Effective Supplementation of the Cow Herd D. Boss , J. Dafoe, C. Parsons, S. Wyfells, J. Bowman and T. Delcurto





Montana Feed Association



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2017 and 2018 what happened?

- Drought New Name Flash Drought
- Entire State on Fire
- * Early / Wet Large Snowfall Pre-weaning
- Worst Winter on record in some areas
 - Record Snow Falls
 - Record Low temps for consecutive days
- Which Means....
 - We will be playing catch up all year and possibly for several years



Drought and Supplementation talk

* Asked for Direction for the Talk?

- Sust talk about what you discussed with Beef Producers this year...
 - Where do I get find grass? Hay
 - What can I buy to get the cows through
 - $\boldsymbol{\ast}$ Just about anything you can think of was fed this year
 - » I am turning my cattle out into 2000 acres of failed SW anything I should be concerned with?
 - Less about effective supplementation than Emergency Supplementation to get by and preserve genetics
 - How do I recover in the next few years
 How do we Drought proof our-your herd and range?





Jim asked me to locate one of the mystical creatures -Supplementation Paradigm



One Plan for everybody? Ideas, Concepts and Questions Great News: Extension Educators and Industry Nutritional Reps



Feed Resources and Supplementation is one of the most important individual decisions on any ranch in any year, let alone in a Flash Drought, Unprecedented Fire Season, and Historic 100 year Winter Climate Event

Goal of Effective Supplementation



- Meet Contract Weights
- Preserving High
 Conception Rates
 - \bullet 1st cycle conception
- Recovery of Range Conditions
- Preservation of Herd Genetics
- Maximize Profits
 - * long-term



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1992 Supplementation Talk

Paradigm Shifts or Same Old Thing Reactive, Proactive or Long Term Planning Look to Unbiased Independent Research and Reputable Industry Partners



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Supplementation

Darrin Boss NARC/MSU

What are we actually talking about?

- Salt
- Hay
- Grain
- Protein
- Liquid productsMinerals





Supplementation

Goal

4/20/2018

- To provide nutrients to the cow herd that are not available in:
 - Sufficient quantity
 - Adequate balance
- # 1 task to identify your management goals and the resources available to you
 - Money
 - Hay base
 - Winter grazing
 - BCS of cows
 - Delivery Contract Weights

Sometimes this discussion takes longer than what product to use

Darrin Boss NARC/MSU

Nutrient Requirements and Supplementation

NO Supplementation

- Change the Paradigm
 - Reduce the gap between lacking nutrients and requirements for the class of livestock
 - Early Wean, deliver higher nutrients to calf
 - Reduce Cow pressure and supplementation need
 - Residues use your highest nutrient profile feed for immediate cash flow, calves

» Alternative Forages, Pastures and AUMs

Recovery of cows, Younger cows may / will need supplementation or attention

On't play catch up be proactive

AGRICU



Supplementation

Directions supplementation can take

 Complement or enhance forage utilization without replacing or decreasing forage intake

- Late season grazing
- 2. Substitute for or Limit forage use
 - Hay or Range is in short supply



1992 Supplementation Talk

Strategies and Goals Industry, Extension Educators and producers Energy and Protein concepts – Paradigm shift with current products Single Component vs Complete Supplement Protein or Energy * Minerals *****Biologics ✤ Goal 100% usage and to the specific class Delivery Techniques, Ingredients, Intakes for closer target consumptions



Supplementation

- Types: when talking about forage based diet
 - Energy
 - Protein
 - Each type contains the other (protein and energy). The difference is the relative amount of protein to energy.

Protein supp should contain at least 30 % CP



Supplementation

Which supplement should I use?
Depends upon your goals and forage quality available to you.
Goal:

• Forage is in short supply \Rightarrow Energy

• Low quality forage (hay or grazing) \Rightarrow Protein



Low Quality Forage Winter Grazing Protein is the limiting nutrient Energy may also be limiting, however, it is usually not as deficient as protein Energy that is available in low quality forages is of little use without protein to support microbial digestion PROTEIN Supp (> 30 % CP) should be utilized



To Review – Winter Grazing

What type of response can we expect:
 From a <u>Protein</u> supp?

