



Dairy Summit 2005

"Dare to Reach the Summit"

**Lower Energy Dry Cow Diets
Could They Work for You?**



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Dairy Summit - 2005**

If It's Not Broke, Don't Fix It!

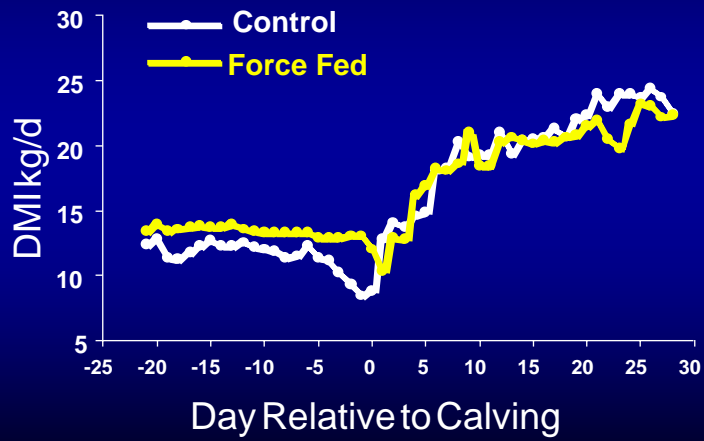


When Should You Try A Low Energy (High Fiber/Low Starch) Dry Cow Program?

- Try a lower energy diet (0.57-0.64 NEL) when:
 - Management & facilities are sub par
 - Higher energy transition diets are not working
 - When you need more consistent intakes through calving
 - Using a 1-group dry cow program
 - Using a short day dry cow program (e.g. 45 days)

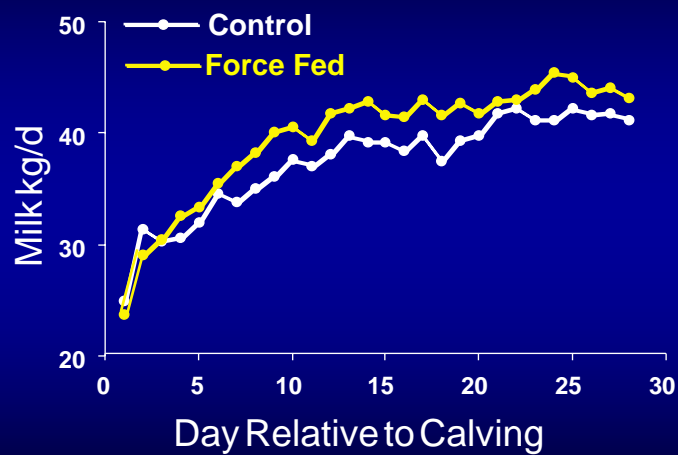


Force-feeding prepartum cows via rumen cannula



Bertics et al., 1992

Milk production of force-fed cows



Bertics et al., 1992

Nutritional Strategies Arising from the Original Transition Cow Research

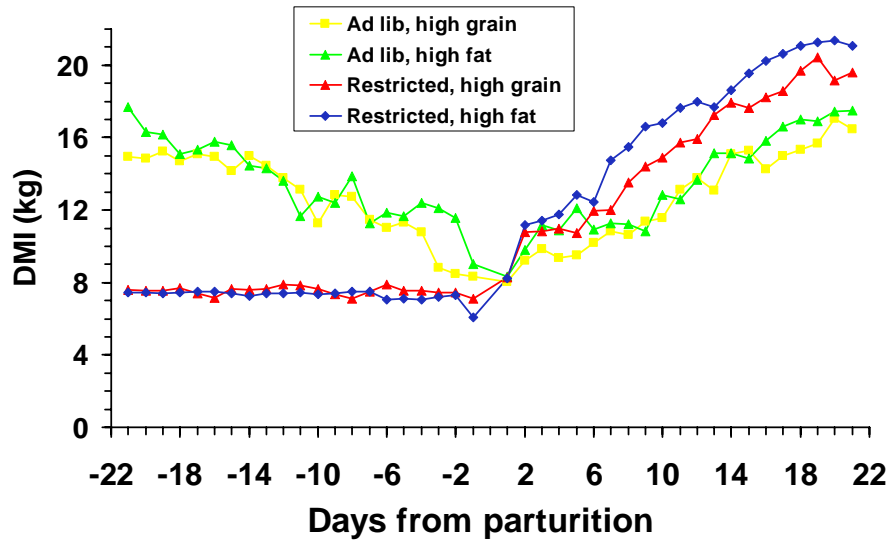
1. Increase starch
2. High Corn Silage diets
3. Feeding highly digestible fiber sources (soy hulls, beet pulp, citrus pulp, wheat midds)
4. Prefresh energy levels of 0.70 to 0.73
5. Achieve high prefresh DMI

