The Right Forages for Dairy Heifers

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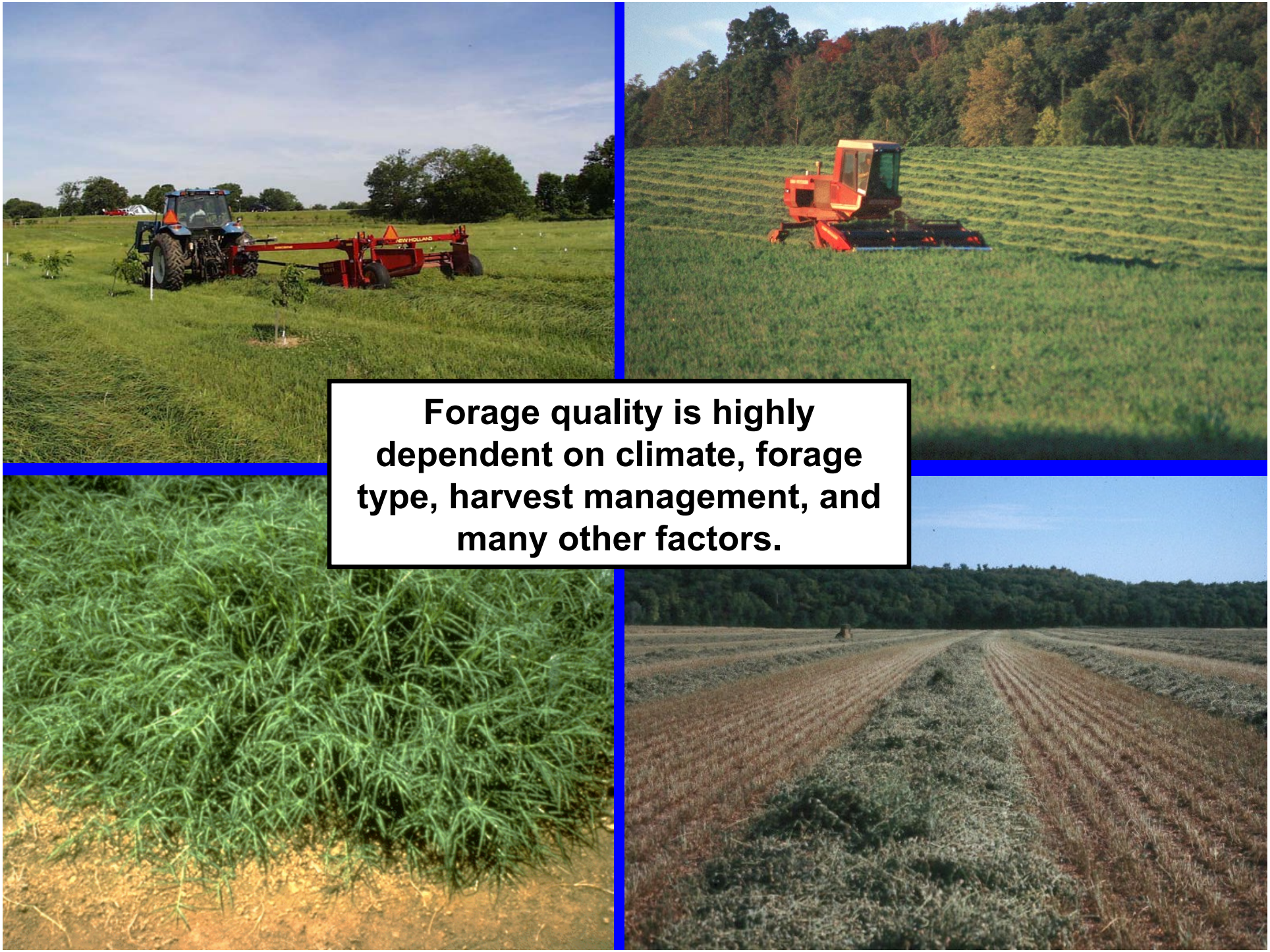
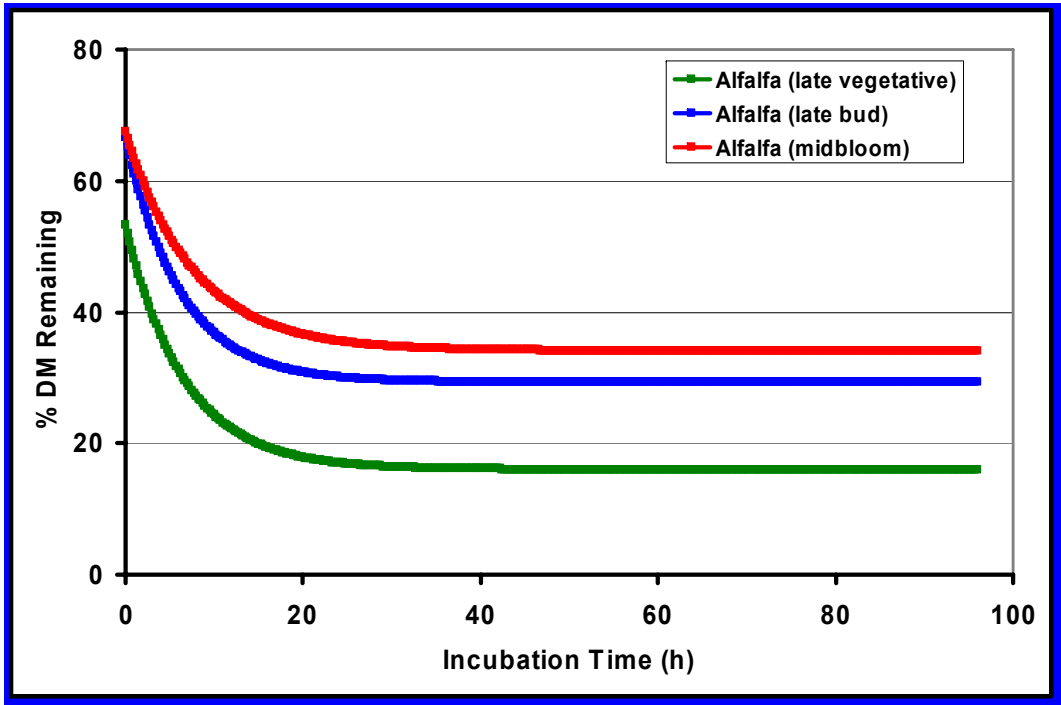
Some Thoughts About
Forage Quality



Forage quality is highly dependent on climate, forage type, harvest management, and many other factors.

