Proceedings for the annual

I-29 Moo University

Dairy Beef Short Course

March 26, 2019

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Program Agenda

9:30 am
- Registration & Visit with Sponsors

10:00 am
- Dr. Daniel Schaefer – Professor University of Wisconsin – Madison, "**Realizing Full Value in Holstein Steers**"

10:45 am
- Warren Rusche –, SDSU Extension, Beef Feedlot Management Associate, "**Considerations for Choosing Beef Genetics to Use in Dairy Herds**".

11:25 am
- Dr. Brenda Boetel, University of Wisconsin – River Falls, "**Dairy Cattle Impact on Beef Supply and Marketing Opportunities**"

12:15 am – Lunch & I-29 Moo University Sponsors

1:10 pm
- Russ Daly, DVM – Professor, SDSU Extension Veterinarian, "**Enhancing the value of your dairy beef bull calf to meet health concerns**"

1:50 pm
- **Roundtable Discussion – Building a Carcass for the Future**
  - Jerry Wulf – Wulf Cattle
  - Kent Pruismann - Rock River Feeders
  - Erik Loe – Consultant for Midwest PMS
  - Duane Broek – Select Sires

3:00 pm – Q/A from participants

3:15 pm – Adjourn & Evaluation

I-29 Moo University Faculty Members

Iowa State University

Jennifer Bentley

Extension Dairy Specialist
Phone: 563-382-2949; Email: jbentley@iastate.edu

Jennifer Bentley is a Dairy Field Specialist for ISU Extension and Outreach in NE Iowa. Her base office is in Decorah, Iowa and she currently works and develops educational programming with producers in 10 surrounding counties. Jennifer grew up on a dairy farm in North Central Iowa, where the 3rd and 4th generation family is operating the dairy farm today. She earned her Bachelor of Science Degree in Dairy Science and Masters of Agriculture Degree both from Iowa State University. She works closely with dairy producers, providing them with information regarding facility design, calf management, and overall dairy herd management. She enjoys educating the public about modern dairy practices and plays an integral role in telling the Iowa Dairy Story, a program to educate consumers about the importance of the dairy industry in Iowa. Jennifer is married and has 2 children Owen (12) and Addison (10).

Fred Hall

Northwest Iowa Extension Dairy Specialist
Phone: 712-737-4230; Email: fredhall@iastate.edu

Hall joined Iowa State University Extension in January 2017 as the dairy specialist for Northwest Iowa. He served as the Chickasaw County Extension Director for Iowa State University Extension from 2005 to July of 2009. Hall was the county lead on the Iowa Emergency Management Agency agricultural disaster team and served on the Iowa Extension Dairy Team. Hall is married to Sharon Lee and has two sons. Conor is a graduate of Iowa State University, served in the U.S. Marine Corps and is currently in law school at the University of Iowa. Cameron is a graduate of Iowa State University in Global Resource Systems and is currently the manager of the Poultry Research Center at Iowa State University. The family lives south of Orange City and are active Milking Shorthorn breeders and beekeepers.

Leo Timms

Extension Dairy Specialist
Phone: 515-294-4522; Email: ltimms@iastate.edu

Leo Timms is a Morrill Professor of Animal Science / Veterinary Diagnostics and Production Animal Medicine and Extension Dairy Specialist at Iowa State University. Leo was reared in NE PA and worked on his brother-in- laws 40 cow dairy. Leo received his BS degrees in Animal Science and Agricultural Engineering from Cornell University in 1978. Following 3 years as a herdsman on a 400-cow dairy in western NY, he returned to school and received a M.S. in 1982 and a Ph.D. in 1984 in Dairy Science from the University of Wisconsin-Madison. He joined the Animal Science faculty at Iowa State in 1984. He has fostered many extension educational opportunities, many jointly with agri-business, and has conducted over 7000 individual farm troubleshooting visits and consultations. Leo co-developed the Dairy Production Medicine rotation at the College of Veterinary Medicine in 1984 and has also developed courses in lactation biology, dairy troubleshooting, and distance education classes in nutrition, facilities, and biosecurity. Leo's research has focused on mastitis prevention and therapy, milk quality, reproductive management tools, accuracy of milk component measurements, dairy housing, comfort and welfare, and using dairy records. Leo is married (37 years) and has 4 children Rob (35), Sam (33), Sadie (22) and Josh (19)

South Dakota State University

Heidi Carroll

Extension Livestock Stewardship Field Specialist & State BQA Coordinator
Phone: 605-688-6623; Email: Heidi.carroll@sdstate.edu

After working in various aspects of the livestock industries across South Dakota and even Beijing, China, Heidi has promoted responsible animal care and safe food products. She has a Masters Degree in animal science with an emphasis in ruminant nutrition. She handles a wide variety of topics concerning animal well-being and perceptions of livestock care practices
Expertise: Low-stress livestock handling and behavior; Quality assurance trainer for BQA, BQAT, PQA, TQA, and SSQA; Consumer perceptions of livestock husbandry practices

Tracey Erickson

Extension Dairy Field Specialist
Phone: 605-882-5140; Email: tracey.erickson@sdstate.edu

After developing a passion for dairy while growing up on a diversified dairy, livestock and crops farm in eastern South Dakota, Tracey continues to be involved with farming today with her husband and in-laws. With a double major in Dairy Production and Manufacturing, as well as a Masters in Human Resource Management, most of her career has been spent serving dairy producers and the agricultural community through SDSU Extension focusing on Human Resource Management and Safety Protocols, Quality Assurance Programs and Dairy / Livestock development and profitability.
Expertise: Dairy production, Human Resource Management, Farm Safety Training Programs, Dairy & Livestock Nutrition, and Quality Assurance Trainer.

Maristela Rovai

Assistant Professor/Extension Dairy Specialist
Phone: 605-688-5488; Email: maristela.rovai@sdstate.edu

Dr. Rovai is a Veterinarian from Brazil with a MSc & PhD degree in Veterinary with emphasis in Animal Science (UAB-Spain). She had postdoc positions in USA (UW-Madison and E. (Kika) de la Garza American Institute for Goat Research-Langston University) and Europe (TUM in Germany and UAB-Spain) working in animal science with emphasis in mammary gland physiology and ruminant management. Dr. Rovai's research activity has involved studies on the area of milk ability in dairy ruminants (goat, sheep, camels and cows), with a strong focus on milking technology, milk quality improvement, mastitis impact on technological properties of milk and cheese. Dr. Rovai has published more than 45 scientific and extension papers and has mentored graduate students in pursuing either their Master or PhD degree in Animal Science.

Currently, she is an Assistant Professor / Extension Dairy Specialist at the Department of Dairy and Food Science at the South Dakota State University in Brookings, SD. Dr. Rovai's main responsibilities are to develop Extension programs for improvement of milk quality and assist dairy producers and industry personnel on workforce development and best production practices. She is also coordinating a program called "Semillas" – the Spanish word for seeds - designed to help Latino youth of dairy workers within the region to embrace their heritage and gain a sense of community while understanding the Dairy Industry. Dr. Rovai has the ability to assist dairy producers on developing farm protocols, educational trainings, which include hands on and assisting with farm employee meetings.

Expertise: Lactation Physiology and Milk Quality; Employee Educational Training; Speaks fluent Spanish, English and Portuguese.

University of Minnesota

Jim Salfer

Extension Educator-Dairy
Phone: 320-203-6093; Email: salfe001@umn.edu

Jim Salfer is a Regional Extension Educator – with University of Minnesota Extension. Jim has served in his present position for 22 years. Before that he managed a feed department, was a dairy nutritionist, a district sales manager for an AI company and managed a dairy farm. Jim has been involved on farm research projects studying robotic milking systems and automatic calf feeders. The focus of his education program has been to help farmers and other industry professionals understand the major factors driving dairy farm profitability and develop management strategies to improve profitability.

Emily Wilmes

Extension Educator-Livestock
Phone: 320-255-6169 ext. 3; Email: krek0033@umn.edu

Emily grew up on her family's dairy farm near Le Sueur, Minnesota. She works for University of Minnesota Extension as an Extension Educator in Stearns, Benton, and Morrison counties. Her programming focuses on dairy, beef, and farm business topics, and her favorite topics to work with are milk quality/mastitis management and farm safety & health. She has a BS in Animal Science and a Masters in Agricultural Education from the University of Minnesota.

