

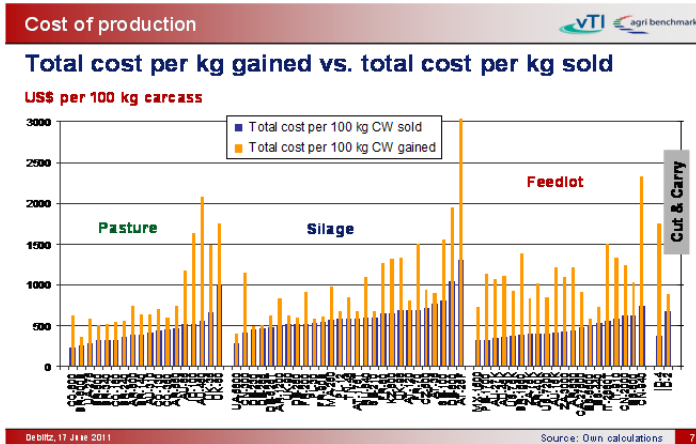


agri benchmark: Feedlot Analysis

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.

Canfax Research Services (CRS) collected 2011 production data from three feedlots in Alberta and Saskatchewan and applied it to the methodology developed by *agri benchmark*. While the sample size is admittedly small the repetition of data submitted provided confidence that the data set that reflected Western Canadian production practices.



This fact sheet summarizes the results of the Canadian feedlot cost of production (COP) data and compares the results internationally. Finishing cattle around the world happens in a variety of ways - in feedlots, on grass, or with a silage ration. This fact sheet focusses only on feedlot cost of production.¹

Farm descriptions are available on page 6.

¹ Exchange Rates – all results are presented in CDN dollars.

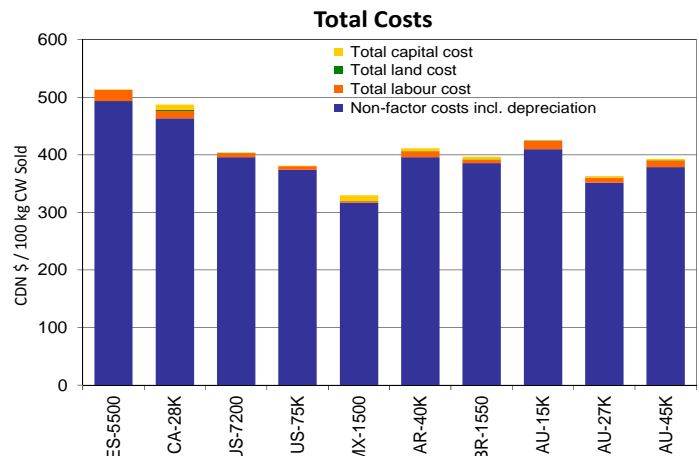
Country abbreviations are followed by the number of cattle the feedlot finishes per year. For example, CA-28K means that the Canadian feedlot (located in Alberta) finished 28,000 head in 2011.

Weights – All weights are in kilograms (Kgs)

FEEDLOT COSTS

The international comparisons below are done on total cost per 100 kgs carcass weight (CW) sold. This takes into account the productivity advantages that some countries have over others.

Mexico (MX-1500) had the lowest cost at \$330 per 100 kgs CW sold while Spain (ES-5500) had the highest at \$514. Canada (CA-28K) is a high cost producer of beef at \$487, second only to Spain, and was followed by Australia (AU-15K) at \$425, Argentina (AR-40K) at \$411 and the mid-sized US lot (US-7200) at \$404.



The US data showed small *economies of scale* with the large US-75K lot at \$392, 3% cheaper than the US-7200 lot at \$404. While the Australian lots did show this trend between the smaller AU-15K and mid-sized AU-27K lot going from \$425 to \$363. The largest AU-45K lot had costs 8% higher than the mid-sized lot at \$393 per 100 kgs CW sold.

Between 97-99.9% of all costs in feedlots are cash costs. Only Mexico (91%) and Brazil (96%) had a smaller portion, with larger opportunity and depreciation costs – particularly for capital.

The two largest costs in any feedlot are the price of the feeder animal and the feed. Non-factor costs (which include both) represent >95% of the total costs in every country.