Maturity

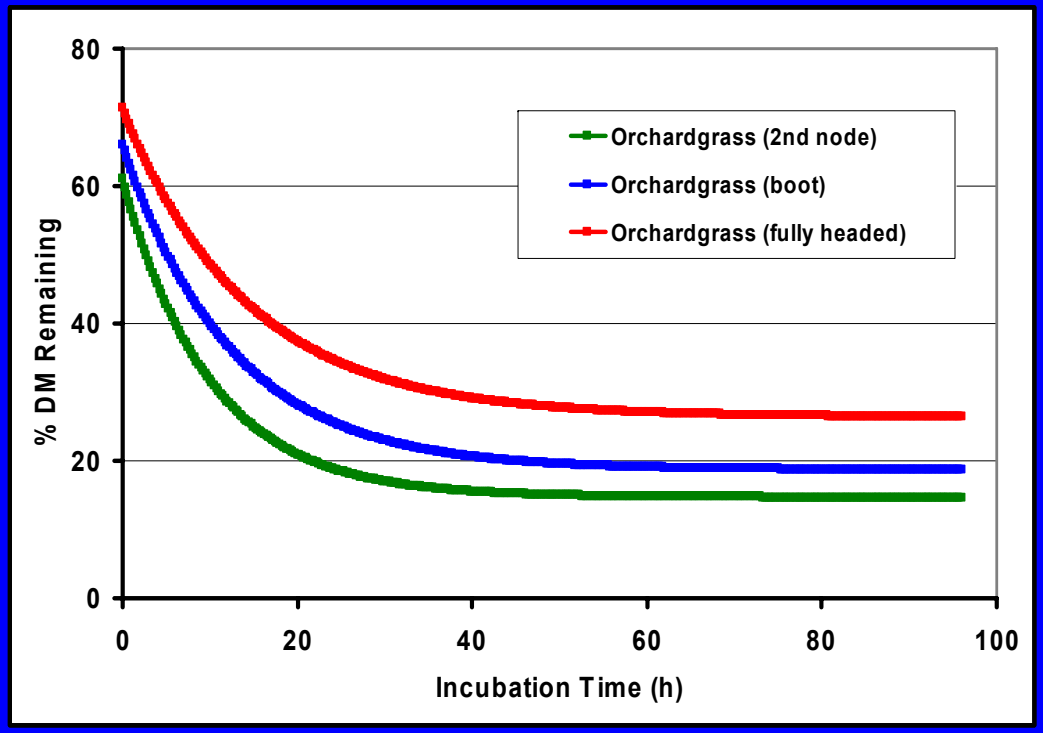
← Alfalfa



	Kd, /h	12-h Dig	24-h Dig	48-h Dig
Mid Bloom	.13	58.9	64.4	65.8
Bud	.16	65.2	69.9	70.7
Veg	.15	77.8	83.0	84.0

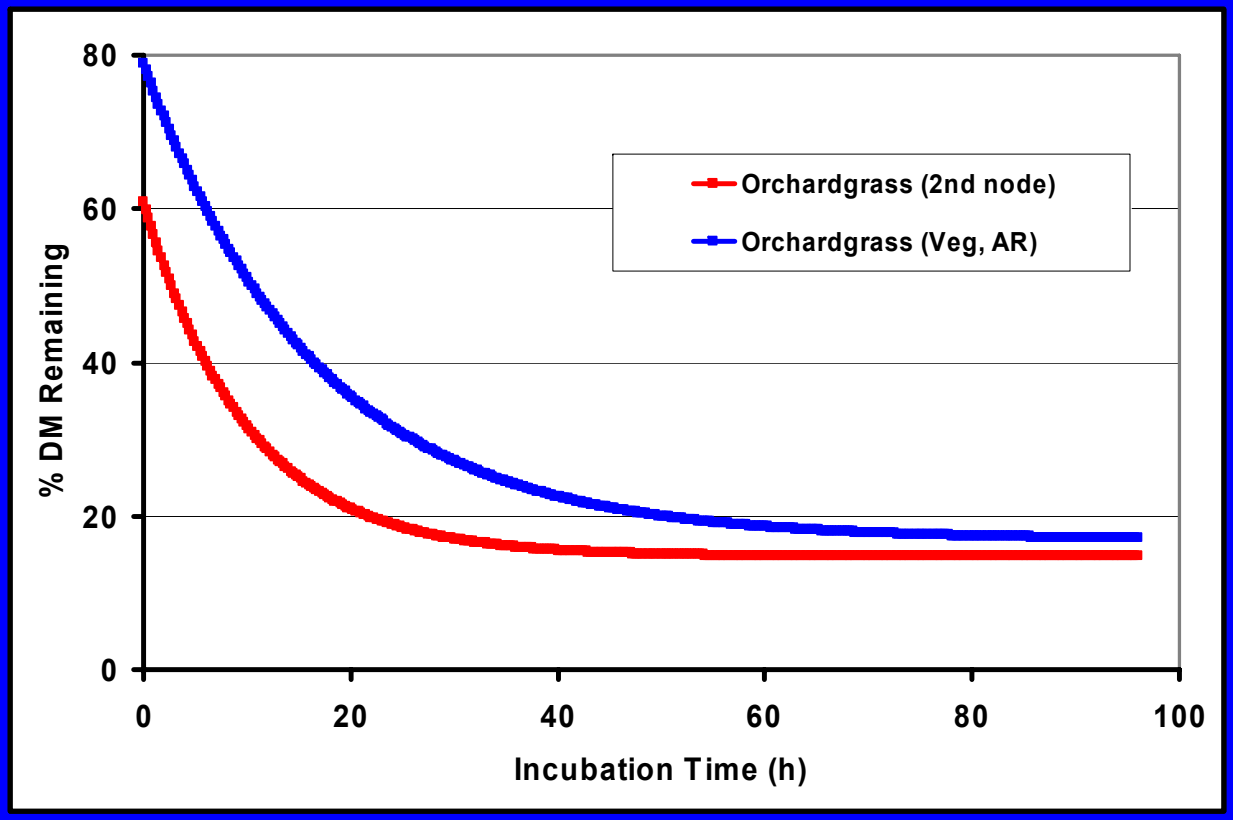
Orchardgrass →

	Kd, /h	12-h Dig	24-h Dig	48-h Dig
Full Head	.07	54.2	65.2	72.0
Boot	.08	63.2	74.4	80.3
2nd Node	.10	71.4	81.1	84.9



