

# **Wheat Ingredients Processing**

## **A Business Case for the Great Falls Montana Region**

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The Great Falls Development Authority (GFDA) is a public/private economic development partnership serving the 13 county Golden Triangle region of north-central Montana. Our mission is to grow and diversify the Great Falls regional economy and support the creation of higher wage jobs. We are a private-sector driven, award-winning professional economic development team that prides itself on providing excellent service to support long-term business success. We were the first economic development organization in the Rocky Mountain region to earn accreditation from the International Economic Development Council.

In Addition to World-Renowned Agricultural Production, we offer a range of support for agricultural and food processors, including workforce recruitment and training grants, land and equipment grants, access to low cost capital, low cost utilities, competitive shovel-ready rail-served manufacturing sites, abundance of spring and municipal water, the 6<sup>th</sup> best tax climate in the nation, and more! We are experts at structuring packages focused on long-term client success.

The Purpose of This Business Case is to document the competitive advantages our region offers for niches in agricultural and food processing operations. We have developed business cases for a variety of other agricultural and food processing niches which may be of interest to you.

We look forward to learning about your company and how we may be able to find a great location for your start-up or expansion.

## Executive Summary

The Great Falls Region is the premier location to develop wheat ingredients processing facilities. The profit opportunities that exist for wheat ingredients processing in Montana are uncommonly advantageous due to the rapidly increasing demand for wheat ingredients, reliable availability of wheat and the plentiful human and energy resources available in the Great Falls Region.

Wheat ingredients manufacturers in the Great Falls Region supplying food, pet food, biofuels, and feed industries will have the opportunity to obtain high quality wheat commodities directly from agricultural producers. Wheat crop inbound transportation costs in the Great Falls Region would be low relative to competitors located outside of wheat crop-growing areas. On-farm storage of commodities throughout the Great Falls Region would provide year around access to high quality wheat crop commodity deliveries to wheat ingredients for foods, pet food, and feed manufacturing facilities.

The combination of cost effective energy, water, property, pulse commodities, and human resources all work together to provide a superior business environment for the establishment of wheat ingredients for foods, pet foods, biofuels, and feed manufacturing operations in the Great Falls Region. The Region can provide an optimum environment for wheat ingredients manufacturing operations.

Wheat crops grow abundantly in the Great Falls Region, giving wheat ingredients processors the substantial economic advantage of procuring grains directly from local growers and elevators.

The Region has established itself as a preferred location for the Intermediate Industrial Products segment of food and beverage manufacturing.

The Region has been active and successful in attracting and supporting a wide variety of food and beverage intermediate ingredients and finished goods manufacturing operations.

The Region has one of the lowest combined costs of industrial energy in the nation. Those costs include one of the lowest electrical rates for industrial use of any of the wheat crop growing areas in North America, which significantly reduces processing energy costs. The Region also boasts low natural gas rates for industrial use, which is economically advantageous for industrial heating purposes.

The Region has plentiful labor resources that can be coupled with Montana-sponsored workforce training financial incentives.

The Region has two impressive, shovel-ready industrial parks with required infrastructure to support wheat ingredients processing facilities.

The Region has the I-15 Interstate Corridor and the nearby I-90/94 Interstate Corridor that interconnect with major highway systems for efficient transport of goods by truck throughout North America.

Dozens of Montana-based and out-of-state trucking firms service the Great Falls Region and I-15 Interstate Corridor in this region interconnects with major highway systems for efficient and cost-reducing transport of goods by truck throughout North America.

The Region has BNSF rail for efficient transport of goods by rail.

This document outlines the justification for the start-up and operation of a wheat ingredients processing facility in the Great Falls Region.

Montana ranks third of all states in the planting and harvesting wheat in the nation.<sup>i</sup> Montana harvested a total 5,265,000 acres of wheat in 2015 and produced a total of 185,415,000 bushels in that year. The Great Falls Region accounted for 50% (92,862,300 bushels) of wheat produced on 48% (2,536,050 acres) of wheat acres harvested in 2015. Other small grains grown and harvested in large quantities in Montana include barley, oats, rye, millet and a variety of other specialty grains. In the 13-County Great Falls Region, the 2015 winter wheat crop was grown on 1,638,850 acres, the spring wheat crop in 2015 was grown on 807,800 acres and the durum wheat crop was grown on 89,400 acres.<sup>ii</sup>

Wheat ingredients processing technology featured in this business case is primarily focused on wheat ingredients that are produced from milled wheat components. Technologies that utilize further processing methodologies in addition to traditional roller milling of wheat can produce high value protein, starch, and oil, and specialty chemicals. Even though the vast majority of wheat grown in the Great Falls Region is exported out of state to domestic and overseas milling enterprises, opportunities are available to produce high value wheat-based ingredients in the state of Montana.

Agriculture is the number one industry for the Treasure State, Montana. According to the 2012 USDA Census of Agriculture, Montana's agriculture industry employed over 9.5 million acres to bring in over \$4.2 billion in revenue to the state.<sup>iii</sup> Agricultural producers and processors in Montana have demonstrated the ability to efficiently grow and process agricultural commodities for shipment to customers worldwide. The Great Falls Region is an agricultural processing hub that excels in the conversion of Montana-grown commodities into intermediate products for food, pet food, and feed industries.

Food, pet food, and feed component manufacturers in the Great Falls Region have been very successful in efficiently supplying value added ingredients and shipping a wide variety of intermediate products to supply chains globally. Prime examples of bulk, intermediate products produced in the Great Falls Region are conditioned grains, wheat malt, oilseeds, and pulses; milled flours, durum semolina, pasta products, vegetable oils, and honey. The Region is also home to a large-scale egg production operation.

Companies that operate manufacturing facilities in the Great Falls Region are:

Malteurop	Pasta Montana	General Mills
Cenex Harvest States	Grain Craft	JM Grain
Great Northern Growers	Montana Milling	Montana Specialty Mills
Montana Advanced Biofuels	Montana Eggs LLC	Columbia Grain
Timeless Seeds	Giant Springs Water	Smoot Honey

Table 1: Great Falls Region Agri-processing Companies

Source: Great Falls Development Authority

The Great Falls Region's electrical costs are among the nation's lowest industrial electrical costs.<sup>iv</sup> The City of Great Falls has the lowest industrial natural gas cost in Montana, and that cost is lower than nearly all industrial sites in the nation. Operating within such substantial wheat acreage coupled with lower energy and human resources costs, a wheat ingredients manufacturing operation in the Great Falls Region would have significant input cost advantages compared with the competition. Additionally, this type of facility in the Great Falls Region would have the opportunity to become the lowest cost producer of wheat ingredients in North America.

## **Wheat Resources in the Great Falls Region**

The Great Falls Region has a near ideal environment for prairie grasslands and their related cousins, small grains. As in other semiarid prairie grassland regions of the world, raising small grains, forage crops, and forage animals continues to dominate agricultural production. Wheat, barley, and forage crops command the Great Falls Region's agricultural crop profile. Only 2.6% of harvested land is used for crops other than wheat, barley, and forage. Of that 2.6%, the majority is made up of another class of wheat, durum wheat for the production of pasta. An alternate crop that is making rapid inroads in the Region is dry peas.

The Great Falls Region has the competitive advantage of possessing a combination of geographic features, climactic conditions, topsoil composition, and water resources to make it a major, intensive supplier of small grains. Montana, specifically the Great Falls Region, produces excellent quality wheat for food and feed consumption. Farmers in the Great Falls Region have the resources and knowledge base to consistently produce high quality wheat in prodigious quantities. Also, the Great Falls Region has the advantage of raising a wide variety of consistently high quality small grain commodities in addition to traditional wheat crops.

