



Considerations for Using Distillers Grains in Dairy Cattle Rations

Dr. L. E. Chase
Dept. of Animal Science
Cornell University



Distillers Grains

- A feed that has been used in ruminant rations for 100+ years
- Earliest research report was from Finland in 1893?
- Henry & Morrison – 1920
 - “This rather bulky feed is one of the best high-protein concentrates for dairy cows, from 2 to 4 lbs. per head daily being usually fed”



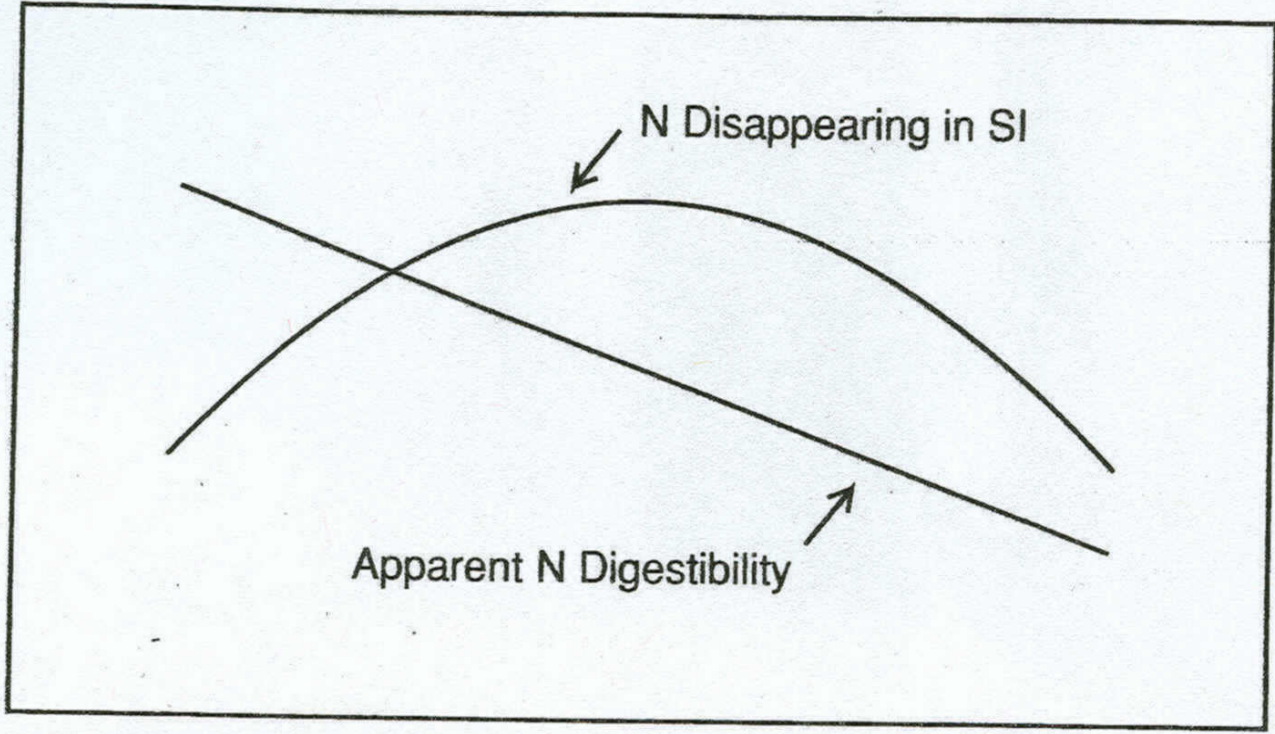
“Typical” Composition

Item	DDG	DDGS	CDS
CP, %	29.5	29.6	29.8
Fiber, %	12.8	9.0	4.2
Fat, %	8.0	9.0	8.4
Ca, %	0.1	0.15	0.3
P, %	0.37	0.71	1.3



Northeast Feed Industry

- Has been a major user of DDGS for many years
- Primarily from the beverage industry
- Lots of variation in nutrient content of DDGS (between & within plants)
- Importance of ADICP level and impact on potential milk production



