WHAT AMOUNT OF BRAHMAN INFLUENCE WILL MEET THE TARGETS OF BRANDED BEEF PROGRAMS ?

M. A. Elzo
University of Florida

- Requirements of Branded Beef Programs
- Angus-Brahman Multibreed Herd
- Growth and Carcass Traits
- Actual Records and Genetic Predictions
- Multibreed Results ⇔ Beef Programs
- Conclusions and Implications

Requirements of Branded Beef Programs

- Live Requirements
- Carcass Characteristics
- Yield Factors
- Quality Factors
- USDA Information

Live Requirements

Genotype	Phenotype
One registered parent	51% Black
Two registered grandparents	51% White Face & Hereford Markings
	Horned or Polled

Carcass Characteristics

Ribeye internal hemorrages	No
"Dark cutting" characteristics	No
Carcasses	Steers, Heifers
Hump Height	<= 2 in

Yield Factors

Yield Grade	None, <= 2.9 to 4.9
Hot Carcass Wt	None, 600 to 950 lb
Fat Over Ribeye	None, 0 to 1.1 in
Ribeye Area	None, >= 11 in*in
Muscling	Color, Text, Firm, Skel Char ⇔ Maturity

Quality Factors

Quality Grade	Prime (700-799) Choice (600-699) Select (500-599)
Marbling	SA to A (700-999) Sm to Md (400-699) Sl (300-399)
Maturity	A,B maturity

Requirements of Branded Beef Programs

- Angus-Brahman Multibreed Herd
- Growth and Carcass Traits
- Actual Records and Genetic Predictions
- Multibreed Results ⇔ Beef Programs
- Conclusions and Implications

Angus-Brahman Multibreed Herd

Composed of purebred and crossbred animals that interbreed

Angus
¾ A ¼ B
½ A ½ B
¼ A ¾ B
Brahman
Brangus

Sires mated to dams of all breed groups

Angus-Brahman Multibreed Herd

12 years of data (1989-2001)

153 sires (12 to 42 per BG)
1124 dams (113 to 293 per BG)
2910 calves (143 to 951 per BG)

Numbers of Sires

	BGS					
BGD	A	.75 A	.50A	.25A	B	Br
A	27	9	15	17	26	26
.75 A	20	12	15	15	27	20
.50A	27	11	15	17	31	29
.25A	20	9	13	13	24	16
B	19	11	13	16	42	21
Br	19	8	13	15	21	31

Numbers of Dams

	BGS					
BGD	A	.75 A	.50A	.25A	B	Br
A	110	43	75	42	55	32
.75 A	28	26	39	25	38	15
.50A	42	30	59	36	49	29
.25A	88	36	69	40	54	33
B	86	45	90	48	258	33
Br	95	38	101	41	52	127

Numbers of Calves

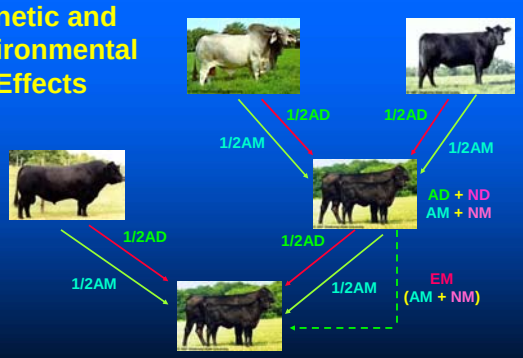
	BGS					
BGD	A	.75 A	.50A	.25A	B	Br
A	200	31	48	107	101	128
.75 A	50	28	38	46	51	50
.50A	98	44	79	93	114	164
.25A	51	28	40	52	60	47
B	65	43	52	62	495	61
Br	40	15	32	36	38	223

- Requirements of Branded Beef Programs
- Angus-Brahman Multibreed Herd
- Growth and Carcass Traits
- Actual Records and Genetic Predictions
- Multibreed Results ⇔ Beef Programs
- Conclusions and Implications

Growth and Carcass Traits

- Graphs
- Actual Records (Phenotypes)
- Genetic Predictions
- Direct
- Moving Averages (100 records)
- Maternal

Genetic and Environmental Effects



(AD + ND) + (AM +NM) + ED (AD + ND) + EM (AM + NM)

Multibreed Model

- Record
- Contemporary Group and Age of Dam
- Sire Group and Mgs Group (A, N, D, M)
- Sire and Mgs (A, N, D, M)
- Residual

Multibreed Genetic Predictions

MEPD	Direct (D)	Maternal (M)
Additive (A)	AD	AM
Nonadditive (N)	ND	NM
Total (T=A+N)	TD	TM

Multibreed Genetic Bases

Additive Genetic Base
=
Mean of Brahman Alleles from Purebred and Crossbred Animals

Nonadditive Genetic Base
=
Mean of A/A and B/B Intrabreed Interactions from Purebred and Crossbred Animals

Multibreed Predictions

Comparison of sires of any fraction of parental breeds

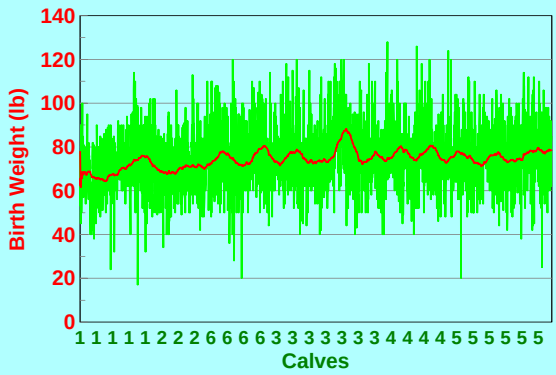
Prediction graphs assumed sires to be mated to ½A ½B cows

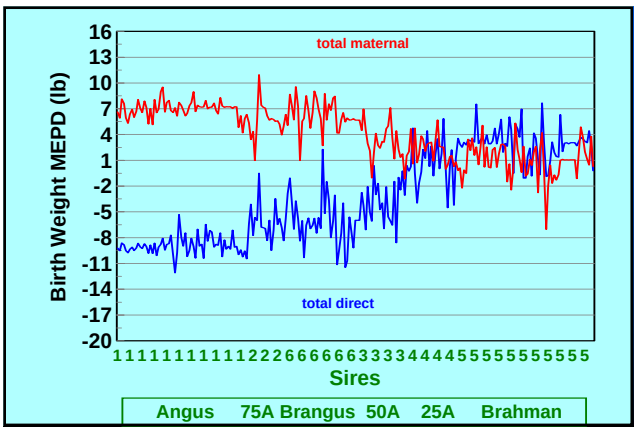
Graphs Growth Traits

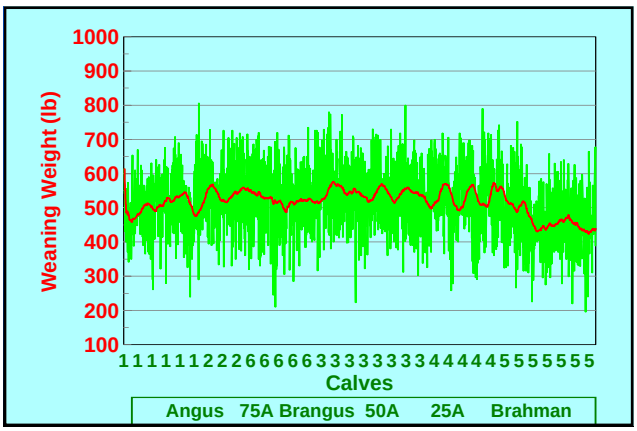
Birth Wt
Weaning Wt
Yearling Wt
Feedlot ADG
Slaughter Wt
Slaughter Age

