

Brahman Crossbred Performance in Distinct Segments of the United States Beef Industry

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Brahman in the United States

- Providing Adaptability
- Role in Crossbreeding



Brahman Adaptability Cycle

Dr. Jay Lush observation from the 1920s:

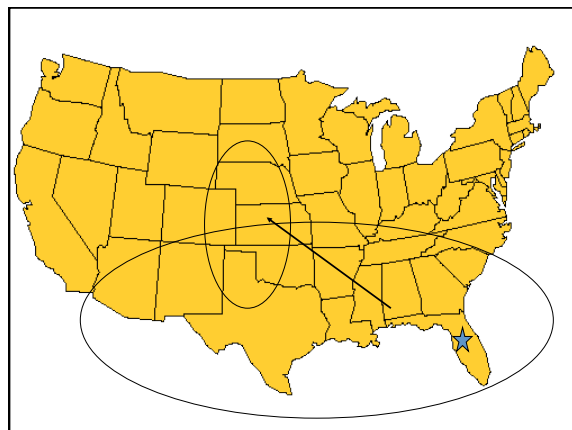
1. Use Brahman bulls until the cow herd is very high percentage Brahman and very adapted.
2. Switch to *Bos taurus* bulls until the cow herd loses their adaptability.

Heterosis

- F_1 average minus Purebred average
- Other crosses also express heterosis, but less than the F_1
- Dependence on how different the breeds in the cross are, e.g. Angus-Hereford vs. Brahman-Hereford
- Traits less responsive to selection

Segment/Environment Suitability

- Brahman crosses are ideal for the cow-calf segment, especially in any region where heat and/or humidity are high.
- Less than ideal for other segments and regions with cooler temperatures.



Objective Today

Review Brahman crossbred experimental results in various industry segments.



Cross Directionality Influences Results

Sire breed	Dam breed	Bulls	Heifers
Brahman	Angus	86	74
Angus	Brahman	67	70
Brahman	Brahman	70	65
Angus	Angus	67	63

COW-CALF SEGMENT



	N	Pregnancy rate	Calving rate	Weaning rate
Brahman	175	0.76	0.76	0.70
Angus	161	0.84	0.84	0.82
F ₁				
BA	420	0.95	0.95	0.93
RA	397	0.87	0.86	0.81
Heterosis				
BA		0.15 (18%)	0.15 (19%)	0.17 (22%)



Brahman Crosses in the Cow-Calf Segment

- The reason Brahman is in the United States
- limiting or challenging environments
- With most *Bos taurus* breeds

TRANSITION FROM THE COW-CALF TO STOCKER SEGMENTS

Transition

- Stress-inducement events
- Weaning in September--Timing
- Destination
- Wide array of management scenarios

21- 35 d Postwean Recovery

	B	A	F ₁ BA	F ₁ RA
N	48	38	77	118
Prewean ADG	1.9	1.7	2.0	1.8
Weaning BW	518	441	537	487
ADG	0.8	0.7	1.2	0.9

Heterosis Weaning-Recovery

	Brahman-Angus		Romo sinuano-Angus	
	lb	%	lb	%
Prewean ADG	0.20	11	0.13	7.8
Wean BW	57	12	35	7.8
Postwean recovery ADG	0.46	63.6	0.29	46

Shipping/Receiving

	B	A	F ₁ BA	F ₁ RA
N	48	38	77	118
Ship BW	545	465	579	518
Wt loss, %	8.5	9.5	9.1	9.4
Rec ADG	0.4	1.0	1.0	0.5

Heterosis Transition

	Brahman-Angus		Romo sinuano-Angus	
	lb	%	lb	%
Shipping BW	75	14.8	44	9.3
Ship BW loss	8.4	18.5	6.2	14.4
Arrival BW	66.1	14.4	37.5	8.7
Receive ADG	0.29	42.6	-0.20	-30

Transition Summary

- F_1 performance after stress
- Large heterosis values may be related to recovery of water loss in transit
- Opportunities to minimize potential problems

STOCKER SEGMENT

Florida Steers on Wheat Pasture

	B	A	F_1 BA	F_1 RA
N	48	38	77	118
Final BW	811	853	951	872
ADG	1.5	2.1	2.0	2.0



Heterosis, Gain on Wheat

	Brahman-Angus		Romosinuano-Angus	
	lb	%	lb	%
Initial BW	81.6	15.5	35.3	7.1
Final BW	119.1	14.3	52.9	6.5
ADG	0.20	11	0.07	3.4

