



What is the Cause of Milk Fat Depression in Layman's Terms?

Tom Jenkins
Animal & Veterinary Sciences



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SMART SOLUTIONS FOR INNOVATIVE DAIRIES



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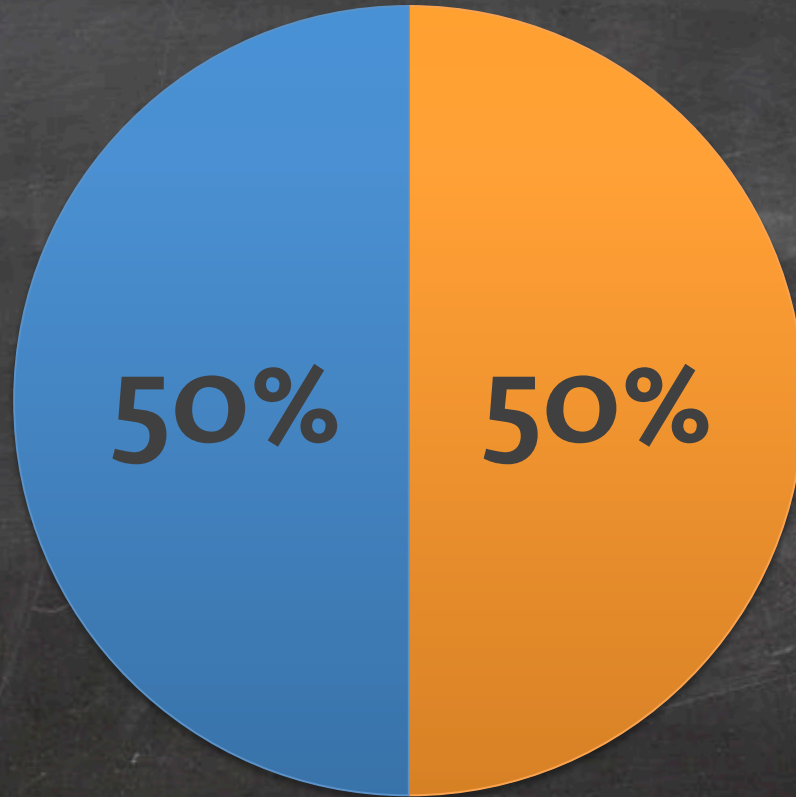
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	High Forage	High Grain	P <
Milk Fat, %	3.36	2.49	0.01
Rumen Ac/Pr	3.08	1.67	0.01



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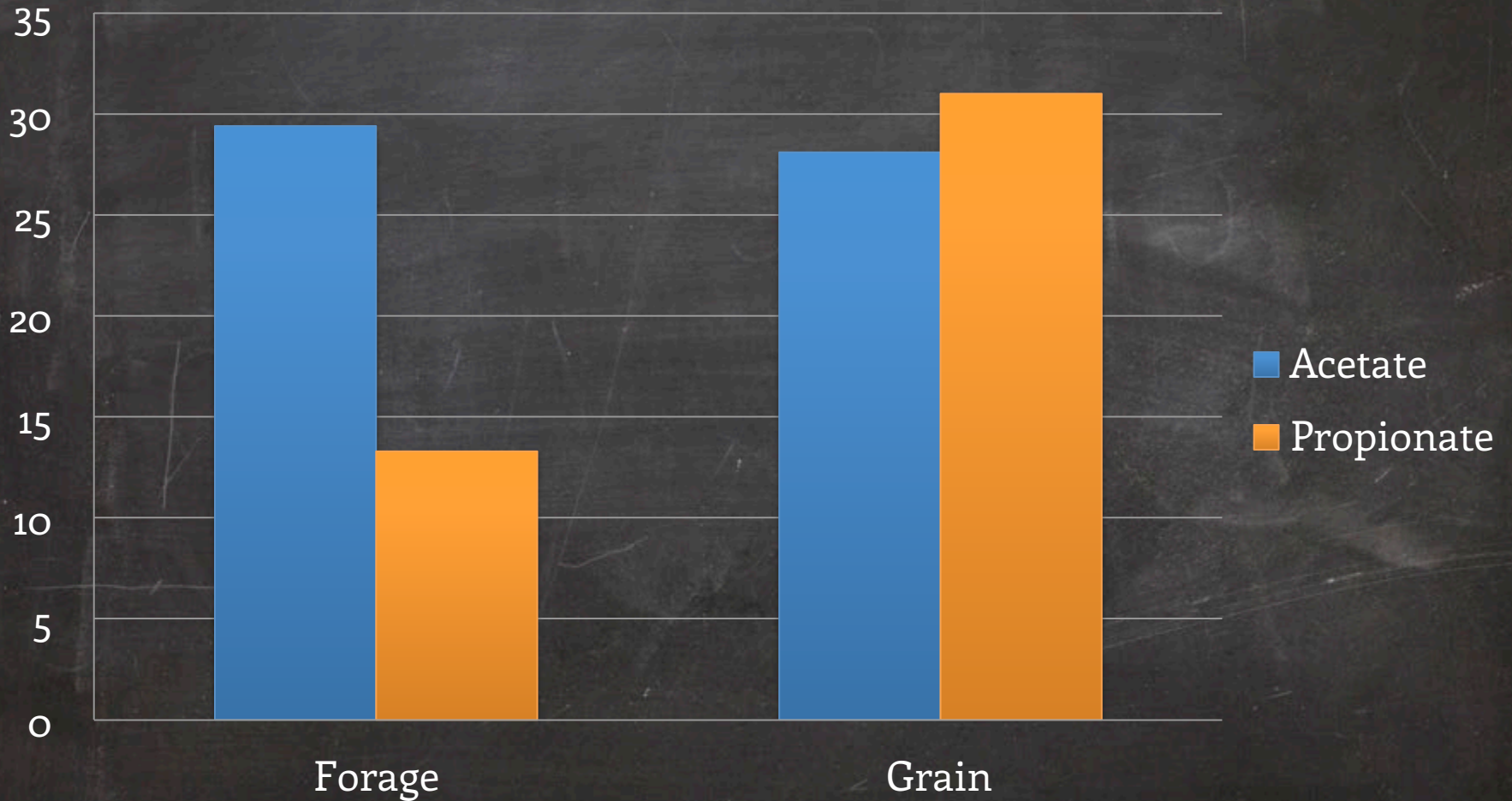