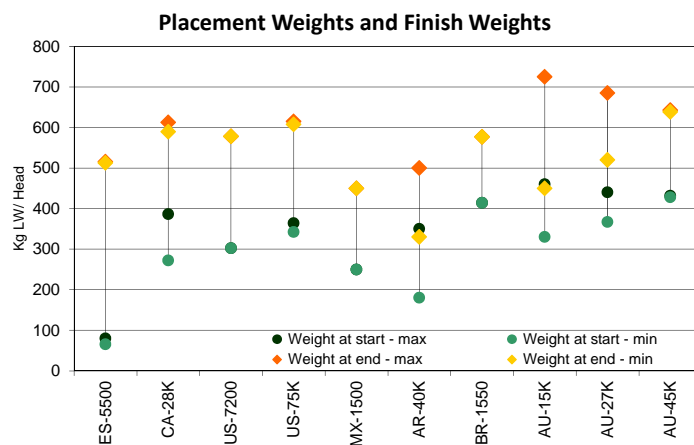
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Feeder Animal Costs

In Australia, the US and Canada the purchase of the feeder animal makes up the lion's share of non-factor costs representing between 60-75% in 2011.

The per unit price of the feeder animal (\$/kg) in 2011 was similar in Canada, the US, and Australia; lower in Mexico and higher in Argentina. However, the total price paid is impacted by the weight of the placement animal.

Placement weights tend to be lower in Europe (resulting in fewer dollars invested in feeder purchases) and higher in Australia than in North America. There is a range of placement weights in all countries reflecting the different ages of placements (calf vs. yearling).



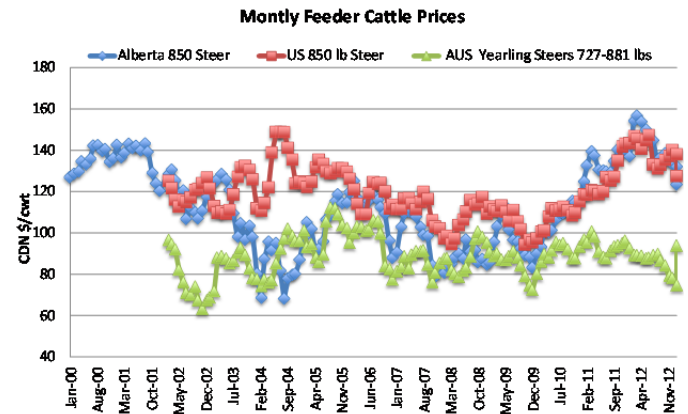
Australian placements tend to be older (300-540 days) as well as heavier compared to the US (265-330 days) or Canada (200-450 days). Age at slaughter has implications in a post-BSE world when trade is restricted to under-30-months (900 days) for many importing countries. Age at slaughter varies in each country with varying weather and production systems, ranging from 435-690 days in Australia, to 450-500 days in the US and 405-586 days in Canada.

Historical Price Analysis

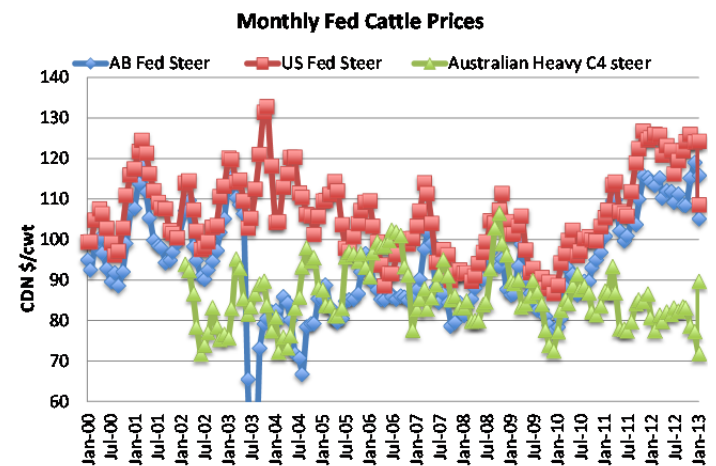
While the *agri benchmark* data is a point in time (2011 production year), it should be noted that there can be as much difference from year to year within a country as is seen between the individual countries results presented here. Taking a longer term overview of cost trends is important in recognizing competitive advantages or disadvantages.

