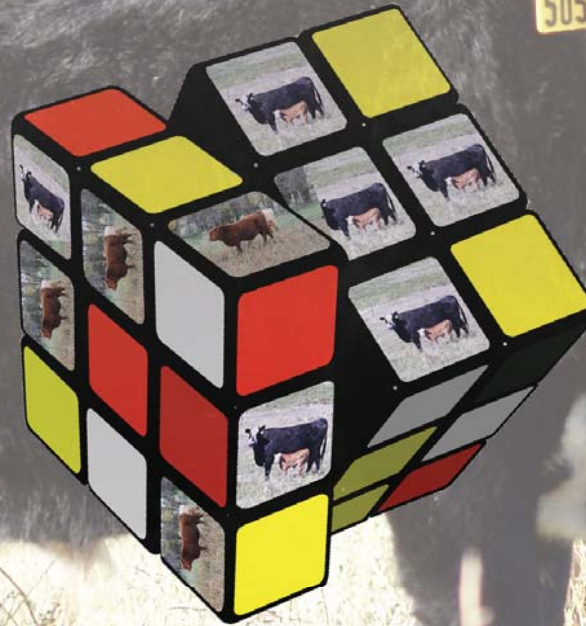


# NDSU

DICKINSON  
RESEARCH EXTENSION CENTER

## CHAPTER 2

What is Right for the Beef Business: A Discussion on Cattle Size



Kris A Ringwall, PhD  
Director, NDSU-Dickinson Research Extension Center  
NDSU Extension Beef Specialist

Continuing Our Commitment Of Service To Agriculture Since 1905  
1041 State Avenue, Dickinson, ND 58601 • 701-456-1100

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**A Discussion  
On Cattle Size**

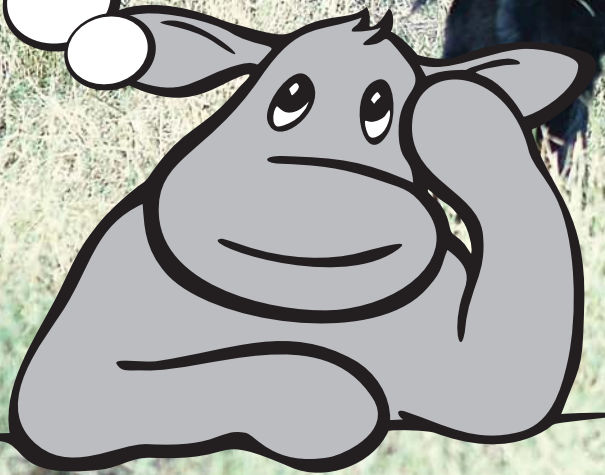
**Kris A. Ringwall, Ph. D.**  
Extension Beef Specialist  
North Dakota State University

September 2, 2017

**What Is Right For The Beef Business?**



Larger cattle have a 10 percent advantage when a cattle system is evaluated based on calves as the unit of production, but when based on acres as the unit of production, smaller cattle have a 10 percent advantage.



**Did You Know . . . ?**

# May-born Calves

*22 Months Later*

NDSU Dickinson Research Extension Center, 2011-13

	<b>Frame Score 3 to 4</b>	<b>Frame Score 5 to 6</b>
Pounds at harvest	1,401	1,610
Carcass value on the rail	\$2,018	\$2,243

Calves born in 2013, 2014, 2015  
Data from 2016 DREC Annual Report, Şentürklü S.,  
D.G. Landblom, R.J. Maddock, T. Petry, and S.I.  
Paisley

