



## Case Study - Dairy Beef MT6 vs. UK90

### Farm Descriptions

**MT6** is a dairy-beef farm operating on a yard site of 1 hectare located in the province of Prince Edward Island, Canada. The elevation is 142 m from above mean sea level. The prevailing soil type in this area is loamy glacial till. The average annual temperature is 5.5°C and the average annual precipitation is 900–1150 mm.

**UK90** is a dairy-beef farm located in the United Kingdom with 54 hectare of land, and 40 m above the mean sea level. The prevailing soil type in this area is sandy loam. The average annual temperature is 10°C and the average annual precipitation is 725 mm.



## Production System and Physical Performance Indicators

### Similar production system and size

**MT6** purchases three days old Holstein and dairy-beef-type calves and take them to slaughter weight. Annual sales average 81 head. Holstein calves are on feed for 582-717 days. Dairy-beef calves are on feed for 447 days. Ration from three to 90 days old consist of milk replacer and calf starter. The finishing ration mainly consist of corn silage (55% of total feed on a fresh matter basis), grass silage (18%) and barley (27%).

**UK90** also takes calves from three days old to slaughter weight. Cattle are on feed for 620 days. Annual sale volume is 93 head. The pre-wean ration mainly consist of milk replacer. The finishing ration mainly consist of maize silage (17% of total feed on a fresh matter basis), grass silage (69%), other forage (7%) and grain (8%) and concentrates (14%).

	MT6	UK90
<b>Breed</b>	Holstein, Angus, Speckled Park	Holstein x Hereford, Simmental
<b>Annual sales of cattle</b>	81 head	93 head
<b>Placement age</b>	3 days	3 days
<b>Placement weight</b>	86 lb.	99lb.
<b>Sale age</b>	820 days	620 days
<b>Sale weight (live)</b>	1,565 lb.	1,322 lb.
<b>Dressing %</b>	53%	54%
<b>Days on feed</b>	582-717 days	617 days
<b>Average daily gain</b>	1.97-3.31 lb.	1.98 lb.
<b>Ration 1</b>	milk replacer, calf starter	milk replacer
<b>Ration 2</b>	corn silage, grass silage, barley	maize and silage, concentrates
<b>% feed purchased</b>	100%	20%
<b>Income source</b>	beef finishing	beef finishing, dairy, cash crops

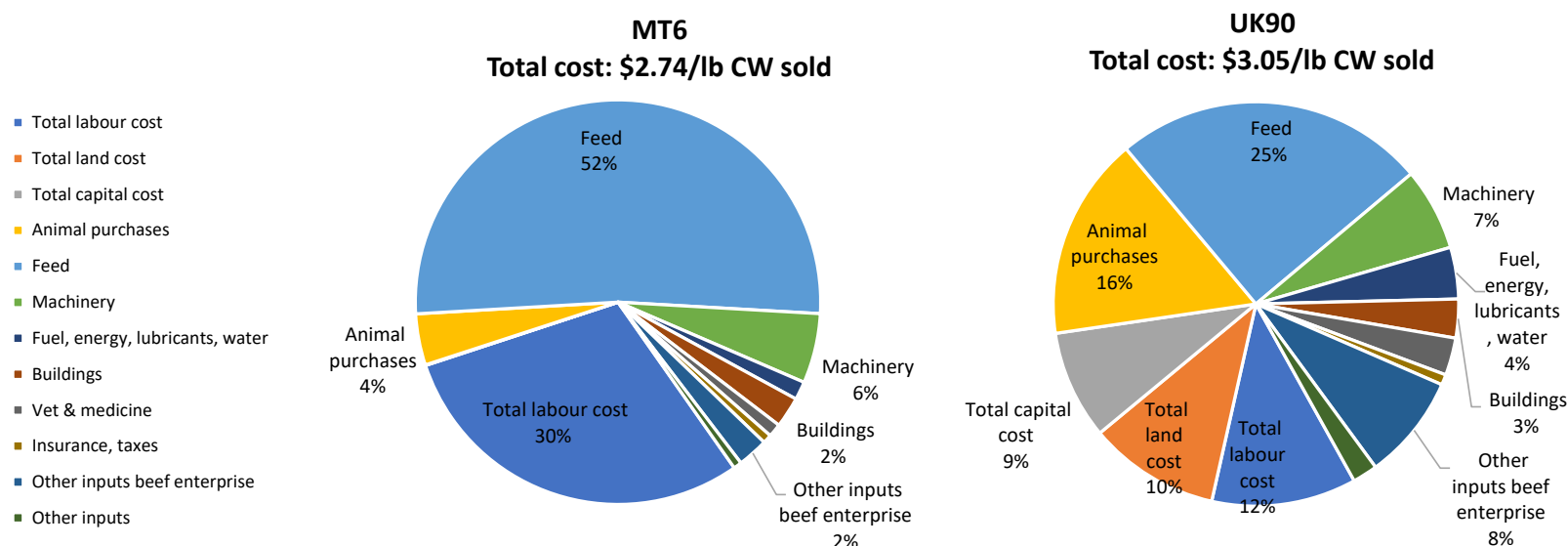
### Different ADG, feed and income sources