Sources: Hoffman et al., 1993

Temperature

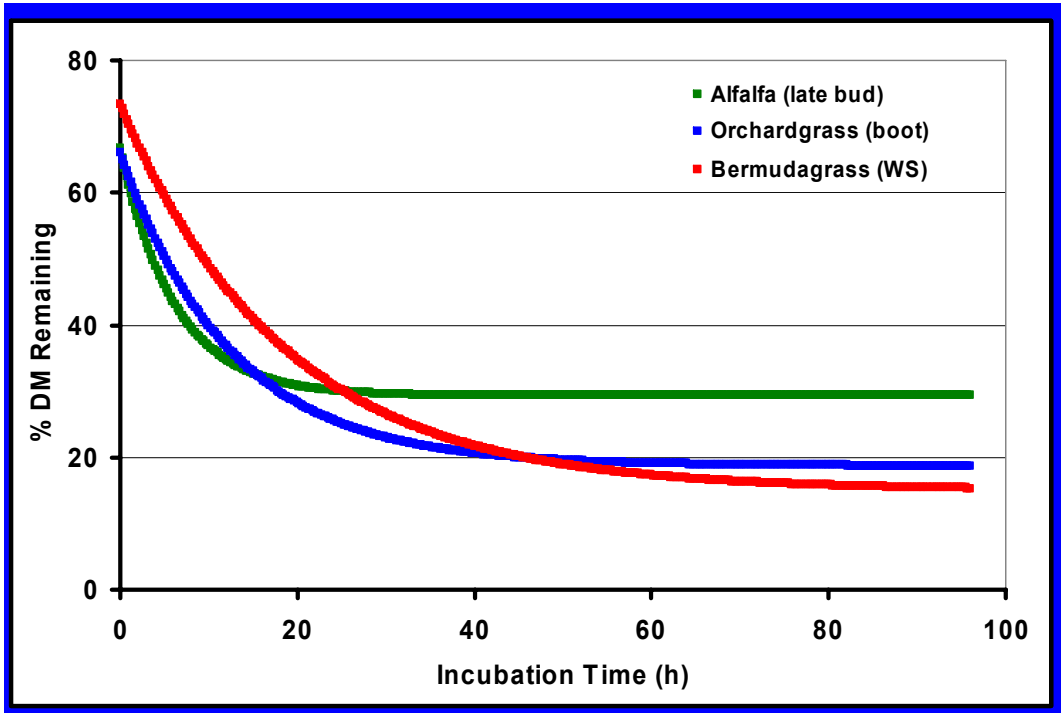


	Kd, /h	12-h Dig	24-h Dig	48-h Dig
2nd node (WI)	.08	71.4	81.1	84.9
Veg Regrowth (AR)	.06	52.9	68.4	79.6

Sources: Hoffman et al., 1993; Ogden et al. (2005)

Forage Type

← High Quality

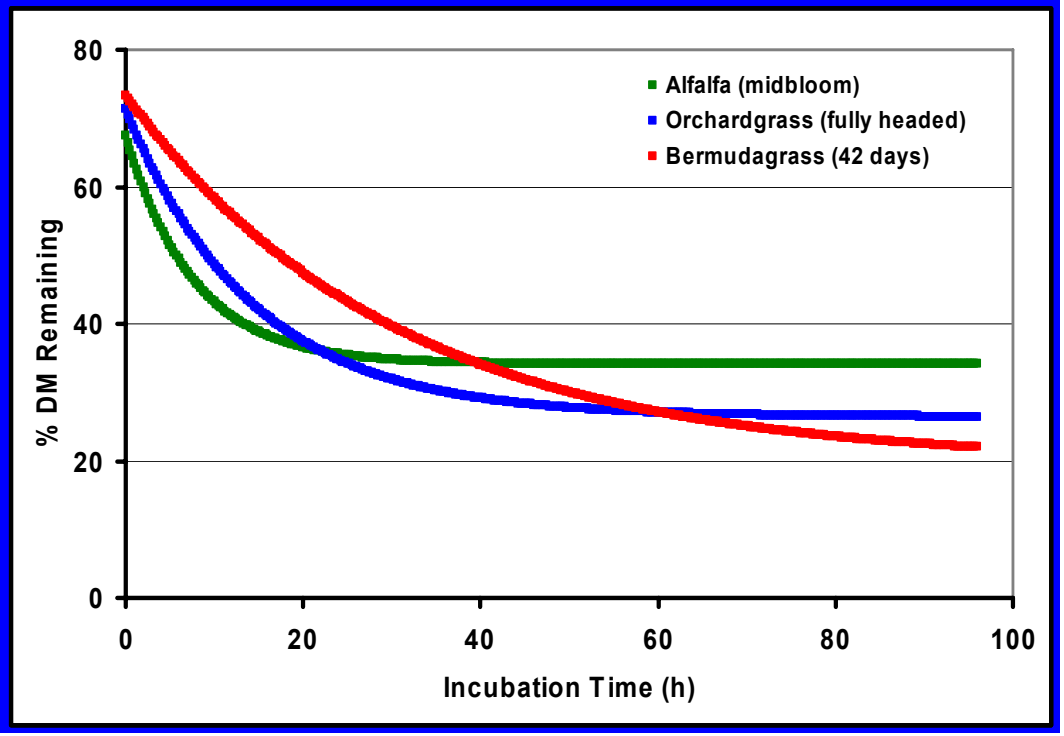


	Kd, /h	12-h Dig	24-h Dig	48-h Dig
Alfalfa	.16	65.2	69.9	70.7
OG	.08	63.2	74.4	80.3
BG	.05	54.5	69.0	80.6

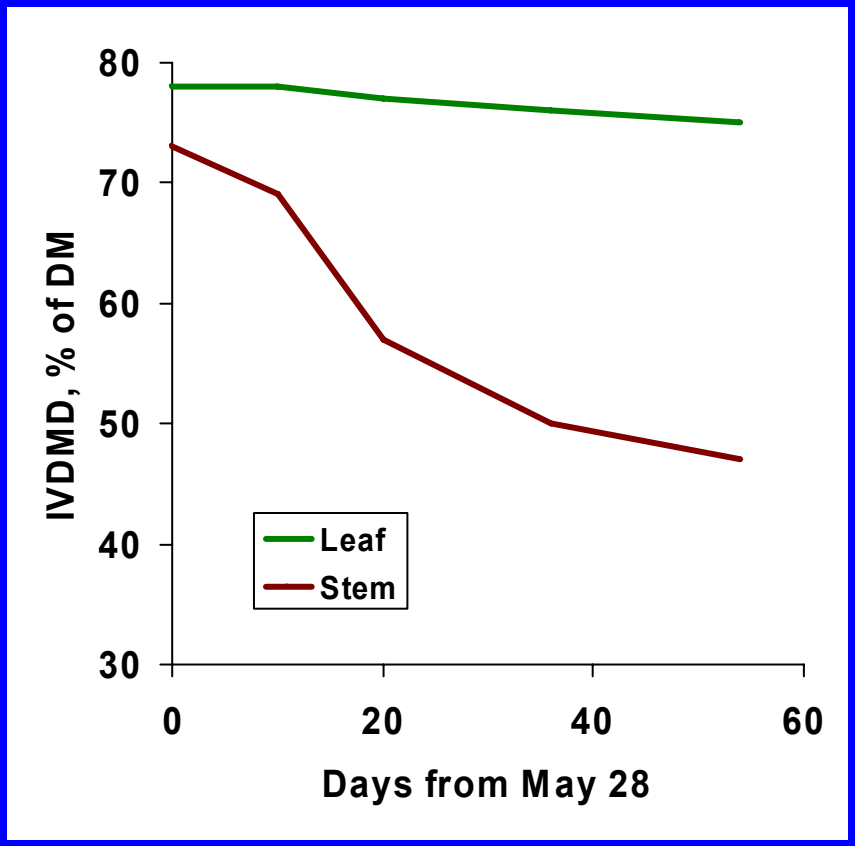
Moderate Quality →

	Kd, /h	12-h Dig	24-h Dig	48-h Dig
Alfalfa	.13	58.9	64.4	65.8
OG	.07	54.2	65.2	72.0
BG	.03	44.2	56.0	69.3

Sources: Hoffman et al., 1993; Galdamez-Cabrera et al., 2003; Ogden et al., 2003.

