Options for Dealing with Bloat: Forage Conditions and Preventative Feeding

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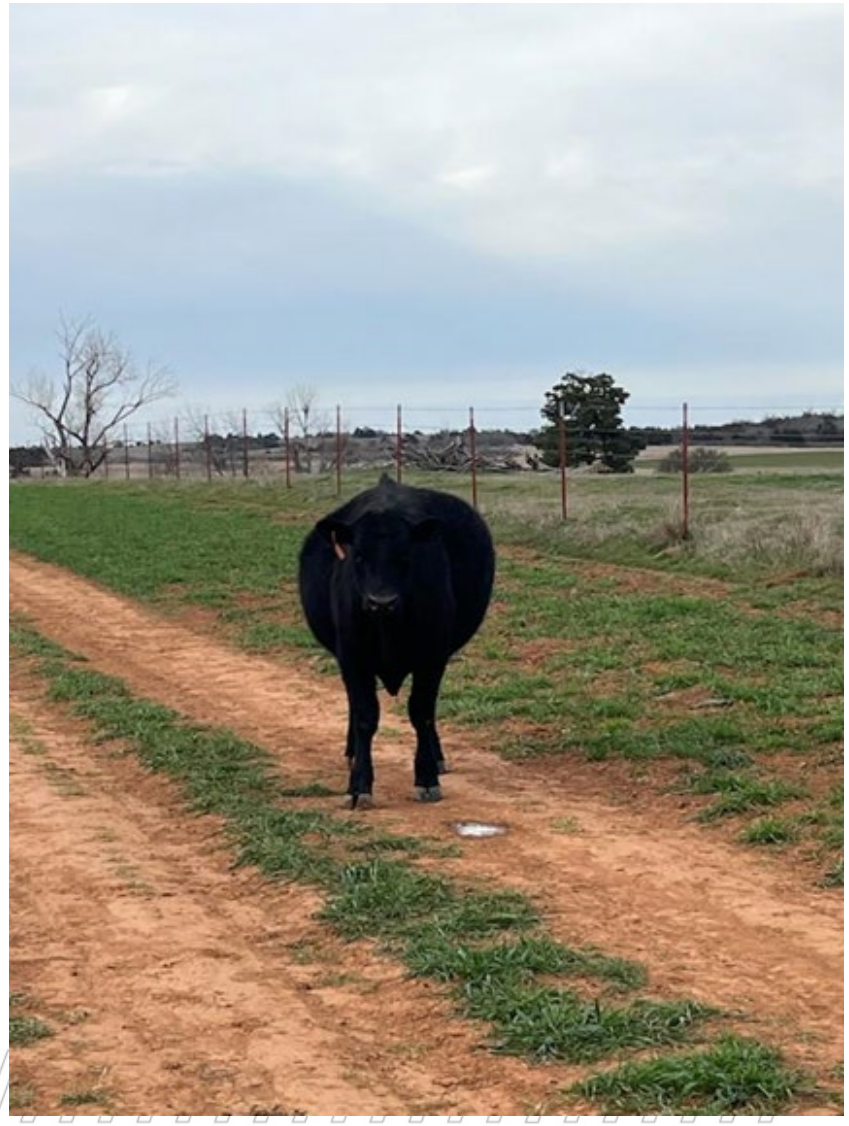
Background

- Etiology of bloat depends on
  - Forage conditions
    - Chemical composition
    - Maturity
    - Fertility
  - Weather
  - Stocking rates
  - Other management



Background

- Frothy bloat is the build up of ruminal gasses that occurs when gas production is greater than gas expulsion through eructation.
  - Stable foam formation from a slime layer formed from soluble proteins and carbohydrates
    - Gasses percolate through slime layer
    - Blocks esophageal orifice entrapping gas

- Death can occur rapidly with severe cases.
- The group of calves on proceeding slide were gathered and penned with water and dry hay.
- This calf was brought all the way from the field to the pens before succumbing to bloat.