- MT6 has higher average daily gain at 2.35 lb for the Holstein groups and 3.31lb for dairy-beef groups, compared to 1.98 lb in UK90.
- MT6 purchases 100% of feed while UK90 mainly uses homegrown feed and purchased 20 per cent of feed requirements.
- MT6 solely depends on beef finishing while UK90 has diverse income from beef finishing, cash crop and dairy enterprises.

## Cost of Production

MT6 is a continuous flow system with some groups' feeding period is longer than a year. Due to model limitations, MT6's sale volumes in this analysis fluctuate from one year to the next, impacting cost of production, hence the 2017-2020 four-year average is used. The four-year average is also used for UK-90 for comparison.

MT6's **total production cost** (including cash cost, depreciation and opportunity cost) averaged \$2.74/lb carcass weight sold (\$2,266/head) in 2017-2020. This was 10 per cent lower than UK90's total cost at \$3.05/lb carcass weight sold (\$2,181/head). The most notable differences between the two farms in terms of cost structure are in feed, labour, animal purchase and capital costs.



**Feed** - For MT6 with 100% of feed purchased, feed costs accounted for the largest portion (52%) of total cost, while other costs related to feed production such as land cost was insignificant. For UK6 where 80 per cent of feed was homegrown, feed cost accounted for the largest part of total cost at 25 per cent while land cost<sup>1</sup> accounts for 10 per cent.

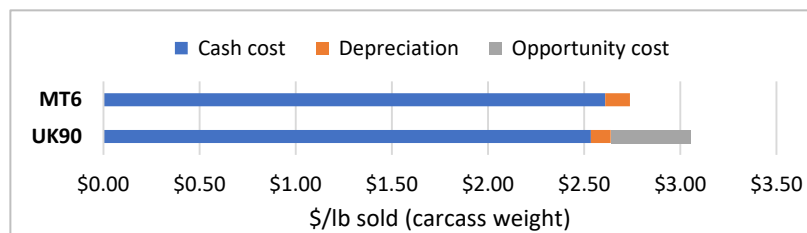
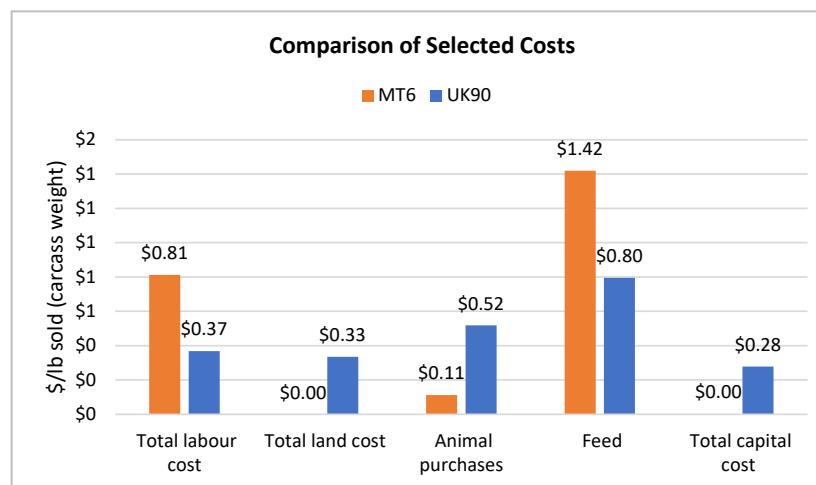
<sup>1</sup> Rental land is counted as cash cost, own land is counted as opportunity cost.