University of Nebraska

Kim Clark

Dairy Extension Educator
Phone: 402-472-6065; Email: kimclark@unl.edu

Kim Clark is a dairy extension educator at the University of Nebraska-Lincoln (UNL) in the Animal Science Department since 2015. Clark earned both her B.S. degree in Animal Science and her M.Ag. Degree in Animal Science and Agricultural Economics with a minor in Agriculture Leadership from the University of Nebraska-Lincoln. Since 2016, Clark has served as chair/co-chair for I-29 Moo University, a five-state dairy extension consortium. Additionally, she also serves as the coordinator for the Nebraska Dairy Ambassador Program. Clark's expertise includes calf care and animal welfare. She is PAACO certified is a National Dairy FARM auditor.

Robert Tigner

Agricultural Systems Economist Educator
Phone: 308-696-6734; Email: Robert.tigner@unl.edu

Tigner was born and raised on a small dairy farm near Fort Dodge Iowa. Tigner joined the US Navy in 1975 and served on active duty and reserve duty for 14 years. He operated a dairy farm near Fennimore WI before starting an Extension career. Tigner earned a Bachelor of Science degree from Iowa State University's Animal Science department majoring in Dairy Science. His Master of Science degree is from the University of Wisconsin-Platteville in Agricultural Industries. Tigner is currently the Area Agricultural Systems Economics Educator. Tigner's educational specialty includes crop marketing, computer decision aids, computer accounting, farm women's financial and risk management education, crop cost and farmland leasing, farm transition and succession, employee management and farm bills as they are passed.

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I-29 Moo University Dairy Beef Short Course

Speakers

Dr. Dan Schaefer– Professor of Animal Science, University of Wisconsin-Madison since 1981. From 1979 to 1981he was a faculty member in Animal Science at Purdue University. His research interests have been nutritional programs for finishing Holstein steers, dietary vitamin E supplementation to finishing beef cattle for the purpose of extending fresh beef color shelf-life, pasture plant species evaluation for stocker cattle utilization and parasite control in these cattle. Dr. Schaefer began his role as Chair of the Department of Animal Sciences in 1999 and continued until 2016. In 2018, he became the Director of the Meat Science and Animal Biologics Discovery program in the Animal Sciences Department.

Warren Rusche– SDSU Extension Beef Feedlot Management Associate. A fourth generation Kingsbury cattle producer, Rusche has served SDSU Extension since 2011.He focuses his research on cattle backgrounders and feeders in South Dakota.

Dr. Brenda Boetel– Professor and Department Chair of Agricultural Economics and Agricultural Marketing Specialist. Boetel is an Extension Agricultural Marketing Specialist focusing in the areas of livestock marketing and price analysis. She joined UW-Extension in this new position in the Fall of 2002.

Russ Daly, DVM, MS, DACVPM, is the Extension Veterinarian and Professor in the Veterinary and Biomedical Sciences Department at South Dakota State University in Brookings, SD, and State Public Health Veterinarian for the South Dakota Department of Health. He is a native of Columbia, SD, and practiced for 15 years as a partner in a mixed-animal veterinary practice in Montrose, SD, before joining the faculty at SDSU. He became board certified through the American College of Veterinary Preventive Medicine in 2010.

Panelists

Jerry Wulf, Wulf Cattle, Morris, MN. Jerry Wulf and his family have been one of the premier Limousine Seed Stock breeders in the United States. He also has a considerable amount of experience in feeding calves from the bulls they produce, both from beef and dairy cattle.

Kent Pruismann, Rock River Feeders, Sioux Center, Iowa. The feedlot houses 3,500 head in outside yards. All cattle are tagged upon arrival with an electronic identification tag. Placement weight of incoming calves averages 270 pounds. They market their dairy steers on a high energy grid to JBS in Wisconsin.

Erik Loe, nutritionist for a number of feed yards in the region doing diet formulation, ingredient quality control, and take part in many aspects of cattle management. He received a PhD from Kansas State University and worked for SDSU as the Feedlot Extension Specialist. He joined the Midwest PMS feedlot nutritionist group in 2008.

Duane Broek, Select Sires Sales and Service Representative. Duane has been involved in the industry since 1982 dealing with both beef and dairy accounts in NE South Dakota helping them with their genetic mating selections.

Realizing Full Value for Holstein Steers

Dan Schaefer, Professor
Bill Halfman, Agriculture Agent, Monroe County
Ryan Sterry, Agriculture Agent, St. Croix County, WI

DEPARTMENT OF ANIMAL SCIENCES University of Wisconsin-Madison

Extension UNIVERSITY OF WISCONSIN-MADISON

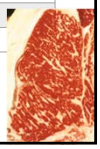
Outline

- Management principles for finishing Holstein steers
- Characteristics of Holstein steers and their beef yield and quality
  - Attributes and limitations
- Dairy farmer criteria for beef x dairy AI matings

Significance of Holstein steers to U.S. beef production

Assumptions	
Calving interval	13.1 months
Dairy calf component of U.S. calf crop	26%
Heifer component of dairy calf crop	53%
Dairy calf death loss	8.1%
Dairy feeder cattle deaths and realizers	3.77%
Holstein component of dairy cow herd	86%
Fed Holstein carcasses, USDA Prime	12.9%[1]
Results of Calculations	
Holstein steer component of fed steer & heifer supply	13.8%
Holstein steer component of USDA Prime carcasses	33%

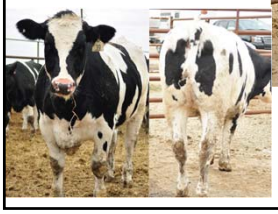
[1] Native carcasses, 2.1% Prime (2016)



The Ideal Holstein Steer

"Really ideal type of steer. Live weight 1415 lbs, dressed yield estimate 61.5%, Y3, High Choice, Muscle score 1-2. The ideal kind of steer that is desired by both the dairy steer harvesters and native cattle packers alike."

Ron Mayer – JBS Packerland



Holstein Steer Packing Plants

- American Foods Group – Green Bay, WI
- JBS – Green Bay, WI; Plainwell, MI; Tolleson, AZ; Omaha, NE
- Cargill – Wyalusing, PA; Fresno, CA

Target for Marketing

- Only two competing Holstein steer harvesters in Midwest
  - JBS
    - Prefers calf-fed steers up to 1550 lbs
  - American Foods Group
    - Prefers 1400 lbs and heavier
- Target finished weight for Holstein steers is 1400-1550 lbs for competitive bidding
  - 840-930 lb carcass
    - Discounts to cow beef price for stags, Standards, and dark cutters

Special Considerations for the Holstein Bull Calf

- Feed colostrum in first 8 hr
  - Feed 4 L of colostrum at the first feeding after birth
  - Absorption of 150 to 200 g Ig within the first few hours after birth is the goal
  - Colostrum supplements (< 100 g IgG/dose) or colostrum replacers (> 100 g IgG/dose)
  - Frozen, pasteurized colostrum is another option
  - Failure of passive immunity transfer is declared for serum concentrations < 10 g IgG/L or < 50 g total proteins/L
- Purchase calves with colostrum feeding as a stipulation

Special Considerations for the Holstein Bull Calf

- Castration
  - Stags: expensive to re-castrate, or steep carcass discounts
  - Two testicles in scrotum before knife-cutting, or before application of elastrator band (and tetanus immunization)
    - Sooner rather than later: Local anesthetic?
  - Simple math – count to two and then the job is done!
- Dehorning
  - Risk of bruising to penmates
  - Remove with gouge or heated dehorning iron
    - local anesthetic?
  - Too much growth setback to remove later

Weaning and Post-weaning

- Pre-weaning milk replacer and housing environment are not equivalent to the calf nursing its dam on pasture
- Age at weaning?
  - "Wean early (28 to 42 d) and promote feed DM intake to take advantage of the efficient growth by young calf." – Hugh Chester-Jones, Univ. Minn.
- Growth target for the nursery phase is to double initial BW by 56 d of age with hip height growth of 4 inches or more
- Provide a high energy diet (60 Mcal NEg/cwt DM) with 18% crude protein
- "Diet transitions should be accomplished in individual housing prior to moving to group pens." – Tom Peters, feedlot consultant

Carryover Effect of Forage in Starter Diet

	Starter Diet		
	All Concentrate	15% Hay	30% Hay
	----- % -----		
Rolled corn	79.9	67.2	54.7
Soybean meal	17.6	15.5	13.3
Ground alfalfa hay	**0**	**15**	**30**
Minerals & vitamins	2.5	1.3	2.0

Starter diet was fed from 1 week of age to 330 lb. Thereafter, all steers were fed all-concentrate diet (corn, urea and supplemental minerals and vitamins).