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**How Big?**

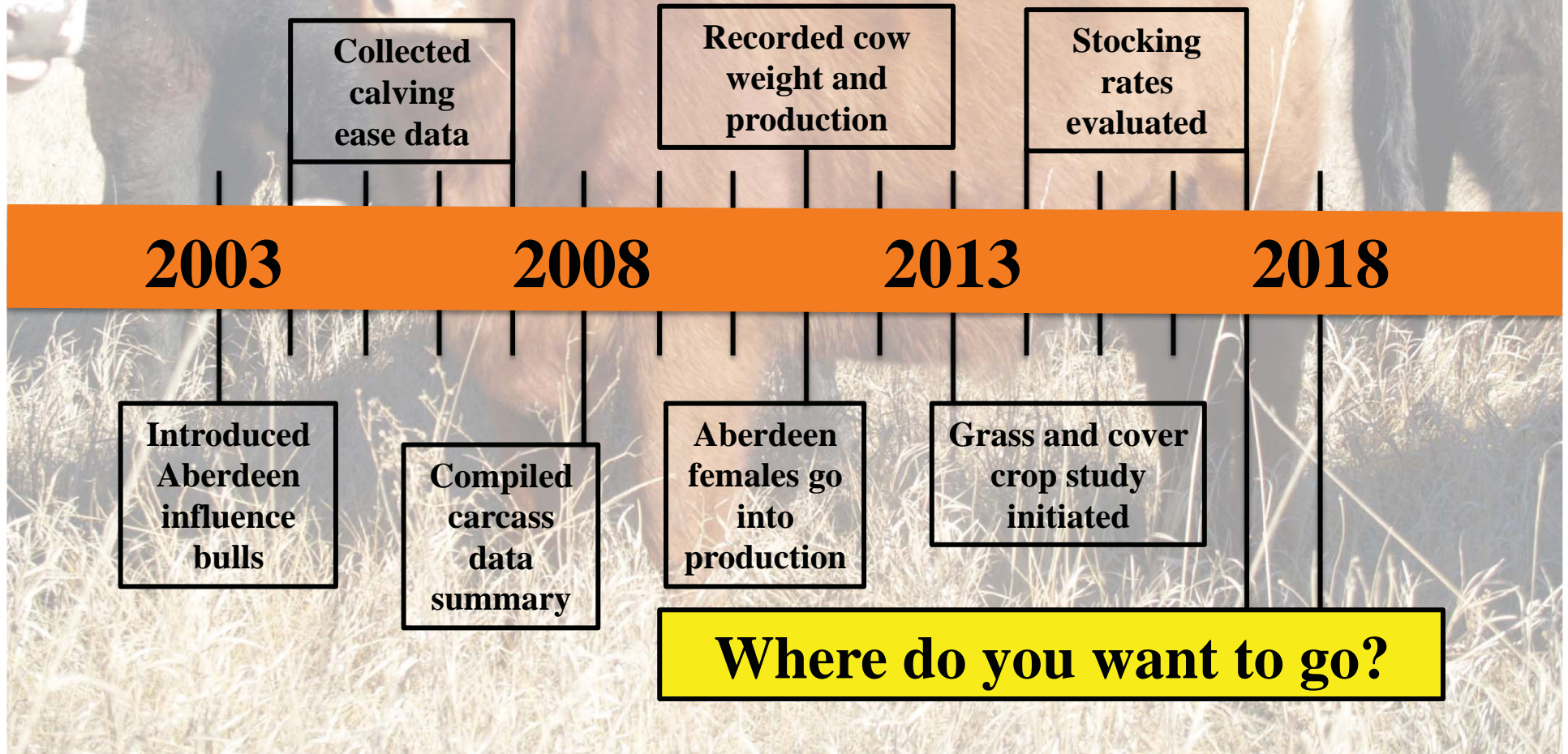
**How Small?**

**How Much Muscle?**

# A Story Of Opportunity



# A Story Of Opportunity



# How we started?

**When the first set of Aberdeen bulls were delivered, I wondered if they were big enough to breed the cows!**



**Following is what happened.**



# Calving Ease

## Early Data Collection

The Dickinson Research Extension Center has been collecting data on low birthweight, Aberdeen bulls. Following is the chart compiled from data collected at the Center.

<b>Year</b>	<b>No</b>	<b>BW</b>	<b>Unassisted</b>	<b>Assisted</b>
2004	9	68.6	9	0
2005	25	64.9	24	1
2006	48	63.8	48	0
2007	44	74.7	42	2

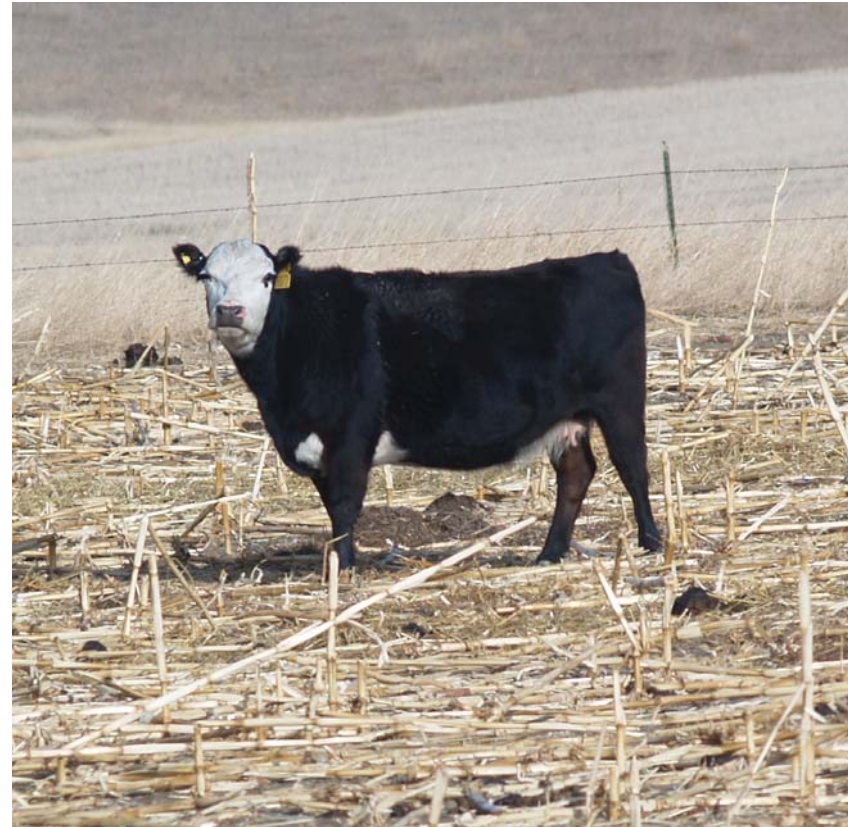
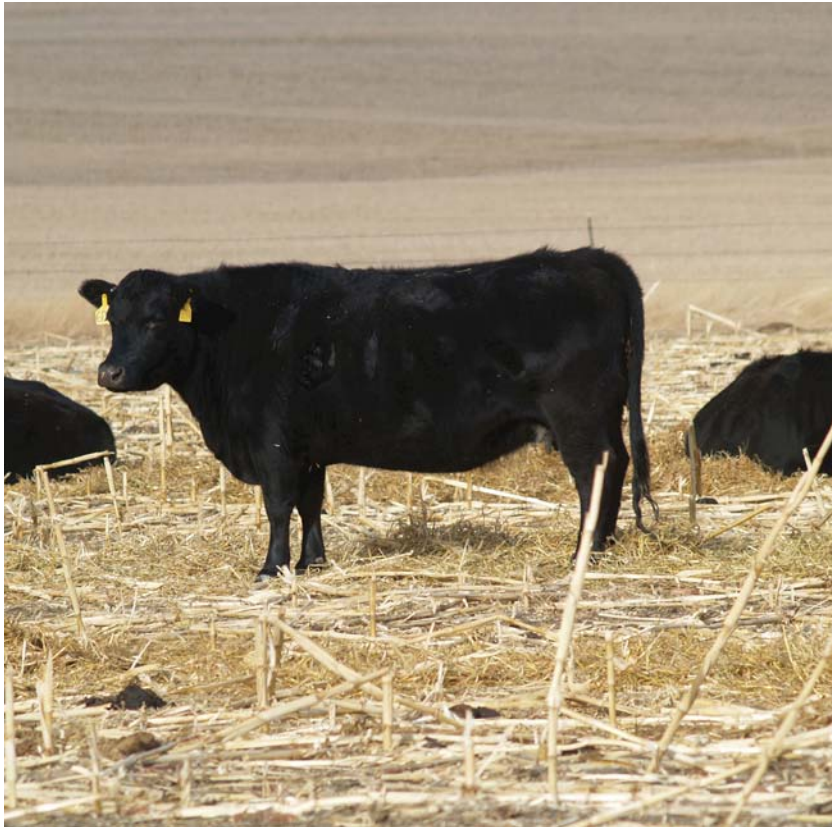
# Carcass Data Summary