Feeder price is an important aspect of feedlot profitability. Alberta 850 lb steer prices and Australia 727-881 lb steer prices were actually similar from August 2003 to December 2009 with Canada only 8% higher; but

after that Canadian feeder prices have averaged 43% higher than Australian prices. Since December 2009 Canadian feeder prices have trended in line with US 850 lb steer prices (averaging 2% higher).



From January 2006 to September 2010 fed cattle prices in Canada were par with Australia and 10% below the US. However, since October 2010 Canadian prices have averaged 32% higher than Australia and 7% below the US. Heavy 500-600 kg C4 prices from Australia were used for this fed cattle price comparison as they would be the most comparable to a grain fed animal in North America. Lower fed cattle prices since late 2010 have given Australia a price advantage internationally when exporting grain fed beef.

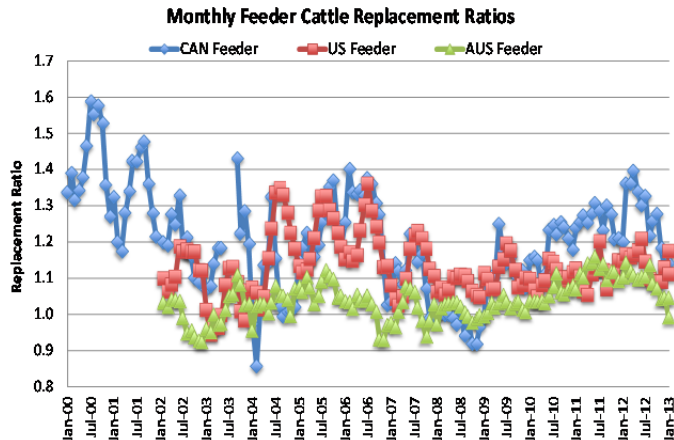


Replacement ratios show how much higher feeder cattle are per pound than fed cattle. The lower the ratio implies less dollars paid by the feedlot to replace an animal; conversely a higher ratio means the feedlot must pay more per pound to replace those animals. Consequently a higher ratio has negative implications on feedlot profitability as more dollars are spent on placing cattle – assuming that feed costs are constant. Replacement

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ratios allow for international comparison on similar weight placements.

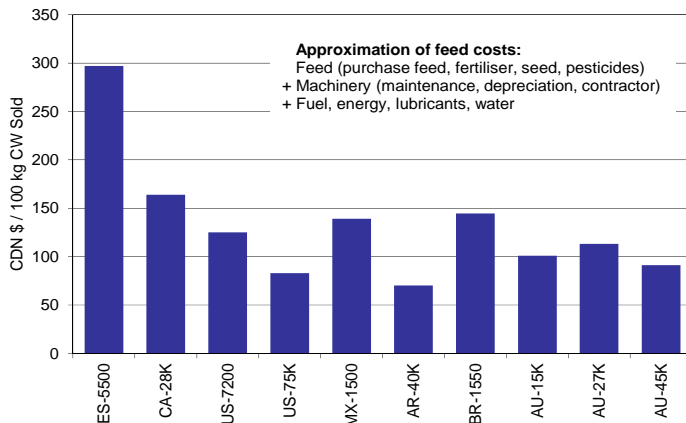
Australia's replacement ratios have historically been lower than Canada or the US. Since January 2010, Canadian replacement ratios on 850 lb steer placements have averaged higher than either the US (11%) or Australia (14%).



Replacement ratios on calves are significantly lower in Australia. However, very few calves are placed on feed as older, heavier feeders are the norm there. US replacement ratios on calves tend to be lower than Canada and averaged 8% lower from January 2010-2013.

Feed Costs

The 2011 feed costs in absolute terms were \$164/100 kg CW sold in Canadian feedlots while 45% lower than Spain this was 31% higher than the small US operation and 73% higher than the large US operation. Australian feed costs were higher than the large US lot but lower than the small lot. Canadian feed costs were higher than Mexico (18%) and Brazil (13%).