- Increased intake of the forage
- Increased forage digestion

In contrast to an <u>Energy</u> Supp

- Decreased forage intake
- Decreased forage digestion

Substituting

Enhancing

When I look at grass hay sample analysis in MT, usually it is good to high quality, just not enough

We decide - we have to Supplement

- Delivery Method?
- * When to Supplement?
- What Class to Supplement or All
 - Do we sort the herd
- * How much?
 - Intake, Additional ingredients and \$\$\$
- ✤ GOAL 100% usage and meeting INTAKE
 - Specifically the younger animals
- If Winter Grazing
 - Distribution on Range
 - Increasing intakes of forage



Decisions for Max Forage Consumption, Protein

Alfalfa Hay, cubes or hand delivered Supplement
 Everyday, skip a day or twice a week
 Maintains high forage intake

* VS

Self fed Supplements
Tubs, creep, liquid,
Remoteness of pastures, 2 hours to North Pasture
Perhaps a reduction of Labor



Decisions for Max Forage Savings, Energy

- Energy cubes (barley/corn) hand delivered ENERGY
 - Stretching hay or forage reserves
 - May be very attractive with low grain prices
 Pulse production increases moderate energy and moderate protein
- ✤ VS
- Self fed Supplements that do not increase forage intake
 - Tubs, creep, liquid,
 - Remoteness of pastures
 - Labor reductions



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Breaking the Paradigm

 Complete Supplementation – Rather than single nutrient supplementation
 Required nutrient, Protein, energy or both
 Minerals, Probiotics, Vitamins or other ingredients in one package

> / Tell us what you've done with

> > all the grass!

Stressful period of high production
 Last trimester
 Breeding Season – April 1
 still no grass







Consecutive days below Zero oh year don't forget 4 feet of snow

Table 2. Lower Critical Temperatures for Beef Cattle

Coat Condition	Critical Temperature ^o F	
Wet or Summer Coat	59⁰	
Dry, Fall Coat	45⁰	
Dry, Winter Coat	32º	
Dry, Heavy Winter Coat	18º	
Dry, Heavy Winter Coat	18º	

Table 3. Daily Dry Matter Intake of Beef Cows Based on										
Temperatures										
Temp. ºl	F </td <td>5º .</td> <td>5-22⁰</td> <td>22-</td> <td>41-</td> <td>59-</td> <td>77-</td> <td>>95º</td>	5º .	5-22⁰	22-	41-	59-	77-	>95º		
				41º	59⁰	77 ⁰	95⁰			
<mark>Intake R</mark>	atio 1	16	107	105	103	102	90	65		

Igrow.org - SDSU



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Consecutive days below Zero

oh year don't forget 4 feet of snow

Table 1. Example of effect of temperature on Energy Needs

weens

Extra Feed Needed

<u>Temperature</u>	<u>Extra TDN</u> <u>Needed</u>	<u>Hay</u> (lbs/cow/da y)	<u>Grain</u> (lbs/cow/da <u>y</u>)
50F	0	0	0
+30F	0	0	0
10F	20%	3.5-4	2-2.5
-10F	40%	7-8	4-6
20 for three weeks			

Have to ahead of the weather if possible - drought

Weak Calf Syndrome

ag animal health spotlight VETERINARY MEDICINE EXTENSION

WASHINGTON STATE UNIVERSITY EXTENSION & WSU COLLEGE OF VETERINARY MEDICINE Weak Calf Syndrome Weak calf syndrome presents as a newborn calf that is weak, unable or slow to rise, stand or nurse. These calves often die within three days of birth. They may be also called "dummy calves" or "fading calves."

<u>Cow nutrition</u> – Weak calf syndrome has been associated with low energy and protein nutrition in late pregnant cows. Researchers from the University of Idaho studied 19 herds to identify the role that pre-calving nutrition might play in "weak calf syndrome" and found the problem was associated with the *amount* of protein consumed by the cow during the last 60 days of pregnancy. Cows eating hay containing more than 10 percent crude protein had no problems with weak calf syndrome but cows eating hay with less than 10 percent crude protein had an average of 8.5 percent weak calves. Calves born to protein-deficient cows cannot generate body heat as well after birth. Therefore, during the last two months of gestation cows should receive at least 2 pounds of protein per head per day to reduce the incidence of weak calves. Energy in the diet of cows also seems to be important because calves born to thin cows are at increased risk of weak calf syndrome. Cow body condition is frequently used as an indicator of energy balance. The following table shows the impact of cow body condition score at calving on calf time to standing after birth, colostrum production, and immune function (IgG or immunoglobulins in the colostrum).

