

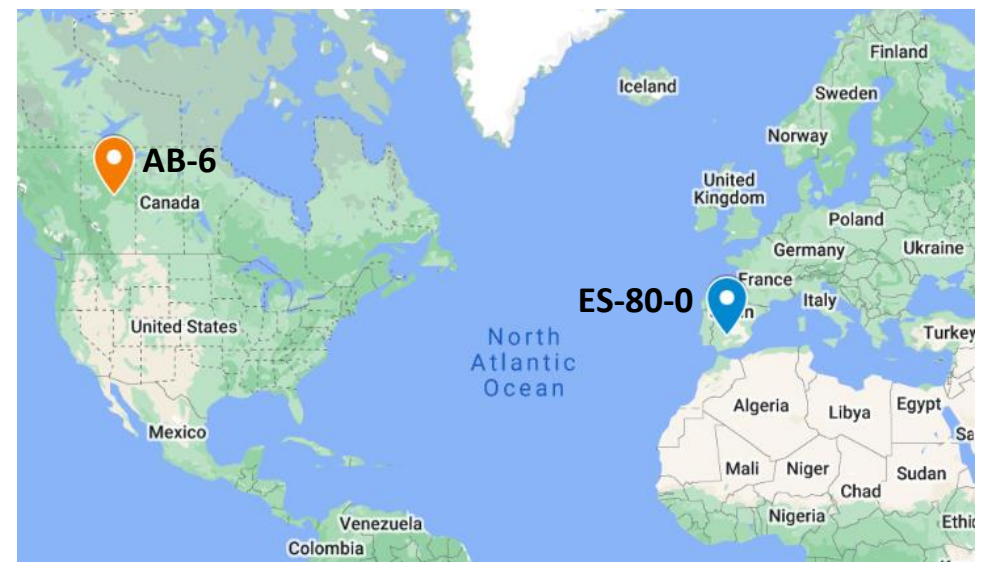


Case Study - AB-6 vs. ES-80-0

Farm Descriptions

AB-6 is a cow-calf operation in the Aspen Parkland region of Alberta, Canada. This operation keeps Hereford and Angus animals, with a beef cow herd of 152 head. The cow-calf enterprise is located on 2,622 ac, in a semi-arid climate with chernozemic and gleysolic soils. Mean annual temperature is 1.5°C, and mean annual precipitation is 450mm with the majority of precipitation falling May-June.

ES-80-0 is a cow-calf and pork producing operation in Santa Eufamia, Córdoba, Spain. A beef cow herd of 83 head maintains this herd of Limousin/Retinta cross animals. This farm is located on 368 ac with predominantly silty clay loam soils. Mean annual temperature is 18°C, and mean annual precipitation is 536mm, with the main period of precipitation November-January.



Production System and Physical Performance Indicators

Similarities

Comparison of **AB-6** and **ES-80-0** was chosen due to similarities in animal performance and per-cow production costs, despite differences in growing conditions, feed purchases, and other farm activities.

Cow Performance and Weaning

Mature cow weight is similar between **AB-6** (1,338 lb) and **ES-80-0** (1,279 lb). Both farms wean calves quite young, at a similar weight. **AB-6** at 176d and 535 lb, and **ES-80-0** at 150d and 529 lb. Due to a 26d difference in weaning age, though similar weaning weights, 200d adjusted weaning weight is considerably higher on **ES-80-0** (706lb) vs. **AB-6** (608lb).

Cow herd replacement rate is similar between farms. Calf death loss is also similar, though slightly higher on **AB-6** (5%) than **ES-80-0** (2%). Despite this, **AB-6** weans 90 calves per 100 cows, and **ES-80-0** only 84.

Cattle Sales and Prices

Both farms sell the entire calf crop at weaning. While sale (weaning) weights are similar between farms, price per head for weaners sold is 40% higher on **AB-6**, at \$1,214/head, compared to \$866/head on **ES-80-0**.

