Dry matter loss, fermentation profile and aerobic stability of wet brewers grains ensiled with or without increasing concentrations of dry ground corn

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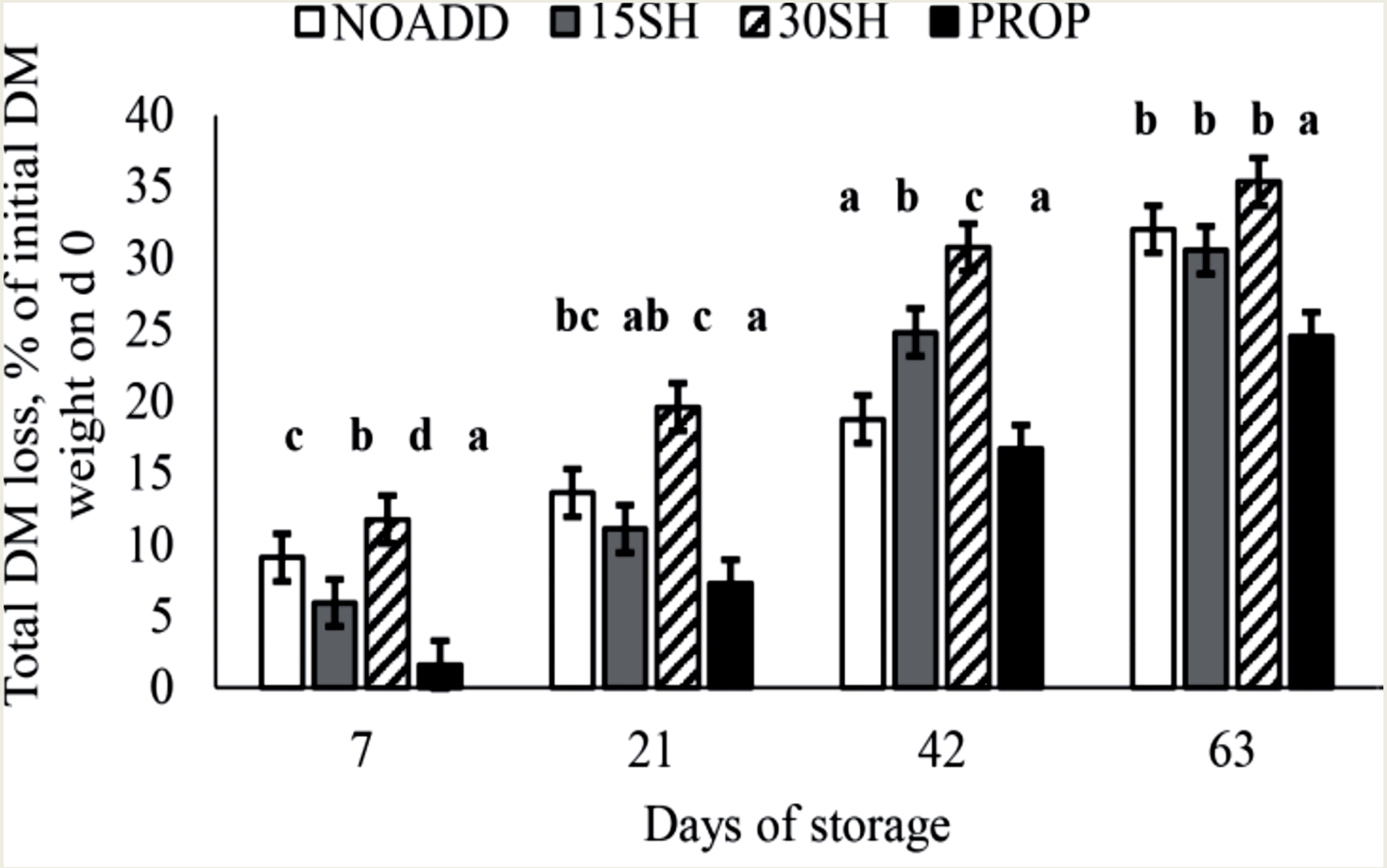
Wet brewers grain (WBG)