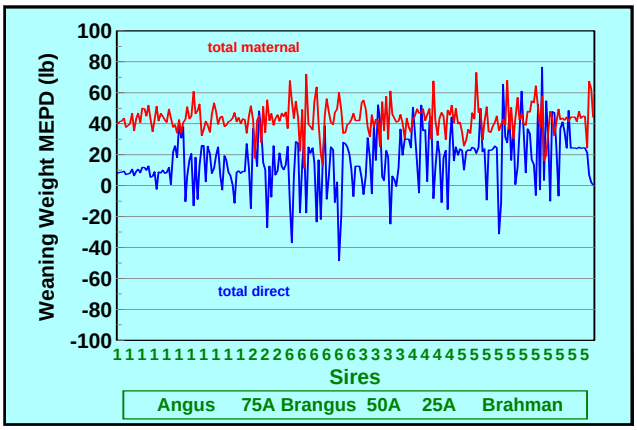
205d Wt
365d Wt
550d Wt

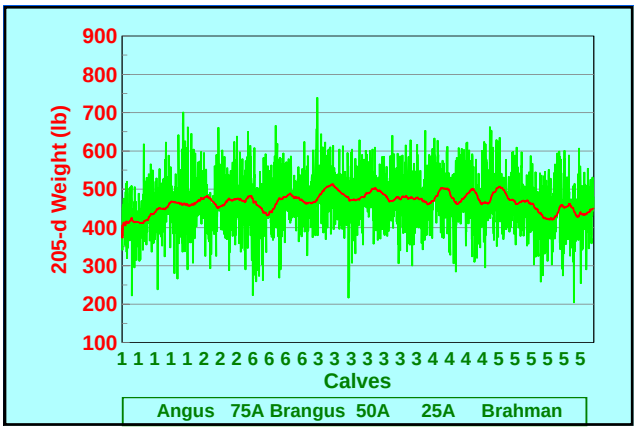
Actual Records | Genetic Predictions

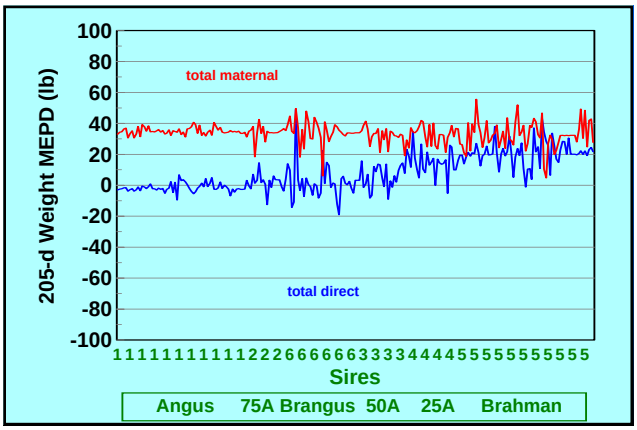


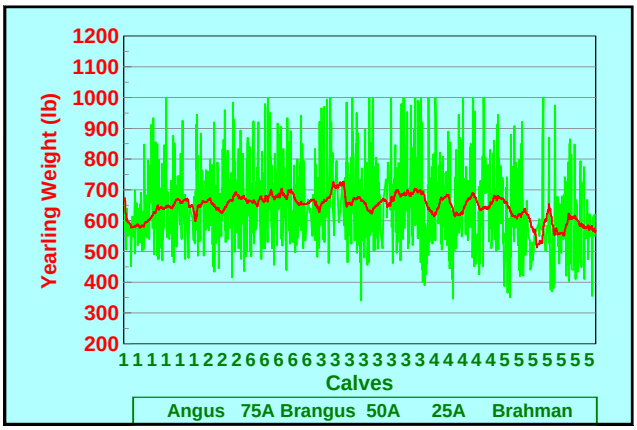


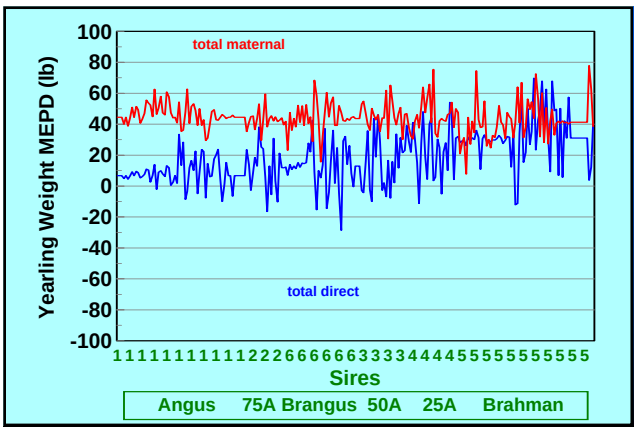


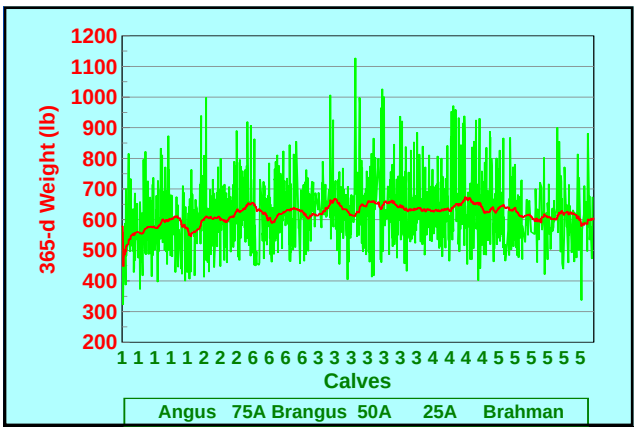

Weaning Weight MEPD (lb)
100
80
60
40
20
0
-20
-40
-60
-80
-100
total maternal
total direct
1 1 1 1 1 1 1 1 1 1 1 2 2 2 6 6 6 6 6 6 3 3 3 3 4 4 4 4 5 5 5 5 5 5 5 5 5 5
Sires
Angus 75A Brangus 50A 25A Brahman

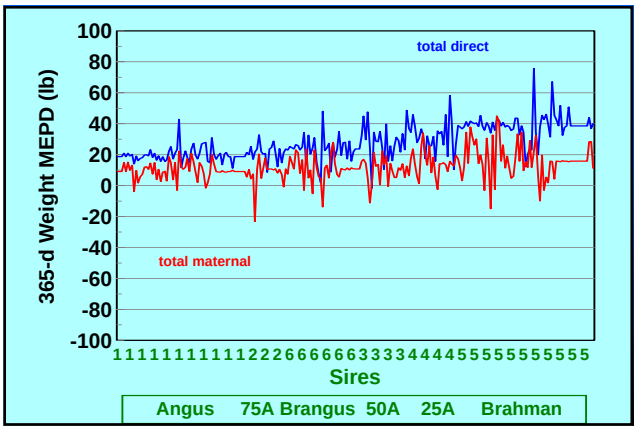

205-d Weight (lb)
900
800
700
600
500
400
300
200
100
1 1 1 1 1 2 2 2 6 6 6 6 3 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 5 5
Calves
Angus 75A Brangus 50A 25A Brahman

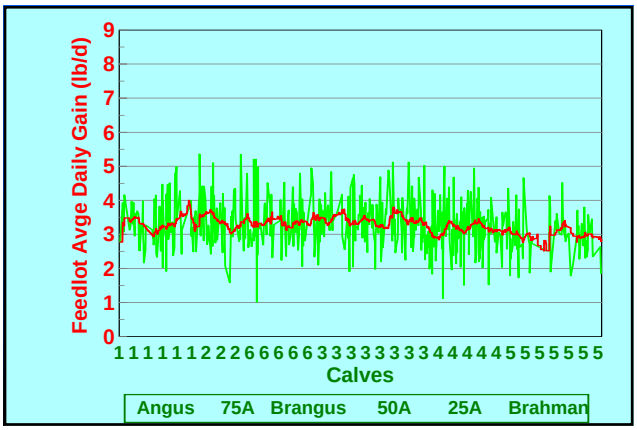

205-d Weight MEPD (lb)
100
80
60
40
20
0
-20
-40
-60
-80
-100
total maternal
total direct
1 1 1 1 1 1 1 1 1 1 1 2 2 2 6 6 6 6 6 6 3 3 3 3 4 4 4 4 5 5 5 5 5 5 5 5 5 5
Sires
Angus 75A Brangus 50A 25A Brahman

