



Case Study - QC-3 vs. UK-65

Farm Descriptions

QC-3 is a cow-calf operation in the St. Lawrence Lowland of Quebec, Canada. A 60 head cow herd is maintained, using 100% purchased bred heifers. After weaning, animals are retained for 30 days of preconditioning. This farm is situated on 61 ac, predominated by medium loam soils. Mean annual temperature is 5°C, with 900mm mean annual precipitation.

UK-65 is a cow-calf and finishing operation in North East England, United Kingdom. The cow-calf enterprise features a 65 head cow herd, and operates on 223 ac of land with predominantly clay loam soils. Mean annual temperature is 8°C, and mean annual precipitation is 1000mm.



Production System and Physical Performance Indicators

Similarities

Comparison of **QC-3** and **UK-65** was chosen for similarities in herd size, climatic conditions, weaning metrics, and some retained ownership. This case study also allows for differences in replacement sources and feed production to be examined.

Cow Performance and Weaning

QC-3 and **UK-65** maintain similar weaning weights, despite calves weaning approximately two weeks later on **UK-65**. This difference in pre-weaning ADG (2.5 lb/d on **QC-3**, 2.2 lb/d on **UK-65**) is reflected in the 200-day adjusted weaning weight. However, due to a larger difference in mature cow weight between the farms, weaning weight as a % of mature cow weight is larger on **UK-65**, 56%, vs. 51% on **QC-3**. Calf death loss is slightly higher on **QC-3**, though this farm weans an additional 6 calves per 100 cows, indicating conception and pregnancy rates are higher.

Cattle Sales and Prices

Both operations sell weaned/backgrounded animals to finishing. Price per head for weaned animals sold at weaning weight is slightly higher for **QC-3**, at \$1,245/hd, as compared to \$1,081 for **UK-65**.

Feed

QC-3 relies entirely on purchased feed, for a hay-based ration for cows. **UK-65** also provides a hay-based ration, though relies primarily on homegrown feeds. Both operations overwinter cows, and therefore provide winter feed, in confinement.

	QC-3	UK-65
Beef cows (hd)	60	65
Breeds	Mixed	Continental crosses
Mature cow weight (lb)	1250	1157
Weaning age (d)	225	244
Weaning weight (lb)	637	646
200 day adjusted weaning weight (lb)	580	530
Weaning weight as % mature cow weight	51	56
Price per head for weaners sold (\$/hd)	1,245	1,081
Annual sales (hd)	55	46
Calf death loss	2.8	2.0
Calves weaned per 100 cows (hd)	92	86
Replacement rate (%)	10.4	15
Feed purchased (% as-is)	100	0.4
Income sources	Cow-calf, preconditioning	Cow-calf, finishing

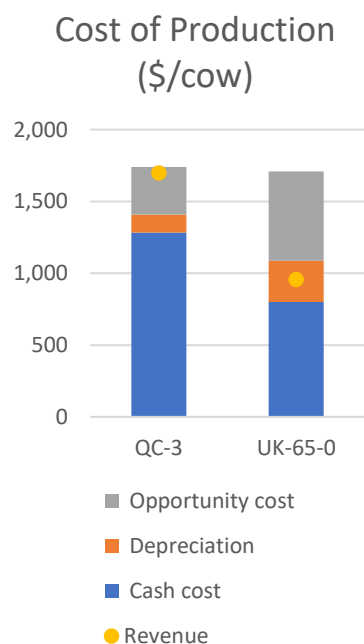
Cow-calf Enterprise

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 **QC-3** averaged \$1,740/cow wintered from 2016-2020. This is consistent with total costs of \$1,709/cow on **UK-65**.

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 comprise the largest percentage total costs on both farms. Cash costs account for 74% of total costs on **QC-3**, and a smaller 47% on **UK-65**.

