



Case Study - ON-4 vs. DE-100-0

Farm Descriptions

ON-4 is a cow-calf operation, also producing cash crops, located around Lake Wabigoon in Ontario, Canada. A beef cow herd of 100 head maintains the cow-calf enterprise comprised of Angus, Limousin, and Simmental animals. The cow-calf enterprise is located on 706 ac with predominantly sandy clay loam soils. Mean annual temperature is 1.4°C, and mean annual precipitation is 645mm.



DE-100-0 is a cow-calf and cash crop operation in the District of Westerwald, Germany. This farm keeps Limousin animals, and has a 100 head beef cow herd. The cow-calf enterprise is located on 383 ac of land with sandy soils. Mean annual temperature is 8°C, and mean annual precipitation is 1000mm with peaks in June-July and December.

Production System and Physical Performance Indicators

Similarities

Comparison of **ON-4** and **DE-100-0** was chosen for similarities in farm enterprises, and beef cow herd size and replacement. There are differences in mean annual temperature and precipitation, though the distribution of precipitation is similar.

Cow Performance and Weaning

Mature cow weight, weaning age and weaning weight are all higher on **DE-100-0** as compared to **ON-4**. This results in weaning weights that are a similar percentage of mature cow weight (41% and 42% for **ON-4** and **DE-100-0**, respectively). However, the 200-d adjusted weaning shows a higher weight for **ON-4** (568 lb) versus **DE-100-0** (526 lb).

Both farms have a 16% cow replacement rate; the beef cow herds likely have similar age composition. **ON-4** weans a fewer number of calves per 100 cows (80) than **DE-100-0** (92), though this may be related to a calf death loss (8%) twice that of **DE-100-0** (4%).

Cattle Sales and Prices

Neither farm retains ownership of weaned calves, thus all are sold at weaning. Prices received per-head for weaned calves are 19% higher on **DE-100-0** (\$1,293/head) than on **ON-4** (\$1,084), though this may be related to differences in weaning weight (sale weight) discussed.

Feeding

ON-4 relies primarily on homegrown feeds, whereas **DE-100-0** purchases 100% of feeds. **ON-4** bale grazes a grass/legume mix in fall, followed by two months of bare grazing oat/pealage following spring calving, with mineral provided throughout. Animals are fed in confinement only during the calving period. **DE-100-0** has all land as pasture feeds animals in a winter barn.

	ON-4	DE-100-0
Beef cows (hd)	100	100
Breeds	Angus, Limousin, Simmental,	Limousin
Mature cow weight (lb)	1,350	1,544
Weaning age (d)	194	248
Weaning weight (lb)	551	650
200 day adjusted weaning weight (lb)	568	526
Weaning weight as % mature cow weight	41	42
Price per head for weaners sold (\$/hd)	1,084	1,293
Calf death loss	8%	4%
Calves weaned per 100 cows (hd)	80	92
Replacement rate (%)	16%	16%
Income sources	Cow-calf, cash crop	Cow-calf, cash crop

Cow-calf Enterprise

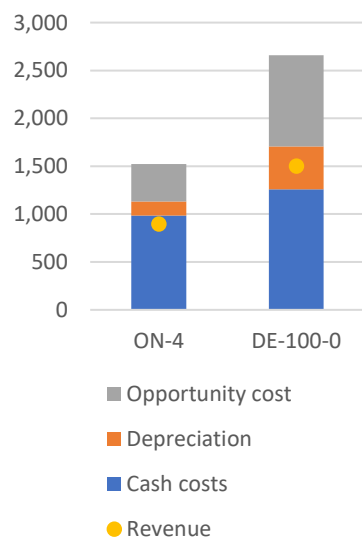
Cost and Profit

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 **ON-4** averaged \$1,524/cow wintered from 2016-2020. Total production costs on **DE-100-0** are 74% higher, at an average of \$2,658/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 are the largest component of total costs on both farms, accounting for 65% of costs on **ON-4**, and 67% of costs on **DE-100-0**.

