

The Brahman Project

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Origin of the Brahman Project

Objectives

Population Structure

Data and Tissue Sampling

Genetic and Genomic Evaluation

Culling, Mating, and Selection

Research and Expected Outcomes

Origin of the Brahman Project

Series of meetings at STARS in Brooksville at the end of 2009 and beginning of 2010

First Meeting: November 2009

Florida Producers
UF Faculty & Administrators
USDA-ARS Scientists & Administrators

Three Other Meetings: December 2009 to May 2010

USDA-ARS Scientists and UF Faculty
Texas A&M Faculty
NMSU, LSU, and USDA-MARC Scientists

First Meeting ...

Brahman cattle widely used for crossbreeding in the Southern Region of the US

Brahman has excellent adaptability to tropical conditions and good growth and feed efficiency
Needed improvement in fertility and carcass and meat palatability

There was a need for a large scale research Brahman project involving producers and researchers
Target Traits: **Reproduction, Growth, Feed Efficiency, and Carcass and Meat Palatability**

The Other Three Meetings ...

Technical Meetings

Objectives of the Brahman Project
Structure of the Population
Construction of the Brooksville Brahman Herd
Pedigree, Phenotypic, and Genotypic Data Collection
Tissue Sample Collection and Storage
Database Storage and Management
Genetic and Genomic Evaluation
Mating, Culling and Selection
Assessment of Genetic Change
Research Areas and Expected Outcomes

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Objectives

Develop a Brahman population with animals from multiple herds to conduct genetics and genomics evaluation and selection for reproduction, growth, feed efficiency, ultrasound, carcass and meat palatability traits

Construct a database with pedigree, genomic, and phenotypic data from all participating herds

Conduct genetic and genomic evaluation of animals for reproduction, growth, feed efficiency, ultrasound, and carcass and meat palatability traits using pedigree, genomic, and phenotypic information

Identify and disseminate genetics from animals with the best predicted genetic and genomic values for reproduction, growth, feed efficiency, and carcass and meat palatability traits