■ From Diet Fat ■ Made by Mammary Gland



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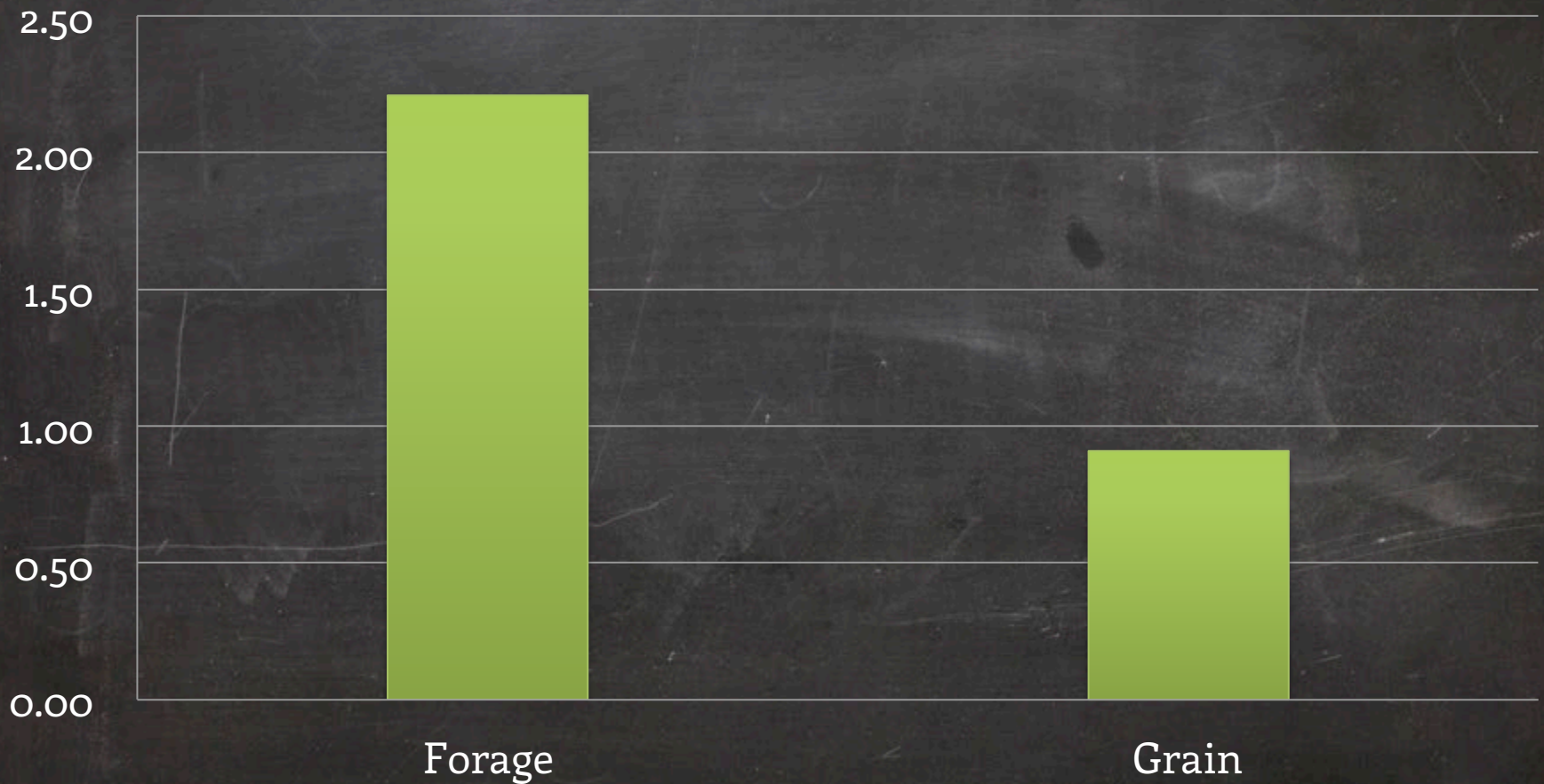