Results have been inconsistent!



**University of Illinois research
took a different direction**

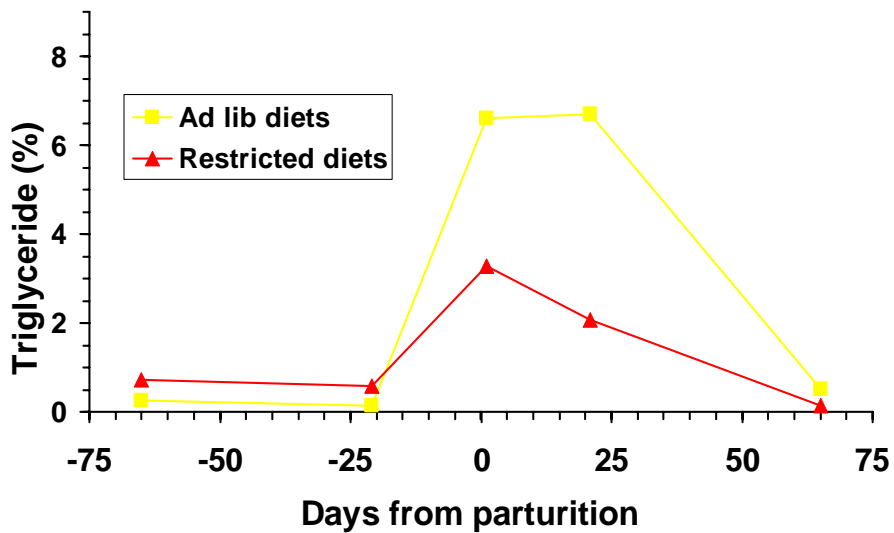
Transition DMI



Prepartum: Amount ($P < 0.0001$); day*amount ($P < 0.0001$);
 day by diet ($P < 0.05$)
 Postpartum: Amount ($P < 0.02$)

Douglas et al., 1998

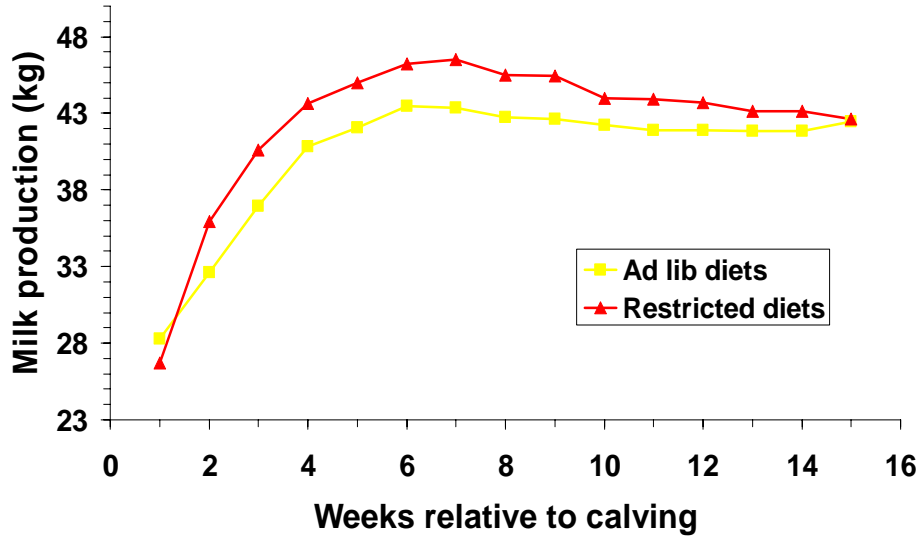
Liver triglyceride content



Amount; day*amount ($P < 0.001$)

