

PULSE PROCESSING

The global health and wellness food market is projected to increase up to \$811.82 trillion U.S. dollars by 2021. High protein pulse crops are an important part of the diets in regions with the fastest population growth, namely India, Africa, the Middle East, and Central and Latin America. The recent recognition of the health risks of sugar consumption also favours adoption of low glycemic index foods such as pulses. All of this points to significant opportunity in the BRAED region to build capacity in added value pulse processing. Increasing feedstock production and existing primary processing facilities offer excellent opportunities to attract investment in secondary and tertiary processing into food products. Major food product research initiatives by pulse industry associations and food processors are expanding the uses of pulses as healthy ingredients. Between 2003 and 2013, over 2,000 new food products containing pulses were developed.



FEEDSTOCK

The BRAED region's production of pulses is primarily field peas (lentils, dry bean, and chick peas are other common pulse crops). Provincially, they are grown from dryland fields in southern Alberta, through Central Alberta, and up into the Peace River Region.

Table 1: Dry Peas in BRAED Region - 2016

BRAED Counties	Total number of farms (w/ land in crops)	Dry field peas - Farms reporting	Dry field peas - Acres
Paintearth County No. 18	344	45	23,033
Flagstaff County	587	152	59,772
Wainwright No. 61	456	75	29,415
Camrose County	823	137	43,284
Beaver County	526	84	32,298
Special Area No. 4	240	35	19,646
BRAED Region Total	2,985	528	207,448

2016 Agricultural Census - Farm and farm operator data

Specifically, in the BRAED region, the number of farms reporting and acres planted of dry peas can be seen in Table 1. There has been significant pea production growth, which is demonstrated by the 162% growth in Acres dedicated to dry field peas between 2011 and 2016.

As per Table 2, Alberta's pulse acreage has grown by 186% between 2012 and 2016 and its share of total Canadian acreage increased from 14% to 23%. This trend should prove attractive to investors.

Table 2: Seeded Acres 2016

	Alberta	Manitoba	Saskatchewan	Canada	% Alberta
Beans, all dry	45,000	117,000	-	287,000	16%
Chick peas	-	-	160,000	160,000	0%
Lentils	565,000	-	5,275,000	5,840,000	10%
Peas, dry	1,860,000	165,000	2,200,000	4,274,000	44%
TOTAL 2016	2,470,000	282,000	7,635,000	10,561,000	23%
TOTAL 2012	862,312	190,000	4,935,000	6,355,000	14%
% Increase 2012-2016	186%	48%	55%	66%	72%

