Introduction of DDGS for Dairy Feed

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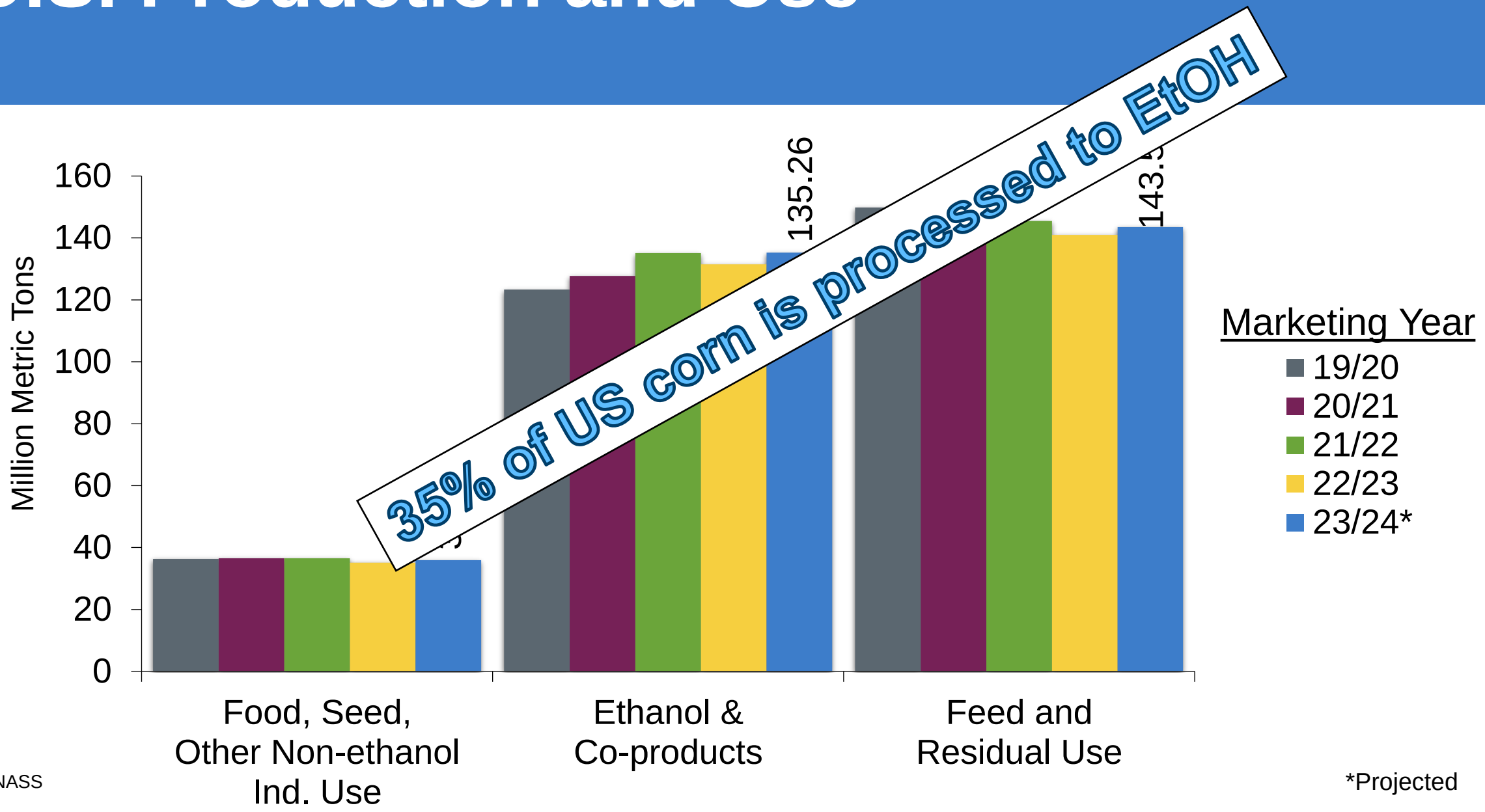
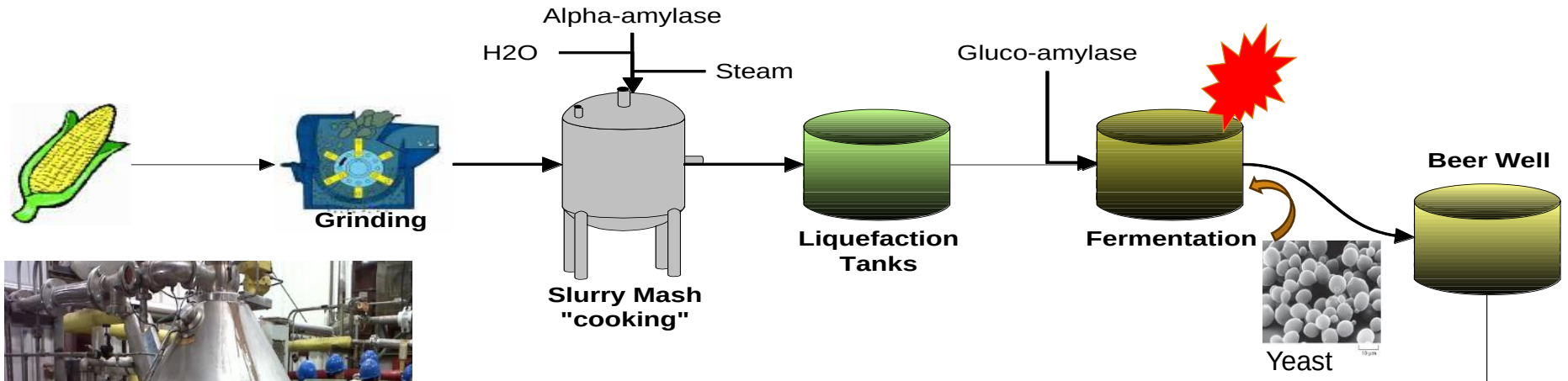
U.S. Production and Use