- Wet brewers grain (WBG) provides energy and protein
- Prices are feasible
- But difficult to handle during storage
  - High-moisture content
  - Lack of sugars
- Alternative: buy smaller batches
  - May reduce losses
  - Increases variability

Mixed with soy hulls or propionic acid



Moriel et al., 2015

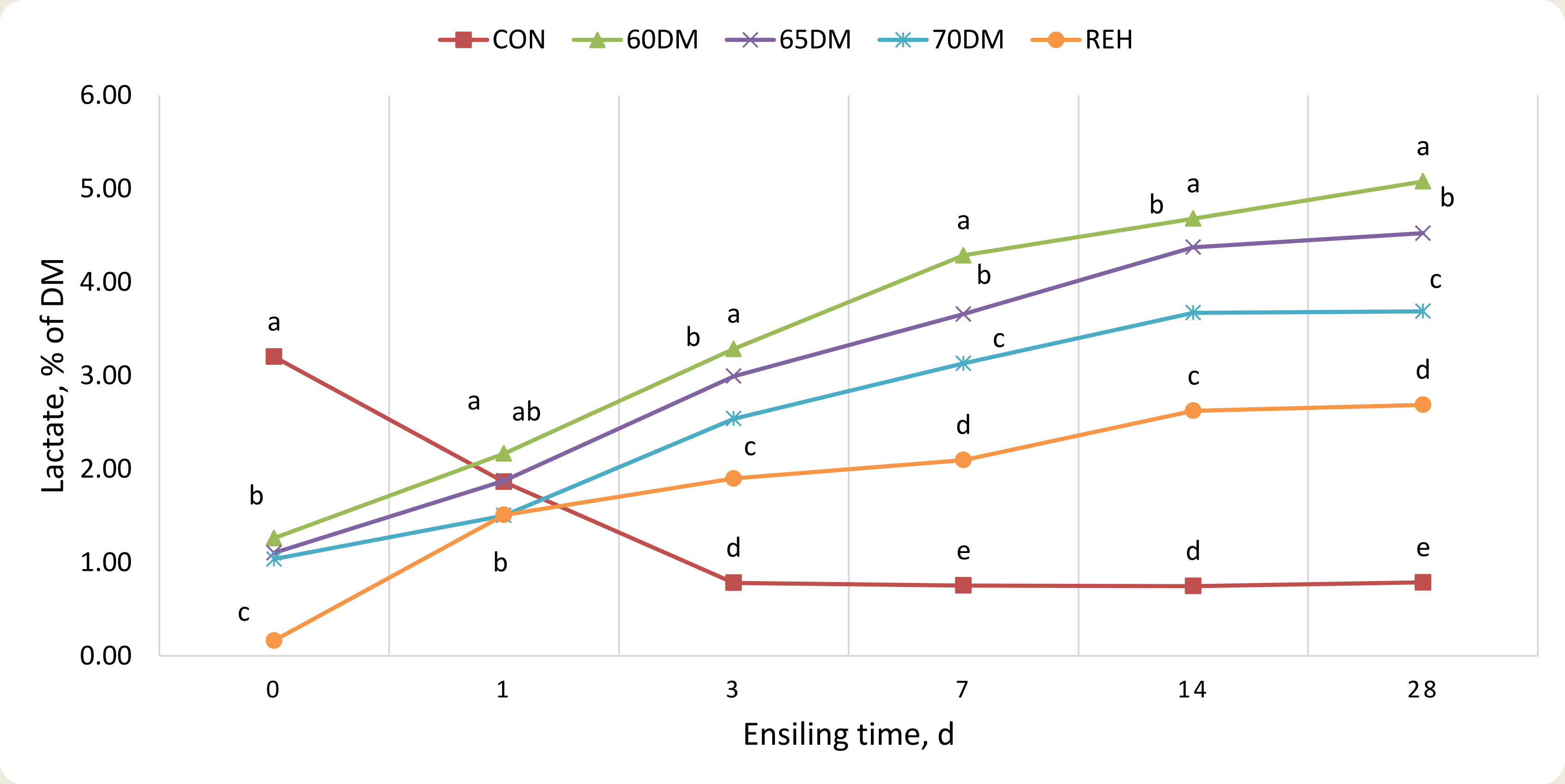
Mixture with dry ground corn

- 5 mixtures of WBG and DGC
  - 100% WBG
  - Mixture targeting 60, 65 or 70% of DM
  - Rehydrated DGC with 70% DM (distilled water)

