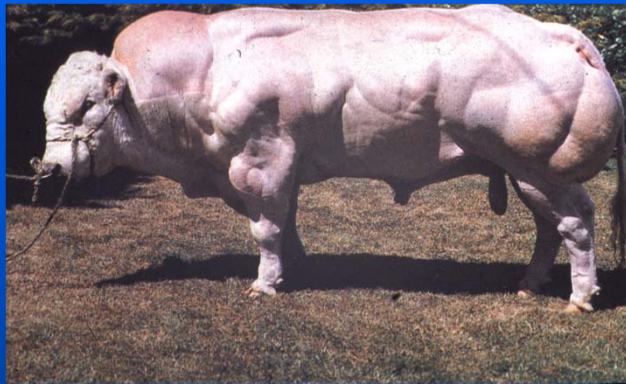


# Crossbreeding in Brazil

## Belgian Blue      Nelore



Brasil  
Aladin (BBB x Nelore) 1240 Kg at 39 month





At 3 weeks







# BBB x Nelore at 7 months – 240 Kg







# The target BBB x Nelore



# **Comparison of Belgium Blue x Nelore Cross and Braford**

**A study realized in Agribahia, Fazenda Lagoa do Morro**

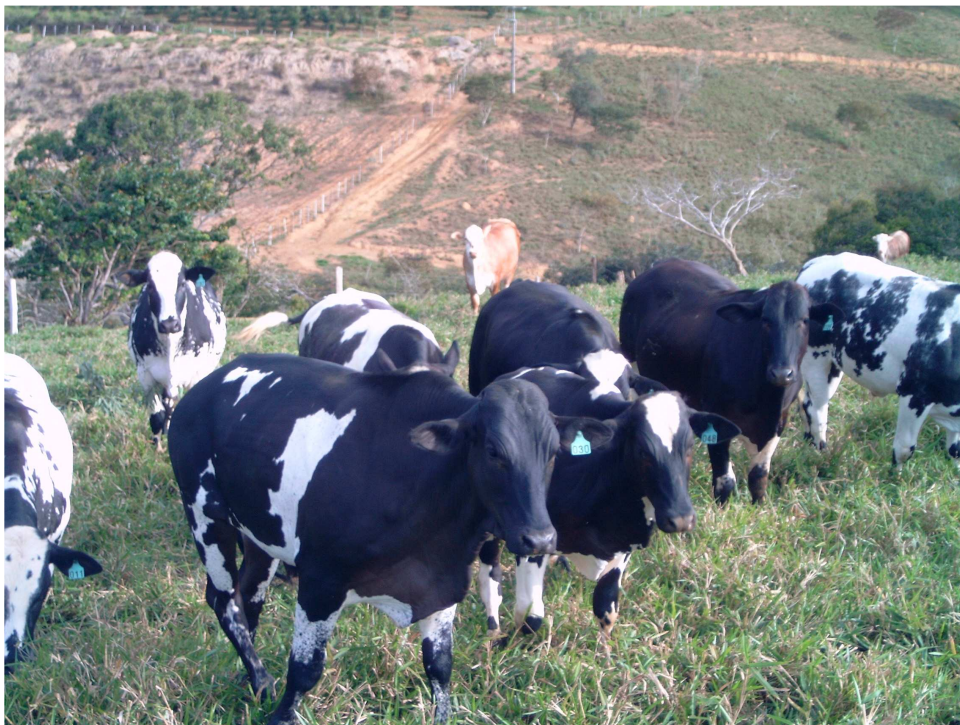
**Bahia – Brazil**

**From 2001 to 2003**

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**December 2004**



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## **Abstract**

43 Belgian Blue x Nelore cross (BBB x Nelore) (21 males and 22 females) were compared to 57 Braford (29 males and 28 females) on the AgriBahia Fazenda Lagoa do Morro (GES), Bahia State, Brazil, from 2001 to 2003. Nelore cows were inseminated with 2 Belgian Blue Bulls belonging to the Company: Belgian Blue Group. Braford animals were already kept on the same farm. Calving was normal without assistance for all cows. During the last three months of fattening, animals got a complementation of 1% of live weight per day.

