Crossbreeding Beef on Dairy

Bradley J. Heins
University of Minnesota
West Central Research and Outreach Center Morris, MN

Why the interest in beef on dairy?

- **Add value to calves**

- **Too many dairy replacement heifers**

- **Improved profitability**

- **Calving ease**

- **Develop a genetic strategy for dairy herd**

- **Consistent end product**

- **~5% in USA (Angus, Limousin, SimAngus)**

Breeding to Feeding

MANAGEMENT NEEDS

THE PROGRAM

GETTING STARTED

COMMITMENT BEHIND THE PROGRAM

BUY-BACK REGIONS

AVAILABLE SIRES

Breeding to Feeding

A New Profit Stream for U.S. Dairies

The state of today's dairy and beef industries have made Breeding to Feeding℠ a clear way to connect beef supply with demand.

- Tight beef supplies worldwide have fueled high beef prices.
- This year's beef calf crop and cow herds are at their smallest levels in more than 60 years. Beef calf numbers have declined each year since 1995.
- Feedlots and packers are searching for uniform, quality cattle, which efficiently convert feed to gain.
- Dairy steers make up a significant portion of the U.S. beef supply.
- Dairies can capture more revenue by providing a consistent supply of dairy-beef calves bred for uniformity, quality, growth and feedlot performance.
- Many dairy herds produce an abundance of heifers – more than enough to replenish their milking herd – due to improved reproduction and new technologies.

ABS InFocus™

ABS InFocus (Beef x Dairy)

ABS InFocus involves the strategic use of proven beef sires on dairy cows within a comprehensive breeding plan. InFocus enables dairies to increase cash flow and improve future herd genetics. Lower performing cows are bred to beef and calves are sold at a premium. Top performing cows are used for heifer replacements.

- ABS InFocus Beef x Dairy Overview Video
- InFocus Dairy Flyer

ABS Beef x Dairy Advantage

There are clear differences between beef bulls when tested on dairy cows for fertility, calving ease, still birth and calf quality. The ABS Real World Data™ program monitors these results and graduates only those sires with a competitive advantage over unproven dairy beef sires.

- **Increased Fertility:** ABS tracks real beef x dairy fertility results, and bulls that achieve a 5-star RWD ranking perform 2-3 percentage points better for conception rate than industry averages. This keeps more cows in lactation and reduces the number of units to achieve pregnancy.
- **Improved Calving Ease:** Improved calving ease reduces stress in the maternity pens and gets cows back on peak milk more quickly. The industry average for Holstein calving difficulty is significantly greater than InFocus sires.
- **Reduced Still Birth:** InFocus sires reduce the still birth rate by more than half compared to Holstein breed averages.
- **Calf Quality:** ABS InFocus sires are designed to produce superior beef cattle from dairy cows, in terms of health, growth rate, feed efficiency and carcass merit. InFocus calves significantly outperform dairy steers and generically-sired dairy beef.

InFocus Angus and SimAngus information based on >29,000 observations Holstein heifer and lactating cows.

All Beef List

| Angus | Red Angus | Brangus | Brahman | Brahman Red | Charolais | Gyr | Hereford | Hereford (P) | Limousin | Lowline | Simmental | Wagyu | Beef On Dairy |

Catalog USA | New | International ▾

Basic

Sire NAAB/Reg Codes:
Multiple NAAB and/or Reg # separated by comma /or Copy & Paste From Excel

☑ Reg Name
☐ Registration #
Bull Picture ☐ ❓
Bull Comment ☐

☑ CED — Less
☑ BW — Less
☑ WW — Less
☑ YW — Less
☑ Milk — Less

Search | Compare | Reset | Export Excel | Print 1 | Print 2

No of Animals: 53

	Naab Code	Reg Name		Sexed	CED	BW	WW	YW	MILK	TM	CEM	SC	REA	IMF	FAT	Sire Name
☐	151AN01418	Quaker Hill **Chieftain**		Sexed	4	2.4	71	119	21.0		5	0.3	0.78		0.00	GAR-EGL Protege
☐	151AN01419	Quaker Hill **Royal Flush** 4AI3		Sexed	3	2.8	78	136	25.0		3	-0.2	0.91		-0.02	Deer Valley All In
☐	151AN01421	Quaker Hill **Disciple**		Sexed	14	-1.1	52	98	32.0		12	-0.1	0.43		0.08	G A R Prophet

Pregnancies for Profit

Beef x Dairy Sires

GENEX™

The Big Unknowns

- What breeds complement each other?

