724857.29.127.KrZUyV](http://www.alibaba.com/product-detail/Bulk-Oats-Steel-Storage-Silo-for_60370603471.html?spm=a2700.7724857.29.127.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-elevated\\_2015063417.html?spm=a2700.7724857.29.136.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-elevated_2015063417.html?spm=a2700.7724857.29.136.KrZUyV)

[http://www.alibaba.com/product-detail/Grain-mill-used-raw-oats-storage\\_1548256943.html?spm=a2700.7724857.29.145.KrZUyV](http://www.alibaba.com/product-detail/Grain-mill-used-raw-oats-storage_1548256943.html?spm=a2700.7724857.29.145.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2013896676.html?spm=a2700.7724857.29.154.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2013896676.html?spm=a2700.7724857.29.154.KrZUyV)

[http://www.alibaba.com/product-detail/Galvanized-steel-silo-bin-assembly-raw\\_1534410834.html?spm=a2700.7724857.29.163.KrZUyV](http://www.alibaba.com/product-detail/Galvanized-steel-silo-bin-assembly-raw_1534410834.html?spm=a2700.7724857.29.163.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-assembly\\_2014845197.html?spm=a2700.7724857.29.172.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-assembly_2014845197.html?spm=a2700.7724857.29.172.KrZUyV)

[http://www.alibaba.com/product-detail/Galvanized-steel-bin-tank-raw-oat\\_1532985323.html?spm=a2700.7724857.29.181.KrZUyV](http://www.alibaba.com/product-detail/Galvanized-steel-bin-tank-raw-oat_1532985323.html?spm=a2700.7724857.29.181.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2014758983.html?spm=a2700.7724857.29.190.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2014758983.html?spm=a2700.7724857.29.190.KrZUyV)

[http://www.alibaba.com/product-detail/Farm-using-storage-bin-oat-silo\\_1309794596.html?spm=a2700.7724857.29.199.KrZUyV](http://www.alibaba.com/product-detail/Farm-using-storage-bin-oat-silo_1309794596.html?spm=a2700.7724857.29.199.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-flexible\\_2014928465.html?spm=a2700.7724857.29.208.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-flexible_2014928465.html?spm=a2700.7724857.29.208.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2013928979.html?spm=a2700.7724857.29.244.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2013928979.html?spm=a2700.7724857.29.244.KrZUyV)



[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2013936996.html?spm=a2700.7724857.29.253.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2013936996.html?spm=a2700.7724857.29.253.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-bolted\\_2014838026.html?spm=a2700.7724857.29.262.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-bolted_2014838026.html?spm=a2700.7724857.29.262.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2014738261.html?spm=a2700.7724857.29.280.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2014738261.html?spm=a2700.7724857.29.280.KrZUyV)

[http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat\\_2014769843.html?spm=a2700.7724857.29.289.KrZUyV](http://www.alibaba.com/product-detail/50-5000T-Hot-Galvanized-Steel-oat_2014769843.html?spm=a2700.7724857.29.289.KrZUyV)

[http://www.alibaba.com/product-detail/Galvanized-Steel-Silo-Bin-Assembly-Raw\\_60097071028.html?spm=a2700.7724857.29.314.KrZUyV](http://www.alibaba.com/product-detail/Galvanized-Steel-Silo-Bin-Assembly-Raw_60097071028.html?spm=a2700.7724857.29.314.KrZUyV)

[http://www.alibaba.com/product-detail/oats-sugar-silo-price\\_60376959572.html?spm=a2700.7724857.29.332.KrZUyV](http://www.alibaba.com/product-detail/oats-sugar-silo-price_60376959572.html?spm=a2700.7724857.29.332.KrZUyV)

19 Equipment Resources: [http://www.alibaba.com/product-detail/Professional-Oat-dehuller-machine\\_1122954539.html?spm=a2700.7724857.29.93.FGnly7](http://www.alibaba.com/product-detail/Professional-Oat-dehuller-machine_1122954539.html?spm=a2700.7724857.29.93.FGnly7)

[http://www.alibaba.com/product-detail/sunflower-seed-dehulling-machine-sunflower-seed\\_60306201996.html?spm=a2700.7724838.30.50.7RkEOf](http://www.alibaba.com/product-detail/sunflower-seed-dehulling-machine-sunflower-seed_60306201996.html?spm=a2700.7724838.30.50.7RkEOf)

