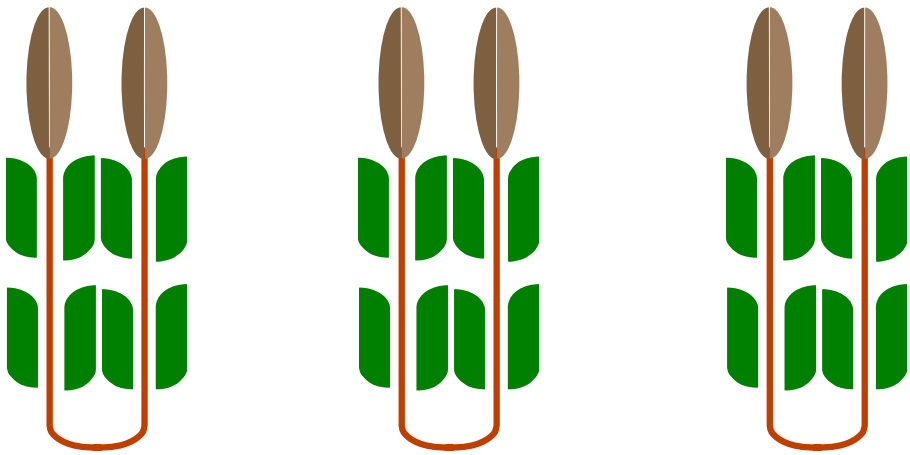
USING DISTILLERS GRAINS IN DAIRY RATIONS



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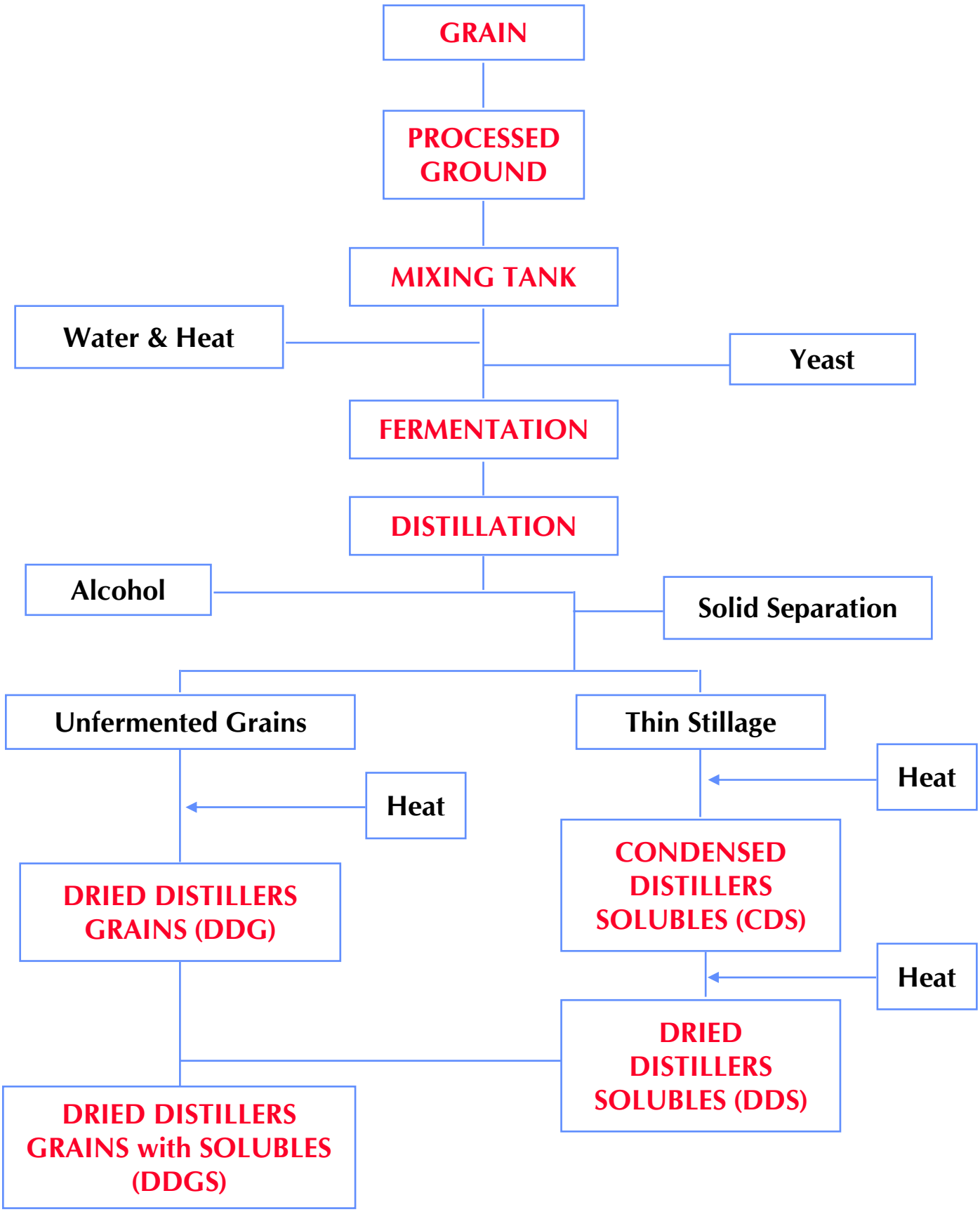
Projected Distillers Grains Production