Feed

AB-6 relies on homegrown feed, while **ES-80-0** purchases 68% of feedstuffs. On **AB-6**, cows swath graze in fall, and are given a hay-based winter ration supplemented with straw, grain, salt and mineral. On **ES-80-0**, 55% of the winter diet is grazed, with the remaining 45% of the diet from grass hay/silage. Both farms feed animals outdoors/on pasture in winter.

	AB-6	ES-80-0
Beef cows (hd)	152	83
Breeds	Hereford, black and red Angus	Limousin * Retinta
Mature cow weight (lb)	1,338	1,279
Weaning age (d)	176	150
Weaning weight (lb)	535	529
200 day adjusted weaning weight (lb)	608	706
Weaning weight as % mature cow weight	40	41
Calf death loss	5.0%	2.0%
Calves weaned per 100 cows (hd)	90	84
Replacement rate (%)	8.0%	10.0%
Sale weight (lb)	535	529
Price per head for weaners sold (\$/hd)	1,214	866
Feed purchased (% as-is)	0%	68%
Income sources	Cow-calf, crop	Cow-calf

Cow-calf Enterprise

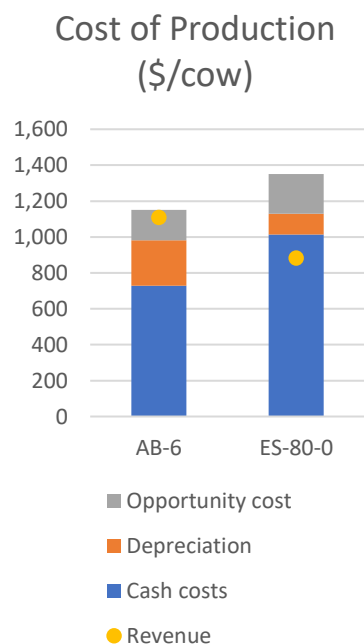
Cost and Profit

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-6** averaged \$1,150/cow. Average production costs on **ES-80-0** were 17% higher, at \$1,351/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 costs account for the majority of total costs on both farms, at 63% of total costs on **AB-6**, and 75% of total costs on **ES-80-0**.

Depreciation on machinery, buildings, etc. accounted for an average of 22% of total farm costs on **AB-6**, and only 9% of total farm costs on **ES-80-0**.

Total costs of the cow-calf enterprise		
Costs (\$/cow)	AB-6	ES-80-0
Cash costs	728	1,013
Depreciation	255	116
Opportunity cost	168	221
<i>Land</i>	40	124
<i>Labour</i>	53	44
<i>Capital</i>	76	54
Total cost	1,150	1,351
Revenue	1,108	883
Short-term profit	381	-131
Medium-term profit	126	-247
Long-term profit	-42	-468



Opportunity costs are calculated for unpaid family labour, owned land, and capital. Opportunity costs make up a similar share of total costs on each farm, accounting for an average of 15% of total costs on **AB-6**, and 16% of total costs on **ES-80-0**. On **AB-6**, the largest component of opportunity cost was opportunity cost of capital (45% of opportunity cost). On **ES-80-0**, opportunity cost of land accounted for more than half (56%) of total opportunity costs.

Revenue from the cow-calf enterprise, including weaned calf and cull sales, was \$1,108/cow on **AB-6**. This is 25% larger than total revenue on **ES-80-0**, which averaged \$883/cow over the 5-year period. The compounding effects of higher total cost and lower total revenue on **ES-80-0**, as compared to **AB-6**, results in differences in profitability of the cow-calf enterprise.

Only **AB-6** is able to cover short-term (cash) costs. **Short-term profits** (revenue – cash costs) averaged \$381/cow on **AB-6**, and -\$131/cow on **ES-80-0**. **AB-6** remains profitable in the medium-term, with average **medium-term profits** (revenue – cash and depreciation costs) of \$126/cow. In contrast, **ES-80-0** had an average medium-term profit of -\$247/cow. However, neither farm was profitable in the long term. **Long-term profits** (revenue – cash, depreciation, and opportunity costs) averaged -\$42/cow and -\$468/cow on **AB-6** and **ES-80-0**, respectively.