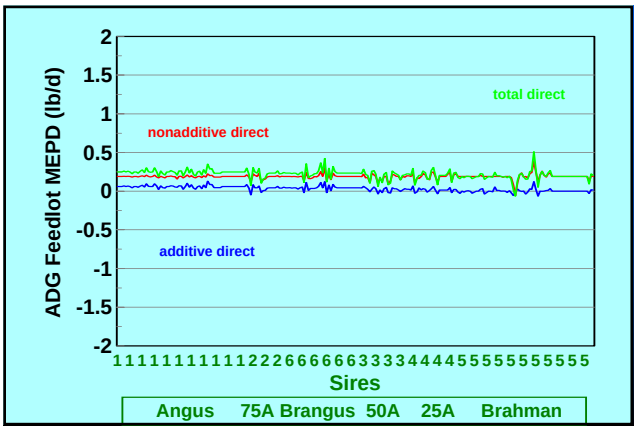

Yearling Weight (lb)
1200
1100
1000
900
800
700
600
500
400
300
200
1 1 1 1 1 1 2 2 2 6 6 6 6 6 3 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 5 5
Calves
Angus 75A Brangus 50A 25A Brahman

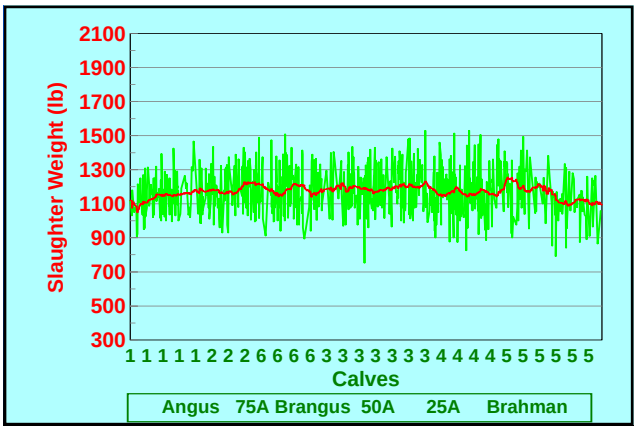

Yearling Weight MEPD (lb)
100
80
60
40
20
0
-20
-40
-60
-80
-100
total maternal
total direct
1 1 1 1 1 1 1 1 1 1 1 2 2 2 6 6 6 6 6 6 3 3 3 3 4 4 4 4 5 5 5 5 5 5 5 5 5 5
Sires
Angus 75A Brangus 50A 25A Brahman

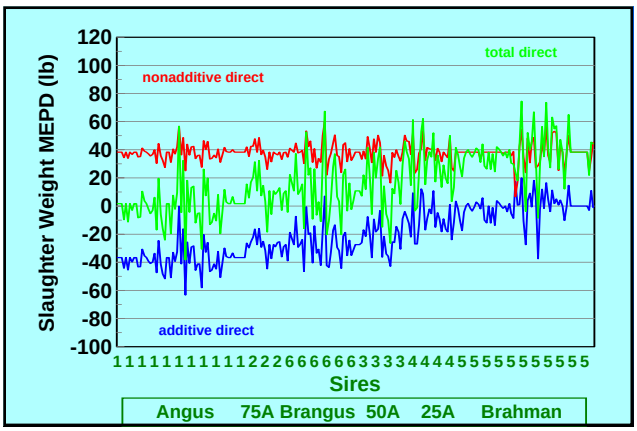

365-d Weight (lb)
1200
1100
1000
900
800
700
600
500
400
300
200
1 1 1 1 1 2 2 2 6 6 6 6 3 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 5 5
Calves
Angus 75A Brangus 50A 25A Brahman

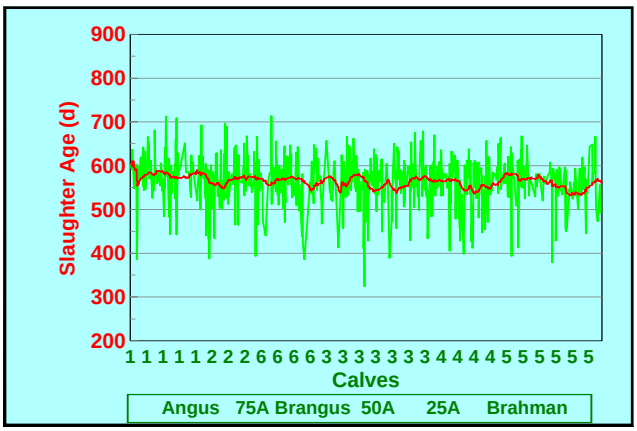

365-d Weight MEPD (lb)
100
80
60
40
20
0
-20
-40
-60
-80
-100
total direct
total maternal
1 1 1 1 1 1 1 1 1 1 1 2 2 2 6 6 6 6 6 6 3 3 3 3 4 4 4 4 5 5 5 5 5 5 5 5 5 5
Sires
Angus 75A Brangus 50A 25A Brahman

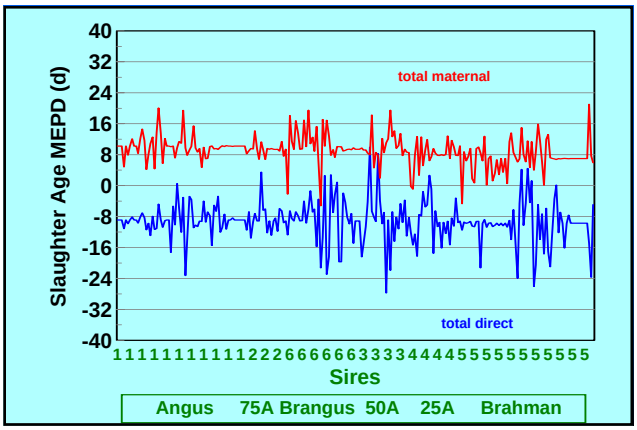

Feedlot Avge Daily Gain (lb/d)
9
8
7
6
5
4
3
2
1
0
1 1 1 1 1 1 2 2 2 6 6 6 6 6 3 3 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 5 5 5 5
Calves
Angus 75A Brangus 50A 25A Brahman

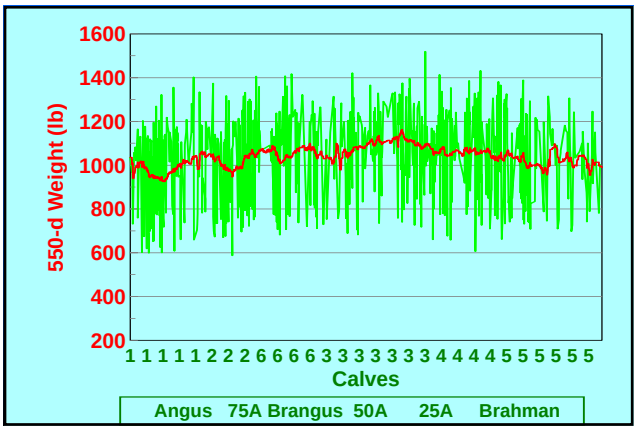

ADG Feedlot MEPD (lb/d)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
total direct
nonadditive direct
additive direct
1 1 1 1 1 1 1 1 1 1 1 2 2 2 6 6 6 6 6 6 3 3 3 3 4 4 4 4 5 5 5 5 5 5 5 5 5 5
Sires
Angus 75A Brangus 50A 25A Brahman