Total costs of the cow-calf enterprise		
Costs (\$/cow)	ON-4	DE-100-0
Cash costs	984	1,259
Depreciation	147	447
Opportunity cost	392	953
<i>Land</i>	85	45
<i>Labour</i>	266	881
<i>Capital</i>	41	26
Total cost	1,524	2,658
Revenue	895	1,500
Short-term profit	-89	241
Medium-term profit	-236	-206
Long-term profit	-628	-1,159

Cost of Production (\$/cow)



Opportunity costs are calculated for owned land, unpaid family labour, and capital. Opportunity costs are higher and make up a greater proportion of total farms costs (36%) on **DE-100-0**, as compared to **ON-4** (26% of total costs). On both farms, opportunity cost of labour is the largest component of opportunity cost, and accounts for 17% and 33% of total cost on **ON-4** and **DE-100-0**, respectively. This high opportunity cost of labour is associated with the reliance on unpaid family labour on both farms.

Revenue from the cow-calf enterprise averaged \$895/cow on **ON-4**, and \$1,500/cow on **DE-100-0**. Similar to the difference in total costs, per-cow revenue is 67% greater on **DE-100-0**.

Over the 5-year period, **ON-4** was unable to cover even cash costs at this level of revenue. **ON-4** had an average **short-term profit** (revenue – cash costs) of -\$89/cow. **DE-100-0** was able to maintain a cow-calf enterprise that is profitable in the short term, with an average short-term profit of \$241/cow. However, neither cow-calf enterprise is profitable in the medium- or long-term. Average **medium-term profits** (revenue – cash and depreciation costs) were -\$236/cow on **ON-4**, and a similar -\$206/cow on **DE-100-0**.

Long-term profits (revenue – cash, depreciation, and opportunity costs) averaged -\$628/cow on **ON-4**, and a staggering -\$1,159/cow on **DE-100-0**.

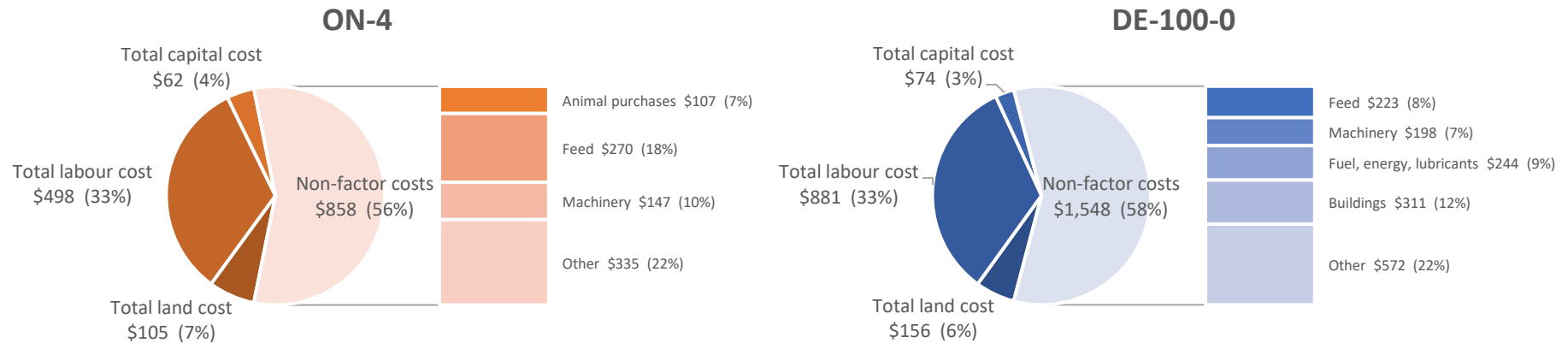
Cost Structure

Total costs can be broken down as land, labour, capital, and non-factor costs. On a per-cow basis, all of land, labour, capital, and non-factor costs are higher on **DE-100-0**, however, expressed as a percent of total costs, cost structure is similar between the two farms.

Land costs account for 6% and 7% of total costs on **ON-4** and **DE-100-0**, respectively. The cost of renting land is significantly higher on **DE-100-0**; land rent is \$47/ac and rent calculated for owned land is \$76/ac on **DE-100-0**, and only \$16/ac and \$15/ac respectively on **ON-4**. However, **ON-4** maintains a significantly larger area of land (706 ac) than **DE-100-0** (383 ac).

Per-cow **labour costs** on **ON-4** are just over half that on **DE-100-0**, though labour accounts for 33% of total cost on both farms. **ON-4** relies on both hired and unpaid family labour, each accounting for approximately half of total labour hours (2,427 hours total). Paid wages are slightly lower (\$19.56/hr) than those calculated for family labour (\$21.43/hr). **DE-100-0**, in contrast, relies entirely on unpaid family labour, for a total of 3,923 labour hrs, 61% more hours than **ON-4**, at a calculated wage of \$22.46/hr, higher than either wage provided on the Canadian farm.

