

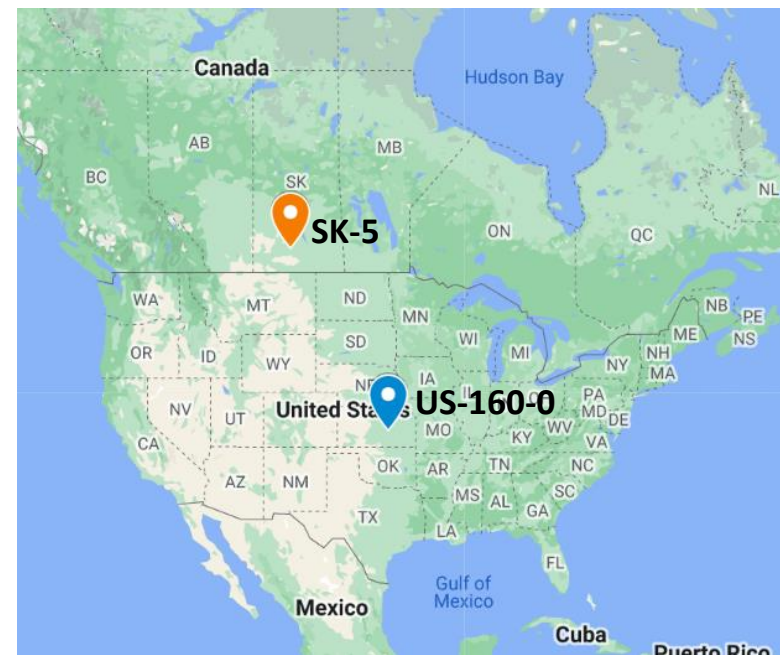


## Case Study - SK-5 vs. US-160-0

### Farm Descriptions

**SK-5** is a mixed cow-calf and cash crop operation located in Saskatchewan, Canada, within the Moist Mixed Grassland ecoregion. This farm has purebred and commercial animals, and maintains a beef cow herd of 135 head. The cow-calf enterprise is situated on 2,193 ac with dark brown chernozemic soils over glacial till. The climate is semi-arid. Mean annual temperature is 2.5°C, and mean annual precipitation range is 350-400mm, with highest rainfall in May-June.

**US-160-0** is a mixed cow-calf and cash crop operation located in Kansas, United States. This farm keeps 159 head of beef cows to maintain its commercial herd. The cow-calf enterprise is situated on 1,721 ac with silt loam soils. The climate is dry semi-arid. Mean annual temperature is 6°C, and mean annual precipitation is 396mm. The main period of precipitation is April-September, peaking in June.



## Production System and Physical Performance Indicators

### Similarities

Comparison of **SK-5** and **US-160-0** was chosen as these are mixed cow-calf and cash crop operations with medium sized herds, under similar climatic conditions for crop production.

### Cow Performance and Weaning

Mature cow weight on **SK-5** is 1,499 lb, 25% heavier than the 1,200 lb mature cows on **US-160-0**. **SK-5** weans calves approximately 4.5 weeks younger, at a lighter weight, and therefore at a lower percentage of mature cow weight, than on **US-160-0**. The 200d adjusted weaning weights (682 lb on **SK-5**, 619 lb on **US-160-0**), though, show heavier calves on **SK-5**.

Calf death loss is slightly higher on **US-160-0** (5.0%) than on **SK-5** (3.0%), though **US-160-0** weans more calves per 100 cows (92) than **SK-5** (89). This may suggest differences in fertility between farms. A slightly higher calving percentage on **US-160-0** (96%) as compared to **SK-5** (92%) may support this.

### Cattle Sales and Prices

Both **SK-5** and **US-160-0** sell calves at weaning. **SK-5** sells weaned calves at 611 lb, at an average price of \$1,182/head. On **US-160-0**, weaners are sold at 650 lb for an average price of \$1,123/head. This is 5% less than prices received on **SK-5**, despite a 6% larger sale weight.

### Feeding

On **SK-5**, following a period of aftermath grazing in fall, cows receive a winter diet consisting of cereal silage, hay, straw and chaff, cereal screening, camelina meal, salt, and mineral. Winter diets are provided on pasture. On **US-160-0**, cows graze throughout the year, but are supplemented with grass hay/silage in winter (55%). **SK-5** purchases 30% of feedstuffs provided, and **US-160-0** purchases 7%.