Cow body condition at calving:	BCS 3	BCS 4	BCS 5
Time to standing (minutes)	60	64	43
Colostrum production (ml)	1525	1112	1433
lgG1 (an immunoglobulin)	146	157	193



Alternative Forages as a Supplement? Planned use of Annual Forages

- Fall Winter alfalfa or hay field residue grazing
 - Rather haying, increase the grazing period and reducing machinery cost of putting up harvested forage
 - Warm season forages Millet, Sorghum-Sudan Grass, Corn
- Cover Crops
 - Planned grazing of the cover crop
 High intensity, short duration -



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Forage Nutrient Composition



The area can grow tremendous amount to <u>season-long</u> warm season Forage or Cover Crops depending upon the year

Targeting high quality forage and preservation of deep subsoil moisture (cereal begins to head)

Above Ground Biomass											
	Planting Statewide		CARC	EARC	NARC	NWARC	SARC	WARC			
23 Cool Season Cool	Cool	1404.5 _ь	938.75 _в	1547.78 _a	1205.83 _{bc}	2654.12 _{abc}		676.12 _{bc}			
24 Cool Season Warm	Warm	2156.2 _a	1489.4 _a	1633.95 _a	2922.59 _a	3820.13 _a		914.96 _{ab}			
25 Warm Season Cool	Cool	394.7 _c	410.55 _c	446.3 _b	186.55 _c	499.77 _d		430.36 _c			
26 Warm Season Warm	Warm	1286.7 _ь	1070.55 _b	1870.47 _a	1166.09 _{bc}	1647.37 _{cd}		679.02 _{bc}			
27 Diversity Early	Cool	1149.2 _b	862.59 _b	1209.94 _{ab}	950.69 _{bc}	2211.57 _{abcd}		510.94 _c			
28Diversity Late	Warm	2153.5 _a	1414.71 _a	1938.52 _a	2811.69 _a	3440.4 _{ab}		1162.28 _a			
29 Alternative Cool	Cool	447.2 _c	500.86 _c	573.47 _b	184.63 _c	558.19 _d		418.75 _c			
30 Alternative Warm	Warm	1472.7 _в	1502.82 _a	1258.08 _{ab}	1676.37 _ь	2018.7 _{bcd}		907.59 _{ab}			
Entr	у Р =	0.0001									
	SE	156.51									
Entry*Location	n P =	0.0079									
	SE		114.54	268.29	351.57	585.21		122.07			

Western Triangle removed from entire data set.

Southern removed from Warm season and Cocktail comparisons due poor emergence related to drought



When water is not a limiting factor other options exist

We are double cropping our pivots to break disease cycles, cover the ground, weed competition, option for hay or late direct or windrow grazing



4 Year Cash Returns – 2 full Cover Crop / Wheat Cycles

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Long Term Response – Epigenetics

Funston et al., Univ. Nebraska

* "In 11 years of studies we have seen no benefit of supplementing cows on winter range to her ability to breed or breed back,"

✤ 1 lb. per day of a 30% protein supplement

Grazing Corn Stalks or winter range



Long Term Response – Epigenetics

- * Big difference was seen in pregnancy rates
 - Heifers from cows grazing winter range and supplementation
 - Pregnancy rates 14% higher
 - than those from non-supplemented dams.
 - Heifers from cows grazing corn crop residue and supplemented had
 - Pregnancy rates 5% higher than those from nonsupplemented dams.
- * "So, we're not only impacting weaning weight and carcass weight of the steers, we're impacting the fertility of heifers before they're ever born," Funston said.



Wyffels et al., 2018 • Strategic Supplementation

- Optimal nutrient delivery systems
- Optimal use of Low-Quality Forages
- Optimal use of Rangelands





Winter Grazing Research at Havre - Winter of 2016/2017 and 2017/2018

- Influence of Supplement Intake and Cow Age on Grazing Behavior and Rangeland Use Patterns
 - Sam Wyffels, Jan Bowman, Lance McNew, Darrin Boss, Cory Parsons, Julia Dafoe, Alyson Hicks-Lynch, and Tim DelCurto
 - Vegetation: production and cover by species, forage quality, robel structure estimates
 - Soil organic matter, temperature maps (GIS Layers)





Figure 1. The influence of cow age on supplement intake and variation in intake. Age class 1 = yearling heifers, age class 2 = 2 & 3 yr cows, age class 3 = 4 & 5 yr cows, age class 4 = 6 & 7 yr cows, age class 5 = 8 & 9 yr cows, and age class 6 = 10 & older (Wyffels et al., 2018).





Figure 2. The influence of environment and cow age on supplement intake behavior. Best-Fit model involved mean daily temperature and cow age (Wyffels et al., 2018).



Effective Supplementation

- Continue to fill the hole
 - Use appropriate delivery techniques
 - Monitor Intakes and young animals
- Use Supplementation as an integrated approach rather than just emergency
 - Early Spring Forage Mid-Season Grazing cover crop – Fall Weaning Windrow Grazing
- Begin to think long term about epigenetics and how that can or may be used as a tool on your operation
 - Increase early Pregnancy Rates and 1st service conception



Thank you dboss@montana.edu Field Day June 21, 2018-

Focus on Forages & After Burn Management