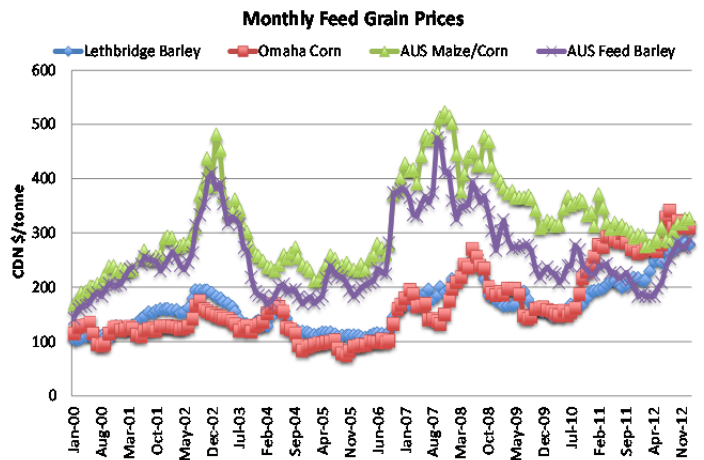
Omaha corn prices averaged CDN\$279/tonne (US\$6.70/bu) in 2011 compared to Lethbridge barley at

\$205/tonne. This would imply the difference in feed costs between the US and Canadian lots was due to silage. In many Canadian feedlots, silage is homegrown (to reduce the cost of transporting water) with grain being primarily purchased. A lower yield on homegrown silage has implications on productivity requiring more acres to produce the same volume of feed. It would be assumed that lower yields would result in lower land prices. However, in the feedlot industry there is no need to actually own more land than what is needed for operations with all feed purchased in some situations. This results in the question of feed grain productivity being pushed to the grain industry with the choice to producing the crop that brings the highest return.

Historical Price Analysis

From 2000 to late 2010 Australia barley and corn prices were higher than Lethbridge barley and Omaha corn prices, giving North America an advantage in producing grain fed beef. Since April 2011 higher feed costs in North America have removed that cost advantage and made Australia more competitive internationally with grain fed beef.

Increased global demand for feed grains has resulted in a convergence of prices as compared to the historical local prices determined by regional supply and demand dynamics. In this new world of global feed prices, grain fed beef production will need to be competitive on other factors.



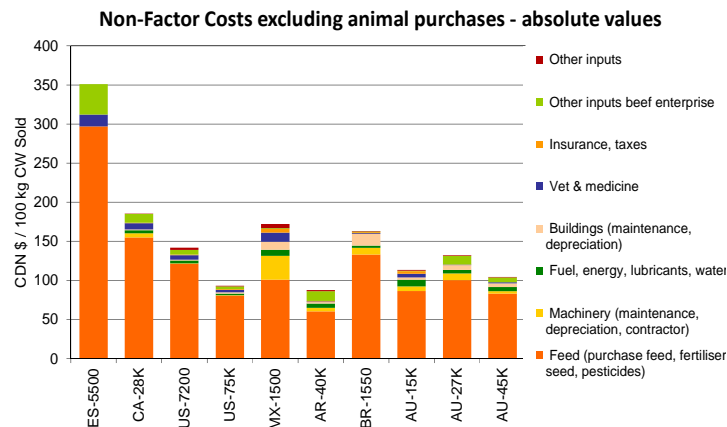
Long term price trends show that historically corn and barley prices were similar in North America and barley was cheaper in Australia. Since 2008 barley has been cheaper than corn in both North America and Australia. One would expect this to provide feedlots located in barley growing regions to have a cost of gain advantage.

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However, in Canada lower feed costs have coincided with lower fed cattle prices.

Non-Factor Costs (excluding animal purchases) - include feed, machinery and building (maintenance and depreciation), fuel, insurance, veterinary and medical supplies. Non-factor costs were the highest in Spain (\$351/100 kg CW sold) followed by Canada (\$185), Mexico (\$172), Brazil (\$163), the US (\$105-142) and Australia (\$104-132). Feed represents over 76% of these costs in all countries except Mexico and Argentina.