Douglas et al., 1998

Milk Production



Week amount (P < 0.20)

Douglas et al., 1998

Dry Matter Intake

Force-fed cows

Cows fed hi energy

Cows fed low energy

3 weeks prepartum

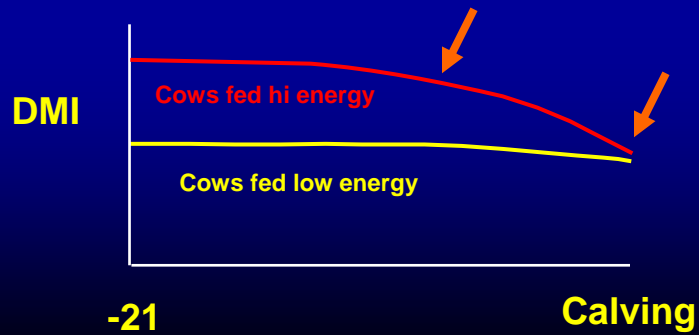
Calving

Adapted from Grummer et al., 2002



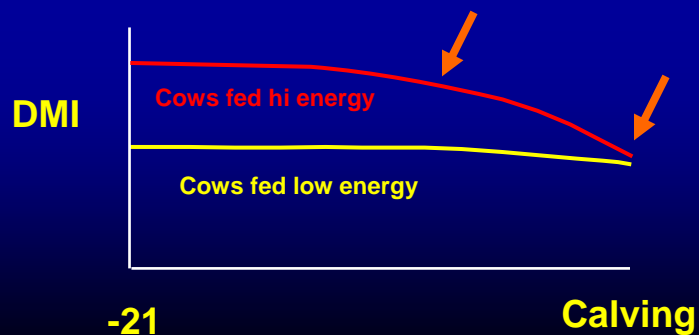
Implications

- No relationship between average intake and fatty liver
- Highly significant relationship between the severity of decrease in DMI and fatty liver
- Cow with high prepartum DMI may be more at risk for metabolic problems if DMI isn't sustained through calving



Implications

- Low energy diets result in a lower, more consistent intake
 - Prevents the sharp intake decline pre-calving
 - Sharp decline pre-calving highly correlated to a higher risk of metabolic disorders



Implications

- Changes in prepartum DMI are more important in determining postpartum DMI and liver lipid accumulation than absolute DMI.
- Focus efforts towards preventing the decline in DMI before calving:
 - Cow Movements
 - Overcrowding
 - Nutritional Stress
 - Water Access
 - Ketogenic Forages
 - Bunk Mgmt Issues
 - Body Condition
 - Social stress
 - Lower energy dry cow diets
 - Environmental Stress
 - Low Days in Prefresh
 - Cow Comfort



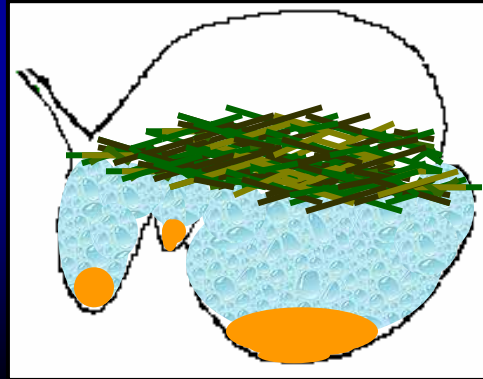
How Low Energy Dry Cow Diets Might Work

1. Low energy diets result in a lower, more consistent intake
2. Increase rumen bulk and better maintenance of the rumen mat
3. Lowering energy intake reduces the chances of “insulin resistance” (Drackley, 2005)



Off-Feed Simulation

- Goff, 1998- Simulated a cow going off-feed to see how quickly the rumen mat would disappear.
- Allowed a rumen fistulated cow to eat to her fill and then took feed away.

