Canfax Research Services

Based on 2011 production data

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Alberta Beef Producers
Alberta Livestock & Meat Agency

agri benchmark: Cow/Calf Analysis

INTRODUCTION

agri benchmark is an international, independent and non-profit network which is coordinated by a German research institution. *agri benchmark* uses a consistent methodology to compare production systems and their economics world-wide. In the area of beef production, this provides a unique data set addressing the challenges of different production practices.

In 2012, Canfax Research Services (CRS) collected Canadian data and applied it to the methodology developed by *agri benchmark.* Two sizes of "typical" cow/calf operations were developed and evaluated in each province – 200 and 800 head operations. These operations incorporated data which was collected from 16 cow/calf producers in Alberta and Saskatchewan on the 2011 production year[1]; 3-5 producers from each operation size and province contributed to each "typical" farm developed. While the sample size was admittedly small the repetition of data submitted and consensus process of the panel discussions created a range in the data that reflected the range in production practices over the two provinces.

This fact sheet summarizes the results of the Canadian cow-calf cost of production (COP) data and compares the results with other countries, as well as with larger survey data published by Western Beef Development Centre (WBDC) and Alberta Agriculture (AB Ag)[2].

DESCRIPTION OF FARMS

There is substantial variety in winter feeding conditions in Western Canada. The difference of days on feed varied from 135 to 210 days depending on location south to north. Access to different feeding options (i.e. swath grazing) are weather related, dependent on snow cover in some locations.

200 AB – located in the irrigation region of central Alberta, higher hay yields provide a higher productivity for this operation. The winter feeding ration included swath grazing in the fall followed by 120 days on 33 lbs/day of silage then 33 lbs/day of hay for 60 days for a total feeding period of 180 days. 100% of feed was grown on the farm. There was no mineral supplement. Labour and machinery costs were divided between the two enterprises of cow/calf and cropping.

200 SK – a mixed (cow/calf and grain) farm in Northern Saskatchewan. Feeding alternatives including silage and swath grazing exist for this operation when weather permits. Typical ration is swath grazing for one month in the fall followed by 35 lbs/day of hay (100% homegrown) with 2 lbs of barley/pellets (60% purchased) for 180 days followed by 35 lbs/day of silage for 30 days during calving (100% homegrown); for a total feeding period of 210 days with mineral supplement of 1.5 oz/day year round.

800 AB – located in central Alberta along the Rocky Mountains. This region has access to mountain range for summer grazing, but has limited alternative winter feeding options due to snow conditions (i.e. no swath grazing, etc.). A winter feed ration included 26 lbs/day of hay supplemented with 3 lbs/day of greenfeed or pellets for 180 days. Located in the hay belt this operation grows 78% of their hay and purchases the other 22% along with mineral supplement of 1 oz/day for the feeding period of 180 days. Pressure from urban expansion keeps land prices high.

800 SK – located in west-central Saskatchewan a mixed grain and beef farm with stubble grazing in the fall followed by 4.5 months (135 days) on 15 lbs/day hay (20% purchased 80% homegrown), 6 lbs/day barley/pellets (100% purchased), and 1 oz/day mineral during the feeding period.

International Farm Descriptions can be found on page 8.

[1] This is a point in time with costs varying from year to year in each country. However, as a general trend for comparison this does provide a snapshot for comparison.

[2] *Exchange Rates* – all results are presented in CDN dollars.
Country abbreviations – are followed by the number of cows on each operation. For example, CA-200 AB means that the Canadian cow/calf operation (located in Alberta) had 200 cows in 2011.
Weight – all weight are in kilograms (Kgs)

CANADIAN COMPARISON

Due to the standard methodology for the international comparison there are limitations to the data presented here. While the purpose of this study was mainly to provide data that could be compared to international competitors, to provide a familiar reference it was also compared to existing provincial data.

Total annual costs per cow, using CRS study data, ranged from $604 to $822 (includes unpaid labour). This compares to $525-744/cow with an average of $625/cow by WBDC for the 2011 production year and $643/cow reported by AB Ag for the 2010 production year. While the lower end of the total cost is similar, there are some notable differences in methodology that resulted in the larger range in the *agri benchmark* data.

WBDC had fewer mixed operations in their 2011 production analysis, with more specialized cow/calf operators. While the typical farms developed under the CRS study all had some level of grain production and therefore more machinery and labour (partly due to availability). Similar to the CRS study, feed was valued at cost of production or price bought.

While many calculations for feed costs value all feed (home grown or purchased) at market value to determine opportunity costs, this does not take into account the numerous reasons a producer may choose to produce their own feed including: (1) reliability of supply, and (2) ability to grow feed cheaper than market value. In this study, homegrown feed is valued at the cost of producing it while purchased feed was given market value.

