

Animal Responses to AM or PM Cuttings of Forages

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Introduction

- No doubt that plants accumulate soluble carbohydrates during daylight hours
 - Affected by day length
 - Affected by light intensity
- Immediately after cutting, PM-harvested plants should have more nonfiber carbohydrates and less fiber
 - Should be more digestible
 - May have higher intake potential
- However, conditions between cutting and feeding may deplete AM vs PM differences

Questions

- Is there evidence that animals can detect and respond to differences in AM vs PM cutting of forage?
 - May not be related to soluble carbohydrates
 - May be related to volatiles or other changes during harvesting
- Is there a difference between hay and silage that is cut in the AM or PM?

Lactating Cow Trial _ Utah (Kim et al., 1995)

Response	AM-cut	PM-cut
DM Intake (lb/d)	44.0	49.7
Milk Yield (lb/d)	75.6	83.4
Milk fat (%)	3.75	3.99
4% Fat-Corrected Milk (lb/d)	73.0	83.2
4%FCM/DMI	1.66	1.67
Starch (%)	6.9	4.7
Total nonstructural CHO (%)	12.9	10.5

Hay was 39.5% of ration dry matter

Tall Fescue Hay _ Idaho Preference Trials (Fisher et al., 1999)

Response	AM-cut	PM-cut
Goat intake (lb/30 min)	0.64	0.91
Sheep intake (lb/30 min)	0.63	0.79
Steer intake (lb/30 min)	1.68	2.38
Starch (%)	1.1	1.0
Total Nonstructural CHO (%)	8.0	9.6
NDF	50.8	48.7
IVDMTD	83.6	85.3

Alfalfa Hay _ Idaho

Preference Trials (Fisher et al., 2002)

Response	AM-cut	PM-cut
Goat intake (lb/30 min)	0.76	1.00
Sheep intake (lb/30 min)	0.85	1.00
Steer intake (lb/30 min)	1.67	2.18
Starch (%)	0.6	0.8
Total Nonstructural CHO (%)	4.4	5.4
NDF	41.1	39.6
IVDMTD	76.3	78.1

Preference ≠ Increased Intake

- Preference is a measure of palatability
 - Preference is the selection of one feed over another
- Palatability = “Pleasant to taste” or “Desirable to eat”
 - Indicated by preference
 - Indicated by rate of eating
- Palatability may not translate to increased intake when there is no choice

AM vs PM Alfalfa Silage - NY Thomas, 2000

- After cutting PM alfalfa had slightly higher starch and sugars than AM
- 7-8AM cut was ready to chop after 9 h
- 3-4PM cut was read to chop after 20 h
- No difference in sugar, starch, NDF or IVDMTD after ensiling

USDFRC Research

- Two trials have been completed, but results have not been analyzed
 - Comparison of alfalfa hay and silage when cut AM or PM
 - Comparison of AM vs PM cut alfalfa from WI or ID

Conclusion

- Ruminants can detect some palatability difference between AM and PM cut forages
 - It is unclear if this is related solely to soluble carbohydrate differences
- Although AM and PM forages may vary in composition after cutting, it is not clear that these differences are maintained after drying or fermentation