- 6 time-points
  - 0, 1, 3, 7, 14 and 28 days

Ferraretto et al., 2018

Mixture with dry ground corn



Ferraretto et al., 2018

Mixture with dry ground corn

- Although fermentation data is promising…
  - Data evaluating higher levels of WBG in the mixture is warranted
  - DM loss was not measured
  - Aerobic stability unknown

Objectives

- To evaluate fermentation profile, DM loss, and aerobic stability of WBG ensiled with or without DGC

Hypothesis

- Mixtures of WBG and DGC would have enough substrates to allow for desirable anaerobic fermentation and thus, improve fermentation, reduce loss of DM and improve aerobic stability compared with WBG ensiled alone.

Material and Methods

- Samples of WBG and DGC were mixed to reach the following treatments:
  - 100% WBG (WBG)
  - Mixture targeting 35% of DM (M35)
  - Mixture targeting 50% of DM (M50)

- 9 mixtures per treatment were prepared and randomly allocated to 3 ensiling time treatments:
  - 0, 14 and 28 days

Material and Methods

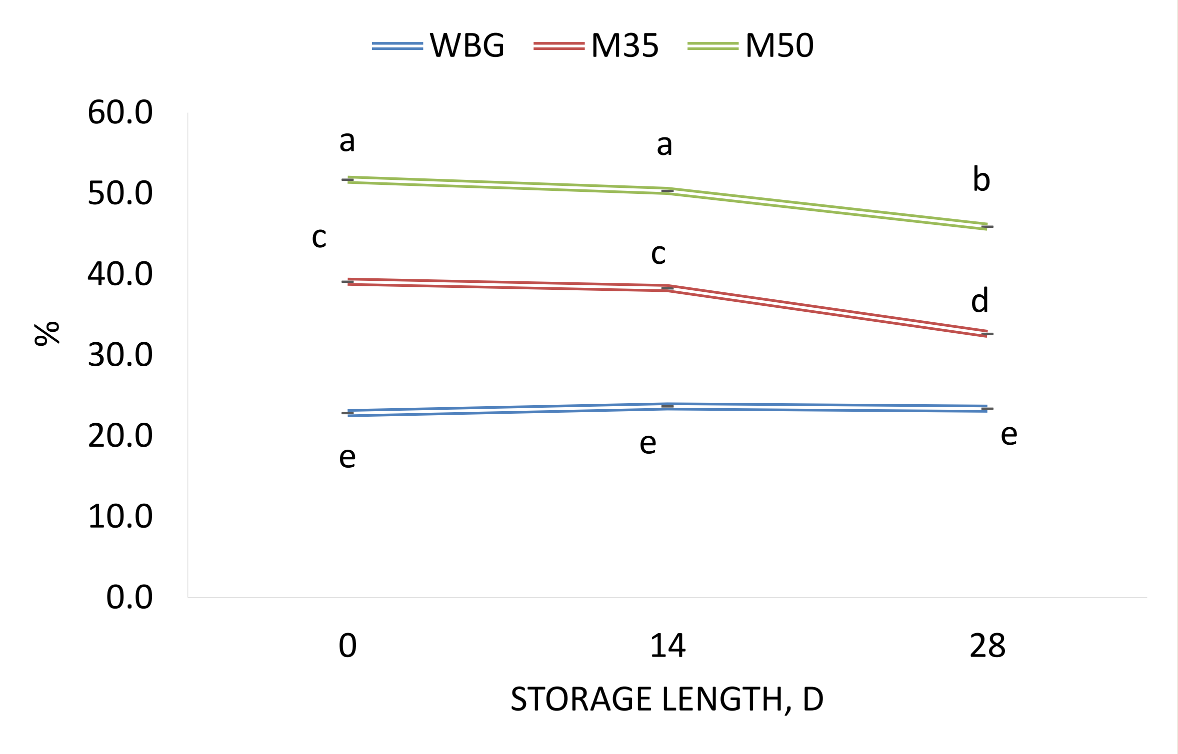
- Mini-silos from all time-points
  - Nutrient composition
  - pH and fermentation profile