**Labour** - MT6 reported 1,745 total labour hours per year, all of which was hired labour (counted as cash cost). This was almost three times of the total labour hours reported by UK90 at 573 hours, of which 283 hours were hired labour (cash cost) and 290 hours were unpaid family labour (opportunity cost). Average wage was also higher for MT6 at \$27/hour compared to \$22/hour for UK90.

**Animal purchases** - Animal purchases accounted for four per cent of total cost for MT6 compares to 16 per cent for UK90. Total animal purchase cost was reported at \$6,560/year for MT6, which was about one-fifth of the cost for UK90 at \$30,626/year. MT6 purchased Holstein calves at \$30-40/head and dairy-beef calves at \$175/head, with a weighted average at about \$92/head. UK90's calf price was much higher at \$363/head. Part of the reason could be related to the stage of industry in the two countries where UK has a relatively mature dairy-beef finishing sector with approximately half of all beef in England is a product of the dairy herd<sup>2</sup>, hence more competition for calves.

**Capital cost** - The main component of capital cost is interest for liabilities. Interest payment reported by MT6 was at \$2,253/year compared to \$56,671/year for UK90. Purchasing 100 per cent of feed reduces MT6's need for land and machinery for feed production, which typically associated with medium and long-term loans. MT6 also reported a low interest rate on their short-term loan which accounts for 56 per cent of their total liabilities. This also contributes to the lower capital cost compared to UK90.

**Cost Structure** - Total cost can be broken down into **cash cost** (e.g. animal purchases, feed, machine and building maintenance, paid labour, vet and medication, etc.), **depreciation cost** (e.g. building and machinery depreciation, etc.) and **opportunity cost** (unpaid family labour, own land, etc.). While cash cost was the major cost for both farms, MT6 had little opportunity cost with all feed being purchased and no unpaid family labour. MT6 has higher short-term cost (cash cost), and medium-term cost (cash cost + depreciation), while UK90 has higher long-term cost (cash cost + Depreciation + Opportunity cost).



<sup>2</sup> Source: Dairy Beef Production System, Agriculture and Horticulture Development Board, UK  
[https://projectblue.blob.core.windows.net/media/Default/Beef%20&%20Lamb/DairyBeefProdMan\\_236x166\\_241120\\_WEB-1.pdf](https://projectblue.blob.core.windows.net/media/Default/Beef%20&%20Lamb/DairyBeefProdMan_236x166_241120_WEB-1.pdf)



## Revenue

### Beef Finishing

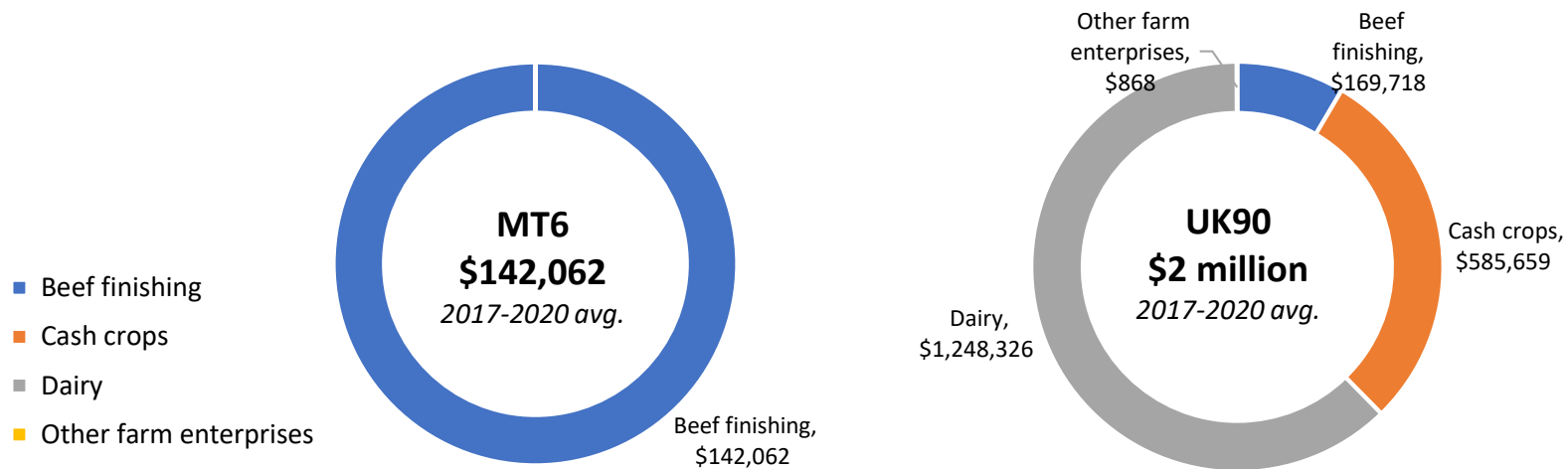
Market returns in the beef finishing enterprise averaged \$2.42/lb carcass weight sold (\$1,998/head) for MT6 in 2017-2020, compared to \$2.59/lb carcass weight sold (\$1,848/head) for UK90. MT6's market returns were seven per cent lower than UK90 on a per pound basis, but eight per cent higher on a per head basis due to heavier sale weight.

