

Replacement Heifer Selection and Development

2010 Victoria County Rebuilding the Cowherd

Joe C. Paschal
Texas AgriLife Extension
Corpus Christi, Texas



Functional Levels of Production of Major Breedtypes in Texas

(adapted from Hammack, 2008)

Breed group	Body size	Milk potential	Age at puberty	Hot climate adapted	Fleshing ability	Muscle expression	Cutability	Marbling
British	H	L-M	E-M	L	H	M	L	M-H
Continental beef	H-VH	L-VL	L	L-M	L-M	H-VH	VH	L-VL
Continental dual purpose	H-VH	M-H	E-M	L-M	M	H	H	L-M
Dairy (H-J)	VH-VL	EH-VH	E-VE	L-M	L-M	L-VL	H-VL	M-VH
Bos indicus	H	M	VL	VH	H	M	M	L
American	M-H	M-H	M	H	M-H	M	M	L-M
Specialty	VL	L	M	M	M	L	M	L

Note: VL = very low, L=low, M=medium, H=high, VH=very high, and EH=extremely high except for age at puberty where VE=very early, E=early, M=medium, L=late and VL=very late.

Breed Types for Commercial Beef Herds

(adapted from Hammack, 2003)

Cow breed or cross	Sire Breedtypes				
	British	Bos indicus	American	Continental	Heifer
British	M (XB)	R	M	M	R
Bos indicus	R			R	R
Bos indicus-British	M		R	M	R
American	M		R (XB or PB)	M	R
American cross	M		M	M (No AXC dams)	R
Continental-British	M	R	M	M	R
Continental-Bos indicus	M		R	M	R
Heifers	S		S		S

Management Procedures Used on Replacement Heifers ^a

<u>Management practice</u>	<u>Percent of operations</u>
Feed separately (light vs heavy)	31.8
Weigh/feed to weight	17.9
Pregnancy diagnosis/palpation	15.9
Breed prior to the mature herd	12.7
Body condition score	4.6
Synchronize estrus	3.0
Artificial insemination	3.3
Pelvic measurements	3.0
Reproductive tract scores	1.2

^aAdapted from NAHMS, 1994a.

Selecting and Developing Replacement Heifers

- Purchase or raise?
 - Adaptability
 - Cost
 - Genetics
 - Herd health
 - Temperament
 - Replacement production
 - Market
 - Salvage value



Selection Criteria

- Beef character
- Structural correctness
- Muscling
- Adjusted vs actual weights
- Postweaning average daily gain
- Maternal performance (milk)
- Temperament
- Reproductive tract scores
- Pelvic area
- Health
- Longevity



5 Step Replacement Heifer Management Plan

- Heifer selection at weaning
- Management from weaning until breeding
- Management at breeding
- Management after breeding
- Management after calving
- Rebreeding



Heifer Selection at Weaning

- Keep heifers with only heavy actual weaning weights
 - Born early in season
- Retain 10% more heifers than you will actually need
- Do not keep heifers with structural defects
- Do not select heifers based solely on feminity
- Herd health program



Relationship Between Actual Weaning Weight of Calves and Calving Date in a 60 Day Season

					Percent of high, medium and low weaning weight calves born during the ..		
Weaning Wt. Rank	No. Head	Weaning Wt.	Weaning Age	ADG	First 20 days	Second 20 days	Third 20 days
High	2910	417	207	1.68	70	24	6
Medium	2916	360	195	1.49	42	39	19
Low	2916	301	181	1.28	19	33	48

Management from Weaning Until Breeding

- Weigh selected heifers at weaning – determine the number of days from weaning until the start of breeding season and their target breeding weight
- Health program
- Apply the following formula:
 - $\frac{\text{Target wt.} - \text{Weaning Wt.}}{\text{Number of days between}}$
 - $(700 - 425)/274 = .55 \text{ lbs/d}$



Winter Feeding Costs and Performance of Heifers Fed Together or Separately

	Fed Together		Fed Separately	
No. Heifers	10	10	19	20
Wean Wt. (lbs)	376	475	374	464
Projected ADG	1.5	1.4	1.72	1.17
Actual ADG	1.27	1.47	1.81	1.24
Projected Wt.	715	715	715	715
Actual Wt.	620	719	669	722
\$/Hd/Day	\$0.75	\$0.75	\$0.89	\$0.67
Avg. \$/Hd/Day	\$0.75		\$0.78	

Evaluate Nutrients

Fecal Analysis

- Very high quality
 - $>20\%$ CP 70% TDN
- Average quality
 - $8-10\%$ CP $>60\%$ TDN
- Low quality
 - $<6\%$ CP $<45\%$ TDN