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Ratio





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Caused by Changes in Dietary Lipid as it Passes Through the Rumen?





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**MAINLY
UNSATURATED
IN FEED**

BIOHYDROGENATION

**MAINLY
SATURATED
IN INTESTINES**



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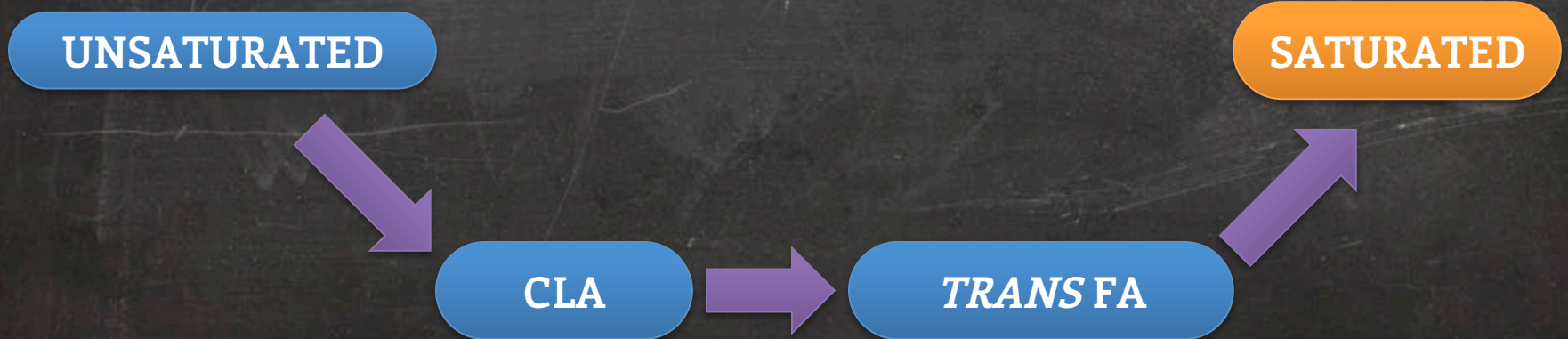
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	Intake g/d	Lipolysed g/d	Duodenal g/d
C12:0	10.56	10.22	10.56
C14:0	13.27	11.10	13.27
C16:0	290.36	226.67	297.06
C16:1	4.65	4.57	4.76
C18:0	35.06	29.31	597.68
C18:1T	0.84	0.76	109.35
C18:1C	233.96	188.13	81.15
C18:2	495.57	477.97	51.32
C18:3	58.93	57.31	2.95
Other	18.21	17.33	58.88
Ration	1161.40	1023.37	1226.96