- *feed costs (purchased and homegrown)* were the highest in Spain, followed by Canada, and Brazil. The US, Mexico and Australia feed costs are all lower. Canadian feed costs were 22% higher than the US, while Brazil feed costs were 25% higher than Australia.
- *Machinery maintenance* was substantially larger in Mexico than other countries which ranged between \$1-8/100 kg. Canada was in the middle of the range at \$5.
- *Fuel costs* ranged between \$2-9/100 kg across all countries.
- *Building costs* were the highest in Mexico and Brazil.
- *Vet & Medicine costs* were the highest in Spain and Mexico. Canadian costs (\$8/100 kg) were higher than the US (\$3-6/100 kg).
- *Insurance & Taxes* were small in all countries (~\$1/100 kg)

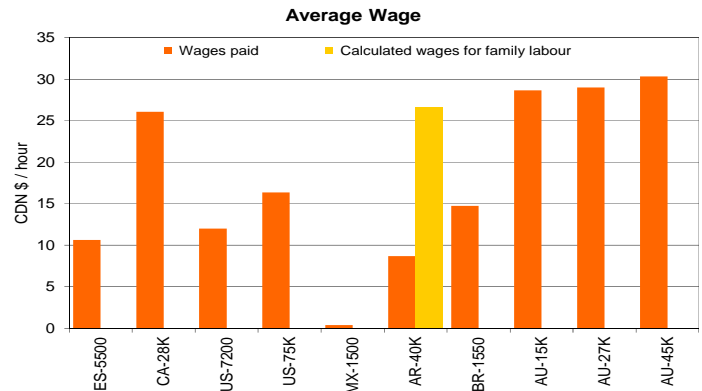


Capital costs like machinery and buildings are directly affected by the turn/fill rate of a feedlot with a lower turn/fill rate during periods of smaller cattle numbers resulting in higher per unit costs. These items are usually very small and therefore have a minimal impact on the overall breakeven.

Labour Costs

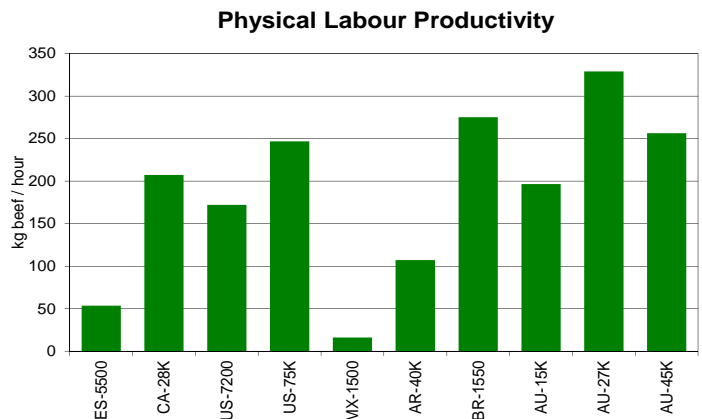
The feedlot sector is more reliant on paid labour than the cow/calf sector. Western Canadian farms must compete directly with the oil field for labor and consequently this

drives up agricultural wages. Canada has some of the highest farm wages in all the countries with only Australia being higher. 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 kilograms of beef per labour hour than other countries, particularly the US, in order to be competitive. While the number of animals per labour unit is higher in Canada (716) and Australia (697), the measure of physical labor productivity (kg beef/hour) is similar to the US and lower than Australia or Brazil.

Consequently, the economic labor productivity (\$returns/\$labour cost) measured was lower in Canada than the US, Brazil or Australia indicating that physical labour productivity needs to improve further before it can offset the higher wages.



PERFORMANCE INDICATORS

As mentioned previously, the two largest variable costs facing the cattle feeding sector are the feeder animal and the feed needed to finish it. This makes the **Feed:Gain Ratio** a key measure of efficiency. While feed:gain ratios

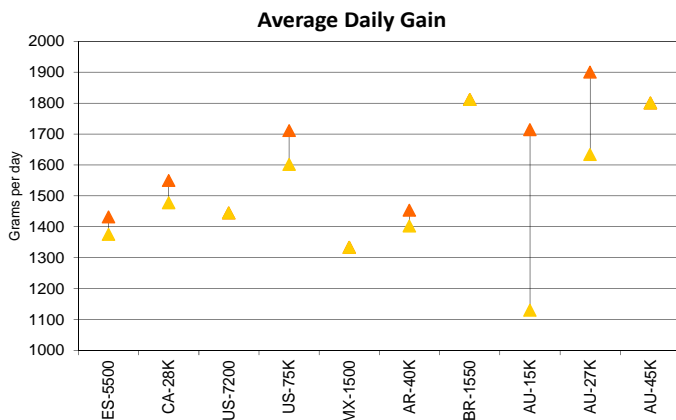
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are difficult to measure for individual animal performance they are critical for productivity improvements.