Miller et al., 1986, Univ. of Minnesota

Carryover Effect of Forage in Starter Diet

Calfhood to Finished Holstein Steers

	All Concentrate	**15% Hay**	**30% Hay**	Significance
Initial wt, lb	99	99	97	
Final wt, lb	1000	1010	1034	
Days fed	418	413	411	
Starter ADG, lb/d	1.50	1.63	1.56	N.S
Grower ADG, lb/d	2.31	2.38	**2.57**	P<0.01; 30%>all-conc and 15%
Finisher ADG, lb/d	2.60	2.53	**2.79**	P<0.05; 30%>all-conc and 15%
Overall ADG, lb/d	2.16	2.20	2.27	
Overall feed/gain	4.74	5.01	4.83	

Include a long-particle forage ingredient in starter diet.

Miller et al., 1986, Univ. of Minnesota

Net Energy$_{gain}$ (NEg) Concentrations in Feedlot Diets

Equivalencies between corn silage:high-moisture corn ratios and net energy for gain concentrations[1, 2].

Corn silage	Corn, high-moisture	Net Energy$_{gain}$
Proportion (%)	Proportion (%)	Mcal/lb
10	60	0.65
15	55	0.64
20	50	0.63
25	45	0.61
30	40	0.60
40	30	0.57
50	20	0.54

[1] Based on diet DM formula as follows: corn silage proportion; high-moisture corn proportion; modified wet distillers grain with solubles, 25%; and supplement, 5%.
[2] NEg values for diet ingredients (NASEM, 2016) were corn silage, 0.44 Mcal/lb; high-moisture corn grain, 0.71 Mcal/lb; and modified wet corn distillers grain with solubles, 0.74 Mcal/lb. Supplement was considered to be only minerals, vitamins and additives with zero NEg value.

Grower Phase

Conditions at a Midwest feedlot into which 300 lb Holstein steers were received. Upon arrival, the steers started at 56 Mcal NEg/cwt DM and were gradually incremented to 62 Mcal NEg/cwt DM. (Below Farms, Waseca, MN)

Grower Phase – Role for Forages?

- A grower phase is not needed for Holstein steers.
- Pastures, silage or hay can be included for middle weight (400-750 lb) steers to accommodate cropping system.
- Subsequently, reduce forage component to achieve ≥62 Mcal NEg/cwt DM

Compensatory Growth

- Period of rapid growth following a period of nutritional or environmental restriction of growth
- If an energy-restricted growth occurs due to grazing or high-forage diet, compensatory growth follows
  - True for Holstein steers
  - Start them on finishing diet (≥ 62 Mcal NEg/cwt DM) by 800 lbs

Comparison of Holstein Steer Performance in two U.S. Regions

	Midwest & Northern Plains[1]	Southwest[2]
Entry wt, lb	475	300
Days on feed	330	349
NEg, Mcal/cwt	63.5	68.5
ADG, lb/d	2.88	2.88
Feed DM/gain	7.25	–
Harvest wt, lb	1425	1294

[1] Tom Peters, DeKalb Feeds, Rock Falls, IL [2] Richard Zinn, Univ. California, El Centro, CA

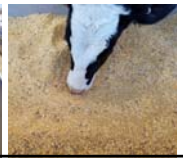
Commercial Diets Self-fed (as-fed basis)

Ingredient	Diet 1	Diet 2
Corn, cracked, %	67	65
Corn gluten feed, pelleted %	12	-
Distillers grain, %	15	30
Balancer pellets, %	6	5

No inclusion of Tylan, Optaflexx, molasses, probiotics or other non-nutritional additives. No forage/roughage provided, except corn stalk bedding.

Summary across 25 Closeouts

Variable	Overall Ave
Head, Ave	346 (n=25)
Initial wt, lb	487
Harvest wt, lb	1437
Duration, d	321
DMI, lb/hd*d	**20.5**
ADG, lb/hd*d	**2.95**
DMI/ADG	**6.97**
Grade	**80+% Choice & Prime**


Closeout 1-5 with Self-feeders

	Group							
	1	2	3	4	5	**Mean**	S.dev.	**C.V.**
Head, n	294	390	114	360	534	**338**		
Implants[a]	E+FO	E+IS	E+FO	E+FO	E+FO			
Housing	Bedded Confinement	Outside lots with sheds	Outside lots with sheds	Outside lots with sheds	Outside lots with sheds			
Begin wt, lb	565	593	594	610	541	**581**	27.4	**4.7%**
Kill wt, lb	1461	1458	1426	1440	1442	**1445**	14.3	**1.0%**
Duration, d	323.5	293	305	307	315	**309**	11	**3.7%**
DMI, lb/hd*d	20.7	21.0	21.8	20.9	21.0	**21.1**	0.4	**2.0%**
ADG, lb/hd*d	2.77	2.95	2.73	2.7	2.86	**2.80**	0.10	**3.7%**
DMI/ADG	7.48	7.11	8.00	7.76	7.34	**7.54**	0.35	**4.6%**
Death & Culls, %	4.85	2.74	5.0	2.7	2.9	**3.64**	1.18	**32%**
Choice & Prime, %	-	78.33	81.25	79.75	80.01	**79.84**	1.20	**1.5%**

Holstein Steer Budget Comparisons

- Prices for budgets
  - Feeders - 8 wts @ **$75/ cwt**;
  - Choice Feds - $90/ cwt;
  - Bedding - 5 lb/ head per day at $35/ ton
  - Yardage –
    - $0.60/ head/day TMR,
    - $0.54/head/day self fed
  - Days on Feed
    - TMR 167 d
    - Self Feeder 155 d

Holstein Budget Comparisons

Program	Self Feeder	TMR Bunk
Income	$1297	$1311
Purchase	$620	$662
Total feed	**$351**	**$287**
Other costs*	$120	$120
Yardage**	$90.18	$93.00
Cost/ lb gain	**$0.90**	**$0.86**
Return to labor & mgt	$116	$149

*Other costs include death loss, interest on feed and cattle, veterinary, bedding, health products, implants, transportation, and marketing
** Does not include any labor and management.

Anabolic Implants Increase Mature Weight

- My thumb rule is that the weight of finished steers is the same as the weight of their mature dams.
  - Steer finished weight > dam mature weight, if steers are implanted
  - Implanting causes feedlot cattle to achieve the desired carcass composition at 30-90 lb heavier live weight
  - Holstein mature cow weights are 1400-1700 lbs
- Carcass weight maximums, not minimums, are the concern

Optaflexx Effects in Calf-fed Holstein Steers

(360-380 days on feed)

	Control	Optaflexx[1]	P-value
Last 28 days			
Weight gain, lb	86	99	0.01
DM intake, lb	22.7	22.7	0.91
Feed DM/gain	7.46	6.54	0.01
Harvest wt, lb	1408	1434	0.01
Carcass wt, lb	878	895	0.01
Loin muscle area, in^2	13.0	13.3	<0.01

[1] 300 mg ractopamine per head daily for last 28 days

Brown et al., 2014

Optaflexx Effects in Calf-fed Holstein Steers

(360-380 days on feed)

	Control	Optaflexx[1]	P-value
Yield of cuts			
All subprimal cuts	0.00	0.61	<0.05
Round	0.00	0.22	<0.05
Palatability			
Shear force[2], kg	16.3	18.3	<0.05
Taste panel tenderness[3]	9.5	8.8	Not Significant

[1] 300 mg ractopamine per head daily for last 28 days
[2] After loin steaks had been aged 14 days
[3] Scale = 0 (tough) to 15 (tender)

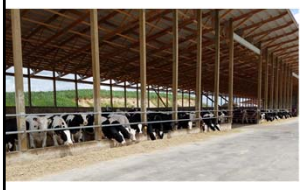
Howard et al., 2014a; Howard et al., 2014b

Comparison of Ideal Thermal Conditions for Native and Dairy Cattle

Physiological age	Native	Dairy
Calf		
Lower critical temperature, C	50	46-50, 59
Upper critical temperature, C	86	84
Yearlings		
Lower critical temperature, C	-31	Not reported*
Upper critical temperature, C	77	Not reported*
Mature cow		
Lower critical temperature, C	5	10
Upper critical temperature, C	82	75

* Consultants and cattle feeders contend that Holstein steers are more tolerant of elevated temperatures, but less tolerant of freezing temperatures than native steers, which may be because of their thinner hide and diminished subcutaneous fat cover.

