BREED EVALUATION OF DIVERSE BREEDS

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Germplasm Evaluation Program Cycle IV
Meat Animal Research Centre, Clay Centre, Nebraska (1)

Overview of MARC

The cattle operation is comprised of a 7,300 head cow herd. The centre has 27,000 acres of cool and warm seasonal grasses used as pasture and forage. 25,000 acres are for the cow herd.

Winter or confined feeding uses alfalfa and cornsilage. The Germplasm Evaluation Program at MARC was initiated in 1970 (Cycle 1). Dr. Larry Cundiff, research leader, Genetics and Breeding Research Unit, has led this project.

The premise being that ***"breed differences in performance characteristics are an important genetic resource for improving efficiency of beef production"***. Diverse breeds are required to exploit heterosis and complementarity through crossbreeding, to match genetic potential with diverse markets, feed resources and climates.

Table 1 -- SIRE BREEDS USED IN GERMPLASM EVALUATION PROGRAM

Cycle I (1970-72)	Cycle II (1973-74)	Cycle III (1975-76)	Cycle IV (1986-90)
F1 Cross from Hereford or Angus dams (Phase 2)			
Hereford	Hereford	Hereford	Hereford a
Angus	Angus	Angus	Angus a
Jersey	Red Poll	Brahman	Longhorn
S. Devon	Brown Swiss	Sahiwal	Salers
Limousin	Gelbvieh	Pinzgauer	Galloway
Simmental	Maine Anjou	Tarentaise	Nellore
Charolais	Chianina		Shorthorn
			Piedmontese

			Charolais
			Gelbvieh
			Pinzgauer
3-way crosses out of F1 dams (Phase 3)			
Hereford	**Hereford**		
Angus	**Angus**		
Brahman	**Brangus**		
Devon	**Santa Gertrudis**		
Holstein			

Characteristics of Diverse Breeds in Cycle IV of the Cattle Germplasm Evaluation. Beef Research, Progress Report No. 4. Dr. Larry V. Cundiff, Koch, R.M., Gregory, K.E., Crouse, J.D., and Dikeman, M.E.

Table 1 shows the mating plan for Cycles 1,11,111, and 1V of the Germplasm Evaluation (GPE) Program. Each cycle consisted of mating Hereford and Angus cows by artificial insemination (Al) to sires of diverse breeds.

Cycle IV, (1986-90) which we will look at today, features work with Galloway cattle, full blood sires and crossbred dams.

Calves were born in the spring, beginning in late March and ending in late May. Each cycle consisted of mating Hereford and Angus dams (F1 Phase 2) by artificial insemination (Al) to sires of diverse breeds.

In Cycle IV eleven (11) different sire breeds were mated to the crossbred dams to produce a total of about 200 calves per sire breed in five calf crops (1986-1990). Following an AI period of about 45 days, clean up bulls were used each year in single-sire breeding pastures for about 21 days. These sires were Angus, Hereford, Charolais, Gelbvieh and Pinzgauer.

Sires used in Cycle 1V were Angus, Hereford, Longhorn, Piedmontese, Charolais, Salers, Galloway, Nellore, Shorthorn, Gelbvieh and Pinzgauer.

3-way crosses out of F1 dams (Phase 3) were retained to evaluate growth, age at puberty, reproduction and maternal performance through mature ages. Heifers were fed in drylot from weaning to about 370 days of age on a diet containing 54% corn silage, 42% alfalfa haylage, and 4% supplement until January, and 45% corn silage, 54% alfalfa haylage and 1% supplement until they were moved to grass in the spring.

Females were bred by natural service to Red Poll sires to produce their first calves as 2-year-olds and subsequently to Simmental sires through mature ages. Data were analysed for 957 matings of Fl females to Red Poll bulls to produce first calves at 2 years of age and 1525 matings of Fl females to Simmental bulls to produce subsequent calves at 3, 4, and 5 years of age.

Data presented here and used for comparison is taken from two different breed groups determined by looking at differences based on growth rate and mature size, lean-to-fat ratio, age at puberty and milk production. Comparisons will be made between Galloway, Shorthorn, Piedmontese and Charolais.

Table 2--BREED CROSS DIFFERENCES IN PREWEANING TRAITS, CYCLE IV - PHASE 2 CALVES

Breed Group of Calf	No. Calves Born	No. Calves Weaned	% Calvings Unassisted	Birth wt. lbs.	% Calf Survival
Charolais-X	203	184	91.2	89.1	90.6
Shorthorn-X	181	170	99.9	86.1	93.4
Galloway-X	173	164	98.0	80.1	94.5
Piedmontese-X	202	188	94.7	83.6	92.6

The results in Table 2 indicate that Galloway sired calves weighed in at 80.1 Ibs. and had a 465 Ib. weaning weight. Unassisted calving was 98% second to the Shorthorn at 99.9%.

Calf survival of 94.6% was highest of all breeds in the study. To a rancher this certainly has to be a factor to be considered.

Table 3--BREED CROSS DIFFERENCES IN REPRODUCTIVE AND MATERNAL TRAITS, CYCLE IV - PHASE 3 - CALVES BORN IN 1988-1991*

Breed Group of Dam	No. Cows Exposed	Calf Crop Born %	Calf Crop Weaned %	% Calvings Unassisted	Birth wt. lbs.
Charolais-X	183	89.7	83.9	78.0	88.6
Shorthorn-X	119	92.4	87.5	80.7	90.6
Galloway-X	172	85.2	80.1	83.0	79.9
Piedmontese-X	215	93.0	86.7	72.9	84.2

*Data were analyzed for 957 matings of F1 females to Red Poll bulls to produce first calves at 2 years of age and 1,525 matings of F1 females to Simmental bulls to produce subsequent calves at 3, 4, and 5 years of age.

Means for calf crop percentage, calving ease, birth and weaning weight for Phase 3 calves, is found in Table 3. The results are presented from four calf crops of females born in 1986, three calf crops from females born in 1987, and two calf crops from females born in 1988, and one calf crop from females born in 1989. These results are preliminary and this needs to emphasized. Data will be obtained on the females for an additional four calf crops. Unassisted calvings remained high and birth weight was consistent, calf crop indicators of percent born and weaned was lower. It is to be remembered that this data is preliminary.

Table 4--BREED CROSS DIFFERENCES IN FINAL WEIGHT AND CARCASS TRAITS OF STEERS, CYCLE IV - PHASE 2

Breed Group of Steer	No.	Final Wt. lb.	Dress pct. %	Marbling Score	Shear Force lbs.	Rib Eye Area sq. in.	Retail Product .0 in trim %
Charolais-X	86	1235	61.8	496	13.0	12.18	66.0
Shorthorn-X	95	1202	61.9	548	12.9	11.08	62.5
Galloway-X	75	1077	62.2	512	12.8	11.28	65.2
Piedmontese-X	80	1130	63.6	492	11.9	13.19	69.8

Table 4 looks at differences in weight and carcass traits of steers from Cycle IV-Phase 2. A marbling score of 500 plus meets minimal requirements for USDA Choice quality grade. All of the Galloway steers excelled in the marbling score and had a high percentage retail product. Carcass weights were lowest.

Current research indicates Galloway cattle certainly have a role to play in our current cattle industry. It will be up to those currently involved and active in the breeding of Galloway cattle to get this message out to commercial cattleman and let cattleman judge for themselves the potential of the breed.

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