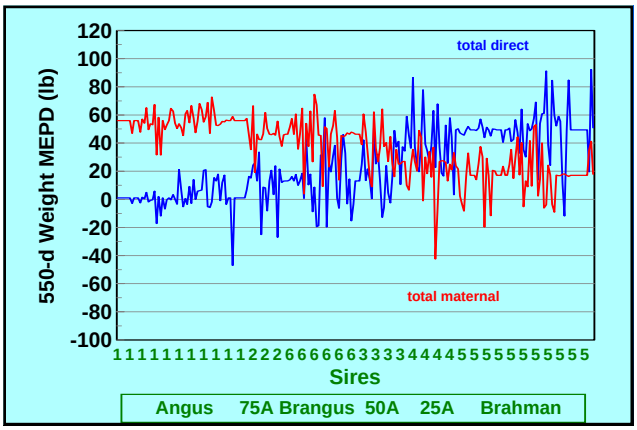

Slaughter Weight (lb)
2100
1900
1700
1500
1300
1100
900
700
500
300
1 1 1 1 1 2 2 2 6 6 6 6 3 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 5 5
Calves
Angus 75A Brangus 50A 25A Brahman


Slaughter Weight MEPD (lb)
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
total direct
nonadditive direct
additive direct
1 1 1 1 1 1 1 1 1 1 1 2 2 2 6 6 6 6 6 6 3 3 3 3 4 4 4 4 5 5 5 5 5 5 5 5 5 5
Sires
Angus 75A Brangus 50A 25A Brahman


Slaughter Age (d)
900
800
700
600
500
400
300
200
1 1 1 1 1 2 2 2 6 6 6 6 3 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 5 5
Calves
Angus 75A Brangus 50A 25A Brahman







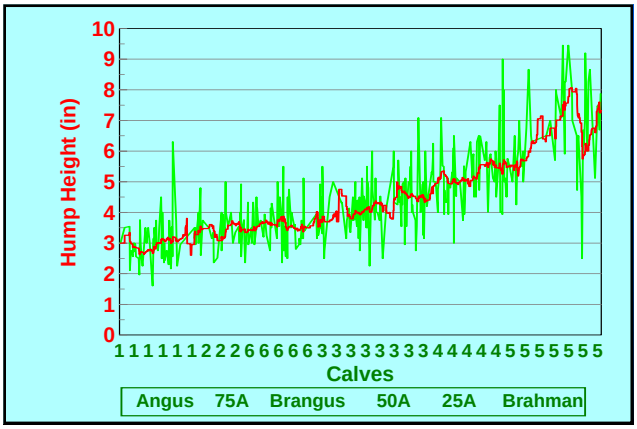
Graphs Carcass Traits

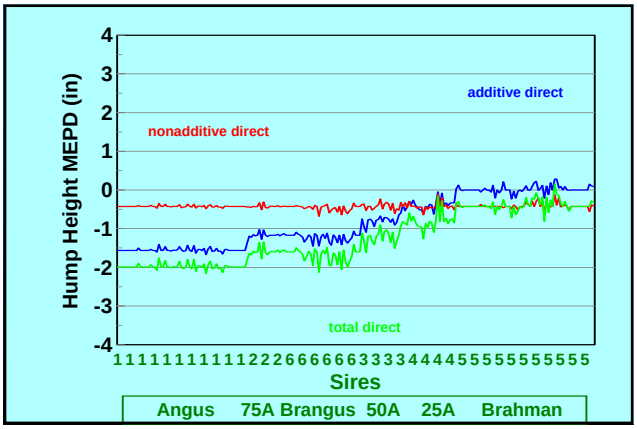
Hump Height

Hot Carcass Wt
Dressing %
Fat Over Ribeye
Ribeye Area
Yield Grade

Marbling
Quality Grade
Shear Force 5d
Shear Force 14d
Tenderness

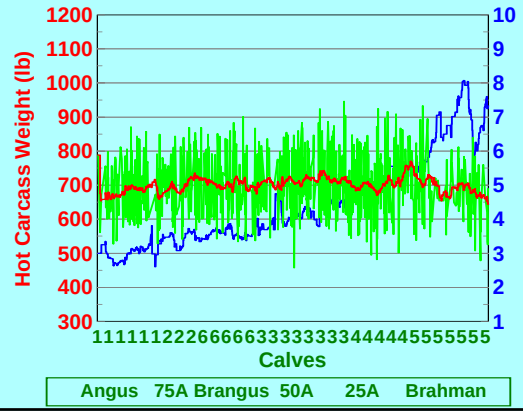
Actual Records | **Genetic Predictions**

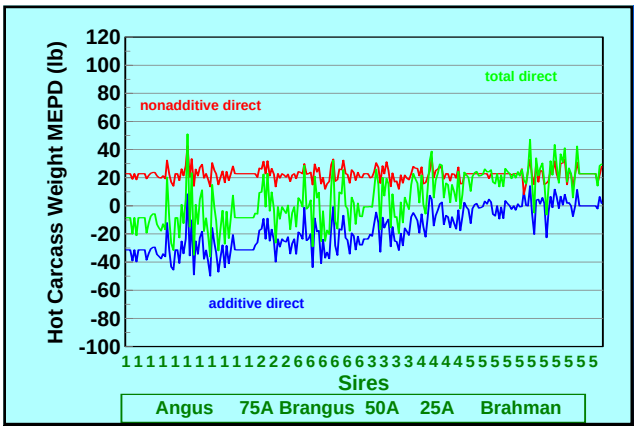


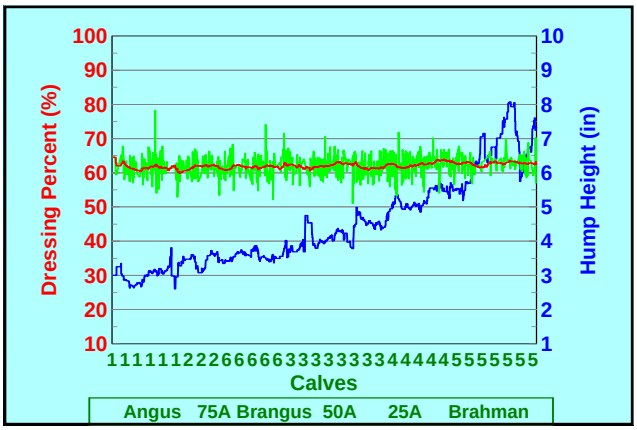


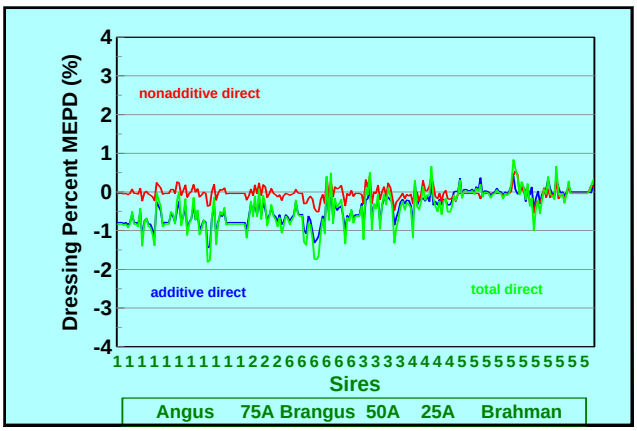
Yield Factors

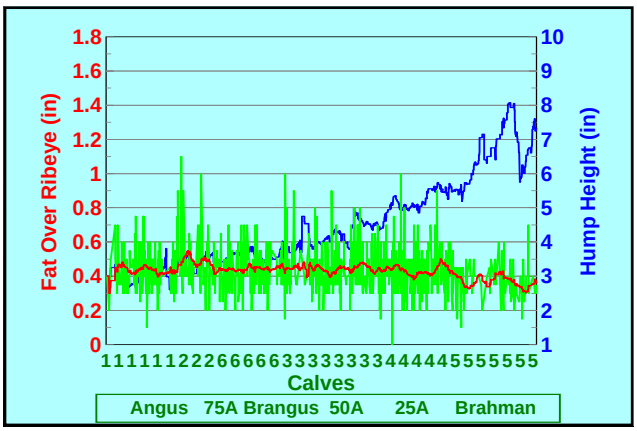
HCW: 600-950 lb	1,2,6,3,4,5
Dressing %	1,2,6,3,4,5
FOE: <= .7 in	1,2,6,3,4,5
REA: >= 11 in*in	1,2,6,3,4,5
YG: <= 2.9 to 4.9	1,2,6,3,4,5