Aim for Dry, Draft-free Housing



Monoslope buildings are popular in the Midwest for housing Holstein steers in cold climates and facilitating manure nutrient management. (Ramthun Farms, West Bend, WI)

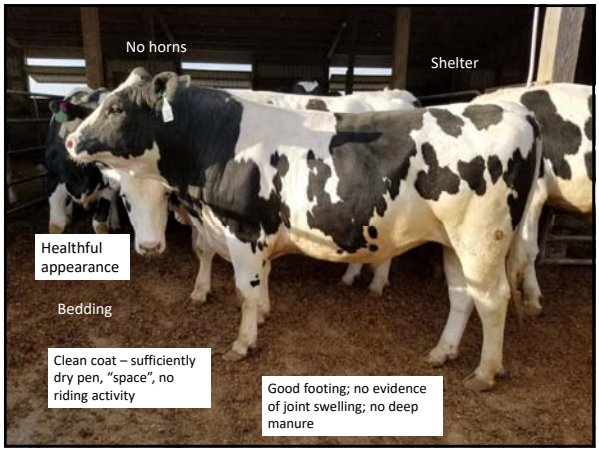
Given the reduced insulation characteristics of dairy beef steers, insulation provided by dry bedding is essential in cold conditions. (Ramthun Farms, West Bend, WI)

Yield Characteristics of Holstein Steer Carcasses

- Lower dressing percentage than native carcasses
  - Due to increased proportion of gut, reduced muscling score, less subcutaneous fat, increased liver size, increased proportion of abdominal fat
  - However, hide as proportion of body weight is less
- Dressing percentage is the distinctive limitation of the Holstein, not carcass composition!
- Loin muscle of the Holstein is stretched over a longer skeleton, resulting in a smaller REA (Nour et al., 1981)

Quality of Holstein Beef

- Finished Holstein steer market price is driven by the Choice cut-out price and drop credit, not price of beef trimmings
- Dairy steers have comparable quality grade attributes and higher marbling scores than the U.S. fed cattle population
- Beef discoloration rate is similar, but Holstein beef seems to be more prone to lipid oxidation
- Holstein loin has greater drip loss but responds to vitamin E supplementation, if there is a large differential
- No repeatable breed difference in taste panel or tenderness attributes, which is supported by histology and biochemistry
- Equality in taste panel evaluation (Holstein vs Angus) is also supported by close similarity of fatty acid and volatile profiles

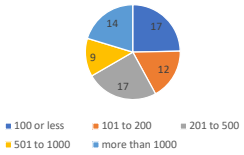


Finished Holstein Steer

Body wt	1388 lb
Dress	58.6%
Carcass	814 lb
Fat thickness	0.28 in
Loin muscle area	12.2 in^2
Kidney, pelvic, heart fat	3.0%
USDA Yield Grade	3.0
USDA Maturity	A
USDA Marbling	Modest[20]
USDA Quality Grade	Choice

Survey of Dairy Farmers to Learn their Criteria for Beef Semen AI of Dairy Cows

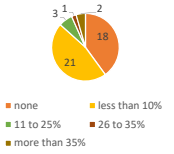
- Fall/winter 2018
- 69 farm responses
  - 47 WI
  - 15 MI
  - 7 IA
- 53 used beef on dairy
- 45 answered most questions



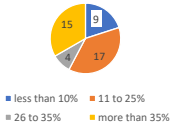
Participants by herd size

Beef Sire AI of Heifers versus Cows

Number of farms breeding <u>virgin heifers</u> to beef bulls by percentage of heifers. (n=45)

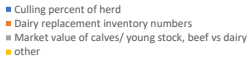


Number of farms breeding <u>cows</u> to beef bulls by percentage of cows. (n=45)

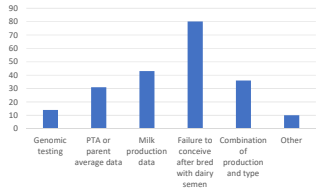


Criteria

Criteria used to determine percent of dairy herd to breed with beef semen.

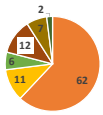


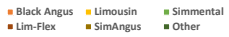
Percent of farms that used criterion to determine which cows to breed to beef bulls (farms could select multiple criteria).



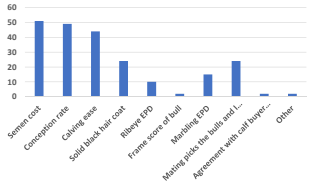
Beef Breed and Sire Selection

Beef breeds by percentage used on dairy females.





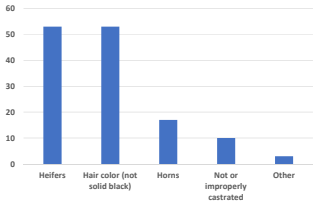
Percentage of farms that used criterion to select beef bull semen (farms could select multiple criteria).



Marketing Methods for the Calves

- Total farms: 45
  - Week old or less: 32
    - Auction market: 19
    - Private treaty: 10
    - Contract agreement with cattle feeder: 3
  - Weaning: 2
  - 400-600 lbs: 2
  - Finished cattle: 9
    - Auction mkt: 7
    - Grade & yield: 2

Percent of respondents for each discount trait



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Considerations for Choosing Beef Genetics to Use in Dairy Herds

Warren Rusche
SDSU Extension Beef Feedlot Management Associate

What's the future of the dairy steer?

- Where are we at?
- How did we get here?
- Where do we go from here?

Where Are We At?

- Dairy Steers (Holstein and Jersey) are being discriminated against in the market place
- Sioux Falls Regional March 13
  - Beef steers (> 1400 #): $129 - $124
  - Holstein: $99 - $90
- Tyson exited dairy steer market
- Limited contract availability

This Isn't New!

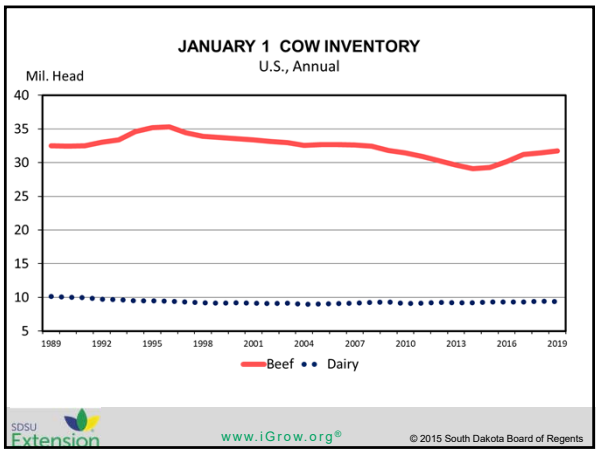
- History of using market signals to drive genetic and management decisions
- Rarely subtle
  - "Do not buy lists"
  - Tighter specifications and requirements

Concerns With Dairy Carcasses

- Insufficient muscling
  - Undesired by some purchasers
  - Ineligible for some branded programs
- Excessive skeletal size (Holstein)
  - Too long for rail height constraints in plants
  - Contributes to greater bruising risk
- Less efficient plant operations
  - More labor, less output per hour

How Did We Get Here?

- 2011-2012 drought drastically reduced beef cow numbers
- Short supplies led to nine packing plant closures from 2013 to 2015
- Dairy beef filled in supply holes for both feedlots and packers
- Record prices in 2014 incentivized beef heifer retention and expansion


JANUARY 1 COW INVENTORY
U.S., Annual
Mil. Head
40
35
30
25
20
15
10
5
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
Beef
Dairy
SDSU Extension
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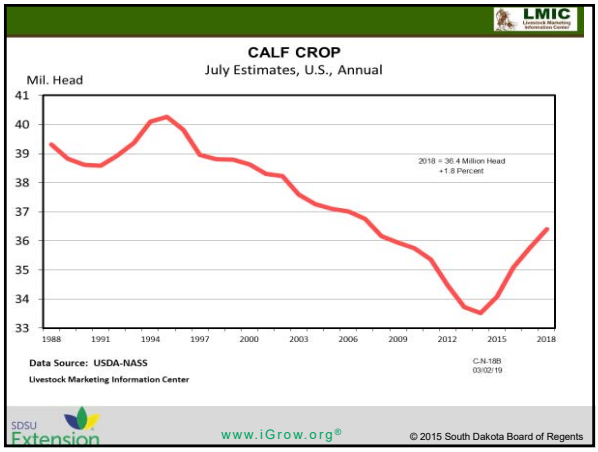
LMIC
CALF CROP
July Estimates, U.S., Annual
Mil. Head
41
40
39
38
37
36
35
34
33
2018 = 36.4 Million Head
+1.8 Percent
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
Data Source: USDA-NASS
Livestock Marketing Information Center
C-N-18B
03/02/19
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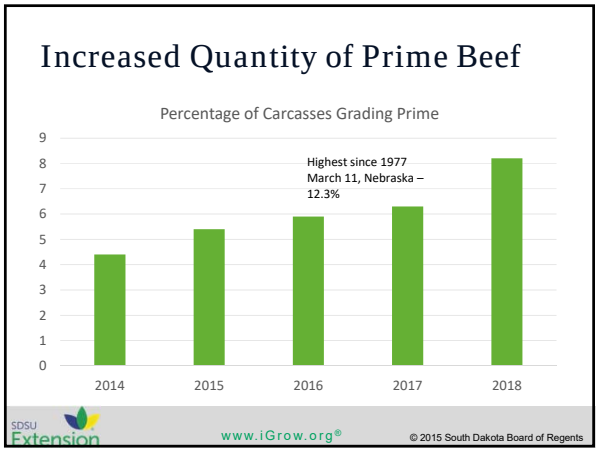
Increased Quantity of Prime Beef
Percentage of Carcasses Grading Prime
9
8
7
6
5
4
3
2
1
0
Highest since 1977
March 11, Nebraska –
12.3%
2014
2015
2016
2017
2018
SDSU Extension
www.iGrow.org®
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Net Results

- Increased supply of higher-quality beef
- Dairy beef losing its competitive advantage compared to native steers
- Limited packing capacity – packers have the leverage to pick and choose the cattle they want to buy and at what price

Where do we go from here?