The competitive advantage of prodigious small grain production in the Great Falls Region points toward using abundant wheat commodities through agri-processing economic development efforts with food and feed processing technologies. Large-scale commodity milling of wheat in the Great Falls Region is dominated by two large mills located in Great Falls, Grain Craft and General Mills, Inc. Grain Craft has a daily milling capacity of 12,000 hundredweights and has a storage capacity of 1,551,000 bushels. General Mills, Inc. has a daily milling capacity of 5,400 hundredweights and has a storage capacity of 1,500,000 bushels.<sup>v</sup>

Another multipurpose milling facility, Montana Milling, Inc. has operations in the Great Falls Region in Great Falls and Conrad and mills a wide variety of grains. Montana Milling, Inc. has the capability of producing customized flour blends for wholesale and retail clients. Montana Milling has a daily milling capacity of over 8,000 hundredweight and has a storage capacity of 645,000 bushels at their two locations. Montana Flour & Grain is located in the Great Falls Region at Fort Benton and mills wheat, durum, rye, and specialty grains. Montana Flour 7 Grain has a daily milling capacity of 480 hundredweights and has a storage capacity of 130,000 bushels. Wheat ingredients processing is feasible in the Great Falls Region due to an abundant, high quality wheat supply, a willing labor force, low cost energy, and a wheat milling infrastructure represented by four wheat flour mills.

## ***Wheat Production***

In 2015, Montana farmers harvested 5,265,000 acres of wheat, the third largest acreage of all states. Over 48% of that wheat acreage, or 2,536,050 acres, were harvested in the Great Falls Region alone. (Figure 1) In 2015, Montana farmers harvested 185,415,000 bushels of wheat, and 92,862,300, or 50%, of those bushels were harvested in the Great Falls Region<sup>vi</sup> on 48% of Montana's wheat acres as shown in Figure 2. Montana's wheat production history has holding steady over the last six years as shown in Figure 3. Montana farmers have continued to raise wheat even as wheat farmers in other wheat producing states have gradually switched to corn and soybeans as evidenced by the chart in Figure 4 showing a dramatic reduction in wheat acres planted and harvested in the U.S.<sup>vii</sup>

In the U.S., 2.05 billion bushels of wheat were harvested in 2015<sup>viii</sup> and more than 958 million bushels (46%) of U.S. wheat was used as food in the U.S.<sup>ix</sup> and 832 million bushels of U.S. wheat were exported in 2015 with a value of \$5.6 billion.<sup>x</sup> The remainder of wheat grown in the U.S. was for seed and feed (Figure 5).

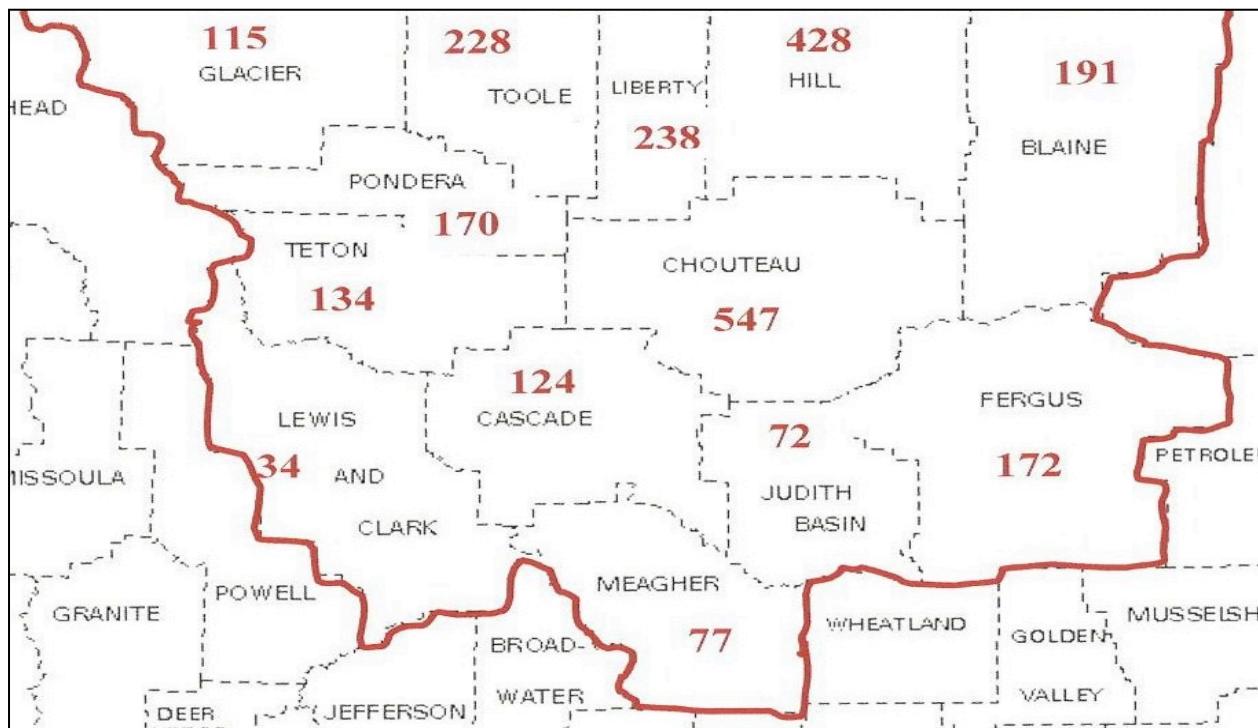


Figure 1: 2015 Wheat Production in the Great Falls Region by County – 1,000 Bushels  
 Source: USDA, NASS

### 48% of Montana Wheat Acres Harvested in Great Falls Region

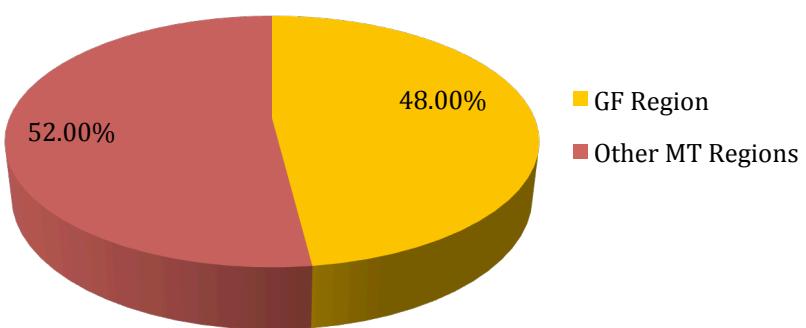


Figure 2: 48% of Montana Wheat Acres Harvested in Great Falls Region Trade Area  
 Source: USDA, NASS 2015 Data