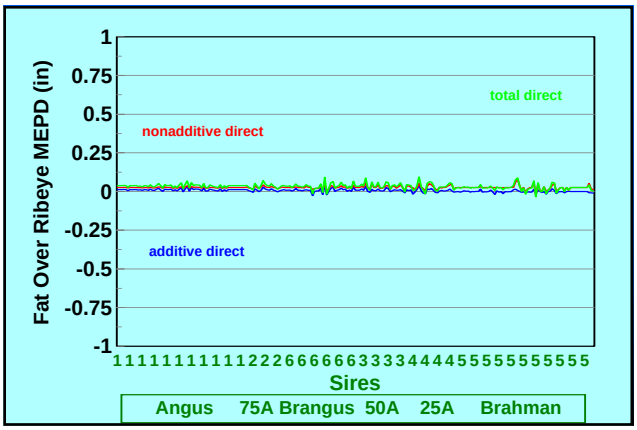


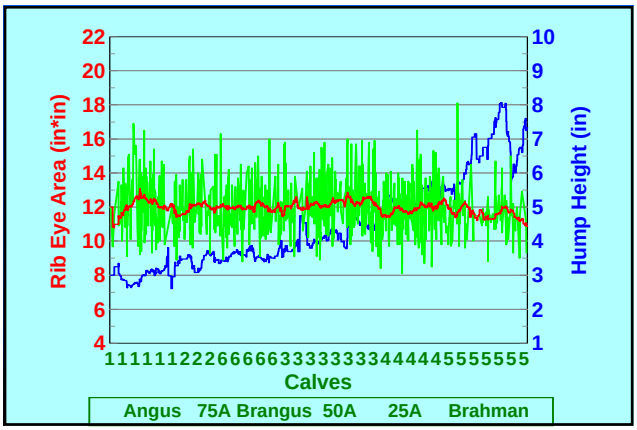


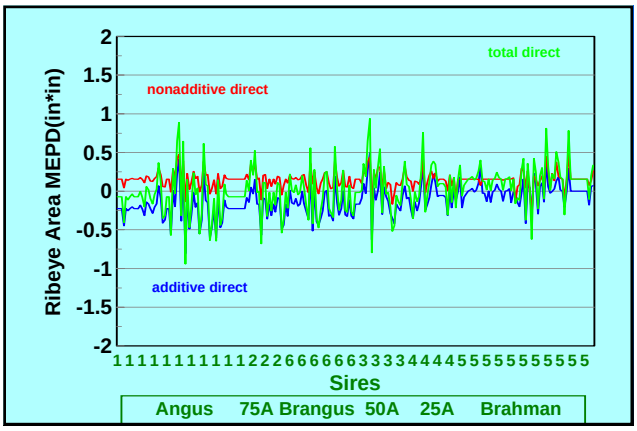


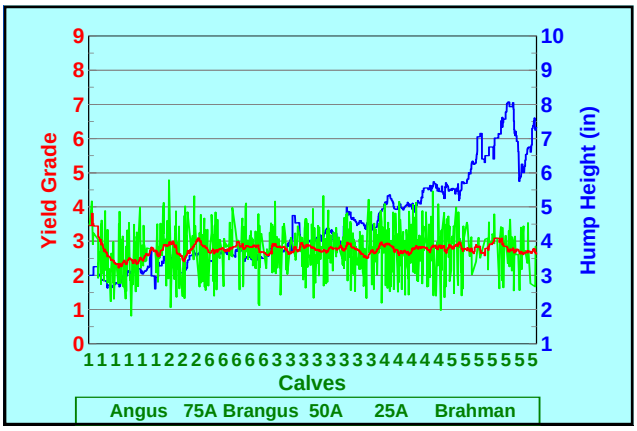


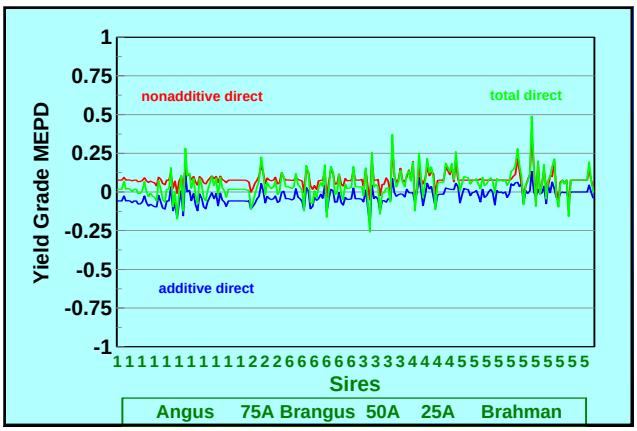










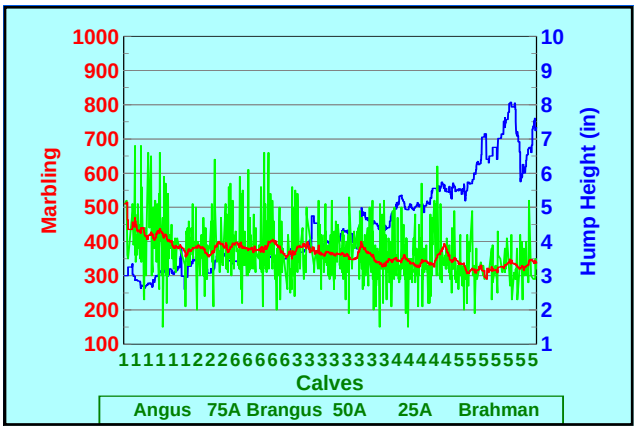


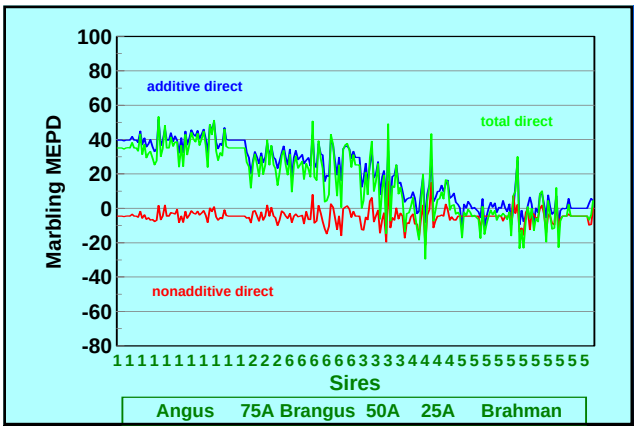
Yield Factors

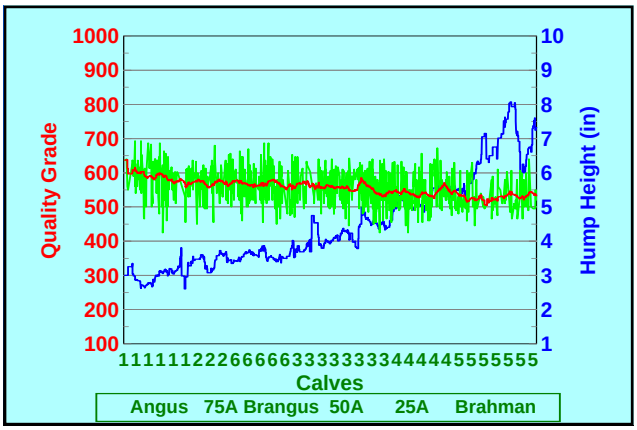
HCW: 600-950 lb	1,2,6,3,4,5
Dressing %	1,2,6,3,4,5
FOE: <= .7 in	1,2,6,3,4,5
REA: >= 11 in*in	1,2,6,3,4,5
YG: <= 2.9 to 4.9	1,2,6,3,4,5