- Develop markets that value dairy beef
  - Identify potential customers (food service, retail)
  - Identify processing partners
  - Takes time
- Change the characteristics of the non-replacement calves from dairies

Definitions

- Heterosis (hybrid vigor)
  - Difference in the performance of a crossbred animal compared to the average of the two purebred parents
  - Most effective with less heritable traits (i.e. calf vigor)
- Breed complementarity
  - Using one breed's strengths to complement the other breed's weakness

Strengths and Weaknesses of Dairy Beef Carcasses

- Strengths
  - Consistent gene pool
  - Excellent marbling
  - Less backfat compared to most beef breeds
- Weaknesses
  - Inadequate rib eye area (size and shape)
  - Holstein's: Skeletal size
  - Jersey's: Inadequate carcass weight

Job Description for Beef Bulls Used on Dairy Cows

- Holstein
  - Acceptable calving ease
  - Add REA and muscling
  - Moderate skeletal size
  - "Do No Harm" for marbling
- Jersey
  - Add pounds
  - Add muscle
  - Maintain marbling

How Much Change is Needed?

Certified Angus Beef Specifications

- Predominately black hided
- Ten carcass characteristics
  - **Modest or higher marbling (Avg Ch or better)**
  - Medium for fine marbling texture
  - "A" maturity, < 30 months of age
  - **10 to 16 inch REA**
  - 1050# max HCW
  - Less than 1" fat
  - **Superior muscling**
  - Practically free of capillary ruptures
  - No dark cutters
  - No neck hump > 2"

Real World Results?

- Recent, relevant, published data from North America is extremely limited
  - Europe: Different market targets and endpoints
  - New Zealand & South America: Different feeding programs and markets
- "The plural of anecdote is not data", but sometimes that's all we've got!
- Can use inferences from beef breeding research and common sense

Breed of Sire Means, Carcass Traits

USDA Meat Animal Research Center

Breed	HCW, lb	REA, sq in	Marbling Score	REA (in^2)/ HCW(cwt)
Angus	931	13.65	566	1.43
Gelbvieh	903	14.45	493	1.60
Limousin	898	14.77	465	1.64
Simmental	921	14.47	504	1.57

Adapted from Kuehn and Thallman, 2018

Crossbred Feedlot Performance

	Limousin X Jersey Steers	Jersey Steers
# Head	14	8
Harvest Wt (Adj 63% Yield)	1481	1081
Hot Carcass Weight	909	680
ADG (Adj 63% Yield)	3.28	1.49
Feed Conversion (Adj 63% Yield)	7.18	12.1

Trial Conducted by University of MN, 2013
Downloaded from www.WulfCattle.com

Crossbred Carcass Characteristics

	Limousin X Jersey	Jersey
% Prime	8%	0%
% Choice	92%	88%
% Select	0%	13%
Yield Grade	3.1	2.5
Ribeye Area (REA)	13.9	11.4
Marbling Score	600	494
Backfat	0.50 in	0.26 in

Trial Conducted by University of MN, 2013
www.WulfCattle.com

Potential Pitfalls

- Just breeding to a generic beef bull won't be as successful!
- Solid black crossbred with Holstein-type muscle:
  - Equals Holstein $$!!
- "If is walks like a duck…"

Selection Tools

- Expected Progeny Differences (EPDs)
  - Carcass traits:
    - Carcass weight
    - Ribeye area
    - Marbling
    - Fat thickness
- Sire Selection Matters!
  - Can't expect improvement using fire sale semen or bull of the month!

Strategies to Capture Value

1. Health Status
   - Superior genetics + inferior health = inferior performance
   - Reward = Continued market access
2. Identify requirements and genetic resources to avoid dairy discount
3. Identify opportunities to capture additional premium
4. Market cattle, don't just sell

Final Thoughts

For bull calves and non-replacement heifers the dairy industry has two options:

1. View these calves as a by-product and receive by-product value
2. Pursue opportunities to add value and create additional income streams

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Dairy Cattle Impact on Beef Supplies

Brenda Boetel, professor and Extension Commodity Marketing Specialist, University of Wisconsin-River Falls
Jared Geiser, undergraduate research assistant, University of Wisconsin-River Falls

The dairy cattle sector is a vital contributor to U.S. beef supplies. The U.S. dairy herd has offered a stable source of both feeder cattle and cull cows to fill beef demand. The percent of beef contributed by the dairy industry grew from 2002 when beef from dairy cattle contributed 17.9% of the U.S. beef supplies, peaking in 2015 at 23.99% and dipping to 21.1% in 2018. While growth in the amount of beef produced from dairy steers and cull cows has not been steady, it has less variability than beef from native cattle. Over the period of 2002 to 2018, U.S. commercial beef production peaked in 2002 at 27 billion pounds, of which 4.8 billion pounds (17.8%) was from dairy cattle. Beef production in 2018 was 26.9 billion, of which 5.7 billion (21.1%) of those pounds was from dairy cattle.

Finished dairy steers contribute more to U.S. beef supplies than culled dairy cows. Finished dairy steers contributed 2.9 billion pounds (10.8%) of total pounds harvested in 2002, peaking at 3.5 billion pounds (14.7%) in 2015 and dipping to 3.4 (12.6%) in 2018. Continued contributions from dairy steers can be expected as the dairy cow herd number is incredibly stable, changing year over year on average since 2002 less than 0.5%.

Additionally, dairy animals contribute to the amount of prime beef supply. With 85-90% of dairy animals being Holstein, Holstein steers contribute the largest portion of dairy beef. While traditionally discounted, Holsteins, particularly when managed as calf feds, have the potential for quality and yield premiums. Due to more predictability in feeding and genetics, finished Holsteins, when compared to beef breeds, will produce a larger percentage grading prime or choice. Between 2002 and 2018, Holstein steers have contributed between 32 and 60% (depending on the year) of prime beef harvested in the U.S. Calendar year 2018 saw the lowest percentage of prime beef (21.3%) contributed by Holstein steers since our data set began in 2002. Note though that the overall percentage of beef that graded prime increased to its highest level ever in 2018, at 8.3% of total U.S. beef production.

Despite dairy steers' impact on and importance to the beef supply and value to the industry, Holstein steers continue to experience an overall discount to native cattle. These discounts exist for different market structure and economic reasons. From an economic perspective, Holstein steer prices are influenced by the same factors that affect native steer price, although the relative impact of the factor varies. For example, the Choice boxed beef price has a positive impact on both finished Holstein steer price and finished native cattle price; however, finished Holstein steer price will have a smaller increase in price for a given increase in Choice boxed beef price than the native cattle will have (Hogan et al., 2009). This smaller increase is due to the difference in primal cut yields between Holstein and native cattle. Breed specific marketing programs also influence the discounts received by Holstein steer producers relative to native cattle producers.

Grid pricing is one method of marketing finished Holstein steers. Grid pricing is based on a pre-determined price (base) that reflects industry or plant averages and adjustments are made for carcasses above or below standard quality specifications. Base grid prices are typically set for

Choice, yield grade 3 and are determined by factors such as boxed beef cutout value, live cattle futures market price, geographic region, etc. Premiums are paid for yield grades 1 and 2, while discounts are applied to yield grades 4 and 5. Similarly carcasses grading Prime receive a premium, while those grading Select receive a discount. Additional adjustments to the base price can be written into the grid depending on the plant, including adjustments based on dairy breed, ribeye size, Certified Angus Beef, dark cutters, bullock/stag, age, etc.