Source: USDA NASS

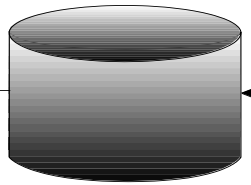
*Projected

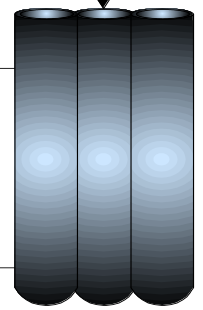
Corn-Ethanol-DDGS Process

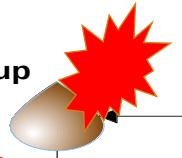


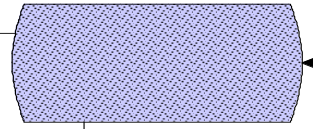
Distillers Oil

0.1-0.3 kg









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One Bushel of Corn (25.4 kg)

1/3

1/3

1/3

ETHANOL

9 Liters

DDGS

8 kg

CO_2

8 kg

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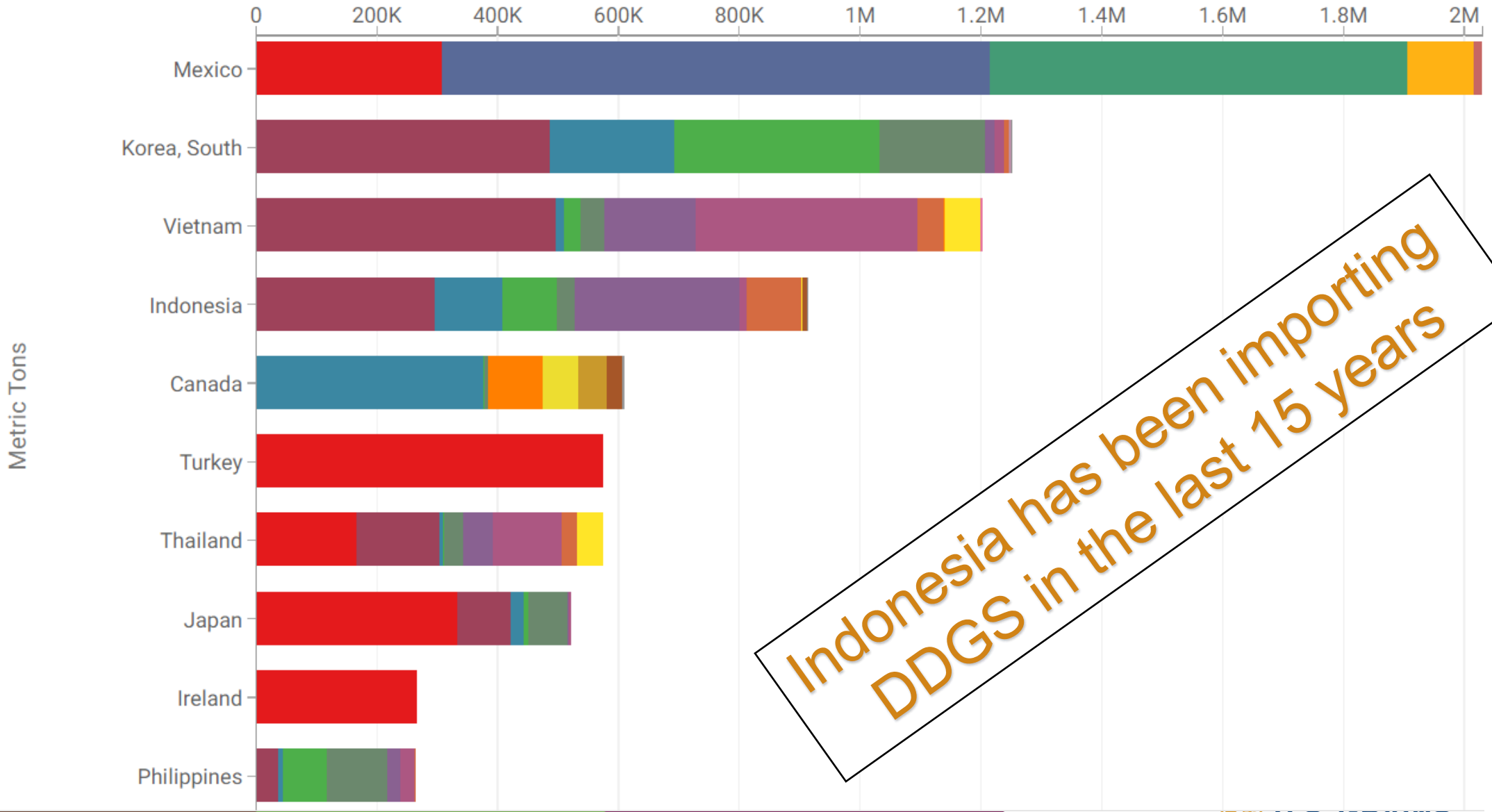
Top 10 Destinations for U.S. DDGS Exports, by Export District

This chart shows U.S exports of DDGS to the top ten destination countries by port district. Use the filters to choose a specific year, country, month or district.



Indonesia has been importing DDGS in the last 15 years

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DDGS composition for dairy

Nutrient	Corn DDGS (% of Dry Matter)
Crude protein	30.1
RUP[a] % of crude protein	55.0
$NE_{maintenance}$, Mcal/kg	2.07
NE_{gain}, Mcal/kg	1.41
$NE_{lactation}$, Mcal/kg	2.26
Neutral detergent fiber (NDF)	41.5
Acid detergent fiber (ADF)	16.1
Ether extract	10.7 (7)
Ash	5.2
Calcium	0.22
Phosphorus	0.83
Magnesium	0.33
Potassium	1.10
Sodium	0.30
Sulfur	0.44

Meta-analysis

- 23 studies with 96 treatment comparisons
  - Studies were from 1982 to 2005.
    - 80's: 5 studies with 14 treatment comparisons.
    - 90's: 8 studies with 41 treatment comparisons.
    - 00's: 10 studies with 41 treatment comparisons.
  - Considered all studies that evaluated the inclusion of distillers grains.
- Objective was to determine the effect of feeding distillers grains on DMI, milk yield and milk fat and protein composition.