Growing Diet Comparison

	0	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$
N	15	20	7	9
Initial BW	602	562	708	604
Final BW	796	717	906	747
ADG	1.6	1.3	1.7	1.2

Reminder of Concepts

- **Residual Feed Intake**—intake adjusted for size and growth rate; negative values are favorable
- **Residual ADG**—ADG adjusted for size and intake; positive values are favorable
- **Metabolizable Energy**—energy available after expenditures for prehension and digestion

Growing Diet Comparison

	0	¼	½	¾
N	15	20	7	9
DMI, lb/day	16.1	13.7	17.6	14.6
CPI, lb/day	1.7	1.5	1.9	1.6
MEI, Mcal/day	18.1	15.2	19.7	16.2
Residual ADG	-0.02	0.03	0.02	-0.03
Residual MEI	0.46	-0.44	-0.03	-0.13

Stocker Segment Summary

- F₁ ADG
- ¾ Brahman lower intake
- Winter conditions on the Great Plains

FEEDLOT



Florida Steers in Feedlot

	B	A	F ₁ BA	F ₁ RA
N	48	38	77	118
Final BW	1045	1100	1217	1159
ADG	1.8	2.1	2.2	2.2

Florida Steers in Feedlot				
	B	A	F ₁ BA	F ₁ RA
N	27	30	57	57
DMI	17.5	18.9	19.2	19.5
F:G	7.75	8.26	7.91	7.97
RFI	-0.37	0.66	-0.20	0.60

Heterosis				
	Brahman-Angus		Romoquinuano-Angus	
	amt	%	amt	%
Final BW	29.5	13.4	77.2	7.1
ADG, lb/d	0.26	13.6		

Crossbred Growth on Feed				
Brahman fraction	0	¼	½	¾
N	15	20	7	9
Initial BW, lb	796	717	906	747
Final BW, lb	1241	1213	1268	1246
Days to finish	155	196	134	199
ADG	2.9	2.6	2.6	2.6

Crossbred Intake and Efficiency				
Brahman fraction	0	¼	½	¾
N	15	20	7	9
DMI	18.5	17.0	18.5	15.0
CPI	2.2	2.0	2.2	1.8
MEI	26	23.8	25.9	21
Residual ADG	0.04	-0.05	-0.01	0.05
Residual MEI	0.46	-0.44	-0.03	-0.13

Selection for Lower RFI?

- Strong positive genetic correlations of RFI and intake
- Selection to reduce RFI would reduce BV for intake
- Potential to influence intake of females on pasture—very undesirable consequence of selection
- Value of Brahman in the cow-calf sector outweighs value in other sectors

Summary Feedlot Segment

- ½ Brahman performance
- Intake of high proportion Brahman
- Winter conditions and high proportion Brahman
- Summer feeding

CARCASS/END PRODUCT

Sire Breed Averages—Quality Traits

Breed	Brahman	Angus	Romosinuano
Marbling score	360	475	393
% Choice	31	75	46
% Standard	23	5	10

Shear & Sensory Sire Breed Means

Breed	Brahman	Angus	Romosinuano
Shear force, lb	9.7	8.6	9.3
Tenderness	5.4	5.8	5.8
Conn. tissue	6.1	6.5	6.5

Carcass Traits of Brahman Crossbreds

	0	¼	⅜	½	¾	1
N	216	182	224	341	206	198
Carcass wt	713	753	751	793	756	719
Dressing %	61.7	62.4	62.6	63.2	63.2	63.3

Carcass Traits of Brahman Crossbreds

	0	¼	⅜	½	¾	1
N	216	182	224	341	206	198
REA	12.6	12.9	12.8	13.2	12.6	12.0
Fat thick	0.51	0.51	0.51	0.51	0.43	0.35

Brahman Crossbred Steers

	0	¼	⅜	½	¾	1
N	216	182	224	341	206	198
WBSF	7.6	7.9	8.1	8.3	8.7	9.2
Tenderness	5.8	5.6	5.5	5.5	5.1	4.6

Brahman Crossbred Steers						
	0	¼	⅜	½	¾	1
N	216	182	224	341	206	198
Conn tissue	6.1	6	5.9	5.9	5.5	5.1
Marbling	446	420	407	394	367	341

Summary—Carcass/End Product

- Acceptability of ¼ and ½ Brahman for many traits
- Traits related to Quality – lower
 - High h^2 of marbling score
- Tenderness
- Strategy for steers with > ½ Brahman

Final Notes

- Cow-calf segment—Adaptability and heterosis
- F₁ Brahman and ¼ Brahman
 - Quantity
 - Tenderness
 - Quality
- More than ½ Brahman inheritance