Grid pricing and the typical discount applied to finished Holstein steers is partially due to differences in dressing percentage and primal cut yield. In some instances, Holsteins have a better yield of cut (e.g., more boneless chuck short ribs, less brisket weight, more 80 lean:20 fat trim and less fat/tissue weight) and in other instances they have a less desirable yield (e.g. less inside round, less outside round, and more bone) than similar weight and yield native carcasses. The combination of type of cut, yield of cut, and price of cut is accumulated for the entire carcass to determine carcass value.

Based off these differences in distribution of cuts, grids tend to place a discount on Holstein steers. The USDA publishes a weekly market summary (LM_CT155) that reports the yield and quality grade premiums and discounts for select packers. Dairy beef cattle have a discount that typically ranges from $0 to $10 per cwt on a carcass basis; however, this discount varies considerably between plants. If native beef is in short supply, the dairy discount is less than if native beef is in abundant supply. Additionally, this dairy beef discount is usually based on providing a large enough ribeye to have marketable middle wholesale cuts; therefore, some grids (Radunz, 2012) will not apply the dairy discount if the LMA is over 71 cm^2 (11 in^2). If a finished Holstein steer is Prime, yield grade 1, the producer would receive the premiums for quality and yield grade; but if the LMA is small, the discount for dairy type would apply. A Holstein steer producer should compare base grid prices as well as the premium/discount structures to determine which grid is most advantageous. Meat packing companies value cattle differently and thus some grids may not be well-suited for Holstein steers. Producers need to re-evaluate grids frequently because the factors that influence these premiums/discounts are constantly changing, thereby changing the grid premiums/discounts.

Holstein steers have the same marketing options as native cattle, including live auction markets, private treaty, and delivery contracts. The Holstein steer producer also has the ability to use live cattle futures contracts to hedge finished cattle. The difference in these marketing and risk management options is that the availability of buyers interested in Holstein steers is more limited, and basis is more variable.

Due to the potential carcass size difference between Holstein steers and native steers, some plants specialize in Holstein steer slaughter and fabrication of Holstein carcasses. Additionally, plant specialization in slaughter and processing of Holstein steers provides alternative marketing opportunities for the packer. Processing plants develop markets for specific products and can focus their production efforts accordingly. Those plants that do not specialize in the fabrication of Holstein steers may still accept Holstein steers but these plants then use Holstein steers to fill needs within their existing markets. Plants that utilize Holstein steers in this manner tend to

increase their slaughter of Holsteins when the prices of native cattle get extremely high, and decrease the slaughter of Holsteins when native cattle prices decrease.

Grain Inspection, Packers and Stockyards Administration estimated in 2013 that the total volume of steer and heifer slaughter accounted for by the four largest packers was 85 percent (GIPSA, 2014). No such data are available for Holstein steers but we can infer based on fed cattle market profiles of the major companies that the concentration for Holstein steers is slightly greater than that for native cattle. Based on market factors, packers, especially those that do not specialize in Holstein fabrication, will at times discontinue purchasing Holsteins. Given the already limited number of packers (and plants) able to harvest Holsteins, any decrease in packer interest significantly impacts the finished Holstein steer price. Withdrawal from market participation by packers further increases the already high level of packer concentration, thereby reducing the number of open market bids. In this market situation, a Holstein steer producer who does not have a forward contract will face steeper than normal discounts at the live auction. Eventually if the open market bids do not increase, the formula-priced contracts offered by packers will be impacted.

Holstein steer producers need to have a buyer in mind prior to the start of production. Holstein delivery contracts tend to differ slightly from those for native steers; however, the advantages and disadvantages for delivery contracts remain the same. A delivery contract is a legal agreement between the buyer and seller and guarantees a price for a specified amount and quality of product to be delivered at a specified time and location. These delivery contracts can vary significantly depending on the producer and the packer. For example, some Holstein calf contracts will require high energy rations be fed for a specified number of days prior to slaughter, while others may have specific requirements regarding the use of implants and the time required between implant administration and slaughter. Delivery contracts do not necessarily guarantee a profit, but do allow producers to reduce the impact of sudden and unexpected changes in the market. Additionally, delivery contracts allow producers to know their cattle have a buyer and will not be subjected to a live auction that has low buyer turnout.

Contract specifications will vary from plant to plant. It is vital to clearly understand the requirements set forth in the contract. Holstein steers yield a predictable carcass. As the dairy industry moves to creating Holstein × native crossbred male calves, the market may adapt. Market contracts that set forth specific weight, grade, yield, and conformation criteria will probably be re-considered since the finished crossbred Holstein steer population will be more diverse in its characteristics than the current full-blood Holstein steer population.

A large portion of finished Holstein steers that are forward contracted utilize a basis discount from the live cattle futures price. Basis is the open market cash price minus the live cattle futures contract price. Although finished Holstein steer price is affected by the same larger market factors that affect native cattle prices, the magnitude of these impacts differ, and as such the basis for Holstein steers is more variable than for native cattle. Holstein basis tends to be at its narrowest in May and reaches its widest point during the winter. Holstein basis also tends to widen as native cattle prices increase and basis decreases as native cattle prices decrease (Holt, 2001).

Even with this increased variability, Buhr (1996) found that Holstein steer producers can successfully utilize Chicago Mercantile Exchange live cattle futures contracts to manage price risk for finished Holstein steers with no increased hedging risk as compared to native steers, except during the month of August. His finding further supports the conclusion that many of the same factors that affect prices in native cattle markets are also active in Holstein markets. Although clear differences exist between Holsteins and natives, the driving forces in the two markets are similar.

Given these marketing characteristics, what are the current market opportunities for finishing Holstein cattle? To determine profitability, one has to know cost of production, which includes an understanding of yardage cost, feed cost, medical cost, insurance cost, etc. Given current feed costs and assuming a yardage cost of $0.50 per day, current total cost of gain per hundredweight will be between $0.75 and $0.95. If one experiences greater than average death loss, those cost of gain per hundredweight will increase. If one achieves a lower feed to gain ratio the cost of gain will decrease. Every producer will have a different cost and knowing your own cost is the first and arguably one of the most important steps in understanding marketing.

Assuming a purchase weight of 300 pounds at $75/cwt and an end weight of 1400 pounds, with a total cost of gain of $0.85/cwt, one has the potential to profitably produce Holstein steers only if they can sell them for $83/cwt. If the purchase price goes to $100/cwt and the total cost of gain is $0.95/cwt, the break-even net selling price jumps to $96/cwt. Table 1 provides net break-even selling prices. Given the current futures price of $121/cwt for April 2020 cattle and assuming a $40 under for Holstein cattle, there is limited potential for profit in finishing Holsteins in 2018 depending on total cost of gain and purchase price.

Much of this abstract is excerpts taken from different publications by Boetel and Geiser. These publications are listed in the references.

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Table 1: Break-Even Net Selling Price for 300 to 1400 pound Holstein Steers