AB Ag calculates winter feed costs based on the market value of the feed, not the cost of producing the feed. Pasture is treated as a cash cost at market value (not at cost). Paid labour is valued at cost or a standard base for unpaid labour, while in the CRS study unpaid labour is valued at the opportunity cost of what a skilled labourer could make elsewhere.

The provincial data assumes the market value of grazing land and feed (i.e. rental rate); therefore separating the decision to invest in land from the beef operation. When comparing internationally this investment in land is included as payment on this investment impacts the long term viability of an industry. Large amount of owned land in other countries can make finding a representative market value/rental rate difficult. Consequently, managerial skills are valued higher in the CRS study and increase the average wage for unpaid labour.

Economies of Scale

While the provincial data based on actual financial information shows economies of scale with larger operations able to spread capital and labour costs over more animals to reach a lower per unit costs, total costs were lower for the smaller operations of 200 head as compared to the larger 800 head operations in the *agri benchmark* data. The larger operations typically had more machinery and paid labour compared to the smaller operations which would indicate that there is a tipping point at which economies of scale work. Buying land to expand the herd usually comes with additional facilities to maintain and as the herd grows there is usually an investment at some point in larger handling facilities, and the more hay needed, the more machinery to hay in a timely manner, etc. Therefore, there is usually a new set of costs with larger herds which offset most advantages of size.

For example, assume there is a 200 head operation and the labour required was two hours every three days for a total of 242 hours or 1.2 hours per cow. With a wage of $18/hour this is $21.60/cow in labour. Comparing this to an operation with 1500 cows and a single full time employee working 1960 hours (this includes time putting up winter feed) for 1.3 hrs/cow at a wage of $24/hr, the total labor is $31.20/cow which is 44% higher than the smaller operation.

This explains some of the resilience of these small <200 head operations which account for 93% of all beef operations holding 62% of all beef cows in Canada (source: 2011 Agriculture Census).

Provincial Comparison **-** The COP for cow/calf operations in Alberta and Saskatchewan were very similar. The differences were so small that it is unknown if they would be statistically different in a larger sample size. This was despite the fact that Alberta land prices are typically higher and taxes typically lower.

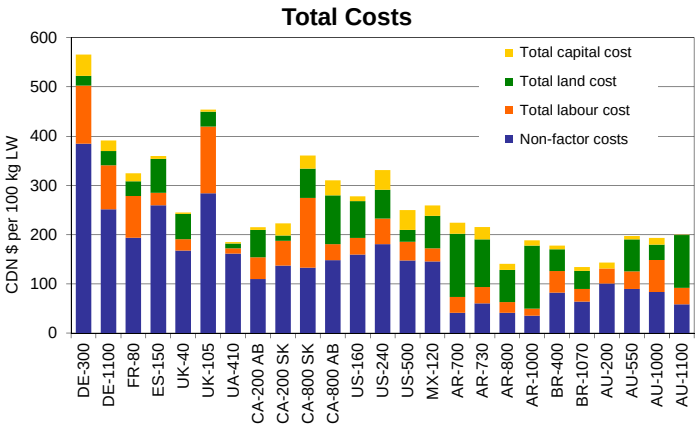
INTERNATIONAL COMPARISON – COST OF PRODUCTION

The international comparisons below are done on total cost per 100 kgs live weight (LW) sold[3]. This takes into

[3] The cost per 100 kgs live weight sold is used when comparing costs internationally instead of the cost per pound weaned because of the high proportion that cull and slaughter animals sold off a cow/calf farm can account for in some countries. See total live weight sold per cow (kg) chart for differences across the countries.

account the productivity advantages that some countries have over others.

The 200 head operations in Canada at $215-223/100 kg LW sold were lower cost than all of Europe ($245-566), the United States ($278-331) and Mexico ($259). They were similar to costs in Argentina ($141-224) and higher than Brazil ($134-178) and Australia ($143-199). The larger 800 head operations at $310-361/100 kg LW had costs similar to Europe but higher than the US.



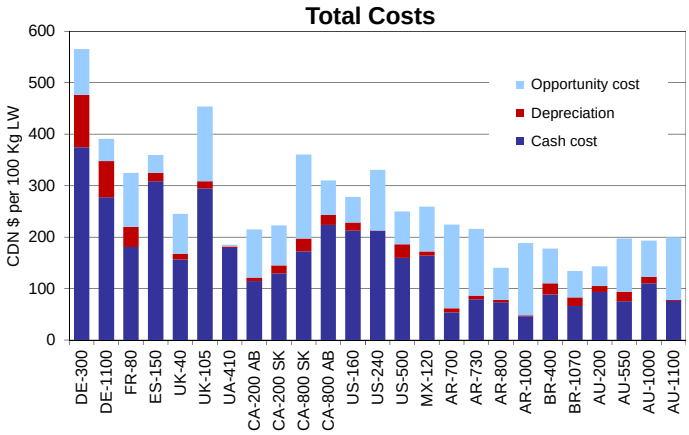
The US data shows ***economies of scale*** with the higher costs for 160 and 240 head operations ($278 and $331) while the 500 head operation has total costs around $250/100 kg LW. However, Australia like Canada had the lowest costs for the smallest operation. The 200 head operation was at $143/100 kg LW sold while the 550 and 1000 head operations were very similar at $198 and $193/100 kg LW sold. This implies that there is no or limited economies of scale in the cow/calf industry after a certain point.

