

Capturing Feeding and Foraging Opportunities Through Byproducts of Other Industries



Winter Feeding Beef Cows in 2010

- Portable Windbreaks
- Portable Electric Fence
- Winter Watering Systems
- Bedding

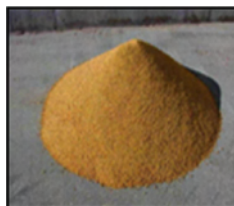


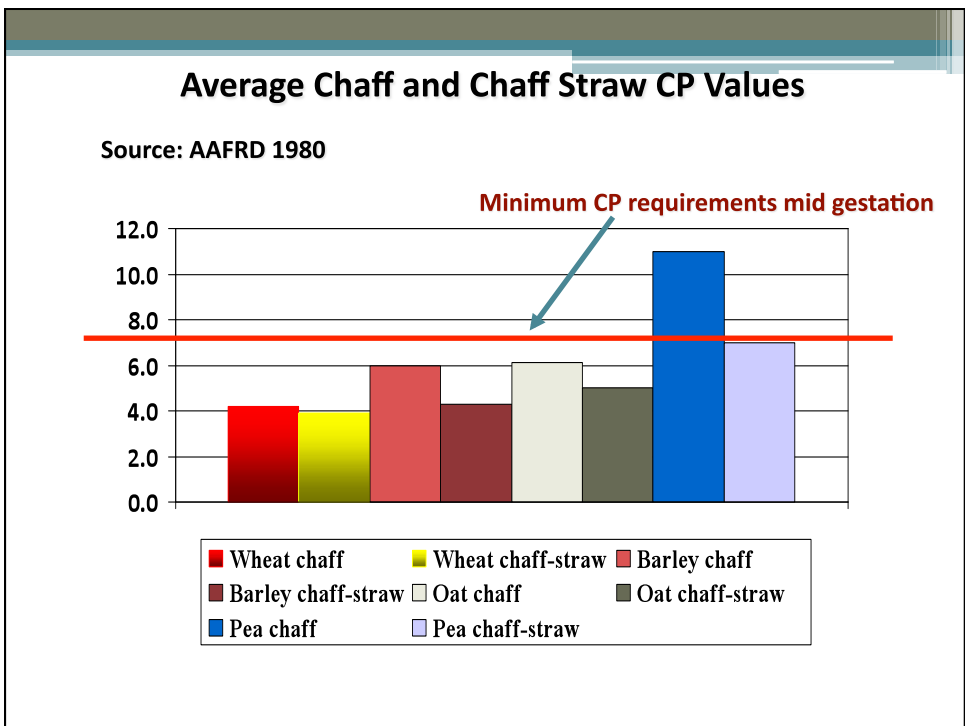
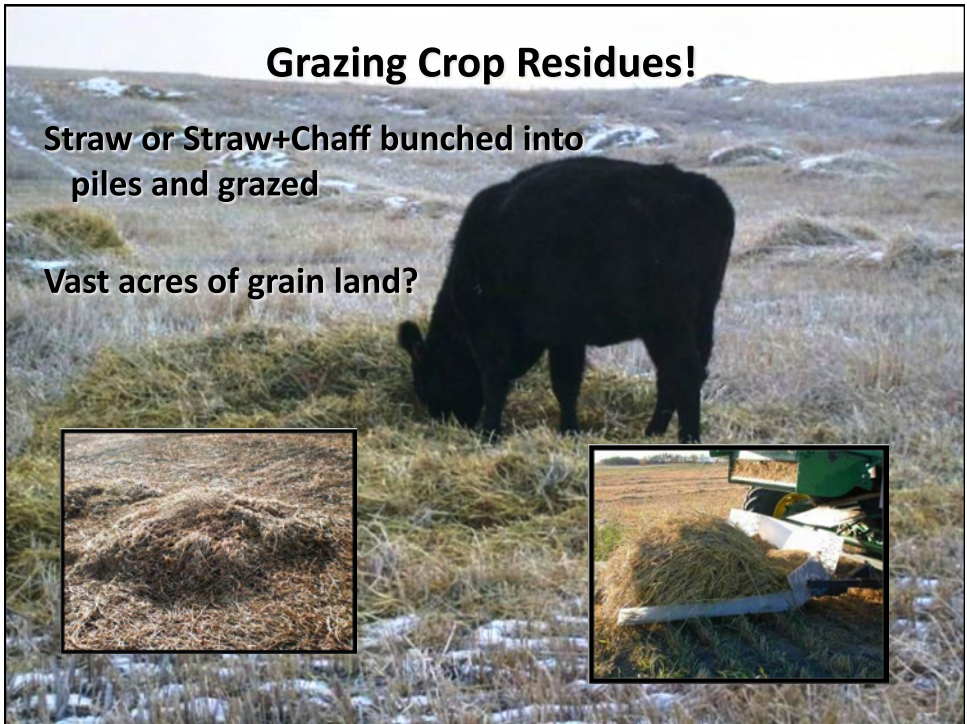
Monitor Cow Weight and Condition!

