

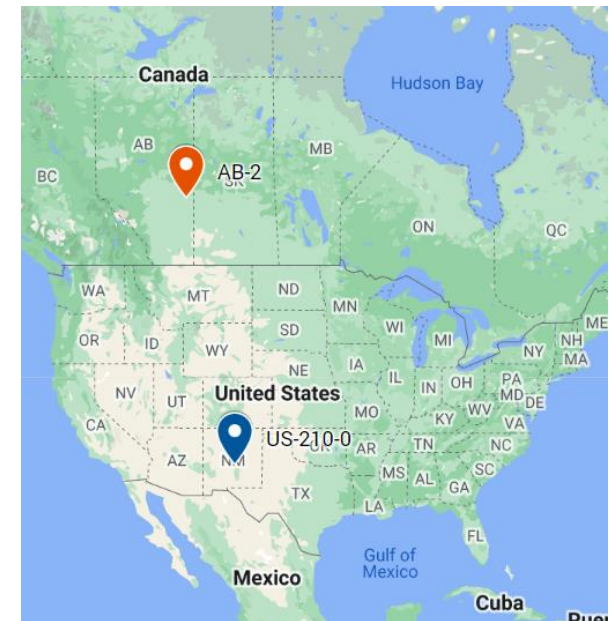


## Case Study - AB-2 vs. US-210-0

### Farm Descriptions

**AB-2** is a cow-calf and backgrounding operation on in Alberta, Canada, within the Aspen Parkland ecoregion. The cow-calf enterprise is situated on 4,030 ac. This operation keeps Angus cattle and maintains a cow herd of 280 head. Mean annual temperature is 1.5°C, and average annual precipitation is 450-550mm. Black chernozemic soils are the predominant soil type in this region.

**US-210-0** is a cow-calf and backgrounding operation in New Mexico, United States, with Continental crosses and 210 head of beef cows. This cow-calf enterprise is situated on 12,338 ac. This farm receives additional farm income from lease hunting. Mean annual temperature is 13°C, and average -annual precipitation is 390 mm, falling primarily May-September. Sandy loam soils predominate.



## Production System and Physical Performance Indicators

### Similarities

Comparison of **AB-2** and **US-210-0** was chosen due to similarities in farm enterprises (cow-calf, backgrounding, and other), average precipitation (for feed production), herd size, and select performance metrics. There are stark differences in mean annual temperature, and feed purchased.

### Cow Performance and Weaning

Weaning ages and weights were higher on **AB-2** as compared to **US-210-0**. Mature cow weights were also higher on **AB-2**, resulting in the two farms weaning calves at similar percentage of mature cow weight. Despite similar calf death loss rates, **US-210-0** weans a greater number of calves per 100 cows, suggesting conception and pregnancy rates may be a contributing factor. **US-210-0** has a greater replacement rate, indicating a more youthful cow herd is maintained.

	AB-2	US-210-0
<b>Beef cows (hd)</b>	280	210
<b>Breeds</b>	Angus	Continental crosses
<b>Mature cow weight (lb)</b>	1350	1250
<b>Weaning age (d)</b>	222	210
<b>Weaning weight (lb)</b>	555	530
<b>200 day adjusted weaning weight (lb)</b>	501	505
<b>Weaning weight as % mature cow weight</b>	41%	42%
<b>Calf death loss</b>	2.2%	2%
<b>Calves weaned per 100 cows (hd)</b>	85	93
<b>Replacement rate (%)</b>	7%	19%
<b>Annual sales (hd)</b>	211	149
<b>Sale weight (lb)</b>	554	529
<b>Price per head for weaners sold (\$/hd)</b>	\$1,154	\$1,262
<b>Income sources</b>	Cow-calf, backgrounding	Cow-calf, lease hunting

### Cattle Sales and Prices

**AB-2** sells 211 head annually from retained ownership (backgrounding), while **US-210-0** sells 149 weaned animals to finishing annually. While sale weight for weaned animals is higher on **AB-2** (555lb vs. 529 lb on **US-210-0**), sale price per head for weaned animals is comparable, though slightly higher on **US-210-0**. Average sale price is \$1,154/hd for **AB-2**, and \$1,262/head for **US-210-0**.

### Feeding

On both farms, all land is in pasture. On **AB-2**, cows swath graze in fall, followed by a full winter ration consisting of grain silage, hay, straw, barley grain, greenfeed, salt and mineral. Cows are fed on pasture. On **US-210-0**, cows remain on pasture all year, with some supplemental feedstuffs purchased.

