Technology Transfer Mission

Argentina Forage Finished Beef

Glenn Friesen & Juanita Kopp, Manitoba Agriculture, Food and Rural Initiatives
February 28, 2008 - March 13, 2008

Photo: Argentina tour participants.

Thank you to our Sponsors.

This booklet is a comprehensive review of the Argentina Forage Finished Beef Technology Transfer Mission that took place in March of 2008. Support for this initiative was provided by the Manitoba Functional Food Opportunities Program in partnership with the Manitoba Forage Council, Manitoba Agriculture, Food and Rural Initatives and Agriculture and Agri-Food Canada.

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Acknowledgments

The Manitoba Forage Council, in partnership with several other organizations, has embarked on a mission to develop the forage finished beef industry in Manitoba. Numerous other feasibility studies, marketing strategies, production manuals and extension material have been developed over the past 3 years by the Manitoba Forage Council and Manitoba Agriculture, Food and Rural Initiatives.

The Manitoba Forage Council and its partners are pleased to present this document – the observations of the Technology Transfer Mission to Argentina (March 2008). This document provides feeding strategies for a forage finished beef product that are transferable to the Canadian climate. This document also includes information on the global consumption of beef, export opportunities, state-of-the-art processing facilities, and carcass traceability and quality assurance methodology.

This project was made possible through a collaboration between the Manitoba Forage Council, Manitoba Agriculture, Food and Rural Initiatives, Agriculture and Agri-Food Canada and the International Institute for Agricultural Technology Experimental and Extension Stations in Argentina, with funding support from the Manitoba Functional Food Opportunities Program and Green Cover Canada.

The Manitoba Forage Council would like to thank Glenn Friesen for organizing the mission and for ensuring the transfer of information about Argentina forage finished beef production via this publication, and Dr. Juanita Kopp, also for her assistance with this publication.

This document may be shared; however, it would be appreciated if credit is extended for all or part of its use.

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Editor/Layout:
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February 28, 2009

Introduction

Argentina is the most southern country located on the continent of South America. It is the second largest country in the nation, second only to Brazil, and covers 2.8 million square kilometers - four times the size of Texas. The capital, Buenos Aires, is located on the east coast of Argentina. It is one of the biggest cities in the world, with a population of over 13 million. The climate is temperate; temperatures range from a low of 3°C in winter to a high of 37°C in summer.

The beef and cattle industry is an important part of Argentina's agricultural sector. In 2005:

- the value of live-weight cattle production reached $4.7 billion CDN;
- the estimated value of processed beef was $5.8 billion CDN and;
- retail beef sales totaled approximately $7.4 billion CDN, including value-added services provided by Argentina's distribution system (e.g. beef brokers, supermarkets and butchers).

Prior to the 1970s, Argentina was the leading exporter of beef and veal, primarily from the La Pampa and Buenos Aires provinces in central Argentina. These cattle were primarily British breeds that were favoured in European markets. In 2005, Argentina was the third largest exporter of beef, after Brazil and Australia, exporting 680,000 metric tonnes.

Region	Cattle stocks (million head)
La Pampa	33.0
North East	12.3
Cuyo & Central	4.5
North West	3.8
Patagonia	1.0
TOTAL	**54.0**

Currently, there are around 250,000 cattle ranches in Argentina, of which approximately 10% are considered large (more than 500 head). Large ranches account for 55% of the country's total cattle stock,[1] which are currently estimated at around 54 million head. Most cattle are located in the La Pampa region, as shown in this table.

Most Argentine cattle are grazed on pasture, however, in recent years much of the country's traditional pastureland has gradually been replaced by cropland (corn, soybeans, and sunflower). To maintain beef production on less land, many ranches are supplementing with corn and other concentrates and a few are beginning to finish on grain during the last two or three months prior to slaughter. Currently, 7% of annual slaughter is from feedlots (one million head). Most of the cattle currently raised in feedlots are low-weight animals (i.e. calves and young steers) that are destined for the domestic market, however, because of higher feed costs, feedlot production is limited by the low cattle prices in Argentina (compared with other countries such as the US, Canada or Australia). Prices for low-weight calves are much higher than prices for steers sold for slaughter.[2] Heavy-weight steers are mainly for export. The annual slaughter has been around 13 to14 million head, of which approximately 12 to 13 million per year are "officially" registered in the formal market system, and the remaining million head are sold domestically through informal agreements.

The breakdown of cattle for slaughter is as follows:

Animal Class	Steer	Young Steer	Heifer	Cow	Calves	Bull
% of Kill	33%	19%	15%	18%	13%	2%

While there is very little vertical integration within Argentina's beef production chain, there is some vertical co-ordination. This includes direct sales from ranchers to slaughterhouses or from ranchers to other domestic distributors such as supermarkets. Such sales are more frequent in the case of large ranches. Some large supermarkets have meat processing facilities. Direct sales are controlled by the National Sanitary and Quality Agri-Food Service (SENASA) because the cattle are processed in registered slaughterhouses.

1 National Agriculture Census, 2002.

2 Live-weight prices for slaughter (March 2006): calves (620-660 lb): $0.53-0.55/lb; young heifers (700 lb): $0.53-0.52/lb; young steers (990 lb): $0.45-0.47/lb; and 1,102 lb steers: $0.45/lb. It is worth noting that the price of calves is listed as a range, because regulations may be subject to change. This weight requirement may eventually be eliminated, however, at the moment, the weight is 620 lb. Prices in U.S. Dollars.

There are about 370 beef-processing plants in Argentina, of which 150 are monitored by the national authority SENASA, of which 100 are authorized to export to the European Union (EU). Domestic sales are divided among approximately 220 small provincial slaughterhouses which process beef for local consumption and are controlled by either provincial or municipal authorities. Most of Argentina's beef-processing plants were built decades ago, and only a few have been upgraded. As a result small domestic processors continue to use lower sanitary standards than export slaughterhouses. Some smaller processors choose to sell cattle on the informal market to avoid the per head levy.

Argentina's beef export sales are concentrated among a few leading operators, with the top five firms controlling 52% of the market and the next five accounting for an additional 16%. Among Argentina's leading beef exporters are its largest slaughterhouses, which also produce beef cuts for domestic markets. These include the following:

- Swift Armour (recently purchased by Friboi from Brazil)
- Finexcor (Cargill)
- Quickfood
- Cepa
- FRIAR
- Gorina
- Arre-Beef
- Argentine Breeders and Packers

The European Union (EU) is Argentina's main beef export destination. Argentine export taxes are currently 15% on all beef products, however, a small portion of the exports to the EU are sold using the advantage provided by the Hilton Quota system. This trade agreement allows for a certain amount of high quality cuts of beef to be sold into the EU with low tariffs. Currently the Hilton Quota amounts to 28,000 tonnes/year; approximately 5% of Argentina's total beef exports, at a value of approximately* $8-10,000 per tonne, sometimes as high as $18,000 per tonne. Exports to the EU that exceed the Hilton Quota are charged higher duties, thus reducing the amount earned by exporters by half. The Argentine Secretariat of Agriculture sets the amount of beef sold to the Hilton Quota annually and determines the distribution of the quota between the packing plants and producers.The value per tonne is set at the international level, based on supply and demand. Currently, packers fill about 90% of the assigned quota with the remaining 10% being filled directly by 15 producer groups. The amount of quota that the plants receive is based on their prior performance. In 2008, the quota was set at 28,000 tonnes for the year, of which 24,000 tonnes was assigned to packers and producers and 4,000 tonnes set aside for new plants or producer groups. A new plant starting up would get 200 tonnes of Hilton Quota, deducted evenly from the producer's portion of the quota and not from the packer's quota.

While Argentina is currently a country that has "free of foot and mouth disease (FMD) with vaccination" status, it still faces sanitary restrictions that limit its ability to sell to most of the markets that offer premium prices. Lower-quality cuts are sold mainly to low-priced markets (e.g. Russia, Chile, and Egypt) that permit imports of beef from countries with "free of foot and mouth disease (FMD) with vaccination" status. Argentina is free of Bovine Spongiform Encephalopathy (BSE) and there is very low risk that it should ever appear given that most domestic cattle are grazed on pasture (feedlots are used for a limited period of time and feedlot-produced beef is not usually exported). This provides good future prospects for Argentine beef exports, while potentially limiting imports of meat and other related products or inputs from countries that have reported cases of BSE. In addition, Argentine beef production includes the use of few concentrates and no growth enhancers; this is a global marketing advantage considered by many regions, including the EU which does not permit imports of beef produced with growth hormones.

* All prices from this page onwards are quoted in U.S. Dollars.

