

Ethanol byproducts use for cattle & implications on nutrient mgmt

G. Erickson, R. Koelsch, T. Klopfenstein, R. Massey, & many students

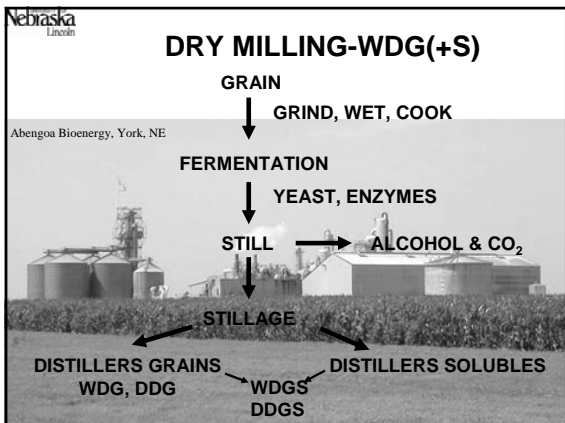


Ethanol Industry Growth



21 green dots
7 red dots

Nebraska Ethanol Board



Archived presentation available at:
http://www.extension.org/Ethanol_Co-Products_Impact_on_Manure_Nutrient_Management_Webcast

Nebraska
Lincoln

Byproducts

- WDGS, modified (45% DM)
- WDGS, traditional (35% DM)
- DDGS (90% DM)
- Syrup, distillers solubles, CCDS
- WCGF (45% DM)
- WCGF-Sweet Bran (60% DM)
- DCGF (90% DM)
- Steep
- "new" distillers grains

Nebraska
Lincoln

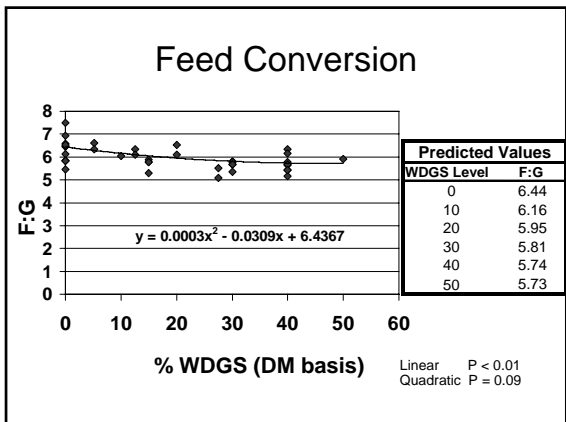
Use

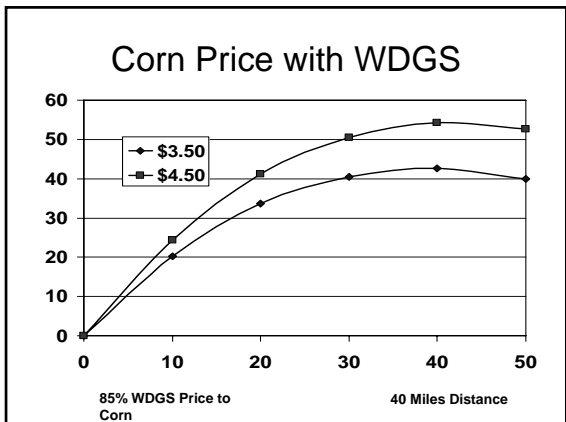
- Inclusion < 15% (2-3 lb): protein
- Inclusion > 15% (4+ lb): energy