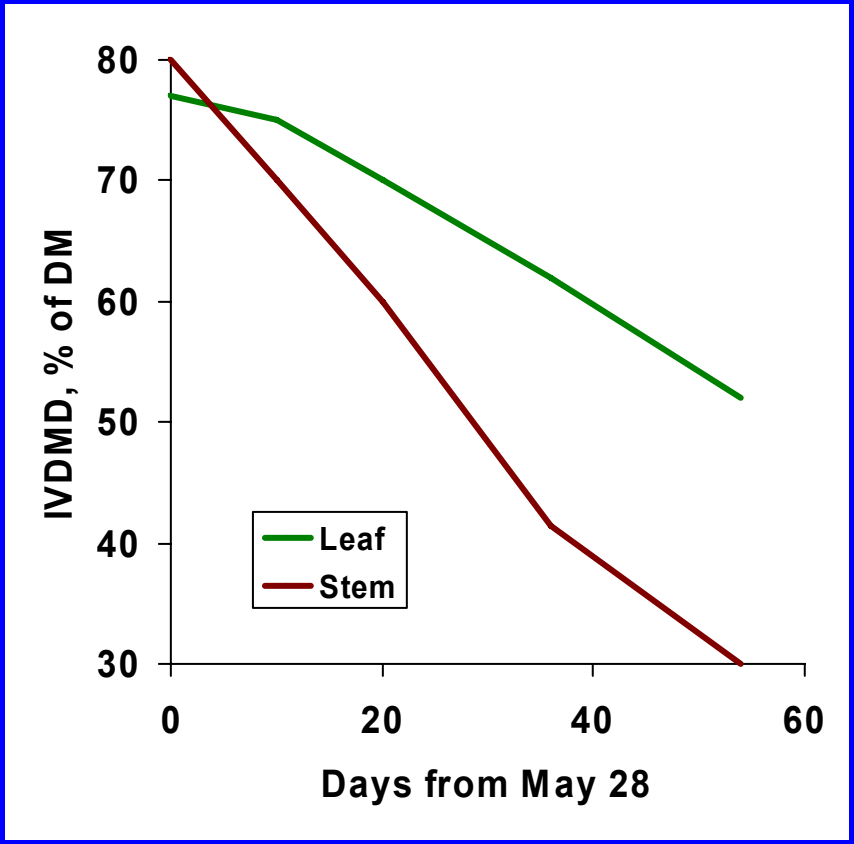


IVDMD vs. Maturity (Alfalfa)

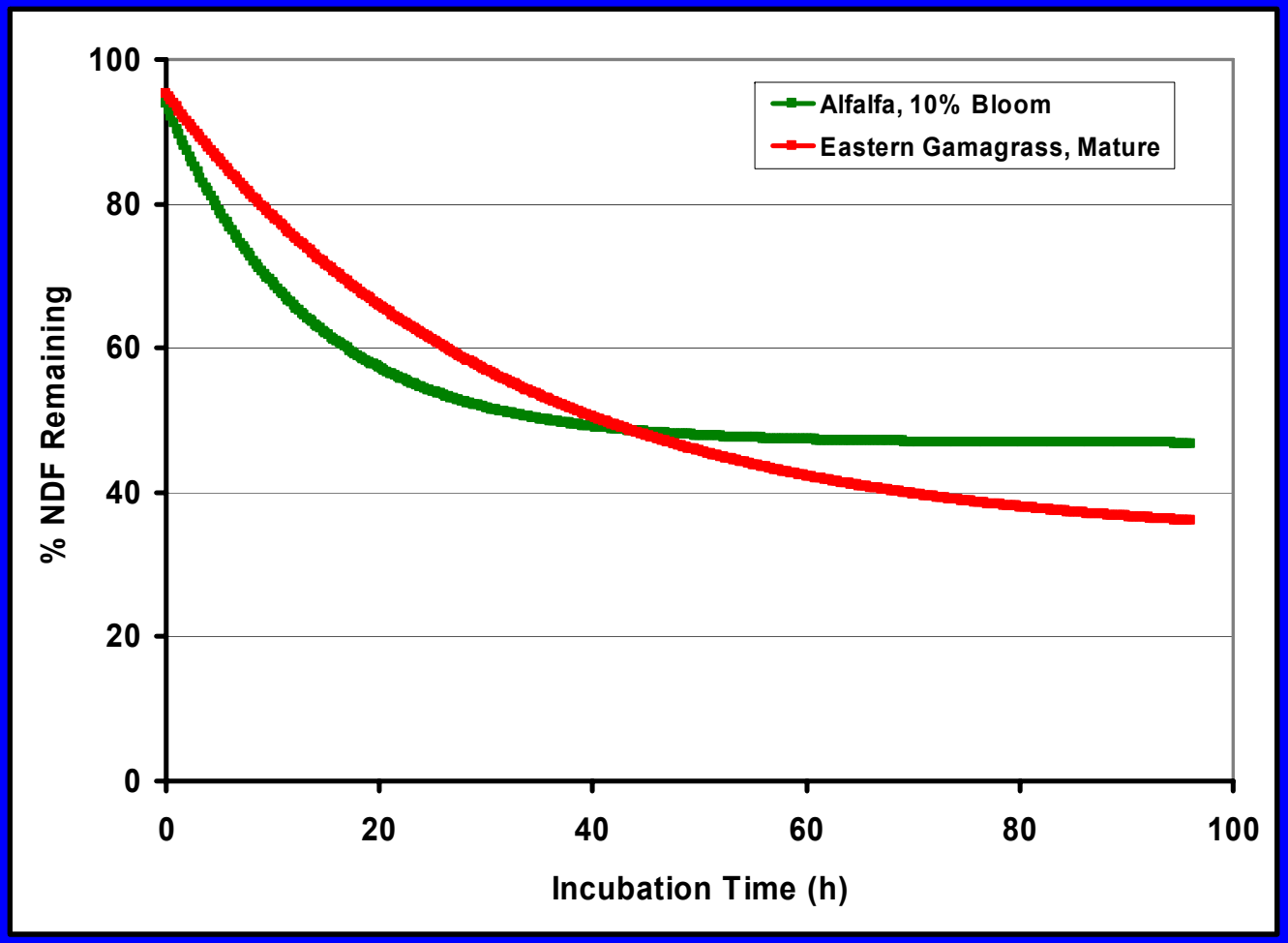


Adapted from Van Soest, 1982

IVDMD vs. Maturity (Van Soest, 1982)