	SK-5	US-160-0
<b>Beef cows (hd)</b>	135	159
<b>Breeds</b>	Purebred Charolais Angus, Simmental; Commercial	Crosses
<b>Mature cow weight (lb)</b>	1,300	1,200
<b>Weaning age (d)</b>	179	210
<b>Weaning weight (lb)</b>	611	650
<b>200 day adjusted weaning weight (lb)</b>	682	619
<b>Weaning weight as % mature cow weight</b>	47	54
<b>Calf death loss</b>	3.0%	5.0%
<b>Calves weaned per 100 cows (hd)</b>	89	92
<b>Replacement rate (%)</b>	13.5%	12.0%
<b>Price per head for weaners sold (\$/hd)</b>	1,182	1,123
<b>Feed purchased (%)</b>	30%	7%
<b>Income sources</b>	Cow-calf, crop	Cow-calf, crop

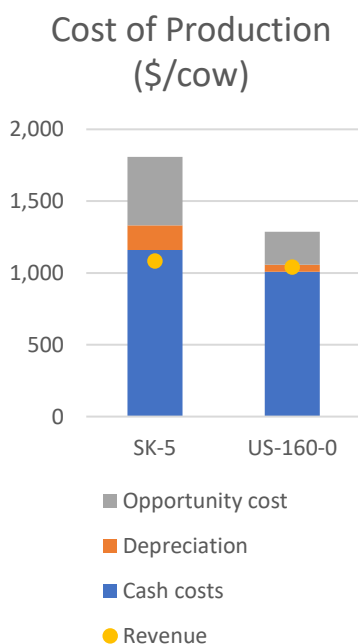
## Cow-calf Enterprise

### Cost and Profit

For comparison of cow-calf 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 **SK-5** averaged \$1,810/cow over the 5-year period. This is 40% larger than total costs incurred on **US-160-0**, at an average of \$1,288/cow.

**Cash costs** include purchased feed, costs of feed production including seed and fertilizer, land rent, wages, machine and building maintenance, interest on liabilities, veterinary and medicine costs, etc. Cash costs make up a considerable share of total costs on both farms. These account for 64% of total costs on **SK-5**, and 78% of total costs on **US-160-0**.

**Depreciation** on machinery, building, etc., accounts for a smaller share of total costs, at 10% and 4% of total costs on **SK-5** and **US-160-0**, respectively.



**Opportunity costs** are calculated for owned land, unpaid family labour, and capital. On **SK-5**, the largest opportunity cost (61% of opportunity cost) is opportunity cost of labour. This is due to a large number of unpaid family labour hours on this farm. On **US-160-0**, over half (54%) of opportunity costs is opportunity cost of land. This cost represents potential revenue generated from alternative uses of owned land, such as renting land to neighbours.

**Revenue** from the cow-calf enterprise, including weaned calf and cull sales, was \$1,085/cow on **SK-5**. This is comparable to cow-calf revenue on **US-160-0**, of \$1,041/cow. Considering that cow-calf production costs are 40% larger on **SK-5**, this will be reflected in profitability measures of the respective cow-calf enterprises.

The cow-calf enterprise on **SK-5** is unprofitable in all of the short-, medium-, and long-terms. Average **short-term profits** (revenue – cash costs) on this farm were -\$74/cow. Average **medium-term profits** (revenue – cash and depreciation costs) were -\$246/cow, and average **long-term profits** (revenue – cash, depreciation, and opportunity costs) were -\$724/cow. **US-160-0** is able to cover short-term (cash) costs, with an average short-term profit of \$33/cow. However, this farm, too, is unprofitable in the medium- and long-terms. Medium-term profits averaged -\$17/cow, and long-term profits -\$247/cow over the 5-year period.

