Hybrid Systems—How to Bring in Pasture into your High Production System

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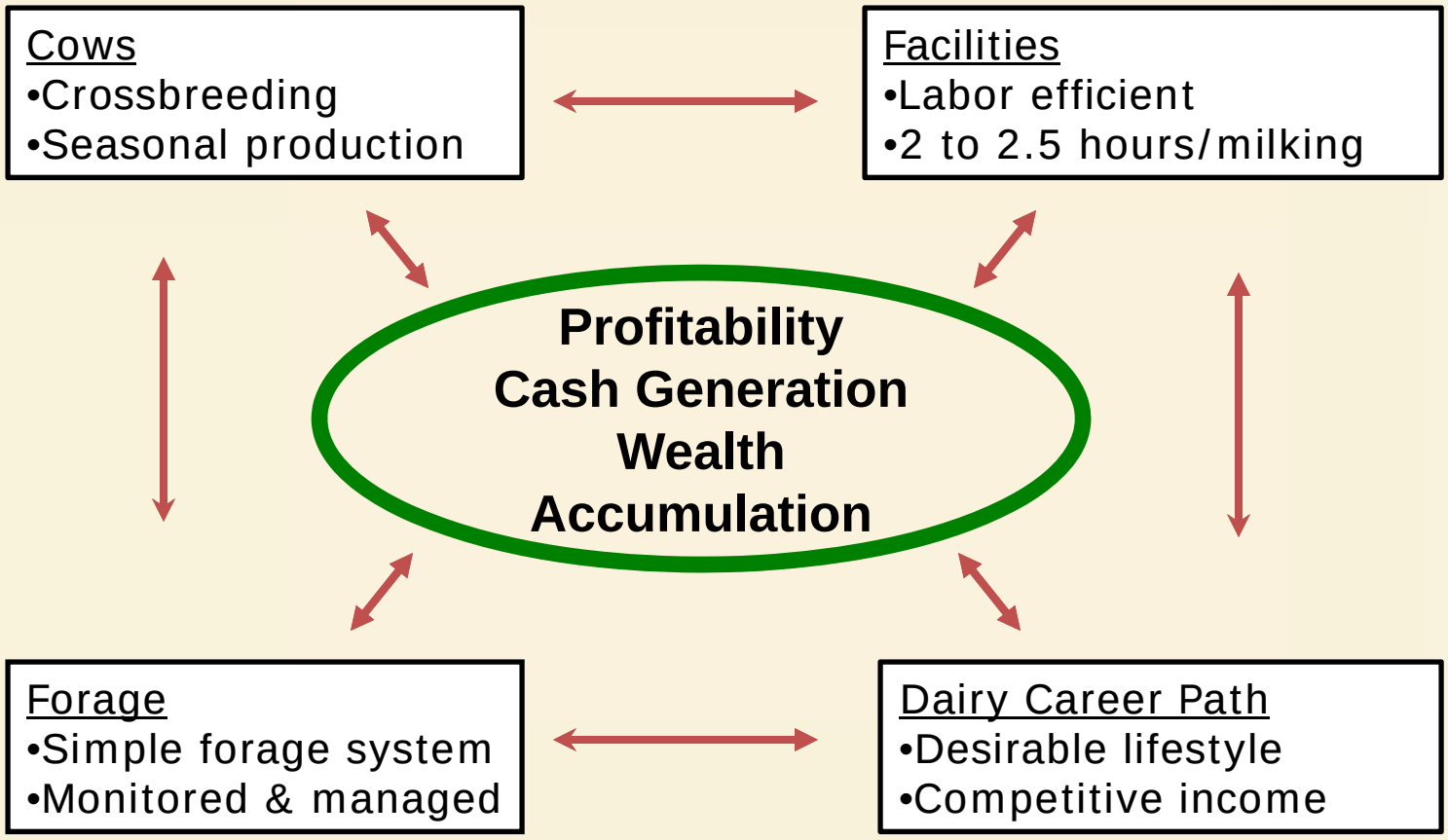
Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius -- and a lot of courage -- to move in the opposite direction.

Albert Einstein

We can't solve problems by using the same kind of thinking we used when we created them.

Albert Einstein



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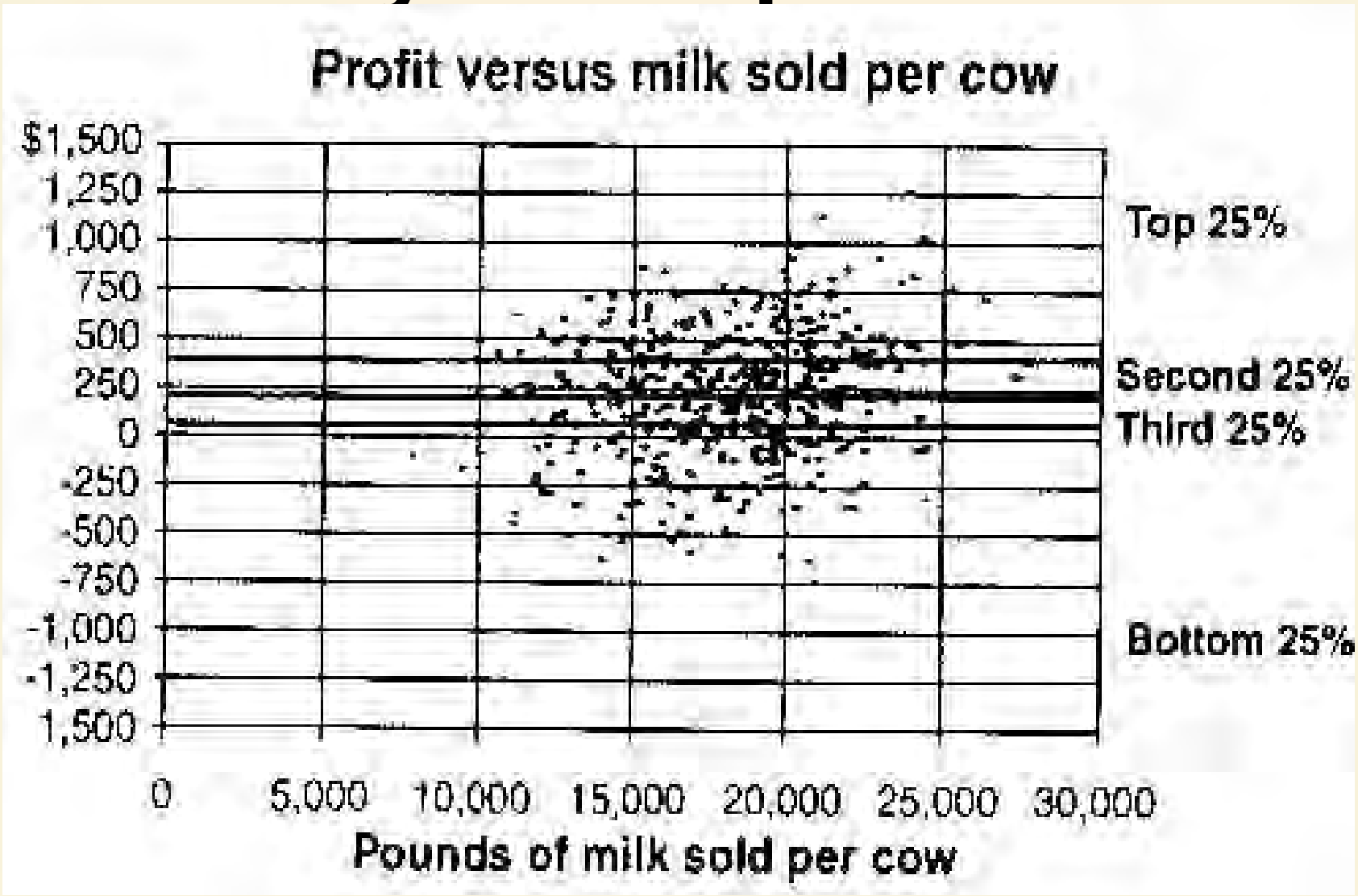
Milk yield vs profit in US