Milk production, kg/d

Inclusion of DGS	Dried	Wet	All
0%	33.2	31.4	33.0
4 - 10%	33.5	34.0	33.4
10 - 20%	33.3	34.1	33.2
20 - 30%	33.6	31.6	33.5
> 30%	32.2	31.6	32.2
SEM	1.5	2.6	1.4

(Meta analysis, Kalscheur 2005)

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Feeding trial at existing Farms

Dairy Farm Cinagara, West Java

Dairy Farm Grati, East Java

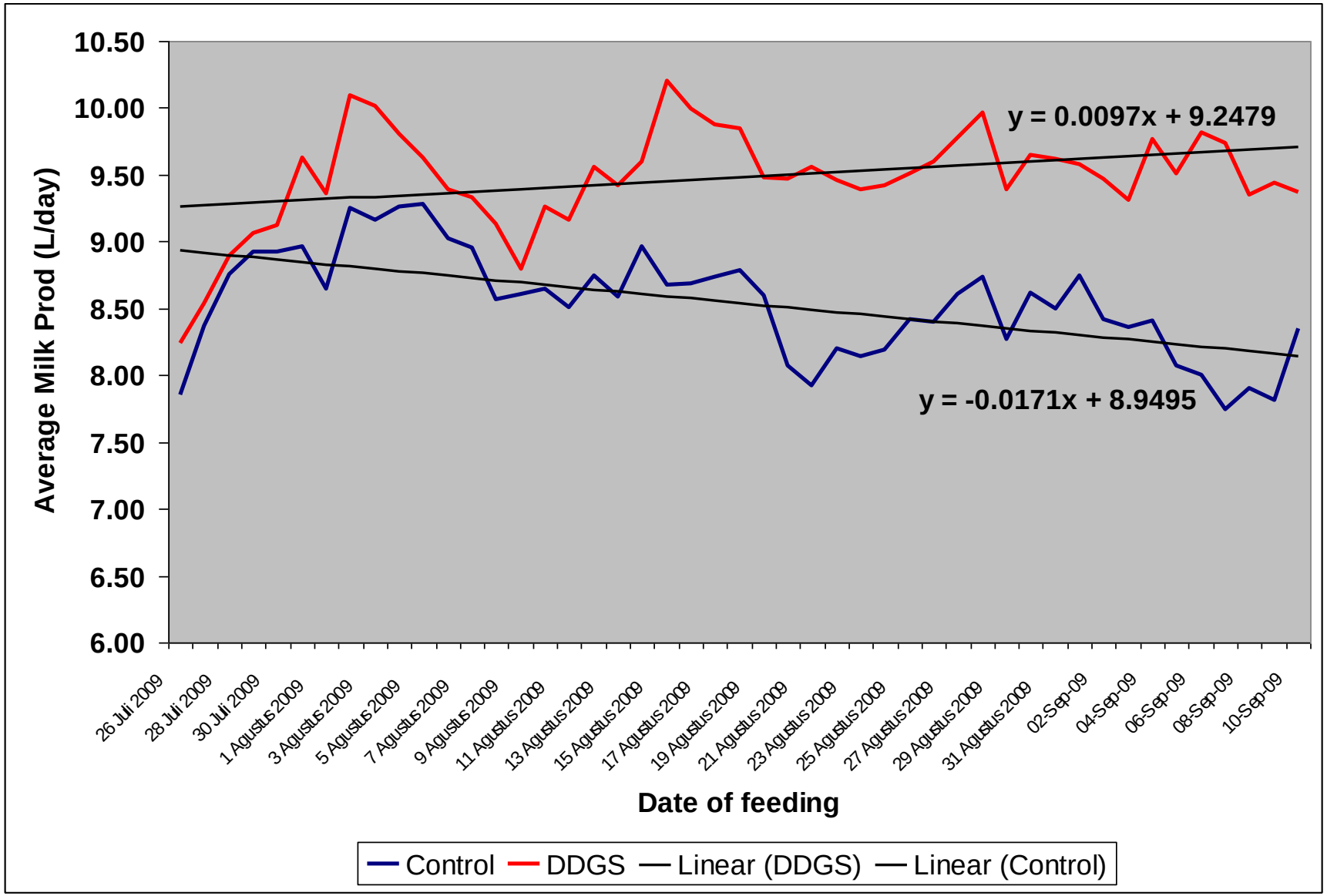


Figure 1. Milk Production of cows fed DDGS 1 kg to replace concentrate (At Cinagara)