Minnesota - 6 to 11 plants

	1,000 tons
1996	135
1997	319
1998	431
1999	454

DISTILLERS GRAINS PRODUCTION



Nutrient Composition of Corn-Based Distillers Grains[1]

	DDG	CDS	DDGS
CP, %	23	30	25 (22-33)[2]
UIP, % CP	54		47 (45-55)
SIP, % CP			15 (5-28)
ADF, %	17	7	18 (10-25)
NDF, %	43	23	44 (29-50)
Fat, %	10	9	10 (2-20)
NE_L, Mcal/lb	.9	.93	.93

[1] DM basis.

[2] Ranges reported in literature.

SOURCES OF NUTRIENT VARIATION

- ✓ Grain source - Corn, Barley, Wheat, Milo
- ✓ Grain quality
- ✓ Production factors
  - Grain processing - particle size
  - Fermentation - extent
  - Separation - solids and liquids
  - Drying temperatures
- ✓ Blending - Grains and Solubles

DISTILLERS GRAINS CHARACTERISTICS

- Generally 3X nutrient content of original grain
- Low in starch
- High fat
- High protein
- High fiber
- High phosphorus

PROTEIN QUALITY IN DISTILLERS GRAINS

- **Heat Damaged Protein**
  - ADIN - Indicator and measure of 11 to 32% CP range
  - < 20% of CP desirable
  - Some ADIN digested postruminally
- **Indicators of Heat Damaged Protein**
  - Reduced animal performance
  - Lowered milk protein percentage
  - Color of distillers grains

    Low - honey golden

    High - dark brown to black
- **Amino Acid Content**
  - Similar to whole grain before fermenting
  - Generally low lysine

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PRICING DDGS

1. Price/lb of CP

$/lb of CP

= $/unit of feed / (unit of feed x DM x CP)

= $150/ton / 2000 lb x 92% x 28%

= .29

2. Price - Energy (corn) and Protein (SBM) basis

$/cwt of DDGS

= ($/cwt of corn x .531) + ($/cwt SBM x .514)

= (7.14 x .531) + (12.50 x .514)

= $10.22/cwt

3. Comparable ingredient blend - 25% CP, 86 Mcal NE_L

	lb/100 lb	x	$/lb	=	$/100 lb
SBM	47.5		.1250		5.94
Corn	46.0		.0714		3.28
Tallow	6.5		.25		1.62
					$10.84

DDGS = $10.84/cwt

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80 lb MILK EXAMPLE RATIONS
"THE MODEL"

	DDGS, % of DM		
	0	13	26
100% Alfalfa			
Peptides, g	-22	-21	+24
Met, %EAA	5.0	5.0	4.8
Lys, %EAA	14.1	13.2	12.4
Met/Lys	2.8	2.6	2.6
50% Alfalfa - 50% Corn Silage (DM basis)			
Peptides, g	2	-4	6
Met, %EAA	5	5	4.9
Lys, %EAA	14.3	13.5	12.6
Met/Lys	2.9	2.7	2.6
100% Corn Silage			
Peptides, g	41	31	26
Met, %EAA	5	5	4.9
Lys, %EAA	14.6	13.8	12.8
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Rations - 8 lb CGF, .25 blood meal, corn and soybean meal