In Canada, the average feed:gain ratio is 7.14 with a standard deviation of 1.33 giving a range of 5.81 to 8.47 to capture a 95% confidence interval². Average daily gain, daily dry matter feed intake and the year explain 91% of the change in the feed:gain ratio since 1955. Improvements in feed:gain have come largely from increased average daily gain rather than decreased intake because it is too expensive to measure on a routine basis. Higher average daily gains have come through improvements in animal management, as phenotypic data is more readily available (Phenotype = genetics and environment/management).

Average Daily Gain

Average Daily Gain (ADG) is a performance indicator closely monitored by feedlots. In general, the higher the ADG, the fewer days on feed – although not always if cattle are on feed for a minimum number of days in order to target specific marbling requirements. The fewer days on feed, the higher the potential turnover rate; resulting in overhead costs being spread across more cattle.

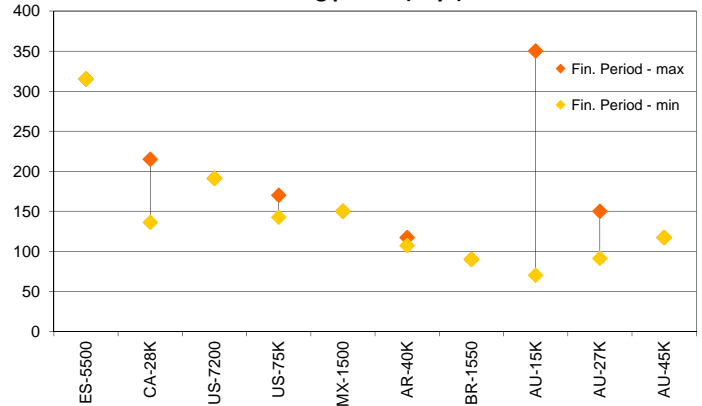


For the less than 150 day cattle in Australia, ADG around 3.96 lbs/day is higher than the large US lot at 3.7 lbs/day. Canada (3.3 lbs) was similar to the small US lot (3.1 lbs/day). North American on average has longer days on feed with lighter in-weights than in Australia, Brazil, or Argentina. Spain has some of the longest days on feed with a very light placement weight and average 3.08 lbs/day gain³.

² A Historic Evaluation of Research Indicators in BCRC priority areas. Beef Cattle Research Council, April 2012.

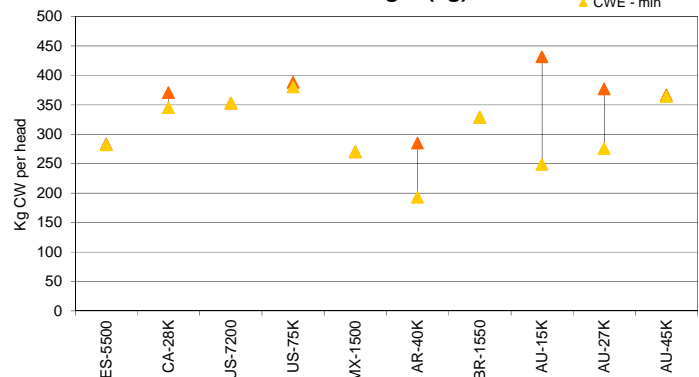
³ The range in finishing periods reflects the varying in-weights of calf versus yearling placements.