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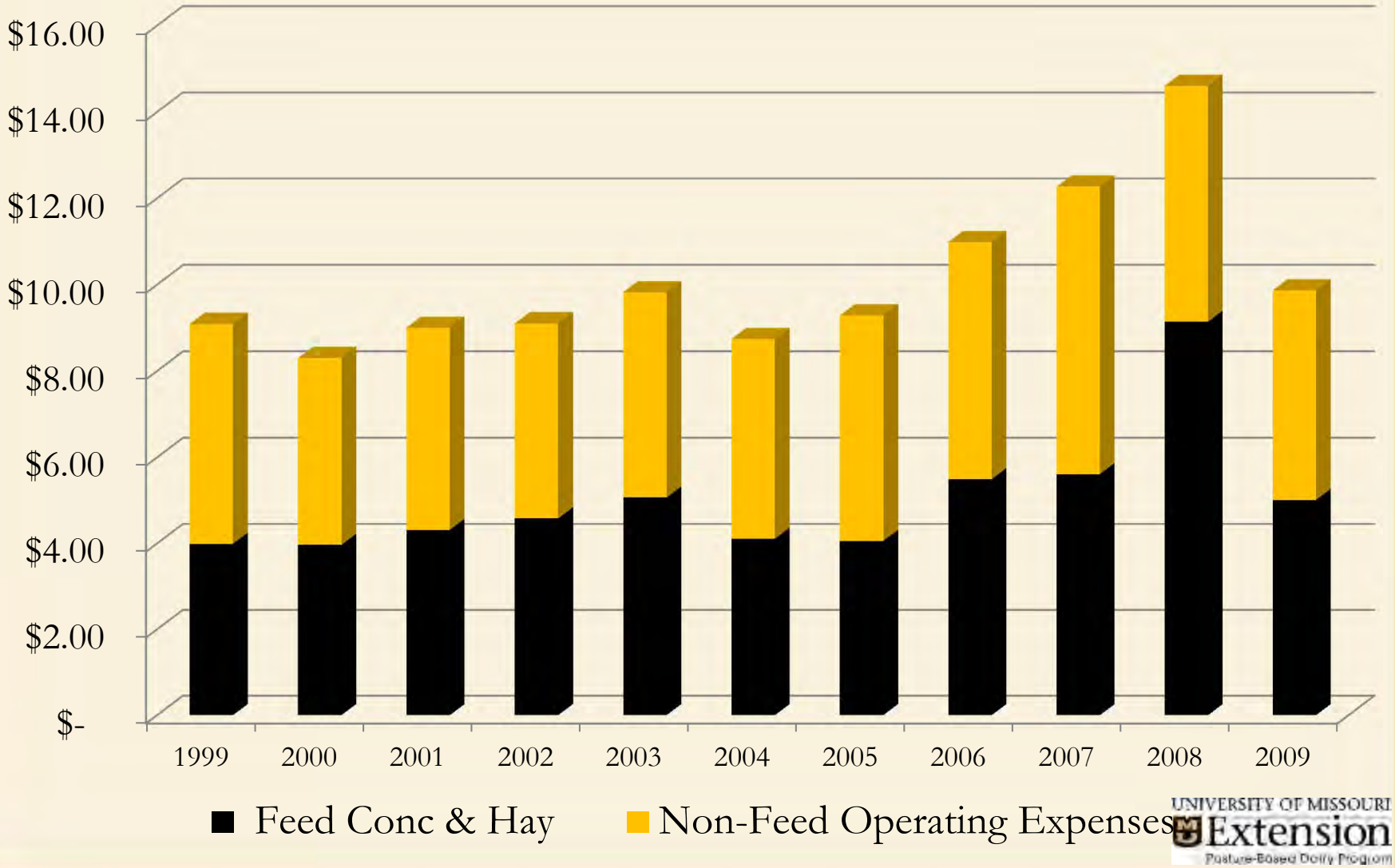
MU Southwest Center Dairy

Production costs excluding heifer raising ($/CWT)



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What is Grazing?
The Myths?

- Low milk production
- Environmentalist
- Thin Cows
- Fescue farmer
- Lazy
- No science

What is Grazing?
The Facts?