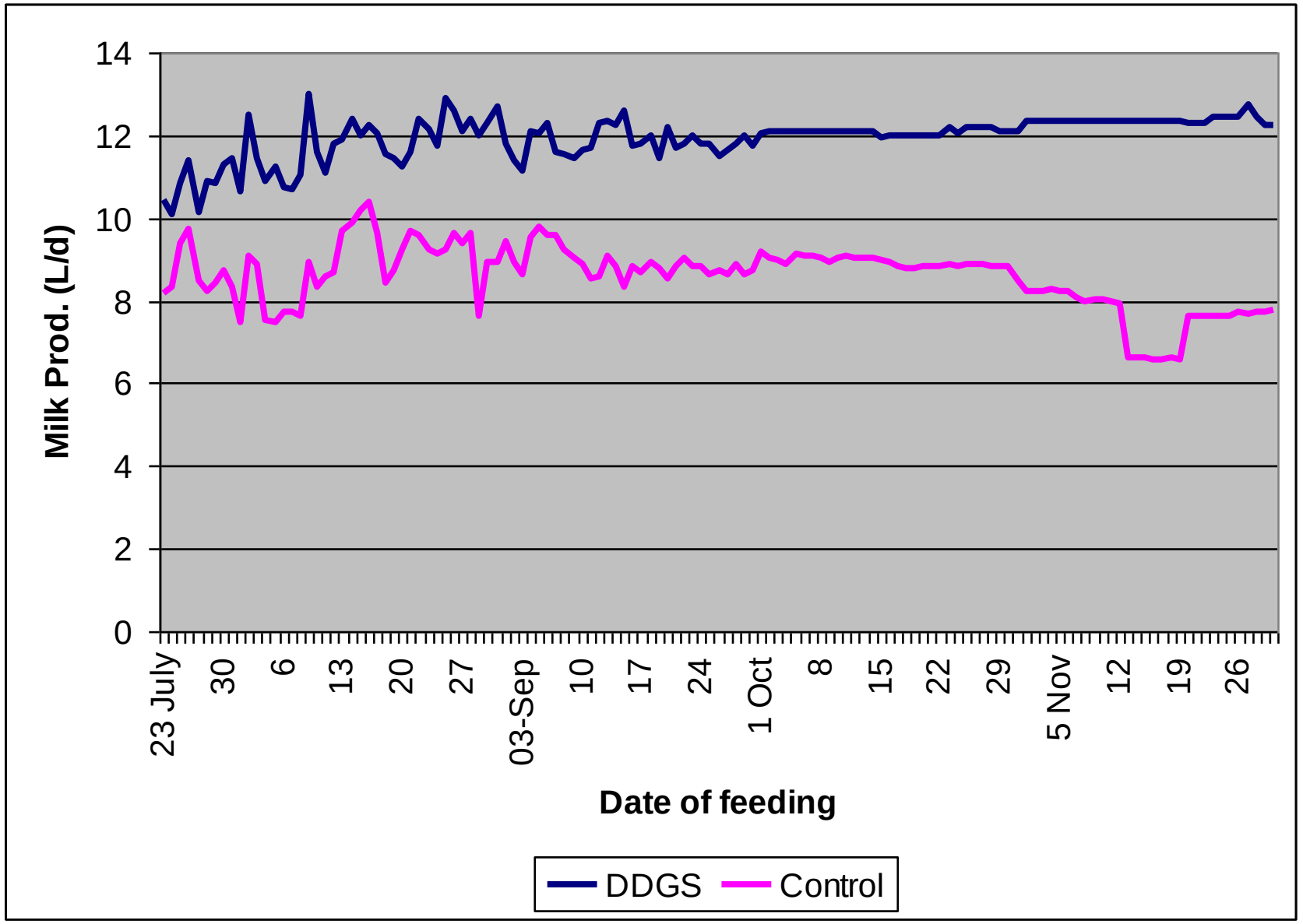
