



 **Hot Topic**  
**Fat vs. Corn:**  
**Time to Re-evaluate**

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## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Substituting Fats for Grains?

Dramatic increases in the price of corn have revitalized questions about the profitability of substituting fats for cereal grains in dairy rations.

### Cost/Unit Energy:

1. Considerations about the energy value of fat.
2. Considerations about the limitations to feeding fat?



 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate  
Consideration #1  
The Energy Advantage of Fat Over Corn

- Total Energy (GE) values
  - Corn 2.09 Mcal/lb
  - Veg. oil 4.03 Mcal/lb
- ~ 2/1 Energy advantage





## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate NE Advantages of Fat Over Corn

- $NE_1$  values
  - ☐ Corn 0.84 Mcal/lb (NRC)
  - ☐ Veg. oil 2.57 Mcal/lb (NRC)
- ~ 3/1 Energy advantage
- Replace 1 lb corn with fat
  - ☐ Increase  $NE_1$  1.73 Mcal
  - ☐ Potential milk increase 5.5 to 6 lb



## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Consideration #2

- Don't assume all fat sources have the same energy content!
- How do fat sources vary?
  - Fatty acid composition
  - Fatty acid content



# **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Fatty Acid Composition

Abbr.	Name	Tallow	DGS	Linseed	Canola
16:0	Palmitic	25	15	5	-
18:0	Stearic	22	3	4	7
18:1	Oleic	42	26	19	54
18:2	Linoleic	3	53	14	30
18:3	Linolenic	-	2	58	7



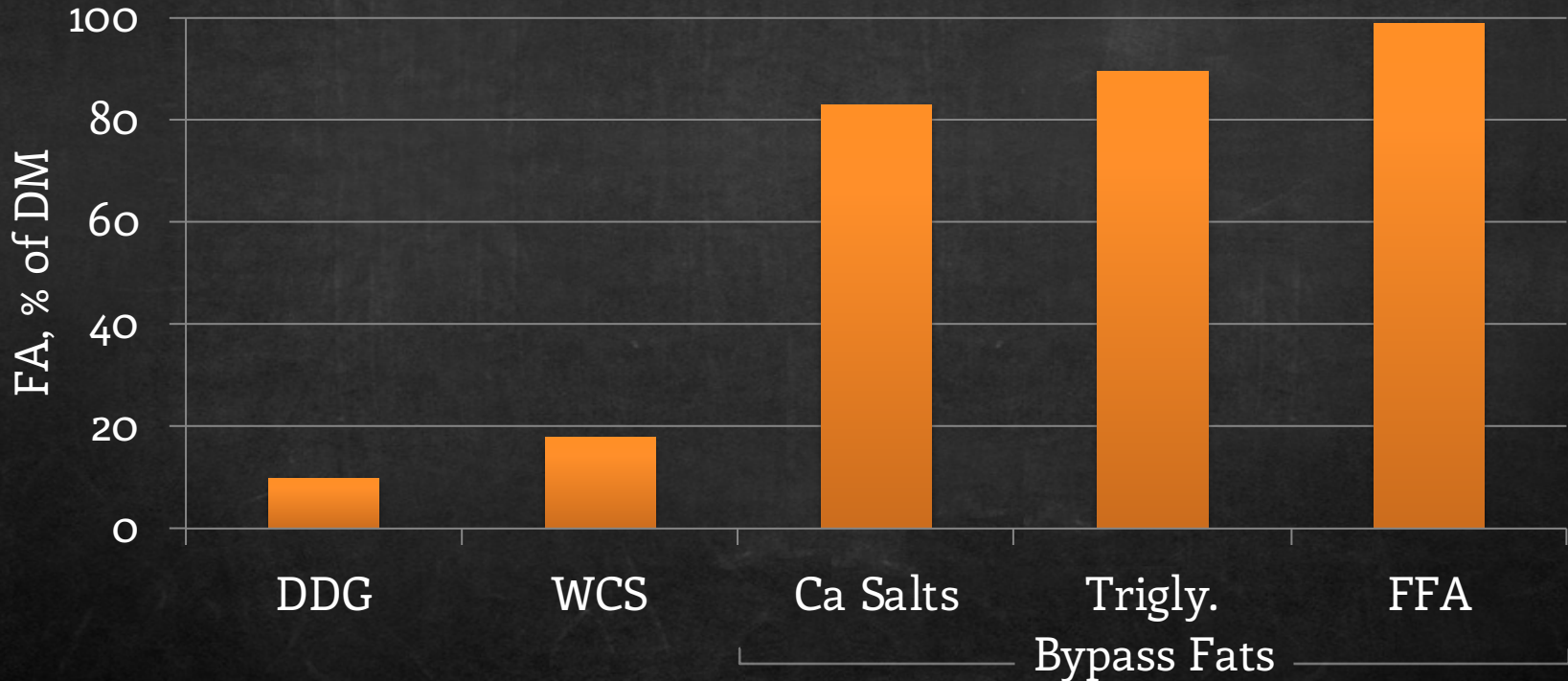


## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Consideration #2

- Don't assume all fat sources have the same energy content!
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 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Fatty Acid Content of Dairy Fat Supplements







## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate GE Values of Commercial Fats

- 100% Free Fatty Acid – 4.26 Mcal/lb<sup>a</sup>
  - Examples
- 100% Triglycerides – 4.03 Mcal/lb<sup>a</sup>
  - Examples
- Calcium Salt of FA – 3.48 Mcal/lb<sup>a</sup>
  - Assumes 82% FA/18% ash

<sup>a</sup> GE Values taken from Grummer & Rabelo. 1998. Southeast Dairy Herd Management Conference, Macon, GA.



 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate  
Consideration #3

Adding fat will always increase diet energy density but not necessarily increase energy for milk.



## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Reasons to Lower Fatty Acids

Three situations where adding fat might not increase (or even decrease) energy available for milk:

1.

2.

3.





# **Hot Topic** Fat vs. Corn: Time to Re-Evaluate 5% Yellow Grease

	Con	Ideal	Actual
DMI, lb/d	50.4	50.4	
GE, Mcal/lb	2.04	2.16	
GE, Mcal	102.6	108.9	
DE, %	65.5	65.5	
DE, Mcal/d	67.2	71.3	





# **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Bypass Fat Effects on Energy

	Con	Ideal
DMI, lb/d	52.6	51.8
DE, %	65.2	64.5
GE, Mcal/d	103.8	106.8*
DE, Mcal/d	1.29	1.33*



 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate  
How Do You Prevent Negative Fat Effects?

- Choose the proper feeding rate.
- Optimal feeding rate varies with fat source.
- Guidelines for choosing the proper level of fat is topic of Webinar #3 on **November 15, 2012.**



## **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Consideration #4

- Fats have value beyond just energy
  - ❑ Reduce negative effects in rumen
  - ❑ Improve transport and handling
  - ❑ Partial rumen protection of unsaturated fatty acids



# **Hot Topic** Fat vs. Corn: Time to Re-Evaluate Why Use Fat Supplements?

Fat Use	Benefits
Increase diet energy density	Increase milk production





 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate  
Consideration #5  
Watch Other Nutrients When Adding Fat

- Total protein
- Fermentable CHO and MP synthesis
- Vitamins and minerals



 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate  
Final Points

- Know fatty acid content of your fat source(s)
- Cows have maximum tolerance to fat



 **Hot Topic** Fat vs. Corn: Time to Re-Evaluate  
Final Points

- Choose a proper feeding rate for rumen-active fats
- Assess risks of commercial fats