## Million Bushels

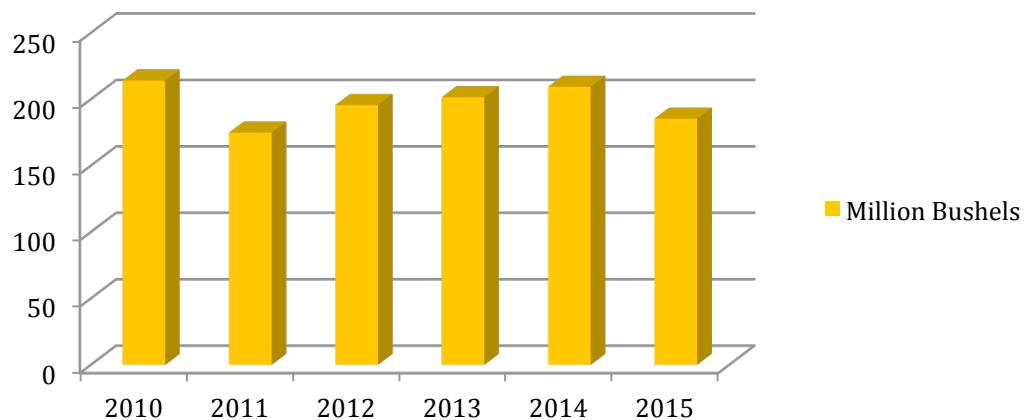


Figure 3: Montana Wheat Production 2010 through 2015

Source: USDA, NASS

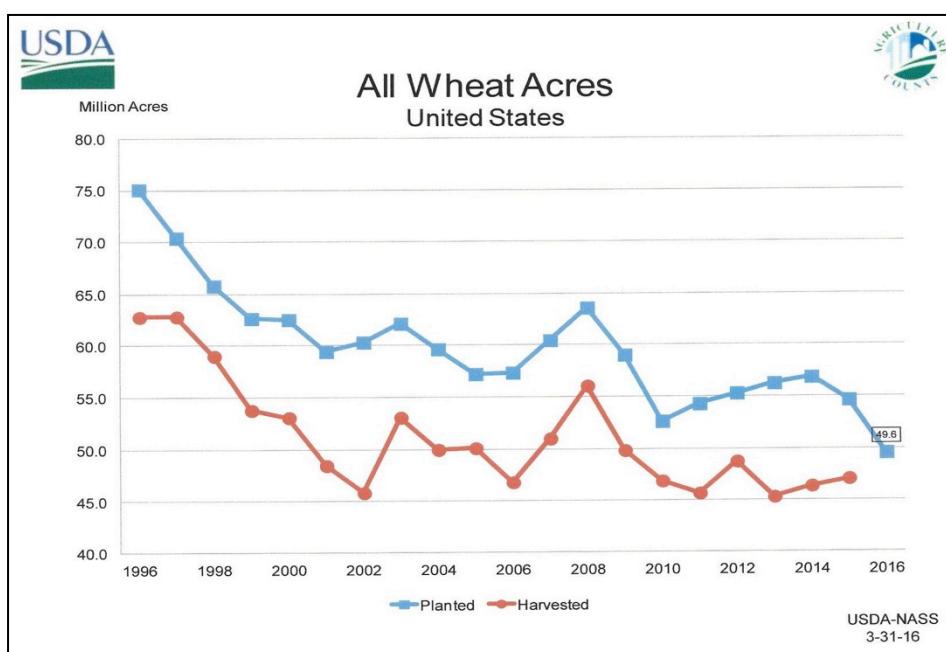


Figure 4: Wheat Acres Planted and Harvested in the U.S. from 1996 to 2016

Source: USDA, NASS

### U.S. Wheat Usage in 2015 (Bushels)

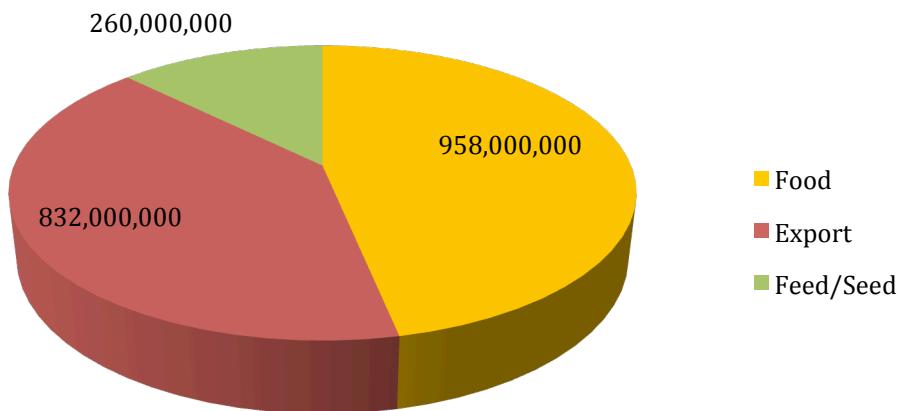


Figure 5: U.S. Wheat Usage in 2015

Sources: USDA, NASS; USDA, FAS; National Wheat Foods Council

The USDA National Agricultural Statistics Service (NASS) mapped out wheat production for Montana in 2015, which is shown in Figure 6 (Winter Wheat), Figure 7 (Spring Wheat), and Figure 8 (Durum Wheat). It can be clearly seen that a considerable proportion of wheat production acres are located in the Great Falls Region. Over 90% of the wheat varieties grown in Montana are made up of two row varieties rather than six row varieties.<sup>xi</sup> Two row varieties are well adapted to Montana's warm summer days and cool summer nights. Montana's Great Falls Region is a preferred area by maltsters to obtain high quality malting wheat.

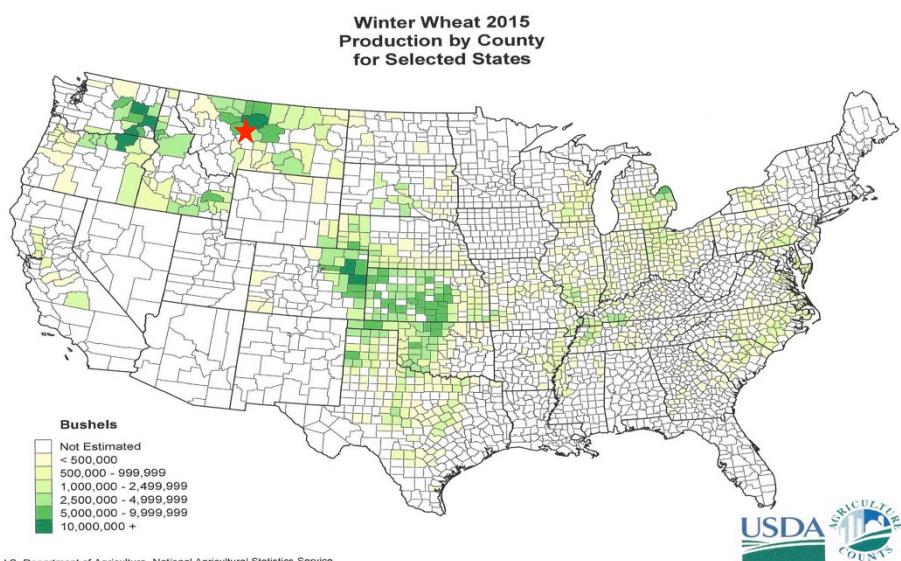


Figure 6: U.S. Winter Wheat 2015, Harvested Acres by County  
 Source: USDA, NASS ★ Great Falls