Extent of Heating →
Index of Heat Damage →



DDGS Composition

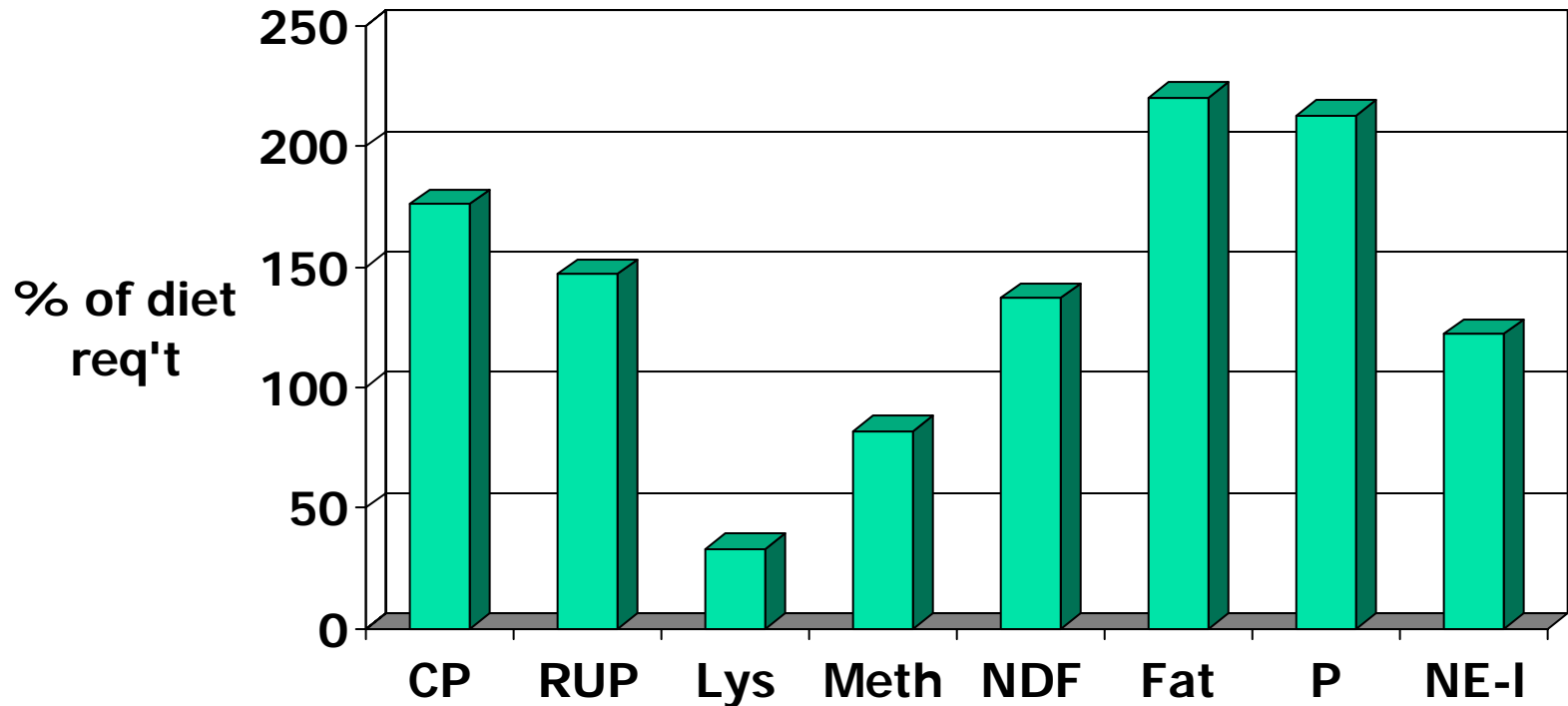
Item	D-1 Ave.	SD	Minn. Ave	SD
CP, %	30.3	2.93	30.9	1.4
Sol- CP, %	14.7	5.6		
ADICP, %	4.55	2.1		
Fat, %	12.97	2.93	10.7	1.75
P, %	0.92	0.15	0.75	0.14

What Does DDGS Bring to the Table?