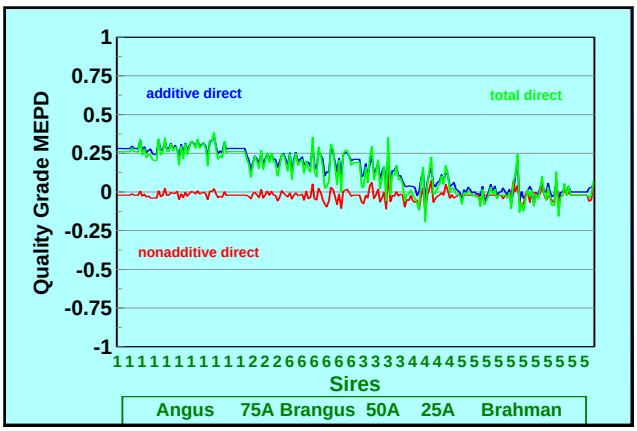
Quality Factors 1

Mar	Sm to Md (400-699): 1,2,6,3,4,5 Sl (300-399): 1,2,6,3,4,5 T (200-299): 1,2,6,3,4,5
QG	Choice (600-699): 1,2,6,3,4,5 Select (500-599): 1,2,6,3,4,5 Standard (400-499): 1,2,6,3,4,5







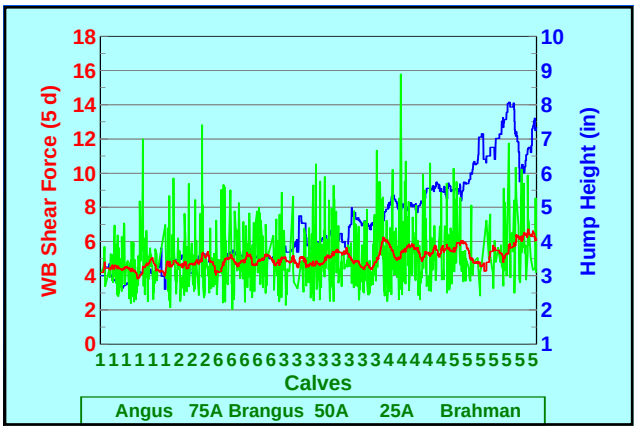


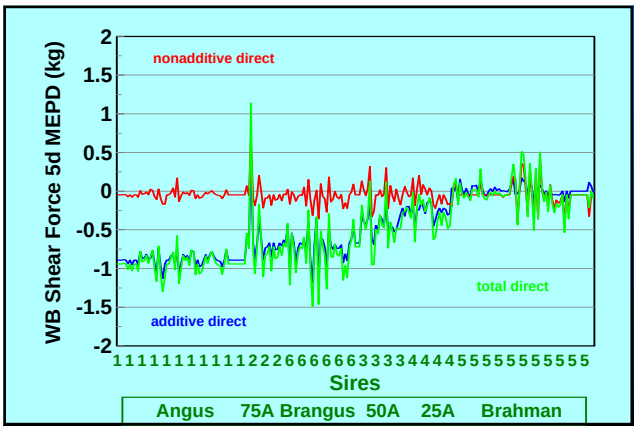
Quality Factors 1

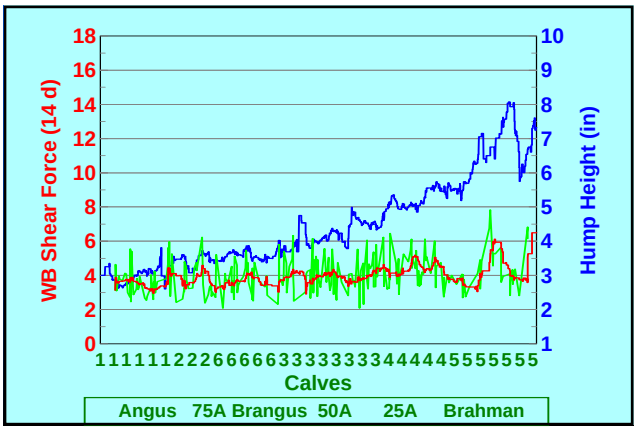
Mar	Sm to Md (400-699): 1,2,6,3,4,5 Sl (300-399): 1,2,6,3,4,5 T (200-299): 1,2,6,3,4,5
QG	Choice (600-699): 1,2,6,3,4,5 Select (500-599): 1,2,6,3,4,5 Standard (400-499): 1,2,6,3,4,5

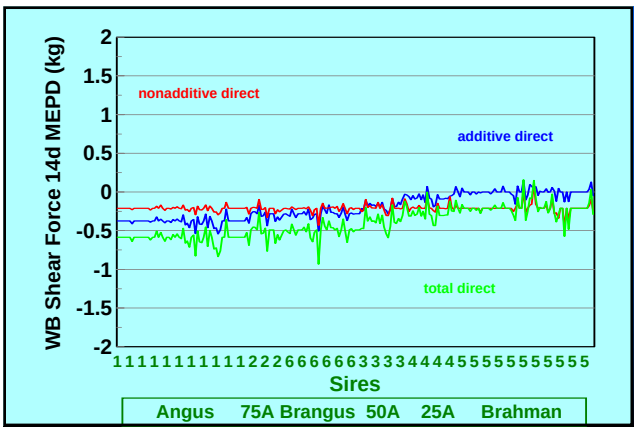
Quality Factors 2

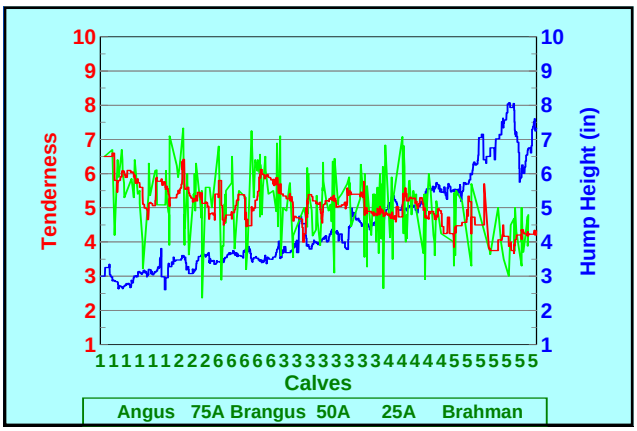
SF 5d	1,2,6,3,4,5
SF 14d	1,2,6,3,4,5
Tenderness	1,2,6,3,4,5

