A Postcard from the Central Chaco of Paraguay

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In May 2005 I had the chance to visit the Central Chaco of Paraguay for the first time. I had heard about the Central Chaco many times, in the years that I have been travelling in South America.

People had always told me that it was a zone of huge potential for tropical beef production.

I had been invited to Rosario in Argentina to speak on the role of genetics for steer backgrounding and finishing at a large annual conference held by AACREA, an Argentinean grassroots organization that has a network of farmers conducting comparative analysis across the country (on a self-help basis). It has links to other CREA groups in neighbouring countries. There were 2400 people at the conference in two salons (1 with a big screen) plus 1200 on the Internet.

the drive north

After my commitments at the conference were over, I travelled north to Paraguay by car with an Argentinean friend, Beno Bustingorri, through Formosa, in the sub tropical zone of Argentina. Then it was on to Asuncion the capital of Paraguay; from there it was on to the central Chaco where we spent a few days visiting research stations and cattle properties. Our return was down through Corrientes state in Argentina thence to Buenos Aires.

loma plata

Our destination in the Chaco was Loma Plata and the Mennonite colony living around that town. Our host and guide was Helmut Klassen from the colony but now based in Asuncion. I had met Helmut previously in the Pampas of Argentina and again when I spoke at a seminar he organised for his company Quebracho Genetics in Asuncion late last year.

the mennonites

The history of the Mennonites in the Central Chaco is a book in itself. I will just briefly touch on this remarkable people in the following lines.

The Chortitzer committee is the cooperative that seems to drive all the commercial activities of the Menno colonies. Immigrants who had left Canada looking for a home where they could follow their religion and their 'non-violent' ways founded this Menno colony in the late 1920's. There are about 16000 Mennos in Paraguay.
Initially they were crop farmers growing peanuts and wheat, and then they formed a dairy cooperative until they had saturated the demand for milk in Paraguay. Now, increasingly they are moving into beef production by developing improved pastures. While in many ways their simple ways of life seems a legacy of the past, they are committed to the use of modern technologies, as the following paragraphs will reveal.

We visited an AI centre, focussing on Hereford and Brahman; from two seedstock breeding herds owned by the cooperative, but also custom -collecting Brangus and Bonsmara and other bulls for private clients.

The Brahmans were very good with good structure, muscle score and clean sheaths that South Americans require. We also visited a research station developing improved pasture and examining supplementation strategies. We also visited commercial beef producers and saw a number of breeds and crossbreeds, all in outstanding condition for the time of the year.

The first stunning fact about this zone is that the alluvial sandy soils have P (phosphorus) levels of up to 200-300 ppm. It is on the Tropic of Capricorn, so it gets v. hot in summer with huge evaporation levels and it gets cold in winter with a few frosts (but not every winter), with an annual rainfall of 700-1100mm; 80% of that falling in summer between October and April.

However before you start thinking that this is a beef production paradise you need to consider that the level of evapotranspiration is about twice the level of the annual rainfall and the underground water is unsuitable for stock water because of its high mineral content.

So water is the 'Achilles heel' of this region. In recent years lack of stock water in the autumn has led to the need to seek agistment for thousand of stock, last year being the worst in recent memory. Moving cattle off these pastures of high P and high nutrition to coastal or Low Chaco areas with better rainfall but low P has many risks, even after accounting for the cattle thieving and bush-butchering that is endemic to those zones.

There is now a strong movement to invest in methods of rainfall harvesting and storage. We saw 30 ha man-made catchments where they have built contoured, graded, water-collecting pads that allow harvested water to run to a dam with a turkey nest ('Tanque Australiano') which is used to distribute water by underground plastic pipes to troughs across the property

As mentioned previously the main breeds are from a Brahman or Hereford cross base, in many cases upgraded from criollo cattle. However today in the Chaco nearly every breed is known. We met people using Gelbvieh and Simmental to cross with their Brahman base cows. The level of milk production is reaching saturation in the country and export is difficult and we frequently saw Brahman bulls in the Holstein- Friesian herds as we drove by.
There is a big trend towards Braford (38% zebu 62% Hereford) and Helmut has introduced red Brangus (38% zebu), aiming for increased meat quality.

With such a great nutritional base I found knowledge, thinking and planning on breeding and crossbreeding very low on their priority list although it was clear that increases in profitability and efficiency would be simple to implement.

There are cattle ticks in the zone and for the past 15 years, horn fly, but with the high level of nutrition in the zone the ticks are really not a great problem apart from when tick-borne diseases cause problems. I found that their general knowledge of inherent tick resistance and control strategies for tick fevers was some way behind their pasture knowledge.

Pasture Paradise

It doesn't take long to realise that this is a tropical pasture paradise. On the better soils the pastures originally planted were Buffel grass, but that has now been superseded with Gatton Panic. The low areas are mainly planted to African Star grass. To see endless hectares covered with green Gatton Panic at the end of May is surely a joy to any tropical cattleperson.

Then they almost 'dropped' me when we turned a corner and there were paddocks full of Panic, but stunningly with 6m double rows of Leucaena not only pumping nitrogen into the soil to improve the grass but also as a direct protein supplement for the grazing animal and part of that protein 'protected' from rumen degradation. There are now about 5000 ha of Leucaena in the zone and it is clear that it won't be long before large swathes of the Chaco will be benefiting from this tropical tree forage.

So committed are they to Leucaena that in March this year they hosted a Congress on the potential of Leucaena and other legumes to boost production, with speakers from Australia and South American countries.

Economics

Well by now you'll be asking for some numbers to put this all in context from a per animal or per hectare perspective.