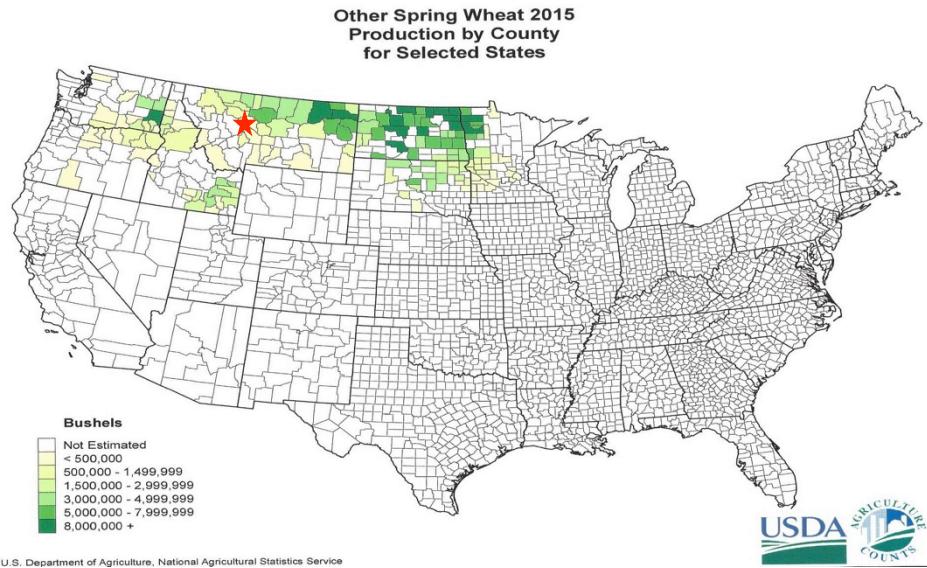


Figure 7: U.S. Spring Wheat 2015, Harvested Acres by County  
 Source: USDA, NASS ★ Great Falls

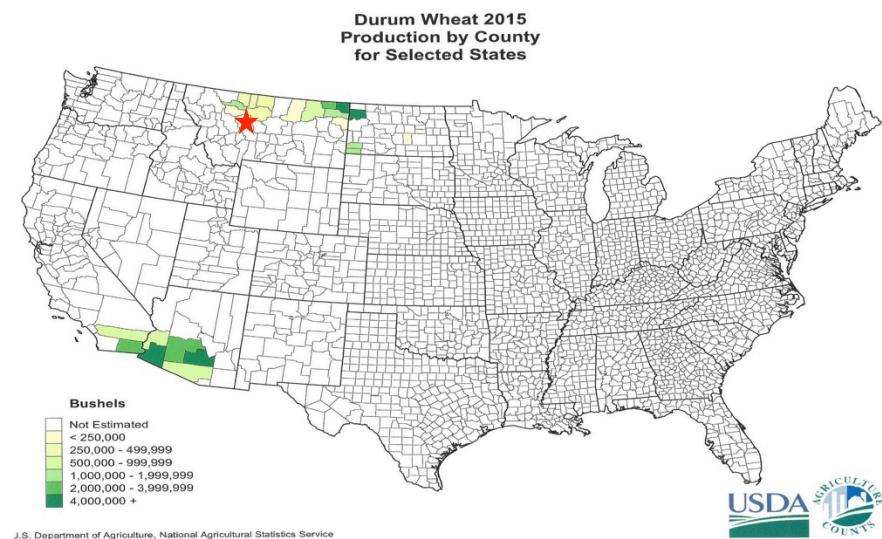


Figure 8: U.S. Durum Wheat 2015, Harvested Acres by County  
 Source: USDA, NASS ★ Great Falls

Farmers in the thirteen-county Great Falls Region trade area have become adept at raising wheat in substantial quantities. Major wheat milling companies in the Great Falls Region and across the nation establish contacts and contracts with Great Falls Region farmers to plant and harvest

milling quality wheat on an annual basis. Milling companies also contract with local, regional, and national grain purveyors. The majority of wheat annually produced in the Great Falls Region consistently qualifies as food quality milling wheat. Table 2 shows the wheat acres harvested and the bushels of wheat produced by the 13 counties within the Great Falls Region. The wheat acres and production are for hard red winter wheat, hard red spring wheat, and durum wheat combined.

Great Falls Region County	Wheat Acres	Wheat Bushels
Teton	134,800	6,111,50000
Pondera	170,700	7,587,000
Toole	228,800	5,994,000
Glacier	115,800	4,640,000
Choteau	546,900	24,010,000
Cascade	46,000	2,385,000
Fergus	172,700	7,982,000
Liberty	238,000	6,674,500
Hill	428,600	10,889,000
Judith Basin	72,100	3,578,000
Lewis and Clark	33,900	961,000
Meager	77,850	2,582,800
Blaine	191,700	5,746,000
<b>Total</b>	<b>2,536,050</b>	<b>92,863,300</b>

Table 2: 2015 Wheat Acres and Production in Bushels in Great Falls Region Counties

Source: USDA, NASS

## Proximity to Raw Materials

One obvious benefit derived from operating a wheat ingredients production facility within wheat production areas is that the operation can contract and purchase its wheat, wheat directly from regional farmers and local elevators. By receiving wheat directly from regional farmers, the company can capture receiving, cleaning, and conditioning margins that can amount to greater than 10% of annual raw material costs.

Wheat contracts and open markets for the current 2016 crop year in June in the Great Falls Region have been quoted averaging \$3.75 for hard red winter wheat, \$4.75 for hard red spring wheat, and \$6.00 for durum wheat.<sup>xii</sup> Recent prices for all classes of wheat in the U.S. have drifted downward compared to historical wheat prices due to large carryover from the 2015 crop worldwide. Launching a wheat ingredients production operation in the Great Falls Region would mean operating in very close proximity to raw materials, which significantly drives down the company's highest volume direct cost: wheat for the production of high value ingredients for food, feed, pet food, nutraceuticals, and pharmaceuticals.

## Traditional Wheat Ingredients Processing

Wheat producers in Montana grow and harvest hard red winter wheat, hard red spring wheat, and durum wheat for use as source material for milling operations. The vast majority of Montana-grown wheat is milled into flour or semolina; with mill by-products used for livestock and poultry feed. Wheat flour, bran, and germ can be further segregated into higher value added products for use as food, feed, pet food, fish food, nutraceutical, and pharmaceutical ingredients.

### Wheat Milling

Most spring and winter wheat grown in Montana is either delivered to regional mills or exported out of state for the production of flour products for human consumption. A modern wheat starch manufacturing operation follows the simplified process shown in Figure 9 and follows the more complex process shown in Figure 10. Modern wheat milling produces a wide range of mill products for a number of uses primarily for human nutrition and animal feeding. The main use of spring and winter wheat flour is for the production of baked goods and cereal products. The main use of durum wheat semolina is for the production of pasta. Bran and secondary flours from the milling process are most often marketed as livestock and poultry feed.

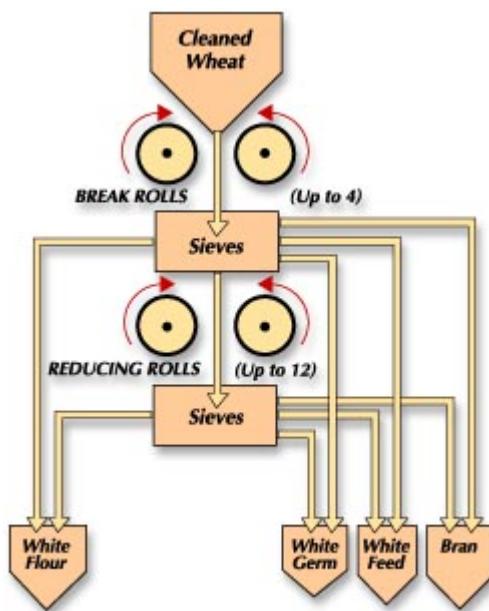


Figure 9: Simplified Wheat Mill Diagram  
Source: School of Biological Sciences, U. of Bristol, England

## Wheat Ingredients Categories

A simplified look at the categories involved in categorizing uses of wheat ingredients can be formatted into five broad areas of intermediate and end products.