The average daily gain was 938.5 g (926.0 g for the BBB x Nelore, 948.7 for the Braford) before 300 days and lower afterward due to a strong dry period reducing the total daily gain (on average 752.8 g from birth to slaughter).

10 BBB x Nelore steers and 10 Braford steers were slaughtered at an average age of 25 months.

Average live weight, carcass weight and killing out% were respectively 553.5 Kg, 286.6 Kg and 51.8% for the Braford. Corresponding values were 539.7 Kg, 292.0 Kg and 54.1% for the BBB x Nelore cross having, on average, lower live weight (-13.8 Kg), heavier carcasses (+5.4 Kg) and a higher value of killing out% (+2.3%).

The 7<sup>th</sup> right rib from each of the 20 steers, taken one day after slaughter, were dissected. Measured values of fat, meat and bone and also the weight of Longissimus Dorsi, Trapezius and Latissimus Dorsi revealed that BBBxNelore had 2.54% less fat, 6.9% less bone and 9.44% more meat in comparison to Braford.

The experiment conducted in Bahia indicated that Belgian Blue crosses were born without assistance, can survive in very dry conditions, have higher dressing out percentages than Braford with carcasses characterized by less fat, less bone and more meat. Belgian Blue is thus suggested to increase meat production in Brazil.

## **Location**

Agribahia, Fazenda Lagoa do Morro, Brejoes, Bahia, Brazil.

## **Objectives**

Comparison of Braford and BBBxNelore cattle

## **Methods**

1. 43 Belgian Blue x Nelore cross (BBB x Nelore) (21 males and 22 females) were compared to 57 Braford (29 males and 28 females) on the AgriBahia Fazenda Lagoa do Morro (GES), Bahia State, Brazil, from 2001 to 2003. Nelore cows were inseminated with 2 Belgian Blue Bulls belonging to the Company: Belgian Blue Group. Braford animals were already kept on the same farm.
2. Calving were all normal without assistance.
3. Data were obtained from the farm during weaning and fattening, starting after the birth of the animals.
4. Animal were slaughtered November 25<sup>th</sup> 2003 at Tecnocarne in Salvador (Bahia).
5. The 7<sup>th</sup> rib of 10 BBB x Nelore and 10 Braford were taken at the slaughterhouse 1 day after slaughter (26<sup>th</sup> November 2003).
6. Ribs were dissected in order to obtain: Fat, Meat and Bone and also the weight of Longissimus Dorsi (measure of inside muscular development), Trapezius and Latissimus Dorsi (measures of muscular external development).

## Results of the slaughter

Live Weight, Carcass Weight, Killing Out%

	Sire	Weight Kg	Carcass Kg	%
Braford	Clarín	540	284	0.526
Braford	Clarín	550	288	0.524
Braford	Clarín	580	311	0.536
Braford	Clarín	565	283	0.501
Braford	Clarín	540	281	0.520
Braford	Clarín	600	323	0.538
Braford	Clarín	530	279	0.526
Braford	Clarín	530	265	0.500
Braford	Clarín	535	273	0.510
Braford	Butú	565	279	0.494
		5535	2866	0.518

	Sire	Weight Kg	Carcass Kg	%
BBB x Nelore	Gib	525	281	0.535
BBB x Nelore	Gib	560	306	0.546
BBB x Nelore	Joy	555	308	0.555
BBB x Nelore	Joy	540	286	0.530
BBB x Nelore	Joy	540	290	0.537
BBB x Nelore	Joy	540	300	0.556
BBB x Nelore	Gib	542	300	0.554
BBB x Nelore	Gib	545	290	0.532
BBB x Nelore	Joy	530	287	0.542
BBB x Nelore	Joy	520	272	0.523
		5397	2920	0.541
	<b>Difference</b>	<b>-138 Kg</b>	<b>+54 Kg</b>	<b>+2.3 %</b>
	(BBB x Nelore – Braford)			