The European Union has a variety of cost structures from a high over $566/100 kg LW to a low of $245 in UK-40 which is comparable to North America and many other countries.

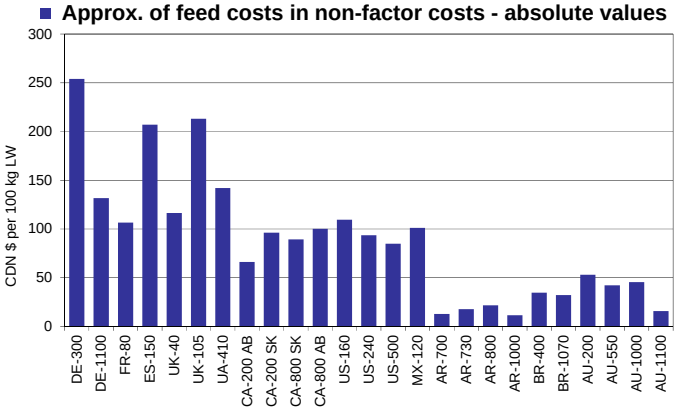
Opportunity costs in the form of unpaid labour, land and capital make up a portion of the cost structure in all countries. Opportunity costs and depreciation represent a sizable 29-44% of total costs in Europe, 28-52% in Canada, 24-36% in the US. The largest opportunity cost in Canada and Europe is *unpaid labour* (this unpaid labour is valued at what a skilled farm labourer would get paid on another operation or trade in the region); while in Mexico, Argentina, Brazil and Australia it is *land*.

When looking only at cash costs Europe is in the $156-375 range compared to $115-224 in Canada and $160-212/100 kg LW in the US.

Cash cost in the Southern Hemisphere ranged from $54-110 with an average of $93/100 kg LW sold. While opportunity and depreciation costs are definitely increasing (representing 35-76% of total costs) in those countries their cash costs continue to be much lower. Production decisions are frequently made based on cash costs with opportunity and depreciation costs absorbed by the farm.



Feed as shown in the following chart is a major cost item in all countries. In North America and Europe feed represents 34% and 40% of total costs while in Australia and Brazil it is 22%. Argentina is the lowest with only 9% going towards feed.



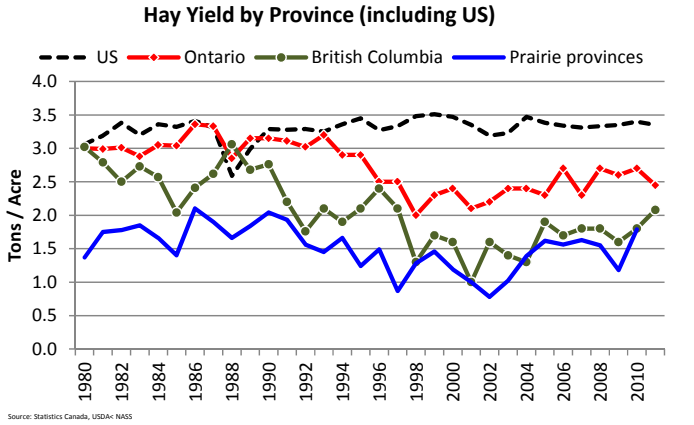
In dollars per 100 kg LW sold there are substantial differences - $16 in Argentina, $33 in Brazil, $39 in Australia, $93 in North America and $169 in Europe. Canada at $66-100 compared to the US at $85-109/100 kg LW sold.

Feed productivity

Although a larger proportion of silage is used in the smaller operations, it provided a much higher yield per acre compared to hay and therefore a lower cost of production even with higher input costs. Despite low hay yields increasing the per unit cost of production when

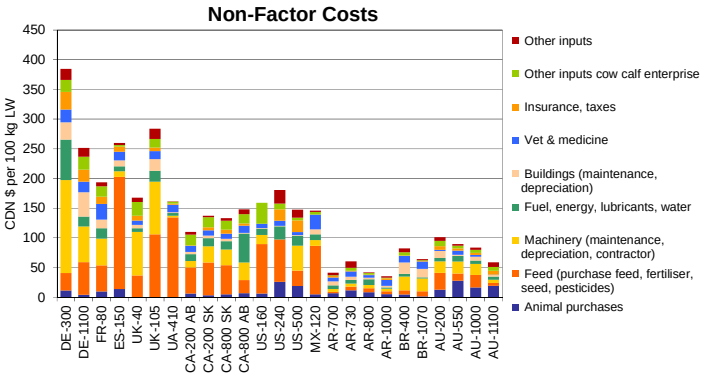
using it as a primary winter feed ingredient, hay is still the primary feed used in Western Canada. Alternative feeding options have been leveraged in many regions to reduce costs. The 2011 Agriculture Census shows that 49% of farms used in-field winter grazing or feeding.