Total costs of the cow-calf enterprise		
Costs (\$/cow)	SK-5	US-160-0
Cash costs	1,160	1,009
Depreciation	172	49
Opportunity cost	478	230
<i>Land</i>	188	125
<i>Labour</i>	290	91
<i>Capital</i>	0	14
<b>Total cost</b>	<b>1,810</b>	<b>1,288</b>
<b>Revenue</b>	<b>1,085</b>	<b>1,041</b>
Short-term profit	-74	33
Medium-term profit	-246	-17
Long-term profit	-725	-247

## Cost Structure

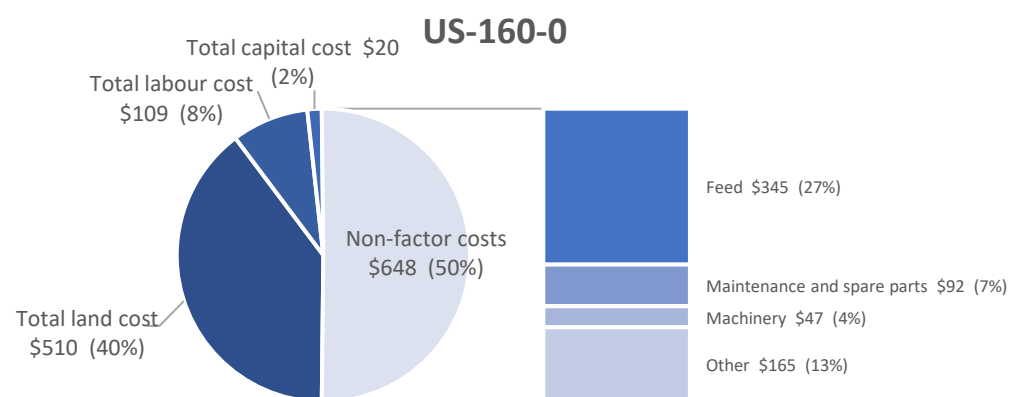
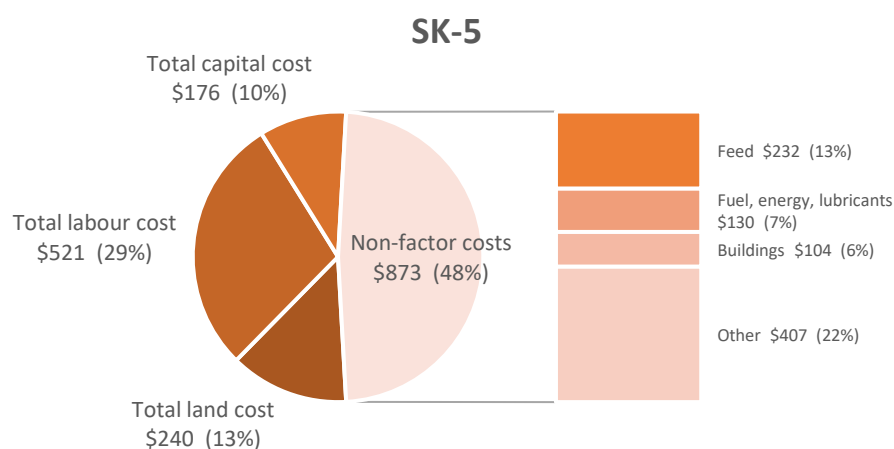
**Total costs** can be broken down as land, labour, capital, and non-factor costs. Per-cow total land costs are higher on **US-160-0**, while total labour, capital, and non-factor costs are higher on **SK-5**. Cost structure, wherein these costs are presented as a percentage of total costs, is also variable between the two farms.

**Land costs** account for 13% of total costs on **SK-5**, and 40% of total costs on **US-160-0**. While US-60-0 maintains a smaller land-base (1,721 ac) than **SK-5** (1,293 ac), and a smaller cow herd, per-cow land costs are over twice that of **SK-5**. This is due to differences in land rents. Between rents paid and rents calculated for owned land, average land rents are \$48/ac on **US-160-0**, as compared to \$14/ac on **SK-5**.

**Labour costs** account for 29% of total costs on **SK-5**, and only 8% of total costs on **US-160-0**. Total labour hours on **SK-5** are 3,331 hrs, over 6 times the total labour hours logged on **US-160-0** (530 hrs). The difference in total labour hours overcomes the difference in labour prices, which are higher on **US-160-0**, at an average \$28.77/hr, as compared to \$21.46/hr on **SK-5**. Both farms utilize both hired and unpaid family labour. Unpaid family labour hours account for 46% and 68% of total labour hours on **SK-5** and **US-160-0**, respectively.