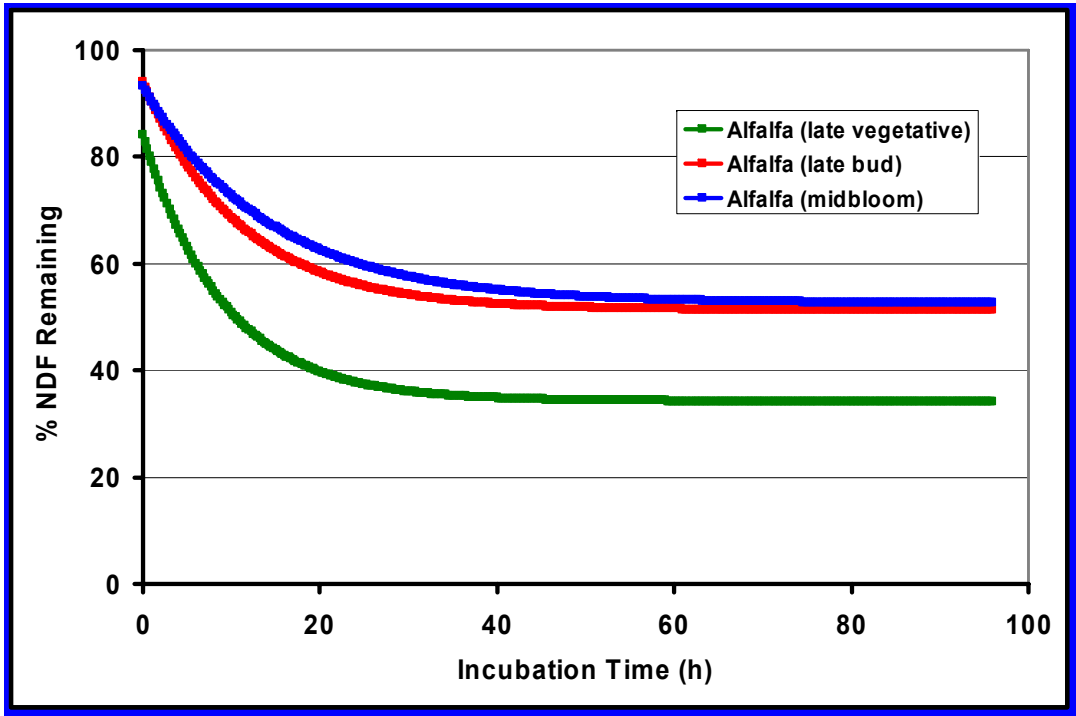


Adapted from Van Soest, 1982



	NDF, %	Kd, /h	NDFD*, %
Alfalfa	40.9	.08	32.3
Eastern gamagrass	78.0	.03	26.3

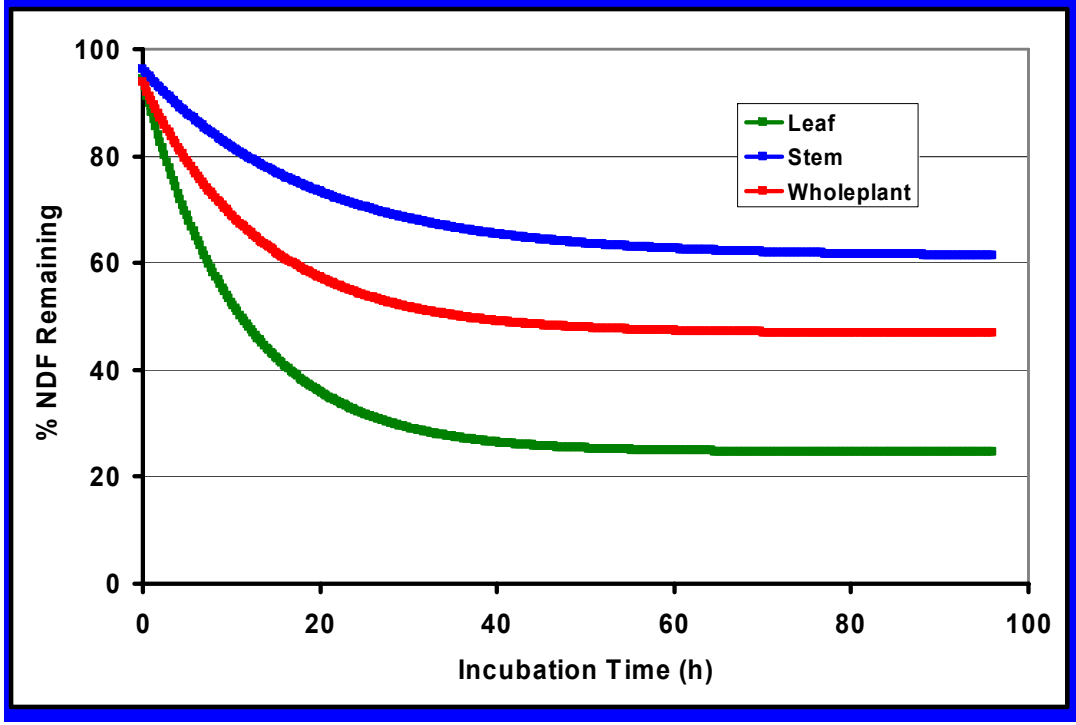
* Effective degradability of NDF calculated on the basis of a 6%/h passage rate.