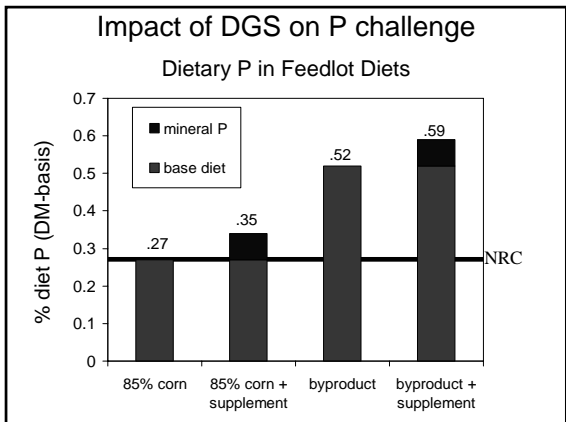
Nebraska
Lincoln

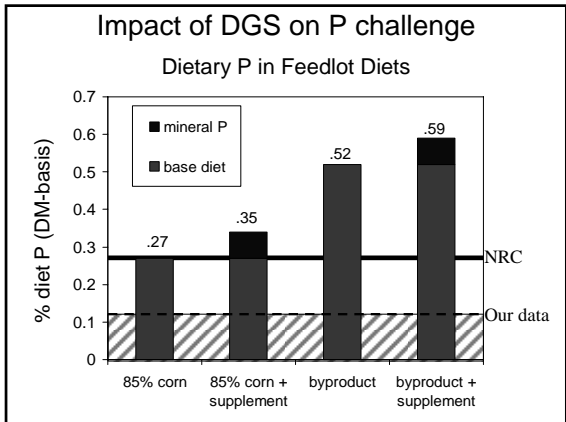
Issues

- Options for feed
 - 20% for dairy?
 - 30% growing beef
 - 40%+ finishing cattle
 - 4-6 lb cow/calf (too good)



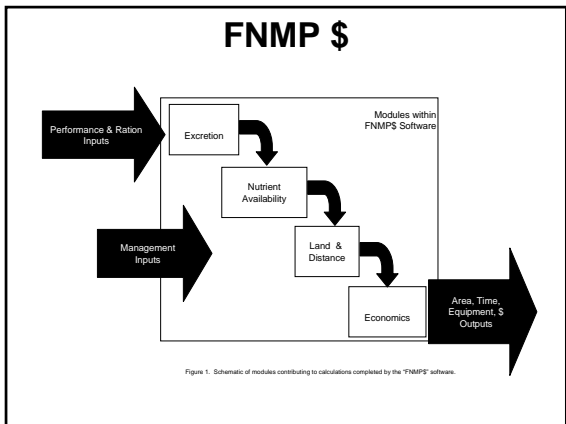




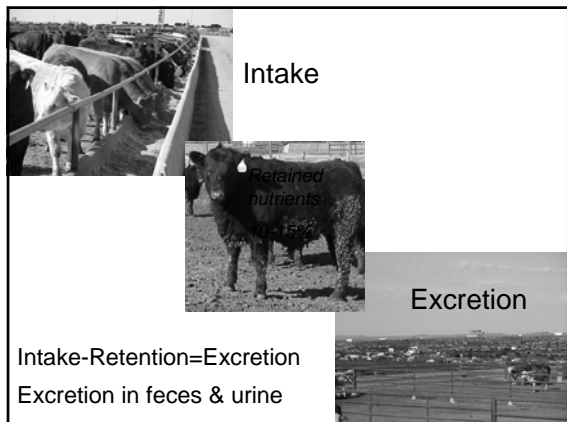


FNMP \$

Comparing a Ration Change
Vs
Manure Transport



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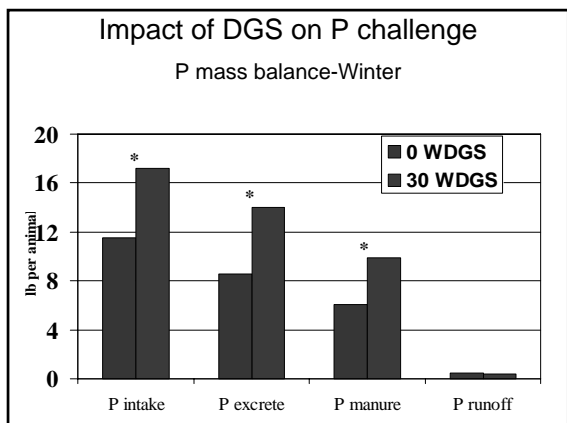