Technology Transfer Highlights

The trip was well-rounded with numerous meetings across the beef sector. The tour took place in the two provinces that are responsible for over 60% of beef production in Argentina (Buenos Aires and La Pampa – see highlight on the map). Over the 12 day tour, the group visited two federal agricultural research and extension facilities; (Santa Rosa in La Pampa province, and General Villegas in Buenos Aires province), eight ranches, two slaughter facilities, a cattle auction mart and several meat retail outlets. As well, the group met with the Argentine Beef Promotion Institute, the Argentine Cattle Brokers' Association, and culinary professionals.

General Production Notes

The latitude of the region is approximately 36 degrees south of the equator – similar to Oklahoma, USA. Average precipitation ranges from 10 inches per year in far western La Pampa, to 26 inches per year in southeast La Pampa, to 40 inches in northeast La Pampa, with frost free periods ranging from 6 months in the west to 8 months in the east. Soils consist mainly of volcanic deposits and sand delivered by westerly winds from the Andes Mountains. As you move north and east, land productivity generally improves; potholes disappear, soils have more organic matter and clay, and more water holding capacity. Crop production has flourished on the highlands of northern Buenos Aires with the use of zero tillage. Average stocking rates range from as high as 0.6 Animal Units per hectare (AU/ac) in eastern La Pampa, to 0.08 AU/ac in central La Pampa, to 0.04 AU/ac in western La Pampa. Stocking rates in Buenos Aires province range from 0.8 AU/ac in the south to 1.0 AU/ac in the north.

The average ranch size is 300 to 500 head in La Pampa, and 1,000 head in northern Buenos Aires. Producers are using tools similar to our Manitoba producers to maximize grazing capacity, including watering site locations and basic infrastructure improvements. The land in the west is mainly native range. Cattle numbers have increased about 17% in this area in the last 5 to10 years (primarily cow-calf pairs), whereas the central region continues to displace cattle production with higher value grain crops.

Much of the feedlot development is in the southern pothole region, where land is less valuable; however, shallow water tables (1 metre) are beginning to raise environmental concerns. Argentine feedlots are smaller than their North American counterparts, and finishing is completed in 60 days. Only about 7% of cattle are finished in feedlots (approximately 1 million of the 14 million killed annually).

It is difficult to determine the true value of the land farmed. Tremendous economic growth in the grain industry, highly fluctuating livestock prices, and unfavorable export policies have made the value of land difficult to assess for many producers.

Land values in the northern areas of Argentina have increased 3 to 5 times over the past few years, as producers are more educated about increasing production potential. For example, land valued at $40 to 60/ac a few years ago is now worth up to $400/ac. Average livestock stocking rates have doubled from 0.3 AU/ac to 0.7 AU/ac. Cash rent is also not common in the livestock industry. Rather, tenants and landlords agree on a combination of the gains per acre and a market price – often a seasonal average. For example, with an average rent of 67 lb/ac gained and a market value of $0.41/lb the landlord is owed $27.32/ac. Rental rates are difficult to determine because approximately 90% of the land is owned and few producers are willing to discuss rental rates openly.

These are a few typical wages from Argentina:

- Gaucho (cowboy): $600/month + $60/month in beef, free housing, benefits, insurance, and pension
- Ranch managers: $1200/month + benefits and typically live in town
- High school teacher: $650/month
- Agriculture scientist: $1200 to $2000/month

International Institute for Agricultural Technology Experimental and Extension Stations

Just as the Prairie Farm Rehabilitation Administration developed in Canada in the 1930's to deal with drought and poor farming conditions, the Argentine government developed the International Institute for Agricultural Technology Experimental and Extension Stations (INTA–EEA) to help Argentina deal with equivalent problems in the 1950's. We visited two stations: Santa Rosa and General Villegas.

Top photo: INTA in Santa Rosa. **Photo below:** INTA in General Villegas.

Production & Research Visits

Day One *(Monday, March 3, 2008)*

International Institute for Agricultural Technology (INTA) Experimental and Extension Station (General Villegas, Buenos Aires)

Beef production in the north western portion of the Buenos Aires province is quite threatened by crop production. Increasing commodity prices and interest in growing grain has significantly increased land value in this area. Pastures able to carry 1.2 to 1.4 AU/ac that were once worth $600/ac (1993) are now valued at $3,200/ac. For comparison sake, land in Santa Rosa is only able to sustain 0.6 AU/ac on average, and has increased from $400/ac in 2005 to $1,200/ac in 2008.

The average beef ranch size in this area is 1,000 head, with 900 to 1,235 ac of forage land, with stocking rates of 10 to 12 head/ac of stockers and finishers. Most ranches also produce all of their own calves for stockers, and often purchase more; very few are custom graziers. They receive 40 inches of rainfall per year and have an 8 month frost free period. Production systems are quite dynamic; they tend to change on a daily or weekly basis to accommodate changes in pasture growth and weather. Soil types are quite variable, and pasture response to fertilizer ranges. As a result, fertilizer is not used regularly, especially now with soil surpluses from crop production. It costs an average of $12/ac to apply 110 lb/ac of urea.

Most pastures consist of alfalfa, brome, and fescue and tend to last 4 to 5 years until weed and disease pressure takes over. Because this region has an average rainfall of 40 inches, some pastures are utilizing birds foot trefoil (Lotus tenuis, which is more productive than L. corniculatus) that produces 7,100 lb/ac.

Grass pastures are grazed in the vegetative stage with 2 to 3 passes. Pastures are often mowed with a bat wing mower after the first graze to control weed populations and even out re-growth. Pastures are allocated at 3% of body weight throughout the life of the animal. Supplements fed include corn (cracked) at 1% of body weight to stabilize the rate of gain, and sunflowers. Although supplements are important, the real key is improving forage uptake. For example, net profit is calculated at $105/ac with supplement, and $81/ac without. The primary finishing period is in the fall. During the wintering period, calves can be grazed on winter annuals like ryegrass plus triticale while being pen fed to stretch the stored feed supplies (e.g. silage, supplements or hay). The ryegrass is planted in midsummer or early fall and is ready to graze in 90 days, when conditions are very dry. Pen feeding reduces the gains needed from the winter cereal. Calves are weaned at 220 to 550 lb, and the growing and finishing cattle weights range from 330 to 990 lb.

Photo below: Steers 60 days from kill.

The animals in the photo (previous page) at the General Villegas Station are 60 days from kill. They are grazing alfalfa (fall dormancy rating of 8), tall fescue, meadow brome-like species, white clover and some alsike clover. They will be moved to the blooming alfalfa tomorrow (March 4).

Top photo: Blooming alfalfa ready to be grazed. **Bottom photo:** Alfalfa/grass pasture with 10 days of regrowth.

Day Two *(Tuesday, March 4, 2008)*

1. Nuevo Campo and El Castillo Ranch

a) General Ranch Comments

Nuevo Campo and El Castillo are two ranches owned by the same family, located 150 km apart. The two ranches cover 1,900 ac and have10 full time employees, managed by Jorge Lasta. They use 37% of the land to produce beef from forage fed cattle. The remaining 63% of the land is used for annual crops such as corn, soybeans, and sunflower. These crops are produced with subcontracted equipment and labour. They have also developed a market for straw via the thoroughbred horse industry.

Beef produced on these ranches is primarily going to Russia as chilled and boxed beef, and to Argentina's capital, Buenos Aires as ground beef or corned beef. As beef prices soften, the demand for bred cows is falling. Currently, 8 to 10 year old bred cows are worth $340, whereas the same cows fattened are worth $500.

When fat cow prices are high these ranches buy bred cows to have one calf and then sell the cows for slaughter. The typical breeding season is in spring/summer (November to January) and lasts for 2½ to 3 months; calving takes place late winter and early spring (July to September). Steers are castrated to improve production and to manage breeding. Missed castrations are typically only discounted at the market if a whole trailer load of them is delivered. Heifers are not spayed – as ultimately forage quality has more influence on gains.

At these two ranches, the key to achieving high weight gains is to graze high concentrations of soluble sugars. Soluble sugars in alfalfa peak during the vegetative to early flower stage (5-10%), however, winter annuals typically have much higher levels (around 10 to 15%). This is the reason companion cropping alfalfa with a winter annual can maximize soluble sugars (from annuals) as well as protein (from alfalfa).

This is an example of the selected forage by month for animals in the stocker and finishing phase.