- Mini-silo from 14 and 28 days
  - DM loss
  - Aerobic stability

Statistical Analysis

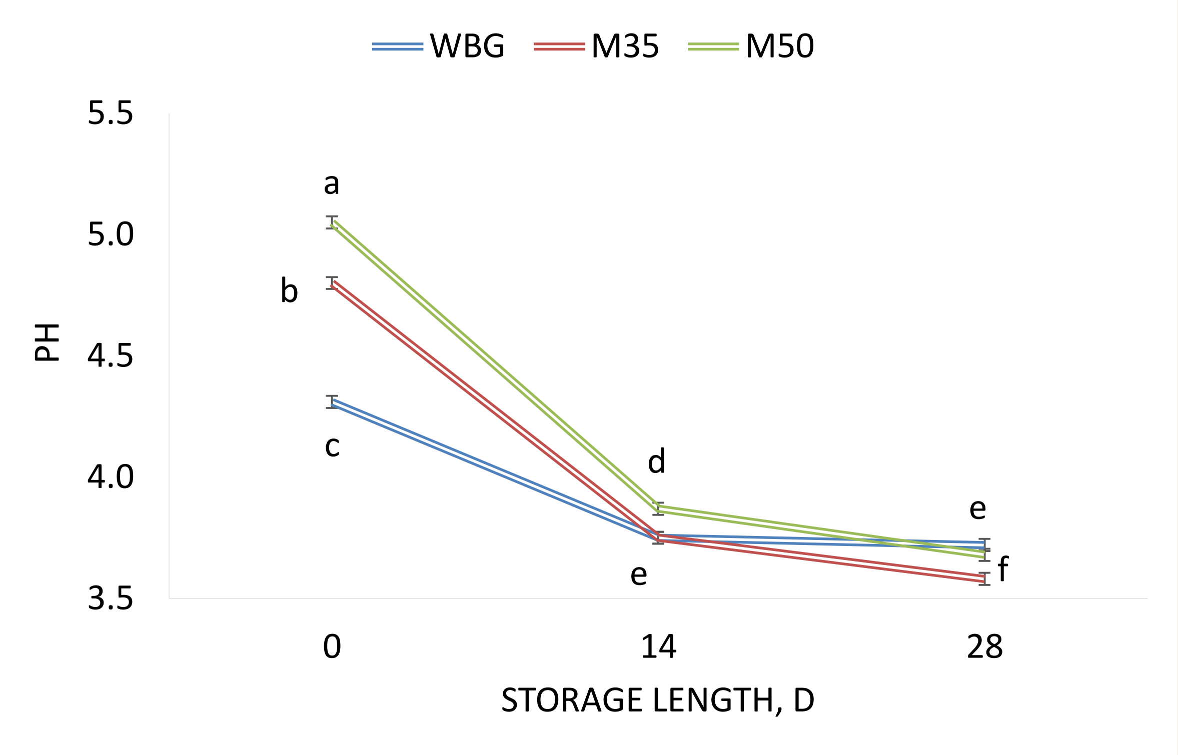
- Completely randomized designed on a 3 x 3 factorial arrangement of treatments
  - Proc Glimmix of SAS
  - Fixed effects of treatment, ensiling time and their interaction
- Loss of DM and aerobic stability
  - Completely randomized designed on a 3 x 2 factorial arrangement of treatments