In the first study they conducted with Leucaena pastures, with a stocking rate of 1.7 Animal Units / ha, the production per hectare for the steers was 475 kgs /ha, in 9 months in Gatton plus Leucaena . In the same period, the steers on Gatton-only stocked at 1.1 Au/Ha or 1.7AU / ha gained 211.5 kg or 311.5 kgs/ ha respectively. Interestingly there were little differences between the ADGs per steer under each pasture regime so it is unlikely the stocking rates were near the optimum in terms of per hectare production.
So here we have some of the most productive pastures in the global tropical zone.

How much does it cost to develop these pastures?

We were told you could buy 'native scrub' (monte) for US $30-120/ha depending on location. We even heard of land for US $8/ha but far from roads. However 40% of virgin land has to be preserved for conservation (by law) so only 60% can be planted to improved pastures.

To clear the 'native bush cover' and to plant improved pastures (Panic, Star grass or other), to fence, to provide stock water and cattle yards for a 1500 ha block we were told would cost c. $200/ha.

Planting of Leucaena would require more investment once the improved Gatton Panic pastures had been cleared of the inevitable re-growth. Ultimately the person who devises a method of clearing native bush and planting Leucaena and Gatton Panic at one time will be highly successful. Table 1 follows, that shows typical beef production levels in the zone.

Forage Resources	Average Liveweight production (kg/ha/yr
Native pasture plus scrub	5-10
Improved pastures (Chaco Central)	154
Improved pasture CREA	300

Source: N Klassen (2005)

The above data (Table 1) are for grass only. The production levels labelled CREA in the above table refers to self –help farmers groups in the zone that are very committed to pasture production especially incorporating legumes. With nitrogen (protein) a limitation to higher production, the planting of tropical legumes that fix nitrogen from the atmosphere through rhizobia, has become popular in many tropical zones of the world. Legumes also provide forage of higher protein for the grazing animal to graze or browse at key points in the year

In the Chaco Central region, Leucaena planted in rows in the pasture can contribute much higher weight gains than improved grasses alone is highly beneficial. Leucaena leucocephala is the tropical legume that is making most impact in the Chaco Central. The effect is clearly demonstrated in the following table.

Table 2: Liveweight gains of steers on pasture with and without Leucaena for a short period of grazing in winter.

Pasture	*ADG per animal (Kg/hd)*
Green Panic or Buffel Grass	0.27
Above Pasture + Leucaena	0.94

It can be seen that Leucaena in rows in the pasture can contribute much higher weight gains. As well as providing high protein leaf for the animal, the Leucaena is also providing nitrogen for the accompanying grass and the effect on the whole pasture complex is highly beneficial.

Table 3: The following are some production parameters supplied by Peter Klassen and Egon Neufeld in the Leucaena Congress at Loma Plata, Paraguay in March 2005. The data are from local CREA groups.

Production Analysis	*Breeding Only (2000-2004)*	*Breeding & fattening (2000-2004)*
No of establishments	19	20
Total area of establishments (ha)	10,656	11,941
Average property size (ha)	561	603

Production Measures	*Average*	*Average*
1. Average no. of head during year	558	690
2. Average no. of Animal Equivalents (AE) during the year	432	553
3. Average stocking rate/ha during year	1.05	1.18
4. Average carrying capacity kg/ha during year	326	383
5. Average stocking rate AE/ha during year	0.82	0.96
6. % of females on the property	48.3	34.9
7. % of females culled/sold per year	18.6	18.8
8. Average weaning weight : males (Kg)	258	254
9. Average weaning weight : females (Kg)	237	244
10. Calves produced per 1000 ha	481	363
11. Total number of animals sold, slaughtered or eaten	316	208
12. Death %	2.0	2.0
13. Extraction %	57	37.37

14. Average sale weight males (kg)	290	428
15. Average sale weight females (kg)	355	426
16. Total kgs liveweight produced	88725	112391
17. Production per head/year	165	166
18. Production per AE per year	209	202
19. Production per hectare per year (Kg)	170	192
20. Percentage of total efficiency (%)*	52.3	50.5
21. ADG growing animals (kg/day)	0.452	0.454
22. Bull %	3.7	3.5
23. Area per labour unit (ha)	423	408
24. Animals per labour unit (n.)	473	499
25. Cost of production per Kg beef produced	USD 17c – A23c	USD 12c - A16c
26. Costs of production per ha	USD 29 – A$39	USD 22 – A$29
27. Gross income per ha	USD 82 – A$109	USD 72 – A$96
28. Net income per ha	USD 49 – A$65	USD 47 – A$63
29. Net gain per ha	USD 43 – A$57	USD 53 – A$71

* Kgs of liveweight at year close less liveweight at beginning of year, plus kgs of liveweight sold minus liveweight purchased, as a % of the liveweight at start of year.

Extras:	
Total pregnancy%	80.1
% Pregnant to first service	72.2
% Pregnant with calf at foot	87.2
Weaning kgs produced/cow mated	195 kgs

Summary:

My personal view is that once the water problems are solved, that this zone could produce the cheapest beef of highly acceptable eating quality available in the tropical world, and as such their systems will be extremely profitable.

They now have a local meatworks, also owned by the Chortitzer committee and export licenses to a range of countries. Paraguay has recently been declared free of foot and mouth (with vaccination) by the OIE, so more export options will eventuate.
Very quickly they can get their pastures set up for sustainable production by incorporating Leucaena with the improved grasses.

If they get their crossbreeding systems in place for higher reproductive performance including yearling mating, plus better meat quality attributes by better breed choices plus grazing management optimized and pre and post slaughter techniques in place, Chaco beef could become a favourite in a store near you. They could produce it organically quite easily.