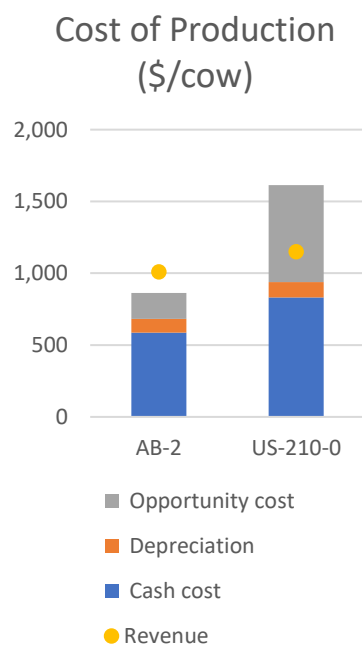
## Cow-calf Enterprise

### Cost and Profit

For comparison of costs and profits, a 5-year average (2016-2020) is used. **Total production costs** of the cow-calf enterprise (including cash cost, depreciation, and opportunity cost) on **AB-2** averaged \$864/cow wintered from 2016-2020. This is approximately half of the production cost on **US-210-0**, at \$1,613/cow.

**Cash costs** include purchased feed, cost of feed production including seed and fertilizer, land rent, wages, machine and building maintenance, interest on liabilities, veterinary and medicine costs, etc. These accounted for 68% of costs on **AB-2**, compared to 52% of costs on **US-210-0**.

Total costs of the cow-calf enterprise		
Costs (\$/cow)	AB-2	US-210-0
Cash costs	587	833
Depreciation	95	107
Opportunity cost	183	674
<i>Land</i>	46	360
<i>Labour</i>	88	240
<i>Capital</i>	49	74
<b>Total cost</b>	<b>864</b>	<b>1,613</b>
<b>Revenue</b>	<b>1,009</b>	<b>1,149</b>
Short-term profit	422	316
Medium-term profit	328	210
Long-term profit	145	-464



**Opportunity costs** are calculated for unpaid family labour, owned land, and capital. These costs made up 21% of total costs on **AB-2**, and 42% of costs on **US-210-0**. The considerably higher opportunity costs on **US-210-0** can be attributed to differences in total family labour hours and wages between the two farms.

**Revenue** from the cow-calf enterprise, including weaned calf and cull sales, was \$1,009/cow on **AB-2**, only 10% smaller than revenue of \$1,149/cow on **US-210-0**. Comparable revenue but significantly smaller total costs allow for **AB-2** to see positive average profits over the 5-year period.

Both farms were able to cover short- and medium-term costs. **Short-term profits** (revenue – cash costs) averaged \$422/cow and \$316/cow for **AB-2** and **US-210-0**, respectively; **medium-term profits** (revenue – cash and depreciation costs) averaged \$328/cow and \$210/cow. **AB-2** remained profitable in the long-term, with average **long-term profits** (revenue – cash, depreciation, and opportunity costs) of \$145/cow. Due to higher cash costs, and large opportunity costs of land and labour, long-term profits on **US-210-0** were negative, at an average of -\$464/cow.

## Cost Structure

Total costs can be broken down as land, labour, capital, and non-factor costs. Total land, labour, capital, and non-factor costs are all higher on **US-210-0** as compared to **AB-2**.

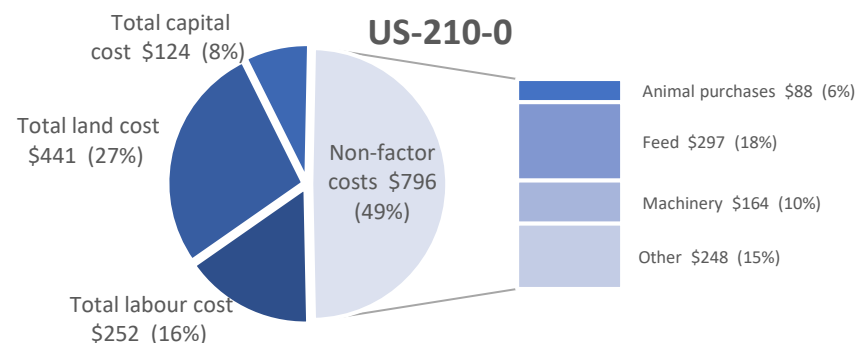
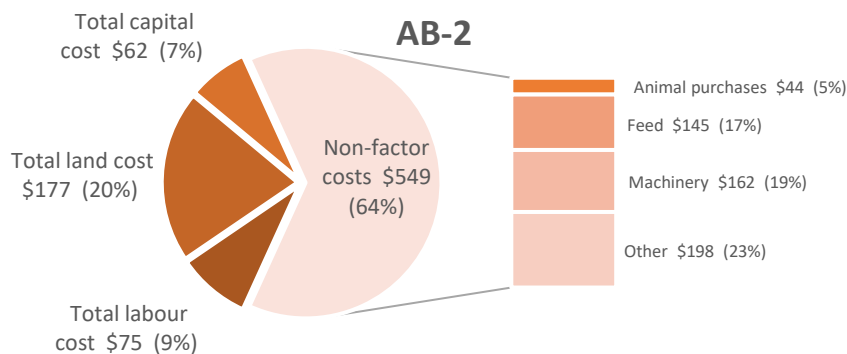
**Land costs** are over twice as high on **US-210-0**, and make up a greater portion of total costs (27%) compared to **AB-2** (21%). This can largely be attributed to the greater number of acres maintained on **US-210-0**, though land rent per acre is higher for **AB-2**. However, it is important to note land productivity on **US-210-0** is approximately twice as high as **AB-2**.