- Lower Milk Production?
- Stewards of the land?
- Thinner Cows
- Forage Farmer First
- Think Smarter (or try to)
- Science and Art (gut feel and experience)

2008 Summary Meier (Rhino) - Holsteins

Plate Meter Measurement Dates	Estimated Growth Rate[1]	Average Pasture Cover[2]	Rotation Length[3]	Pre Grazing Cover[2]	Post Grazing Cover[2]	Milk Production[4]	Lbs of Hay for Milking Herd[5]	Lbs of Grain for Milking Herd[5]	Lbs of Hay for dry cows[5]	Lbs of Grain for dry cows[5]
03/27/08	-	1114	-	1445	825	60	0	20	-	-
04/07/08	25	1358	-	1613	1135	61	0	18	-	-
04/14/08	51	1522	-	1894	1023	61	0	14	-	-
04/21/08	48	1720	-	2449	1247	63	0	12	-	-
04/27/08	181	2375	-	3311	1167	63	0	10	-	-
05/05/08	56	2243	-	3049	1550	63	0	10	-	-
05/12/08	73	2400	-	3921	1069	58	0	10	-	-
05/19/08	131	2363	-	3668	1357	58	0	10	-	-
05/26/08	81	2571	-	3956	1390	57	0	10	-	-
06/02/08	36	2399	-	2998	1539	56	0	10	-	-
06/09/08	41	2384	-	2998	1580	54	0	10	-	-
06/17/08	112	2233	-	4887	1306	52	0	10	-	-
06/23/08	62	2176	-	2800	1644	52	0	10	-	-
07/07/08	48	2570	-	3844	1841	50	-	10	-	-
07/21/08	54	2650	-	4027	2095	46	-	10	-	-
07/29/08	25	2368	-	2716	2011	45	-	10	-	-
08/11/08	21	2304	-	2857	1813	43	-	12	-	-
08/18/08	28	2337	-	2800	1504	46	-	12	-	-
08/25/08	48	2394	-	3223	1841	41	-	10	-	-
09/09/08	42	1914	-	2659	1136	41	-	10	-	-
09/15/08	55	1973	-	3092	1108	40	-	10	-	-
09/24/08	28	1808	-	2857	1390	40	-	10	-	-
09/29/08	40	1811	-	2432	1503	36	-	10	-	-
10/06/08	42	1792	-	2180	1109	36	-	12	-	-
10/13/08	28	1675	-	2264	1005	43	-	12	-	-
10/20/08	34	1683	-	2510	1193	39	0	12	-	-
10/27/08	20	1682	-	2208	1306	36	30	12	-	-
11/05/08	27	1637	-	1954	810	42	-	12	-	-

[1] Pounds of dry matter per acre per day.
[2] Pounds of dry matter per day.
[3] Days till cows return to given paddock.
[4] Pounds per day.
[5] Per cow per day.

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2009 Summary Meier (Rhino) – 75% H 25% XB

Plate Meter Measurement Dates	**Estimated Growth Rate** (lbs of DM per acre per day)	**Average Pasture Cover** (lbs of DM per day)	**Pre Grazing Cover** (lbs of DM per day)	**Post Grazing Cover** (lbs of DM per day)	**Milk Production** (lbs per day)	**Lbs of Grain for Milking Herd** (per cow per day)	**Lbs of Hay for Milking Herd** (per cow per day)
03/30/09	-	1671	2067	1290	73	12	-
04/13/09	14	1620	1926	1221	72	14	5
04/18/09	73	1799	2687	1200	71	10	-
04/27/09	65	2218	2998	1447	75	9	-
05/04/09	119	2359	3082	1531	70	9	-
05/11/09	85	2627	3346	1884	70	8	-
05/18/09	82	2491	3985	1616	69	8	-
05/29/09	66	2435	3200	1870	66	8	-
06/02/09	66	2372	2941	1500	60	8	-
06/08/09	69	2362	2969	1672	64	8	-
06/15/09	41	2070	2434	1559	64	8	-
06/21/09	232	2610	4295	1700	60	8	-
06/29/09	219	3906	6043	930	53	8	-
07/06/09	192	4041	6241	1334	51	8	-
07/13/09	166	2893	7000	1170	50	8	-
07/21/09	93	2124	4182	1520	51	8	-
07/27/09	82	2345	3634	1727	54	8	-
08/03/09	43	2352	2941	1510	53	8	-
08/11/09	69	2408	3872	1516	50	6	-
08/20/09	30	2055	2790	1236	47	6	-
09/01/09	38	2335	2772	2050	43	6	-
09/10/09	39	2275	2913	1418	43	6	-
09/21/09	30	2109	3505	1440	43	6	-
09/28/09	57	2028	2900	1550	41	6	-
10/07/09	50	1616	2330	1136	45	6	-
10/13/09	25	1564	2264	1247	40	6	-
10/26/09	15	1511	1898	995	36	6	-
11/03/09	24	1624	2079	1000	38	8	-
12/01/09	14	1086	1610	4	43	8	-

2010 Season Summary Meier (Rhino) – 50% H & 50% XB

Plate Meter Measurement Dates	Estimated Growth Rate[1]	Average Pasture Cover[2]	Rotation Length[3]	Pre Grazing Cover[2]	Post Grazing Cover[2]	Milk Production[4]	Lbs of Hay for Milking Herd[5]	Lbs of Grain for Milking Herd[5]	Lbs of Hay for dry cows[5]	Lbs of Grain for dry cows[5]
04/05/10	-	1511	-	2546	1030	63	-	14	-	-
04/12/10	49	1592	-	2095	967	65	-	12	-	-
04/17/10	75	1767	-	2264	1503	69	-	9	-	-
04/26/10	46	1854	-	2377	1165	68	-	8	-	-
05/05/10	95	2106	-	2687	1410	65	-	8	-	-
05/10/10	80	2187	-	3139	1610	67	-	8	-	-
05/18/10	46	2207	-	2887	1410	65	-	8	-	-
05/24/10	101	2232	-	2941	1410	61	0	8	-	-
06/01/10	62	2020	-	2344	1360	60	-	8	-	-
06/07/10	76	1721	-	2462	1210	57	-	8	-	-
06/14/10	78	1930	-	2546	1360	56	-	10	-	-
06/21/10	86	2292	-	3505	1475	60	-	8	-	-
06/29/10	161	2983	-	3605	1531	59	-	8	-	-
07/06/10	67	2775	-	3985	1644	56	-	8	-	-
07/12/10	126	2448	-	3139	1757	55	-	8	-	-
07/21/10	186	2872	-	4182	1362	50	-	8	-	-
07/28/10	76	2462	-	4323	1370	50	-	8	-	-
08/02/10	68	2227	-	3026	1501	47	-	8	-	-
08/09/10	113	2524	-	2928	1588	46	-	8	-	-
08/17/10	41	2412	-	2898	1544	46	-	8	-	-
08/24/10	18	1679	-	2828	1200	47	13	10	-	-
09/08/10	1	1276	-	1450	1165	45	20	12	-	-
09/15/10	49	1464	-	1801	1165	46	20	12	-	-
09/21/10	75	2054	-	2659	1610	45	20	12	-	-
09/28/10	68	1966	-	3408	1362	48	0	8	-	-
10/04/10	24	1825	-	3139	1082	45	-	8	-	-
10/11/10	35	1721	-	3110	1250	49	-	10	-	-
10/18/10	52	1930	-	2784	1559	44	25	10	-	-
10/25/10	50	2259	-	3195	1559	44	0	10	-	-
11/09/10	9	1731	-	2490	1130	48	-	8	-	-
11/24/10	0	1280	-	1447	1100	40	-	10	-	-