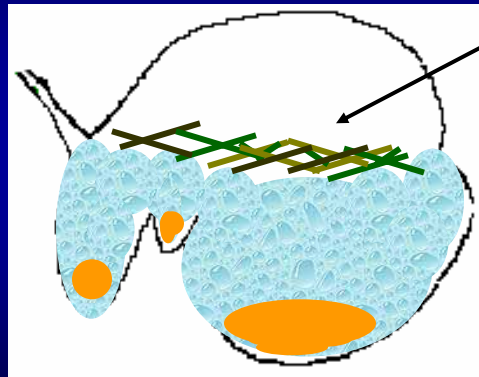


Off-Feed Simulation

<u>Time after Feeding</u>	<u>Rumen Mat Weight</u>
6 hrs.	56 lbs.
16 hrs.	28 lbs.
24 hrs.	17 lbs.
28 hrs.	13 lbs.



Off Feed Consequence



Limited rumen mat

Transition Goal: Maintain Rumen Mat!!



Low Energy Dry Cow Diets

- May Give You More Room For Error
 - When faced with challenges that negatively affect feed intake
 - **Increased rumen bulk and better maintenance of the rumen mat**
 - More consistent intake before and after calving
 - Reduce slug feeding after calving
 - Reduce SARA in fresh cows



How Low Energy Dry Cow Diets Might Work

1. Low energy diets result in a lower, more consistent intake
2. Increase rumen bulk and better maintenance of the rumen mat
3. **Lowering energy intake reduces the chances of “insulin resistance”:**
(Drackley, 2005)
 - **Post calving appetite improvement**
 - **Decrease in body fat mobilization**
 - **Decrease in fatty liver and ketosis**



Implementing Low Energy Dry Cow Diets

1. **Feeding high levels of straw (5 to 12 lbs)**
2. Feeding Higher Fiber Byproducts to reduce energy

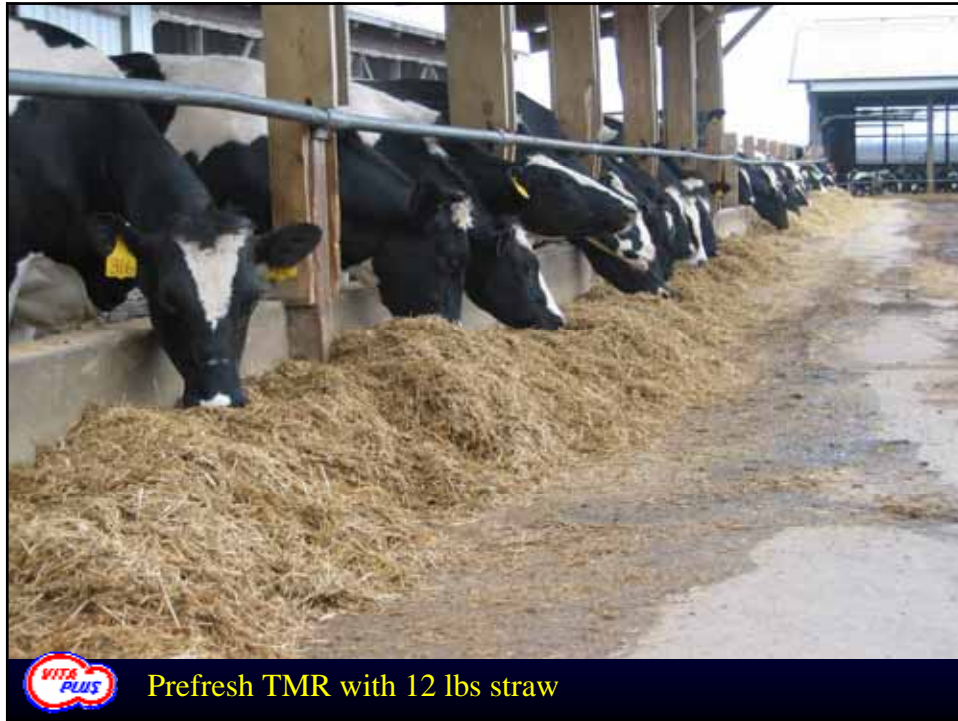


Feeding Straw in Low Energy Dry Cow Diets (Drackley, 2005)