Calendar: April to March												
Forage	A	M	J	J	A	S	O	N	D	J	F	M
Rye or Oat	//	//	//	//	//	/				/	//	/
Alfalfa	//	/				//	//	//	//	//	//	

Both ranches use fence posts cut from one of two native, high tannin hard woods: the Cabratcho tree, or the nitrogen-fixing Calden tree (*Prosoeis Caldenea*). Fences made from these woods typically last 30-40 years. Poles are delivered to the ranch fresh off the lathe. Ground holes are dug by hand, and fencing holes are drilled in the post on site using a hand held hydraulic drill. Fencing costs are approximately $3/meter in Argentina (of which $1 is labour), compared to $6-9/meter in Canada.

b) Nuevo Campo Ranch (La Pampa Province, near Santa Rosa)

The soil on Nuevo Campo ranch is very sandy (65-73% sand), so soil erosion is an issue. As a result, zero tillage is the only field practice used, with some reliance on herbicides for weed control and fertilizers. This area receives about 32 inches of rainfall annually and wells are typically dug down to 33 feet. They breed 480 cows each year, achieving a conception rate of 93% and a weaning rate of 83%. Twenty percent of heifers are used for replacements. They fatten all their steers and 80% of their heifers. They also buy 300 male calves each year. All animals weighing 440 lb in April are fed on pasture. Lighter calves are pen fed with grain until they reach 440 lb, and then sent to pasture. They finish their calves between October and March/April on alfalfa pasture. Typical finishing weights are 880 to 900 lb within 12 to 14 months of weaning; typical ADG is 1.3 lb/day.

Photo below: Steers 60 to 90 days from slaughter.

Currently this ranch is fattening 620 steers in 3 groups.These photographs (previous page and below) are the lighter steers that still needed 60 to 90 days to reach the 840 to 880 lb size for the domestic market.These steers would take too long to finish for the export market.Calves are weaned at 6 months of age (400 to 440 lb). Steers finish in about 12 to 13 months and are 18 to 19 months of age at kill.

Pastures at Nuevo Campo are seeded with 6.3 lb/ac alfalfa (fall dormancy rating of 6), 2.7 lb/ac brome (*Bromus auleticus*), 2.7 lb/ac tall fescue, with volunteer *Cynodon* spp., a warm-season palatable grass related to Bermuda grass and similar to Johnson grass. Typically, no fertilizer is used because sufficient levels remain from crop production (20 to 25 ppm); however, pastures low in phosphorus (P) sometimes receive mono ammonium phosphate. Pastures are maintained for 4 to 5 years, after which they are rotated to summer crops for 4 to 5 years (soybeans, corn, and sunflowers) and winter annuals (cereal rye) for 1 to 2 years. Planting a more dormant alfalfa variety could extend the life of the stand under grazing; however, maintaining pastures for 4 to 5 years fits well in the rotation. Millets have been used for hay in the past, but they are not profitable in this region of Argentina.

Paddocks are grazed for 1 to 1.5 days and rested for up to 40 days. The maximum rest period is used for low dormant varieties of alfalfa as it becomes too advanced. If needed, paddocks are mowed after each graze for weed control.

Pastures are grazed 6 to 7 times each year with a target utilization of 70%. The target dry matter intake (DMI) is 2.5% of body weight for old animals and 3.2 to 3.5% of body weight for young animals, to give an ADG of 1.4 to 1.5 lb/day. The total dry matter yield reaches 7,200 to 10,800 lb/ac. All animals are weighed every 90 days, however, a small group of benchmark animals are weighed every 30 days. Proloxalenes (similar to Alfasure™) are only used when absolutely necessary for bloat control, as they are thought to increase the rate of passage through the rumen and thus reduce gains.They will feed hay (3,000 bales) and corn silage (1,200 tonnes dry matter from 370 ac) during the winter, but without supplements.

Photo below: Steers 60 to 90 days from slaughter. the pasture on the right finished 1 day ago (March 3).

c) El Castillo Ranch (La Pampa Province, near Santa Rosa)

This ranch is owned by the same family that owns Nuevo Campo ranch, located approximately 150 km south east of Nuevo Campo. Here the pastures are planted with 5.4 lb/ac alfalfa (a slightly more winter hardy variety with a fall dormancy rating of 5), 2.7 lb/ac orchard grass, 1.8 lb/ac meadow brome-like species, and divided into 20 ac paddocks. Most producers will plant certified forage seed fields on their farm for seed production, and then save seed for further plantings thereafter. After 5 years, pastures are rotated to annual crops for 5 years, however, alfalfa pastures can remain productive for up to 7 years.

The cows were on sorghum pastures when we visited El Castillo (in March). Sorghum pastures are typically grazed 4 times per year with 20 to 25 days of rest in between. Total yields are 8 tonnes of dry matter/ac over 4 passes. They use forage-type sorghums with 18-20% sugar as their summer annual, especially during a drought year. Sorghum typically doesn't have enough energy to finish, so it's usually reserved for cows, however, it's used for calves as a stopgap measure when other pastures are not ready.

Photo below: 8 to 10 year old cows being fattened with corn silage and cracked corn fed at 1% of live weight.

Photo below left: Sorghum below is 5 feet tall and cattle will begin grazing today. **Photo below right:** Sorghum is 6 to12 inches high and will be grazed for 1 to 2 more days.

Calves at El Castillo Ranch are weaned early – at 3 months. The calves on the right were in pens for 15 days, had one pass on the sorghum, and now they are on alfalfa-grass pasture. They are now 4½ months old and worth $150. The calves need copper and selenium supplementation (copper is injected every 2 months).

This ranch uses frontal grazing with nylon or poly wire to graze each paddock for 5 days at a stock density of 900 lb/ac. This equates to approximately 40 animals grazing on a 20 ac paddock for 5 days. Bloat control (proloxalene, similar to Alfasure™) is used in some years; however, the death loss due to bloat is minimal at 1% (there is a death loss of 0.5% for other reasons). They supplement at less than 1% of body weight with high moisture corn (sometimes cracked). When pastures are not needed, they cut hay, but high humidity prevents harvesting before 4 to 6 days of drying. As a result, quality is often limited. Only round bales are produced.

Photo: 4½ month old calves.

2. EL 23 Ranch (La Pampa Province near Santa Rosa)

This ranch was established in the early 1900's. The owner is Juan Carlo (John Kenny), an 85 year old immigrant from Ireland who ranches with his 25 year old grandson Mario Carlo. Juan's father moved here from Ireland to purchase land which now totals 9,900 ac. The land supported 20 cows during the drought of the 1950's. Today, approximately two-thirds of the land base is used for cattle production, which is a stark difference from that of the other farms nearby – by the owner's choice. The remaining third is used for crop production (corn, sunflowers, soybeans, and peanuts). Land rental rates in this region are approximately $100/ac/yr. Of the ranches toured, this was the only one with peanuts in the rotation. As a comparison, gross margins for cattle are $80/ac and peanuts are $300/ac; although peanut production tends to reduce soil quality and crop productivity in the following years.

The herd consists of 450 head of Red Angus cross cows with some Bos indicus influence ("Brangus"), and 700 finishing steers. The cows range from 1 to 10 years old, and the calving season is July to September. Their typical rotation is 4 years of alfalfa/intermediate wheatgrass, followed by 4 years of crop production; however, because only one-third of the land is cropped, half the pastures are 6 years old. Steers will be fattened to 840 to 880 lb and sold to the domestic market.They hope to move these animals by the end of March as they have already purchased 130 to 180 lb calves to be delivered shortly. Water is a big concern at this ranch – high salt and arsenic (molybdenum) levels require copper supplementation.

Photo below: The cow herd.

Photo below: Corn grazing.

Photo below:
6 year old alfalfa/grass pasture (right paddock overgrazed).

The early seeded corn crop (above) was very poor due to drought this year, therefore the corn is being grazed instead of harvesting it. They will graze 200 steers on 35 ac of corn for 3 months (divided into 3 paddocks, for 1 month each). The steers are 18 months old. They have been on this paddock for 1 month.

Alfalfa pastures are seeded with intermediate wheatgrass, however, after a few years two less desirable grasses, *Cynodon dactylon* (a relative of Bermuda grass) and Johnson grass quickly become a problem. Pastures are rested for 20 to 25 days in spring, and 30 to 35 days in summer. The photo is of a 6 year old alfalfa-grass stand. The paddock on the right side of photo has a higher population of *Cynodon dactylon* and Johnson grass because it was over grazed a few times. They will graze both paddocks for one more month, and then terminate the stand because of the high *Cynodon dactylon* density.

They graze 450 cows on 600 ac of alfalfa grass pastures for the summer season. This equates to a season long stocking rate of 0.7 head/ac. Paddocks are 50 ac each, and grazed for 7 to 10 days.

Photo below: 700 to 770 lb steers.

The steers on the previous page will reach kill weight (840 to 880 lb) in the next 60 days. When sold, they are walked to the corral by horse back and loaded; the animals remain remarkably calm.

The Red Angus cows (below) are the culls from the herd. They will be fattened and sold to the Russian market as boxed beef. It was noted that these cows looked more suited to grass finishing than the better herds in Manitoba.

Photo below: 2008 culled cows.