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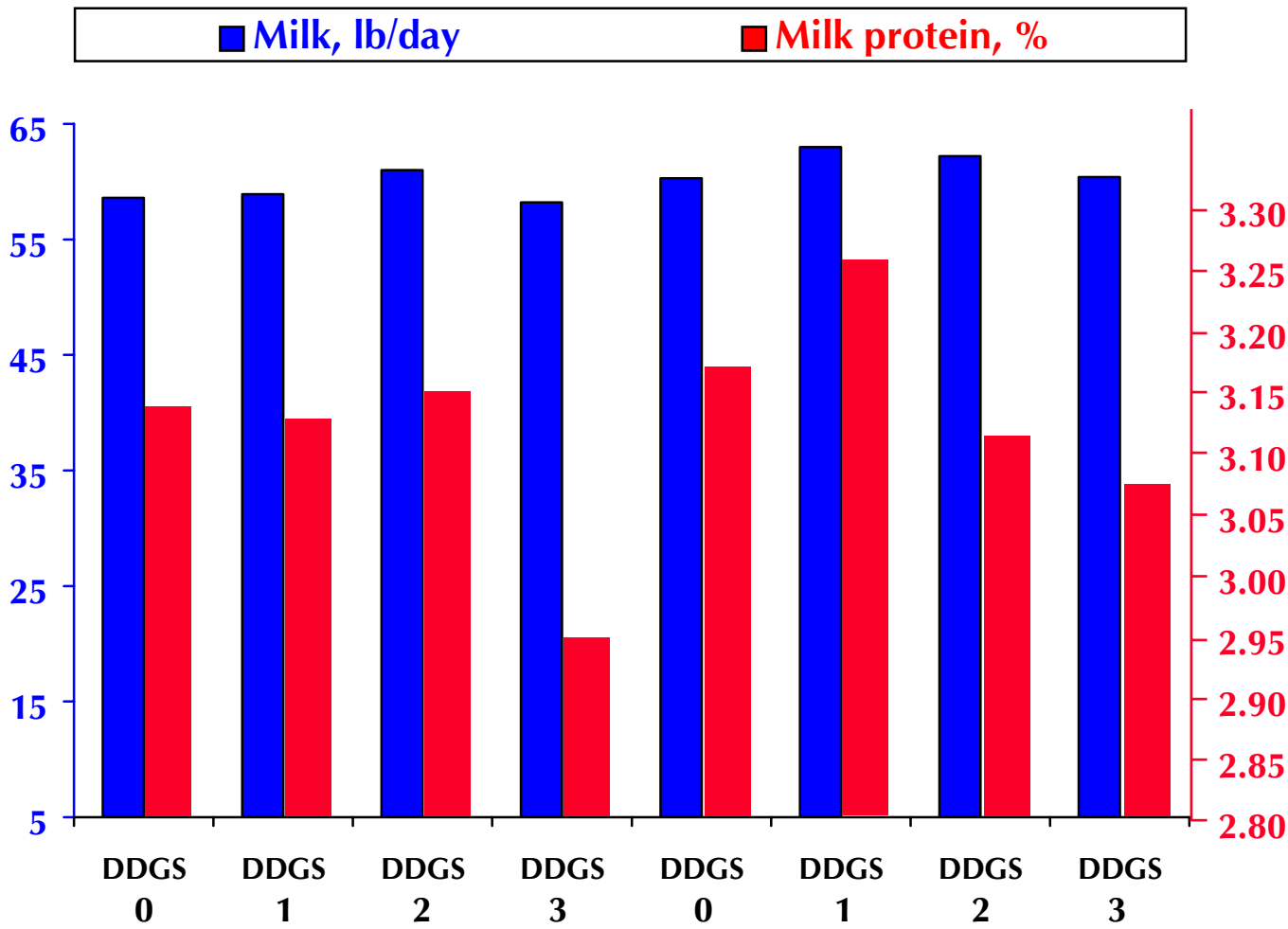
FEEDING RECOMMENDATIONS DISTILLERS GRAINS