## Results of the dissections ( 7<sup>th</sup> rib of the right carcass)

Results of the dissection (Bra = Braford, BBBxNel = BBB x Nelore)

	Bra 26	Bra 5	Bra 20	Bra 25	Bra 41	Bra 24	Bra 21	Bra 23	Bra 18	Bra 15
<b>Fat (g)</b>	497	695	655	790	845	415	935	635	1110	1135
<b>Bone (g)</b>	1295	980	1220	1285	1370	1145	1050	1250	1280	1160
<b>Muscle (g)</b>	1776	1854	2616	1874	1645	1930	2000	1995	2430	2035
<b>Total Rib (g)</b>	3568	3529	4491	3949	3860	3490	3985	3880	4820	4330
<b>All Ribs (g)</b>	39 902									
<b>%</b>										
<b>Fat</b>	13.93	19.69	14.58	20.01	21.89	11.89	23.46	16.37	23.03	26.21
<b>Bone</b>	36.29	27.77	27.17	32.54	35.49	32.81	26.35	32.22	26.56	26.79
<b>Muscle</b>	49.78	52.54	58.25	47.46	42.62	55.30	50.19	51.42	50.41	47.00
<b>Longissimus dorsi (g)</b>	294	177	104	265	175	205	245	220	290	190
<b>Longissimus dorsi (%)</b>	8.24	5.02	2.32	6.71	4.53	5.87	6.15	5.67	6.02	4.39
<b>Periph. Muscle (g)</b>	413	356	491	424	360	475	405	400	435	375
<b>Periph. Muscle (%)</b>	11.58	10.09	10.93	10.74	9.33	13.61	10.16	10.31	9.02	8.66

	BBBxNel 9	BBBxNel 32	BBBxNel 3	BBBxNel 26	BBBxNel 30	BBBxNel 38	BBBxNel 37	BBBxNel 11	BBBxNel 28	BBBxNel 23
<b>Fat (g)</b>	630	605	900	555	795	860	395	730	495	650
<b>Bone (g)</b>	895	930	880	805	1115	920	1065	785	1000	1000
<b>Muscle (g)</b>	2145	2220	2520	2010	2540	2330	2875	2205	2350	2820
<b>Total Rib (g)</b>	3670	3755	4300	3370	4450	4110	4335	3720	3845	4470
<b>All Ribs (g)</b>	40 025									
<b>%</b>										
<b>Fat</b>	17.17	16.11	20.93	16.47	17.87	20.92	9.11	19.62	12.87	14.54
<b>Bone</b>	24.39	24.77	20.47	23.89	25.06	22.38	24.57	21.10	26.01	22.37
<b>Muscle</b>	58.45	59.12	58.60	59.64	57.08	56.69	66.32	59.27	61.12	63.09
<b>Longissimus dorsi (g)</b>	295	280	245	220	255	245	315	230	255	300
<b>Longissimus dorsi (%)</b>	8.04	7.46	5.70	6.53	5.73	5.96	7.27	6.18	6.63	6.71
<b>Periph. Muscle (g)</b>	345	540	480	370	670	525	630	580	520	620
<b>Periph. Muscle (%)</b>	9.40	14.38	11.16	10.98	15.06	12.77	14.53	15.59	13.52	13.87