[http://www.alibaba.com/product-detail/grain-pre-clean-machine\\_60182148233.html?spm=a2700.7724857.29.82.LGmFXO](http://www.alibaba.com/product-detail/grain-pre-clean-machine_60182148233.html?spm=a2700.7724857.29.82.LGmFXO)

[http://www.alibaba.com/product-detail/Grain-Pre-Cleaning-Machine-In-Flour\\_60266796856.html?spm=a2700.7724838.30.9.s4mX6S&s=p](http://www.alibaba.com/product-detail/Grain-Pre-Cleaning-Machine-In-Flour_60266796856.html?spm=a2700.7724838.30.9.s4mX6S&s=p)

[http://www.alibaba.com/product-detail/Best-selling-automatic-boiling-machine-for\\_689565809.html?spm=a2700.7724838.30.23.b5V4xb](http://www.alibaba.com/product-detail/Best-selling-automatic-boiling-machine-for_689565809.html?spm=a2700.7724838.30.23.b5V4xb)

[http://www.alibaba.com/product-detail/Multifunctional-oat-peeling-machine-oat-peeler\\_60251442350.html?spm=a2700.7724838.0.0.0f](http://www.alibaba.com/product-detail/Multifunctional-oat-peeling-machine-oat-peeler_60251442350.html?spm=a2700.7724838.0.0.0f)

[http://www.alibaba.com/product-detail/Grain-hot-wind-Rotary-Kiln\\_60114798210.html?spm=a2700.7724838.30.1.zwPGNW](http://www.alibaba.com/product-detail/Grain-hot-wind-Rotary-Kiln_60114798210.html?spm=a2700.7724838.30.1.zwPGNW)

[http://www.alibaba.com/product-detail/Supply-Mobile-Grain-Dryer-used-for\\_1897298618.html?spm=a2700.7724838.30.27.zwPGNW](http://www.alibaba.com/product-detail/Supply-Mobile-Grain-Dryer-used-for_1897298618.html?spm=a2700.7724838.30.27.zwPGNW)

[http://www.alibaba.com/product-detail/ultrasonic-grain-vibrating-cleaning-sieve-machine\\_916653374.html?spm=a2700.7724857.29.21.VYVOpl&s=p](http://www.alibaba.com/product-detail/ultrasonic-grain-vibrating-cleaning-sieve-machine_916653374.html?spm=a2700.7724857.29.21.VYVOpl&s=p)

[http://www.alibaba.com/product-detail/ZYD-Grain-Sieving-Machine\\_473517680.html?spm=a2700.7724857.29.3.VYVOpl&s=p](http://www.alibaba.com/product-detail/ZYD-Grain-Sieving-Machine_473517680.html?spm=a2700.7724857.29.3.VYVOpl&s=p)

[http://www.alibaba.com/product-detail/YongQing-stainless-steel-vibrating-sieve-for\\_952433962.html?spm=a2700.7724838.30.9.iptFHi](http://www.alibaba.com/product-detail/YongQing-stainless-steel-vibrating-sieve-for_952433962.html?spm=a2700.7724838.30.9.iptFHi)

[http://www.alibaba.com/product-detail/grain-sorting-machine\\_60318600042.html?spm=a2700.7724857.29.39.3hoPDy&s=p](http://www.alibaba.com/product-detail/grain-sorting-machine_60318600042.html?spm=a2700.7724857.29.39.3hoPDy&s=p)

[http://www.alibaba.com/product-detail/Grain-Color-Sorting-Machine-with-top\\_60316787053.html?spm=a2700.7724857.29.161.3hoPDy](http://www.alibaba.com/product-detail/Grain-Color-Sorting-Machine-with-top_60316787053.html?spm=a2700.7724857.29.161.3hoPDy)

[http://www.alibaba.com/product-detail/12000-GS-Standard-type-304-rare\\_536452612.html?spm=a2700.7724838.30.1.kEEv5c&s=p](http://www.alibaba.com/product-detail/12000-GS-Standard-type-304-rare_536452612.html?spm=a2700.7724838.30.1.kEEv5c&s=p)

[http://www.alibaba.com/product-detail/Portable-Electric-Peanut-Machine-Granulating-Machine\\_60033564135.html](http://www.alibaba.com/product-detail/Portable-Electric-Peanut-Machine-Granulating-Machine_60033564135.html)