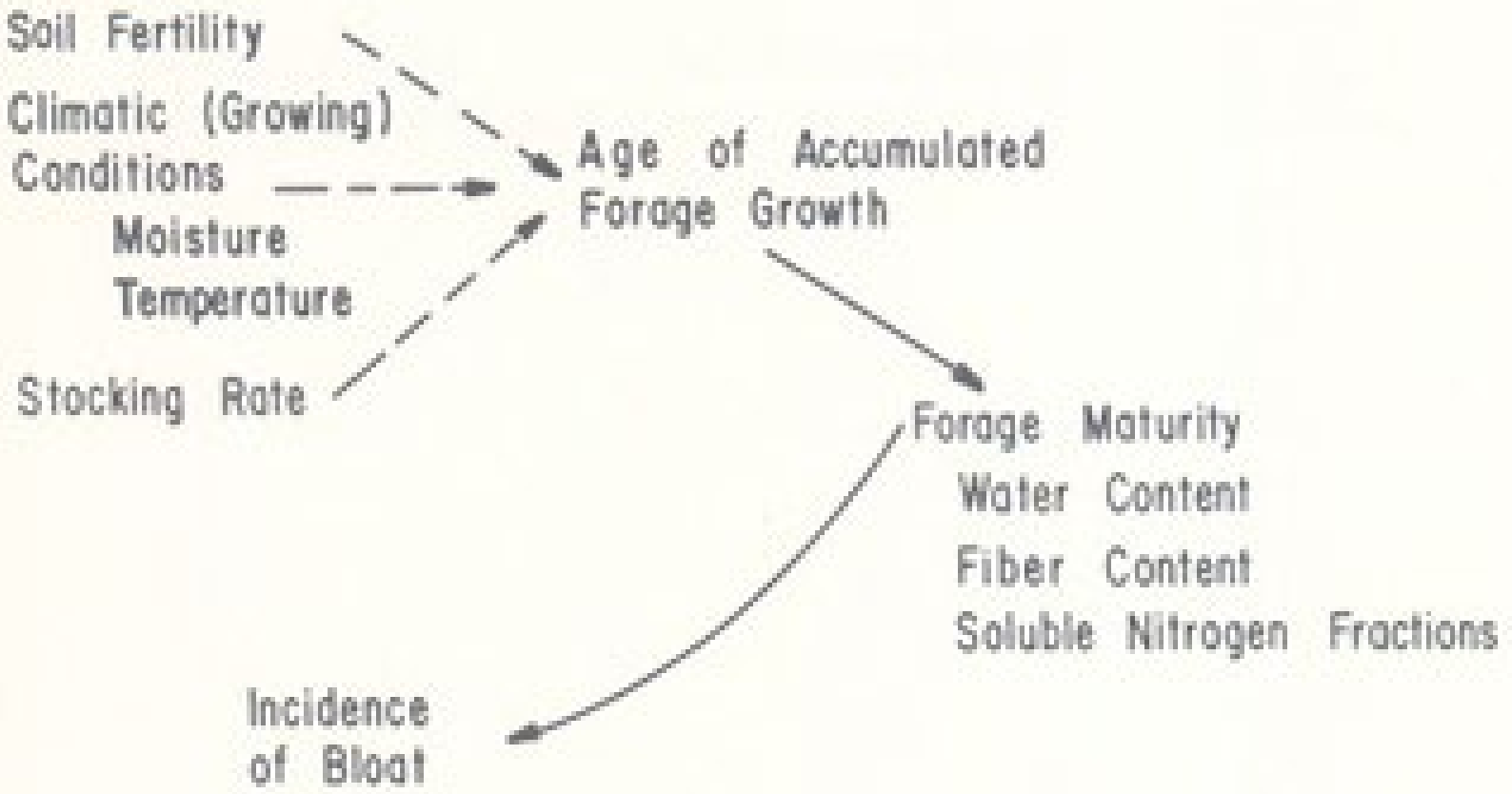
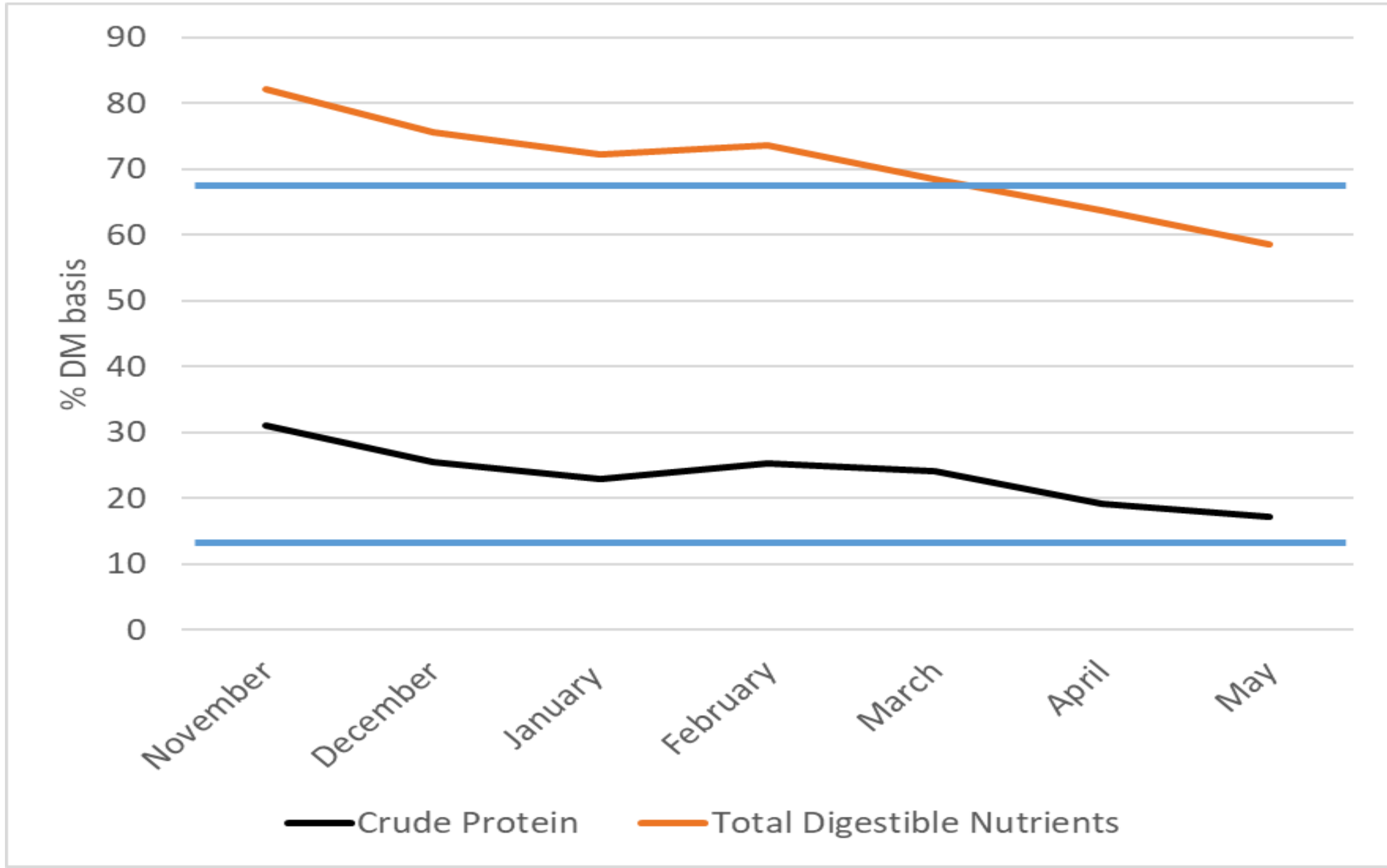