## Results of the dissection: means and differences

<b>Braford</b>		<b>Mean</b>	
Fat (g)		771.2	
Bone (g)		1 203.5	
Muscle (g)		2 015.5	
Total Rib (g)		3 990.2	
<b>%</b>		<b>%</b>	
Fat		19.11	
Bone		30.40	
Muscle		50.50	
<b>Longissimus dorsi (g)</b>		<b>216.5</b>	
<b>Longissimus dorsi (%)</b>		<b>5.49</b>	
<b>Periph. Muscle (g)</b>		<b>413</b>	
<b>Periph. Muscle (%)</b>		<b>10.44</b>	
		<b>Mean Kg</b>	<b>Diff.</b>
<b>BBB x Nelore</b>	Fat (g)	661.5	- 109.7 g (-14.22%)
	Bone (g)	939.5	- 264.0 g (-21.94%)
	Muscle (g)	2401.5	+ 386.0 g (+19.15%)
	Total Rib (g)	4002.5	
<b>%</b>		<b>Mean %</b>	<b>Diff.</b>
	Fat	16.56	- 2.54 %
	Bone	23.50	- 6.90 %
	Muscle	59.94	+ 9.44 %
		<b>Mean</b>	<b>Diff.</b>
	Longissimus dorsi (g)	264	+ 47.5 g
	Longissimus dorsi (%)	6.62	+ 1.13 %
	Periph. Muscle (g)	528	+ 114.6 g
	Periph. Muscle (%)	13.13	+ 2.68 %

(Diff = difference BBB x Nelore – Braford)  
 (Periph. Muscle = Muscles of the periphery : Trapezius and Latissimus dordi)

BBB x Nelore bulls had 109.7 g less fat (-14.22%), 264 g less bone (-21.94%) and 386 g more meat (+19.15%) in the 7<sup>th</sup> rib in comparison to Braford bulls.

Corresponding values computed on the total weight of the rib are -2.54%, -6.90% and +9.44%.