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Population Structure

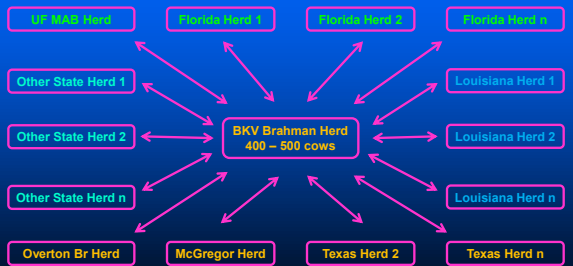
Data and Tissue Sampling

Genetic and Genomic Evaluation

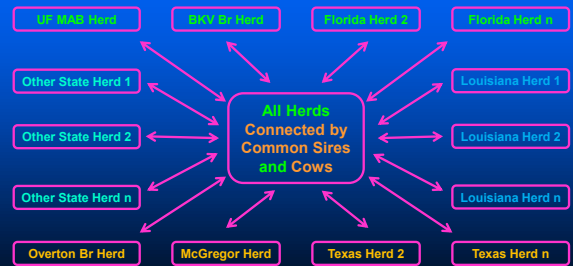
Culling, Mating, and Selection

Research and Expected Outcomes

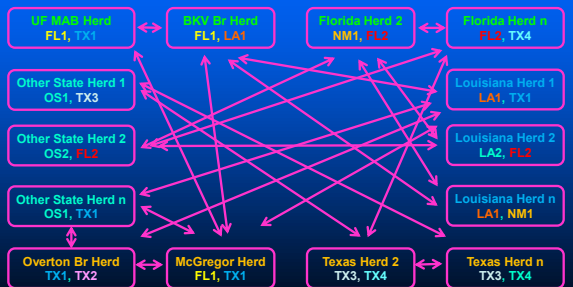
Initial Population Structure



Future Population Structure



Future Connectedness Among Herds



[AI, ET, IVF] Sire Usage by State, Year, and Herd from 2010 to 2013

Years Used [AI,ET,IVF]	Sire Reg #	Name	Herd	State
2010, 2011	794508	REP SIR MANSO MANGUM 420	DOC PARTIN RANCH	TX
2011, 2013	805040	DOC SUTTON DUBO 116	KEMPER CATTLE COMPANY	TX
2011	794506	REP SIR MANSO MANGUM 420	DOC PARTIN RANCH	TX
2011	832596	KCC EMPEROR DUBO	KEMPER CATTLE COMPANY	TX
2013	783104	REP IMPRA MANGUM 370	UF MULTIBREED HERD	TX
2013	816797	REP WALTER MANSO	UF MULTIBREED HERD	TX
2010, 2011	306420	HL LITTLE BOZO 116	BERCHMAN LAVERONE	LA
2011	877366	SCD DIDOR ESTO 623	D BAR RANCH	LA
2011, 2013	848844	NMSU AX CLOVERDALE 1128	NEW MEXICO STATE UNIVERSITY	NM
2011, 2013	803784	NMSU GARRETT MANSO 7087	NEW MEXICO STATE UNIVERSITY	NM
2013	778115	MR.SUNLAND 6X 874	NEW MEXICO STATE UNIVERSITY	NM
2013	871628	NMSU DUBO CHERRA 45/1	NEW MEXICO STATE UNIVERSITY	NM
2010, 2011	853237	MR TAES 7145	TEXAS A & M UNIVERSITY	TX
2010, 2011	800995	JDH MR MANSO 236/3	J.D. HUDGINS-FORGASON DIV.	TX
2011, 2013	851136	MSP SPECIAL RELOAD 945	PARTIN & PARTIN HEART BAR RANCH	TX
2011	295806	JDH MULHIM EMP MANSO	J.D. HUDGINS-LOCKE DIV.	TX
2011	829894	MR TAES 3040	TEXAS A & M UNIVERSITY	TX
2010	854694	MR TAES 6087	TEXAS A & M UNIVERSITY	TX
2013	868630	EJL EMPER SULLIVE 176	DAVID HUSFELD-SANTERLAND RANCH LTD. CO	TX
2013	809356	MSP ESTO CHERRA 754	PARTIN & PARTIN HEART BAR RANCH	TX

[NS] Sire Usage by State, Year, and Herdfrom 2009 to 2012

Years Used [NS]	Sire Reg #	Name	Herd	State
2009, 2010	856461	TH BURMA BEN 182-04	TREASURE HAMMOCK RANCH	FL
2009	857614	BB MR WEST BERCH 508	BARTHLE BROTHERS RANCH	FL
2009	842143	STARS 03-048	STARS	FL
2010	828050	JCC DAK Charley 109/1	DOUBLE C BAR RANCH	FL
2011	894378	STARS 09-212	STARS	FL
2012	864628	KCC 272 OF 185-176	KEMPFER CATTLE COMPANY	FL
2011, 2012	863297	MR TAES 7145	TEXAS A & M UNIVERSITY	TX
2012	890628	MR. TAES 0107	TEXAS A & M UNIVERSITY	TX

Numbers of Brahman Females by Herd of Origin and Age

Herd of origin	Repro System	Cows	2-Year Olds	Yearlings	Calves	Total
Brooksville	NS	83	11	7	27	118
Texas AgriLife	NS	19				19
Barthle Bros Ranch	ET				4	4
Brooksville	ET			8	4	12
Doc Partin Ranch	ET			9	7	16
Kempfer Ranch	ET			2		2
Texas AgriLife	ET				12	12
Total		75	11	26	54	166

Number of Donor Brahman Cows Producing Heifers by Herd of Origin and Year of Mating¹

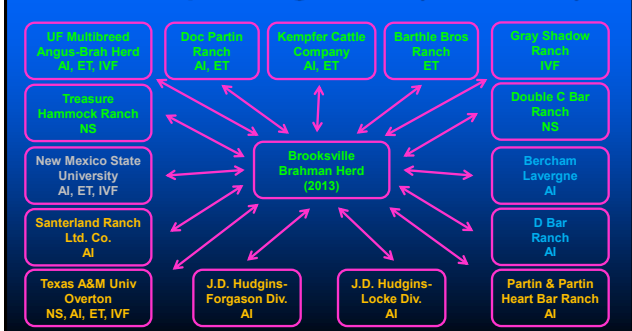
Herd of origin	2010	2011
Barthle Bros Ranch		3 (4)
Brooksville	3	2 (5)
Doc Partin Ranch	3	3 (4)
Kempfer Ranch	1	
Texas AgriLife		8 (9)
Gray Shadow Ranch		0 (3)
Total	7	16 (25)