Alfalfa - Maturity (NDF)

	NDF, %	Kd, /h	NDFD*, %
Midbloom	47.3	.07	28.6
Bud	42.6	.09	32.0
Veg	31.0	.11	47.9

Source: Hoffman et al. (1993)



Alfalfa - Plant Part (NDF)

	NDF, %	Kd, /h	NDFD*, %
Stem	59.4	.05	20.2
Whole-plant	40.9	.08	32.3
Leaf	25.4	.09	47.7

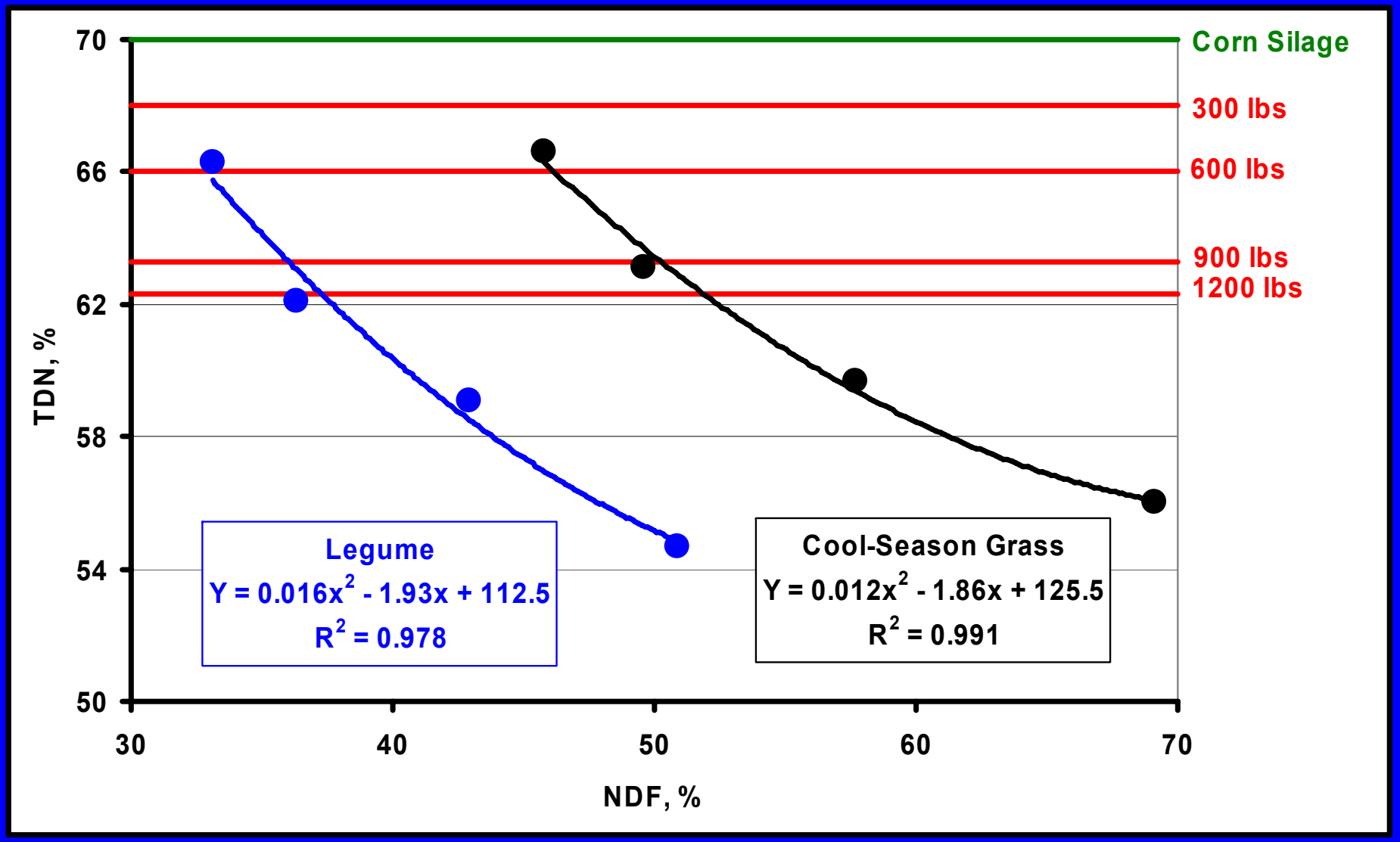
Source: Coblentz et al. (1998)

*Passage rate = 6%/h

A discussion of appropriate forage quality *(the right forage)* is highly dependent on what you intend to feed.

Assuming this is a 1200-lb (pregnant, nonlactating) beef cow wandering aimlessly in the Ozarks, the required energy density of her diet should be about 47.1% TDN.

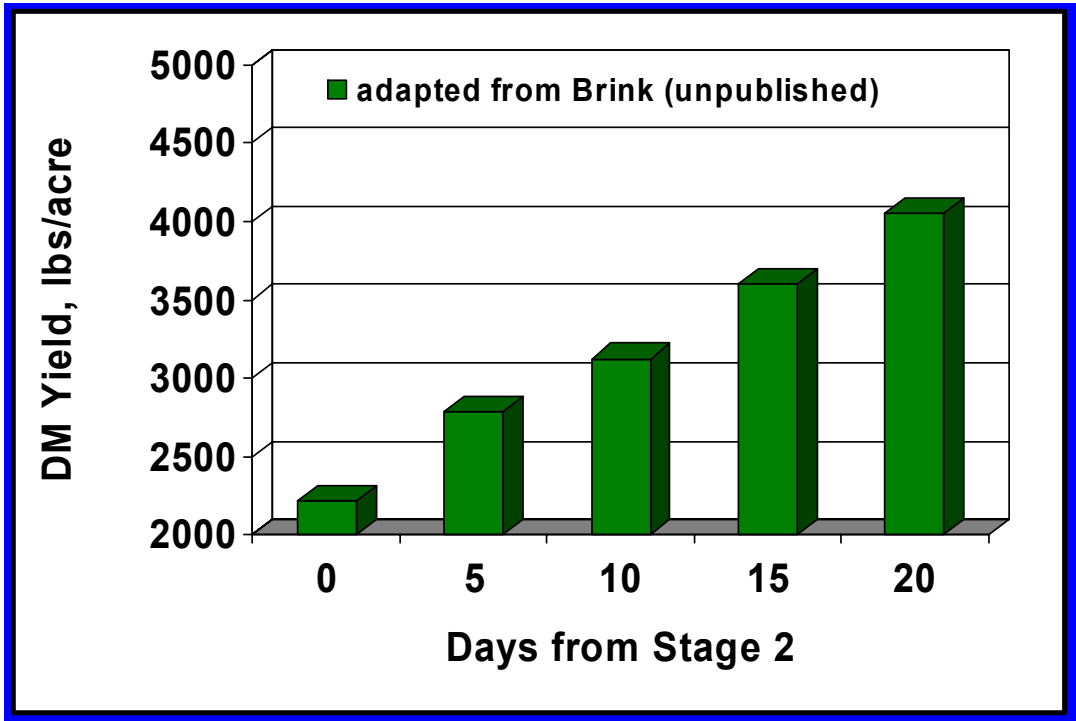
Relationship between TDN and NDF (NRC, 2001)



Within this context ……,

maturing forages are not necessarily a problem, and in many cases actually may be desirable.