**Capital costs** are the smallest share of total costs on both farms. Capital costs account of 10% of total costs on **SK-5**, of which all costs are interest on liabilities. On **US-160-0**, capital costs account for only 2% of total costs, with the majority of capital costs (67%) as own capital.

Costs (\$/cow)	SK-5	US-160-0
Total land cost	240	510
Total labour cost	521	109
Total capital cost	176	20
Non-factor costs	873	648
Animal purchases	35	17
Feed	232	345
Machinery	94	47
Fuel, energy, lubricants	130	41
Buildings	104	3
Vet & medicine	25	36
Insurance, taxes	54	0
Other inputs	199	161
<b>Total costs</b>	<b>1,810</b>	<b>1,288</b>



**Non-factor costs** account for the largest share of total costs, at 48% of total costs on **SK-5**, and a similar 50% of total costs on **US-160-0**. On both farms, the most significant non-factor costs are **feed costs**. These account for 27% of non-factor and 13% of total costs on **SK-5**, and 53% of non-factor and 27% of total costs on **US-160-0**. Despite differences in amount of feed purchased, purchased feed is the feed cost on both farms, followed by inputs for homegrown feed production. Other significant non-factor costs on **SK-5** are **fuel, energy, and lubricants** (15% of non-factor costs), primarily diesel for vehicles, and **building** costs (12%). On **US-160-0**, general farm maintenance and spare parts (classified as “other” cow-calf inputs) is the next-largest non-factor costs (\$92/cow or 14% of non-factor costs).

## Whole Farm

### Other Farm Enterprises

In addition to the cow-calf enterprise, both **SK-5** and **US-160-0** generate additional farm revenue from a cash crop enterprise, as well as other farm activities. **US-160-0** also receives government payments.

### Cost and Profit

**Total farm revenue** on **SK-5** averaged \$158,107 over the 5-year period. Market revenue from the cow-calf enterprise accounted for 93% of whole-farm revenue, followed by the cash crop enterprise (6%), and other farm activities (1%). Total farm revenue on **US-160-0** averaged \$986,976 over the 5-year period, over 6 times the total revenue on **SK-5**. On **US-160-0**, the majority of farm revenue (75%) is market revenue from the cash crop enterprise. Only 17% of revenue is market revenue from the cow-calf enterprise.

**Total farm expenses** on **SK-5** averaged \$185,209 over the 5-year period. Wages, rent, and interest were the largest expenses incurred on this farm (34% of total expenses), followed by fixed costs (24%), and the cow-calf enterprise (18%). On **US-160-0**, total farm expenses averaged \$540,177. Similar to total costs, the cash crop enterprise is the largest source of expenses on this farm (55%). This is followed by wages, rent, and interest (24%), and the cow-calf enterprise (13%).

Whole-farm cost and profit		
Costs (\$)	SK-5	US-160-0
<b>Revenue</b>		
Market revenue	156,367	907,116
Cow-calf	146,509	165,536
Cash crop	9,858	741,580
Other farm revenue	1,667	58,527
Government payments	0	21,334
<b>Total farm revenue</b>	158,034	986,976
<b>Expenses</b>		
Depreciation	24,104	45,737
Fixed costs	44,843	0
Wages, rent, interest	63,883	127,206
Cow-calf	33,276	67,772
Crop production	19,102	299,463
<b>Total farm costs</b>	185,209	540,177
<b>Profits</b>		
Net income	-27,175	446,799
Net cash farm income	-3,070	491,541

The cow-calf enterprise on **SK-5** was not profitable in the short-, medium-, or long-terms. Despite the additional farm revenue from the cash crop enterprise and other farm activities, **SK-5** remains unprofitable at the whole-farm level. Average **net income** for **SK-5** was -\$27,175<sup>a</sup> over the 5-year period, and average **net cash farm income** was -\$3,070. In contrast, the success of the cash crop enterprise, as well as additional revenue from other farm activities and government payments received by **US-160-0**, allow this farm to achieve whole-farm level profitability. Over the 5-year period, net income averaged \$446,799<sup>a</sup>, and net farm cash income averaged \$491,541<sup>b</sup>.

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<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.