Total costs of the cow-calf enterprise		
Costs (\$/cow)	QC-3	UK-65
Cash costs	1,284	799
Depreciation	124	289
Opportunity cost	333	621
<i>Land</i>	14	124
<i>Labour</i>	275	484
<i>Capital</i>	44	14
Total cost	1,740	1,709
Revenue	1,697	955
Short-term profit	413	156
Medium-term profit	289	-133
Long-term profit	-43	-754



Opportunity costs are calculated for unpaid family labour, owned land, and capital. Opportunity costs are larger, and account for a larger percentage of total costs (36%) for **UK-65**, as compared to **QC-3** (19% of total costs). The highest opportunity costs for both farms are for unpaid family labour (16% and 28% of total costs for **QC-3** and **UK-65**, respectively).

Revenue from the cow-calf enterprise, including weaned calf and cull sales and government payments, was \$1,697/cow on **QC-3**, and \$955/cow on **UK-65**. Where total costs were similar, average revenue on **UK-65** was only 57% of **QC-3**.

Both **QC-3** and **UK-65** were able to cover cash costs with revenue, resulting in positive average **short-term profits** (revenue – cash costs). These are \$413/cow for **QC-3**, and \$156/cow on **UK-65**. In the medium-term, **QC-3** had an average **medium-term profit** (revenue – cash and depreciation costs) of \$289/cow. However, **UK-65** was unable to cover both cash and depreciation costs with revenue, resulting in an average medium-term profit of -\$133/cow. Both **QC-3** and **UK-65** were unprofitable in the long-term, with **long-term profits** (revenue – cash, depreciation, and opportunity costs) averaging -\$43/cow on **QC-3**, and -\$754/cow on **UK-65**.

Cost Structure

Total costs can be broken down as land, labour, capital, and non-factor costs. **QC-3** has higher capital and non-factor costs; **UK-65** exceeds in total land and labour costs.

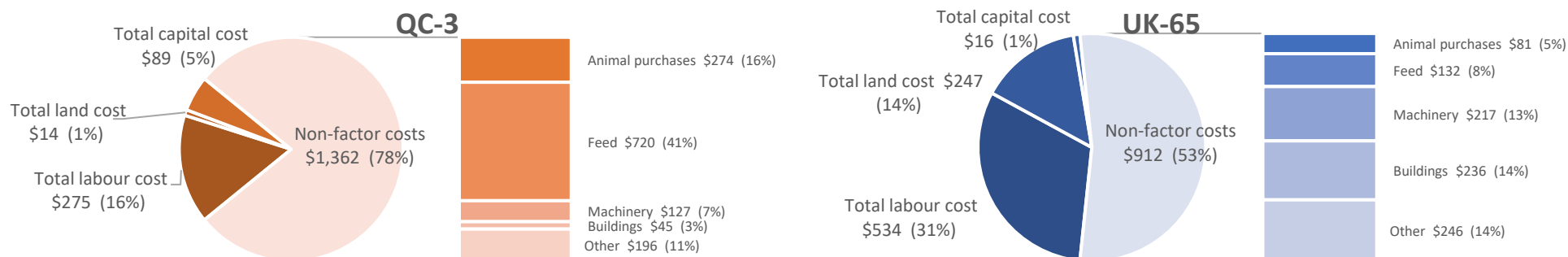
Land costs are higher for **UK-65**, comprising 14% of total costs. In comparison, land costs account for only 1% of total costs on **QC-3**. **QC-3** maintains a smaller land base than **UK-65** (62 vs. 235 ac), and farms on entirely owned land, minimizing land rent and total land costs.

Labour costs are greater for **UK-65**. **UK-65** has higher total labour hours (1,563 hrs) than **QC-3** (769 hrs), and slightly higher wages for familial labour (\$22.63/hr vs. \$21.43/hr). Where **QC-3** relies entirely on family labour, **UK-65** uses primarily family labour with 11% as hired labour, though paid labour wages are the lowest overall (\$19.01/hr).