- **Monitor Cow Requirements**

- **Protein**
- **ENERGY!**

Supplementation Strategies for Low-Quality Forages



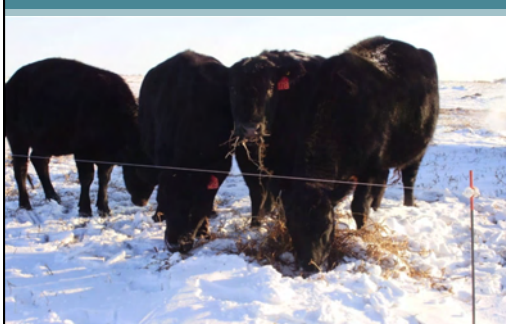


Chaff and Chaff-Straw

- Chaff and Chaff Straw Residues
 - Meant for non-lactating mature cows in good body condition!
- Low quality feeds
 - Cereal - Pulse - Oilseed
 - Supplement
- Crop residue calculators – www.agr.gov.sk.ca



Utilizing Crop Residues in Winter Feeding Systems for Beef Cattle



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Background

- Winter feeding costs are a major contributor to the overall cost of production for cow-calf producers (Taylor 2007)
- Some studies have suggested that swath grazing can reduce cow costs per day (Karn et al. 2005, McCartney et al. 2004)
- Lately there has been renewed interest in utilizing crop residues in beef cow diets because of their potential to reduce winter feed costs (McCartney et al. 2006)

Research Method

- 3-year trial conducted to evaluate the performance and economics of beef cows winter grazing crop residues



Objectives

- To determine the effect of field grazing crop residue on beef cow performance
- To determine the effect of field grazing crop residue on cow reproductive performance
- To determine if oat straw/chaff or pea straw/chaff can provide the majority of nutrients for mature pregnant beef cows with minimal supplementation

Objectives

- Characterize the nutritive value of oat straw/chaff or pea straw/chaff
- Determine total crop biomass and the crop residue for oat/pea crops
- Evaluate cow wintering systems economically for total costs and effect on net returns per cow

Experimental Approach

Site Management:

- The research site is 78 ha field located on Section 35, Field #10 at Termuende Research Ranch, Lanigan, SK.
- At the site, 39 hectares of each crop residue [pea and oat] will be used for the winter field grazing trials
- A control group of beef cows will be fed a dry based roughage ration in dry lot pens

Experimental Approach

Site Management:

- Peas (cv. Performance 40-10) and oats (cv. Baler) will be seeded in June of each year
- Crops will be swathed at maturity for combining
- Grain will be harvested using a 9600 John Deere combine attached with a modified Whole Buncher straw-chaff collector

Experimental Approach

Treatments – Winter Feeding Systems:

- 90 Black Angus cows stratified by age, body weight, body condition, and pregnancy status were randomly allocated to 1 of 3 treatments
- Cows will be allocated feed in each system based upon environmental conditions, cow body weight, pregnancy status and feed nutrient density (in accordance with the National Research Council's (1996) Nutrient Requirements of Beef Cattle)
- All rations will be formulated using CowBytes ration formulation program

Supplementation

- Oat grain will be supplemented to meet additional energy requirements in all diets
- Canola meal will be supplemented to meet additional protein requirements

Treatments – Winter Feeding Systems:

- Each treatment consists of replicate groups (n=3) of cows (n=10)
- 1. Dry lot Feeding System (DL)
 - Grass-legume hay will be fed as round bales in feeders in drylot pens
- 2. Grazing Pea Crop Residue (PR)
 - An 80-85% pea chaff/straw residue, 15-20% oat grain ration will be allocated every 3 days
- 3. Grazing Oat Crop Residue (OR)
 - An 80-85% oat chaff/straw residue, 15-20% oat grain ration will be allocated every 3 days

Cow Data

1. **Body Weight, Body Fat and Condition**
 - Cows will be weighed and ultrasounded at the start and end of trial
 - Cows will also be weighed every 21 days throughout the trial
 - Cows will be body condition scored by an independent technician at the start and end of trial (Lowman et al. 1976)

Cow Data

2. Reproductive performance

- Cows will be pregnancy checked prior to start of test
- Calving data will be recorded each spring including:
 - Calf birth date and birth weight
 - Date of first and last calf born
 - Calving span, interval, calving pattern as well open and cull rates will be determined
 - Calving ease
- Cattle will be observed the following year to determine whether conception rates and calving ease are affected by treatment

Preliminary Cow Data (2009-2010)

	<i>Drylot</i>	<i>Oat Straw/Chaff</i>	<i>Pea Straw/Chaff</i>
Start of Trial	1398.5	1400.1	1396.8
Day 40 Weight	1527.9	1479.5	1414.2
ADG (lb/d)	2.99	1.83	0.29
Day 62 Weight	1578.9	1498.2	1449.6
ADG (lb/d)	2.84	1.52	0.77

Crop Residue Quality and Yield

- Current literature is limited for crop residue quality (McCartney et al. 2006)
- Characterization of nutritive value of oat straw/chaff and pea straw/chaff
- Replicate samples of each feed will be analyzed for:
 - DM
 - TDN & DE
 - CP
 - IVOMD (degradability & digestibility)
 - NDF
 - ADF
 - Ca and P

Preliminary Crop Residue Quality Data (2009)

	<i>Oat Straw/Chaff</i>	<i>Pea Straw/Chaff</i>
TDN	52.6 %	47.5 %
CP	3.5 %	9.4 %
NDF	77.1 %	70.9 %
ADF	51.1 %	61.3 %

Prediction of Daily Dry Matter Intake (DMI)

- Crop Residue Treatments
 - Randomly weigh piles (pre-grazing) to determine average weight
 - Post-grazing, residual feed weight estimated in spring
 - Kg DM P^{-1} allocated – Kg DM P^{-1} residual/ n^{-1}/P^{-1}
 - $\text{P} = 3$ d feeding period, $n = 10$ cows/group
(Volesky et al. 2002)
- Drylot Treatment
 - Individual DMI determined by similar technique

Economic Data

- Economic differences determined for each winter feeding system
- Annual inputs for labour, equipment and feed
- Total cash cost and overhead costs per cow in each feeding system

Conclusions

- A significantly unused resource for many grain and cattle operations is the use of small grain and pulse crop chaff for livestock grazing
- In Saskatchewan, thousands of acres of crop residues are available each year for extending the grazing season and to provide adequate nutrition

Questions?