[http://www.alibaba.com/product-detail/2015-Hot-Sale-Peanut-Walnut-Cashew\\_60309910162.html?spm=a2700.7724838.30.52.mjm50l](http://www.alibaba.com/product-detail/2015-Hot-Sale-Peanut-Walnut-Cashew_60309910162.html?spm=a2700.7724838.30.52.mjm50l)

[http://www.alibaba.com/product-detail/alibaba-top-sale-sand-removing-machine\\_60106256124.html?spm=a2700.7724838.30.96.fXrL1S](http://www.alibaba.com/product-detail/alibaba-top-sale-sand-removing-machine_60106256124.html?spm=a2700.7724838.30.96.fXrL1S)

[http://www.alibaba.com/product-detail/alibaba-top-sale-sand-removing-machine\\_60106256124.html?spm=a2700.7724838.30.96.fXrL1S](http://www.alibaba.com/product-detail/alibaba-top-sale-sand-removing-machine_60106256124.html?spm=a2700.7724838.30.96.fXrL1S)

[http://www.alibaba.com/product-detail/ALLUNDER-oat-peeler-peeling-machine-moringa\\_60259950594.html?spm=a2700.7724838.8.43.JR7AXG](http://www.alibaba.com/product-detail/ALLUNDER-oat-peeler-peeling-machine-moringa_60259950594.html?spm=a2700.7724838.8.43.JR7AXG)

[http://www.alibaba.com/product-detail/Oat-Wheat-Grain-Color-Sorting-Machine\\_60256557541.html?spm=a2700.7724838.30.8.JQb1BN&s=p](http://www.alibaba.com/product-detail/Oat-Wheat-Grain-Color-Sorting-Machine_60256557541.html?spm=a2700.7724838.30.8.JQb1BN&s=p)

[http://www.alibaba.com/product-detail/Oat-CCD-color-sorter-oat-sorting\\_1700418836.html?spm=a2700.7724838.30.24.JQb1BN](http://www.alibaba.com/product-detail/Oat-CCD-color-sorter-oat-sorting_1700418836.html?spm=a2700.7724838.30.24.JQb1BN)

[http://www.alibaba.com/product-detail/Hot-sale-2015-wheat-flour-milling\\_1480094360.html?spm=a2700.7724857.29.64.BXiIH1](http://www.alibaba.com/product-detail/Hot-sale-2015-wheat-flour-milling_1480094360.html?spm=a2700.7724857.29.64.BXiIH1)

[http://www.alibaba.com/product-detail/200T-European-oats-mill\\_717224715.html?spm=a2700.7724838.30.10.40WKgV](http://www.alibaba.com/product-detail/200T-European-oats-mill_717224715.html?spm=a2700.7724838.30.10.40WKgV)

[http://www.alibaba.com/product-detail/200T-European-oats-mill\\_717224715.html?spm=a2700.7724838.30.10.40WKgV](http://www.alibaba.com/product-detail/200T-European-oats-mill_717224715.html?spm=a2700.7724838.30.10.40WKgV)

[http://www.alibaba.com/product-detail/CN-stainless-steel-vacuum-dryer-of\\_60322952226.html?spm=a2700.7724838.30.77.k1y63P](http://www.alibaba.com/product-detail/CN-stainless-steel-vacuum-dryer-of_60322952226.html?spm=a2700.7724838.30.77.k1y63P)

[http://www.alibaba.com/product-detail/CN-stainless-steel-vacuum-dryer-of\\_60322952226.html?spm=a2700.7724838.30.77.k1y63P](http://www.alibaba.com/product-detail/CN-stainless-steel-vacuum-dryer-of_60322952226.html?spm=a2700.7724838.30.77.k1y63P)

[http://www.alibaba.com/product-detail/CN-stainless-steel-vacuum-dryer-of\\_60322952226.html?spm=a2700.7724838.30.77.k1y63P](http://www.alibaba.com/product-detail/CN-stainless-steel-vacuum-dryer-of_60322952226.html?spm=a2700.7724838.30.77.k1y63P)

[http://www.alibaba.com/product-detail/2015-small-wheat-flour-mill-plansifter\\_60324031677.html?spm=a2700.7724857.29.21.PxWx3i&s=p](http://www.alibaba.com/product-detail/2015-small-wheat-flour-mill-plansifter_60324031677.html?spm=a2700.7724857.29.21.PxWx3i&s=p)