	ADG =	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
	Days on Feed	733	629	550	489	440	400	367	338	314	293	275
Total Cost per LB	Months on Feed	24.44	20.95	18.33	16.30	14.67	13.33	12.22	11.28	10.48	9.78	9.17
Net Gain	Purchase Price											
$ Per Lb.	$75.00	$80.00	$85.00	$90.00	$95.00	$100.00	$105.00	$110.00	$115.00	$120.00	$125.00	$130.00	$135.00	$140.00	$145.00
0.72	72.64	73.71	74.79	75.86	76.93	78.00	79.07	80.14	81.21	82.29	83.36	84.43	85.50	86.57	87.64
0.73	73.43	74.50	75.57	76.64	77.71	78.79	79.86	80.93	82.00	83.07	84.14	85.21	86.29	87.36	88.43
0.74	74.21	75.29	76.36	77.43	78.50	79.57	80.64	81.71	82.79	83.86	84.93	86.00	87.07	88.14	89.21
0.75	75.00	76.07	77.14	78.21	79.29	80.36	81.43	82.50	83.57	84.64	85.71	86.79	87.86	88.93	90.00
0.76	75.79	76.86	77.93	79.00	80.07	81.14	82.21	83.29	84.36	85.43	86.50	87.57	88.64	89.71	90.79
0.77	76.57	77.64	78.71	79.79	80.86	81.93	83.00	84.07	85.14	86.21	87.29	88.36	89.43	90.50	91.57
0.78	77.36	78.43	79.50	80.57	81.64	82.71	83.79	84.86	85.93	87.00	88.07	89.14	90.21	91.29	92.36
0.79	78.14	79.21	80.29	81.36	82.43	83.50	84.57	85.64	86.71	87.79	88.86	89.93	91.00	92.07	93.14
0.80	78.93	80.00	81.07	82.14	83.21	84.29	85.36	86.43	87.50	88.57	89.64	90.71	91.79	92.86	93.93
0.81	79.71	80.79	81.86	82.93	84.00	85.07	86.14	87.21	88.29	89.36	90.43	91.50	92.57	93.64	94.71
0.82	80.50	81.57	82.64	83.71	84.79	85.86	86.93	88.00	89.07	90.14	91.21	92.29	93.36	94.43	95.50
0.83	81.29	82.36	83.43	84.50	85.57	86.64	87.71	88.79	89.86	90.93	92.00	93.07	94.14	95.21	96.29
0.84	82.07	83.14	84.21	85.29	86.36	87.43	88.50	89.57	90.64	91.71	92.79	93.86	94.93	96.00	97.07
0.85	82.86	83.93	85.00	86.07	87.14	88.21	89.29	90.36	91.43	92.50	93.57	94.64	95.71	96.79	97.86
0.86	83.64	84.71	85.79	86.86	87.93	89.00	90.07	91.14	92.21	93.29	94.36	95.43	96.50	97.57	98.64
0.87	84.43	85.50	86.57	87.64	88.71	89.79	90.86	91.93	93.00	94.07	95.14	96.21	97.29	98.36	99.43
0.88	85.21	86.29	87.36	88.43	89.50	90.57	91.64	92.71	93.79	94.86	95.93	97.00	98.07	99.14	100.21
0.89	86.00	87.07	88.14	89.21	90.29	91.36	92.43	93.50	94.57	95.64	96.71	97.79	98.86	99.93	101.00
0.90	86.79	87.86	88.93	90.00	91.07	92.14	93.21	94.29	95.36	96.43	97.50	98.57	99.64	100.71	101.79
0.91	87.57	88.64	89.71	90.79	91.86	92.93	94.00	95.07	96.14	97.21	98.29	99.36	100.43	101.50	102.57
0.92	88.36	89.43	90.50	91.57	92.64	93.71	94.79	95.86	96.93	98.00	99.07	100.14	101.21	102.29	103.36
0.93	89.14	90.21	91.29	92.36	93.43	94.50	95.57	96.64	97.71	98.79	99.86	100.93	102.00	103.07	104.14
0.94	89.93	91.00	92.07	93.14	94.21	95.29	96.36	97.43	98.50	99.57	100.64	101.71	102.79	103.86	104.93
0.95	90.71	91.79	92.86	93.93	95.00	96.07	97.14	98.21	99.29	100.36	101.43	102.50	103.57	104.64	105.71
0.96	91.50	92.57	93.64	94.71	95.79	96.86	97.93	99.00	100.07	101.14	102.21	103.29	104.36	105.43	106.50
0.97	92.29	93.36	94.43	95.50	96.57	97.64	98.71	99.79	100.86	101.93	103.00	104.07	105.14	106.21	107.29

*This figure assumes feed and all other costs associated with feeding an animal to a specified weight. The net gain considers any shrink in the feeding and marketing process.

DAIRY BEEF CALVES: ENHANCING VALUE BY OPTIMIZING HEALTH

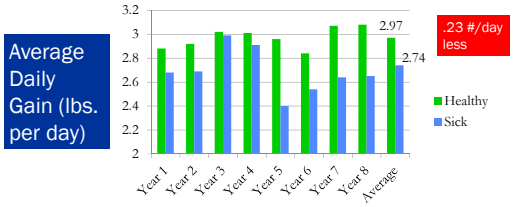
RUSS DALY, DVM, MS, DACVPM
EXTENSION VETERINARIAN

South Dakota State University
College of Agriculture, Food and Environmental Sciences

HEALTH = VALUE

ILLNESS EFFECTS: LOST PERFORMANCE

- Comparing "Healthy" vs. "Sick" calves
  ("Sick" = at least one treatment in feeding period)

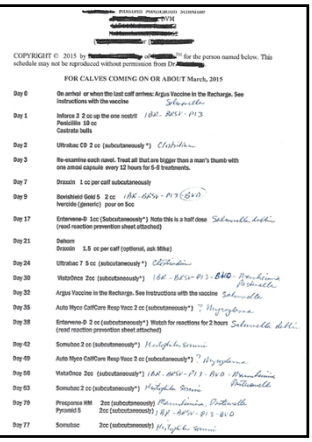


McNeill, Texas A & M Ranch to Rail (17,005 calves)

WHAT ARE THE THREATS TO CALF HEALTH? A SYSTEMS APPROACH

1. Respiratory tract problems – pneumonia
2. Digestive tract problems – pre-weaning
   - Diarrhea
   - Abomasal bloating
   - Enterotoxemia
3. Digestive tract problems – post-weaning
   - Bloating
   - Coccidiosis

NOT THE SOLUTION



[redacted]

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FOR CALVES COMING ON OR ABOUT March, 2015

Day 0	On arrival or when the last calf arrives: Argus Vaccine in the Recharge. See instructions with the vaccine
Day 1	Inforce 3 2 cc up the one nostril IBR. BRSV - PI3 Penicillin 10 cc Castrate bulls
Day 2	Ultrabac CD 2 cc (subcutaneously *) Clostridium
Day 3	Re-examine each navel. Treat all that are bigger than a man's thumb with one antoil capsule every 12 hours for 5-6 treatments.
Day 7	Dravzin 1 cc per calf subcutaneously
Day 9	Bovishield Gold 5 2 cc IBR-BRSV-PI3-BVD Ivercide (generic) pour on 5cc
Day 17	Enteroxine-D 1cc (Subcutaneously*) Note this is a half dose Salmonella bacteria (read reaction prevention sheet attached)
Day 21	Dalbaxx Dravzin 1.5 cc per calf (optional, ask Mike)
Day 24	Ultrabac 7 5 cc (subcutaneously *) Clostridium
Day 30	VistaOnce 2cc (subcutaneously*) IBR-BRSV-PI3-BVD-Mannheimia Pasteurella
Day 32	Argus Vaccine in the Recharge. See instructions with the vaccine Salmonella
Day 35	Auto Myco CalfCare Resp Vacc 2 cc (subcutaneously*) Mycoplasma
Day 38	Enteroxine-D 2 cc (subcutaneously*) Watch for reactions for 2 hours Salmonella bacteria (read reaction prevention sheet attached)
Day 42	Somubac 2 cc (subcutaneously*) Haemophilus somni
Day 49	Auto Myco CalfCare Resp Vacc 2 cc (subcutaneously*) Mycoplasma
Day 56	VistaOnce 2cc (subcutaneously*) IBR-BRSV-PI3-BVD-Mannheimia Pasteurella
Day 63	Somubac 2 cc (subcutaneously*) Haemophilus somni
Day 70	Presponse HM 2cc (subcutaneously) Mannheimia Pasteurella Pyramid 5 2cc (subcutaneously) IBR-BRSV-PI3-BVD
Day 77	Somubac 2cc (subcutaneously) Haemophilus somni

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MOST OF THE SOLUTION

- Nutrition
  - Matched to genetics and ambient environment
- Cleanliness – facilities and equipment
  - Includes the air!
- Colostrum

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COLOSTRUM IN THE CALF: AMOUNT

- Goal = **100 grams** of Ig
  - 4 quarts of good colostrum
- Goal = supply full quantity of colostrum in first 6-12 hours of life

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"FAILURE OF PASSIVE TRANSFER"

- 40% of Dairy Calves
- 25% of Beef calves
- Greater risk of:
  - Preweaning mortality (5.4 x normal)
  - Neonatal morbidity (6.4 x normal)
  - Preweaning morbidity (3.2 x normal)
  - **Feedlot** morbidity (3.0 x normal)
  - **Feedlot** respiratory morbidity (3.1 x normal)

Wittum, Perino, Am J Vet Res. 1995

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MEASURING PASSIVE IMMUNITY IN CALVES

- Serum protein
  - Collect blood from calf 1-5 days old
  - Fairly accurate indication of blood immunoglobulin levels
  - Can be measured with refractometer

> 5.5 g/dl = adequate
5.0 – 5.5 = borderline
< 5.0 = insufficient

- Evaluate on a group basis

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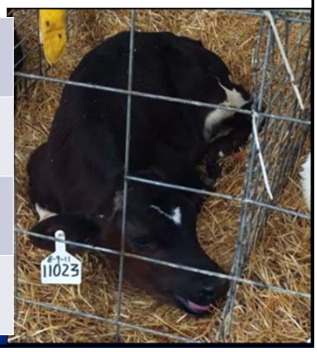
RESPIRATORY DISEASE / CALF PNEUMONIA

Mannheimia haemolytica

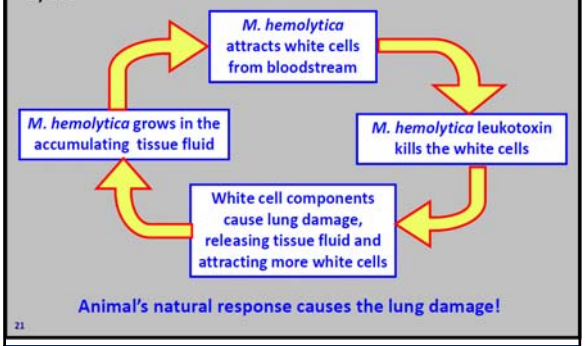
Histophilus somni

Pasteurella multocida

Mycoplasma bovis



BRD lung damage is due to a vicious inflammatory cycle



Animal's natural response causes the lung damage!