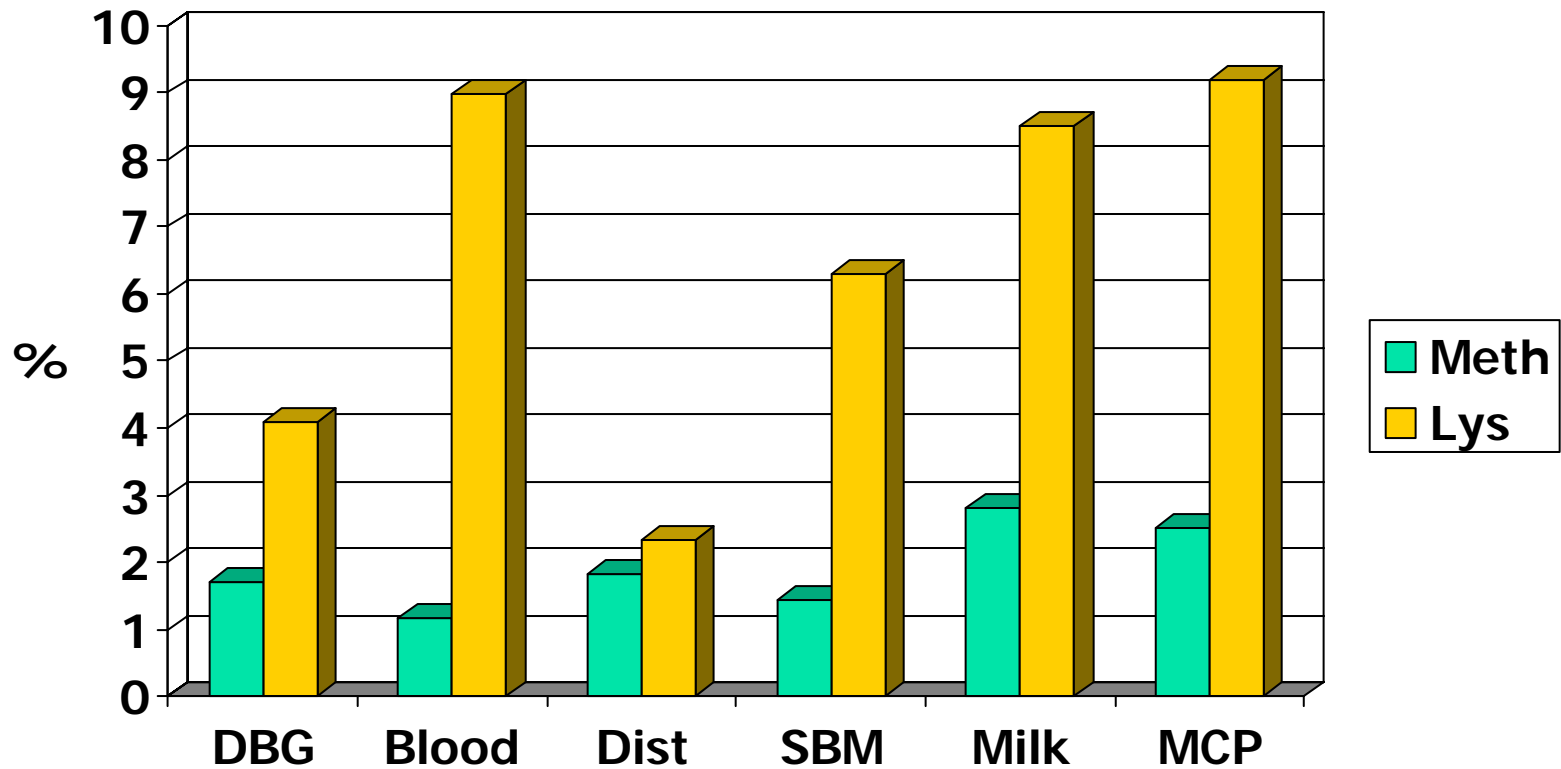


- Medium CP, low soluble CP, high RUP
- Low lysine
- Medium fat level (high linoleic)
- Medium NDF – good fiber digestibility
- Low lignin and starch
- High P
- High energy

How Does DDGS Match Cow Needs?