- Structural Components – Derived from Wheat Starch, Protein, Straw
- Fuel – Derived from Wheat Starch, Straw
- Feed – Derived from Whole Wheat, Flour, Bran, Germ, Distiller Grains
- Food – Derived from Whole Wheat, Flour, Bran, Germ, Protein, Starch
- Nutraceuticals/Pharmaceuticals – Derived from Flour, Bran, Germ, Protein, Starch

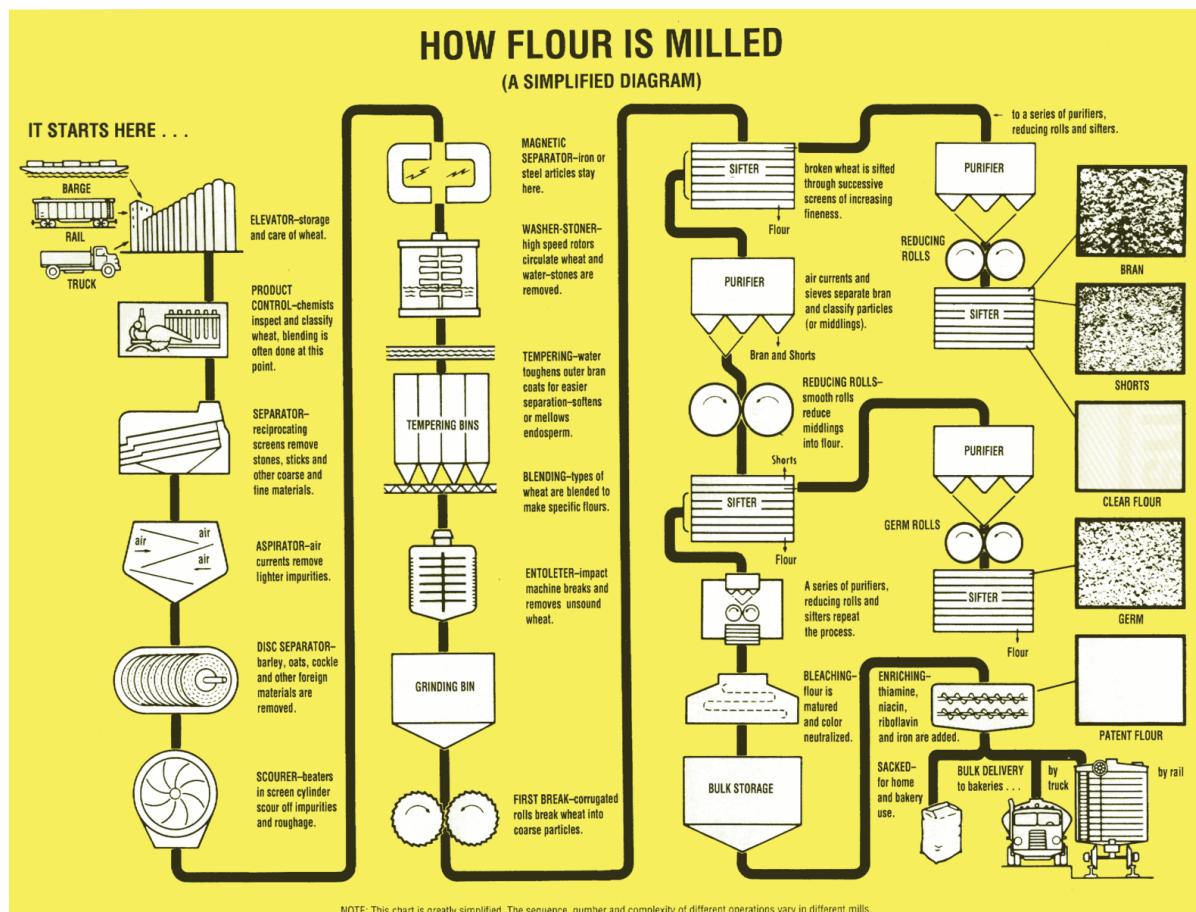


Figure 10: How Flour is Milled

Source: Montana Wheat and Barley Committee

## Vital Wheat Gluten and Wheat Starch Production

Wheat flour from milling operations is the source material for the wet fractionation of wheat flour to produce vital wheat gluten, which is primarily used as a protein source to improve baking characteristics of flour. Wet fractionation of wheat flour also produces wheat starch, which is used to improve the texture and taste of foods and to produce ethanol through fermentation. The fermentation industry also hydrolyzes gluten protein into hydrolyzed vegetable protein for food and feed as well as for producing glutamic acid as a flavor enhancer. Wheat flour is the source material for vital wheat gluten and wheat starch as food and industrial ingredients.

In vital wheat gluten operations, the by-product, wheat starch, is most often utilized as a source material for ethanol production. In Europe, 1/3 of all food starches produced are from wheat, which totals 3 million tons of wheat starch annually. Over 40% of European starch production is utilized by the paper production industry. European wheat starch is also used for ethanol production, sweeteners, and food thickeners.<sup>xiii</sup> Many of the new or improved uses for wheat utilize milled products or gluten/starch production products. Figure 11 shows a flow diagram for the production of wheat ingredients from wheat flour that yields vital wheat gluten, wheat starch, and wheat glucose ingredient products.

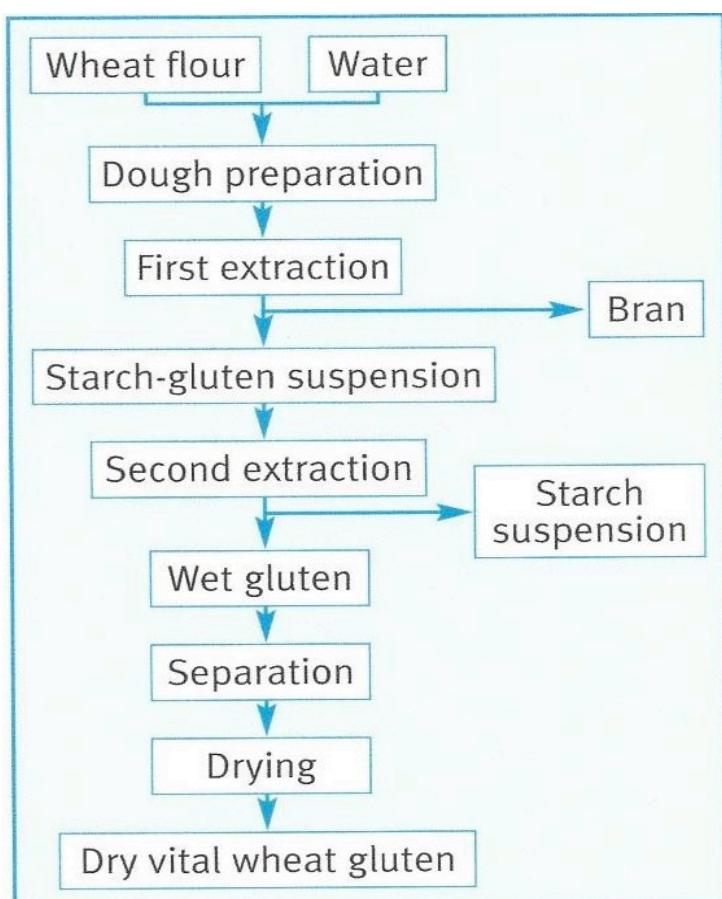


Figure 11: Vital Wheat Gluten and Wheat Starch Process  
Source: The Martin Process

## Vital Wheat Gluten Uses

Gluten refers to a collective group of proteins in wheat, barley, and rye. Gluten forms long chain molecules that are insoluble in water. Gluten provides elastic and tensile characteristics that permit dough to capture and hold gases, such as carbon dioxide, in dough that allows breads and cakes to rise and provide product structure. The manufacture of vital wheat gluten from wheat flour yields both gluten protein and wheat starch as valuable ingredient products.