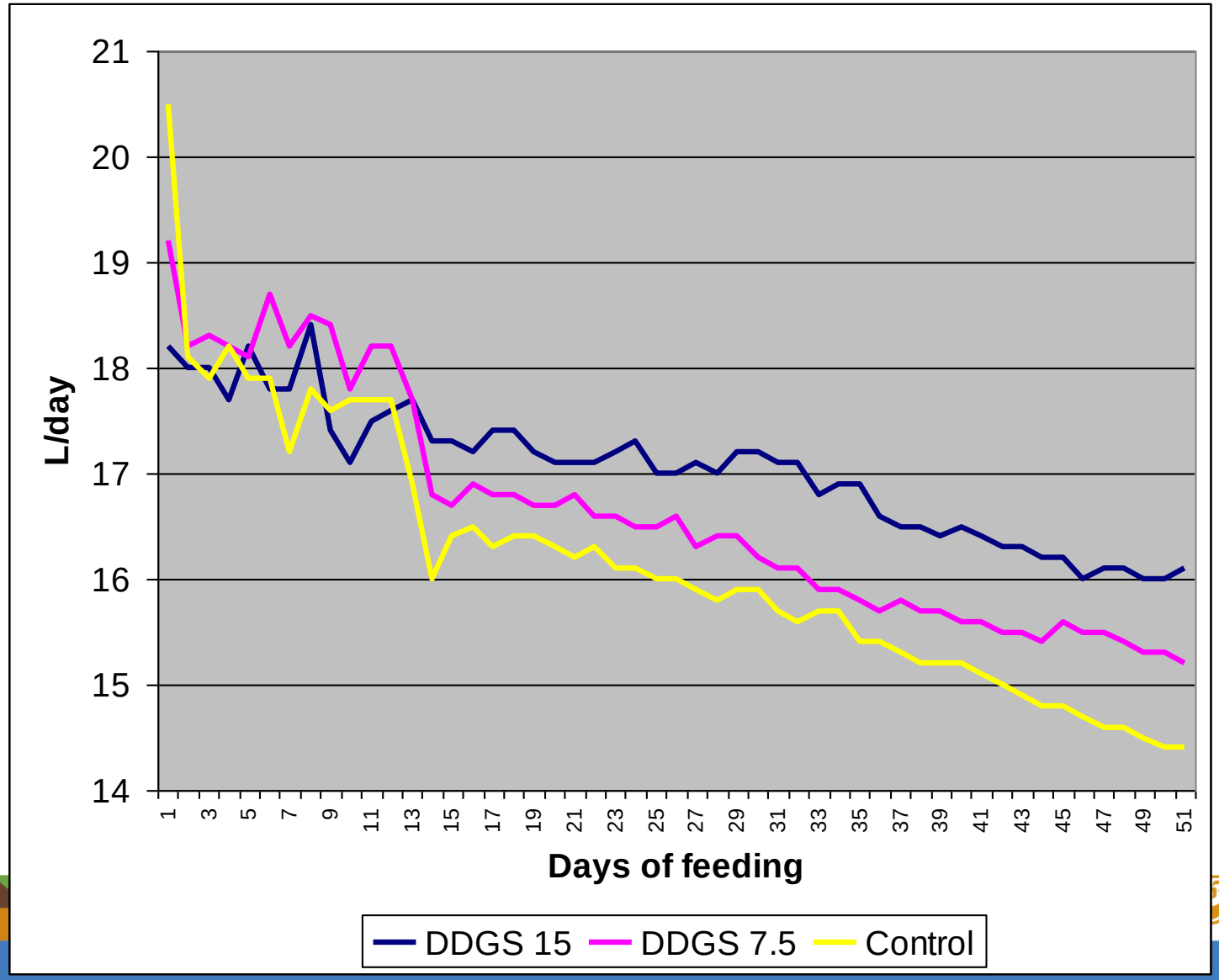