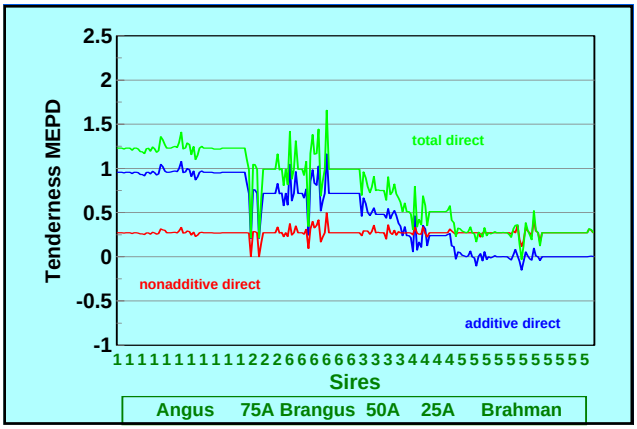












Quality Factors 2

SF 5d	1,2,6,3,4,5
SF 14d	1,2,6,3,4,5
Tenderness	1,2,6,3,4,5

- Requirements of Branded Beef Programs
- Angus-Brahman Multibreed Herd
- Growth and Carcass Traits
- Actual Records and Genetic Predictions
- Multibreed Results ⇔ Beef Programs
- Conclusions and Implications

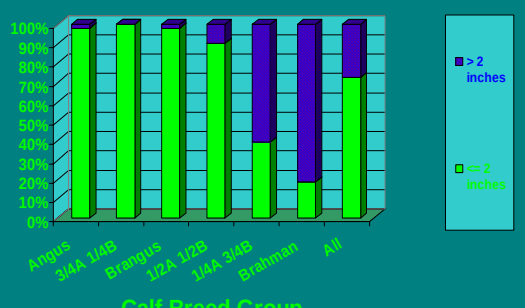
Multibreed Results ⇔ Beef Programs

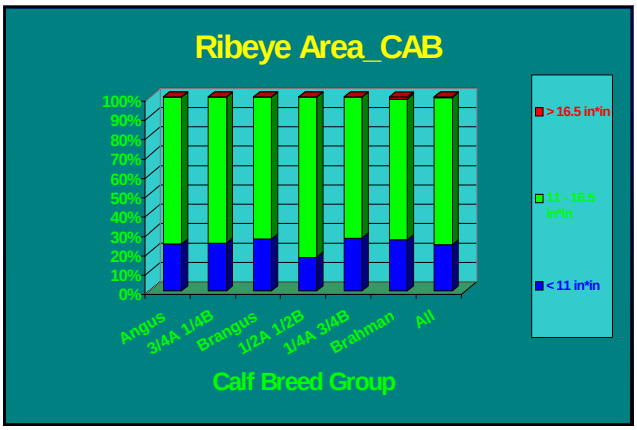
- Certified Angus Beef
- Nolan Ryan's All Natural Tender Aged Beef

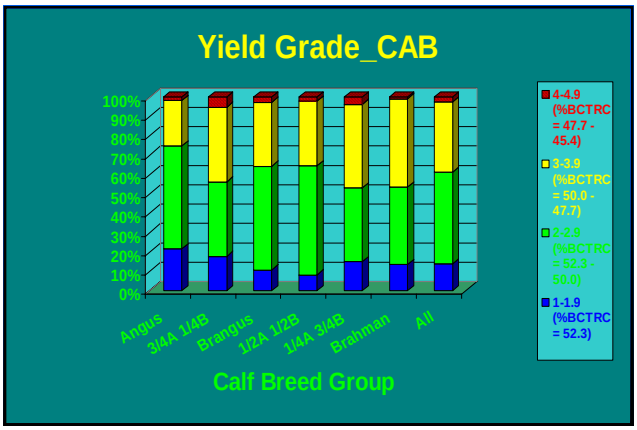
Certified Angus Beef

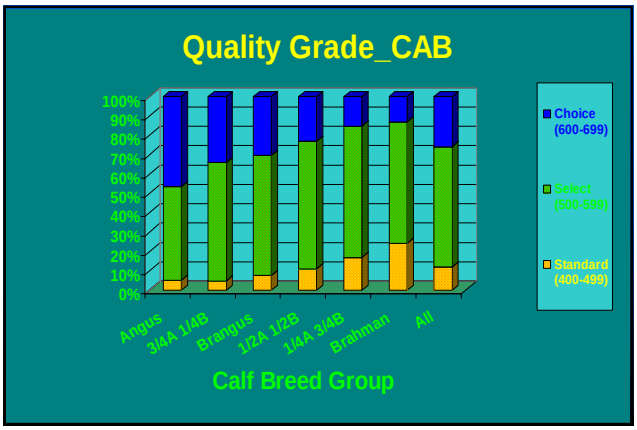
LR	51% Black: (1,2,6,3,4)
HHT	2 in or lower: (1,2,6,3,4,5)
Mar	Modest or Higher: (1,2,6,3,4,5)
QG	Prime, Choice: (1,2,6,3,4,5)
REA	No Restriction : (1,2,6,3,4,5)
YG	3.9 or lower: (1,2,6,3,4,5)
TEN	Tender (5 to 8): (1,2,6,3,4,5)

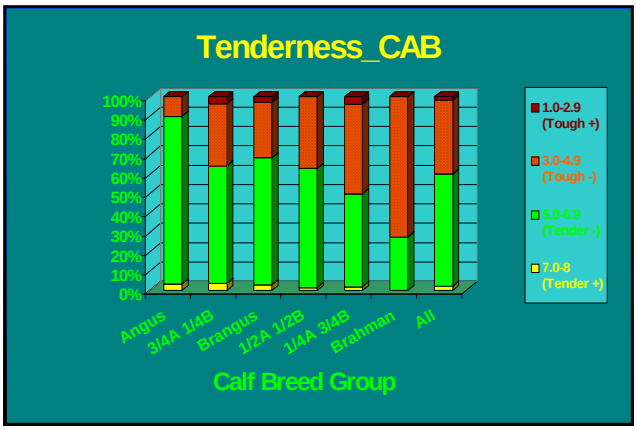
Hump Height_CAB

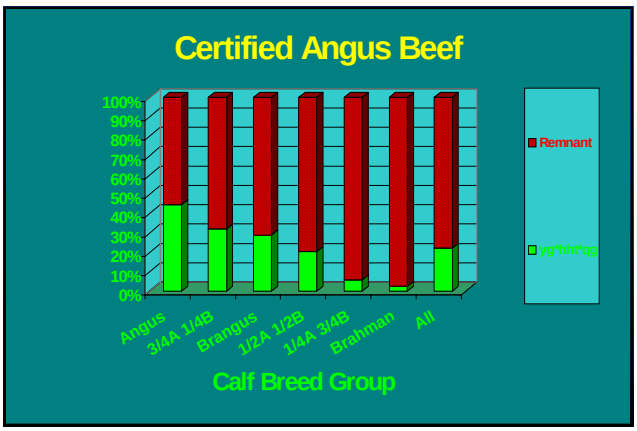


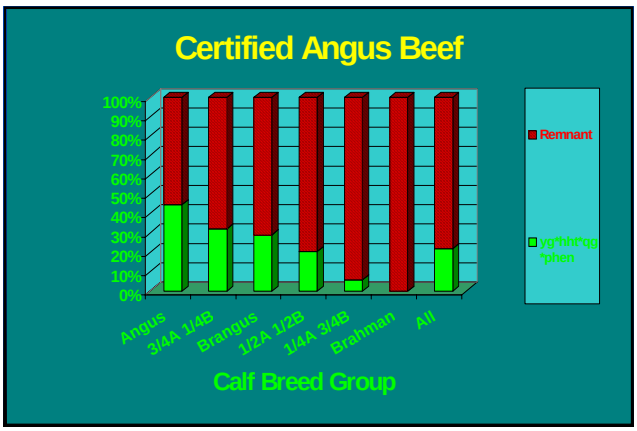

Ribeye Area_CAB
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Angus
3/4A 1/4B
Brangus
1/2A 1/2B
1/4A 3/4B
Brahman
All
Calf Breed Group
> 16.5 in*in
11 - 16.5 in*in
< 11 in*in