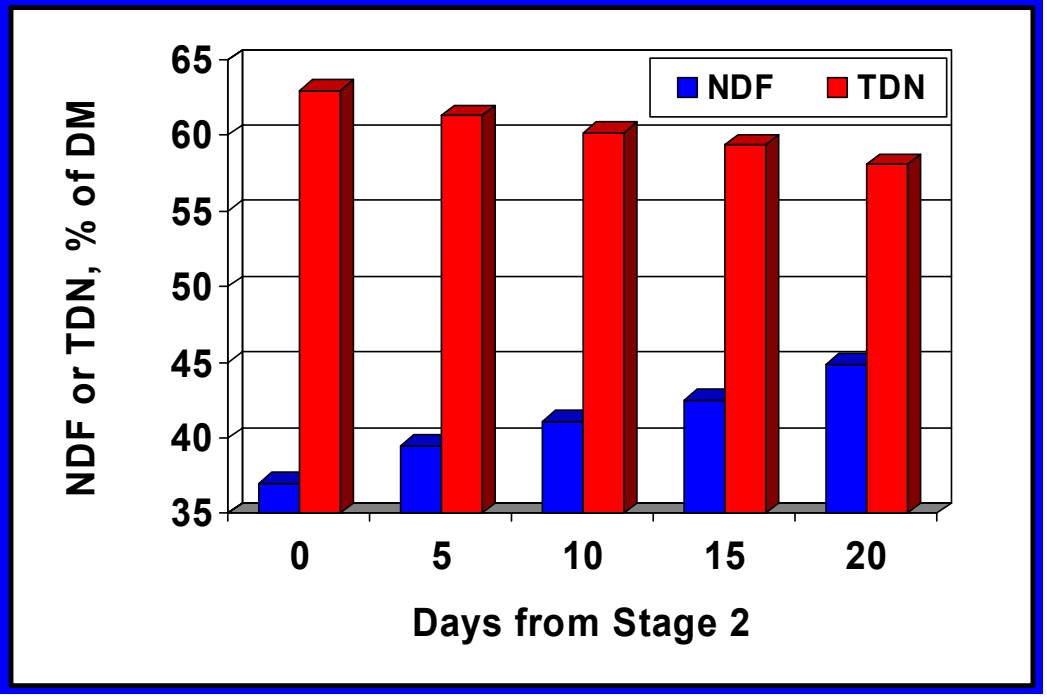
The "right forage" may not be the one with the best or highest quality.



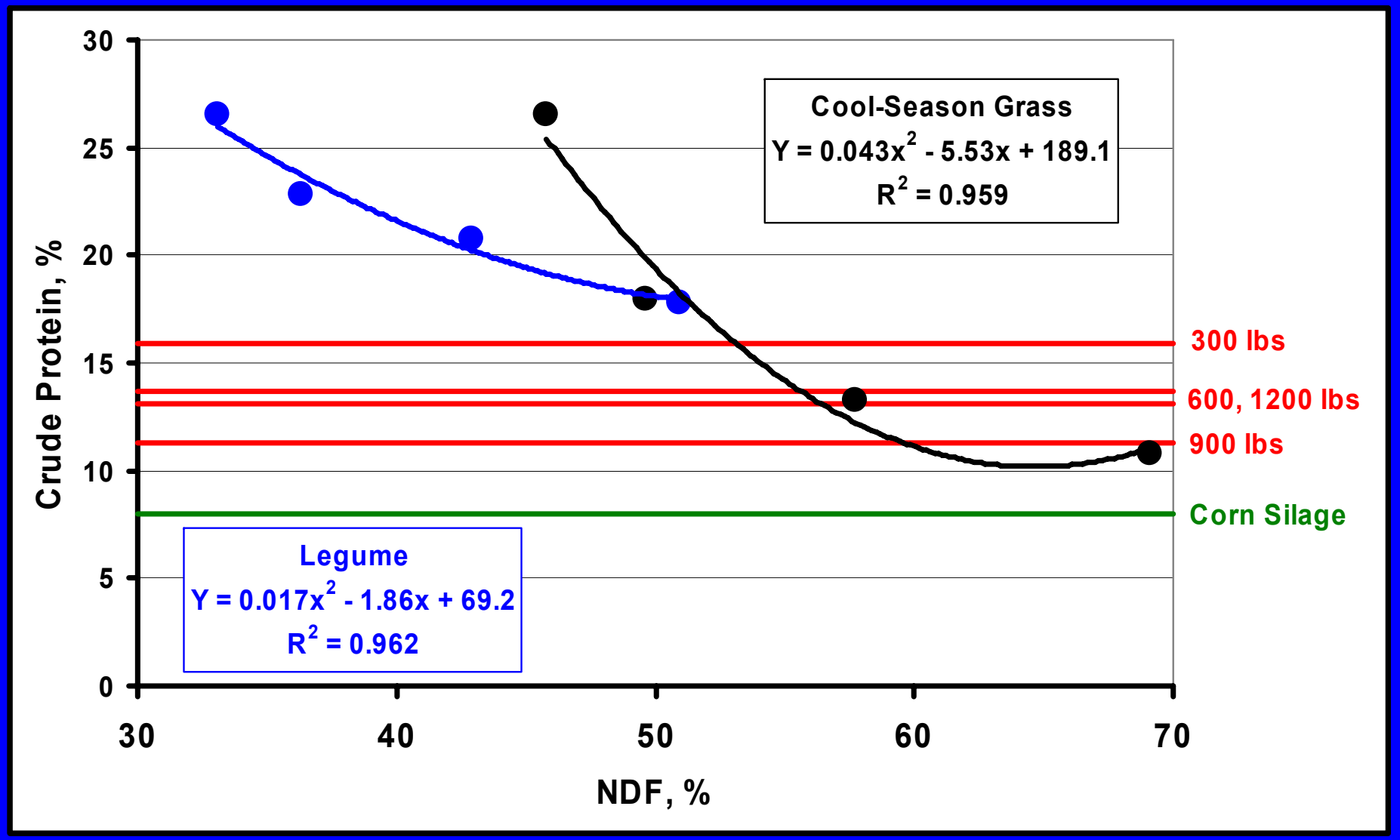
Effects of Maturity on Alfalfa Yield and NDF

- mean of eight harvests of 'Affinity' alfalfa over two years (2004-2005)
- increase of 92 lbs DM/acre/d following Stage 2
- results in improved harvest efficiency and (possibly) fewer harvests.