In addition to market return, UK90 reported a direct payment of \$54/head<sup>3</sup>, bringing total return to \$1,902/head.

### Whole Farm

Annul total revenue at whole farm level averaged at \$142,062 for MT6 in 2017-2020, compared to \$2 million for UK90.

MT6 solely depends on beef finishing, while UK90 has diverse income. The dairy enterprise accounted for 62% of UK90's total market returns, followed by cash crop (29%) and beef finishing (9%). It is also worth noting that 100% of MT6's total revenue was market returns while UK90's total revenue was comprised of 91 per cent (\$2 million) market returns and nine per cent (\$193,000) coupled payments.



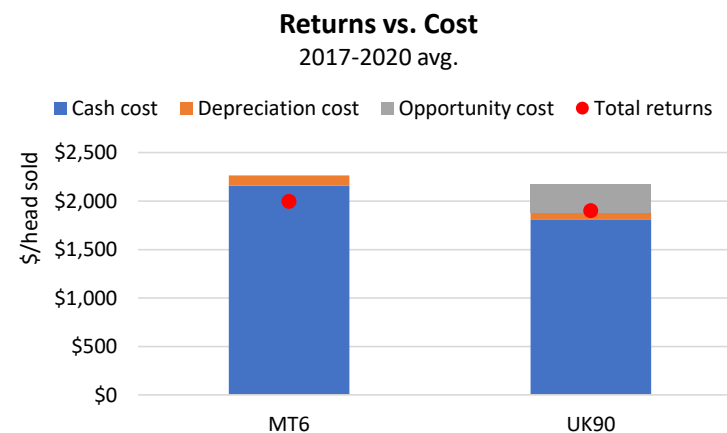
<sup>3</sup> Direct payment reported at \$216/head in 2020 and \$0 for 2017-2019 for an average of \$54 over the four-year period.

## Profitability

### Beef Finishing

At the beef finishing level, MT6 was unable to cover short, medium or long-term cost. UK90 covered short and medium-term cost but had a larger loss in the long-term.

Profitability (\$/head sold)			
	Short-term Profit <i>Total Return less Cash Cost</i>	Medium-term Profit <i>Total Return less (Cash &amp; Depreciation Cost)</i>	Long-term Profit <i>Total return less (Cash, Depreciation &amp; Opportunity Cost)</i>
<b>MT6</b>	-\$161	-\$267	-\$267
<b>UK90</b>	\$91	\$17	-\$279



### Whole Farm

At the whole farm level, MT6's farm income<sup>4</sup> averaged at -\$19,000/year in 2017-2020, and net cash farm income<sup>5</sup> averaged at -\$11,000/year. UK90 was profitable at the whole-farm level with average farm income at \$1 million/year, and net cash farm income at \$886,000/year.

<sup>4</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>5</sup> Net cash farm income = Whole farm profitability + depreciation + changes in inventory + capital gains/losses.

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