Breedtype, Size and Production Effects on Reproduction

- Heifers should be at least 60-65% of their mature body weight and a BCS of 5 to expect them to cycle
- Heifers need to be cycling BEFORE breeding
 - Bull effect
- Heavier milking breeds do reach puberty at an earlier age BUT also have higher nutritional requirements
- Crossbreeding and hybrid vigor important for fertility
- Larger breeds (and animals within breeds) will be heavier (and possibly older) at puberty than smaller ones
- Bos indicus heifers will exhibit later puberty (older)
- Over developed (fat) heifers will have reduced milk production and wean lighter calves
- Some evidence that disposition affects fertility

Management at Breeding

- BCS and reproductive tract score and pelvic area measurements
- Breed 20-30 days before the start of the breeding season of the mature cow herd
- Mate to fertile bulls with high accuracy for calving ease and low birth weight
- Breed heifers for 70-90 days.



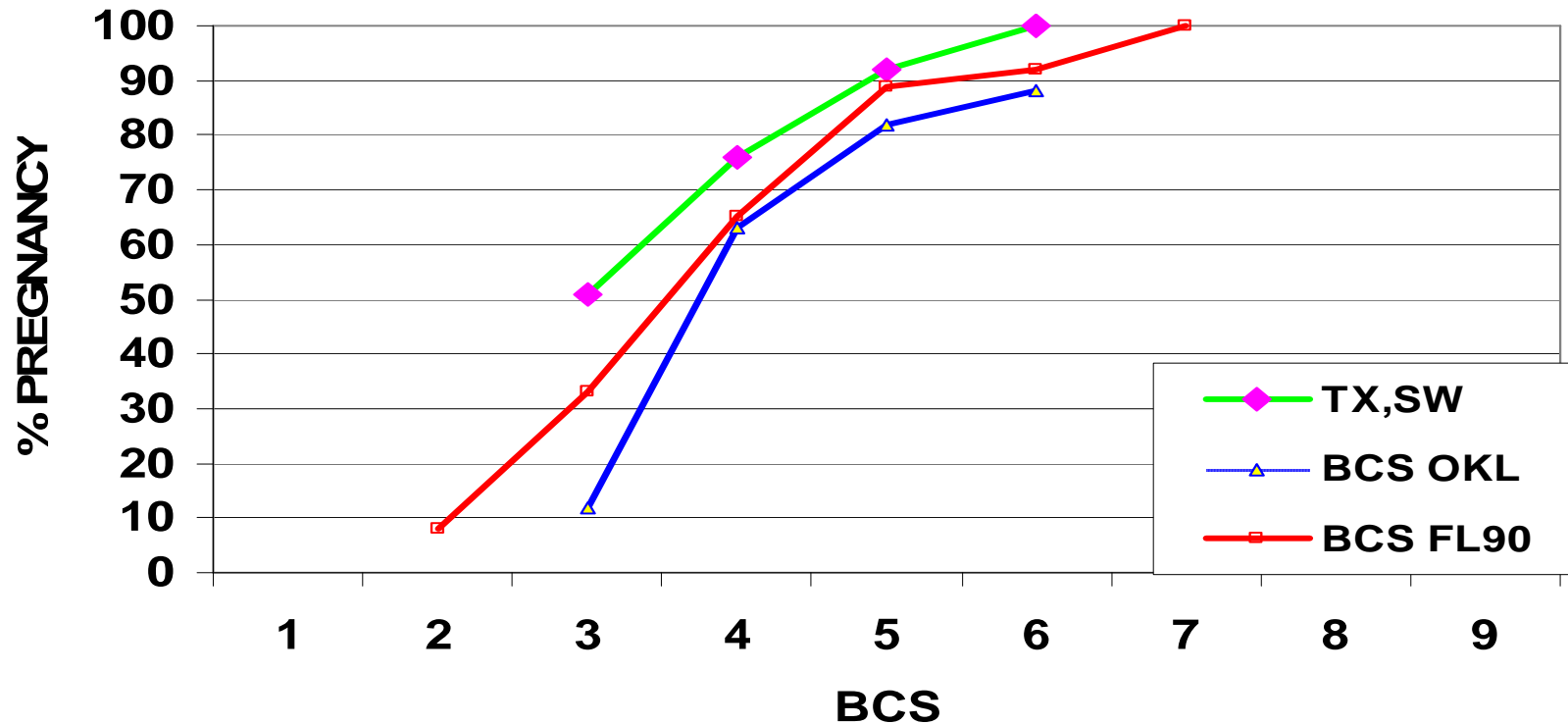
Body Condition Scores

- BCS 3
 - All ribs are showing
- BCS 4
 - Last 2-3 ribs showing
 - Borderline condition
- BCS 5
 - Optimal