Finishing period (days)



Australia actually sees some finished weights (live and carcass weights) as high, or higher than North America. Despite a heavier in-weight and subsequently heavier out-weight in Australia a lower dressing percentage (see section below) results in carcass weights that are lower in Australia than in North America. The exception being cattle destined for the Asian (Japan) market which are finished to carcass weights that are even heavier than North America. There is large variation even within a single operation in Australia with carcass weights ranging from 250-431 kgs (551-950 lbs). The lowest carcass weights are in Argentina and Mexico at 200-285 kgs (440-628 lbs). The highest are found in the US, Canada and Australia with Brazil at 329 kgs (725 lbs).

Carcass Weight (kg)

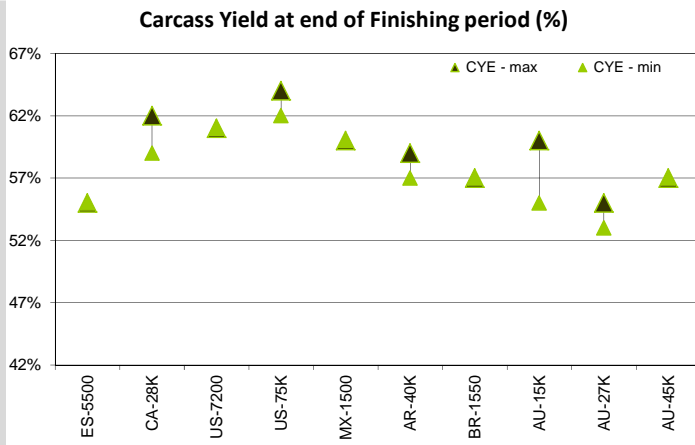


Survival Rates/Death Loss is typically small in feedlots with international data being consistent around 1%.

Dressing Percentage

A notable difference between Australia, Canada, and the US feedlots was the dressing percentage (DP) with a range of 53-60% in Australia, 59-62% in Canada, and 61-64% in the US.

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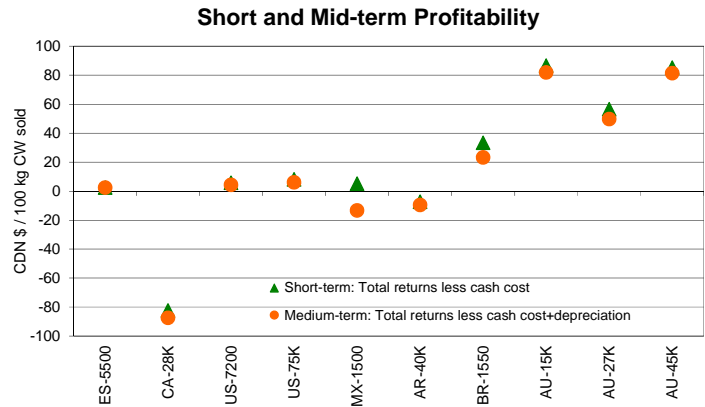
This is a complex issue with a number of factors contributing to this difference:

1. US carcass weights are adjusted to include kidney, pelvic and heart fat (KPH), which are typically around 2.5% of carcass weight but can range between 1.5-3.5%. Australian and Canadian carcass weights exclude KPH.
2. Dressing percentage is calculated on the hot carcass weight in all countries. In the US and Canada cattle are weighed at the feedlot. A pencil shrink of 4% is typically applied. In Australia, the recording of live weight is recommended after a 12 hour curfew. This is 15-18 hours after mustering to weighing. However, the impact of this difference is unclear.
3. The use of beta agonists like Zilmax and Optaflex in North American feedlots (although not necessarily on all cattle) may result in DP's that are 0.5-1.0% higher.
4. Calves that have been backgrounded with grain (as occurs in many North American cases) prior to the feedlot would typically yield 0.1-0.2% higher than those backgrounded without grain (which is more common in Australia).

The sum of these differences may account for up to a 7.7% spread in carcass yield. Note: the different procedures and approaches are priced into the rail price. It is therefore not necessary to make modifications to the beef price for the comparisons.

PROFITABILITY

How strong an industry is, in any country, depends on profitability. So even with high costs structures if prices are high enough to provide profits an industry will thrive.



In 2011, short and medium-term margins in Australia are strong and positive, while margins in Spain and the US are small and positive. Margins in Canada, Mexico and Argentina are all negative. Moving into 2012, record high feed prices in the US also moved them into a negative margin stressing feedlots across North America. Australia definitely has the current advantage in the feeding sector.