(Compiled in 2008)

	2004	2005	2006	2007
Arrival Weight	945	994	830	786
Frame Score	4.4	4.7	4.8	5.2
Harvest Weight	1186	1297	1179	1309
Harvest Value (in dollars)	1093	1223	1074	1176
Number of Steers	22	26	38	24
Days on Feed	85	95	110	138
Average Daily Gain	2.85	2.73	3.03	3.81
% Choice or Higher	77%	100%	68%	88%
Percentage YG3 or Lower	86%	76%	97%	75%



# Opportunity Grows



**F1 Aberdeen heifers grew up!**

# Beef Cattle Systems Evaluation



**So,  
where  
do the  
females fit?**

# Let's continue the story . . .

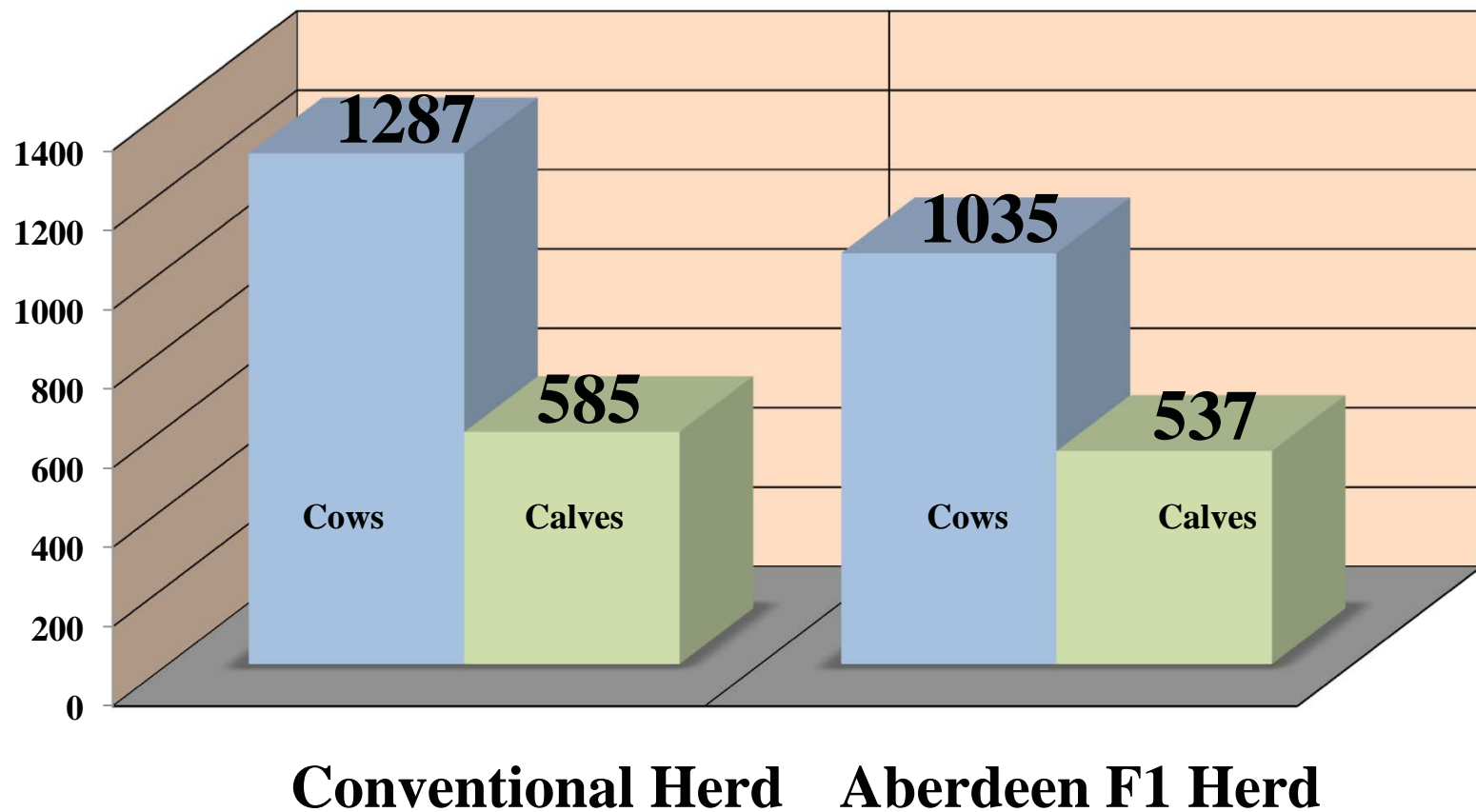
## Cow size and calf birth size

2011 calves

Cow group	No.	Calving Date	Calf BW	Cow WT
Conventional cows	68	1-Apr	91	1358
Aberdeen F1 cows	53	17-Mar	68	999