Cost Structure

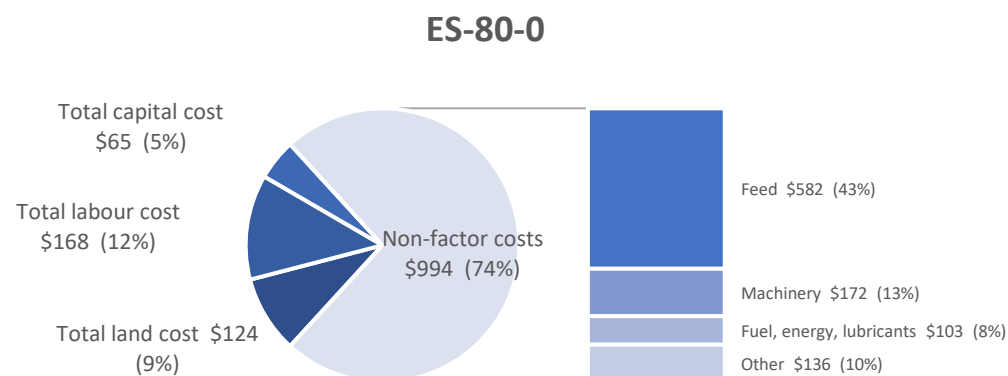
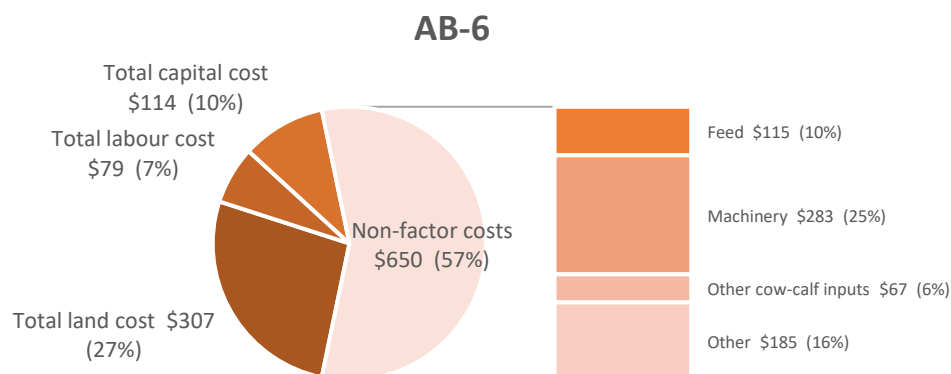
Total costs can be broken down as land, labour, capital, and non-factor costs. Per-cow total land and capital costs are higher on **AB-6**, whereas total labour and non-factor costs are higher on **ES-80-0**. Cost structure, where these costs are represented as a percentage of total costs, also differ between farms.

Land costs are approximately 2.5 times higher per-cow on **AB-6** than on **ES-80-0**. While **ES-80-0** pays considerably more for land rent (\$28/ac calculated rent for owned land) as compared to **AB-6** (an average \$17/ac for rent and calculated rent for owned land), this farm operates on approximately 1/8th of the land base (368 ac) of **AB-6** (2,889 ac).

Labour costs are over two times higher on **ES-80-0** (\$168/cow) than on **AB-6** (\$79/cow). A similar number of labour hours are contributed annually on each farm – 1,065 hrs on **AB-6**, and 1,136 hrs on **ES-80-0**. **AB-6** relies primarily on unpaid family labour (67% of total labour hours), while **ES-80-0** uses primarily hired labour (81% of total labour hours). The higher per-cow labour costs on **ES-80-0** can be attributed to the higher cost of labour (average \$14.06/hr), as compared to **AB-6** (average \$11.20/hr), as well as smaller herd size.

On both farms, the main component of **capital costs** is own capital. Capital costs account for 10% and 5% of total costs on **AB-6** and **ES-80-0**, respectively.