Costs (\$/cow)	ON-4	DE-100-0
Total land cost	105	156
Total labour cost	498	881
Total capital cost	62	74
Non-factor costs	859	1,547
Animal purchases	107	42
Feed	270	223
Machinery	147	198
Fuel, energy, lubricants	59	244
Buildings	64	311
Vet & medicine	53	67
Insurance, taxes	66	162
Other inputs	93	301
Total costs	1,524	2,658



Capital costs make up the smallest percentage of total costs, accounting for 4% and 3% of costs on **ON-4** and **DE-100-0**, respectively. On **ON-4**, the greatest proportion of capital costs is own capital, whereas on **DE-100-0**, it is as interest on liabilities.

On both farms, **non-factor costs** make up the largest proportion of total costs, at a similar 56% of total costs on **ON-4**, and 58% of total costs on **DE-100-0**. Despite this, there are notable differences in the composition of non-factor costs. A notable difference is **feed costs**. On **ON-4**, feed costs account for 33% of non-factor costs, or 18% of total costs. **DE-100-0** spends a smaller percentage of costs on feed – only 14% of non-factor costs, or 8% of total costs. Feed costs on **ON-4** are primarily associated with fertilizer and seed, in contrast to **DE-100-0**, where the majority of feed costs are purchased feed. A larger percentage of non-factor costs on **DE-100-0** are associated with **buildings**, as this farm has a winter barn for cows, and **fuel, energy, and lubricant** costs, which include gas/oil, electricity, and water as the highest costs, which may also be connected to the building costs described. A similar share of non-factor costs is associated with **machinery** (despite differences in feed production), **veterinary and medical costs**, and **insurance and taxes**, on both farms.

Whole Farm

Other Farm Enterprises

Both **ON-4** and **DE-100-0** operate a cash crop enterprise, in addition to the cow-calf enterprise, as well as generate a small additional income from other farm activities.

Cost and Profit

With the cow-calf and cash crop enterprise, total farm **revenue** on **ON-4** averaged \$236,902 for the 5-year period. The cash crop enterprise is the largest revenue stream, accounting for 62% of whole-farm revenue. The cow-calf enterprise accounts for 38% of revenue, and other farm revenue for <1%.

Average whole-farm revenue on **DE-100-0** was \$304,018. On this farm, the cow-calf enterprise was the greatest source of farm revenue, accounting for 42% of total revenue. Government payments accounted for a sizable 31% of total farm revenue, followed then by the cash crop enterprise, at 27% of revenue, and other farm revenue at <1%.

Whole-farm cost and profit		
Costs (\$)	ON-4	DE-100-0
Revenue		
Market revenue	236,897	210,674
Cow-calf	89,545	129,151
Cash crop	147,352	81,524
Other farm revenue	5	399
Government payments	0	93,025
Total farm revenue	236,902	304,018
Expenses		
Depreciation	38,818	100,127
Fixed costs	62,142	52,556
Wages, rent, interest	31,290	25,119
Cow-calf	27,251	61,900
Crop production	38,192	59,195
Total farm costs	197,693	298,898
Profits		
Net income	39,209	5,120
Net cash farm income	78,022	104,928

Total farm **expenses** averaged \$197,693 on **ON-4**, and \$298,898 on **DE-100-0**. The largest expenses on **ON-4** were associated with fixed costs (31% of total expenses), followed by depreciation (20%), the cash crop enterprise (19%), wages, rent, and interest (16%), and finally the cow-calf enterprise (14%). In contrast, the greatest expense incurred on **DE-100-0** was depreciation (33% of total costs), with an approximately equal contribution of the cow-calf (21%) and cash crop enterprises (20%) to total expenses. Lower costs were associated with fixed costs (18%), and wages, rent, and interest (8%).

While only **DE-100-0** was able to maintain a profitable cow-calf enterprise in the short-term, and neither farm in the medium- or long-terms, the success of the respective cash crop enterprises and additional government payments to **DE-100-0** allow for both farms to achieve positive average profits over the 5-year term. **ON-4** has an average **net income** of \$39,209^a, and **net farm cash income** of \$78,022^b. **DE-100-0** saw an average net income of only \$5,120^a, but an average net farm cash income of \$104,928^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.