Vital wheat gluten production extracts gluten protein from wheat flour using a gentle drying technique to ensure that gluten protein retains its characteristics of extensibility and strength to improve the baking qualities of flour that has lower gluten content. Commercial vital wheat gluten is dried to a minimum of 90% dry matter and is comprised of the following makeup:

- 70% to 80% Protein
- 6% to 8% Fats
- 10% to 14% Carbohydrates
- 0.8% to 1.4% Minerals<sup>xiv</sup>

Vital wheat gluten is primarily used to fortify lower gluten-content flour. Gluten is also used as a meat extender and as a protein source and binder for vegetarian meat analogs. The fermentation industry hydrolyzes gluten to produce hydrolyzed vegetable protein for food flavor enhancement and to produce glutamic acid as a nutritional supplement and flavor enhancer. Gluten is also used as a protein source for pet food.

## Wheat Starch Uses

Wheat starch produced in the wet fractionation of wheat flour is divided into two categories depending upon the size of wheat starch granules produced. A-Starch granules are larger in diameter (20-35  $\mu\text{m}$ ) and are 80% to 85% of total wheat starch content in wheat flour. B-Starch granules are smaller in diameter (2-15  $\mu\text{m}$ ) and lighter in weight and are 15% to 20% of total wheat starch content in wheat flour. A-Starch granules are generally nearly 100% starch and B-Starch granules are less pure with amounts of pentosans, fibers, fats, and protein included.

Wheat starch can be used as a source material for ethanol production. Wheat starch can also be a precursor for a variety of food sweeteners and thickeners. Wheat starch can be modified using temperature, pH, and chemicals to produce a wide range of modified starches for food and industrial uses in textile, paper, adhesives, and cosmetics. Companies that manufacture wheat gluten produce wheat starch as a by-product. Wheat starch from gluten producers generally becomes raw material for ethanol production. Wheat starch can be enzymatically and chemically reduced to dextrose (glucose) as a raw material for lactic acid and ultimately poly lactic acid (PLA) plastics.

The wheat gluten/starch industry in the U.S. is concentrated in Kansas with MGP Ingredients, Atchison, KS, where winter wheat is the primary raw material. The Manildra Group, Australia, is the largest supplier of vital wheat gluten in the world. The Manildra Group had built a wheat

gluten and starch facility in Minneapolis in 1979, but subsequently moved operations to Hamburg, IA. The Manildra Group also operates the world's largest vital wheat gluten/wheat starch production facility in the world at Nowra, New South Wales, Australia. As with other gluten facilities, wheat starch is primarily dedicated toward ethanol production. Appendix I shows the members of the International Wheat Gluten Association who produce over 90% of the world's gluten supply.

## **Wheat Fractionation Energy and Water Requirements**

The wet fractionation methodology described above has been employed within the soybean isolate industry and corn wet milling industry over the past fifty years. The USDA Northern Regional Research Laboratory (now the National Center for Agricultural Research Utilization) provided energy and water input requirements for the isolation of protein from soybeans. Isolation of gluten protein and wheat starch from wheat would utilize similar levels of energy and water during the wet fractionation process.<sup>xv</sup> Wet fractionation processes operate continuously. Energy and water estimates are shown below for a continually processing 300,000 lb/day of wheat flour. (Table 3)

Input	Amount
Wheat	300,000 lb/day
Water	900,000 gallons/day
Natural Gas	1,400,000 cubic feet/day
Electricity	40,000 kWh
Steam	400,000 lb/day

Table 3: Wet Fractionation Process – Estimated Input Amounts for Water and Energy  
Source: USDA, National Center for Agricultural Research Utilization

## **Capital Requirement for Wheat Ingredient Production**

Wet milling and/or fractionating facility developers have reported that comparable corn wet milling facility capital costs average about \$80 million for a 100,000 bushel per day operation.<sup>xvi</sup> Operating costs for a wet corn milling operation utilizing 100,000 bushels per day is about \$90 million per year that includes factoring in revenue from co-products. As can be seen by this example, wet fractionation requires sizeable capital investment. The Austrian company, Agrana, Picscheldorf, Austria, has built in 2013 a \$100 million wheat starch/gluten facility that utilize 250,000 metric tons (9.1 million bushels) of wheat to produce 107,000 metric tons of wheat starch, 23,500 metric tons of gluten protein, and 55,000 metric tons of wheat bran. Wheat starch will be used to manufacture bioethanol and wheat gluten will be used to manufacture non-GMO, premium grade, high protein animal feed and fish food.<sup>xvii</sup>

The choice of a wheat fractionation facility size and complexity depends upon a number of factors including available capital, market accessibility, manufacturing expertise, and enterprise

objectives. Wet fractionation production of wheat gluten and wheat starch requires relatively large capital investments of equipment involving hydration, separation, treatments, precipitation, and drying. Depending upon wheat gluten and wheat starch output volumes required equipment and installation costs can exceed \$25 million. Also, equipment costs must include equipment purchased to deal with processing discharge effluent in order to mitigate all federal and state wastewater requirements.

In addition to equipment costs, total plant costs include equipment installation, instrumentation, piping, electrical supplies, buildings, land, yard structure, rail improvements, engineering, supervision, construction, contractor's fees, contingency fee, certifications, taxes, and working capital. If a wheat fractionation ingredients facility had equipment costs of \$25 million, total facility equipment, start up, and working capital costs would be estimated to be nearly \$100 million. Any proposed wheat ingredients production facility must be designed as an FDA food and/or feed facility with full compliance with the 2011 FDA Food Modernization Safety Act in order to address safe ingredients manufacturing for pet food, animal feed and human food markets.

## **Financial Illustration**

Shown below is a summary compilation of the financial performance of 8 U.S.-based flour starch manufacturing facilities from 2010 through the second quarter of 2015. Represented in the data are primarily corn starch manufacturing facilities, however, a comparison can be made with wheat starch/gluten protein production facilities. Wheat ingredient production facilities have analogous financial performance results within the starch manufacturing industry. The data was compiled by Bizminer.com from a combination of U.S. government and private organization information sources. The average annual sales revenue for the representative starch manufacturing companies averaged about \$30 million. The annual sales volume of the representative companies ranged from \$500,000 to more than \$50 million.

Table 4 shows Income and Expenses in dollars for the representative starch manufacturing companies from 2010 through the second quarter of 2015. Table 5 shows Income and Expenses as percentages of revenue. Analysis of Table 5 shows annual after tax net profits percentage of revenue range from 4.91% to 7.41%. Discretionary annual owner earnings percentages of revenue range from 10.23% to 12.79%.