- 5 to 12 lbs may be required
- Must be 2 inches or less
- Straw should be clean, dry, and free of mold
- 10 days may be required to adapt cows to bulky diets with high amounts of straw
- Water may be added to bind TMR together



Prefresh TMR with 12 lbs straw



Prefresh TMR with 12 lbs straw

Implementing Low Energy Dry Cow Diets

1. Feeding high levels of straw (5 to 12 lbs)
2. Feeding Higher Fiber Byproducts to reduce energy



Feeding Higher Fiber Byproducts to Reduce Energy

- Most common higher fiber byproducts fed to dry cows have been soyhulls, beet pulp, wheat midds, and citrus pulp
 - Energy levels range from 0.7 to 0.8 Mcal NE/lb DM
 - Sometimes used to replace forage
 - Typically fed in high corn silage diets
 - Final diet is high in energy
 - Inconsistent results



Feeding Higher Fiber Byproducts to Reduce Energy

- Higher fiber byproducts such as oat hulls, cottonseed hulls, almond hulls, and flax hulls can successfully lower energy and increase fiber
 - Energy levels range from 0.36 to 0.55 Mcal NE/lb DM
 - Long stem dry forage is required to maintain cud chewing and rumen mat
- Oat hulls are in the majority of my dry cow and prefresh diets. Why?
 - Hard to prevent sorting when feeding large amounts of straw
 - Reduce energy and starch with oat hulls. Maintain good rumen mat with long stem forage.





Prefresh TMR: 6.5 lbs oat hulls, 2 lbs straw, 2 lbs alfalfa hay

Vita Plus Field Data: Low Energy Dry Cow Program

- 1500 milk cow herd
- Target dry days = 45
- All dry cows fed the same diet
- Cows were trailered to dry cow site, trailered to prefresh area, and trailered after freshening
- Fairly high rate of DA's in the past
- Goals were to stop feeding anionic salts, decrease culling, improve fresh cow health, milk production, and reproduction