2016 Agricultural Census - Farm and farm operator data



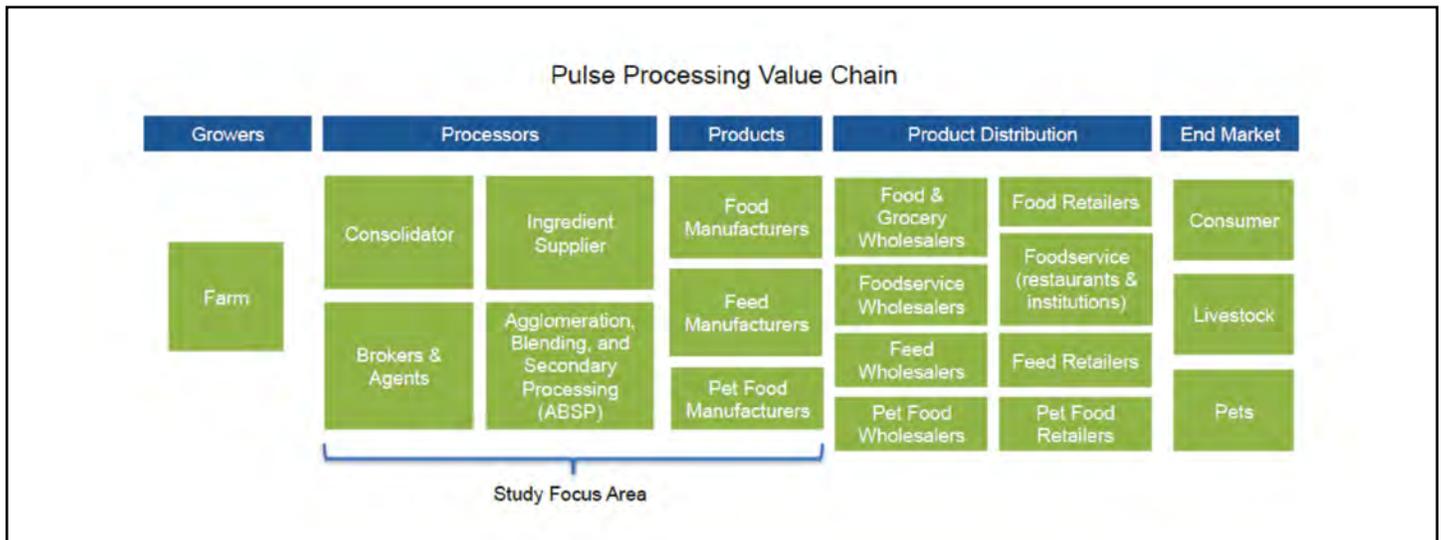


Figure 1: Source: "Opportunities in Pulse Processing Report" Field Guide Consulting 2013

A comprehensive study conducted in 2013 for the Regional Economic Development Alliance for Southeast Alberta identified three elements of the value chain with investment attraction potential as per the diagram above. These are:

- Pulse Consolidators – consolidators buy from growers and perform primary processing and may sell to secondary processors or export directly
- Pulse Ingredient Manufacturers – milling to produce flours and further fractionation to extract proteins, starches, and fibre
- Food Manufacturers – consumer food products such as spreads, baked goods, prepared meals, etc.

Attraction of pulse consolidators and ingredient manufacturers are both actionable opportunities for the BRAED region and can serve as attractors to food manufacturers in the medium to long term. While the region does not have the facilities to conduct R&D in this sector, companies locating processing facilities within the BRAED region could use the Leduc Food Processing Development Centre, less than one hour away.

MARKET

Peas is the main pulse crop produced in the BRAED region. Global dry pea trade increased from 0.5 million tonnes in 1980 to 4.1 million tonnes in 2013, the most recent data available. In 2015, Canada exported 6 million tonnes of pulses worth more than \$4.2 billion, representing 41% of global trade in pulses and serving over 150 countries. About 80% of the dry pea exports were sold to India, Bangladesh, and China. Dry pea exports to Europe, North America, and South America are also important destinations. While Canadian pea exports were up only 30% over the 10-year period as shown in Figure 2 above, the value of exports almost tripled, indicating a significant strengthening in global pricing.

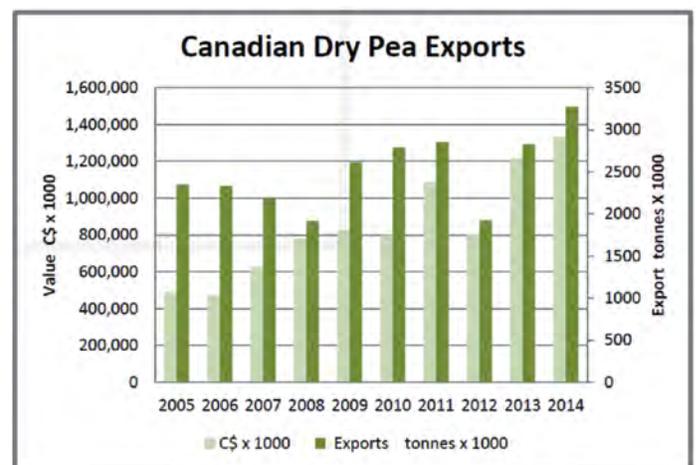


Figure 2: Source - Statistics Canada, January 2016



TYPICAL CAPITAL & OPERATING COSTS

Capital costs for a basic 30,000 to 50,000 tonnes per year pea processing plant with storage, handling, cleaning, splitting, storage, weighing, rail siding and loading facilities were in the range of \$2 million to \$7 million in 2005, depending on existing infrastructure. The US Bureau of Labour Statistics Producer Price Index for food processing for the period 2005 to 2016 denotes a 10.2% increase. Thus, the capital costs would fall approximately into the range of \$3.3 million to \$7.7 million. Labour costs represent about 50% of a primary pulse processing plant, electricity 25% and the remainder is comprised of maintenance, consumables, and general expenses. Employment at such a plant will typically range from between 15 to 40 people, depending on the size and scope of the operations.