Income and Expense- Profit and Loss \$						
	2010	2011	2012	2013	2014	2015q2
Business Revenue	29,726,375	32,296,200	33,982,527	33,551,831	30,920,430	29,515,053
Cost of Sales	16,954,251	18,592,702	19,489,116	19,673,593	18,395,532	17,514,999
Cost of Sales - Labor Portion	1,002,860	1,471,487	1,348,620	1,102,156	1,172,477	1,116,354
Gross Margin	12,772,124	13,703,498	14,493,411	13,878,238	12,524,898	12,000,054
Officers Comp.	907,151	840,729	810,742	833,165	844,637	786,264
Salary-Wages	3,284,094	3,354,644	3,382,992	3,486,980	3,136,131	2,890,772
Rent	364,828	468,657	621,560	563,737	459,264	427,939
Taxes Paid	386,506	487,693	455,666	534,470	432,795	394,516
Advertising	571,995	484,677	612,660	758,235	486,037	436,161
Benefits-Pensions	400,585	217,217	475,443	478,037	524,486	483,754
Repairs	93,628	123,796	152,636	224,346	160,488	145,291
Bad Debt	70,843	258,731	112,812	123,900	25,248	24,172
Sales, General, Admin & Misc.	3,609,038	3,677,597	3,948,902	3,701,860	3,596,599	3,421,319
EBITDA	3,083,456	3,789,757	3,919,998	3,173,508	2,859,213	2,989,866
Amortization						
Depreciation						
Depletion						
Operating Expenses	904,763	1,197,590	1,017,109	1,159,570	716,969	656,255
Operating Income	10,593,431	11,111,331	11,590,522	11,864,300	10,382,654	9,666,443
Interest Income	2,178,693	2,592,167	2,902,889	2,013,938	2,142,244	2,333,611
Interest Expense	14,277	31,118	112,399	47,679	39,688	38,271
Other Income	431,477	165,139	222,974	313,065	290,141	284,200
Pre-Tax Net Profit	591,428	538,553	1,025,928	740,259	534,191	478,384
Income Tax	2,352,921	2,996,699	3,818,242	2,488,811	2,425,982	2,566,066
After Tax Net Profit	799,994	1,018,877	1,298,202	846,195	824,834	872,462
Discretionary Owner Earnings	1,552,927	1,977,822	2,520,040	1,642,616	1,601,148	1,693,604
Discretionary Owner Earnings	3,364,841	4,016,141	4,347,891	3,635,351	3,162,754	3,136,123

Table 4: Compiled Income Statement in \$ for 8 Starch Manufacturers from 2010 to 2015 (2<sup>nd</sup> Q)  
Source: Bizminer.com

Income and Expense- Profit and Loss %	2010	2011	2012	2013	2014	2015q2
Business Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost of Sales	57.03%	57.57%	57.35%	58.64%	59.49%	59.34%
Cost of Sales - Labor Portion	3.37%	4.56%	3.97%	3.28%	3.79%	3.78%
Gross Margin	42.97%	42.43%	42.65%	41.36%	40.51%	40.66%
Officers Comp.	3.05%	2.60%	2.39%	2.48%	2.73%	2.66%
Salary-Wages	11.05%	10.39%	9.96%	10.39%	10.14%	9.79%
Rent	1.23%	1.45%	1.83%	1.68%	1.49%	1.45%
Taxes Paid	1.30%	1.51%	1.34%	1.59%	1.40%	1.34%
Advertising	1.92%	1.50%	1.80%	2.26%	1.57%	1.48%
Benefits-Pensions	1.35%	0.67%	1.40%	1.42%	1.70%	1.64%
Repairs	0.31%	0.38%	0.45%	0.67%	0.52%	0.49%
Bad Debt	0.24%	0.80%	0.33%	0.37%	0.08%	0.08%
Sales, General, Admin & Misc.	12.14%	11.39%	11.62%	11.03%	11.63%	11.59%
EBITDA	10.38%	11.74%	11.53%	9.47%	9.25%	10.14%
Amortization Depreciation Depletion	3.04%	3.71%	2.99%	3.46%	2.32%	2.22%
Operating Expenses	35.63%	34.40%	34.11%	35.35%	33.58%	32.74%
Operating Income	7.34%	8.03%	8.54%	6.01%	6.93%	7.92%
Interest Income	0.05%	0.10%	0.33%	0.14%	0.13%	0.13%
Interest Expense	1.45%	0.51%	0.66%	0.93%	0.94%	0.96%
Other Income	1.99%	1.67%	3.02%	2.21%	1.73%	1.62%
Pre-Tax Net Profit	7.93%	9.29%	11.23%	7.43%	7.85%	8.71%
Income Tax	2.69%	3.15%	3.82%	2.52%	2.67%	2.96%
After Tax Net Profit	5.24%	6.14%	7.41%	4.91%	5.18%	5.75%
Discretionary Owner Earnings	11.33%	12.45%	12.79%	10.85%	10.23%	10.63%

Table 5: Compiled Income Statement by % for 8 Starch Manufacturers from 2010 to 2015 (2<sup>nd</sup> Q) Source: Bizminer.com

Table 6 shows the dollar based compilation balance sheet of the representative companies for years 2010 to 2015. Table 7 shows the percentage based compilation balance sheet of the representative companies for years 2010 to 2015. The balance sheet shows very favorable current ratios of total current assets divided by total current liabilities. The total liabilities to total assets ratio is very favorable for the representative companies. Net worth to total liabilities ratio is favorable averaging 45.10% to 47.04%.

Balance Sheet - dollar-based						
	2010	2011	2012	2013	2014	2015q2
<b>Assets</b>						
Cash	1,558,498	1,388,077	1,851,946	1,796,125	1,637,263	1,643,670
Receivables	3,761,220	3,869,528	4,229,433	5,164,956	4,456,364	4,470,739
Inventory	3,016,653	3,501,294	3,518,173	4,363,082	3,752,526	3,754,577
Other Current Assets	735,242	375,578	766,601	422,876	403,632	425,966
Total Current Assets	9,071,613	9,134,477	10,366,153	11,747,039	10,249,785	10,294,952
Gross Fixed Assets	10,239,381	11,276,446	12,381,373	13,216,267	11,511,691	12,010,225
Accum. Depreciation-Amortization-Depltn.	4,286,253	4,720,373	5,182,900	5,532,391	4,818,847	5,027,536
Net Fixed Assets	5,953,129	6,556,073	7,198,473	7,683,876	6,692,844	6,982,689
Other Non-Current Assets	1,221,915	3,239,975	3,208,802	3,539,705	2,857,361	2,981,565
<b>Total Assets</b>	<b>16,246,657</b>	<b>18,930,525</b>	<b>20,773,428</b>	<b>22,970,620</b>	<b>19,799,990</b>	<b>20,259,206</b>
<b>Liabilities</b>						
Accounts Payable	1,870,969	2,344,869	2,256,181	2,720,243	2,433,490	2,369,997
Loans/Notes Payable	1,256,740	1,431,346	1,322,670	1,722,336	1,462,951	1,526,689
Other Current Liabilities	1,424,834	1,753,823	1,836,951	2,149,202	1,854,159	1,930,480
Total Current Liabilities	4,552,543	5,530,038	5,415,803	6,591,782	5,750,600	5,827,165
Total Long Term Liabilities	4,194,015	4,593,607	5,586,347	5,885,093	5,119,296	5,277,917
Total Liabilities	8,746,558	10,123,645	11,002,149	12,476,874	10,869,896	11,105,083
Net Worth	7,500,099	8,806,880	9,771,279	10,493,746	8,930,094	9,154,123
<b>Total Liabilities &amp; Net Worth</b>	<b>16,246,657</b>	<b>18,930,525</b>	<b>20,773,428</b>	<b>22,970,620</b>	<b>19,799,990</b>	<b>20,259,206</b>

Table 6: Compiled Balance Sheet in \$ for 8 Starch Manufacturers from 2010 to 2015 (2<sup>nd</sup> Q) Source: Bizminer.com