[1] Pounds of dry matter per acre per day.
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Grazing Wedge Website http://plantsci.missouri.edu/grazingwedge/

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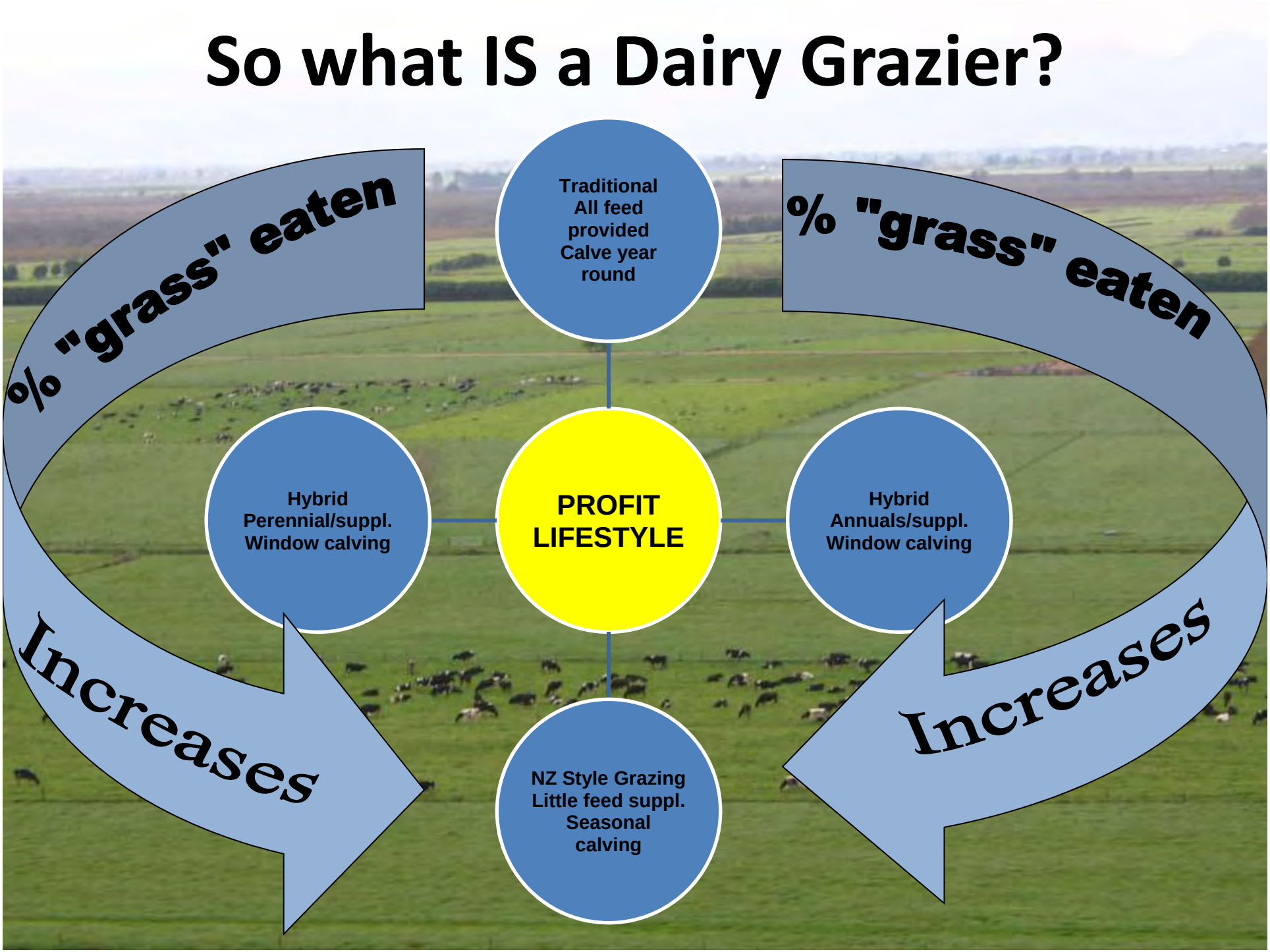
What is a hybrid system?

anything derived from heterogeneous sources, or composed of elements of different or incongruous kinds

Are grazing dairies totally grazing?

- **Missouri**
  - **240-290 days that some dry matter intake derived from pasture**
    - **Budget 3 lb hay or equivalent/day of grazing to cover inadequate pasture**
  - **Non grazing days, cows managed as "confinement"**

So what IS a Dairy Grazier?