- Are there sire differences?

- How do we feed these animals?

- How will these beef x dairy crossbreds affect the beef market?

Selection of breeds

- Select semen from top bulls and breeds

- Black maybe good, but might not be the answer

- Want a calf that looks like a beef animal

- Maximize growth – may desire to think from a feedlot mentality

- Understand the beef markets

Beef breed differences

Breed	Birth weight (lb)	Marbling Score	Ribeye Area (in^2)	Fat Thickness (in)	Carcass Weight (lb)
Angus	85.5	5.67	13.78	0.662	937.3
Red Angus	85.5	5.47	13.47	0.635	901.2
Charolais	91.1	4.94	14.70	0.456	922.4
Gelbvieh	87.5	4.97	14.46	0.536	914.9
Hereford	88.6	4.91	13.62	0.586	890.3
Limousin	87.5	4.90	14.80	0.517	911.2
Simmental	88.9	5.06	14.52	0.495	920.1

Angus

- Small frame, high quality carcass
- Well-marbled meat
- Naturally polled
- Vigorous breed

Hereford

- Docile and easy handling
- Superior foraging ability, vigor and hardiness
- Fast growing cattle with good beef quality

Charolais

- **Good growth, heavy muscling in round and loin**
- **Calving ease**
- **Large frame animal**
- **Fit into any system**

Limousin

- **Early maturing, lean beef**
- **High yield of saleable meat – The Carcass breed**
- **Excellent feed efficiency**

Simmental

- **Excellent feed conversion and efficiency**
- **Calving ease**
- **Good growth rates**

Gelbvieh

- **Early maturing, excellent temperament**
- **High cutout yields – large ribeye area**
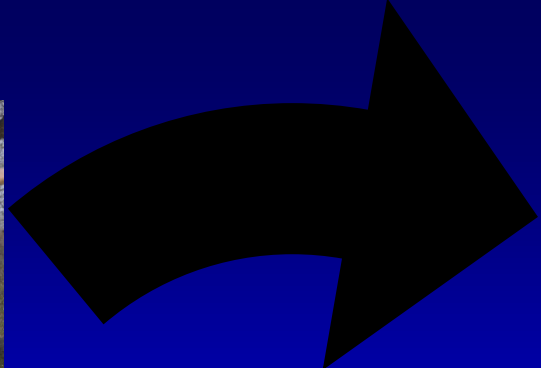- **Good birth weight of calves**
- **Lean breed**

European breeds

- **Calving ease, muscle development, growth rate, hide color and meat color**

- **Belgian Blue**
- **Charolais Excellence**
- **INRA95**
  - **Charolais**
  - **Blonde d'Aquitaine**
  - **Limousin**
  - **Maine Anjou**
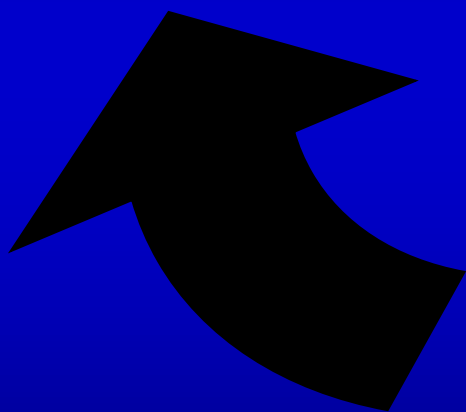
Holstein sire

Viking Red sire

Montbeliarde sire

Pro Cross at the U of MN

Jersey

Viking Red

Normande

UMN WCROC crossbreeding

Normande, Swedish Red, Jersey, Holstein

Holstein, Swedish Red, Montbéliarde, Holstein

Swedish Red, Holstein, Jersey, Montbéliarde, Holstein

Averages for genetic groups

Trait	H64	HO	HI	LO
Birth weight (lb)	91.5[a]	94.1[a]	91.9[a]	79.6[a]
Weaning weight (lb)	223.8[b]	228.4[a,b]	250.4[a]	218.3[b]
Hip height (in)	37.8[a,b]	37.8[a,b]	38.7[a]	36.8[b]
Weight gain (lb)	132.1[a]	134.3[a]	158.5[b]	138.7[a]
Average daily gain (lb/d)	1.46	1.48	1.65	1.52