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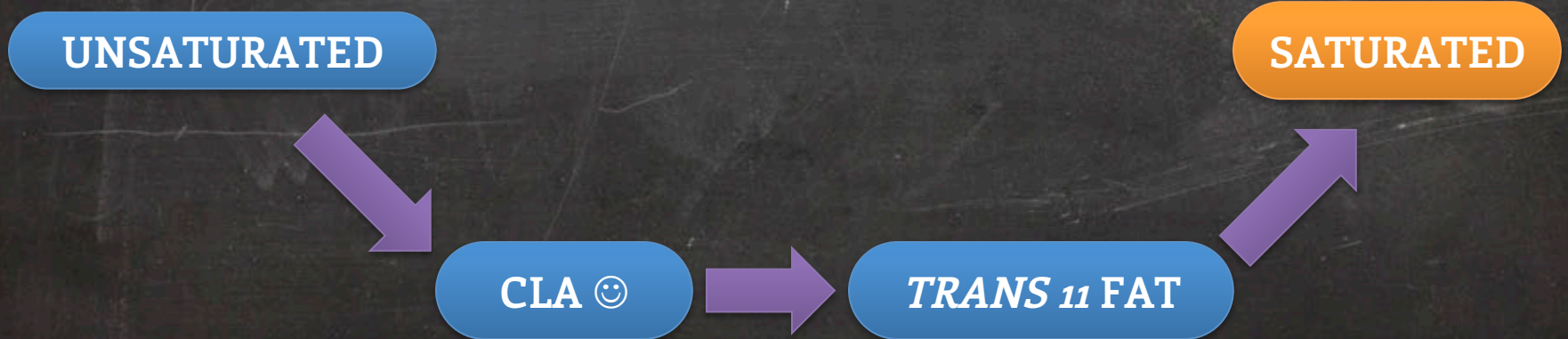
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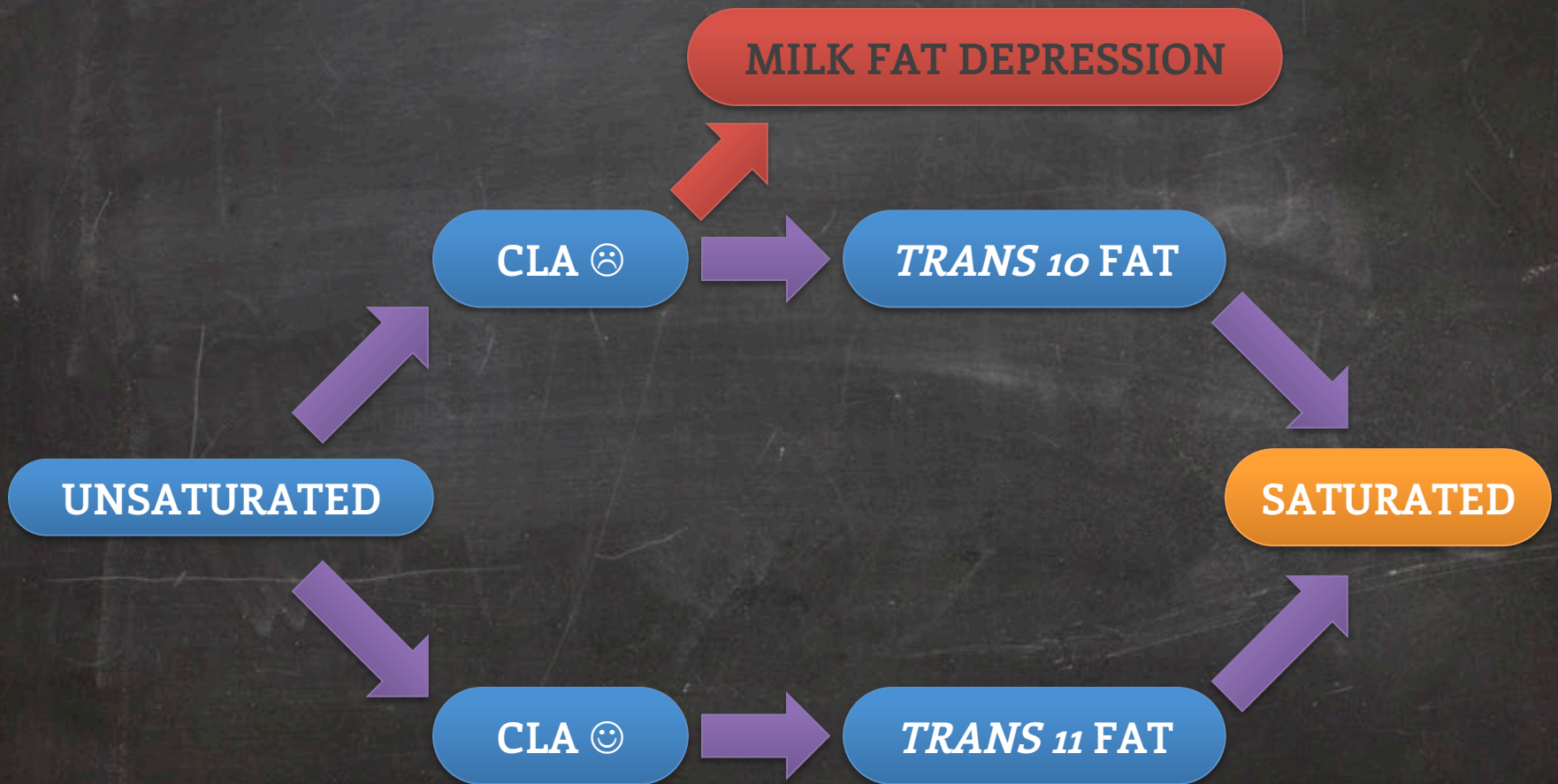
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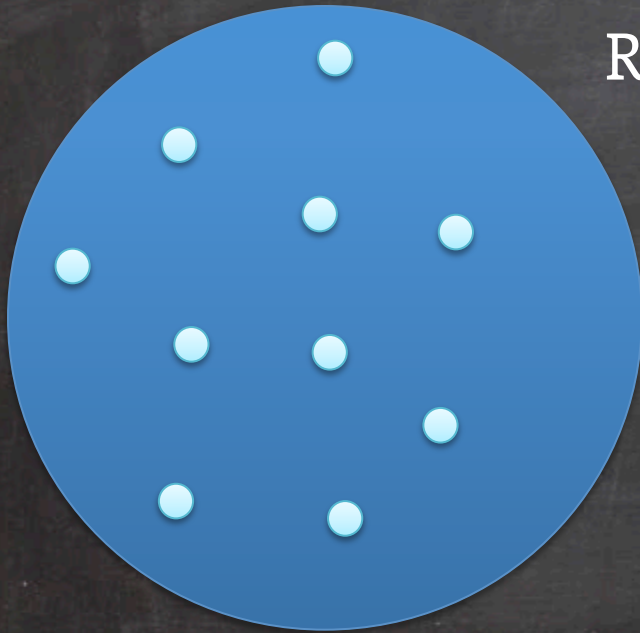