Balance Sheet - percentage-based						
	2010	2011	2012	2013	2014	2015q2
<b>Assets</b>						
Cash	9.59%	7.33%	8.91%	7.82%	8.27%	8.11%
Receivables	23.15%	20.44%	20.36%	22.49%	22.51%	22.07%
Inventory	18.57%	18.50%	16.94%	18.99%	18.95%	18.53%
Other Current Assets	4.53%	1.98%	3.69%	1.84%	2.04%	2.10%
Total Current Assets	55.84%	48.25%	49.90%	51.14%	51.77%	50.82%
Gross Fixed Assets	63.02%	59.57%	59.60%	57.54%	58.14%	59.28%
Accum. Depreciation-Amortization-Depltn.	26.38%	24.94%	24.95%	24.08%	24.34%	24.82%
Net Fixed Assets	36.64%	34.63%	34.65%	33.45%	33.80%	34.47%
Other Non-Current Assets	7.52%	17.12%	15.45%	15.41%	14.43%	14.72%
<b>Total Assets</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
<b>Liabilities</b>						
Accounts Payable	11.52%	12.39%	10.86%	11.84%	12.29%	11.70%
Loans/Notes Payable	7.74%	7.56%	6.37%	7.50%	7.39%	7.54%
Other Current Liabilities	8.77%	9.26%	8.84%	9.36%	9.36%	9.53%
Total Current Liabilities	28.02%	29.21%	26.07%	28.70%	29.04%	28.76%
Total Long Term Liabilities	25.81%	24.27%	26.89%	25.62%	25.86%	26.05%
Total Liabilities	53.84%	53.48%	52.96%	54.32%	54.90%	54.81%
Net Worth	46.16%	46.52%	47.04%	45.68%	45.10%	45.19%
<b>Total Liabilities &amp; Net Worth</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Table 7: Compiled Balance Sheet by % for 8 Starch Manufacturers from 2010 to 2015 (2<sup>nd</sup> Q) Source: Bizminer.com

Table 8 and Figure 12 show favorable percentage returns on EBITA (earnings before interest, taxes, and amortization), assets, net worth, and sales. Review of the financial data of representative flour millers shows that the business of flour millers can be profitable and can provide favorable returns on equity. Additional financial data for representative starch manufacturing companies can be obtained from Bizminer.com.<sup>xviii</sup>

Financial Ratios: Profitability	2010	2011	2012	2013	2014	2015q2
EBITDA: Business Revenue (%)	10.37	11.73	11.54	9.46	9.25	10.13
Pre-Tax Return On Assets (%)	14.48	15.83	18.38	10.83	12.25	12.67
Pre-Tax Return on Net Worth (%)	31.37	34.03	39.08	23.72	27.17	28.03
Pre-Tax Return on Business Revenue (%)	7.93	9.29	11.23	7.43	7.85	8.71
After Tax Return on Assets (%)	9.56	10.45	12.13	7.15	8.09	8.36
After Tax Return on Net Worth (%)	20.71	22.46	25.79	15.65	17.93	18.50
After Tax Return on Business Revenue (%)	5.24	6.14	7.41	4.91	5.18	5.75
Discretionary Owner Earnings (%)	11.33	12.45	12.79	10.85	10.23	10.63

Table 8: Financial Returns for 8 Starch Manufacturers from 2010 to 2015 (2<sup>nd</sup> Q)  
Source: Bizminer.com

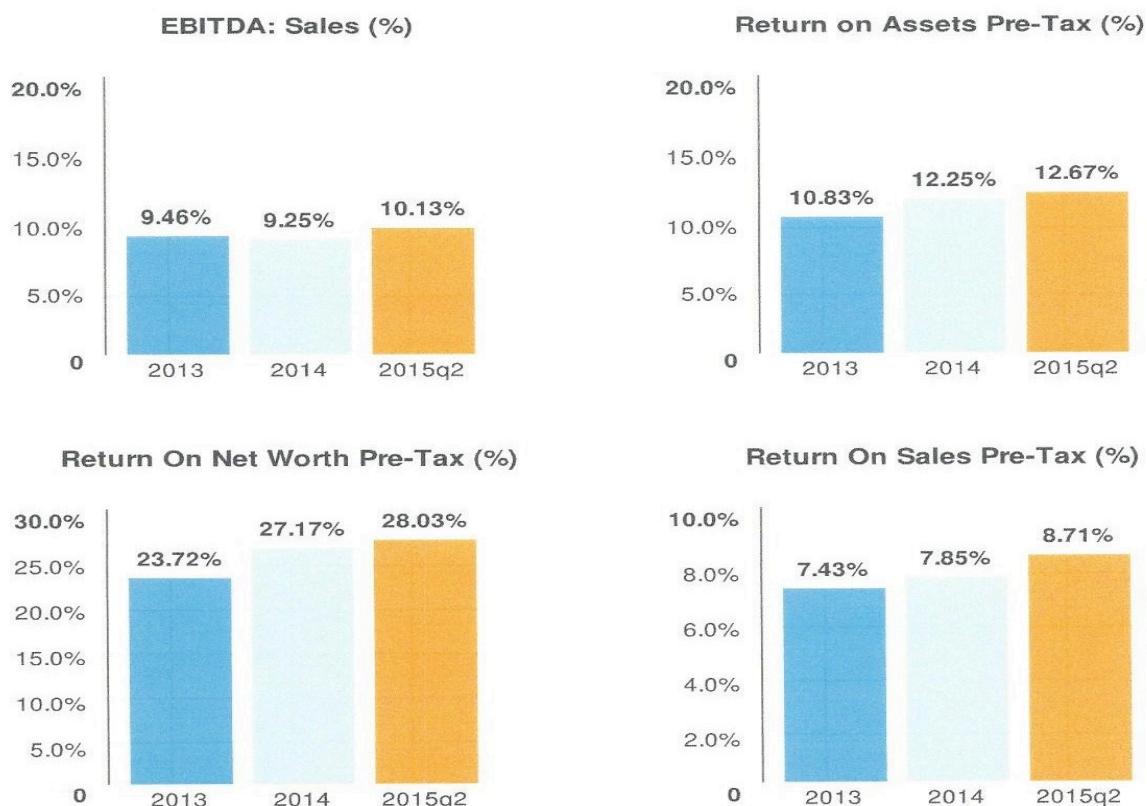


Figure 12: Compiled Profitability Ratios by % for 8 Starch Manufacturers from 2010 to 2015 (2<sup>nd</sup> Q)  
Source: Bizminer.com

## **Summary**

The Great Falls Region is well suited for the development and operation of wheat ingredient manufacturing facilities. The Region has the advantages of an abundant supply of high quality wheat commodities; low cost electrical and natural gas energy inputs; shovel-ready, fully equipped industrial parks; a robust transportation system; plentiful labor resources; and a pro-business attitude. The production of wheat ingredients, such as vital wheat gluten, wheat starch, wheat germ oil, wheat bran, and other wheat-based products, could be successfully established in the Great Falls Region.

Wheat ingredients manufacturers in the Great Falls Region supplying food, pet food, biofuels, and feed industries will have the opportunity to obtain high quality wheat commodities directly from agricultural producers. Wheat crop inbound transportation costs in the Great Falls Region would be low relative to competitors located outside of wheat crop-growing areas. On-farm storage of commodities throughout the Great Falls Region would provide year around access to high quality wheat crop commodity deliveries to wheat ingredients for foods, pet food, and feed manufacturing facilities.

The combination of cost effective energy, water, property, pulse commodities, and human resources all work together to provide a superior business environment for the establishment of wheat ingredients for foods, pet foods, biofuels, and feed manufacturing operations in the Great Falls Region. The Region can provide an optimum environment for wheat ingredients manufacturing operations.

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