Day Three *(Wednesday, March 5, 2008)*

International Institute for Agricultural Technology (INTA) Experimental and Extension Station (Santa Rosa, La Pampa Province)

The Santa Rosa station was established in 1951, and sits on 9,300 ac of sandy soil averaging 16 to 24 inches of rainfall per year. The objective of the station is to answer questions on the low cost of production (COP) of livestock. It currently employees 120 people; 50 are research staff - half of whom work in animal production, and half in agronomy. This facility has a soil, forage and veterinary lab on site.

The station's funding is ultimately supplied by federal government and private industry (industry that is typically focused on soil management for grain production). Funding is allocated by a board of directors. Members are directors from producer associations (of which one is elected as Chair), regional research directors, municipal, provincial and federal staff.

The top priorities in the last 8 years are:

- Soil quality
- Zero till
- Cattle infrastructure
- Water quality & quantity
- Need for production of forage seed
- Current distribution and ownership of land parcels and future subdivisions
- Technology transfer
- Increasing the scale of research to ranch size
- Current situation in agriculture production

Cow Research:

Maintenance pastures for cows are primarily Lovegrass (*Eragrostis*), providing 3 to 4% CP in winter and 10 to13% in

summer, or a new cultivar of Kleingrass (*Panicum coloratum*) in development, which can provide up to 6 to7% CP in winter. Both also have excellent soil stabilization qualities. The rotation is to graze Lovegrass in spring or early summer when protein is high, then to move to Kleingrass in late summer/winter. In winter, they supplement every 3 days with 2 lb of sunflower pellets/cow/day (consisting of meal and hull at 31% CP) plus salt. After grazing these grasses, cows are often sent to crop stubble, continuing to supplement with either sunflower pellets and some pearl millet or oat hay to maintain condition. During dry periods grazing grain sorghum and sorghum/sudan grass hybrid mixes (50:50) has been met with better success than love grass. They have tried chicory, but don't really have enough moisture to get a good yield. Some dairies to the east of Santa Rosa do use chicory.

Stocker Research:

Pastures consist of alfalfa-grass mixes. It costs approximately $45 to 50/ac to establish a pasture (this includes $20 to 25/ac of glyphosate). In most frontal grazing regimes, cattle are moved every other day. They are also given cracked corn as a daily supplement (1 to 1.2% of body weight) on some ranches and every other day on others. This is to maintain gains and manage ammonia feed-back in the rumen.

The calves in this photo (top right) are 6 months old and weigh about 330 lb (they were weaned at 4 months at 240 lb). They are grazing a 50:50 blend of grain sorghum and sorghum-sudan grass hybrid seeded at 13.5 lb/ac at a cost of $20 to 25/ac to establish (half the cost of perennial pastures). The calves appear to prefer the hybrid, however, they don't clean it up, which is ideal because the residue remaining stabilizes the soil. Weaned calves are on chopped hay for the first 10 days. The sorghum mixture provided gains of 1.4 lb/day and is stocked at 1,800 lb/ac (live weight) at a cost of gain of $0.20/lb. Calves are moved every other day. The soil qualities: pH: 6.6 to 6.8; organic matter 1.2 to 1.5%; phosphorus: 10 to11ppm; sulfur: low; and nitrogen is quite variable. The limiting factors for alfalfa are: phosphorus, sulfur, boron, cobalt, and water.

The 660 to 880 lb steers shown in this photo (bottom right) are also grazing the sorghum-sudan grass mixture. They were born in Nov/Dec and weaned April/May. They grazed winter annuals for the winter (May to Sept), then were on alfalfa until Dec/Jan, when they started on the sorghum mixture. Sorghum mixtures are used more than corn due to the lower moisture content and the waxy cover – which maintains quality as winter progresses. At the time of this photo, they had been grazing the sorghum mixture for two months. They gained 1.8 lb/day in the 1st month (Dec), 1.7 lb/day on 2nd graze (Jan), and estimated about 1.5 lb/day on the 3rd and final graze (Feb). The sorghum mixture is testing 58% TDN and13% CP. The steer on the left is an example of a less than ideal body type, whereas the steer on the right is an example of a good body type for grass finishing; small frame, wide in the gut with short narrow canon bones. The steer on the right is close to slaughter weight.

The station has also tested a sorghum-sudan grass hybrid mixed with foxtail millet for grazing and proso millets for hay. Proso millet hay is yielding 2,250 lb/ac with 80-82% DM.

Photo below: Calves are 6 months old and 330 lb.

Photo below: 660 to 880 lb steers (steer on right is more suitable for forage finishing).

Day Four *(Thursday, March 6, 2008)*

La Bertha Ranch (near Santa Rosa, La Pampa Province)

This ranch started in 1952 with a Spanish settler, and is managed today by three brothers and one cousin who are trained in agronomy and veterinary medicine. They have produced finished beef for decades and will add a cow/calf herd (paying $300/head for 470 cows) in order to have more control over the finishing herd genetics. They feel they'll need high quality calves within the next 3 years. They lease low land to the south to grow the calves. The breeds here are British (Black Baldy) crosses. They have also produced grain for the past few years.

Their average rainfall is 28 inches annually, but can be as high as 36 to 40 inches, with winter being the driest season.The soil is primarily sand (65%); the remainder is clay and ash. However, the 1st layer is a 2 meter deep layer of calcium carbonate that can accumulate 4 to 6 inches of water in the rooting zone.Water quality is not an issue here, except for high sulfates in most ground water.

Pastures account for 80% of their forage supply. They plant either 100% alfalfa or alfalfa-grass mixes, and are kept for 4 to 5 years. They use zero-till openers to plant all pastures into sunflower stubble in early March with 7 lb/ac alfalfa, 2.7 lb/ac tall fescue (Lolium arundicea), 1 to 2 lb/ac meadow brome-like grass. They graze all year, but alfalfa grows best in spring and fall (growth is limited in summer and negligible in winter). Alfalfa pastures produce 10,800 lb/ac in good years and 5,400 lb/ac in bad years. Pastures are grazed an average of 6 to 7 times/year, and up to 9 times/year in good years.Typical pasture shortages are in winter (July - September). To supplement this shortage, fescues are added to pastures to extend the grazing into the winter and to balance energy with the high protein alfalfa. Because feeding costs are increasing (including protein supplementation), they are trying to get more from the pasture. They continue to try to increase grazing efficiency. On-ranch trials have resulted in an increased stocking rate, but reduced average daily gain (ADG) and pasture longevity - from 5 or 6 years to 4 or 5 years. A typical stocking density is 383 head on 15 ac for 2.5 days, with 35 days rest. This intensity is reducing alfalfa persistence.

All calves are purchased in fall/winter.They are sorted by weight upon arrival, with heavy/older calves going to pasture and lighter/younger calves to pens.The target ADG is 1.3 to 1.4 lb/day in pens or winter pasture to reach a weight of 660 lb by spring. The target ADG is 1.5 to 2 lb/day in spring and 0.9 to 1.3 lb/day in summer. In fall they sort animals into two groups: those that are 840 to 880 lb (for the domestic market) and those that are 880 to 990 lb (for export). When pasture shortages are too great, they simply cut short the pasture phase and pen feed calves on corn silage, hay, extra grain and supplements (soybean meal). Sorghum is not as successful in this region as other species.

Pastures are rotated into annual crops for at least 6 years in the following order: soybean, corn, sunflower, small winter annual, soybean, and then maybe corn or another annual depending on prices. However, they are considering fragmenting the land to continuously crop annuals on higher quality soil and have continuous pasture on lower quality soils.

Photo below: Two year old pasture on La Bertha Ranch.

Hay production is not a big priority on this ranch. Their typical alfalfa/grass hay reaches 16% CP and ≤60 TDN. Their feeling is that "the potential is 0.9 lb/day on hay that would produce 1.8 lb/day as pasture." However, they are considering producing pasture silage as their experience increases.

Photo below: Examples of alfalfa/grass bales that are produced.

Photo below: 660 to 880 lb steers.

Day Five *(Friday, March 7, 2008)*

Nueva Castilla Ranch (Trenque Lauquen, Buenos Aires)

This ranch was established in 1883 by the family of Eduardo Pereda (the current owner). The ranch operates 7,500 ac, half of which is in crop production, and half in pastures. Pasture paddocks are divided into 370 ac pieces and some are further sub-divided into 30 ac paddocks, bounded by electric fences. It is located at a 36 ° 02' latitude S and 63 ° 02' longitude W (approximately equivalent to the state of Oklahoma). The location of the ranch is shown by the red arrow on the map above, and the 8 partnering cow-calf operations in yellow.