Means within rows with different superscripts are significantly different ($P < 0.05$)

Carcass characteristics for genetic groups

Trait	H64	HO	HI	LO
Final live weight (lb)	1,031[a,c]	1,090[a,b]	1,167[b]	958[c]
Carcass weight (lb)	566[a]	578[a]	634[b]	507[c]
Fat thickness (in)	0.18	0.20	0.24	0.17
Ribeye area (in^2)	10.2[a]	9.8[a,b]	10.2[a]	9.1[b]
KPH fat (%)	1.5[a]	1.5[a,b]	1.4[b]	1.5[a,b]
Dressing percentage (%)	56.0[a]	53.9[c]	55.3[a,b]	54.4[b,c]

Means within rows with different superscripts are significantly different ($P < 0.05$)
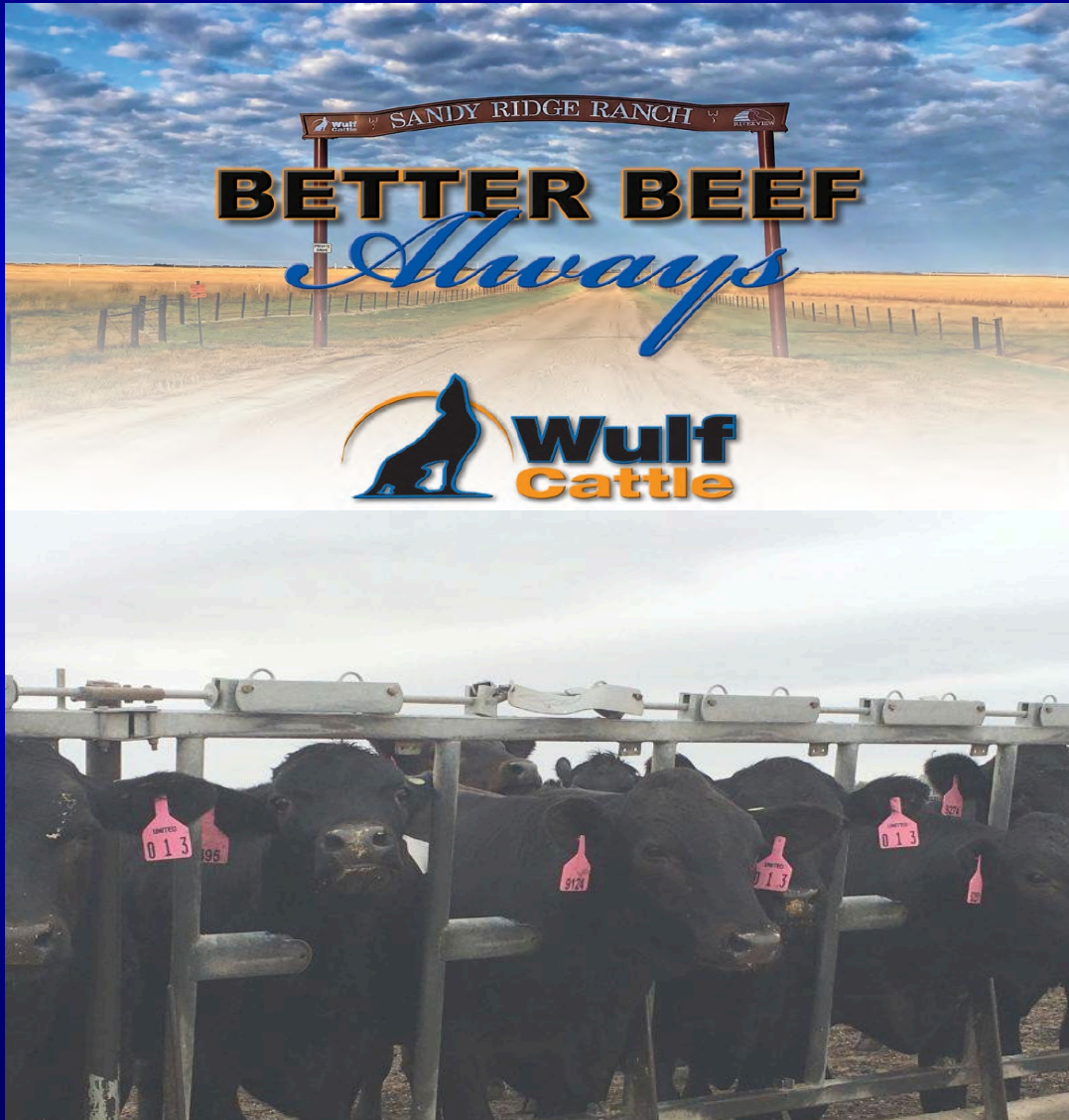
Marbling and Yield Grade for genetic groups