There are no OBSTACLES only OPPORTUNITY

3 Keys to a Success

- **KEEP IT SIMPLE**
- **KEEP IT SIMPLE**
- **KEEP IT SIMPLE**
  - **DOESN'T MEAN EASY!!!**

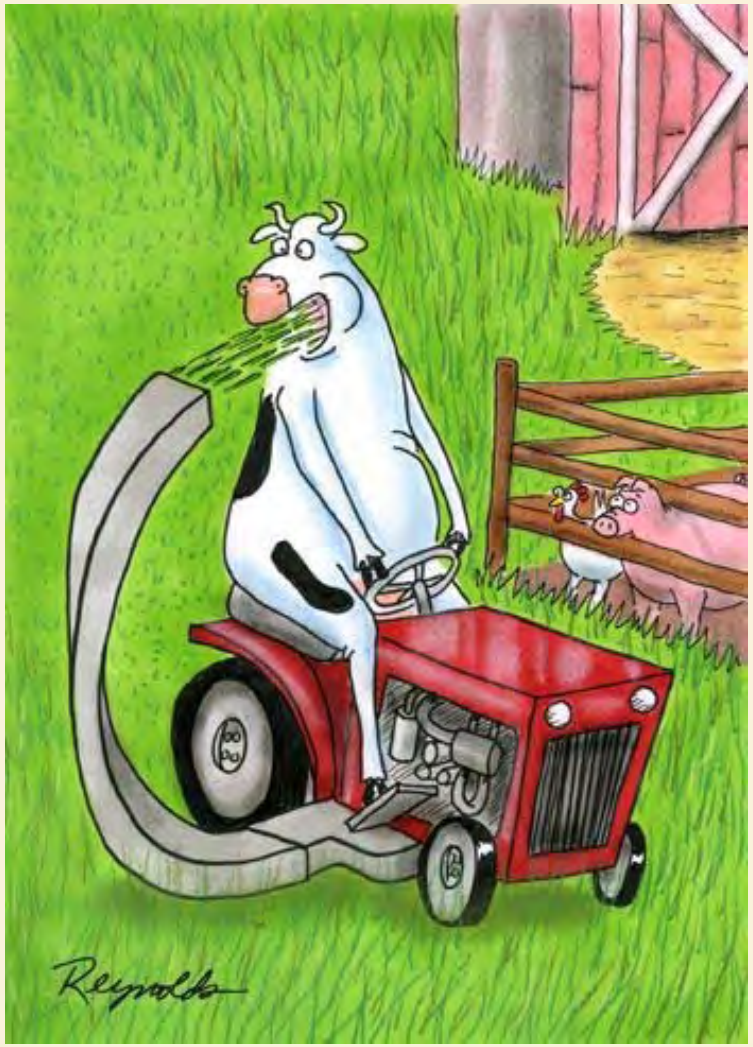
So, how do you plan on grazing?

So, how do you plan on grazing?

So, how do you plan on grazing?


Do you think you have the right cows?

The Missouri Grazing Cow



University of Wisconsin

- **4 groups of weaned calves**
  - **Group 1, pasture, pasture, pasture**
  - **Group 2, pasture, confinement, pasture**
  - **Group 3, confinement, pasture, pasture**
  - **Group 4, confinement, confinement, pasture**

Unpublished data

Do you think you have the right cows?

Milk production dropped as much as 10 pounds per day for lactating cows newly introduced to a pasture, mostly because the newcomers didn't eat as much when they first arrived, he reports. But they adapted quickly. By the end of the first week on pasture, milk production was essentially the same.

David Combs

University of Wisconsin

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05/19/08	131	2363	-	3668	1357	58	0	10	-	-
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07/29/08	25	2368	-	2716	2011	45	-	10	-	-
08/11/08	21	2304	-	2857	1813	43	-	12	-	-
08/18/08	28	2337	-	2800	1504	46	-	12	-	-
08/25/08	48	2394	-	3223	1841	41	-	10	-	-
09/09/08	42	1914	-	2659	1136	41	-	10	-	-
09/15/08	55	1973	-	3092	1108	40	-	10	-	-
09/24/08	28	1808	-	2857	1390	40	-	10	-	-
09/29/08	40	1811	-	2432	1503	36	-	10	-	-
10/06/08	42	1792	-	2180	1109	36	-	12	-	-
10/13/08	28	1675	-	2264	1005	43	-	12	-	-
10/20/08	34	1683	-	2510	1193	39	0	12	-	-
10/27/08	20	1682	-	2208	1306	36	30	12	-	-
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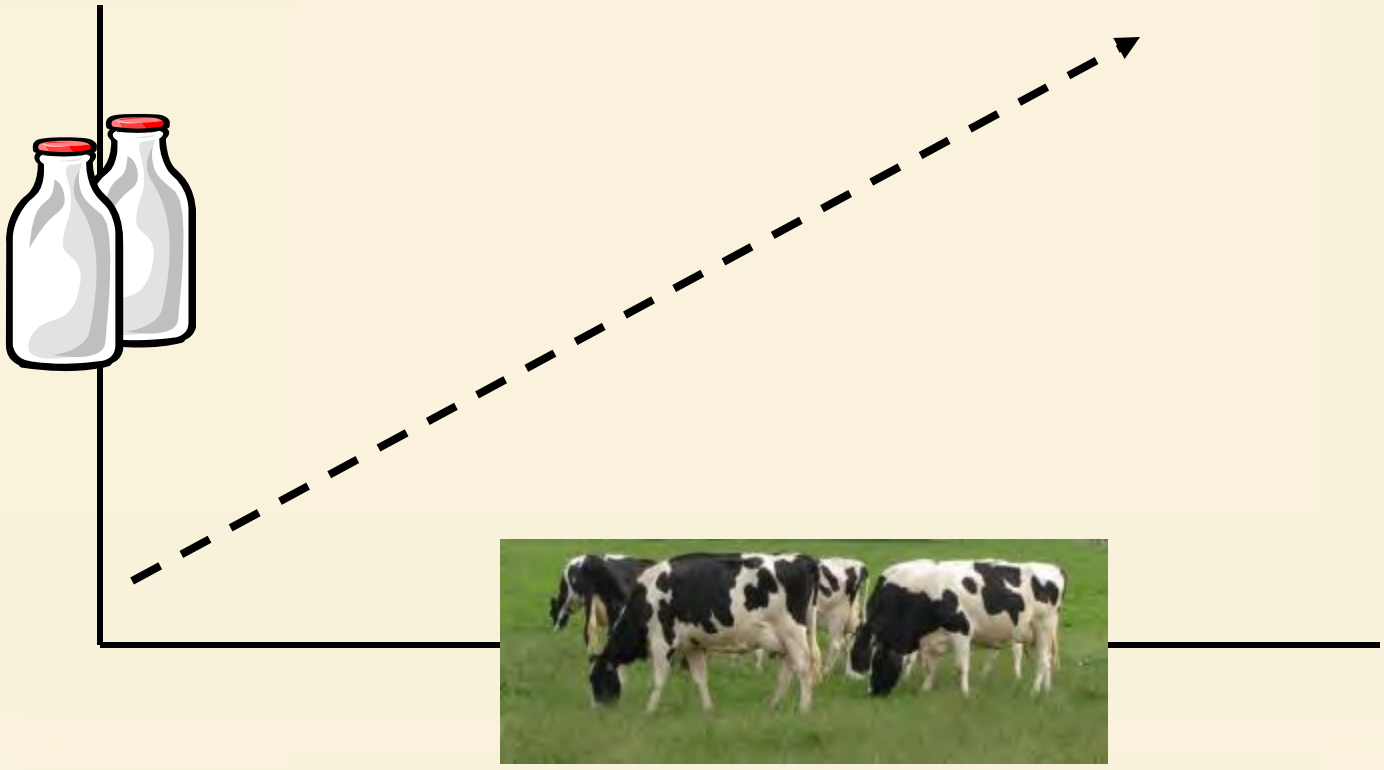
How to feed cows on pasture