Impact of DGS on excretion

- Excretion numbers using ASABE std approach

	AVG	MIN	MAX
Diet P, %	0.31	0.25	0.50*
P Excretion	7.0 lb	4.6 lb	14.1 lb
"old" std	13.9 lb		
<hr/>			
Diet CP, %	13.3	12.0	20.5*
N Excretion	64 lb	57 lb	104 lb

150 days fed for an "average" steer



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**Land area needed
&
Application costs**

Impact of DGS on P challenge

Land Requirements, 4yr P basis (acres)

Diet:	DGS at 0%	DGS at 40%
Excreted P, kg/yr	61,000	116,000
Land required, ac	5800	11,110
Time, hrs/yr	824	1,175
Cost	\$ 48,000	\$ 72,000

Assumes: 40% of land area accessible
175 bu corn, 60 bu soybean rotation

Koelsch et al., 2007

Impact of DGS on P challenge

Land Requirements, 4yr P basis (acres)

Diet:	DGS at 0%	DGS at 40%
Excreted P, kg/yr	61,000	116,000
Land required, ac	5800	11,110
Time, hrs/yr	824	1,175
Value	\$ 109,000	\$ 192,000
Cost	\$ 48,000	\$ 72,000
Net	\$ 61,000	\$ 120,000

Assumes: 40% of land area accessible
175 bu corn, 60 bu soybean rotation

Koelsch et al., 2007

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Impact of application "scheme"

N rate compared to a P rate application scheme, with P rate based on 1 yr

scheme:	N rate	P rate
Excreted P, kg/yr	116,000	116,000
Land required, ac	2406	11,110
Annual land	2406	11,110
Time, hrs/yr	920	2100
Value	\$ 192,000	\$ 192,000
Cost	\$ 52,200	\$ 144,130
Net	\$ 139,800	\$ 48,070

Assumes: 40% of land area accessible
175 bu corn, 60 bu soybean rotation
Koelsch et al., 2007

Impact of application "scheme"

N rate compared to a 4 yr P rate application scheme, with P rate based on 4 yr

scheme:	N rate	P rate
Excreted P, kg/yr	116,000	116,000
Land required, ac	2406	11,110
Annual land	2406	2,780
Time, hrs/yr	920	1,200
Value	\$ 192,000	\$ 192,000
Cost	\$ 52,200	\$ 71,700
Net	\$ 139,800	\$ 120,300

Assumes: 40% of land area accessible
175 bu corn, 60 bu soybean rotation
Koelsch et al., 2007

Impact of DGS on P challenge

Land Requirements, 4yr P basis (acres)

Feedlot size (hd):	2500	10,000	25,000
0 byp 0.30 P	1,320	5,300	13,200
40 byp 0.50 P	2,500	10,000	25,000

Assumes: 50% of land area accessible
185 bu corn, corn-soybean rotation, ~35 lb P per acre (80 lb P₂O₅)
Kissinger et al., 2006 NE Beef Report


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Impact of DGS on P challenge

Costs and Net Value, C-SB rotation
4-Yr P Basis, (\$/hd)

	2500	10,000	25,000
COSTS			
0 byp 0.30 P	3.00	2.10	3.00
40 byp 0.50 P	3.90	3.30	5.75
NET VALUE			
0 byp 0.30 P	2.50	3.50	2.50
40 byp 0.50 P	6.10	6.80	4.30

Kissinger et al., 2006




Beef Summary

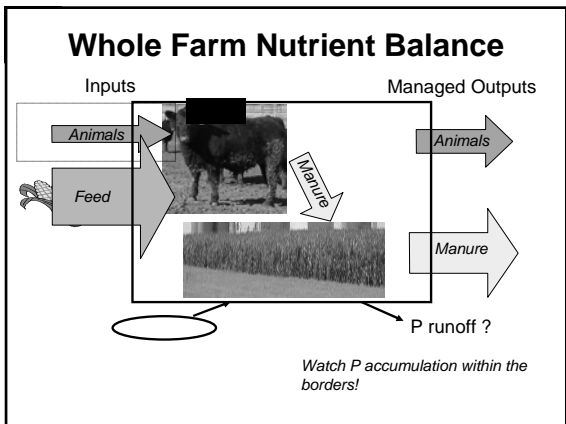
- N increased by 50%...
Most lost as NH₃**
- P and Land
Increased by 90%**
- Time and costs
increased by 20% &
35% (2,000 hd)**
- Time and costs
increased by 30% &
40% (20,000 hd)**