The bottom line is that yield of the feedstuff has significant implications on per unit costs. Western Canadian hay yields are lower than Eastern Canada, which are lower than the US. Therefore more acres per cow are required to produce winter feed.



Other Non-Factor Costs - include things like animal purchases, machinery and building (maintenance and depreciation), fuel, insurance, veterinary and medical supplies.

Non-factor costs were the highest in Europe ($263/100 kg LW sold), followed by the US ($162), Mexico ($146), Canada ($132), Australia ($83), Brazil ($73) and Argentina ($45). The largest non-factors costs in Europe were feed and machinery. In North America feed and machinery were followed closely by fuel. In Mexico the largest items were feed, vet and medicine.

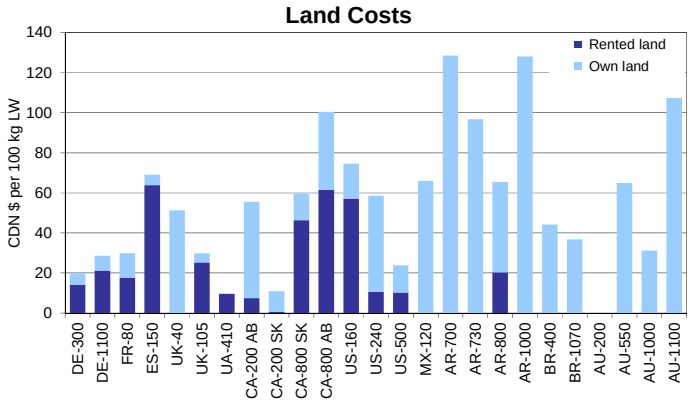


- *Animal Purchases* for replacements were higher in Europe, Australia, and the US compared to Canada.
- On average *feed costs* in Canada were 38% lower than Europe and 30% lower than the US but over double the amount in Australia. Brazil and Argentina were both significantly lower than Australia.
- *Machinery maintenance and depreciation* costs were much higher in Europe, and over double what was seen in Canada or the US. Australia was 30% below Canadian costs on a per 100 kgs LW sold basis.
- *Building maintenance and depreciation* was extremely high in Europe and Brazil compared to all other countries which had minimal costs in this area.
- Canadian *Fuel* costs in general were 25% below Europe and 29% higher than the US; all other countries were significantly lower.
- *Veterinary & Medical* ranged from $2-7/100 kgs LW in Australia, $5-8 in the US, $7 in Argentina, $12 in Brazil, $9-13 in Canada, $7-26 in Europe (average of $17), $24 in Mexico.
- *Insurance & Land Taxes was* the largest in the US, followed by Europe with Canada and Australia being similar and all other countries significantly lower.

Land

Land costs per cow vary for both the per unit price of land (rented or owned) and productivity (i.e. carrying capacity or yield of forage and feed). There were much higher per acre stocking rates in Europe, Mexico, Argentina and Brazil than in Canada, the US or some locations in Australia. There was considerable range within each country as productivity in each region varies.

Rental costs as well as calculated costs on owned land in Alberta and Saskatchewan were similar to US operations with rents varying by location. Rents in other countries varied widely with Australia seeing both higher and lower rental rates on a per hectare basis. Brazilian rental rates were closer to the top end of what was seen in Canada. Argentina, Mexico and Europe were all higher.

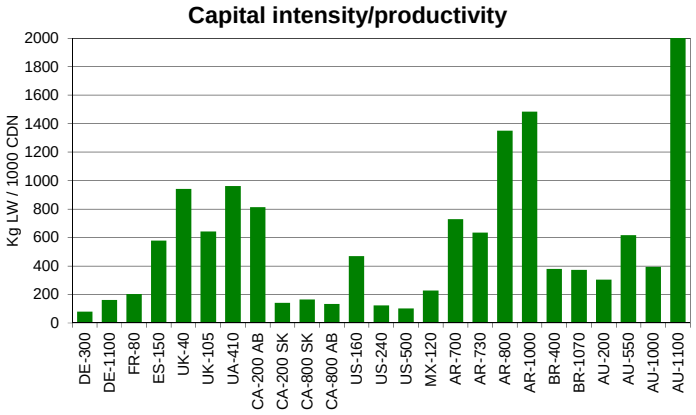


Rented land was much more common in Canada and Europe than other countries and did not have a significant difference in cost to the producer compared to owned land. In fact, in the US owned and rented costs were the same[4]. The above chart showing land costs gives the cost in CDN$ per 100 kg LW sold accounting for both the per unit price of land and productivity (stocking rate).