- Traditional operator trying to save on feed cost
  - Probably less than 10 lb pasture for short periods
  - Assuming quality is similar, not much ration change if any
- Hybrid Operator
  - Desire or need for higher yields of milk?
  - Probably 10-15 lb pasture for longer periods
  - Design and balance ration for the higher milk yields?
- Low Input Producer
  - Goal of 50% or greater pasture consumption totally over 365 days
  - Design and balance ration
    - Low protein-higher energy/starch in spring
    - Moderate protein – summer
    - Low-moderate protein –fall
    - 4-10# DM grain

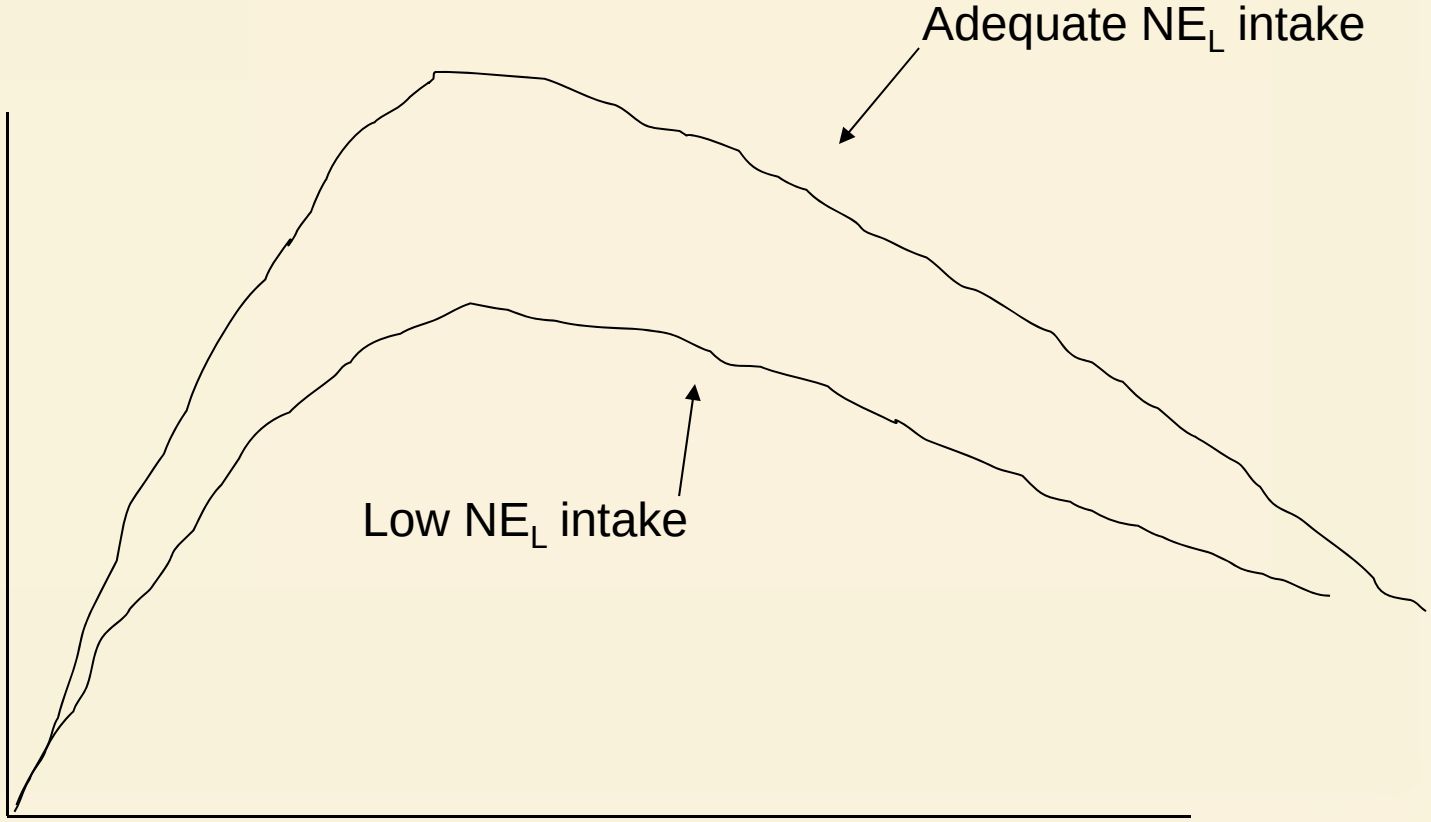
Intake (energy) drives production

75 % of milk production response is related to intake



Effect of energy intake on lactation response

Peak lactation affected by energy intake



Characteristics of Pasture

Characteristics of Pasture

- **18 - 34% Protein**
  - **High soluble protein**
- **0.66 - 0.80 Net Energy**
- **30 – 55% NDF**
- **Low non-fiber carbohydrates**
  - **12 - 24%**

Average nutrient composition for cool season grass pasture and legumes over a grazing season