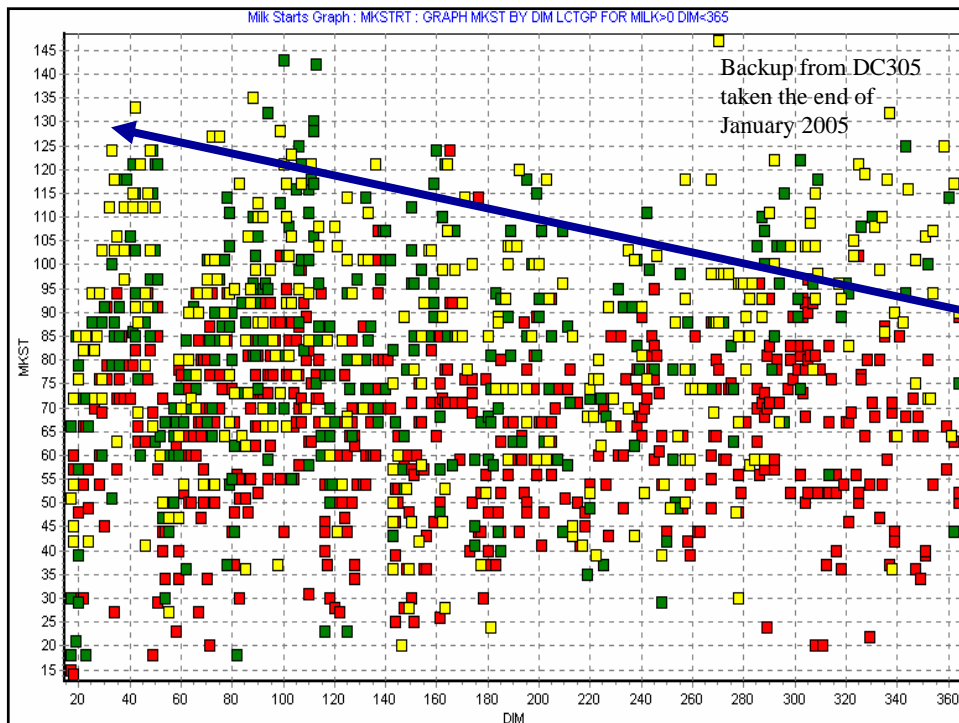
Diet started end of Sept 2004

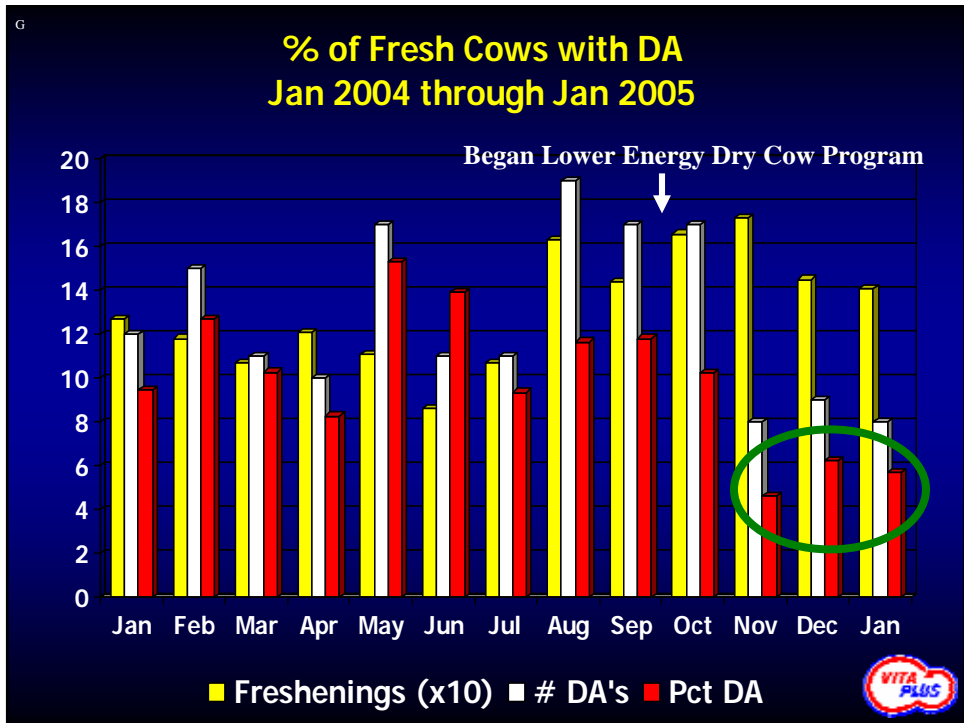
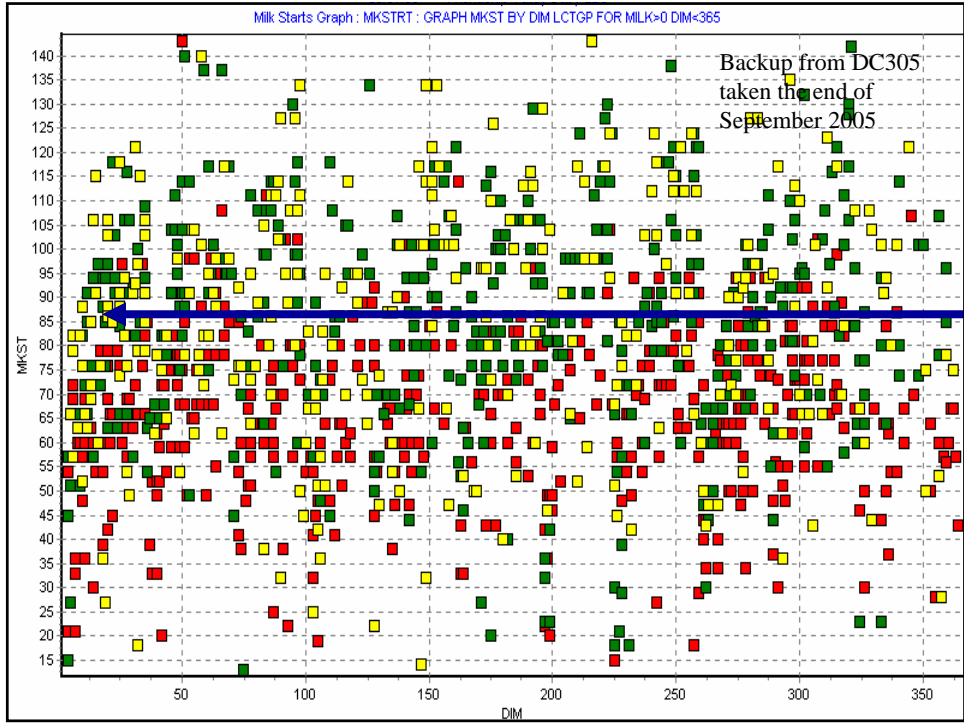
Ingredient	lb DM
Corn Silage	12.7
Grass Hay	3.5
SBM, 47%	3.3
Oat Hulls	5.5
Soy Hulls	1.6
Min/Vit*	1.3