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Rumen Input of Fatty Acids in Cows



● Feed C16 and C18 Sat\Unsat (n=10)

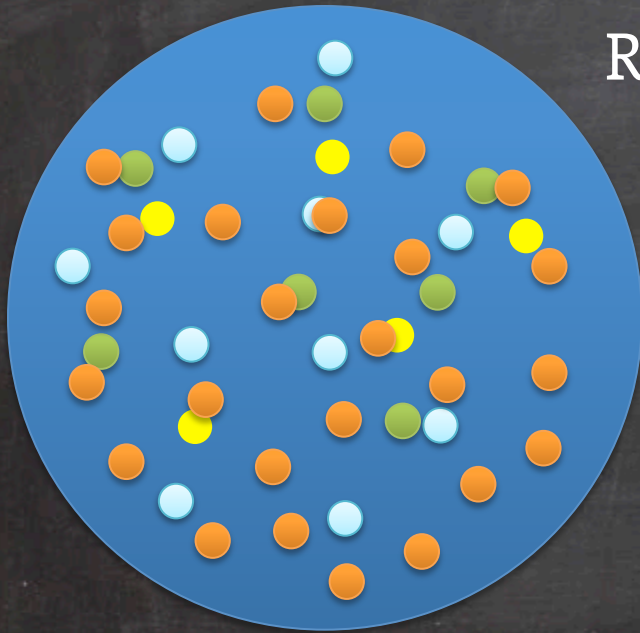


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Rumen Output of Fatty Acids in Cows

CLA_{MFI} (n=3)



- Feed C16 and C18 Sat\Unsat (n=10)
- Microbial Trans FA (n=5)
- Microbial CLA (n=7)
- Microbial Other (n=28)



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CLA

Bioactive lipids made by microorganisms in the rumen from unsaturated fatty acids in the feed.

CLAMFI

The three CLA produced in the rumen that are milk fat inhibitors and cause milk fat depression.



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CLA Isomers Tested in the Dairy Cow

- trans-8, cis-10 CLA
- cis-9, trans-11 CLA
- trans-9, trans-11 CLA
- trans-9, cis-11 CLA (Perfield et al. 2007)
- trans-10, cis-12 CLA (Baumgard et al. 2000)
- cis-10, trans-12 CLA (Saebo et al. 2005)
- trans-10, trans-12 CLA
- cis-11, trans-13 CLA



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Points to Remember

- CLA_{MFI} overproduction in the rumen leads to MFD.
- Excessive grain causes MFD by overproducing CLA_{MFI} not by inadequate acetate production in the rumen.
- CLA_{MFI} are synthesized when microorganisms in the rumen convert unsaturated fat consumed to saturated fat.
- The rumen production of CLA_{MFI} can be controlled by diet.



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