	Predominantly Grass (Cool season)		Grass with Legumes	
Nutrient	Spring	Summer	Spring	Summer
Crude Protein (CP), % DM	21-25	18-22	22-26	20-24
RUP[b], % of CP	20-25	25-30	20-25	25-30
Sol. P[c], % of CP	35-40	25-30	30-35	25-30
ADF[d], % DM	24-28	28-34	21-25	25-30
NDF[e], % DM	40-45	48-55	30-36	35-45
NE, Mcal/lb	0.72-0.78	0.66-0.72	0.74-0.80	0.70-0.74
Non-fiber carbohydrate (NFC), %DM	15-20	12-15	18-24	15-20
Fat, % DM	3-4	3-4	3-4	3-4
Ca, % DM	0.50-0.75	0.50-0.75	1.1-1.3	1.1-1.3
P, % DM	0.30-0.35	0.30-0.35	0.30-0.35	0.30-0.35
Mg, % DM	0.15-0.20	0.15-0.20	0.18-0.24	0.18-0.24
K, % DM	2.0-3.5	2.0-3.5	2.5-3.5	2.5-3.5
S, % DM	0.16-0.22	0.16-0.22	0.18-0.26	0.18-0.26

Characteristics of Pasture

	TMR Goals
•18 - 34% Protein – High soluble protein	16-19%
•0.66 - 0.80 Net Energy	0.76-0.79
•30 – 55% NDF	47% max
•Low non-fiber carbohydrates •12-24%	32-36%

Nutritive Analysis

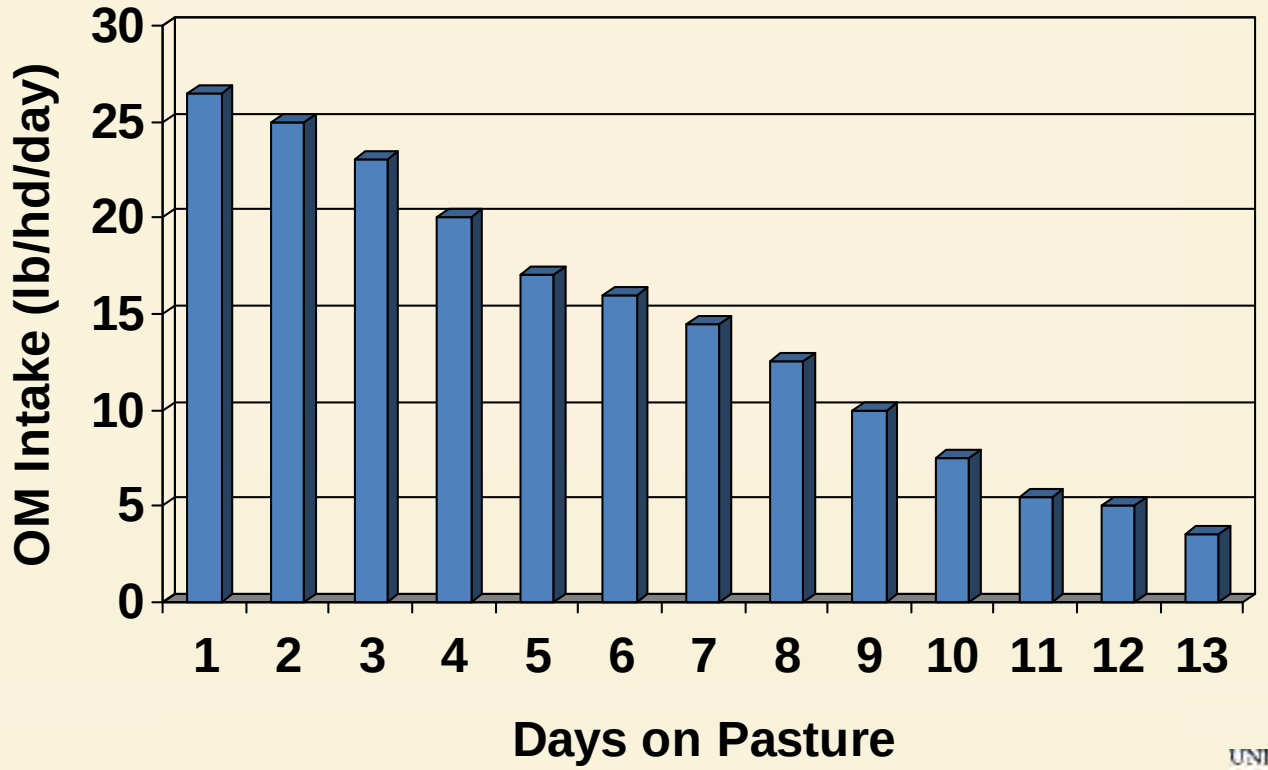
- Just as critical as any other system of dairying
  - Pasture
  - Primarily protein and fiber
  - Remaining Diet
  - Allows adjustment based on pasture analysis

Critical Points to Consider

- **Adequate water**
  - **Within 800 feet of grazing animals**
- **Adequate bunk space**
  - **24-30 inches/cow**
- **Flexibility**
- **Corn silage is a plus**