Range Program incorporated Aberdeen Cattle

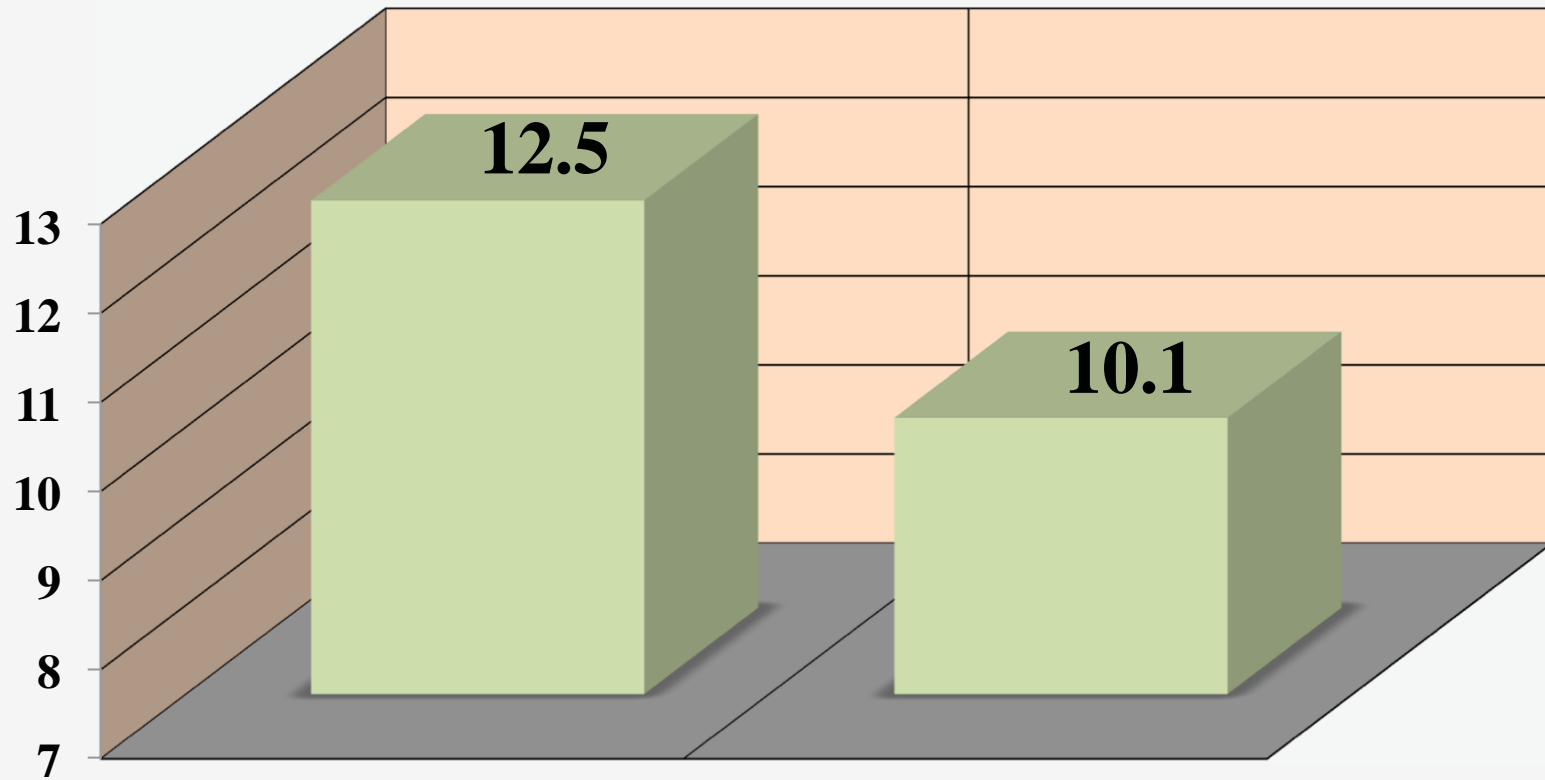
# Cow and Calf Weights



*Data Courtesy of Llewellyn Manske, Ph.D.*

**Range Program incorporated Aberdeen Cattle**

**Acres/Pair**

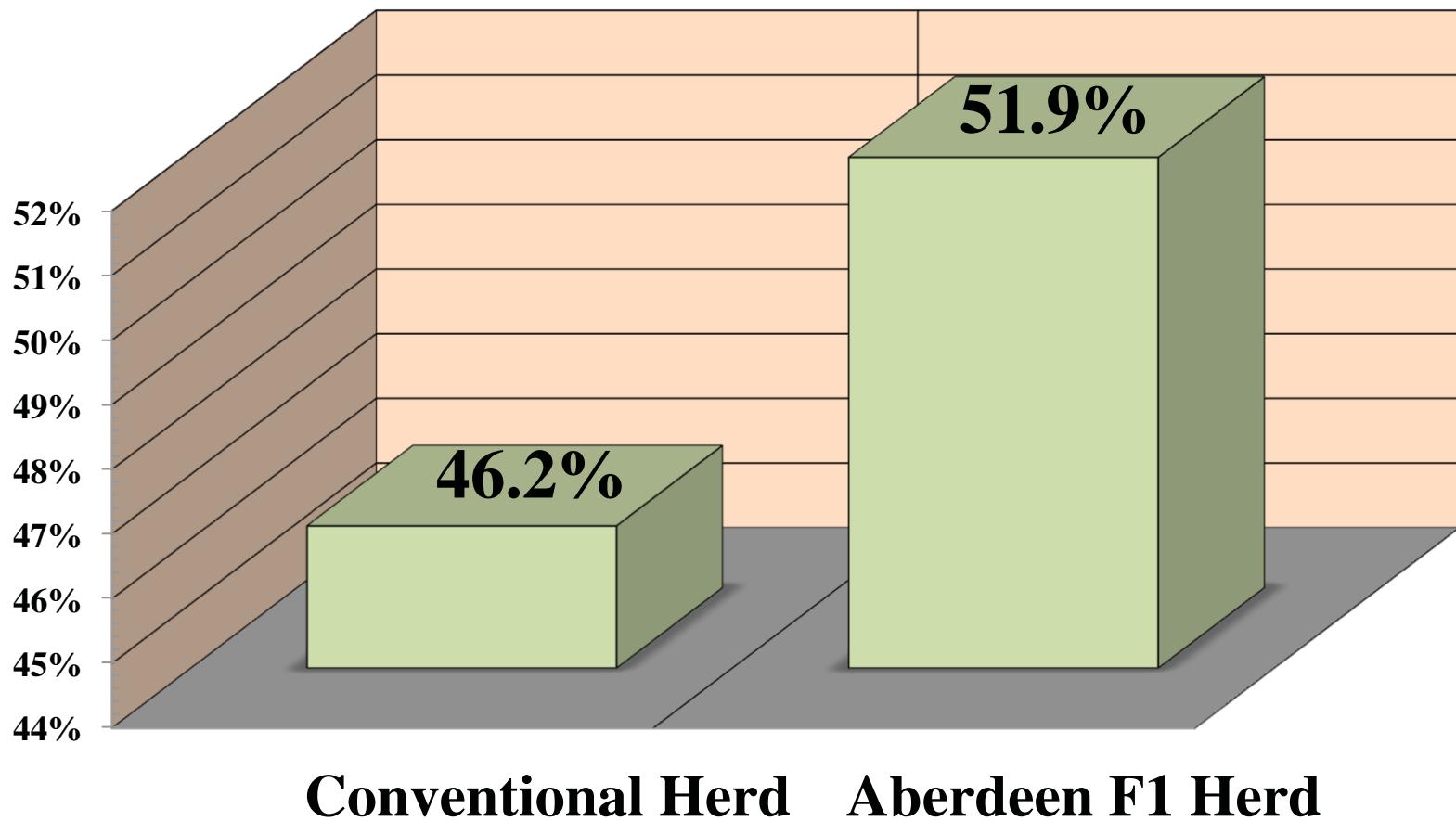


**Conventional Herd    Aberdeen F1 Herd**

*Data Courtesy of Llewellyn Manske, Ph.D.*

Range Program incorporated Aberdeen Cattle

# % Cow Wt Weaned

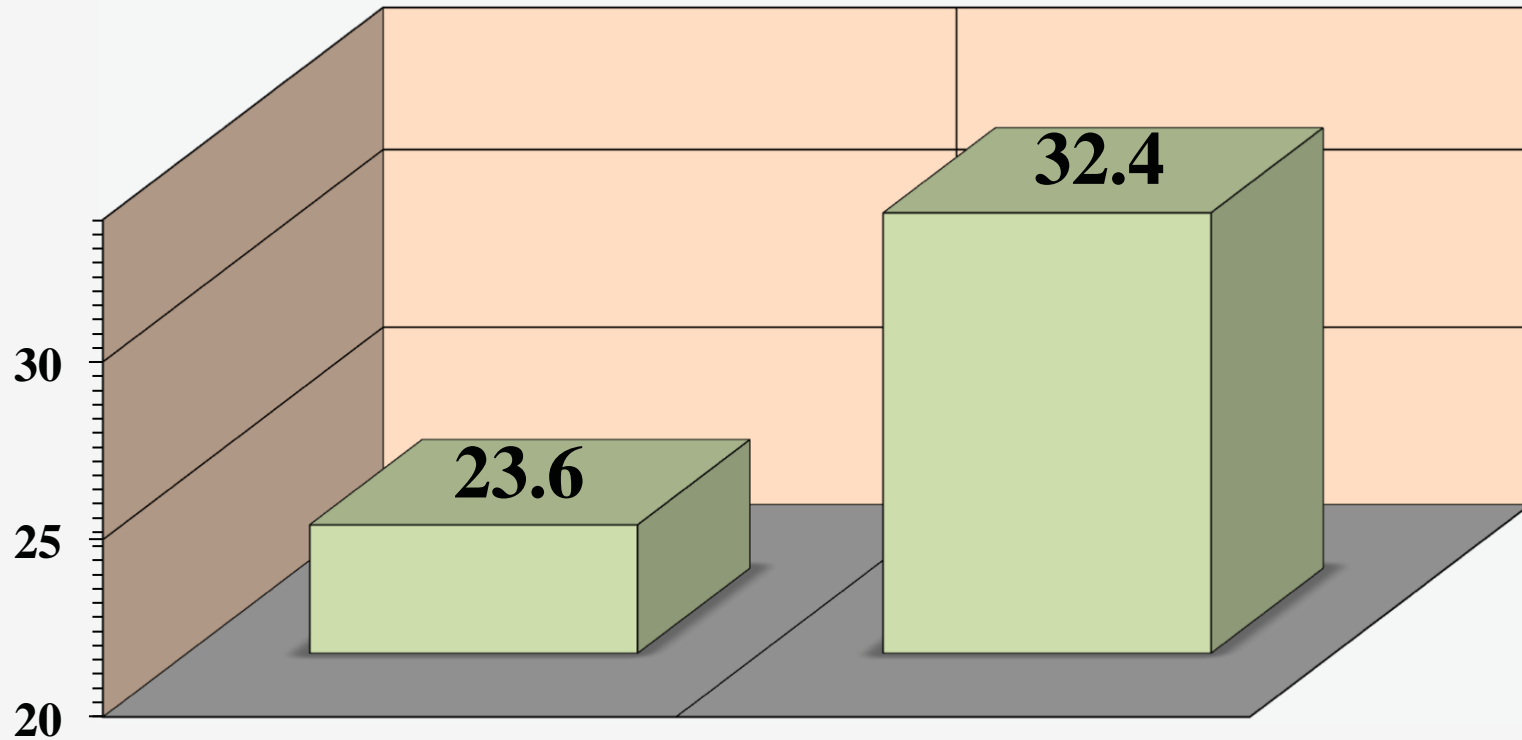


*Data Courtesy of Llewellyn Manske, Ph. D.*



**Range Program incorporated Aberdeen Cattle**

# **Gain/Acre**



**Conventional Herd    Aberdeen F1 Herd**

*Data Courtesy of Llewellyn Manske, Ph.D.*

## What did we do? – Established 2 Herds

Conventional females



Aberdeen F1 females



# Subsequent CHAPS Data

## Herd H38 Animal Performance



Critical Success Factors	Conventional 2012-2014	Aberdeen Influence 2012-2014
Average Daily Gain	2.52	2.09
Weight Per Day of Age	3.06	2.51
Birth Weight	89	75
Adjusted 205 Day Weight	639	535
Frame Score	5.0	3.7