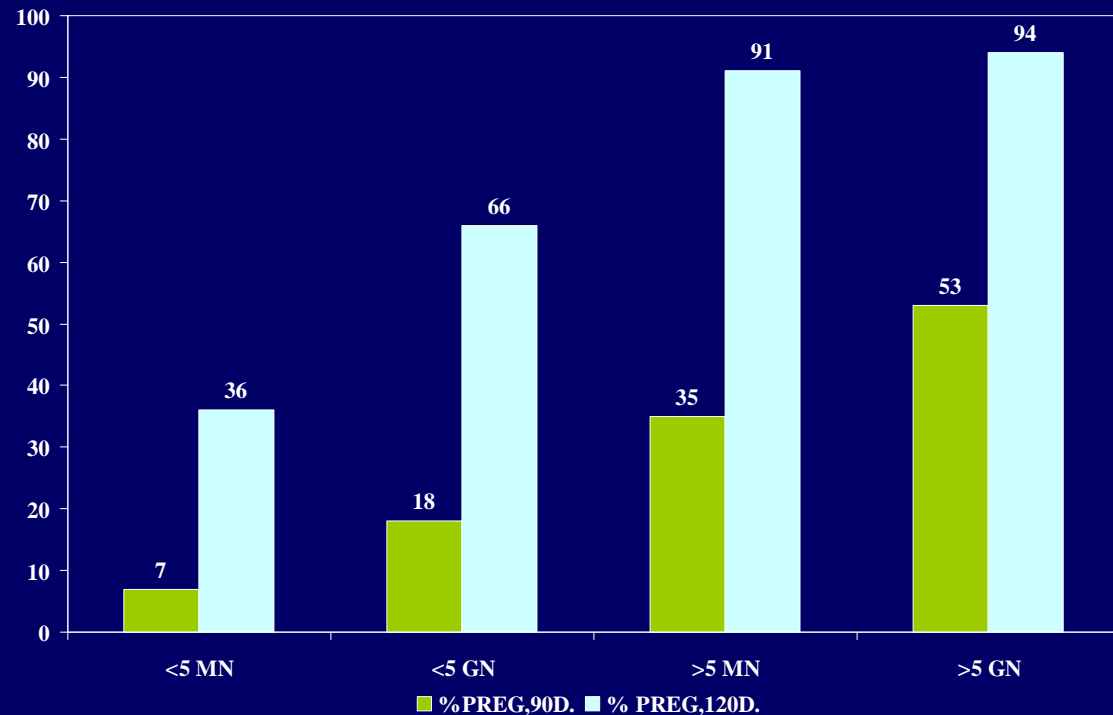
Effect of Body Condition Scores on Cow Pregnancy Rates

EFFECT OF BODY CONDITION SCORE (BCS) ON % PREGNANCY



Effect of Supplementing Cows to Gain or Maintain BCS on Pregnancy Rate at 90 and 120 d

- Cows with less than a BCS 5 fed to gain weight had higher pregnancy rates than those that were fed to maintain their weight at 90 and 120d
- Cows with at least a BCS of 5 exhibited a major difference at 90d but not at 120d



Reproductive Tract Scores

- 1. No uterine tone (< 20 mm diameter), small ovaries; no palpable follicles
- 2. No uterine tone (20-25 mm diameter), 8 mm follicles
- 3. Slight uterine tone (20-25 mm), 8-10 mm follicles
- 4. Good uterine tone (30 mm diameter), 10 mm follicles; CL possible
- 5. > 30 mm diameter, CL present



Management After Breeding

- Pregnancy test 60-65 after breeding season ends
- Retain only pregnant heifers, market others as open or exposed or rebreed for a late calf
- At 60-90 days before calving, separate bred heifers from mature cowherd to aid in feeding and any special care needed
- Grow heifers to 85% of their mature weight
- Heifers need to calve in a BCS of at 6 to ensure high rebreeding rates
- Herd health



Management at Calving

- Hold heifers in an easily accessible pasture or trap for observation and assistance at calving
- Check heifers 3-4 times daily, be ready to assist those needing it (keep your vet in the loop!)
- Continue to feed heifers to maintain body condition and continue to grow to improve rebreeding percent



ReBreeding Management

- If first calf heifers are in poor body condition and/or you are short of feed, consider early weaning at 30-60 days of age or use once daily sucking to reduce nutrient demand on cow
- Breed for 60-90 days, starting the breeding season at the same time as the mature cows, pregnancy test 60 days after the end of the season.
- Cull any that fail to rebreed.
- Health program



Functional Productive Cows Don't Have to be Pretty



Beef.tamu.edu