Impact of Adaptability Grant: Identifying Local Adaptation and Creating Region-specific Genomic Predictions in Beef Cattle



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Hair Shedding

- 1 to 5 subjective score
- "Hair shedding scores: A tool to select heat tolerant cattle"
- http://articles.extension.org/pages/74069/hair-shedding-scores:-atool-to-select-heat-tolerant-cattle







- Comparing adjusting calf weaning weight with adjusting hair shedding score of the dam,
- Decreasing hair score by 1 unit results in an increased weaning weight of 12.6 pounds (p = 0.056).
- From Gray et al. estimated 24.5 pound difference between calves out of late shedding and early shedding cows.

Hair shedding scores were adjusted for:

- Sex
- Age in years at time of scoring
- Deviation of the scoring date from May 1
- Farm
- Year
- Calving season spring (January 1-June 30) or fall (July 1-December 31)
- Animal effect
- Repeated measure



















Environment-Specific Genomic Predictions

Region	Birth Weight	Weaning Weight	Yearling Weight
1	376	388	156
2	408	465	335
3	3650	3743	3019
4	3	3	3
5	79	86	48
6	0	0	0
7	741	747	558
8	4496	4648	3701
9	1095	1092	842

Regions	•
predicted breeding values.	
Correlations between phenotypes and	

	0.010	Region 2	Region 3	Region 7	Region 8	Region 9
	1&5	Negion 2	Inc Bioli D	negion /	Inc Bioli O	negion 3
Birth	0.304	0.306	0.452	0.391	0.400	0.349
Weight Weaning	0 195	0 283	0 212	0 276	∩ 272	0 2/12
Weight	0.133	0.205	0.310	0.270	0.272	0.242
Yearling	-0.176	0.318	0.268	0.217	0.261	0.216
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Realized accuracies between phenotypes and predicted breeding values.

	Regions	Region	Region	Region	Region	Region	h2
	1 & 5	2	3	7	8	9	"
Birth	0.509	0.511		0.654		0.584	0 257
Weight	(25.9%)	(26.1%)		(42.8%)	(44.9%)	(34.1%)	0.357
Weaning	0.395	0.573		0.558		0.489	0 2 4 4
Weight	(15.6%)	(32.8%)		(31.1%)			0.244
Yearling	-0.319	0.574	0.484	0.393			0.000
Weight	(10.2%)	(32.9%)		(15.4%)			0.306







Take Home Messages

- Genomic predictions for hair shedding will come
- Easy to measure, multiple measurements per cow
- See lots of signatures of selection
- Some of that selection is for environmental adaptation
- Environment-specific genomic predictions look promising