**Labour costs** on **US-210-0** also exceeded those on **AB-2**. **US-210** had greater total labour hours (2786 vs. 1488), as well as higher wages for both paid (\$19.92/hr vs. \$17.20/hr) and unpaid family labour (\$19.92/hr vs. \$12.80/hr). Both farms rely primarily on unpaid family labour.

The main component of **capital costs** on both farms were own capital, at \$49/cow for **AB-2** and \$74/cow on **US-210-0**. The remainder of capital costs are interests on liabilities. Interest rates are considerably lower for **AB-2** (2.4%) as compared to **US-210-0** (5.3%).

**Non-factor costs** account for 64% of total costs on **AB-2**, and 49% of total costs on **US-210-0**. A considerable portion of non-factor costs on both operations are **feed** costs. As **AB-2** relies on primarily homegrown feeds, these costs are those associated with feed production (seed, fertilizer, etc.). On **US-210**, feed costs are those for purchasing feed. Despite this, feed costs make up a comparable share of total costs on both farms, at 17% and 18% on **AB-2** and **US-210**, respectively. A notable difference in non-factor costs is **machinery** costs, the largest component of non-factor costs on **AB-2**, accounting for 19% of total costs. Of machinery costs, the largest component is contract labour, followed by depreciation and maintenance. **US-210-0** does not hire contract labour, keeping machinery costs to 10% of total costs. Costs associated with **animal purchases**, **fuel**, and **insurance and taxes**, as a proportion of total costs, were comparable between the two operations.

Costs (\$/cow)	AB-2	US-210-0
Total land cost	177	441
Total labour cost	75	252
Total capital cost	62	124
Non-factor costs	549	796
Animal purchases	44	88
Feed	145	297
Machinery	162	164
Fuel, energy, lubricants	21	24
Buildings	46	5
Vet & medicine	34	34
Insurance, taxes	22	59
Other inputs	74	126
<b>Total costs</b>	<b>864</b>	<b>1,613</b>



## Whole Farm

### Other Farm Enterprises

**AB-2** gained additional farm income from backgrounding, some cash crop production, and other farm enterprises. **AB-2** also receives government payments. Income sources are less diverse on **US-210-0**, comprised of the cow-calf and lease hunting enterprises.

### Cost and Profit

**Total revenue** on **AB-2** is approximately 2.5x that of **US-210-0**, though the cow-calf enterprise is only 41% of total revenue, as compared to 93% of total revenue on **US-210-0**.

A similar trend occurs for **total farm expenses**. Costs associated with the cow-calf enterprise alone (animal purchases, feed, veterinary and medical, etc.), make up only 9% of total farm costs on **AB-2**, whereas other farm enterprises make up 64% of total costs. Forty-eight per cent of total costs on **US-210-0** are associated with the cow-calf enterprise. **US-210-0** spends a greater share of expenses on fixed costs, and wages, rent, and interest, while a comparable share of expenses on both farms can be attributed to depreciation.

While only **AB-2** is able to maintain a profitable cow-calf enterprise in the long-term, both **AB-2** and **US-210-0** are able to cover total farm costs and remain profitable over the 5-year period. At whole-farm level, **net income** for **AB-2** averaged \$126,482<sup>a</sup>, and **net cash farm income** averaged \$194,966<sup>b</sup>. **US-210-0** averaged a net income of \$62,152<sup>a</sup> over the five-year period, and net cash farm income of \$87,822<sup>b</sup>.

Whole-farm cost and profit		
Costs (\$)	AB-2	US-210-0
<b>Revenue</b>		
Market revenue	679,487	256,719
Cow-calf	282,457	256,719
Retained ownership	311,436	0
Cash crop	85,594	0
Other farm revenue	7,829	18,181
Government payments	7,698	0
<b>Total farm revenue</b>	<b>695,014</b>	<b>274,900</b>
<b>Expenses</b>		
Depreciation	68,490	25,918
Fixed costs	26,051	52,710
Wages, rent, interest	57,273	32,217
Cow-calf	53,521	101,903
Retained ownership	259,754	0
Cash crop	103,453	0
<b>Total farm costs</b>	<b>568,532</b>	<b>212,748</b>
<b>Profits</b>		
Net income	126,482	62,152
Net cash farm income	194,966	87,822

<sup>a</sup>This is whole farm profitability, calculated as Market returns (+ coupled payments) (+ decoupled payments) – whole-farm costs +/- changes in inventory +/- capital gains/losses. Whole-farm costs include Direct costs enterprises, overhead costs, paid labour, paid rents, paid interest, depreciation

<sup>b</sup>Net cash farm income = Whole farm profitability + depreciation + changes in inventory + capital gains/losses.