Capital

Due to the high proportion of mixed cow/calf operations in Alberta and Saskatchewan many producers noted that they had a higher amount of capital than was strictly necessary to operate a beef operation, with a portion of the equipment being used for both beef cattle and grain farming.

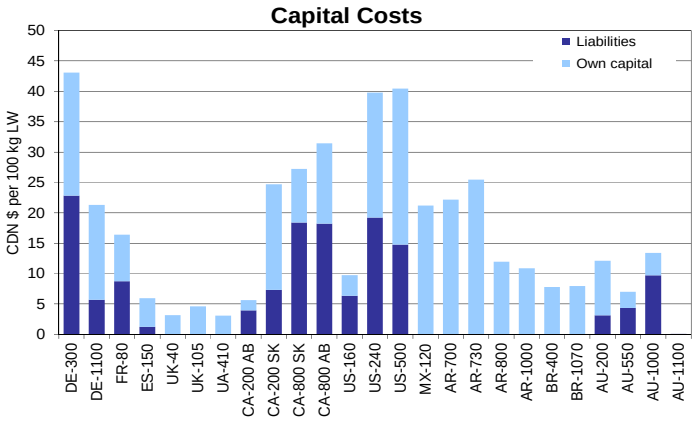
It was also noted that paid labour was particularly hard on capital investments, requiring replacement of machinery much sooner and higher repair costs than when an operation was only family operated. This was the case particularly for older or larger producers, who no longer have extended family involved in the day to day operations.



The above chart showing capital intensity provides the number of kgs live weight sold for every CDN$1,000 invested in capital. The much lower capital intensity shown in Canada, the US, and some European countries reflect a much higher investment in capital.

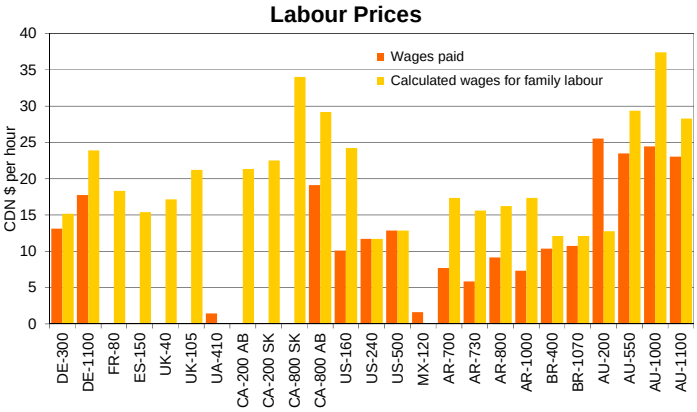
Despite this, capital costs were both lower and higher in the US, generally lower in Australia and similar to higher in Europe.

Most countries had a short term interest rate of 3% available to them with the exception of Argentina. Longer term rates varied from 3.8-16%. Canadian rates were very competitive with a range similar to higher in the US, Australia, and Europe.



Labour

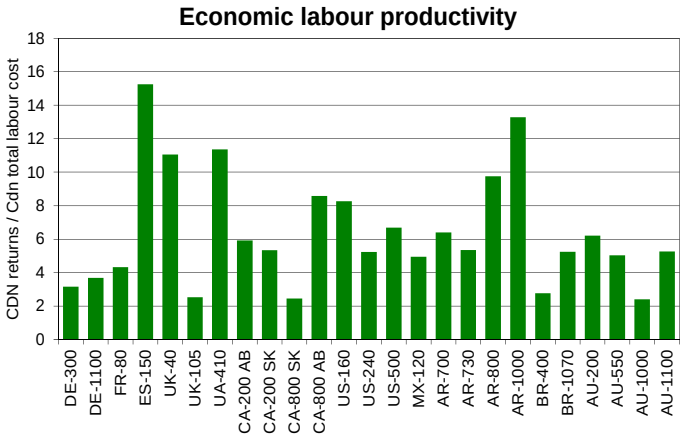
Western Canadian farms must compete directly with the oil field for labour and consequently this drives up agricultural wages. Canada has some of the highest wages in all the countries at $21-34/hour. Australian paid wages at $23-25/hour came in the highest; when unpaid labour is included this increases to $37. In Australia agriculture competes with the mining industry, however there is geographic separation with the mining industry in the north while the majority of the cattle industry is in the south and west.