On **QC-3**, the largest component of capital costs was interest on liabilities, averaging \$46/cow. Own capital costs were \$44/cow. On **UK-65**, capital costs were primarily as own capital, though much smaller than for **QC-3**, at \$14/cow, and interest on liabilities \$2/cow.

On both farms, **non-factor costs** make up the largest proportion of total costs, at 78% and 53% of total costs on **QC-3** and **UK-65**, respectively. Notable differences in non-factor costs between these farms are animal purchases and feed costs. **QC-3**, purchasing 100% of bred heifers for replacement, understandably has a larger cost associated with **animal purchases**, accounting for 15% of total costs on this farm. **QC-3** also has much greater **feed cost** than **UK-65**, as the former relies entirely on purchased feed. This results in 41% of total costs attributed to feed, while only 8% of total costs are spent on feed on **UK-65**. Though small, feed costs on **UK-65** include fertilizer and herbicide for homegrown feed and purchased mineral. As a proportion of total costs, the largest non-factor costs for **UK-65** are those associated with **buildings** (14% of total costs) and **machinery** (13%). In order of largest contribution, depreciation, contract labour, and maintenance contribute to these costs.

Costs (\$/cow)	QC-3	UK-65
Total land cost	14	247
Total labour cost	275	534
Total capital cost	89	16
Non-factor costs	1,362	912
Animal purchases	274	81
Feed	720	132
Machinery	127	217
Fuel, energy, lubricants	41	43
Buildings	45	236
Vet & medicine	29	46
Insurance, taxes	43	26
Other inputs	84	132
Total costs	1,740	1,709



Whole Farm

Other Farm Enterprises

In addition to the cow-calf enterprise, **QC-3** generates market revenue from retained ownership (pre-conditioning). **UK-3** has more diverse income sources, operating cow-calf, finishing, and sheep production enterprises.

Cost and Profit

Due to the additional farm enterprises, **total farm revenue** on **UK-65** (\$340,701) is approximately twice that of **QC-3** (\$178,009). On both farms, market returns from cow-calf and retained ownership make up a similar share of total farm revenue. On **QC-3**, the cow-calf and retained ownership enterprises account for 42% and 40% of total revenue, respectively. On **UK-65**, the cow-calf and retained ownership enterprises each account for 18% of total revenue, while the sheep enterprise accounts for 21% of total revenue. Both farms also receive considerable income from government payments, accounting for 16% and 42% of total farm revenue on **QC-3** and **UK-65**, respectively.

On both farms, the retained ownership enterprise accounts for the largest proportion of **total farm expenses**. The cow-calf enterprise accounts for 35% of total farm costs on **QC-3**, and only 7% of total farms costs on **UK-65**. This can likely be attributed to the differences in animal purchases and feed costs described above.

While neither farm was able to operate a profitable cow-calf enterprise in the long-term, due to the success of other farm enterprises, **UK-65** was able to generate an average positive **net income** of \$94,357^a, and **net farm cash income** of \$131,049^b. **QC-3** maintains a negative net income, at an average of -\$889^a. Net farm cash income was positive, averaging \$12,118^b over the five-year period.

Whole-farm cost and profit		
Costs (\$)	QC-3	UK-65
Revenue		
Market revenue	147,231	196,587
Cow-calf	75,521	62,106
Retained ownership	71,710	62,830
Sheep production	0	71,650
Other farm revenue	0	52
Government payments	29,172	143,956
Change in inventory	1,605	106
Total farm revenue	178,009	340,701
Expenses		
Depreciation	14,612	36,850
Fixed costs	20,346	34,181
Wages, rent, interest	4,733	36,292
Cow-calf	62,287	16,688
Retained ownership	76,197	61,636
Sheep production	0	24,892
Cash crop	723	35,806
Total farm costs	178,898	246,344
Profits		
Net income	-889	94,357
Net cash farm income	12,118	131,049

^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.