**BBB x Nelore calf in Agribahia  
4/11/2001**



**Braford and BBB x Nelore calves in Agribahia  
4/11/2001**

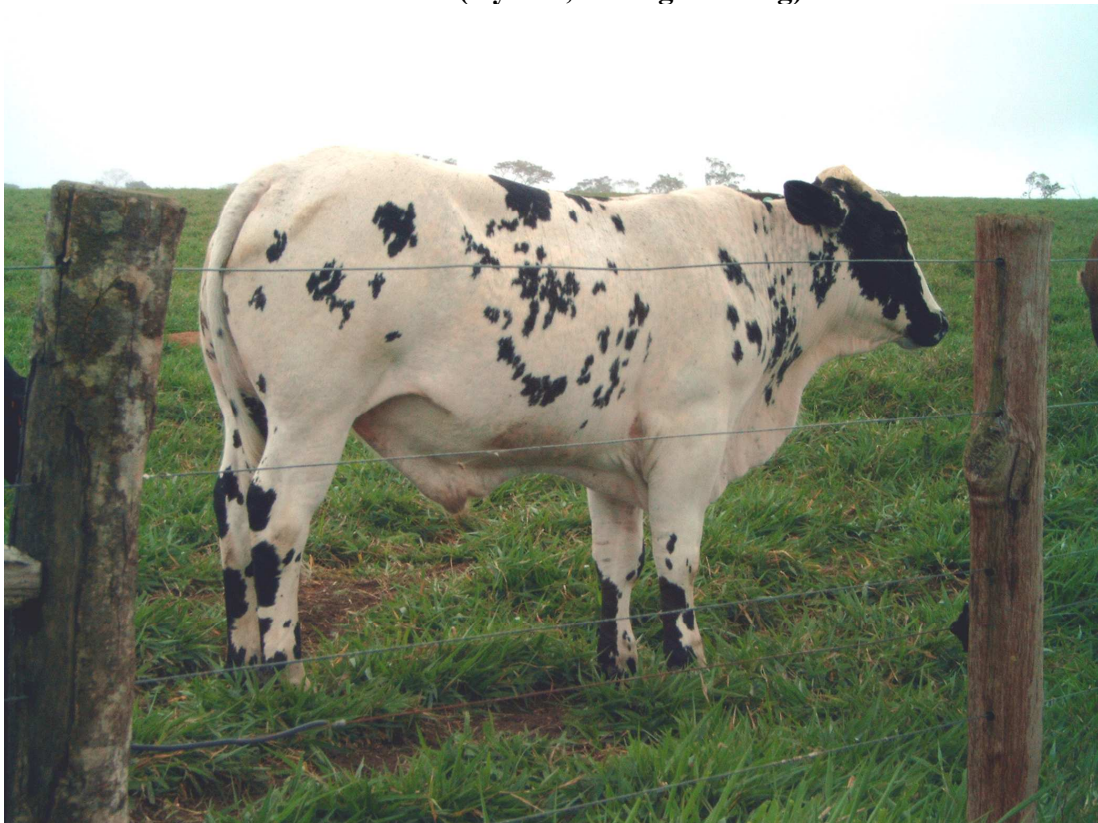




**BBB x Nelore in Agribahia  
07/09/2003 (2 years, average 540Kg)**



**BBB x Nelore in Agribahia (same animal as in previous page)  
07/09/2003 (2 years, average 540Kg)**



**Slaughter in November 2003**  
(age= 2years)

**BBB x Nelore**



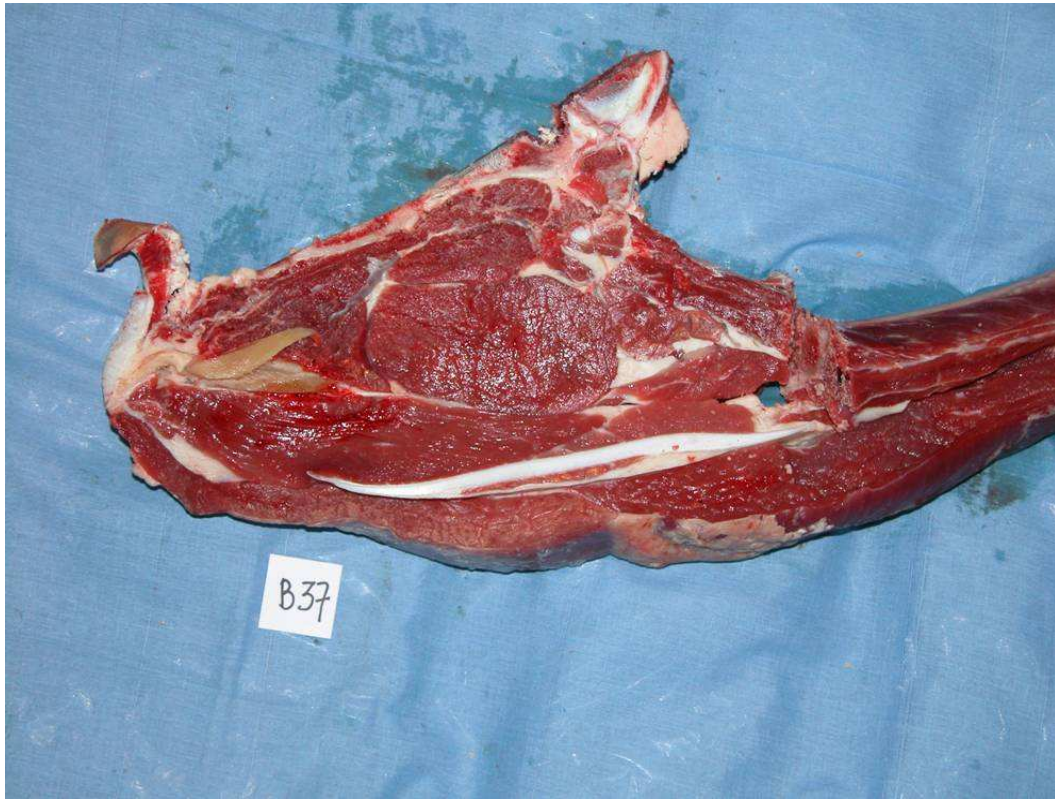
**Braford**



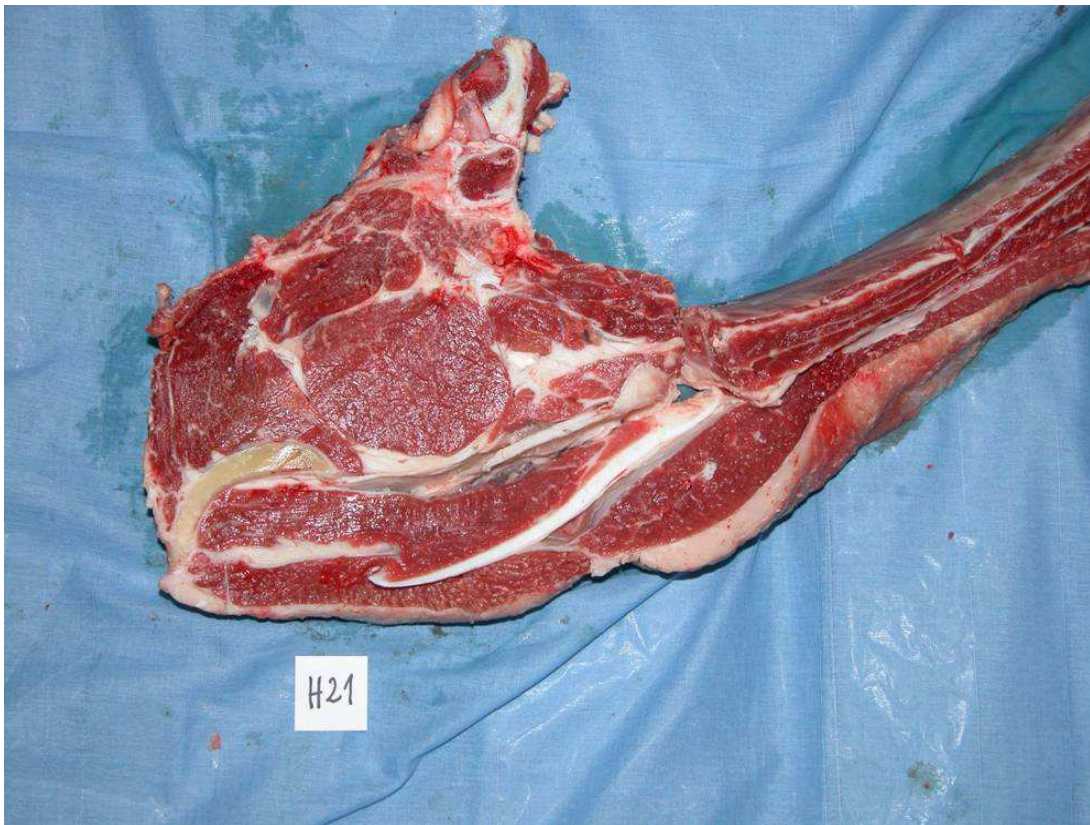
**7th rib taken before dissection**



**Dissection of the 7th rib**



**B37 BBB x Nelore**



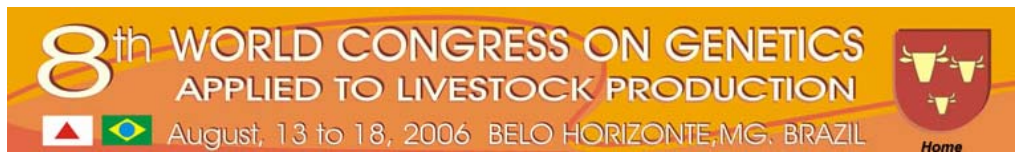
**H21 Braford**

**Bone, fat, muscles of the 7th rib**



**Proposals for a new brand of meat in Bahia**





**GROWTH AND CARCASS PERFORMANCES OF BELGIAN BLUE x NELORE AND  
BRAFORC CATTLE IN BAHIA STATE BRAZIL**

**P. L. Leroy, E. Leroy, R. Cassart**

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Medicine, University of Liège, B-4000 Liège, Belgium