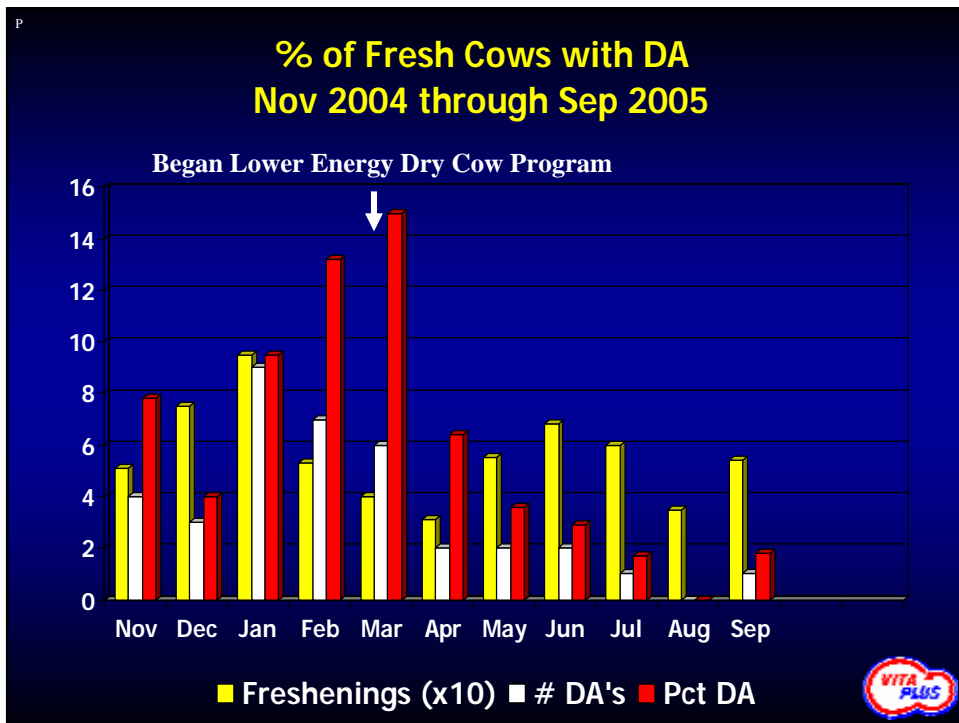
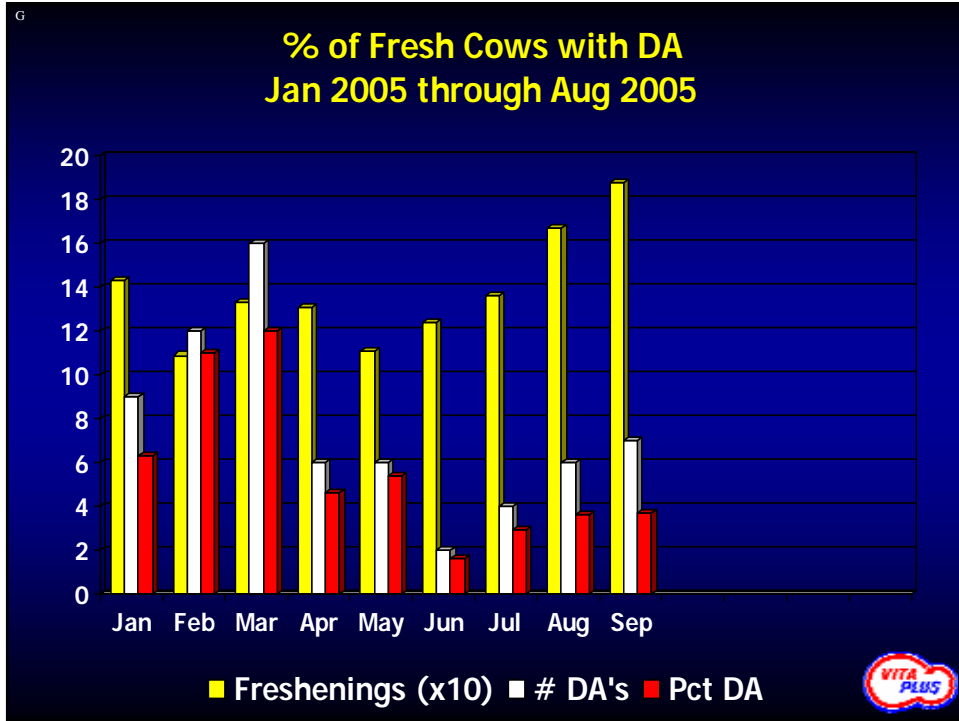
CP, %	14.1
NEI, Mcal/#	0.62
ADF, %	29
NDF, %	45
NFC, %	30
S + S, %	18
K, %	1.25
DCAD _{meq/100g}	6