Trait	H64	HO	HI	LO
Marbling[1]	3.8	3.9	3.7	3.6
Maturity[2]	1.4	1.3	1.3	1.3
Yield grade (units)	1.6[a]	1.7[a,b]	1.8[b]	1.7[a,b]

Means within rows with different superscripts are significantly different ($P < 0.05$)
[1] Slightly Abundant = 1, Moderate = 2, Small = 3, Slight = 4, Traces = 5
[2] Maturity A = 1, Maturity B = 2, Maturity C = 3

Limousin x Jersey research

- **31 Limousin x Jersey strip loins**

- **25 Certified Angus Beef (CAB) strip loins**

- **Carcass measurements and sensory panel**

- **SDSU 2012 study**

Palatability of beef

Table 1. Least Squared means of WBSF, and palatability traits of Limousin x Jersey and CAB steaks.

Item[a]	Limousin x Jersey	SEM	Certified Angus Beef	SEM	P-Value
	Treatment				
WBSF (kg)	2.58[x]	0.08	2.22[y]	0.09	0.0059
Tenderness	5.78	0.11	5.97	0.12	0.2657
Juiciness	5.34	0.08	5.52	0.09	0.1476
Beef Flavor	6.11	0.07	6.19	0.08	0.4355
Off Flavor	7.68	0.04	7.65	0.04	0.6123

[a] WBSF = Warner-Bratzler shear force; Tenderness: 1 = Extremely tough, 8 = Extremely tender; Juiciness: 1 = Extremely dry, 8 = Extremely juicy; Beef Flavor: 1 = Extremely bland, 8 = Extremely intense; Off Flavor: 1 = Extremely intense, 8 = Non detectable
[xy] Means within rows with different superscripts differ ($P < 0.05$)

Sire differences

Item	Sire Group Sire A[a]	SEM	Sire Group Sire B[b]	SEM	P-Value
12th Rib Fat Thickness (in)	2.84	0.08	2.8	0.05	0.8589
Hot Carcass Weight (lbs.)	759.38	17.69	787.61	10.43	0.1798
Ribeye Area (in^2)	14.16	0.38	14.46	0.22	0.5022
KPH[c] (%)	2.25	0.11	2.37	0.06	0.3395
Yield Grade	2.10	0.15	2.17	0.09	0.7062
Marbling Score[d]	400.00	49.15	399.57	11.30	0.9845
Lean Maturity[e]	162.50	6.95	168.70	4.10	0.4489
Skeletal Maturity[e]	152.50	5.30	155.22	3.13	0.6622

[a] Wulf Limousin x Jersey sire 137LM3270, n = 8
[b] Wulf Limousin x Jersey sire 137LM3405, n = 23
[c] Kidney, Pelvic, Heart fat
[d] Slight 00 = 300, Small = 400
e A 00 = 100, B 00 = 200

Bumsted et al. 2012, Tenderness and beef palatability traits of Limousin Jersey cross bred steers and Certified Angus Beef.

Quality grade

Table 4. Palatability and WBSF values of Limousin x Jersey steaks based upon Quality Grade.