A higher wage means that Canada must produce more kgs of beef per labour hour than other countries in order to be competitive. This can be done with fewer hours or by producing more pounds. The measure of physical labour productivity ranged from 26-69 kgs LW per hour in Canada, slightly higher than 22-57 kgs in the US, but lower than 43-81 kgs in Australia. Brazil (25-44 kgs) and Argentina (21-54 kgs) were slightly lower while Europe spanned the range (12-74 kgs). It should be noted that time spent producing/procuring winter feed is included in these hours.

[4] Incomplete international information on land taxes made it infeasible to see how much of the difference was created by taxes.

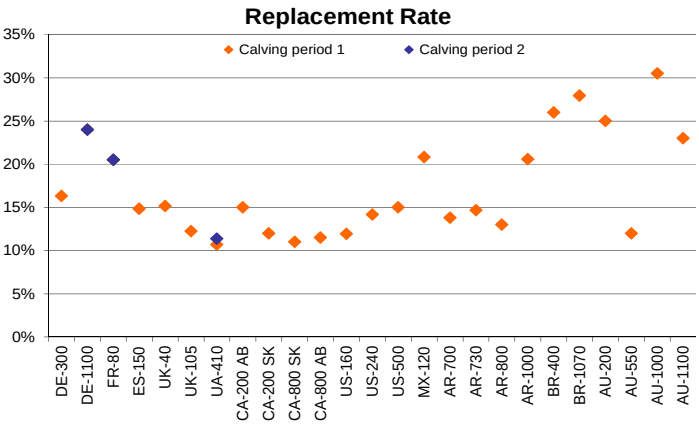
The economic labour productivity combines the wage and physical labour productivity to provide the dollars in returns per dollar spent on labour. The highest economic labour productivity was achieved in Spain (ES-150) and Argentina (AR-1000) with higher productivity of 62 and 54 kgs/hour, and lower wages of $25 and $14 per hour compared to other operations in their region.



INTERNATIONAL COMPARISON - PRODUCTIVITY

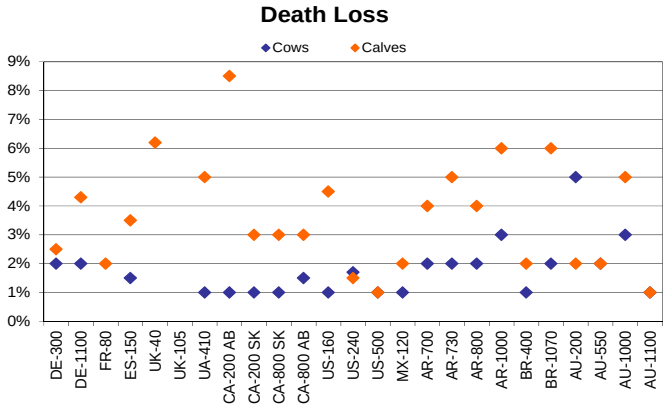
Being competitive requires not just competitive input prices but also a highly productive industry that can compete internationally with countries that are constantly improving performance. Agriculture worldwide is facing pressure to reduce its environmental footprint. Productivity gains that result in more beef produced with fewer resources is an important contribution to reaching this goal.

The ***replacement rate*** (% of cull cows + % of cow losses) was the lowest in Canada, Uruguay and one Australian farm at 11-12%. Considering the cost of raising a replacement heifer higher replacement rates can become a significant cost for an operation. A lower replacement rate contributed to Canada's lower cost on purchased animals (see non-factor cost section).



Reproductive efficiency (the number of calves born per 100 cows) was the highest in the US and Uruguay (all over 90), followed by Canada (all over 89), Europe (all over 86), Argentina (77-97) with an average of 91, Australia (70-92) average of 80, Brazil which averaged 74, and Mexico with an average of 64.

Death loss on calves from birth to weaning was typically around 3% in Canada with one exception over 8%. Argentina and Brazil had the second highest death loss at 6% while the US and Australia reported the lowest at 1%. While it is frequently noted that smaller operations have the opportunity to provide more attention to their herd and hence could reduce death losses that does not show up in the data with herd size having no influence on death loss and in fact some of the smaller herds had the highest losses.



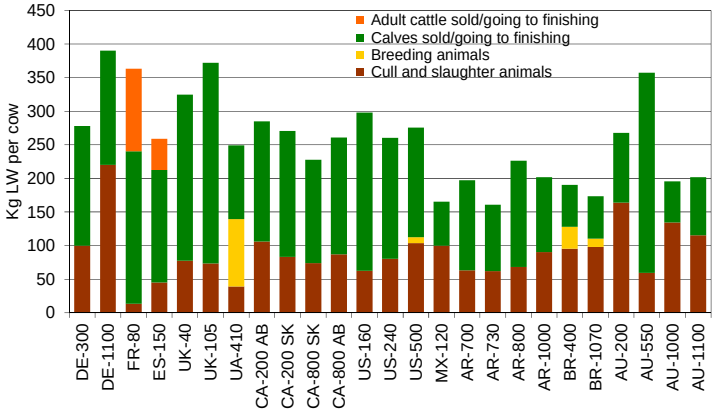
The ***number of calves weaned per 100 cows*** ranged from 83-92 in Canada, 88-92 in the US, 65-90 in Australia, 67-74 in Brazil, and 72-93 in Argentina.