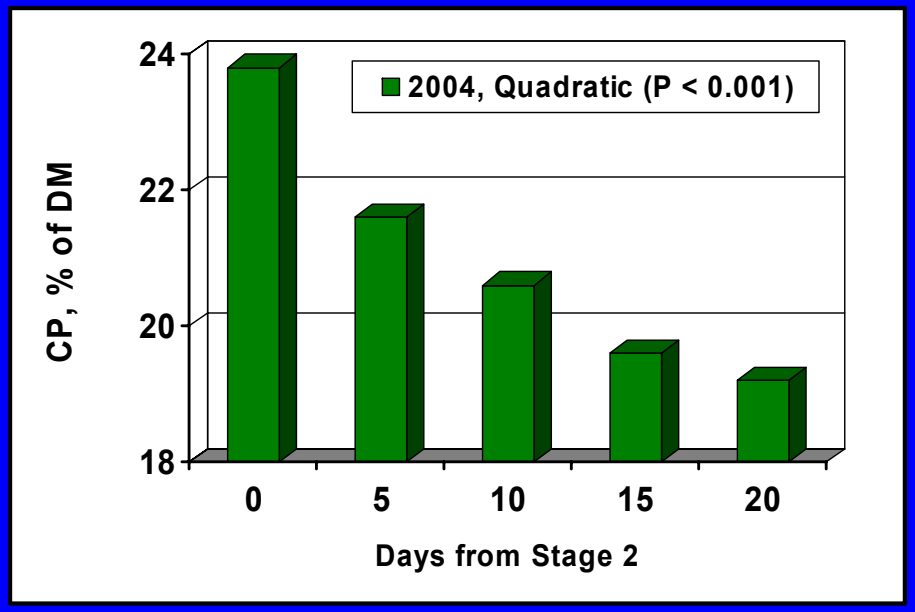
- linear increase of NDF (0.4 percentage units/day), plus an associated reduction of TDN (0.25 percentage units/d) following Stage 2

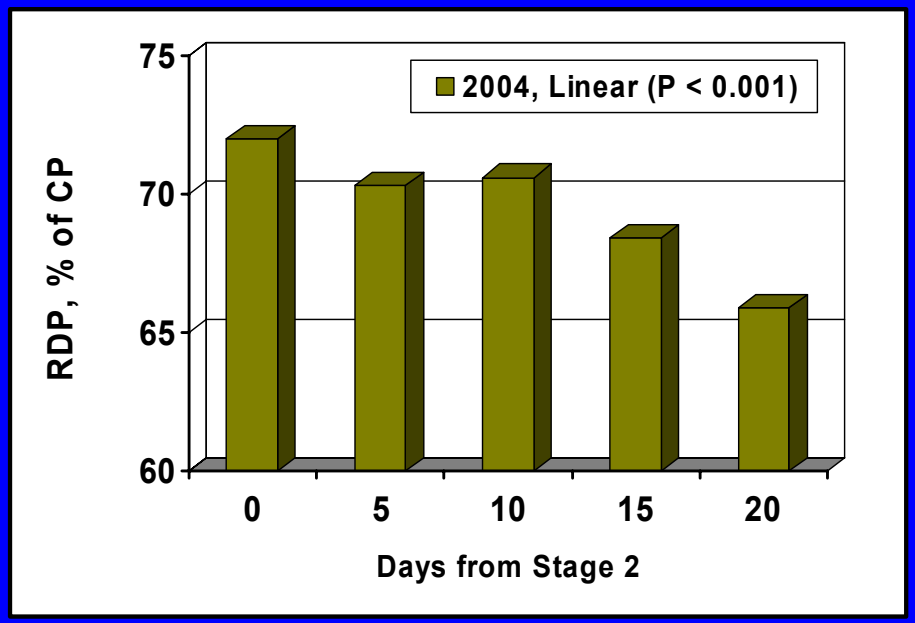


Relationship between CP and NDF (NRC, 2001)



Effects of Alfalfa Harvest Timing on Estimates of RDP by *SGP* Method (Coblentz et al., 2008)





Increased maturity also results in lower CP and rumen degradable protein (RDP), both of which are desirable generally for dairy heifers.

A Practical Application

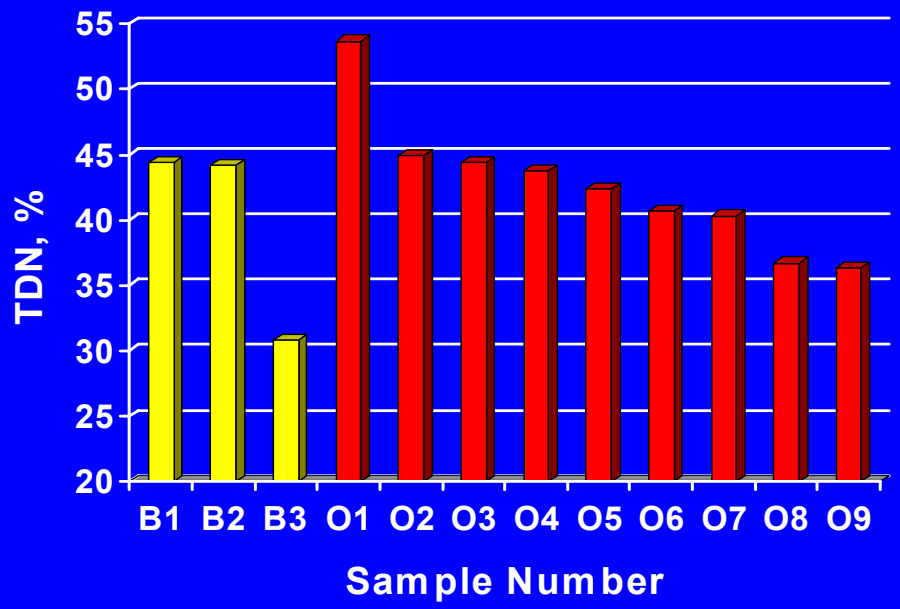
Many commercial dairy heifer growers would like to maximize the use of corn silage and by-products of the ethanol industry in the diets of replacement heifers.

- **This has created the need for 'cutter' forages that (ideally) exhibit:**
  - **high DM yield**
  - **high fiber (~ 70% NDF)**
  - **low energy (45 – 50% TDN)**
  - **high protein (~ 15% CP)**
  - **low K (~ 1.5%)**

		---------- % of Dietary DM ----------		
Bodyweight, lbs	Energy Requirement, TDN	Corn Silage (72% TDN)	Alfalfa Silage (60% TDN)	Cutter Forage (48% TDN)
300	68.0	50	50	Grain
600	66.0	50	50	0
900	63.3	43	43	15
1200	62.3	39	39	22

Source: P. C. Hoffman, University of Wisconsin

Energy Density of Oat and Barley Straws



Synchrony of Forage and Livestock Needs

1) delayed harvest schedules
2) comparisons of straws
3) tropical corn
4) perennial warm-season grasses

Source: P.C. Hoffman, University of Wisconsin

tropical corn

eastern gamagrass

All of these forages might be the "right forage", it just depends.

Final Thoughts

- Alfalfa and corn silage tend to complement each other in heifer diets, and often do not allow for incorporation of other low-cost nutrients, especially those with relatively high energy densities.
- Use of significant proportions of corn silage may necessitate limit feeding or the use of an ‘energy diluting’ forage.

Final Thoughts

- Producers might consider being proactive in their harvest management of legumes and grasses – “dairy quality” is not necessarily helpful.
- Avoid being “boxed in”, where you have only “dairy quality” or low-energy forages available.
- Routinely test forages and have ration balanced (energy, protein) based on appropriate heifer size/weight.

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