# Subsequent CHAPS Data

## Herd H38 Animal Performance



Critical Success Factors	Conventional 2012-2014	Aberdeen Influence 2012-2014
Average Age at Weaning	168	175
Steers	537	452
Heifers	487	430
Bulls	NA	NA
Average Weaning Weight	514	441
Pounds Weaned/Cow Exposed	472	394

# Subsequent CHAPS Data

## Herd H38 Reproductive Performance



Critical Success Factors	Conventional 2012-2014	Aberdeen Influence 2012-2014
% Pregnant	98.23	95.50
% Pregnancy Loss	0.85	0.80
% Cows Calving	97.38	94.7
% Calf Death Loss	3.72	6.13
% Cows Weaning Calves	93.66	88.90

# Subsequent CHAPS Data

## Herd H38 Reproductive Performance



Critical Success Factors	Conventional 2012-2014	Aberdeen Influence 2012-2014
% Cows Calving in 42 Days	95.52	96.0
Cow Age	5.0	4.5
Cow Weight	1437	1094
Cow Condition	5.3	5.2

# At the Crossroads . . .



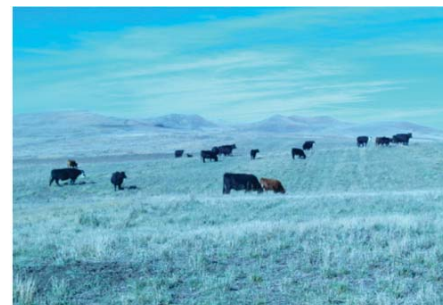
# 2016 Late Weaning Cow Weight Tidbit



	Fall Weight	Winter Wean Weight	Fall BCS	Winter BCS	Weight Loss
<b>Conventional Cows</b>	<b>1473</b>	<b>1400</b>	<b>5.3</b>	<b>4.6</b>	<b>-.92 lb/day</b>
<b>Aberdeen Influence Cows</b>	<b>1230</b>	<b>1168</b>	<b>5.4</b>	<b>4.5</b>	<b>-.67 lb/day</b>



# 2016 Late Weaning Calf Weight Tidbit



	<b>Fall Weight</b>	<b>Winter Wean Weight</b>	<b>Weight Gain/Day</b>	<b>Hip Height</b>	<b>Fall Weight</b>
<b>Conventional Cows</b>	<b>534</b>	<b>609</b>	<b>1.19</b>	<b>44.8</b>	<b>534</b>
<b>Aberdeen Influence Cows</b>	<b>443</b>	<b>540</b>	<b>1.31</b>	<b>42.6</b>	<b>443</b>

# **What Kind of Beef Cattle System Is This? Beef Cattle Systems Evaluation**



# What Do We Know?

## Aberdeen Influence



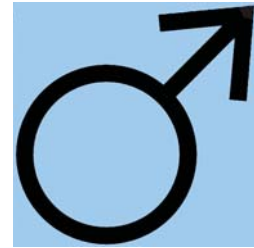
- Reduce cow size
- Reduce calving issues
- Produce more ribeye/cwt
- Produce more gain/acre



**Creates management opportunities**

# Beef Cattle Systems Evaluation

## How we continue!



Conventional  
Cows



F1 Aberdeen  
Cows




Conventional  
Bulls



# A quick note: Animal Revenue Adjusted for Stocking Rate at DREC



<b>Large Frame</b>	<b>Small Frame Influence</b>
<b>119 calves</b>	<b>143 calves</b>
<b>\$895.82</b>	<b>\$821.81</b>
<b>\$106,603</b>	<b>\$117,518</b>

A photograph of three black cows standing in a grassy field. The cows are in the foreground, with a vast, rolling landscape of green and brown fields extending to the horizon under a clear blue sky. The text 'What's next?' is overlaid in large, bold, black letters across the upper portion of the image.

# What's next?

**Producers control the future of beef!**



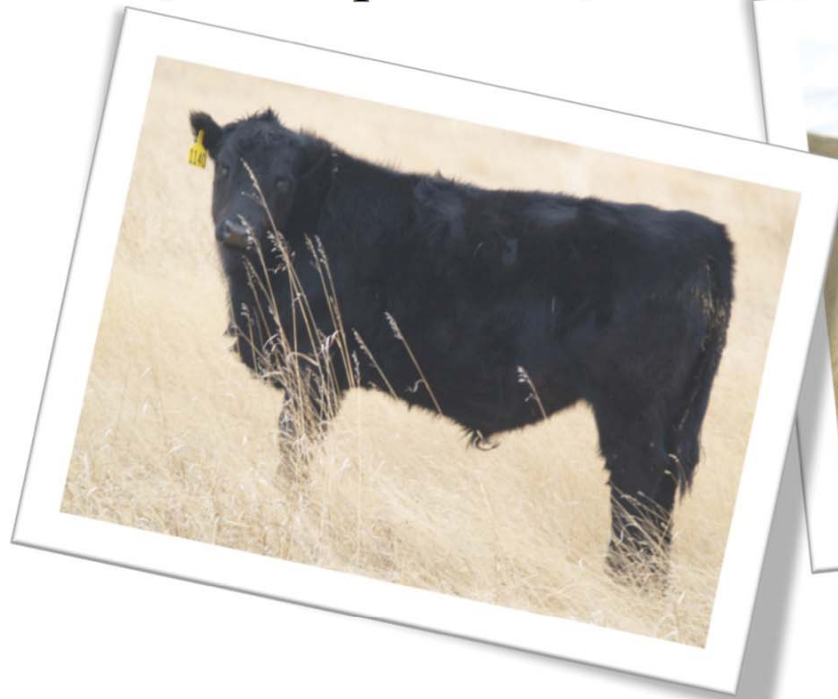
**Here's The Beef!**

# Beef Cattle Systems Evaluation

## Thoughts

There are opportunities in the beef business.