# **GROWTH AND CARCASS PERFORMANCES OF BELGIAN BLUE x NELORE AND BRAFORD CATTLE IN BAHIA STATE BRAZIL**

**P. L. Leroy, E. Leroy, R. Cassart**

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## **INTRODUCTION**

In order to improve the efficiency of beef production, crossbreeding exploiting complementarity and heterosis is a widely accepted means of incorporating desirable traits from various breeds (Lunstra and Cundiff, 2003).

Double muscling in cattle is recognized as an autosomal recessive trait (locus *mh*) widespread in the Belgian Blue Breed (BBB) (Charlier et al., 1995). Braford is a synthetic breed, approximately 3/8 Brahman and 5/8 Hereford, developed in Florida since 1947 and currently used in USA and South America. Nelore is a Brazilian cattle breed originated from the Ongole breed (India) first introduced in Salvador, Bahia, in 1868.

In Brazil, beef producers are more and more concerned with the fat content of the carcass and the tenderness of the meat, especially for export markets.

In this study, we compare the growth and the carcass performances of Belgian Blue x Nelore cattle and Braford cattle kept on the same pasture and fattening conditions in the Bahia state of Brazil.

## **MATERIAL AND METHODS**

A total of 90 animals (36 BBB x Nelore and 54 Braford) of the Fazenda Lagoa do Morro, Agribahia, GES Group, were followed, from 2002 to 2005, by the CEPAB, a joint project of University of Liège, University of Gembloux and Seagri of Bahia State.

Nelore cows belonging to AgriBahia (GES) were inseminated with 2 Belgium Blue Bulls belonging to the Company "Belgium Blue Group". Braford cattle was kept previously on the farm. The calvings were all normal and without assistance. A complementation based on rice by products (1% of live weight) was given to the animals during the test period.

Data were obtained from the farm, starting after the birth. The animals were all slaughtered the same day at 2 years in Tecnocarne in Salvador (Bahia). The 7<sup>th</sup> rib of 10 BBB x Nelore and 10 Braford bulls were taken at the slaughterhouse 1 day after slaughter. Ribs were dissected in order to obtain the weight of fat, meat and bone and also the weight of specific muscles: Longissimus Dorsi (measure of the inside muscular development) and Trapezius and Latissimus Dorsi (measures of the external muscular development).

## **RESULTS AND DISCUSSION**

The growth rate of both genetic groups was similar (Figure 1) with a global average daily gain from birth to slaughter of 740.9 g, a value to be considered in relation with a strong dry period in Bahia State starting when the animals were 300d old.

At slaughter, the average age of the 10 Braford bulls and the 10 Belgian Blue x Nelore bulls were 755.9 d and 750.4 d and the corresponding averages for weight at slaughter were 553.5 kg and 539.7 kg, respectively.

Braford had, on average, a higher value of live weight (+13.8 kg) but a lower carcass weight (-5.4 kg) than BBB x Nelore crosses.

The average killing out percentage of the BBB x Nelore (54.1%) was 2.32% higher than the Braford (51.78%). Similar improvements were found by Cundiff et al. (2000) in the MARC project. The dissection revealed that, in the 7<sup>th</sup> rib, BBB x Nelore males had : 2.54% less fat, 6.9% less bone and 9.44 % more meat, bigger Longissimus dorsi (eye muscle) and bigger peripheral muscles (Trapezius and Latissimus dorsi) (Table 1. and Figure 2).

The results show a redistribution of fat, bone and meat within the 7<sup>th</sup> rib (right half carcass) of BBB crosses which are characterized by more meat. The redistribution is well illustrated in Figure 2. Since the rib content is highly correlated with the rest of the carcass, one could consider that Belgian Blue crosses have a higher commercial value with the improvement of secondary cuts.