Grazing Management

Impact of Days on Paddock on Organic Matter Intake



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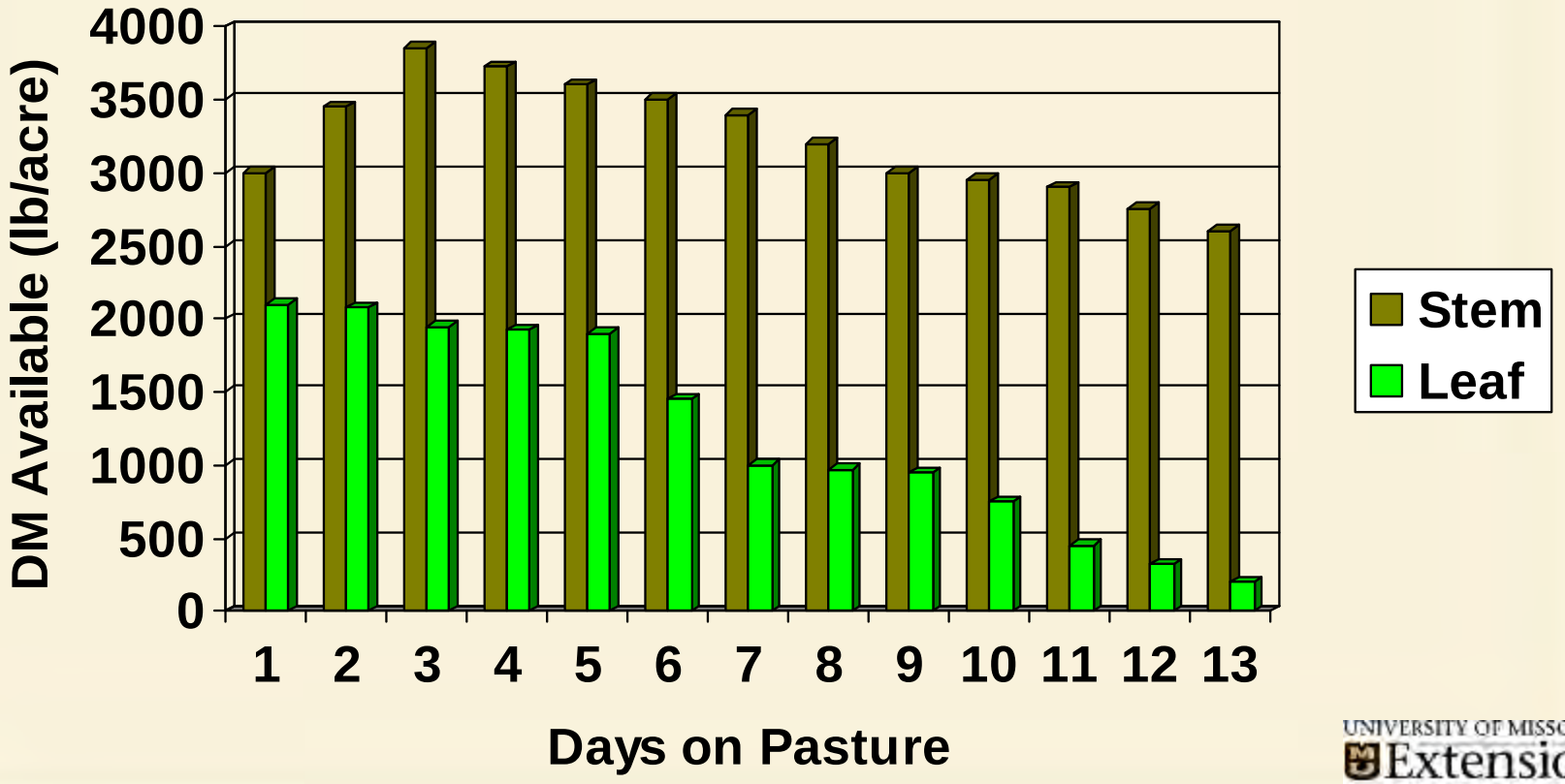
Impact of Days on Paddock on Change in Sward Composition



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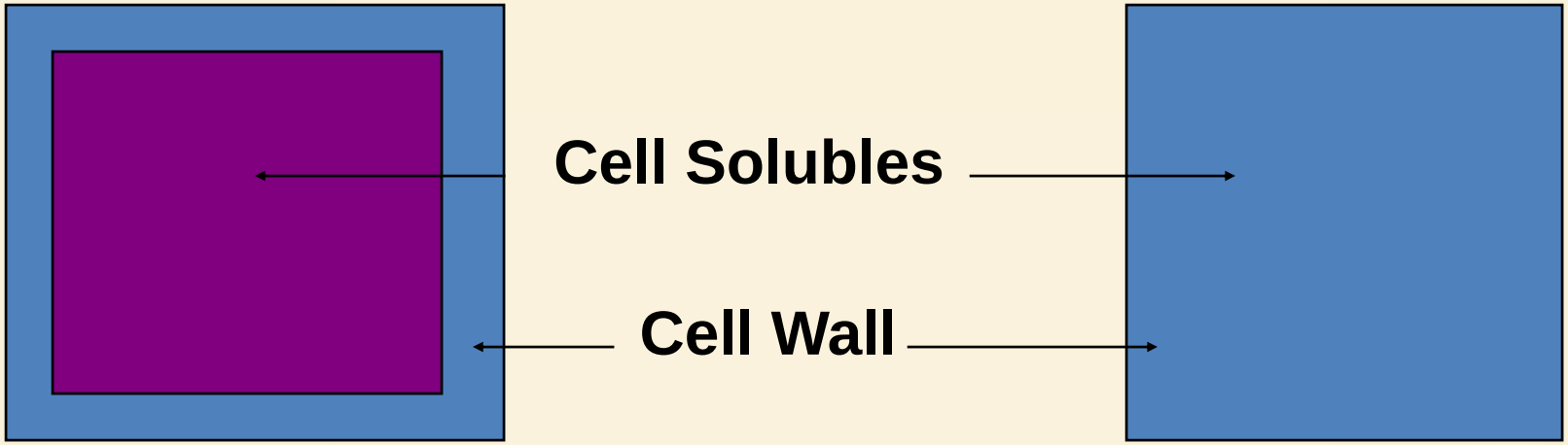
Cell Wall & Quality



Quality – HIGH
Cell Wall - 42%
Protein - 25+%
NE_L - .68

Quality – LOW
Cell Wall – 65+%
Protein – 14%
NE_L - .50

A cow can consume ~ 1.1% of BW as NDF (cell wall)

But remember……

- **Substitution of pasture when feeding other feeds**
  - **Grain**
    - **up to 0.6 lb DM pasture/lb DM grain fed**
  - **Other forage**
    - **Up to 1.3 lb DM pasture/lb DM grain fed**

What grain mix?

- **Few hours grazing**
  - **Current mix**
- **12 hours grazing**
  - **Probably current, but evaluate**
- **24/7**
  - **New mix**

Ingredients in grain mix

- **24/7**
  - **High soluble carbohydrate (starch) feeds**
    - **Limit to maximum of 12-16 lb/day**
- **Other levels of grazing will be dependent of quality of pasture**

Conclusions

- **Feeding the grazing cow**
  - **Forage Quality**
  - **Forage Intake**
  - **Compliment With Grain**
    - **Energy**
    - **Protein ??**
    - **Vitamins & Minerals**

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