CONCLUSIONS

In 2011, the Australia feedlot industry was the most profitable internationally. However, as noted throughout this analysis there can be as much difference from year to year within a country as is seen between the individual countries results presented here for the 2011 production year. Taking a longer term overview of cost trends is important in recognizing prevailing competitive advantages or disadvantages.

Increased global demand for feed grains has resulted in a convergence of prices as compared to the historical local prices determined by regional supply and demand dynamics. Higher feed costs in North America have made Australia more competitive exporting grain fed beef. In this period of high global feed prices, grain fed beef production will need to be differentiated on factors other than price.

Canada has the second highest cost of production at \$487 per 100 kgs CW in the feedlot sector with only Spain showing higher costs at \$514 per 100 kg CW. Australia (AU-15K at \$425), Argentina (AR-40K at \$411) and the small US lot (US-7200 at \$404) followed with costs 12.7%, 15.6% and 17% lower than Canada. At the low end was Mexico (MX-1500 at \$330), and Australia (AU-27K at \$363).

Given that Canada is a high cost producer of beef it is not surprising to find no distinct cost advantage. Higher feed costs are the major Canadian disadvantage, along with a

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higher replacement ratio which is amplified at times when the fed cattle basis is wider. Land costs were higher than anywhere else. Labour costs were on par with Australia but higher than the US and other countries. Capital costs were similar to Mexico but higher than anywhere else.

Compared to the **United States**, Canadian costs were higher for land, labour and capital, but the big differences were primarily due to higher feed costs and wages. In terms of performance the US had the highest dressing percentage with Canada following closely (difference was partly due to definition).

Compared to **Australia**, Canadian costs were higher, primarily due to higher feed costs as wages were similar. Average daily gains tended to be higher in Australia but dressing percentage was lower.

Compared to **Spain**, Canadian feed costs were significantly lower but wages were much higher. ADG and dressing percentage was higher in Canada.

Bottom line: there are many areas for Canada to improve in terms of regulations (wages) and research (feed).

INTERNATIONAL FARM DESCRIPTIONS

Country abbreviations are followed by the number of cattle the feedlot finishes per year. For example, AU-15K is an Australian lot finishing 15,000 head per year.

ES-5500 places Simmental cross bull calves purchased from the dairy industry. Feeding straw and grain concentrate this feedlot is located in Northeastern Spain.

CA-28K purchases primarily heavy calves and yearlings with >60% of placements as steers. Feeding barley silage and barley grain this feedlot is located in Central Alberta.

US-7200 purchases weaned steers from British Continental cow/calf producers. Feeding grain, soybean meal and alfalfa hay this finishing feedlot is located in Kansas.

US-75K purchases backgrounded cattle from dairy and cow/calf producers with 56% steers. Feeding corn, distiller grains and alfalfa hay this finishing feedlot is located in Kansas.

MX-1500 purchases backgrounded steers from Angus/Brangus cow/calf producers. Feeding corn silage, cotton, peanut straw and concentrates this finishing feedlot is located in the Chihuahua province of Mexico.

AR-40K purchases weaned calves and backgrounded cattle from dairy and Angus cross cow/calf producers with 21% bulls, 53%

steers, and 22.8% heifers. Feeding side products and grain this finishing feedlot is located in the Buenos Aires province of Argentina.

BR-1550 purchases backgrounded Nelore steers from cow/calf producers. Feeding corn silage, cotton seed, corn and soy this finishing feedlot is located in the central Goias state of Brazil.

AU-15K purchases backgrounded cattle from dairy and British/Wagyu cross cow/calf operations with 85% bulls and 15% heifers. Feeding concentrate and roughage this finishing feedlot is located in South East Queensland. Manure sales provide supplemental income.

AU-27K purchases backgrounded steers from Taurus and Taurus/Indicus cross cow/calf operations. Feeding grain and maize silage this finishing feedlot is located in South East Queensland. Manure sales provide supplemental income.

AU-45K purchases backgrounded steers from Angus and British cross cow/calf operations. Feeding grain, cotton seed, molasses, supplement this finishing feedlot is located in New South Wales. Manure sales provide supplemental income