You, as the producer, set the course for the future!





# Beef Cattle Systems Evaluation

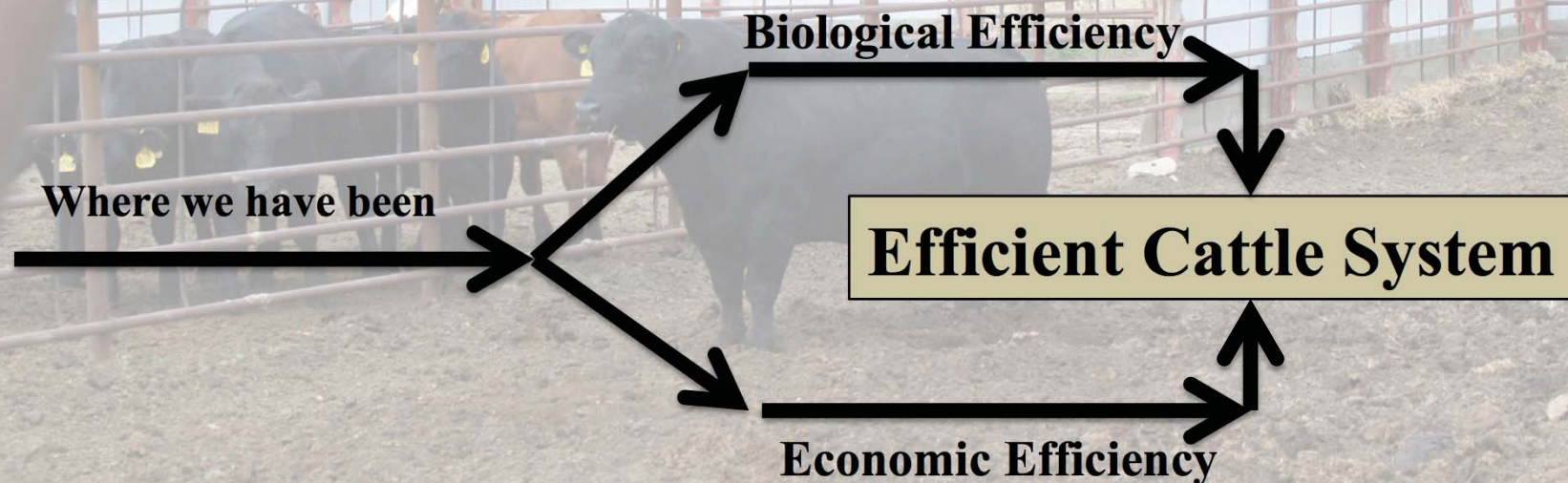
Ponder this thought:

**If we take  
300 pounds  
off cow  
size, what  
do we get?**



# Beef Cattle Systems Evaluation

## Thoughts



**Do you know your stocking rate?**


# AUM Stocking Rate Information

Assume 100 cows and dry matter intake at 2% of Body Weight

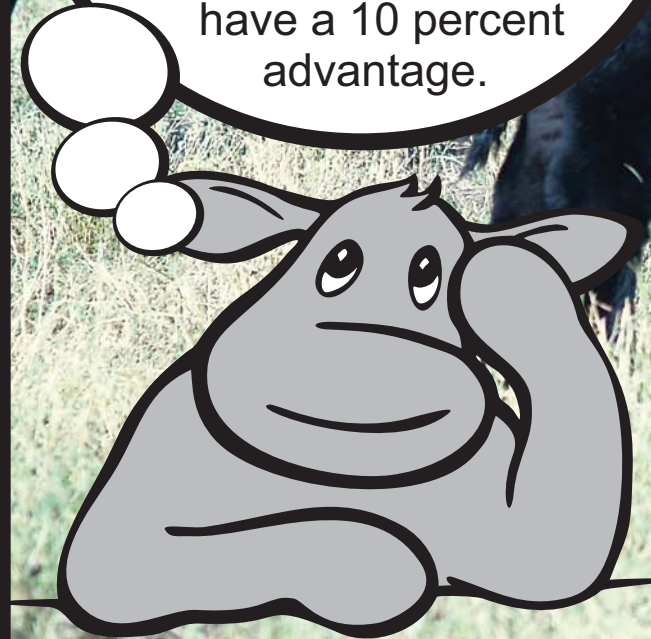
Cow Weight	Daily Feed Intake For Cow	# Cows Run	Calves Wean Weight	Chaps Wean %	# Calves Wean	Pounds of Calves Weaned
1094	24	91	394	90%	82	32,341
1437	33	70	472	90%	62	29,496

**Difference = 2,845 pounds**

**More from Aberdeen Influence Cows**



Larger cattle have a 10 percent advantage when a cattle system is evaluated based on calves as the unit of production, but when based on acres as the unit of production, smaller cattle have a 10 percent advantage.



**Now You Know . . .**



**Effective Use Of EPDs** **BULL SELECTION WORKSHEET**

BREED		RED ANGUS									
Reg. No.	Sire Name	BW	WW	YW	Milk	Marb	REA	\$HBI	\$GMI		
1617778	KUHNS CONTOUR A079	0.6	61	94	18	0.45	0.45	119	49		
1617805	KUHNS CONTOUR A042	-2.8	61	105	23	0.26	0.37	134	50		
1691764	KUHNS HOBO B143	1.4	74	116	24	0.68	0.48	104	51		
3473741	KUHNS TRILOGY C020	-3	60	87	15	0.38	0.69	124	50		
3473777	KUHNS DEFENDER C107	-2.3	61	93	17	0.61	0.46	94	51		
3473800	KUHNS DEFENDER C078	-1.4	62	96	21	0.84	0.26	117	51		
3546164	KUHNS DEFENDER D065	-2.8	60	91	24	0.79	0.58	141	52		
3546176	KUHNS TRILOGY D007	-1.9	73	111	15	0.74	0.62	144	53		
3546181	KUHNS TRILOGY D024	-1.6	66	104	16	0.62	0.59	132	52		
	AVG	-1.5	64	100	19	0.60	0.50	123	51		
<b>Percentile Scores For Actual EPD</b>											
Breed 10%		-5.2	78	122	31	0.80	0.44	143	53		
Breed 30%		-3.1	67	104	25	0.61	0.25	114	51		
Breed 50%		-1.6	59	91	21	0.48	0.12	94	50		
Breed 70%		-0.1	51	78	17	0.34	-0.02	74	48		
CURRENT SIRES AS OF 1-3-2017		<a href="http://redangus.org/genetics/epd-percentiles">http://redangus.org/genetics/epd-percentiles</a>									