PULSE PROCESSING ALREADY IN THE BRAED REGION

In terms of processing facilities, the BRAED region has three pulse cleaning plants located in Wainwright, Alliance, and Coronation. There are now over 50 pea processing facilities in Alberta but these are mainly just cleaning and sorting and bagging or bulk loading operations. There are significant opportunities for secondary and tertiary processing of pulse into ingredients and higher value products. A list of pea processing facilities is available in Table 3:

Table 3: Pea Processors in the BRAED Region

Processor	Location
Viterra	Killam
Viterra	Provost
Bashaw Processors	Bashaw
Cargill	Camrose
Cargill	Viking

TRANSPORTATION CAPACITY IN BRAED REGION

The BRAED region has an excellent transportation system for moving agricultural products, connected by a series of high load highways. The high load corridors along Highway 41 and 36 run north-south to U.S. and Mexican markets. The Queen Elizabeth II Highway corridor, the province's major north-south route, is only 40 minutes west of the City of Camrose. Well-maintained principal highways in the region include Highways 13 and 14, which bisect the region from west to east, and north-south. A series of other secondary highways connect the region, along with CN and CP rail lines, and a number of regional airports. In addition, Edmonton International Airport is just east of the BRAED region.

CENTRAL LOCATION

The BRAED region's central location within Eastern Alberta positions businesses well for easy access to local, national and international markets, opening up product export and import opportunities. The BRAED region's partnership with the Ports to Plains Alliance further expands market access down into the United States and Mexico.

LOCATION SITING CRITERIA

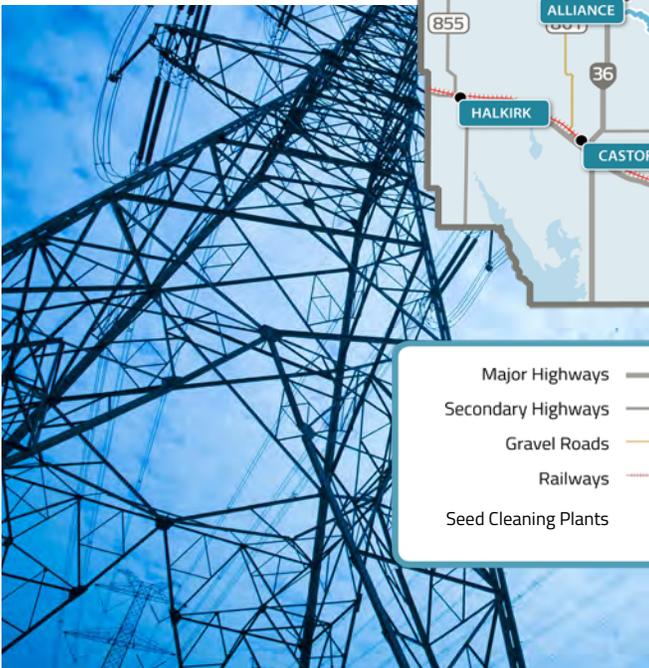
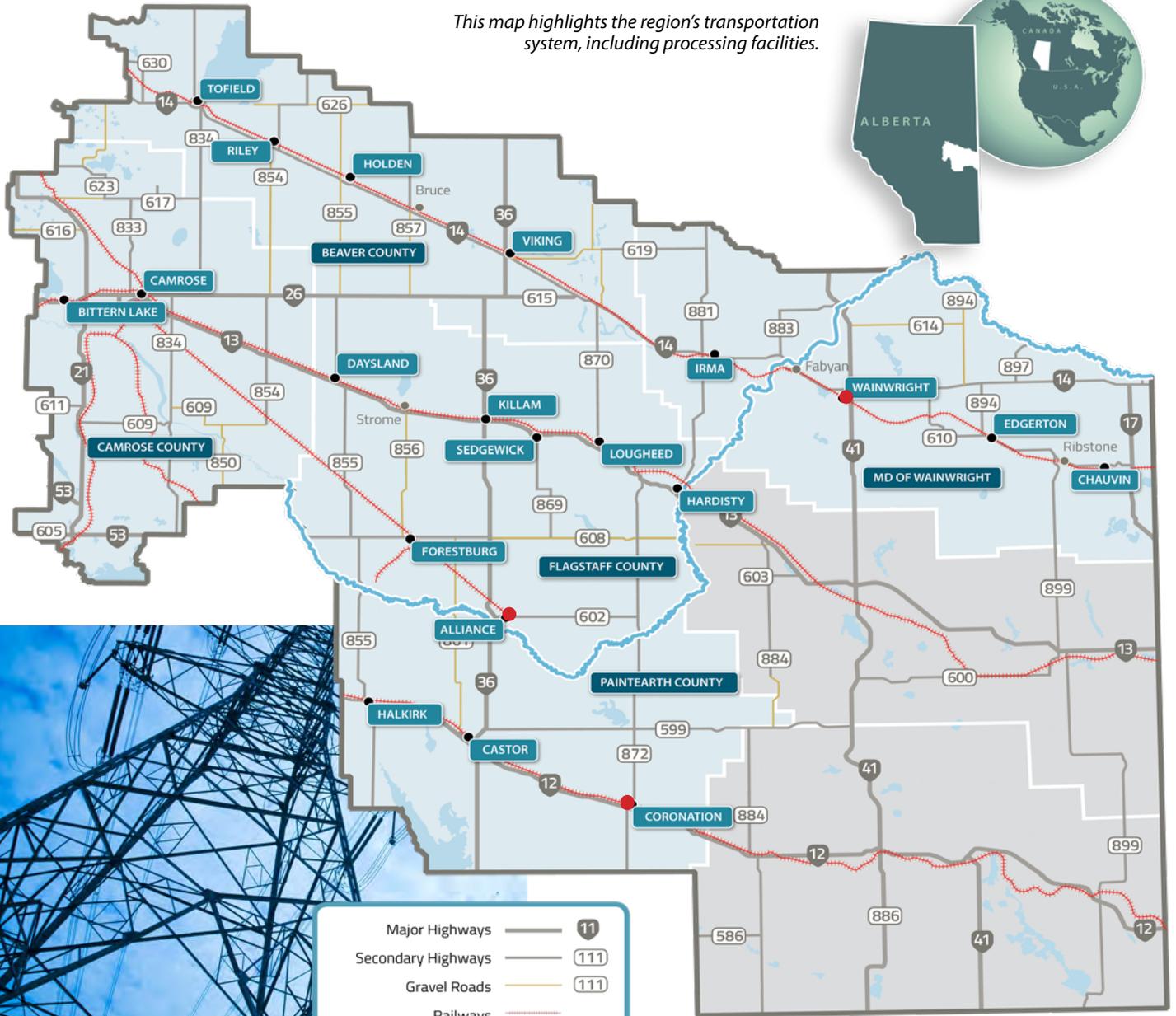
The criteria listed in Table 4 narrows down the potential sites to those in or nearby rail corridors with a proximity to growers. Rail lines with existing sidings are useful - any unused sidings recently built to handle frac sand would present an opportunity. And as wet processing of pulses requires water, careful assessment of long term availability is required for potential sites, prior to development.