Weaning weights in Canada ranged from 213-292 kgs (470-644 lbs) compared to the US (240-295 kgs) or Europe (238-353 kgs). Mexico, Argentina and Brazil all had lower weaning weights at less than 200 kgs (440 lbs). While the larger operations (>1,000 head) in Australia had lower weights (175 kgs), the smaller operations had heavier weight (345 kgs) at older ages. Similarly, the heavier weights in Canada corresponded with the smaller 200 head operations, with lighter weights on the larger 800 head operations corresponding to a younger age at weaning due to a later calving date. Many of these larger operations retained ownership into the first quarter of the following year, to sell a heavier calf.

An accumulation of the above factors is the ***total live weight sold per cow***. In Canada, this was 260 kgs (573 lbs) per cow with calf sales representing 63-69% of the total volume sold. Europe had the highest total live weight

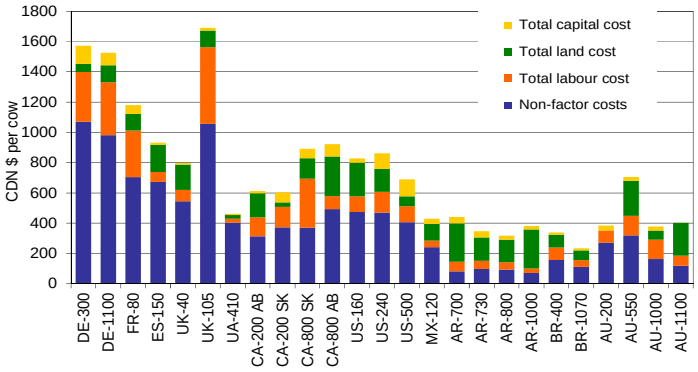
sold per cow at over 350 kgs (771 lbs) with 44-80% coming from calves. The US ranged from 260-300 kgs (573-661 lbs) with calves representing 59-79% of total volume sold. The larger Australian operations sold around 200 kgs (440 lbs) per cow with culls and slaughter cattle representing 57-69% of the total weight sold, compared to calves which make up the majority of the weight sold in North America.

Total Live weight sold per cow (KG)



To see the impact productivity has on cost of production we can look at the costs per cow versus the costs per 100 kgs LW sold as presented throughout this article. In particular, you see higher costs on the AU-550 farms than the other Australian farms. However, the costs per 100 kg LW sold are similar due to the higher productivity. The large range in the Australian operations show not just differences in size but also climatic conditions from the tropical (AU-1000, AU-1100), and temperate (AU-550) to the Mediterranean (AU-200). Regional differences within countries had implications on productivity and subsequently cost structures that show up on a per cow basis.

Total Costs



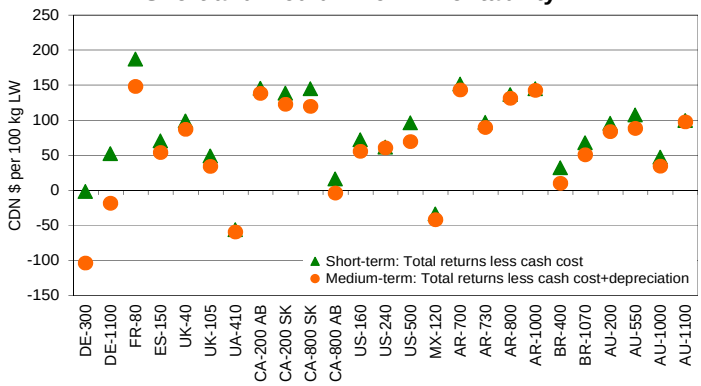
The UK-105 farm is the most expensive on the per cow basis, but is lower than DE-300 when productivity is considered. The CA-800 farms are very similar to the US-160 and US-240 farms on a per cow basis but actually have higher costs as they wean a lighter calf. While, the CA-200 farms are more expensive on a per cow basis than countries in the Southern Hemisphere, higher productivity results in lower costs per 100 kg LW sold.

As costs increase with competition for land and labour, many countries, particularly in South America, will be looking to increase productivity in order to stay competitive internationally.

INTERNATIONAL COMPARISON - PROFITABILITY

Who is in a position to expand? While positive margins were evident in many countries in 2011, expansion has not been occurring for a number of reasons; primarily strong competition for land, with the commodity bringing the largest return to land, labour and capital being invested in. This is usually a grain like sugar cane, corn, canola or soybeans depending on your location.