Figure 2. Milk Production of cows fed supplemented with 1 kg DDGS (At Grati)

Vinamilk, one of largest dairy in VN

Daily milk production of cows fed DDGS under hot climate in Vietnam.



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Advantage and disadvantage in using *DDGS* As feed for dairy

ADVANTAGES:

- High Protein content (30%) + Energy > Corn
- Can be fed to 30% inclusion rate in the diet
- High Digestibility and by-pass protein
- Very palatable for cows
- Improve milk production

DISADVANTAGES:

- Low level of lysine
- Lower Milk Protein at high inclusion >30%

Conclusion

- >1/3 of US Corn for Ethanol and DDGS production is 40 MMT and 11-12 MMT is exported. Indonesia import >800TMT
- DDGS contain energy, protein, phosphorus and has a feeding value for dairy cattle
- DDGS can be fed up to 30% in TMR
- Trial in Vietnam during hot summer showed DDGS slow down decreasing in milk production
- Trial in Indonesia showed DDGS can replace concentrate or top up concentrate to increase milk yield

Building a Tradition

Thank You!

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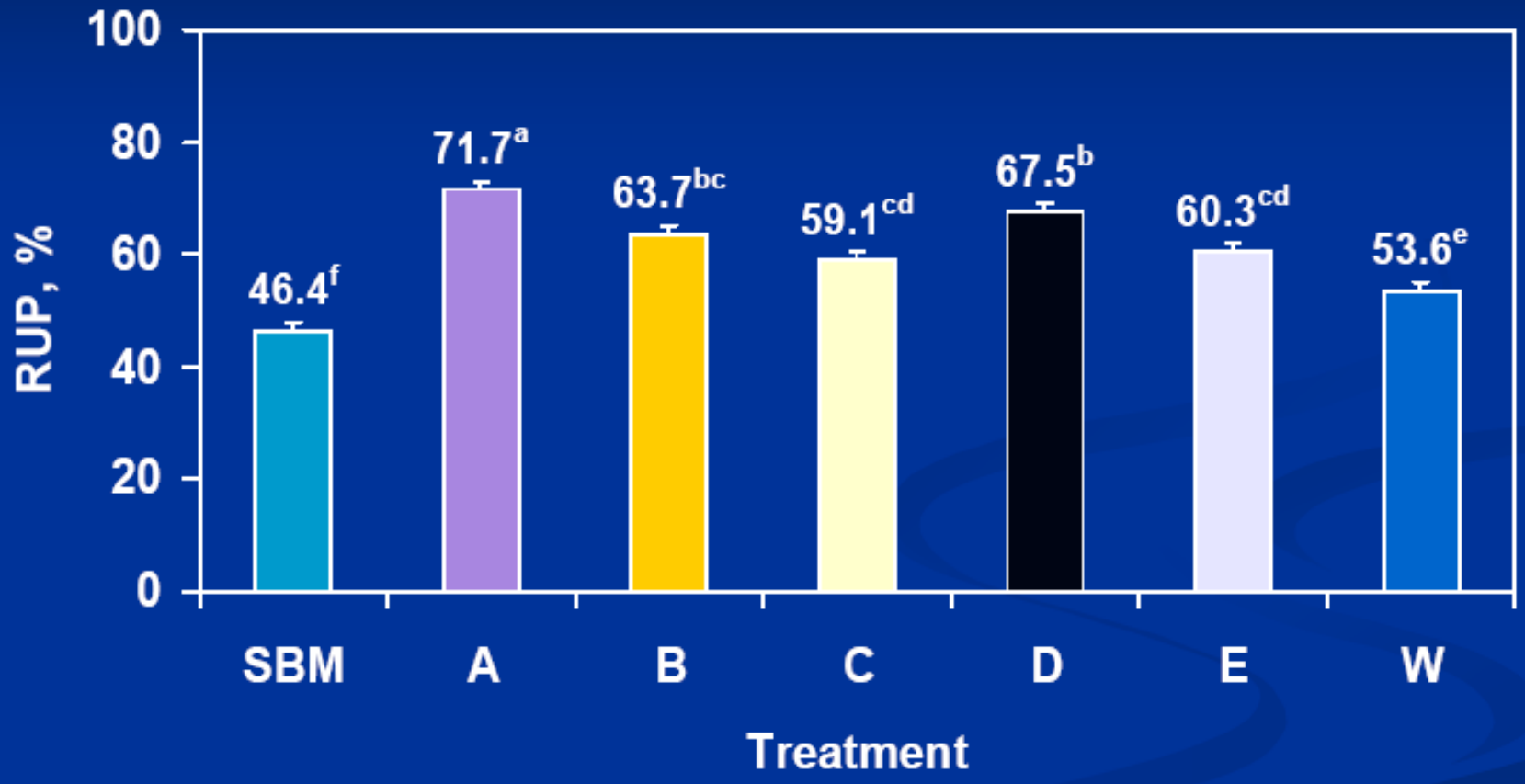
Rumen-undegraded CP



Five sources of DDGS: A – E; SBM = soybean meal;
W = wet distillers grains.

(Kleinschmit et al., 2007)

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