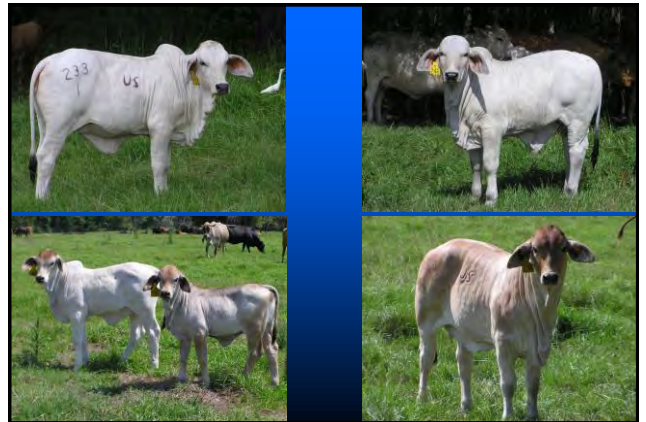
¹Total number of donor cows in parenthesis.

Natural Service Matings for 2012

	MR TAES 7145	MR TAES 0107	KCC 272 OF 185-176	Total
Heifers (Yearling)	0	26	0	26
Cows	38	12	36	86
Total	38	38	36	112

Connectedness Brooksville Herd and Cooperating Herds (2009-2013)





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- Data and Tissue Sampling**
- Genetic and Genomic Evaluation
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Data Collection and Storage 1

Pedigree Data

Complete pedigree file with information on all animals (calves, sires, and dams) from all experimental and private herds in the population

Phenotypic Data 1

Reproduction: age at puberty, calving interval
Growth: calf weights at birth, pre-weaning, weaning, yearling, post-yearling; cow weights, condition scores

Data Collection and Storage 2

Phenotypic Data 2

Feed Efficiency: postweaning weights, feed intake, water intake, residual feed intake, feed conversion ratio

Temperament: pen score, exit velocity

Ultrasound: ribeye area, intramuscular fat, backfat

Phenotypic Data 3

Carcass: carcass weight, dressing percent, ribeye area, marbling, backfat thickness

Meat Palatability: shear force, tenderness, connective tissue, juiciness, flavor, off-flavor

Where and What Data?

Brooksville Brahman Herd

Multibreed Angus-Brahman Herd

Contributing Experiment Stations (TX, LA)
Private Herds

All Herds: phenotypes that are part of herd management (e.g., calving dates, calf and cow weights)

Some Herds (**Funding Permitting**): feed efficiency, carcass, and meat palatability traits

Realistic Objective

Collect as much data as feasible at each location

Tissue Collection and Storage

Sires

Semen (4 straws) or Blood (10cc)

Dams and Calves

Blood (10cc)

DNA from tissue samples would be maintained in a repository for long-term storage and retrieval
UF Interdisciplinary Center for Biotechnology (ICBR)
Other suitable site

Genomic Analysis of Tissue Samples

Provided that funding is available

DNA samples will be analyzed using available commercial genotyping chips

Illumina 50K, HD (770K), and LD (7K)
GeneSeek
UF ICBR

Genotypic data would be added to the pedigree and phenotypic data to conduct genetic and genomic evaluation of animals in the Brahman population

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2012 Brooksville Brahman Herd: Culling and Mating

Culling

Minimum culling of females due to health, reproduction, and production issues

Mating

Artificial Insemination: None (only ET Donor cows Synchr & AI)
Embryo Transfer and In-Vitro Fertilization: None
Natural Service: Brahman cows placed in groups of 35 to 50 with a Brahman sire for 60 days; Recipient cows placed with crossbred Angus-Brahman sires for 60 days

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Expected Outcomes

Genetic and genomic evaluation of animals from all cooperating herds in the population for all traits in common

Within-herd and across-herd ranking of animals by their genetic and genomic predicted values

Improvement of traits within herds and in the complete Brahman population by preferential use of males and females with superior EBV as parents of subsequent generations

Determination of genetic and genomic trends for males and females for traits in common and comparisons of Brahman cattle grouped by various criteria (e.g., location, selection lines)

Acknowledgements

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Partin & Partin Heart Bar Ranch, TX
Rocking S Ranch, FL
Texas AgriLife Research & Extension Center, Overton, TX
Treasure Hammock Ranch, FL

American Brahman Breeders Association
Florida Brahman Association