In 2003 the land rotation was 5 years of annual crops followed by 5 years of pasture. Ranch management has changed in recent years. They have:

1. Classified soils by production potential (A, B, and C) to maximize the use of each soil type for the production for which it is best suited. Crops are grown on good soils, and cattle on poor soils.
2. Eliminated production overlaps and competition.
3. Added value to corn.
4. Maintained the number of cattle owned by the operation (although not all animals are located at Nueva Castilla Ranch).
5. Taken an inventory of all animals on the ranch twice/year.

Data collection and record keeping is very important at Nueva Castilla Ranch. They have historical production data as well as future targets based on improvements to the land, and satellite imagery for indexing pasture growth.The impact of improved management on ADG and stocking densities over the past 20 years are shown in the table below.

Historical Stocking Densities and ADG for Nueva Castilla:

Years	Stocking Density (pounds live weight/ac)	Average Daily Gain (pounds/day)
1988 - 1993	385	593
1993 - 2002	491	523
2007	665	591
2008	1053	604

The administrative structure of this ranch is quite organized. They have a Crop Team, a Cattle Team and an Administration Team. Because the cows are on leased land elsewhere, part of the Cattle Team work off the ranch.

Their normal rainfall is 32 inches; but in 2007 they received 28 inches.The soils consist of 70% sand, 15% silt, 15% clay, and 1.6% organic matter.

Cow Program

There are 9,000 cows on 8 cow-calf ranches located across Argentina that supply the Nueva Castilla Ranch with calves for fattening. The cows are Braford (Brahman x Hereford crosses) with ¼ Cebu, ¼ Brahman, ½ - ¾ Hereford or Red Angus. The first-calf heifers are bred at 15 months of age to Red Angus bulls, with a conception rate of 92%. They average 6 to 7 calves/cow, and cows without calves are automatically culled; averaging a cull rate of 20%. Culls are fattened and sold from the ranch on which they are raised; however, very thin cows come to the main Nueva Castilla ranch in Trenque Lauquen for fattening. Calving is unassisted except for first-calf heifers. Calves from weak and/or thin cows are weaned early, followed by calves from first-calf heifers. Early-weaned calves are given access to shade. Weaning takes place around December 15th, with a weaning rate of 95%. Bull calves are castrated with a knife at calving, when flies are few.

Recently, Nueva Castilla received 3,000 calves (from Hamcuo in the Andes mountains), which are the early-weaned calves (weaned at 80 to 90 days of age and 160 to 250 lb). They are transported in "cattle liners," which are double deck trailers with180 calves/truck, similar to the one shown in the photo below. Transportation is from as far as 900 km away (a 20 to 24 hour trip), and calves are transported without feed or water. They claim none of the calves die during transport, however, they lose 0.8% after arrival in Dec/Jan to Feb/Mar. Calves are weaned on the truck, and vaccinated for clostridial and pulmonary diseases before transporting. Calves are given vitamins and minerals upon arrival and fed in pens.

Photo below: Cattle transport.

Stocker Program

The ranch's goal is to have all animals go to pasture in groups at the same weight. Upon arrival, calves are sorted and weighed; heavier steers go directly to pasture and the lighter animals are fed in pens initially, and then sent to pasture.This allows the ranch to finish all animals within 12 months of weaning.

Calves are all weighed again 70 days after arrival. Then a smaller group of calves are selected to be used as benchmark calves - these are re-weighed every 90 days thereafter. The calves are fed rations in the pens. The light steers and heifer calves (<300 lb) get 50% whole grain corn, 20% corn silage, 30% sunflower meal pellets, plus minerals & vitamins. They are fed twice a day without restriction. The trough is usually empty in the morning, but since they eat less during the hot days, dry matter intake averages about 3% of body weight. The heavy calves (>300 lb) are fed 10 to 15% whole grain corn, 68% corn silage, 20% screenings or sunflower meal pellets (15% CP and 10% CF), 2% mineral, plus vitamins. Sometimes crushed barley screenings (4 to 5%) are added. The concept is that in 3 to 4 months the lighter calves will match the heaviest group in weight (by achieving 2 lb/day gain).

Pen feeding has allowed them to achieve the same degree of finish achieved even when pasture conditions are less than optimum (dry summer). This year they were able to sell lightweight steers at 880 to 950 lb live weight that were finished.

They have 22 pens in total, each approximately 2.5 acres in size, with 400 head in each pen and 200 meters of bunk space. They use a 3 inch pipe to bring water to each pen from the windmill site.

A unique characteristic of this ranch is that the infrastructure for the pen feeding is not permanent. They are mobile units that are typically moved every 2 years. They locate the pens on sandy soils, knolls, or land where production is limited and add

nutrients to improve future crop production. Bedding is not used, so manure is minimal and easily leveled or spread on-site with a blade.

Below is an example of pen feeding using portable pens with polyethylene troughs. There are relatively few rodent issues (except for armadillo) because there are many predatory birds (hawks, eagles, vultures). This photo (below right) illustrates the trench used to catch armadillos around a corn silage pile.

Photo top left: Mobile pens. **Top right:** Armadillo trap and corn silage pile. **Bottom:** Pen watering trough.

The calves (bottom photo) arrived 10 days ago and were the light heifers in pens (<300 lb). The steers above (top left photo) weigh between 300 and 400 lb and are fed a ration of 10 to15% grain, 68% silage, 20% sunflower meal, 2% mineral, and vitamins. The target gain is 2 to 2.1 lb/day in the pen. In 3 to 4 months calves will reach their target weight and match the heavy group. At that time, they'll be moved to a grass and winter annual pasture (without supplementation), with a target gain of 1.4 lb/day.

They don't observe a lot of problems in the transition from pens to pastures. As long as diets consist of at least 30% silage on a dry matter basis the transition is not a problem. However, they do try to put calves on more grassy pastures rather than alfalfa.

Although it is not the optimum grass for livestock production, some producers (including Nueva Castilla Ranch) still grow love grass because of its erosion control, however, it's often planted with wheatgrass to improve feed quality. The majority of producers use newer and higher quality species for grazing and utilize new technologies for erosion control. The heifers in the pens above will go to love grass and a winter annual pasture for the winter and be finished in pens (note: heifers generally finish more easily and thus are never finished on grass as they tend to become to fleshy on high quality pastures).

Chart top left: Chart used to track animal performance and to measure their progress towards their target weight.
Photo top right: Sunflower harvest at Nueva Castilla Ranch.

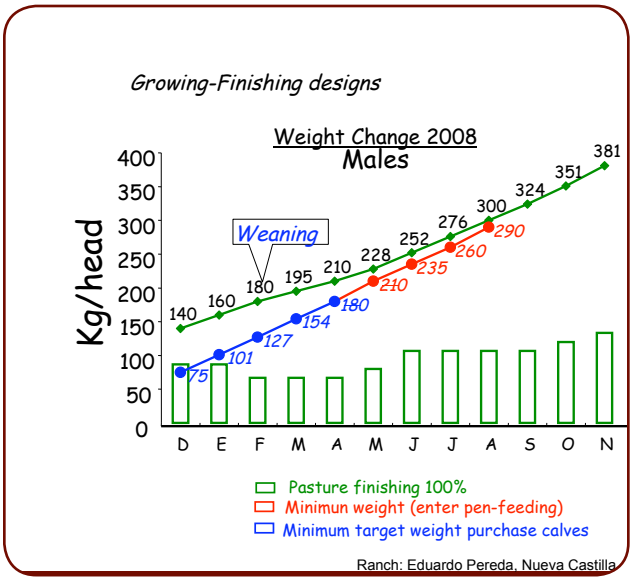


Photo right: Living quarters for grain harvesting crew.

Finishing Program

Forage availability and demand (based on DMI of 3% of body weight) is estimated every 15 days. Stocking rates are adjusted accordingly. They tend to leave the same animals in the same paddock for 3 to 4 months at a time.

The pasture shown here (right) was seeded last spring with a triticale cover crop, 5.4 lb/ac alfalfa (fall dormancy rating of 6), 4.5 lb/ac tall fescue (endophyte free), with 0.5 lb/ac white clover. Diammonium Phosphate (DAP) was banded beside the seed at a rate of 135 lb/ac. This pasture will last 3 to 3.5 years. The triticale is grazed first at 60 to 75 days after seeding, then again for 3 more passes after 20 to 30 days rest. The target utilization is 50% of top growth. The alfalfa population was low because 2007 was dry and the triticale cover crop was too competitive.The target stock density for this pasture was 2,400 lb of live weight/ac, but dry weather in 2007 has kept them at 630 lb/ac. Alfalfa density in this field appears low because it's young; however, it experienced a moderate spring frost in November (45 days later than normal). Summer conditions (Dec/Jan) have been drier than normal.

Photo below: alfalfa, tall fescue, white clover pasture.