Costs (\$/cow)	AB-6	ES-80-0
Total land cost	307	124
Total labour cost	79	168
Total capital cost	114	65
Non-factor costs	650	994
Animal purchases	8	0
Feed	115	582
Machinery	283	172
Fuel, energy, lubricants	27	103
Buildings	57	31
Vet & medicine	58	35
Insurance, taxes	14	5
Other inputs	87	65
Total costs	1,150	1,351



Non-factor costs are the largest component of total costs on both farms, accounting for 57% of total costs on **AB-6** and 73% of total costs on **ES-100-80**. The largest non-factor costs on **AB-6** are **machinery** costs. These costs account for 44% of non-factor and 25% of total costs, and are primarily associated with depreciation, followed by contract labour, and maintenance. Machinery costs are also significant on **ES-80-10**, accounting for 18% of non-factor costs and 13% of total costs. Instead, the highest non-factor cost on **ES-80-0** is **feed costs** (58% of non-factor and 43% of total costs), which is also the second-highest non-factor cost on **AB-6** (18% of non-factor and 10% of total costs). As **ES-80-0** purchases most (68%) feed ingredients, 88% of feed costs are for purchased feed. Meanwhile, as **AB-6** grows the majority of feedstuffs, the largest feed cost is fertilizer for feed production. Other significant non-factor costs include **other cow-calf inputs** (maintenance, transport, advisory services, etc.) on **AB-6** (10% of non-factor costs, 6% of total costs), and **fuel, energy, and lubricants** on **ES-80-0** (11% of non-factor costs, 8% of total costs). A similar, small (<5%) share of total costs is spent on **animal purchases, buildings, veterinary and medical costs, and insurance and taxes** on both farms.

Whole Farm

Other Farm Enterprises

Both farms are primarily cow-calf operation. However, **AB-6** does acquire additional farm revenue from the sale of feed/forage crops, as well as other farm activities. **ES-80-0** also runs a pork production enterprise, classified under other farm revenue.

Cost and Profit

Total revenue on **AB-6** averaged \$351,883 over the 5-year period, approximately 2.8 times that of **ES-80-0**, at an average of \$126,614. Market revenue from the cow-calf enterprise is the largest contributor to total revenue on both farms (48% of total revenue). Crop sales make up a significant share of total revenue on **AB-6** (40%), with an additional 11% from other farm activities. On **ES-80-0**, other farm revenue (pork production) accounts for 28% of total revenue, and government payments the remaining 24%.

Average **total farm expenses** are \$289,937 on **AB-6**, and \$106,649 on **ES-80-0**. Total expenses are 2.7 times higher on **AB-6**, which is proportional to the difference in total farm revenue.

Whole-farm cost and profit		
Costs (\$)	AB-6	ES-80-0
Revenue		
Market revenue	308,677	60,606
Cow-calf	168,484	60,606
Crop production	140,193	0
Other farm revenue	37,371	36,045
Government payments	5,835	29,964
Total farm revenue	351,883	126,614
Expenses		
Depreciation	85,981	10,579
Fixed costs	12,533	31,467
Wages, rent, interest	64,912	14,400
Cow-calf	32,051	45,360
Cash crop	94,459	4,842
Total farm costs	289,937	106,649
Profits		
Net income	61,946	19,966
Net cash farm income	147,923	30,545

The composition of total farm expenses is considerably different between farms. On **AB-6**, the largest share of total expenses is attributed to crop production (33%). This is followed by depreciation (30%), wages, rent, and interest (20%), the cow-calf enterprise (11%), and fixed costs (4%). In contrast, the cow-calf enterprise is the largest contributor to total farm expenses, accounting for 43% of total expenses. This is followed by fixed costs (30%), wages, rent, and interest (14%), depreciation (10%), and crop production (5%).

Due to the additional revenue from crop sales and other farm activities on **AB-6**, and other farm revenue and government payments on **ES-80-0**, both farms are able to maintain whole-farm profitability over the 5-year period. This is in contrast to the profitability of the cow-calf enterprise alone. **Net income** for **AB-6** averaged \$61,946^a, and **net cash farm income** averaged \$147,923^b. On **ES-80-0**, net income averaged \$19,966^a over the five-year period, and net cash farm income \$30,545^b.

^aThis 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

^bNet cash farm income = Whole farm profitability + depreciation + changes in inventory + capital gains/losses.