Dairy Summary

- N increased by 10%**
- P Increased by 10 to 30%**
- Land requirement
increased by 10 to 25%**
- Low P in diet made N the
limiting nutrient for land
application.**
- Modest increases in time
and costs**



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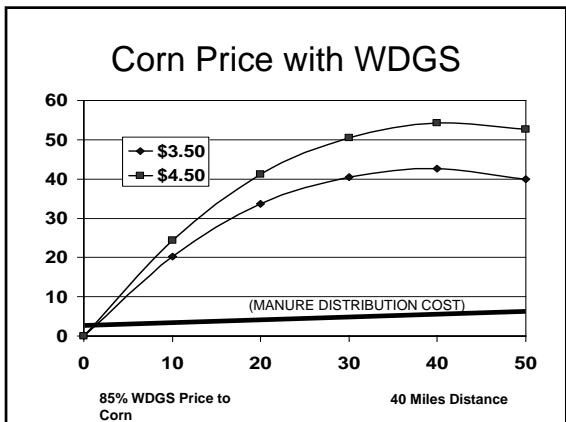
Implications of Greater P Inputs

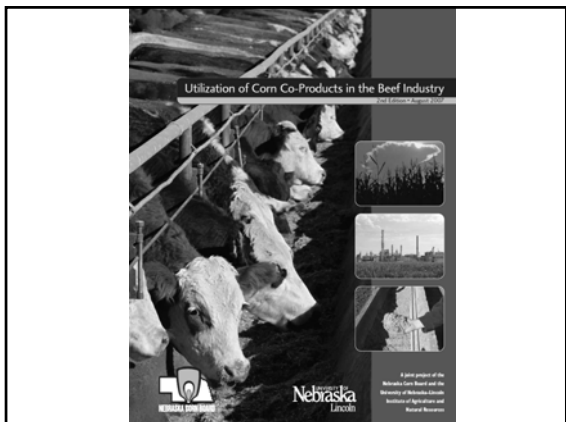
- Using DGS and Beef Feedlots as example
- Two options
 - Export manure across more acres
 - At a cost, and that < feed cost improvement (LAND RICH AREAS)
 - Discontinue use of high P feeds (LAND RESTRICTED AREAS)
- Ignoring the challenge (ignorance) is not an option

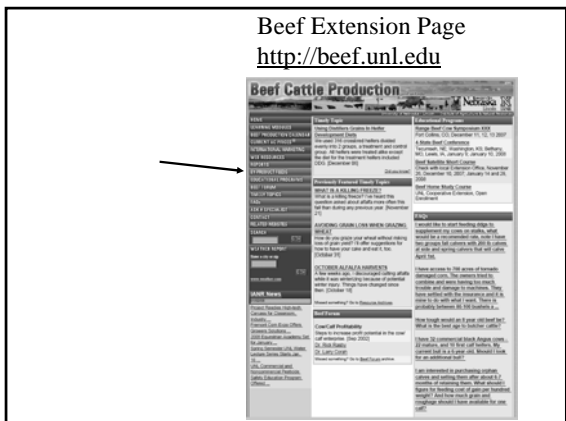
Conclusions

Use the tool, make more informed decisions

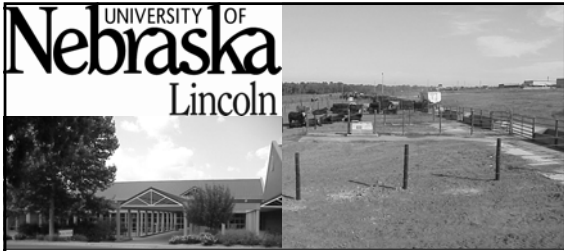
Be sure your feed ingredient decisions
 make more \$ than manure costs
 increase \$ of manure
 account for nutrients fed, it impacts CNMP!







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