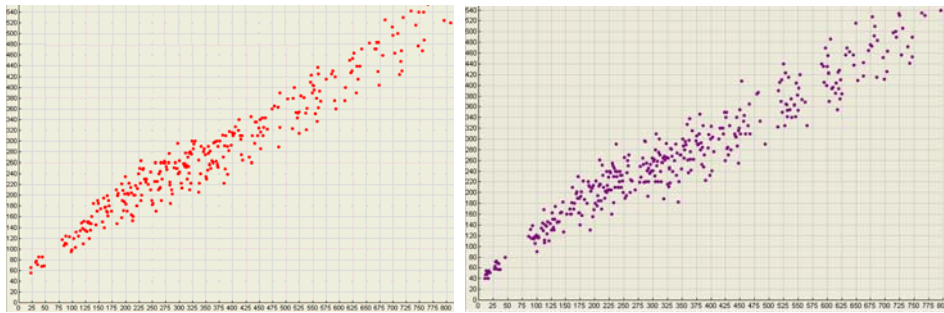
**Table 1. Results of the dissection of the 7<sup>th</sup> rib of Braford and Belgian Blue x Nelore bulls**

Traits of the rib	Breeds		Difference BBB-Braford	
	Braford	BBB x Nelore		
Fat (g)	771.2	661.5	- 109.7 g	P<0.25
Bone (g)	1203.5	939.5	- 264.0 g	P<0.001
Muscle (g)	2015.5	2401.5	+ 386.0 g	P<0.01
Total Rib (g)	3990.2	4002.5		NS
Fat % in the rib	19.11	16.56	-2.54%	P<0.20
Bone % in the rib	30.40	23.50	-6.90%	P<0.001
Muscle % on the rib	50.50	59.94	+9.44%	P<0.001
Age at slaughter (d)	755.9	750.4	-5.5 d	NS

**Table 2. Comparison of individual muscles of the 7<sup>th</sup> rib of Braford and Belgian Blue x Nelore bulls**

Traits of the rib	Breeds		Difference BBB-Braford	
	Braford	BBB x Nelore		
Longissimus dorsi (g)	216.5	264	+47.5 g	P<0.05
Longissimus dorsi (% of the rib)	5.49	6.62	+1.13%	P<0.10
Periph. Muscles (g)	413	528	+114.6 g	P<0.01
Periph. Muscles (%)	10.44	13.13	+2.68%	P<0.005





**Figure 1. Growth from birth to slaughter of BBB x Nelore and Bradford cattle in AgriBahia, Bahia State, Brazil**

## CONCLUSION

The experiment organized in Bahia State illustrates the potential use of the Belgian Blue Breed on the Zebu type cattle, especially in tropical or subtropical regions.

Since Belgian Blue animals have a bigger muscular development, a fine skin and a smaller digestive system, the average carcass weight (and the killing out percentage) of the BBB x Zebu Nelore crosses shows the same trend as in pure Belgian Blue cattle but is less extreme.

With a redistribution of fat, meat and bone percentage within the rib and thus, by extrapolation, in the carcass, the crossbreeding of Belgian Blue with Zebu type cattle leading to more muscular cattle has a lot of potential.

According to the results of the dissection, it is clear that the meat industry should also pay more attention to the forequarter of the Belgian Blue x Nelore carcasses. In fact, the quantity of meat in the forequarter BBB x Zebu Nelore crosses is more important with a higher transformation potential. The forequarter should thus have another destination than the classical destination of the Nelore carcasses.

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**Figure 2.** 7<sup>th</sup> Rib (right half carcass) of a BBB x Nelore (B37) bull and a Bradford (H21) bull slaughtered in Bahia State, Brazil (same scale see white square)

## Zebu Nelore (Brazil)



**Aladin, Belgina Blue x Nelore, 1240 Kg at 39 month**