**OWNER:**

**DATE:**

# Beef Cattle Systems Evaluation

## Other presentations

### **Providing Adequate Late Season Crude Protein with Pasture Grasses**

Dr. Lee Manske

### **Pasture Tour: Impacts of Cow Size and Frame on Carcass Endpoints**

Dr. Robert Maddock

### **Beef Cattle Systems as influenced by frame size**

Dr. Songul Senturklu and Doug Landblom

### **How to Select Efficient Cows**

Dr. Clint Rusk, Oklahoma State University

### **How to Find Cows that Fit Your Ranch Environment**

Dr. David Lalman, Oklahoma State University

### **Nutritional Effects of Frame Size on Efficiency and Longevity of Beef Cows**

Dr. Kendall Swanson

### **Genetic Effects of Frame Size on Efficiency and Longevity of Beef Cows**

Dr. Lauren Hulsman Hanna

# Beef Cattle Systems Evaluation

Some final thoughts





# Biological Efficiency

*“Biological efficiency is real and regulated by inputs, environmental limitations like climate and soil types.”*

**Beef talk 888**

# Economic Efficiency

*“Economic efficiency is imposed by humans who assign a dollar value to a biological type based on human preference and desire.”*

**Beef talk 888**

# Efficiency

*“Natural selection forces biological efficiency. There is no economic force within Mother Nature. All economic forces are a product of human civilization. Furthermore, there are few human preferences that are sustainable within Mother Nature.”*

**Beeftalk 888**

# Aberdeen Influence Production

(Average of 8 years data)

	Cow age	Avg Actual WW	Avg Cow Wt at Weaning	% of cow weight weaned	Carcass Wt	Grade	YG	BF	REA
s6266	10	514	1139	45%	793	CH+	2	0.4	13.4
u8054	9	547	1237	44%	943	Prime	3	0.6	13.0
u8082	9	551	1256	44%	1038	Ch-	2	0.4	16.1
u8190	9	498	1053	47%	871	Ch-	2	0.3	14.6
u8302	9	520	1162	45%	868	Ch-	3	0.4	12.1
x0271	7	501	1181	42%	910	Ch	3	0.6	13.5
x0298	7	520	1100	47%	921	Ch	2	0.4	15.2
y1002	6	538	1070	50%	996	Ch+	2	0.4	15.4
y1019	6	471	1022	46%	899	Ch+	3	0.6	13.2
y1027	6	446	984	45%	684	Ch+	2	0.3	13.0

# Aberdeen Influence Production

Here's a look at the cows!



**After May calving**



**With ~ 165 day old calf**

# Aberdeen Influence Production

Here's a look at the cows!



# Aberdeen Influence Production

A look at cow and calf

	Cow age	Avg Actual WW	Avg Cow Wt at Weaning	% of cow weight weaned	Carcass Wt	Grade	YG	BF	REA
y1002	6	538	1070	50%	996	Ch+	2	0.4	15.4



**y1002:  
A cow for  
all the  
ages! Look  
at this  
production.**

Photo taken Aug. 28, 2017

# Aberdeen Influence Production

A look at cow and calf

	Cow age	Avg Actual WW	Avg Cow Wt at Weaning	% of cow weight weaned	Carcass Wt	Grade	YG	BF	REA
u8082	9	551	1256	44%	1038	Ch-	2	0.4	16.1



**Here is u8082 with her May 2015 calf that produced the above shown performance and harvest values.**



# Aberdeen Influence Production

A look at cow and calf

	Cow age	Avg Actual WW	Avg Cow Wt at Weaning	% of cow weight weaned	Carcass Wt	Grade	YG	BF	REA
u8190	9	498	1053	47%	871	Ch-	2	0.3	14.6



**Cow u8190 with calf at about 165 days of age; note this calf's harvest record.**

# Aberdeen Influence Production

A look at cow and calf

	Cow age	Avg Actual WW	Avg Cow Wt at Weaning	% of cow weight weaned	Carcass Wt	Grade	YG	BF	REA
y1019	6	471	1022	46%	899	Ch+	3	0.6	13.2

**y1019:  
1022 pound  
cow produces  
carcass that  
weighs 899  
pounds at  
harvest.**



# Aberdeen Influence Production

(Average of 8 years data)

	Avg Cow Wt at Weaning	Carcass Wt	% of cow weight harvested
s6266	1139	793	70%
u8054	1237	943	76%
u8082	1256	1038	83%
u8190	1053	871	83%
u8302	1162	868	75%
x0271	1181	910	77%
x0298	1100	921	84%
y1002	1070	996	93%
y1019	1022	899	88%
y1027	984	684	70%

## Group Average

Cow weight: 1120 pounds  
Carcass weight harvested: 891 lbs  
% Cow Weight harvested: 80%

# A final note: Animal Revenue Adjusted for Stocking Rate at DREC



<b>Large Frame</b>	<b>Small Frame Influence</b>
<b>119 calves</b>	<b>143 calves</b>
<b>\$895.82</b>	<b>\$821.81</b>
<b>\$106,603</b>	<b>\$117,518</b>

# Aberdeen Influence Production

## **Y1002: What A Cow**

1070 pound cow

Carcass weight: 996 lbs

93% of cow weight harvested

Choice, YG2

15.4 sq. in. REA

**WOW!**

# Thank you

**for your interest and your dedication  
to growing the beef cattle industry!**