Figure 1. Some variables affecting forage maturity and possibly the incidence of bloat in wheat pasture stockers.


90
80
70
60
50
40
30
20
10
0
% DM basis
November
December
January
February
March
April
May
Crude Protein
Total Digestible Nutrients

Wheat Forage in bloat pastures vs non-bloat pastures

Item	Non-Bloat	Bloat
%DM	28.5	22.3
%NDF	44.6	35.0*
%Crude Protein	25.4	31.8*
Soluble N, %DM	1.8	3.2**
% of N	44.9	61.8**
Soluble Protein N, %	0.8	1.3*
Non Protein N, % DM	1.1	1.9**
% of N	25.8	37.2**
Soluble Carbohydrate	13.1	9.3

Table 1. Macro (% of DM) and Trace Mineral (mg/kg of DM) Content of Fresh Wheat Forage Analyzed at the Dairy One Forage Laboratory for Years from 2004 to 2022.

		Dairy One[a]			
Item	NASEM Requirement[b]	Average	N	Standard Deviation	Range
Ca, %	0.73	0.38	1,984	0.181	0.19 - 0.55
P, %	0.35	0.31	1,989	0.095	0.22 - 0.41
Mg, %	0.10	0.17	1,897	0.069	0.10 - 0.24
K, %	0.60	2.54	1,902	0.971	1.57 - 3.52
S, %	0.15	0.20	1,651	0.133	0.13 – 0.27
Fe, mg/kg	50	509	643	577.3	0 – 1,086
Cu, mg/kg	10.0	8.4	641	3.70	4.8 – 12.2
Mn, mg/kg	20.0	58.5	641	54.17	4.4 – 113.7
Mo, mg/kg	-	1.8	634	2.05	0 – 3.9
Zn, mg/kg	30.0	30.3	644	12.39	17.9 – 42.7

Feeding Hay to Prevent Bloat

- Low levels of fiber of wheat forage may limit rumen motility.
- Providing low quality hay has been suggested to decrease bloat by adding fiber for rumen stimulation.
  - Slow passage rate and increase ruminal retention time to increase digestion
- Mader and Horn fed wheat straw or sorghum-sudan hay to calves grazing wheat pasture
  - Low daily consumption WS=0.15 to 0.4 lb/day SS = 0.35 to 0.9 lbs/day
  - No affect on forage intake, digestibility, passage rate or weight gain
  - Bloat was only observed during a short period in the last two weeks of the experiment (during March).
  - There was no effect of low-quality roughage feeding on the incidence and severity of bloat.