Table 4: Key Location Criteria for Pulse Fractionation

Pulse Consolidators	Ingredient Manufacturers
Rail service and container availability (min. 40 railcar siding)	Rail service and container availability (min. 40 railcar siding)
Proximity to growers, which in medium term may be impacted by water supply	Market Access - Tariffs
Local crop failure history	Proximity to growers
Labour availability and cost	Water and sewer access (more important for wet fractionation)
Electricity and other operating costs	Labour availability and cost.
Competition among crops	Electricity and other operating costs.



This map highlights the region's transportation system, including processing facilities.



- Major Highways 11
- Secondary Highways 111
- Gravel Roads 111
- Railways
- Seed Cleaning Plants

Sample Site Locations in the BRAED Region for Pulse Processing

Location	Rail	Rail Terminal	Labour	Water	Transmission
Camrose	CN/CP	Yes	18,000	Battle River / Dried Meat Lake (may be limited)	115 – 229 kV line
Wainwright	CN	Yes – (operated by Altex Energy)	5,900	Battle River / Betty Lake (may be limited)	Forestburg 115 – 229 kV line

Battle River Alliance for Economic Development (BRAED) strives to provide current and accurate information, however, numbers are approximate and information is subject to change. This information has been sourced from communities, Government of Alberta departments and other organizations. Please contact BRAED should you require additional information or visit www.braedalberta.ca.

KEY REGIONAL ADVANTAGE

Both Canadian Pacific and Canadian National Railway provide daily freight service, and interchange is available at many points throughout the region. CN runs a line connecting Camrose to the Alliance region with a 268,000lb line and CP runs a main line east of Camrose through Hardisty.