Additionally, the pasture is on a high clay soil (producer experience shows that alfalfa competes better on sandy soil). Pastures are terminated when weed populations become too high or alfalfa populations too low. Even under normal conditions when the alfalfa population is higher, bloat control agents (proloxalenes) are seldom used.

The calves in the photo below are British-type calves from first-calf heifers and Red Angus bulls. The black calves were purchased from the province of Corrientes; they are from older cows with Brahman influence – thus the Brahman features on the calves. They were born May/June 2007 (now 7 to 8 months of age). They were weaned at 3 months (170 to 200 lb), pen fed for 2.5 months, and have been grazing for the last two months since December 15, 2007. They will stay on this pasture until they're finished. They weighed over 400 lb last week (late February) and are gaining 1.1 to 1.3 lb/day on this pasture. Their final target weight is high at 880 to 1,000 lb. These calves will move to the next paddock in 3 days.

Photo below: British type calves.

Bulls, Steers and Replacement Heifers

On average the cows will have 6 to 7 calves during their lifetime. The offspring below are the result of crossing purebreds with mixed crosses. They are 17 months old and will be sold between early March and May. Replacement heifers cannot be shipped to southern Argentina due to foot and mouth disease restrictions, therefore, all these heifers will stay within the Buenos Aires province. Although they ship calves long distances (up to 900 km), cows are not shipped as far. Of the replacement heifers, about 32% are fed on pastures, 23% are fed in pens, and 45% are grown in pens & pastures. Replacement heifers are bred at 15 months of age (October through December) – approximately one month prior to the cows – achieving a conception rate of 80%. All breeding is by bull service with the exception of some artificial insemination to produce bulls for their own herd. Undesirable bulls are sold at a discount into the meat market.

The alfalfa-grass pasture shown here was seeded in 2007 with a triticale cover crop and fertilized with 180 lb/ac DAP. The perennials remain protected under the cover crop canopy for the winter, and the cattle graze the triticale cover crop instead. Typically alfalfa is the dominant plant in the first year and tall fescue in the second. However, in this case, the tall fescue and *Cynodon* (a warm season grass similar to Bermuda grass) have taken over within the first year because of hot, dry weather. The pasture stocking rate target was 2,600 lb of live weight/ac to achieve a gain of 1.8 lb/day.

True cost of production (COP) is difficult to calculate as many costs are not included, and not known (sometimes intentionally). At this ranch, they estimated COP to be $0.14/lb gain in 2006; however, COP was higher in 2007 ($0.18/lb gain) because of the dry conditions. This COP includes all aspects of livestock management, inputs, infrastructure and labour. However, it doesn't include land rental, tax or opportunity cost. A weaned calf was worth $0.39/lb live weight in 2007.

Day Six *(Saturday March 8, 2008)*

International Institute for Agricultural Technology (INTA) Experimental and Extension Station (Santa Rosa, La Pampa)

Dr. Anibal Pordomingo is a rancher and scientist at the National Institute of Farming Technology at the Experimental Station at Anguil near Santa Rosa Argentina.He specializes in grass finished beef in his research and on his ranch. He finishes beef using a year round forage chain with alfalfa-grass mixtures and annuals for grass finishing rations. Dr. Anibal Pordomingo has published many refereed papers and articles on grass finishing beef animals in many North America publications, including the Stockman Grass Farmer. He has been a speaker at many conferences around the globe and has been a featured speaker at several international grass-finishing conferences.

Dr. Pordomingo reviewed numerous research projects for the group as well as future research intentions. It should be noted that although typical feeding strategies in Argentina use grain as a supplementary feed, the research station does not, due to the high cost.

Below are some of the research highlights:

Omega-3 fatty acids and conjugated linoleic acid (CLA) levels in beef:

- Preliminary research suggests that heavier animals may be less desirable from a nutritional standpoint as they tend to have lower Omega-3 levels.
- Feeding sorghum, corn and legumes tends to decrease Omega-3 and CLA levels, while cool season grasses tended to increase CLA levels because of their higher linoleic acid content.
- Research has been unable to determine if animal gender has any influence on Omega-3 or CLA levels in the meat.
- Supplementing with corn (cracked) for the first 4 months or last 5 or 9 months of the finishing period lowered CLA levels, but had no significant effect on the ratio of Omega-6 to Omega-3 fatty acids. Their study also showed that the optimum time to pen feed calves is in fall when forage availability is low.

Soluble sugars in forage:

- Research shows that the level of soluble sugars in the forage is more influential than the level of acid detergent fibre (ADF) in determining the suitability of a feed for finishing animals.
- Typically lower ADF = higher energy content and soluble sugars in the feed; and more soluble sugars = higher average daily gain (ADG); lower ADF = higher dry matter intake; and higher dry matter intake = higher ADG.
- However, acid detergent fibre (ADF) can't entirely predict gains – it's a unit of measure more suitable for perennial and warm season species.
- Winter annuals have soluble sugar levels 3 times higher than that of alfalfa, thus they have higher average daily gains (ADG's).
- Timing grazing events to when forages contain the highest levels of soluble sugars can increase gains. For example, delaying grazing of winter annuals to times of peak soluble sugar levels (either peak sunlight periods of the day or long photoperiods in season) can increase gains from 2 to 2.1 lb/day.

Antioxidants in beef:

- Research has shown that beef from animals finished on winter annual pasture has 3 times more antioxidants than those finished on grain.
- In addition to nutritional benefits, antioxidants slow meat darkening (oxidation) after exposure to air – a benefit for storefront displays. In theory, this will also slow color change when cooking; a steak that appears rare to medium rare is already cooked to medium because it resists the change in color more than grain fed beef. They continue to study the effects of feeding strategies on composition and the nutraceutical profiles of beef.

Chemical composition of alfalfa:

They also studied the effect of the growing season and fall dormancy rating on the chemical composition of alfalfa. The study

included 9 varieties of alfalfa divided into 3 groups of fall dormancy (fall dormancy >8, fall dormancy 7 to 8, and fall dormancy 4 to 6). Results showed that fall dormancy plays no role in alfalfa chemical composition, however there was a significant seasonal effect.The alfalfa had higher ether extract levels as the season progressed. This was explained by increasing phospholipids levels in plant membranes as the ambient temperatures changed.

Feeds that improve fatty acid profiles:

- The target ratio of Omega-6 to Omega-3 fatty acids should be 4:1 or less for improved human health.
- Typically, grain finished beef has 18 times as much Omega-6 compared to Omega-3 (a ratio of 18:1).
- Pasture finished beef has 2 to 4 times as much Omega-6 compared to Omega-3 (a ratio of 2:1 to 4:1 is ideal).
- Dr. Pordomingo has shown similar Omega-6 to Omega-3 ratios between pen finished (with some supplementary grain) and pasture finished cattle. However, conjugated linoleic acid (CLA) levels did drop in grain supplement diets.
- Cool season plants will add more Omega-3's and CLA's than warm season plants (C4) because warm season plants produce less linoleic acid, a precursor for CLA's.
- Grasses will add more Omega-3's and CLA's than legumes.
- Cool season annuals will add more Omega-3's and CLA's than perennial forages.
- In general, the Omega-3 and CLA levels are best in cool season winter annuals, followed by perennial grasses, and then perennial legumes.

Future research

Future research includes comparing the nutritional profile of meat between breeds, including Angus, Hereford, and Bonsmara (a breed introduced because of its suitability to the western provinces of Argentina). They are also considering adding more Brahman genetics.

Santa Cecilia Ranch - La Marca Del Shorthorns (*Breeder)*, 100 km southeast of Santa Rosa

This Shorthorn breeding ranch is owned and operated by Hector Mario Eyherabide and was established by his family early in the 20th century. The family began breeding shorthorns after research from Australia showed that shorthorn meat is more tender. The ranch originally produced over 300 bulls per year; this year it will be reducing production to 120 bulls. The owner has partnered with a few cow/calf operations to trade calf crops (heifers and steers) for bull service. All bulls are produced through natural breeding and sold at 15 months; 80% are used in cross breeding programs.

The bulls are managed in 30 to 40 head/pen groups, with a feeding strategy of moving bulls from pen to pasture, and then back to pen. However, a new feeding regime will eliminate pen feeding due to high feed costs, and instead supplement pasture diets with grain or silage corn at 30% or less of the diet on a dry matter basis. Steers from their bulls finish in 512 days from wean to harvest with 1.6 to 1.7 lb/day gain. The typical mating season is completed in 75 days, but they have finished as early as 45 days. Usually, three bulls at two years of age are supplied for every 100 cows.

Their bull selection criteria are as follows:

- Each bull must be more than 440 lb live weight in April (born in Nov/Dec); and
- Their target weight must be reached at 2 years of age. In order for this to occur, their ADG must not exceed 2.2 lb/day and they must not fatten. To maintain cash flow, they sell half of the bulls at 2 years (those produced through artificial insemination) and half at 15 months (those produced through natural breeding).