Item[a]	USDA Quality Grade				
	USDA Choice[b]	SEM	USDA Select[c]	SEM	P-Value
Tenderness	5.49[y]	0.14	6.00[x]	0.11	0.0078
Juiciness	5.31	0.12	5.36	0.11	0.7266
Beef Flavor	5.91[y]	0.09	6.25[x]	0.08	0.0076
Off Flavor	7.62	0.06	7.71	0.05	0.2349
WBSF	2.72	0.14	1.59	0.12	0.2358

[a] WBSF = Warner-Bratzler shear force; Tenderness: 1 = Extremely tough, 8 = Extremely tender; Juiciness: 1 = Extremely dry, 8 = Extremely juicy; Beef Flavor: 1 = Extremely bland, 8 = Extremely intense; Off Flavor: 1 = Extremely intense, 8 = Non detectable
[b] n = 13
[c] n = 18
[xy] Means within rows with different superscripts differ ($P < 0.05$)

Bumsted et al. 2012, Tenderness and beef palatability traits of Limousin Jersey cross bred steers and Certified Angus Beef.

# Beef on Dairy Business Plan

- **Know the market**
  - **More dairy-beef calves means buyer will become more selective**
  - **Crossbred calves need to be competitive in the feedlot**

- **Excellent calf care and identification**

- **Conduct a genetic audit of herd**
  - **Low genetic animals do not need to contribute offspring**

Determine heifer goal numbers

- **Determine goal cull rate and herd size**
  - To maintain herd size, the number of first-calf heifers coming into herd per year needs to equal the number of milking cows leaving

- **The number of heifers you need annually depends on heifer cull rate and heifer death loss**

- **The number of heifers born per year is affected by the gender of the pregnancies and how quickly cows become pregnant each year**

Selecting replacements

- **How many heifers will a dairy produce**
  - **Determine the number of heifers you need to replace cows**

- **Cost to raise heifers keeps increasing**
  - **$1,800 to $2,200 to 24 months of age**

- **Genomic test heifers – cull bottom 20% or breed to beef**

- **Keep track of economics and data**
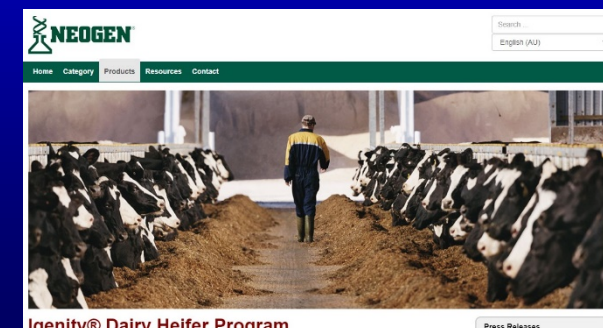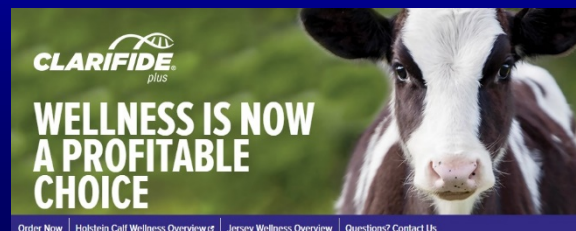
WCROC Dairy Example

- **300-cows dairy in west central Minnesota**
  - **Generate 115 to 150 heifers per year**
  - **No sexed semen**
  - **Crossbreeding with Holstein, Montbéliarde, Viking Red, Normande, Jersey**
  - **Need about 90 to 100 heifers per year to maintain herd size**
  - **Bred 40 cows with Limousin and Limflex bulls to end the breeding season**

7LM12
WULF'S WARBONNET 6254W

- Double Homozygous PB Sire with tons of shape and dimension throughout
- Sires super docile progeny that excel on the rail
- Tried and true, he's amongst the best from the respected Wulf Cattle

$20.00

[- 5 +] BUY SEMEN

7LM15
WULFS AFRICA 1086A

- Top 10% for birth weight while still reaching top 20% yearling weight and top 5% for $MTI too
- Another double homozygous Limflex option to consider
- His value should only increase upon arrival of the next generation

$20.00

[- 5 +] BUY SEMEN

Conclusions

- **Consider your goals**

- **Shifts in the beef market will happen – how does this affect how many heifers you need**

- **Don't just use the cheap bulls**
  - **Sire selection matters**

- **Keep track of economics and data**

Brad Heins
hein0106@umn.edu
320-589-1711