Dried distillers grains with solubles as a supplement for wintering beef cows

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Introduction

• Expansion of bio-fuel industry creates a challenge and an opportunity for livestock producers.

• Increased demand for cereal grains for ethanol production increase competition for feed grains.

• Increased supply of by-products/co-products from ethanol production provides a novel feed source.
Example

- Pound-Maker Agventures (SK)
  - 12.5 million litre per year ethanol production
    - 33 600 tonnes Wheat
    - 10 000 tonnes DDGS (ca. 30%)
- 28,500 head capacity beef feedlot

- Husky Energy (MB)
- 130 million litre per year ethanol production
Previous Research

• Existing research has focused on use of corn-based DDGS in beef feedlots.
  – Found DDGS to have energy content comparable to cereal grains
  – Optimal inclusion rates of ca. 20% of DMI
  – Limited research on wheat-based DDGS
  – Limited research on non-feedlot production systems

• Value of Manitoba produced DDGS in forage-based diets for beef cattle?
Scenario

- Supplementation of forage-based diets for wintering beef cows.

- Treatments
  - Control – Barley silage (40%) and hay or straw (60%) formulated to just meet requirements of wintering beef cows
  - Barley supplemented – Control diet supplemented with rolled barley grain at ca. 20% of DMI
  - DDGS - Control diet supplemented with DDGS at ca. 20% of DMI
Trials

• Production Trial
  – 3 pens of 8 cows each per treatment (72 cows total)
  – 56 d trial
  – Measurement of voluntary intake, weight, and condition
  – Carried out over two winters
  – Manure composted for fertilizer

• Metabolism Trial
  – 9 individually fed cows
  – 3 periods of 21 d (63 d trial)
  – Measurement of digestibility and methane emissions
  – Carried out over two winters
DDGS – Production Trial Results

- Year 1
  - Control
  - Barley
  - DDGS

- Year 2
  - Control
  - Barley
  - DDGS

DMI, kg/d
DDGS – Production Trial Results

The diagram shows the average daily gain (ADG) in kg for three treatments: Control, Barley, and DDGS, across two years (Year 1 and Year 2).

- **Year 1**:
  - Control: Approximately 0.9 kg
  - Barley: Approximately 1.3 kg
  - DDGS: Approximately 1.5 kg

- **Year 2**:
  - Control: Approximately 0.7 kg
  - Barley: Approximately 1.1 kg
  - DDGS: Approximately 1.4 kg

The chart indicates that DDGS had the highest ADG in both years, followed by Barley, and then Control. There are letter annotations (a, b) that likely denote statistical significance differences between treatments.
DDGS – Production Trial Results

Backfat Gain, mm

Year 1

Year 2

[Graph showing backfat gain for three groups: Control, Barley, and DDGS, with labels for significant differences between groups in Year 1 and Year 2.]
DDGS – Production Trial Results

Feed Conversion, kg DMI/kg ADG

Year 1
- Control (a)
- Barley (ab)
- DDGS (b)

Year 2
- Control (a)
- Barley (b)
- DDGS (b)

Legend:
- Control
- Barley
- DDGS

Note: Different letters indicate significant differences among treatments.
DDGS – Metabolism Trial

- Cold weather methane collections

- Digestibility determination awaiting completion of laboratory analyses
DDGS – Metabolism Trial Results

Methane, L/d

Control  Barley  DDGS
DDGS – Metabolism Trial Results

![Bar graph showing ADG, kg for Control, Barley, and DDGS. The graph indicates that Control has the highest ADG, followed by Barley, and then DDGS.]
DDGS – Metabolism Trial Results

The chart shows the DMI (Dry Matter Intake) in kg/d for different groups: Control, Barley, and DDGS. The groups labeled 'a' are statistically equivalent, while the group labeled 'b' is significantly different from the others.
Still to Come

• Production trial manure composting results.

• Metabolism trial digestibility results.

• Economic evaluation.
Conclusions

• Supplementation wintering beef cows fed forage-based diets with DDGS results in performance comparable to supplementation with barley grain.

• Methane emissions are not increased despite greater DMI suggesting a reduced emissions rate.

• Supplementation choice can be based on relative cost of providing rolled barley grain or DDGS.