On this ranch, they have noticed that Shorthorn x Angus and Hereford x Angus crosses have better weight gains and final weight than Angus x Angus crosses. Cows are 1,050 to 1,100 lb when fresh (post partum). The target frame size is 3 to 3.5 for cows and 3.5 to 4.5 for bulls.

Pastures are seeded with 5.4 lb/ac of alfalfa, 2.7 lb/ac of orchard grass, and 2.7 lb/ac of a meadow brome-like species. The typical pasture lasts approximately four years, by which time the alfalfa level has declined significantly.

Photo top right: Dr. Pordomingo (I NTA), Glenn Friesen (MAFRI), Hector Mario Eyherabide (Owner).

Photo middle right: 18 month old shorthorn bulls.

The shorthorn bulls to the right are 18 months old; the higher quality 15 month old bulls are currently elsewhere providing bull service. Some bulls are sent to the southern tip of Argentina to breed with local cows (primarily Herefords) to increase milk production and weaning weights to 440 to 500 lb. The southernmost region of Argentina is known for cooler temperatures, more droughts, and some blizzard activity, so higher weaning weights are desirable.

El Carmen Ranch (Santa Rosa, La Pampa)

El Carman is a family owned ranch currently managed by Carlos Prado. This is a unique ranch as they purchase agronomic support from an outside private consulting company called Consorcios Rurales de Experimentación Agricola (CREA). Approximately ten ranches in this region collaborated to hire CREA to provide marketing and agronomic support. There are multiple similar groups across Argentina. The groups meet once per month, to discuss solutions or prepare questions for the consulting agronomist. The agronomist meets regularly with each ranch to provide information on various topics. The consulting firm is also encouraged to collaborate with university and government researchers to conduct on-ranch research.

Like Neuva Castilla Ranch, this ranch is also about to change its livestock business. Due to dry conditions, falling cow prices ($250), and increasing feed costs they are significantly reducing the cow herd and expanding the stocker herd. They are purchasing 1,195 heifers/steers for the 2008 wintering period. The target is to finish 1,000 by next fall with a gain of 2.2 lb/day.

Weaning weights range from 370 to 400 lb; calves are then pen fed for a few months and sent to pasture. In pens they are fed hay at 5% of body weight (on a dry matter basis) for 30 to 40 minutes, two times a day. Then they are moved to another area with whole corn and sunflower meal, with the goal of maintaining fiber levels in the diet. The steers are then moved to pasture and the heifers kept in pens to finish. Because the steers don't gain for 15 to 20 days after leaving the pen, they are fed whole grain (0.5 to 1% of body weight depending on pasture conditions) while on pasture during the entire wintering period (4 to 5 months) to catch up to the heavier calves.

Photo below: New arrivals.

The calves pictured here arrived in mid February (2 weeks ago) from approximately 500 km southwest of this ranch. They were weaned on the truck and put straight onto grass. They are all from first-calf heifers bred to Red Angus bulls.

Pastures are seeded with 5.4 lb/ac alfalfa, 1.8 lb/ac tall fescue, 1.8 lb/ac orchard grass, 1.8 lb/ac of a meadow brome-like grass, and 0.5 lb/ac white clover. Approximately 135 lb/ac of DAP fertilizer is added at planting. They graze each pasture a total of 19 times/year - every 18 to 20 days in summer, and every 40 to 50 days in winter. The ranch has collected pasture yield averages over the past 10 years by hand clipping forage samples. This data is used to benchmark yields and calculate grazing changes. Typical yields for alfalfa-grass pastures are 71 lb DM/ac/day in summer and 5 to 6 lb DM/ac/day in winter. Typical winter annual yields are 13 lb DM/ac/day in winter. Because of the difference in winter yields between perennials and annuals, they put more feed efficient cattle on alfalfa in winter (heifer calves gain 1.1 lb/day and breed at 15 months). Total alfalfa yield is approximately 7,200 lb/ac/yr. In this region, the alfalfa density is main-

tained over time because the hot summers set the grass back. However, they reseed pastures every 3 to 4 years, and they do occasionally broadcast white clover for ground cover. Proloxalene (for bloat control) is used infrequently – none was used in 2008.

The average stocking rate on this ranch is 1,012 lb live weight/ac in total but the effective stocking rate is 2,032 lb live weight/ac. Their average stocker size is 744 lb. Animals are finished on pasture while supplementing with grain corn at 1 to 1.5% of body weight (on a dry matter basis). Silage is not used. This feeding strategy provides an ADG of 1.8 lb/day.

Using a pen feeding strategy to take the animals from 350 to 600 lb provides an estimated return on investment (ROI) of 0 to 4%. In comparison, their pasture feeding strategy provides an ROI of 30%, netting $110/ac.

Overall, the ranch nets $150,000/year on 2,600 head. The cost of production is $0.39 per lb. However, this cost doesn't include the cost of the land, which used to be $110 to 113/ac. Rent is not included as it is quite variable (due to increased competition from cropland). For reference, corn yields in this region are approximately 6,300 lb/ac (110 bu/ac) with an annual rainfall of 28 to 32 inches.

The steers pictured below are Braford x Hereford cross and arrived light at 290 lb. They were pen fed for three months and then pastured. These steers represent the smaller animals on the ranch (about 20% of the herd was light) but they will be marketed soon. Most of the steers are sold by March.

Photo below: 290 lb Braford x Hereford crosses on two year old alfalfa/grass pasture.

Commodity Group & Marketing Visits

Day Seven *(Monday, March 10, 2008)*

Instituto De Promocion De La Carne Vacuna Argentina (Argentinean Beef Promotion Institute, Buenos Aires City)

The Argentinean Beef Promotion Institute (ABPI) was initiated after Argentina's economic collapse in 2001. Another commodity group did exist prior to 2001, however, producer and private industry interest moved away from the former organization. The development of the Institute was slow, with staff actually beginning work in July 2004. The ABPI board of directors consists of 8 members – four chairs from the national producer groups (of which one is the elected chair), three representatives from the processing industry, and one government representative (typically the Secretary of Agriculture) to act as the auditor.

The organization manages beef promotion, research, sanitary and quality control, and communication. The ABPI is the only livestock group to collect a check-off in Argentina, with 70% of their funding coming from producers, with the remaining 30% from the processing industry (slaughter facilities). The ABPI collects 1.8 pesos ($0.558) per bovine slaugh-

tered (nothing is collected during live trading). This is matched by the federal government, up to 25 million pesos. The ABPI is directly involved in research, spending 4 million pesos each year on research (primarily in the International Institute for Agricultural Technology, visited earlier in the trip). The ABPI maintains all intellectual property. Additionally, ABPI contracts economic, scientific and marketing projects to third party groups.

Some of the largest challenges faced by the ABPI include the low market value of beef. This has been attributed to government interference in export policy, alleged government price setting, a fledgling black market, increasing costs of production (feed and land values) and the unpredictability of raw product supply.

Marketing and Promotion

Current export markets consume 15% of beef produced in Argentina, of which 72% is frozen and 23% is chilled. Major markets are boxed beef to Russia and the Hilton Quota for the European Union. The Hilton Quota consists of only the best cuts of the carcass (the loin), and although it only accounts for 10% of all export volume, it's valued at $18,000/metric tonne. The Hilton Quota has been one of the new marketing strategies to compete with Brazil's "high volume, low value" products in the Russian marketplace. These cuts are sold chilled and arrive within 18 to 20 days of leaving the processing facility (the vacuum packed beef can be kept for 80 to 90 days without spoilage).

The carcasses shown below have had the portion destined for the Hilton Quota removed. This is the highest valued area of the carcass, along the upper backbone including the loin. The missing loin is highlighted on the right.

Sanitary and Quality Control

The Argentine population prefers lean, tender beef. As a result, the industry strives to slaughter young animals, as this is the primary factor in meat tenderness. The grading system has two levels of classification, with the primary objective being to provide incentives for quality (i.e. tenderness). The classification system categorizes each animal as cow, heifer, or steer; then an additional grade of 1 to 5 is assigned. This system was designed by large retailers (who provide 17 to 20% of beef consumed) to add structure and a financial incentive for higher quality animals. However, the reality is that 80% of the beef consumed in Argentina is purchased at the local butcher shop where buyers have little interest in this classification system.

The finishing industry continues to see significant shifts in production practices. Over the past decade, the grain finished feedlot industry has grown to represent approximately 7% of beef produced in Argentina (consuming 25% of Argentina's corn crop). However, all of this production will be consumed domestically until export markets open. The current market value for beef is $0.45/lb live weight.