Feeding Monensin to Decrease Bloat

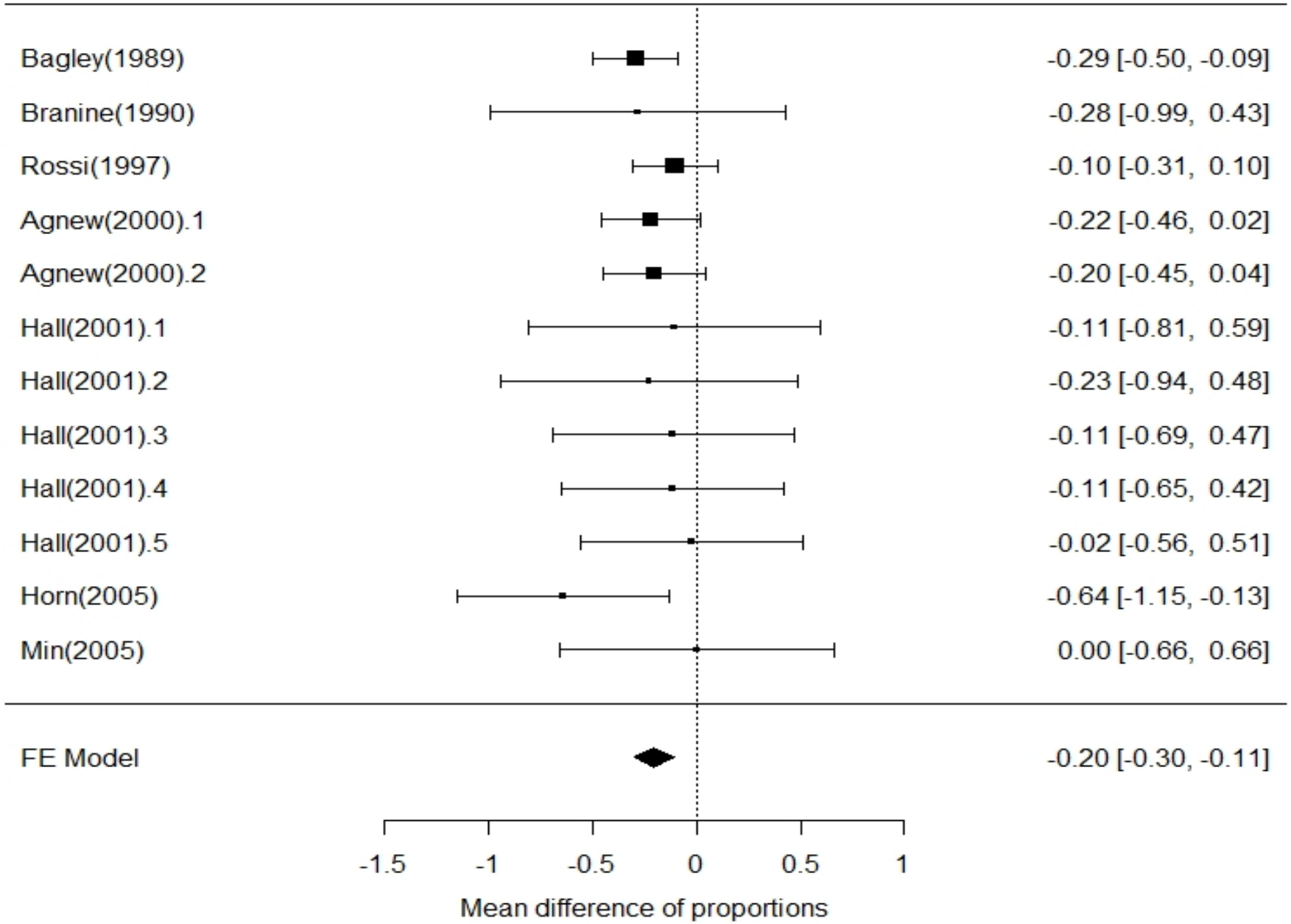
from Horn et al., 2005

Table 10. Effect of ionophore on the incidence and severity of bloat[a,b,c]

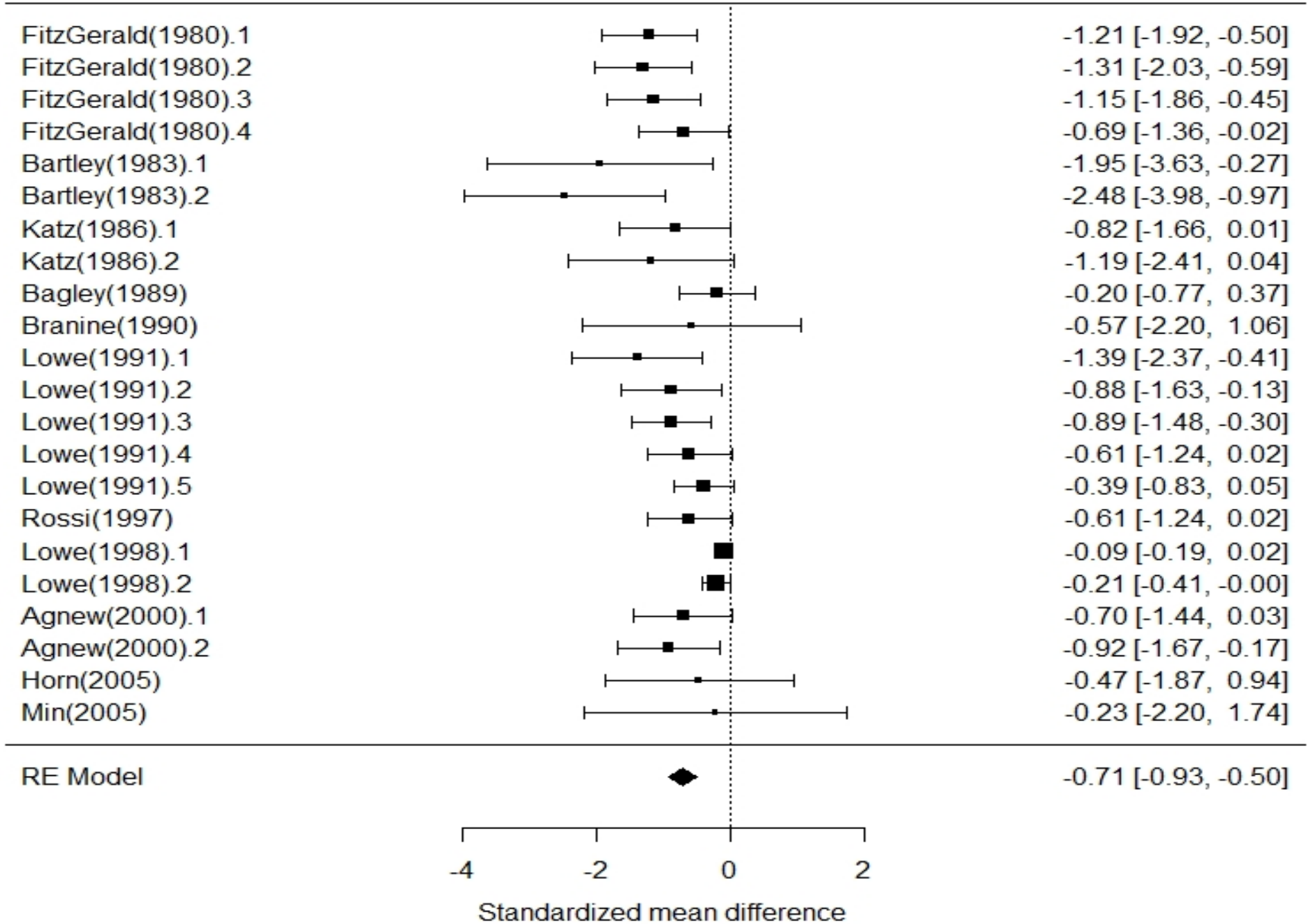
Item	Control	Monensin	Lasalocid	SEM	Control vs. ionophore[d]	Monensin vs. lasalocid[d]
No. of steers	4	4	4			
No. of steers that bloated[e]	4	2	4			
Total steer days of bloat	40	4	33			
Mean days of bloat/steer	10.0	1.0	8.3	2.25	0.083	0.049
Mean bloat score/steer	0.88	0.05	0.77	0.206	0.097	0.036