*CaSO₄,MgSO₄,Ca,MgO,DiCal, YeastFort,Rum,Salt,Urea,FortiPlus,Availa4







Peak Milk Data

Farm	Time Period	1 st Lact	2 nd Lact	3 rd Lact	All
P Prior	May04-Mar05	91	123	132	114
P After	Apr05-Oct05	92	121	136	115
M	Apr04-Nov05	97	121	127	113
H	YTD	87	113	115	105
G	YTD	89	111	116	103

Example Dry Cow/Prefresh Diet: Fed Lower Energy Since March 2004

Ingredient	lb DM	CP, %	14.0
CS (30% starch)	8.0	NEI, Mcal/#	0.61
Oat Hull Pellets	5.5	ADF, %	28.5
Haylage	6.0	NDF, %	45.0
Grass hay	3.5	NFC, %	29.0
PrFr Mix	2.8	S +S, %	17
SBM	1.3	DCAD meq/100g	-6.6
		K, %	1.50

Prefresh mix includes beet pulp, soyhulls, SoyChlor, additives, MIN/VTM



Example Prefresh Diet: Fed Lower Energy Since March 2005

Ingredient	lb DM	CP, %	14.0
CS (24% starch)	14.0	NEI, Mcal/#	0.59
Oat Hulls	5.9	ADF, %	29.0
Haylage	5.0	NDF, %	47.0
Straw	1.6	NFC, %	29.0
PrFr Mix	1.4	S +S, %	17
SBM	3.6	DCAD meq/100g	5.9
		K, %	1.4



Take Home Messages

1. 0.57 to 0.64 Mcal NEI/lb DM
2. Hi Energy/Starch prefresh diets = inconsistent
3. Higher prepartum DMI may = decrease in DMI during the final days before calving
4. Decrease DMI before calving = fatty liver
5. Lower energy diet = more consistent DMI = better rumen mat



Take Home Messages

6. Minimize sorting of high straw diets by chopping straw to 2 inches or less
7. Low energy, high fiber byproducts decrease energy and starch
8. Low energy, high fiber byproducts alone will not maintain rumen mat. They must be fed with high quality chopped straw, grass hay, alfalfa hay, or soybean stubble.
9. Lower energy dry cow diets have improved fresh cow health and reduced DA's



Take Home Messages

10. Lower energy, high fiber diets fit on farms that feed a single diet to all dry cows
11. Lower energy, high fiber diets fit on farms with shortened dry periods
12. Farms with 2 dry cow diets must feed high quality lower energy feeds to far-off dry cows
13. Good management, facilities, and cow comfort in conjunction with a well balanced diet will help reach the goals of transition cow programs
 - Healthy fresh cows that breed back quickly and produce large amounts of milk