Amino Acids, % of CP





What's DDGS Worth?

- Used current NE feed prices
- Used 3 different approaches
- Distillers grains were worth \$130 – 160/ton
- Current prices are \$115 – 130/ton
- DDGS are a good feed buy!

How Much DDGS Can We Feed?



- Will depend heavily on the forages and other feeds available or in the ration
- ADICP
- P
- Amino acids
- Unsaturated fat levels



CPM-Dairy Runs

- Used the optimizer
- 1450 lb. cow, 90 lbs. milk
- Current NE feed prices
- Alfalfa silage = 17% CP, 43% NDF
- 60:40 CS:AS, 58 % forage
- 60:40 AS:CS, 50% forage



CPM-Dairy Runs -2

- Initial run had no constraints for P and amino acids
- P restricted to max of 100% of NRC
- Methionine and lysine set at a minimum of 90% of requirement



CPM-Dairy Runs - Results

- High corn silage rations – 1 to 6 lbs of DDGS were pulled into the ration
- High alfalfa silage rations – 0 to 4 lbs. of DDGS were pulled into the ration



ADICP Considerations

- Average ADICP from Dairy One samples is 15% of total CP
- Average + 1 sd is 22% of CP
- Samples with ADICP > 30% of CP do exist
- Milk production loss from higher ADICP levels may be 1 – 4 lbs/day



ADICP Considerations - 2

- High ADICP levels also decrease RDP and increase RUP (but the extra RUP may not be available in the animal)
- High ADICP levels are related to the drying process
- Price should be adjusted for ADICP
- What are ADICP levels in ethanol DDGS?



Lysine Considerations

- All corn products are low in lysine
- As ADICP levels increase, lysine availability decreases
- A bypass lysine source is currently not available
- Will need a high lysine feed (blood meal) to complement DDGS



Fatty Acid Considerations

- The concern is high levels of linoleic acid (18:2) which is an unsaturated FA
- High 18:2 levels can be related to milk fat depression via CLA
- Low rumen pH accentuates this problem



Linoleic in Feeds

Feed	Fat, %	% 18:2
Corn grain	4	55
DDGS	8 – 14	55
WCS	18 – 20	56
Roasted SB	18 – 20	52
Brewers grain	8	49



P Considerations

- DDGS is a high P feed
- Use will be limited in CAFO farms
- Most of the P is in the CDS
- Are there ways to lower or segregate the P from the CDS to produce a lower P DDGS?



Feed Industry

- They are going to “preferred” suppliers
- Will select products (like DFGS) based on quality, *consistency* and price
- They have data on composition and variability by source (specific plant, etc.)



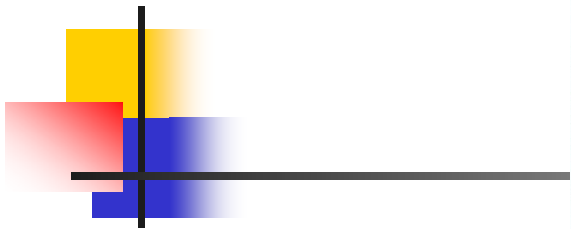
Summary

- DDGS is an economical protein source for use in dairy cattle rations
- Actual quantity fed will be determined by protein needs, P, ADICP, amino acids and FA levels
- Ethanol distillers database should include ADICP information



Summary - 2

- As more information becomes available, the FA levels in rations will become a more limiting factor
- At present, a practical guideline for NE dairy rations is that DDGS feeding levels will be < 10% of the total ration DM
- This is 5 lbs/day for a cow consuming 50 lbs. of DMI.
- Will be less in many farm situations



**MILK. FRESH
SQUEEZED DAILY.**

Questions?





Products

- DDG – Distillers Dried Grains –
Nutrients remaining after starch is
fermented to ethanol
- DDGS – Distillers Dried Grains +
Solubles (at least 75% of the solubles)
- CDS – Condensed distillers solubles –
The thin stillage that is condensed