Dry matter (% of as fed)



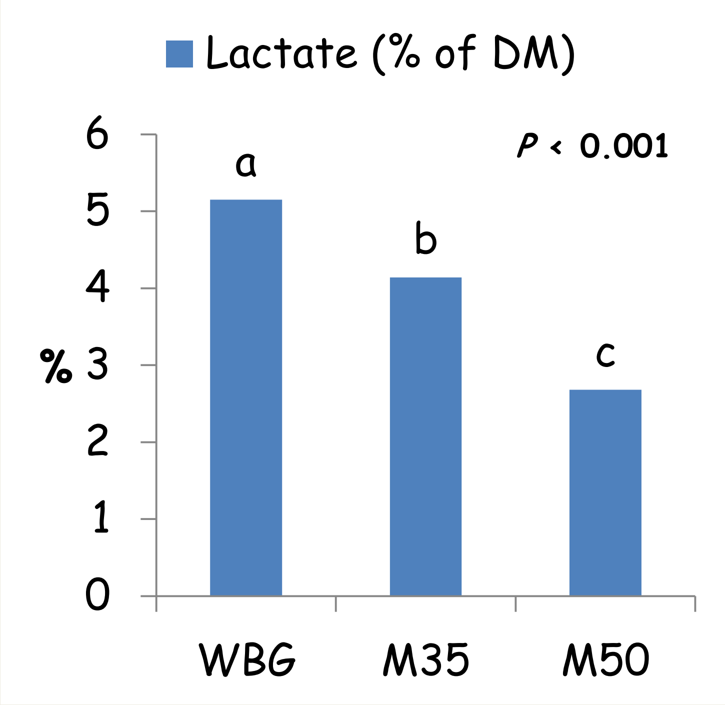
Treatment P **= 0.001; Time** P **= 0.0001; Interaction** P **= 0.001**

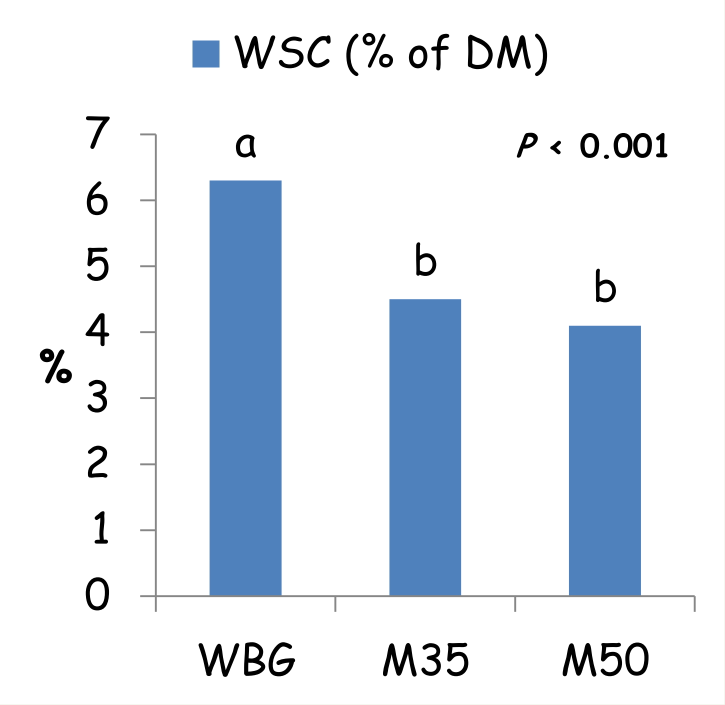
pH



Treatment *P* = 0.001; Time *P* = 0.0001; Interaction *P* = 0.01

Lactate and water-soluble carbohydrates





Mixture by ensiling time interaction *P* > 0.10 for these parameters

Fermentation and Aerobic Stability

Item	WBG	M35	M50	SEM	*P*-value
Acetate, % of DM	0.26[b]	0.65[a]	0.39[b]	0.08	0.001
DM loss, %	1.5[b]	10.2[a]	8.2[a]	1.2	0.001
Aerobic Stability, h	51.7	41.3	54.0	5.3	0.08