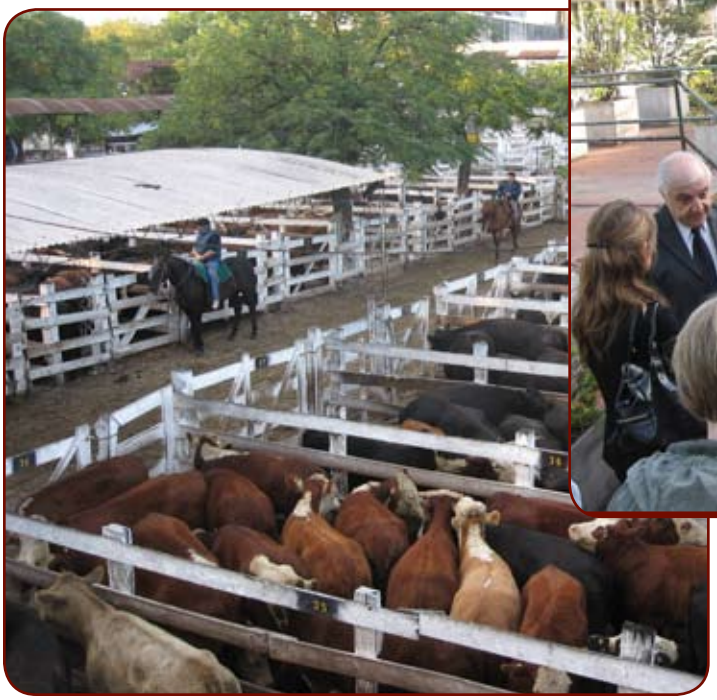
National Sanitary and Quality Agri-Food Service (SENASA)

The SENASA is the federal government branch responsible for inspection and quality control. SENASA has also collaborated with private industry to develop a unique record-keeping system that provides carcass information to each individual producer. For a fee, the producer can request the information on carcass weights, yields, and grading. This service is highly promoted for its ability to help herdsmen improve production and finishing rates. All animals born after 2006 are required to register with SENASA using two specific tags (one tag and one button). The tag lists country of origin, ranch name, calf number and security number; while the button records the producer name and ranch location.

Day Eight *(Tuesday, March 11, 2008)*

Mercado De Liners Auction Mart (Buenos Aires City, Buenos Aires)

The Mercado de Liners (livestock auction) is the largest livestock auction mart in Argentina. It was formerly a state-run operation marketing cattle, sheep, pork, and horses. It was privatized in 1992 and over time market forces have narrowed the focus to cattle sales. It has grown to cover 80 acres of property on the outskirts of the city of Buenos Aires. Their website receives 30,000 visits per day from government and university staff as well as producers from across the country.This facility is reserved for marketing only finished animals to both domestic and export markets, and it sets the price for the country. However, no animals sold to the Hilton Quota are marketed through large auction facilities. Mercado de Liners currently markets animals for 16,000 producers each year, with each ranch selling an average of 100 head/yr.



It has the capacity to market 25,000 head per day, however, at the time of our visit it was selling only 8,000

per day due to low beef prices and high feed costs. It markets 17% of Argentina's cattle (down from 20%), which equates to 50 to 75% of the beef consumed in the city of Buenos Aires. The remainder is from export packers in rural areas.

The facility has a state of the art fiber optic tracking system with over 7 km of wire spread over the entire facility. The 55 auctioneers employed are connected to a central processing unit where all sale information is collected and immediately uploaded onto a client-accessible website. The auctioneers also act as brokerage firms, guaranteeing sellers a payment for a 3% commission.The number of animals sold in a particular day is somewhat unpredictable as no bookings are required. The producer must fill out and deliver a form (on sale day) from his municipal hall before the animal can be sold.

All animals must arrive between 6 p.m. the night before and 6 a.m. the day of the sale (90% arrive by 2 a.m.). Animals are weighed twice, once before sale and once after. In an average day of 8,000 head, 25 will be non-ambulatory and 5 dead. The dead are inspected by SENASA, who determine if they should be processed for food or destroyed. The pens are cleaned every day; solids are collected and applied on nearby cropped fields, and water is used to wash down the remainder (pens are not disinfected).

Processing Facility Visits

Day Four, *(Thursday, March 6, 2008)*

Small Processing Facility - Frigorifico Trenel (Trenel, La Pampa)

At the time of the tour, this processing plant was only marketing beef within Argentina, however in one year it expects to begin selling internationally. The export quota is allocated to different plants throughout the province. Frigorifico Trenel has a number of upgrades to make before they can comply with export regulations, including covering the animal holding pens and separating the domestic and international export cattle. European regulations require a facility inspection every six months.

Each day they kill about 400 head; monthly totals range from 8,000 to 9,000 head. They ship out about 700 head on an average day, but with the infrastructure expansion they will need more cattle and additional staff. The facility has three separate processing lines, and is powered by natural gas. It employs 200 people: 160 facility staff and 40 truck drivers. Once

the expansion is completed they will have approximately 400 staff. Like most packing plants in Argentina they ship chilled cryo-packed boxed beef. Grading is not by fat content; instead animals are classified by age and sex.

Day Nine, *(Tuesday, March 11, 2008)*

Large Processing Facility - Frigorifico Visom (Buenos Aires City)

Jose Tiscomia, the General Manager of the plant conducted the tour of the abattoir. The facility is expanding to include a second building for cutting, deboning and trimming of carcasses. Building One of the facility is for slaughter; they kill 3,000 to 3,500 head per week. The majority (about 65 to 70%) is purchased by the domestic market.The remaining 30 to 35% is exported to countries that allow Argentine beef imports, including Africa, all of South America and some countries in the EU. (Note: the U.S. and Canada do not accept Argentine beef imports).

The Hilton Quota is an important revenue stream for Frigorifico Visom.They purchase beef at regular prices and decide in-house which beef will be used for the Hilton Quota. Frigorifico Visom collects the premium, and uses it to market the rest of the carcass. Frigorifico Visom's Hilton Quota was reduced to less than 40% of what they previously had due to government reductions in available export quota. As a result, a lower volume of their beef is now internationally exported, so they have to choose their export clients carefully in order to maximize margins. However, the company is still investing in this plant because they think this will turn around and export markets will expand.

Chilled wet aged beef takes 18 to 20 days to get to Europe, and will remain in good eating condition in vacuum packages for up to 90 days.

A 20% increase in the prices for steers in January and February of 2008 resulted in poor supply. Heifers regularly sell for 10 to 15% more than steers, but beef demand is up so steer prices were also up at the time of our visit (March 2008).

Frigorifico Visom employs 230 people, with 100 on the kill floor. Once the expansion is completed they will hire another 100 people. The basic starting wage is about 5 pesos/hour ($1.85 CDN/hr). For the most specialized work, the top wage is about 2500 pesos/month after taxes ($924 CDN/month).

The Argentine carcass grading system is very different from the Canadian grading system. In Argentina they classify their carcasses by sex, age, conformation and fat cover. But fat cover is not measured, rather it is only visually inspected. They do not like intramuscular fat, just outer fat cover and there are no minimum or maximum standards. The following is a direct quote from the general manager of the plant "If there is intramuscular fat it's not good; it does not taste as good as grass-fed beef."

Argentina implemented a compulsory animal identification program in 2007, and calves born from now on will have to be tagged with an official tag. At the packing plant level they have a fairly sophisticated traceability system for the export carcasses and a less stringent system for the domestic carcasses. A barcode is added to the carcass based on the ear tag. The tag is magnetically read, with one code generated for each half carcass. The code provides information on the animal type and age, category, number of animals in the lot, carcass weight, and producer information.

Photo top left and right: Examples of back fat thickness of grass fed beef carcasses,

Photo bottom left: Yellow fat of grass fed carcasses, **Bottom right:** Carcass information.

Photo: The tour group at Frigorifico Visom, Buenos Aires.

Tour Attendees:

Mr. Glenn Friesen – Manitoba Agriculture, Food and Rural Initiatives, Carman, MB.

Dr. Juanita Kopp – Manitoba Agriculture, Food and Rural Initiatives, Pilot Mound, MB.

Dr. Shannon Scott – Agriculture and Agri-Food Canada, Brandon, MB.

Dr. Alan Iwaasa – Agriculture and Agri-Food Canada, Swift Current, SK.

Mr. Clayton Robins – Agriculture and Agri-Food Canada, Brandon, MB.

Mr. Bragi Simmundson – Grass-fed beef producer, Arborg, MB.

Mr. Jim McDonald - Grass-fed beef producer, Cartwright, MB.

Mr. Jonathon Bouw - Grass-fed beef producer, Anola, MB.

Tour Host:

Dr. Anibal Pordomingo

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