Short and Medium Term Profitability



Australia

Financial challenges following multiple years of drought mean that like Canada, producers there are looking to pay down debt (accrued when buying feed during the drought) and rebuild equity. However, profits in the industry have many producers looking to expand as long as feed is available. Moisture in 2011 and 2012 made this possible. Feed grain and forage production is expected to be down in 2013 but still above the five year average which will support further expansion although at a slower rate in 2013.

Brazil

Higher profits in grains have resulted in producers focusing on corn, soybean and sugar cane production. So even with positive margins and a growing domestic market there is little reason for primary producers to expand the herd. Production has been relatively stable since 2007.

Argentina

Export restrictions resulted in sharp liquidation after 2005. The herd has since stabilized and actually increased in 2012; however export restrictions continue to influence this industry with limited incentive to expand the herd under current conditions.

United States

Profits have been evident in the US cow/calf sector for many years but expansion has not occurred. First they have had recurring drought that affect both beef regions as well as feed regions nationally. Most of the profits are being seen in regions where expansion is not feasible due to land constraints. Therefore, until feed resources are replenished in the drought regions where there is land, expansion is unlikely. The USDA has revised beef production projections with the cow herd not expected to expand until 2015 with increased beef production not until 2016 or later.

CONCLUSIONS

There is a wide range of beef production costs in Europe, which shows that not all operations there are high cost producers. Some could be reasonably competitive with North American counterparts. Admittedly, that is not the norm at this point. Australia also shows a wide variation depending on climate zone with the 550 head operation more similar to North America than to other operations within its own country. This stresses the fact that there is a range of cost structures in any country and it may not necessarily be a certain country that stands out as competitive internationally so much as a group of low cost producers within each country. These are the producers who will expand first in response to market signals and gain market share over time.

Despite a long term trend of rising costs in the South American countries with rising land and labour costs they are still lower cost producers particularly in terms of cash costs versus Northern hemisphere competitors.

Given that Canada is a high cost producer of beef it is not surprising to find no distinct cost advantage. However, there are a number of disadvantages particularly when compared to major grain-fed competitors including: high labour costs, lower forage yields, higher machinery & building costs, and veterinary & medicine costs.

Compared to the ***United States***, Canadian costs spans the range both lower and higher. Feed, non-factor and capital costs are similar. Land costs are lower in Canada while labour costs are higher.

Compared to ***Australia*** (AU-550), Canadian costs are similar or higher. Canada has higher feed, non-factor and capital costs, while land and labour is similar.

Compared to ***Spain*** (ES-150) Canadian costs are lower. While land costs are similar, feed and non-factor costs are lower in Canada, while capital and labour costs are higher.

Small mixed operations showed remarkable resilience and competitive cost structures in Canada.

INTERNATIONAL FARM DESCRIPTIONS

DE-300 is a cross bred operation located around Berlin, Germany.
DE-1100 is a Charolais-Fleckvieh cross operation in Northern Germany.
FR-80 is a Limousin operation that also has a beef finishing side of around 70 head per year located in France.
ES-150 is a crossbred operation that also has a beef finishing side of around 600 head per year located in Western Spain.
UK-40 is a Limousin cross operation finishing around 35 beef animals annually along with cash crops and lease hunting located in Suffolk.
UK-105 is a Limousin cross operation in South Yorkshire.
UA-410 is a Limousin cross operation with finishing 275 beef animals annually along with a dairy and cash crops located in Uruguay.
US-160 has crossbred cattle with some machine work done on the operation located in Kansas.
US-240 has British Continental cross cattle with backgrounding and lease hunting on the operation located in New Mexico.
US-500 has British Continental cross cattle with lease hunting on the operation located in Montana.
MX-120 is a mixed beef/dairy operation with Zebu cattle located in Southeast Mexico along the Gulf.
AR-700 is an Angus cow/calf operation finishing 550 beef cattle annually located in Eastern Argentina near Buenos Aires.
AR-730 has Hereford Brahman cross cows located in Northeastern Argentina.
AR-800 has Angus cows with beef finishing and cash crops located in the Santa Fe region of Central Argentina.
AR-1000 has Angus cows with beef finishing and cash crops located in Eastern Argentina near Buenos Aires.
BR-400 has Nelore cattle located near Mato Grosso in central Brazil with cow/calf through beef finishing on the operation.
BR-1070 has Nelore cattle located near Mato Grosso in central Brazil with cow/calf through beef finishing on the operation.
AU-200 is a British cross operation that includes beef finishing located in New South Wales on the Tablelands.
AU-550 is a Charolais-Angus cross operation that includes beef finishing located on the North-west slopes of New South Wales.
AU-1000 is a Brahman operation that includes beef finishing located in Northern Queensland.
AU-1100 is an Indicus operation with beef finishing located in Central Queensland.