Interaction $P > 0.10$ for these parameters

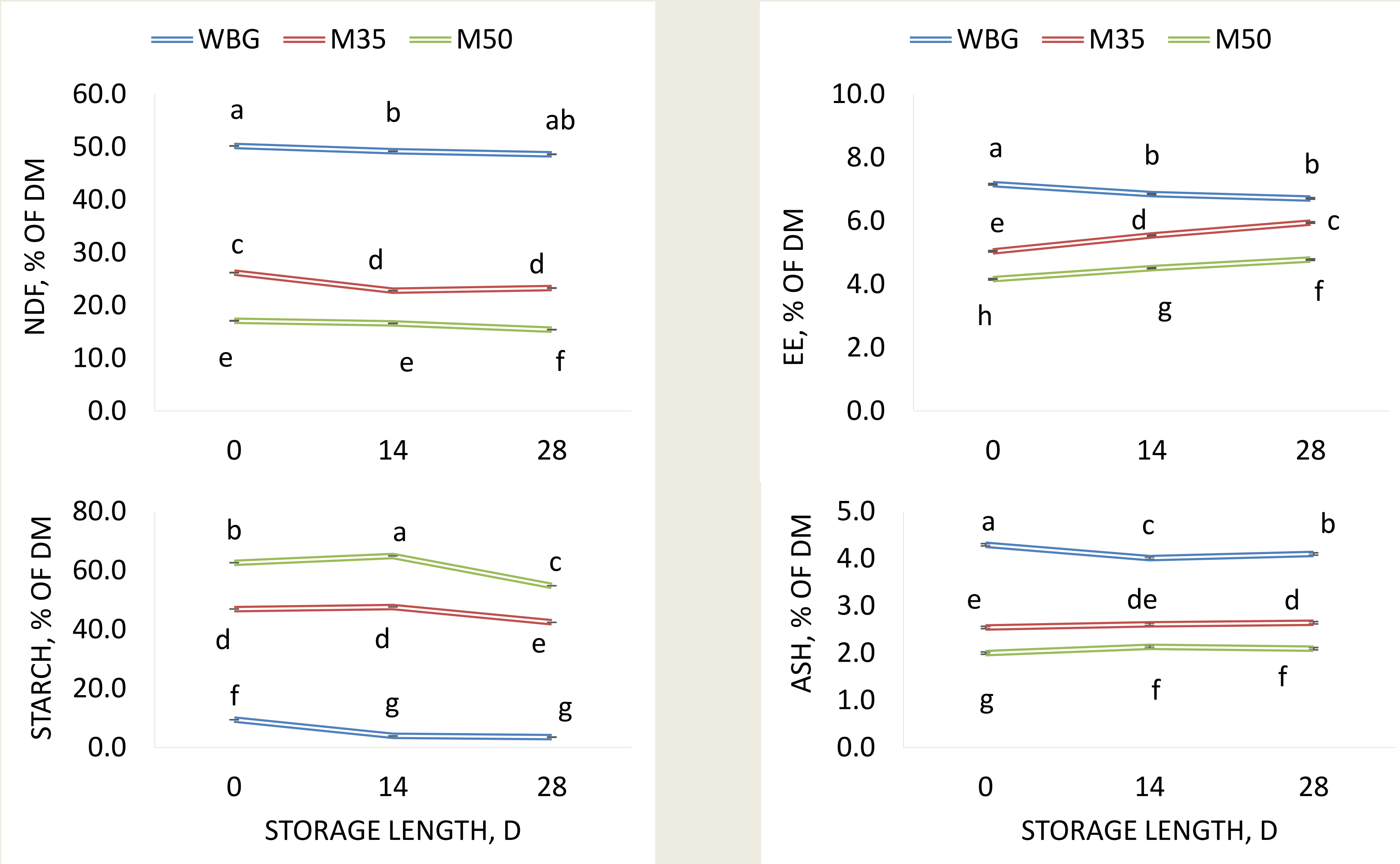
Fermentation and Aerobic Stability

Item	0 d	14 d	28 d	SEM	*P*-value
Lactate, % of DM	1.70[b]	4.90[a]	5.36[a]	0.51	0.001
Acetate, % of DM	0.22[b]	0.43[ab]	0.65[a]	0.08	0.01
WSC, % of DM	11.4[a]	2.0[b]	1.5[b]	0.5	0.001
DM loss, %	ND	2.7[b]	10.6[a]	1.2	0.001
Aerobic Stability, h	ND	44.2[b]	54.0[a]	5.3	0.05

ND- not determined

Interaction $P > 0.10$ for these parameters