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Slide courtesy Dr. John Gay, Washington State Univ.

CALF PNEUMONIA BACTERIA

Mannheimia haemolytica	Present in the upper respiratory tract (nose, throat)?
Histophilus somni	OK
Pasteurella multocida	
Mycoplasma bovis	

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CALF PNEUMONIA BACTERIA

Mannheimia haemolytica	Present in the upper respiratory tract (nose, throat)?
Histophilus somni	OK
Pasteurella multocida	Present in the lower lungs (bronchioles, alveoli)?
Mycoplasma bovis	Not OK

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PULMONARY CLEARANCE: KEEPING THE BACTERIA OUT OF THE LUNGS

In healthy calves inoculated with *M. hemolytica*, these clearance mechanisms:

- Eliminate 75% of bacteria in 2 hours
- Eliminate 90% of bacteria in 4 hours

- Inhibiting colonization
- Mucus
- Cilia
- Epithelial cell receptors
- Antimicrobial substances in epithelium
- Antibody defenses
- Pulmonary macrophages

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HAMPERING PULMONARY CLEARANCE

- Viral infections: IBR, BRSV, BVDV, PI-3, Coronavirus
- High numbers of bacteria in environment
- Cold air
- Dehydration
- Dust
- Corticosteroids/Stress
- Vitamin deficiency
- Poor colostrum
- Lack of prior exposure
- Acidosis

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RISK FACTORS FOR CALF PNEUMONIA

- Viral infections: IBR, BRSV, BVDV, PI-3, Coronavirus
- High numbers of bacteria in environment
- Cold air
- Dehydration
- Dust
- Corticosteroids/Stress
- Vitamin deficiency
- Poor colostrum
- Lack of prior exposure
- Acidosis

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RESPIRATORY DISEASE: NON-VACCINE STRATEGIES

- Deep bedding
- Ventilation
- Gradual acclimation to herdmates

CALF PNEUMONIA VACCINES: WHAT'S AVAILABLE?

- Virus combinations (BRSV-IBR-BVD-PI3)
  - MLV – Killed – Intranasal
- Bacterial vaccines
  - *Mannheimia hemolytica* +/- *Pasteurella multocida*
    - (some combined w/virals)
  - *Histophilus somni* (in combinations)
  - *Mycoplasma bovis*
- Autogenous vaccines

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VACCINATING THE YOUNG CALF

- Active immunity difficult to stimulate in calves < 1 month old
  - Role of colostrum
- Intranasal vaccines
- MLV BVD vaccines: avoid before 4-5 weeks of age
- Clostridial toxoids OK

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BABY CALVES: PNEUMONIA VACCINATION

- 0-2 weeks of age
  - Intranasal IBR-PI3 (+/- BRSV)
- ~ 2 weeks prior to weaning
  - Viral respiratory agents (IBR, PI3, BRSV)
  - *Mannheimia* / *Pasteurella*

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DAIRY CALVES POST-WEANING: PNEUMONIA VACCINATION

- Anticipate pen moves, co-mingling, and long transport
- > 2 weeks prior to first "stressful event":
  - MLV virals (IBR, BVD, PI-3, BRSV)
  - *Mannheimia hemolytica*, *Pasteurella multocida*
- Prior to subsequent events:
  - Consider boosters of virals – especially if intranasals used
- Hauled/comingled calves
  - Do not vaccinate on arrival

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DIGESTIVE TRACT ISSUES

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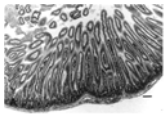
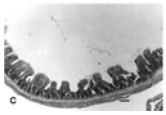
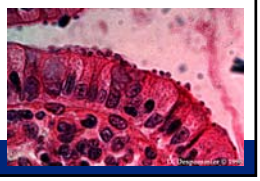
NEONATAL DIARRHEA

- Rotavirus, coronavirus: villous atrophy
- Cryptosporidiosis







NEONATAL DIARRHEA

- Calving area hygiene
- Colostrum
- Limiting spread by cleanliness of equipment
  - Chlorine dioxide – crypto

ORAL FLUIDS - ELECTROLYTES

- Need to correct acidosis along with electrolyte/fluid deficiency - acetate
- Feed separately from milk
- Calf still needs nutrient support

DIGESTIVE TRACT ISSUES: ABOMASAL BLOATING - ENTEROTOXEMIA

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PREVENTION AND CONTROL

- Double-check feeding practices:
  - Mix milk replacer properly:
    - Powder/water ratio
    - Mix completely (no clumps)
    - No additives (electrolytes)
  - Feed at proper temperature (body temp.)
  - Same time every day
  - Make changes gradually
- Vaccines

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CONTROL WHAT YOU CAN CONTROL

UNDERSTAND AND MANAGE WHAT YOU CAN'T

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KEEP YOU AND YOUR PEOPLE SAFE

- Cryptosporidiosis
- Salmonellosis
- E. coli O157

ROCK RIVER FEEDERS

ROCK VALLEY, IA

KENT & SYLVIA PRUISMANN, & FAMILY

- animal well-being
- environmental sustainability
- incorporation of new technologies

ROCK RIVER FEEDERS FAMILY OWNED FEEDLOT THAT FOCUSES ON…

- **3500 head of cattle in outside yards**
  - meeting all federal and state manure management regulations.
- **Beef Quality Assurance normal mode of daily operation.**
- **All cattle are tagged upon arrival with an electronic identification tag**
  - tracking animal origin
  - health
  - movement.
- **Incoming calves averages 270 pounds.**
- **The feedlot rations are a TMR consisting**
  - earlage, corn, wet distillers grains and mineral supplementation.
- **Dairy steers marketed on a high energy grid to JBS in Wisconsin**

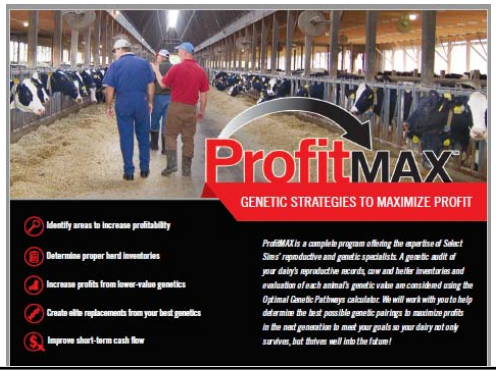
FEEDLOT PARAMETERS

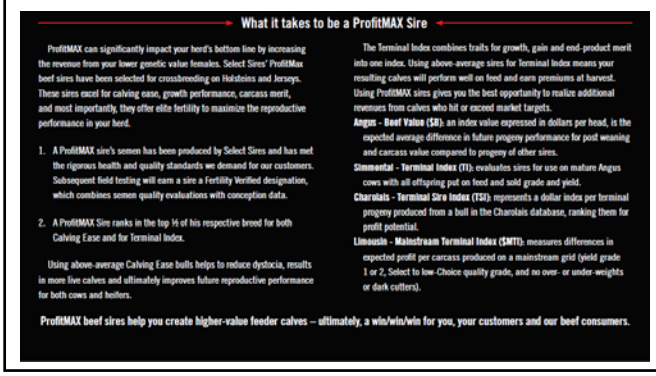
Duane Broek,

Select Sires Sales & Service Representative

broekcvss@gmail.com

605-881-1989





CED = Calving Ease Direct
- Good 10-15
- Poor <1

BW = Birth Weight
- Good <0
- Poor > 1

WW = Weaning Weight
- Good >52
- Poor < 52

YW = Yearling Weight
- Good >92
- Poor <92

CW – Carcass Weight
- Good >36
- Poor <36

REA = Rib Eye Area
- Good >0.47
- Poor <0.47

MB = Marbling
- Good >0.5
- Poor <0.5

$B = Terminal Index (Carcass Weight, Marbling & Ribeye Index)
- Good >$115.00
- Poor <$115.00

Understand Beef EPD's