[http://www.alibaba.com/product-detail/Full-automatic-oat-flour-packaging-machine\\_885891922.html?spm=a2700.7724838.30.95.0kiG9j](http://www.alibaba.com/product-detail/Full-automatic-oat-flour-packaging-machine_885891922.html?spm=a2700.7724838.30.95.0kiG9j)

[http://www.alibaba.com/product-detail/Factory-Price-Full-Automatic-Oats-Packing\\_1942317851.html?spm=a2700.7724838.30.166.0kiG9j](http://www.alibaba.com/product-detail/Factory-Price-Full-Automatic-Oats-Packing_1942317851.html?spm=a2700.7724838.30.166.0kiG9j)

[http://www.alibaba.com/product-detail/oat-packaging-machine\\_60347412228.html?spm=a2700.7724838.30.175.0kiG9j](http://www.alibaba.com/product-detail/oat-packaging-machine_60347412228.html?spm=a2700.7724838.30.175.0kiG9j)

[http://www.alibaba.com/product-detail/2015-Best-selling-high-quality-automatic\\_60188181498.html?spm=a2700.7724838.30.313.0kiG9j](http://www.alibaba.com/product-detail/2015-Best-selling-high-quality-automatic_60188181498.html?spm=a2700.7724838.30.313.0kiG9j)

## Appendix

Summary list of the companies that were successfully contacted during market research.

Company	City, State	Phone #	Web site ( <a href="http://www.">http://www.</a> )	Description
<b>Angry Minnow Brewing</b>	Hayward, WI	715-934-3055	Angryminnow.com	Restaurant and brewery
<b>Ann's GF Bakery</b>	Appleton, WI	920-954-0832	Anns glutenfreefoods.com	Bakery
<b>Atlanta Bread Co.</b>	Appleton, WI	920-735-1540	Atlantabread.com	Bakery
<b>Bill's Shop N Save</b>	Arena, WI	231-924-5850	Shopnsave.com	Grocery retailer
<b>Breadsmith</b>	Whitefish Bay	414-962-6203	Breadsmith.com	Bakery
<b>Bull Falls Brewery</b>	Wausau, WI	715-842-2337	Bullfallsbrewery.com	Brewery
<b>Chris and Lori's Bakehouse</b>	Poynette, WI	608-635-7901	Chrisandlorisbakehouse.com	Bakery
<b>Country Rose Bakery Cafe</b>	Union Grove, WI	262-878-5474	Countryrosebakery.com	Bakery and cafe
<b>Door County Brewing Co.</b>	Bailey's Harbor, WI	920-839-1515	Doorcountybrewingco.com	Brewery
<b>Lake Louie Brewing</b>	Arena, WI	608-753-2675	Lakelouie.com	Brewery
<b>Landmark Services Cooperative</b>	Cottage Grove, WI	800-236-3276	Landmarkservicescooperative.com	Farming Cooperative
<b>Nature's Best, Inc.</b>	Sheboygan, WI	920- 452-6176	Naturesbest.net	Wholesaler-distributor of natural food products
<b>O's Brewing Co.</b>	Plover, WI	715-254-2163	Osobrewing.com	Brewery
<b>Pearl Street Brewery</b>	La Crosse, WI	608-784-4832	Pearlstreetbrewery.com	Brewery
<b>Woodlake Market</b>	Kohler, WI	920-457-6570	Americanclubresort.com	Grocery retailer and cafe
<b>Woodman's</b>	Appleton, WI	920-735-6655	Woodmans-food.com	Grocery retailer

**Interviewed Companies Table: Industrial Contractors and Grain Transportation Companies**

<b>Company</b>	<b>City, State</b>	<b>Phone #</b>	<b>Web site (http://www.)</b>	<b>Description</b>
<b>Duffy Grain Inc.</b>	Columbus, WI	(920)-623-4160	duffygrain.com	Grain Transportation Company
<b>H&amp;M Trucking</b>	Omaha, NE	(420)-431-9410	hmtrucking.com	Grain Transportation Company
<b>Oakley Inc.</b>	North Little Rock, AR	(501)-945-0875	bruceoakley.com	Grain Transportation Company
<b>Johnson Insulation Industries Johnson-Phoenix Group L.L.C.</b>	Madison, WI	(908)-235-7388	insul8it.com/	Industrial Insulation Contractor
<b>Enterprise Electric</b>	Waukesha, WI	(262) 832-9920	enterprisellc.com	Electric Contractor