Nutrient composition



Interaction *P* = 0.001 for all parameters

Conclusions

- Under the conditions of the present study, mixing WBG with DGC did not improve ensiling of WBG.
- However, adequate patterns of fermentation were achieved for all treatments.

Questions?

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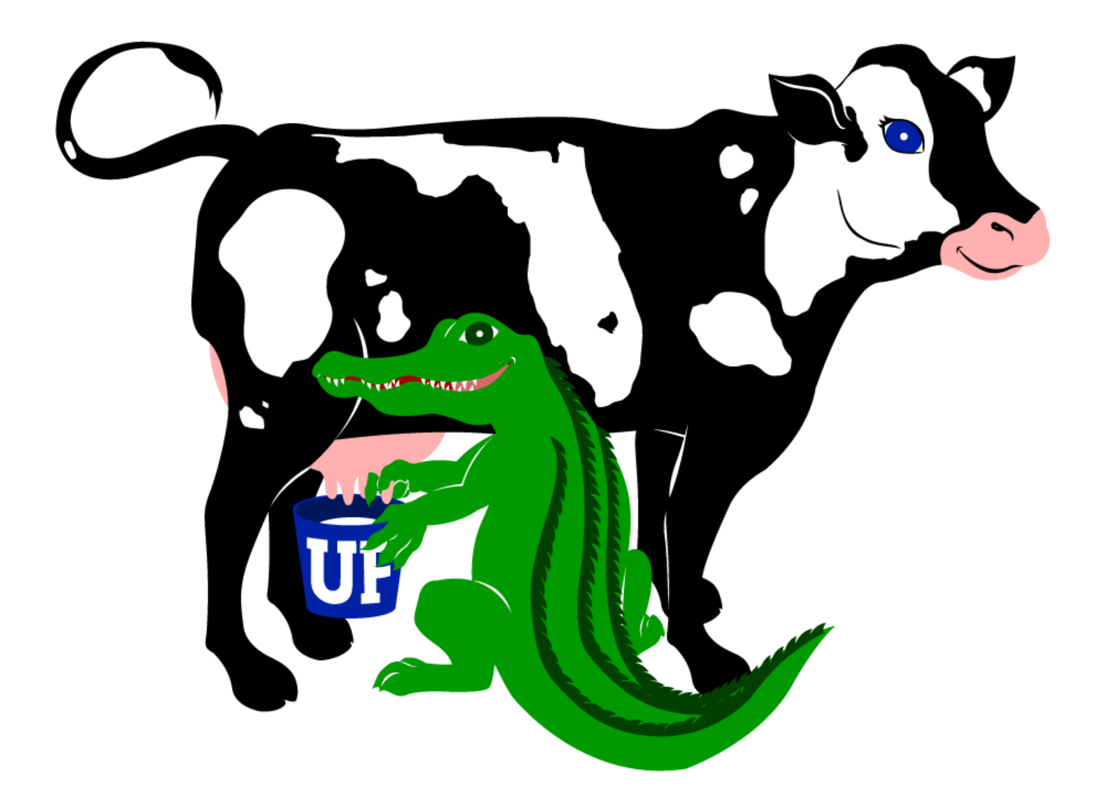

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