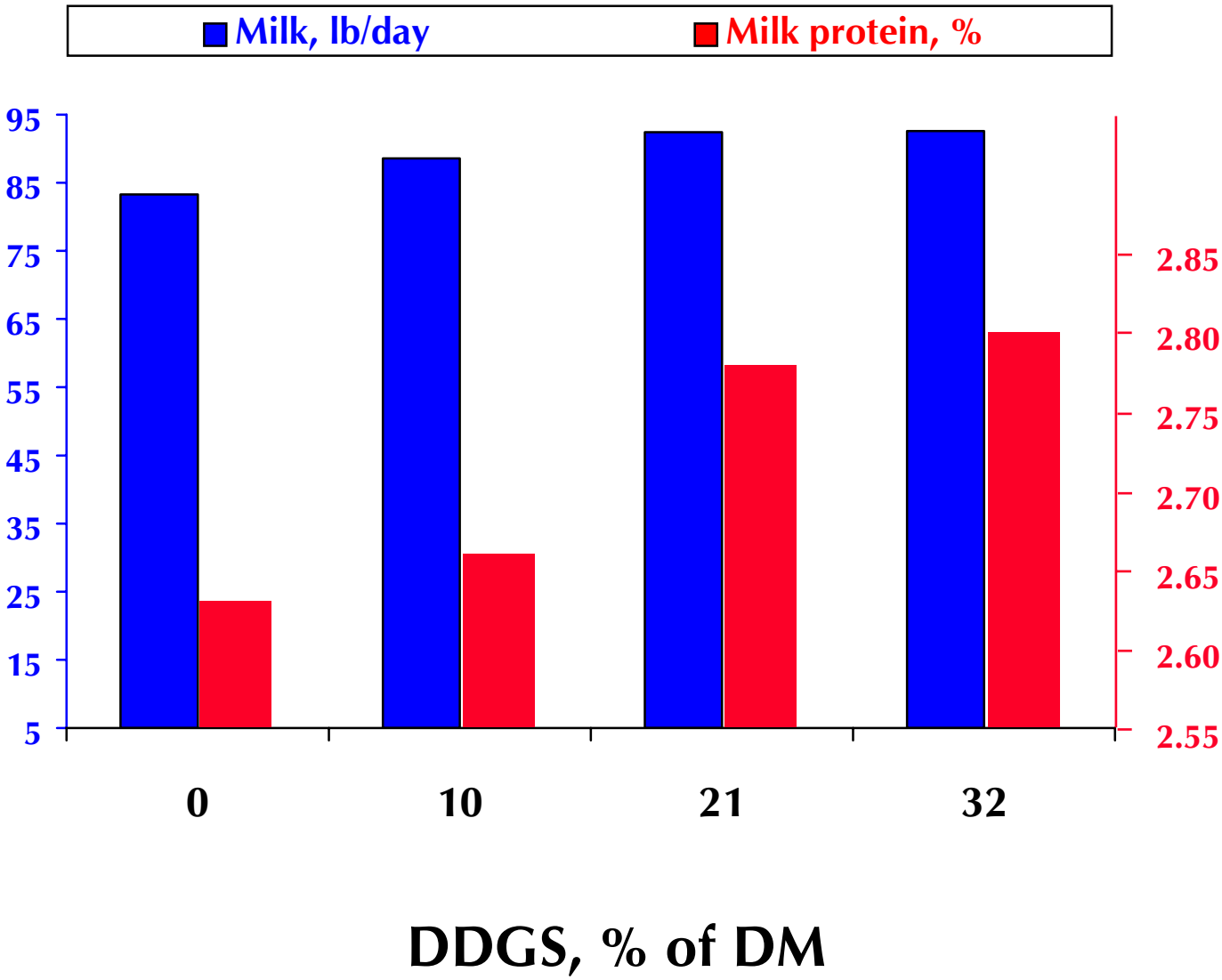
- Maximum amount - 26% of diet DM
- Limit amount of CP from corn products to < 60% of total CP
- Lysine will be limiting in many rations
- Feed DDGS in combination with other protein sources
- Balance CP, DIP, SIP
- Effective NDF content of distillers grains is limited
    - ❖ Replaces corn-soybean meal, NOT forage in rations

Milk Production
DDGS with Corn Silage



Powers et al., 1995

Milk Production
DDGS with Alfalfa



Grings et al., 1992