[a]Paisley and Horn (1998).
[b]From March 15 to March 28, 14 d.
[c]Bloat scores consist of 0 = no visible signs of bloat; 1 = slight distention of left side; 2 = marked distension of left side; 3 = left and right sides distended.
[d]*P*-value associated with orthogonal contrasts.
[e]Steers given a bloat score greater than zero on one or more days.

Monensin and Bloat Incidence



Monensin and Bloat Severity



Poloxalene, synthetic non-ionic surfactant

- Labeled for prevention and control of wheat pasture and legume bloat for over 60-years.
- Surfactant that disrupts foam formation and releases trapped gasses.
- Labeled for feeding at 1 to 2 grams/100 pounds of bodyweight.
- Commercially available in variety of forms
  - Feed additives
  - Top dress for concentrate supplements
  - Mineral supplements
  - Blocks
  - Liquid feed
- <u>Must be consumed daily</u>

Feeding Poloxalene - Example

- 6.6% poloxalene
- 0.8 oz/100 lb bodyweight
  - 4 oz for 500 lb steer
  - 132 steer days/block
  - $0.25 to $0.33/steer-day

Current Recommendation

- Feed mineral supplement designed for wheat pasture continuously
  - High Ca & Cu, low P &K, moderate Mg
  - Include monensin
    - Increase gains
    - Decrease incidence and severity of bloat
    - Allows observation of bloat before death losses occurs
      - Gives time to provide alternative cures
- Feed a moderate quality, palatable hay
  - Doesn’t hurt anything
  - Peace of mind
- Be prepared to take action…bloat will not wait for you to run around trying to figure out what to do and find product and …

Summary of Forage Characteristics

- Bloat is primarily an issue when soluble plant cell contents combine to form a stable foam and inhibit eructation of rumen gases.
  - Rapid growth of immature forage allows for high rates of intake of forage
  - Frost after mild days –rupture cell walls
  - Behind a frontal system – high forage intake rate
- Low fiber content – reduced ruminal activity
- Minerals associated with muscle contraction (such as Ca and Mg) are deficient and/or unbalanced, and are also implicated in the etiology of bloat.

Questions?