Yield Grade_CAB
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Angus
3/4A 1/4B
Brangus
1/2A 1/2B
1/4A 3/4B
Brahman
All
Calf Breed Group
4-4.9 (%BCTRC = 47.7 - 45.4)
3-3.9 (%BCTRC = 50.0 - 47.7)
2-2.9 (%BCTRC = 52.3 - 50.0)
1-1.9 (%BCTRC = 52.3)

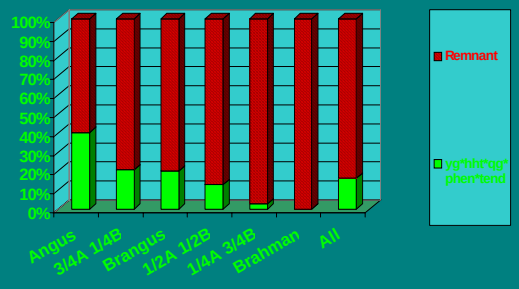

Quality Grade_CAB
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Angus
3/4A 1/4B
Brangus
1/2A 1/2B
1/4A 3/4B
Brahman
All
Calf Breed Group
Choice (600-699)
Select (500-599)
Standard (400-499)


Tenderness_CAB
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Angus
3/4A 1/4B
Brangus
1/2A 1/2B
1/4A 3/4B
Brahman
All
Calf Breed Group
1.0-2.9 (Tough +)
3.0-4.9 (Tough -)
5.0-6.9 (Tender -)
7.0-8 (Tender +)


Certified Angus Beef
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Angus
3/4A 1/4B
Brangus
1/2A 1/2B
1/4A 3/4B
Brahman
All
Calf Breed Group
Remnant


Certified Angus Beef
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Angus
3/4A 1/4B
Brangus
1/2A 1/2B
1/4A 3/4B
Brahman
All
Calf Breed Group
Remnant

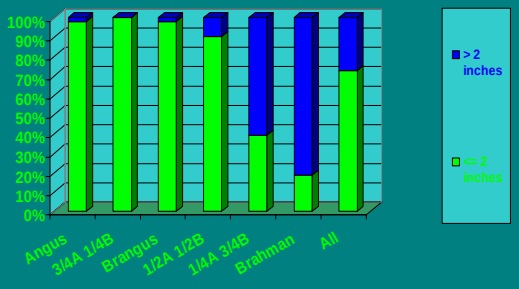
Certified Angus Beef



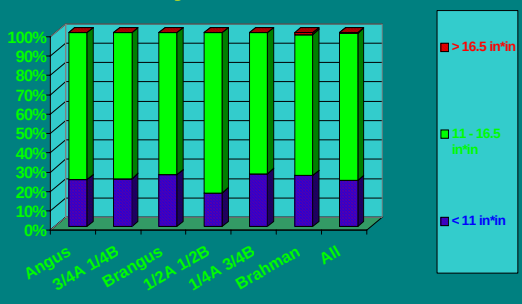
Nolan Ryan's All Natural Tender Aged Beef

HHT	No restriction: (1,2,6,3,4,5)
REA	11-16.5 in*in: (1,2,6,3,4,5)
YG	2.9 or lower: (1,2,6,3,4,5)
Mar	Slight to Moderate: (1,2,6,3,4,5)
QG	Choice, Select: (1,2,6,3,4,5)
TEN	Tender (5 to 8): (1,2,6,3,4,5)

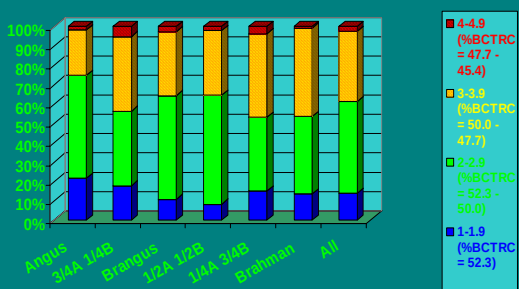
Hump Height_NR



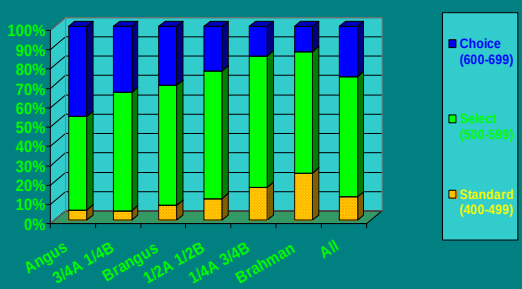
Ribeye Area_NR



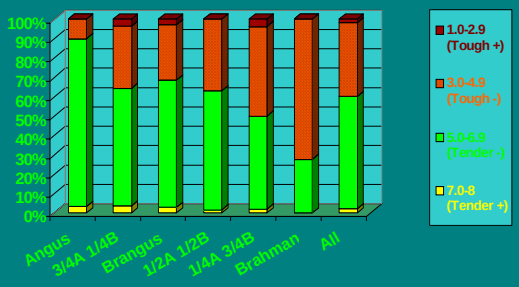
Yield Grade_NR



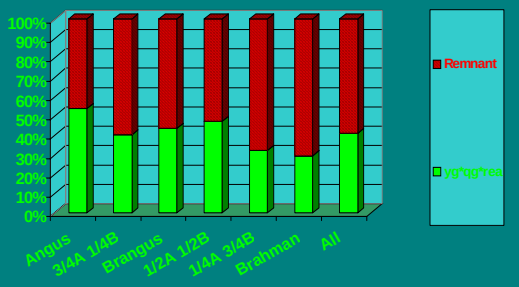
Quality Grade_NR



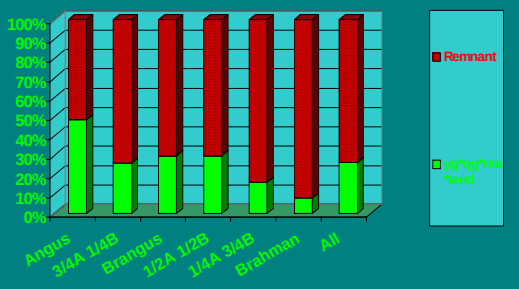
Tenderness_NR



Nolan Ryan's Tender Aged Beef



Nolan Ryan's Tender Aged Beef



- Requirements of Branded Beef Programs
- Angus-Brahman Multibreed Herd
- Growth and Carcass Traits
- Actual Records and Genetic Predictions
- Multibreed Results ⇔ Beef Programs
- Conclusions and Implications

Conclusions – Growth Traits

- Brahman and Brahman crossbreds tended to grow faster than Angus calves
- Direct growth genetic effects tended to increase from Angus to Brahman
- Maternal growth genetic effects tended to decrease from Angus to Brahman

Conclusions – Carcass Traits

- There were some animals in all purebred and crossbred groups that met the criteria of all beef programs
- Yield traits were similar across all breed groups
- Quality traits tended to decrease from 100% Angus to 100% Brahman

Implications for Brahman and Brahman Influenced Cattle

- Growth: NO problem
- Yield Grade and Ribeye Area: Major Factors for Low Marbling Programs
- Quality Grade and Marbling: Major Factors for High Marbling Programs
- Tenderness: Major Factor for Low and High Marbling Programs

However,

- There was genetic variability (additive and nonadditive) in all yield, quality, and carcass traits
- Can select for carcass traits in purebred and crossbred animals
- Conservative Selection Rule
  First select Sires for Additive MEPD, and then for Total MEPD

Beef Cattle Producers
Personnel at the Beef Units
Personnel at the Meats Lab
Animal Breeding Graduate Students
Paul Dixon
Dwain Johnson
Don Wakeman
Jerry Wasdin
Roger West
Glen Hembry