

# ENTERIC METHANE EMISSION OF DAIRY COWS FED WITH FRESH OR ENSILED SUGAR BEETS

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# WHY SUGAR BEETS?

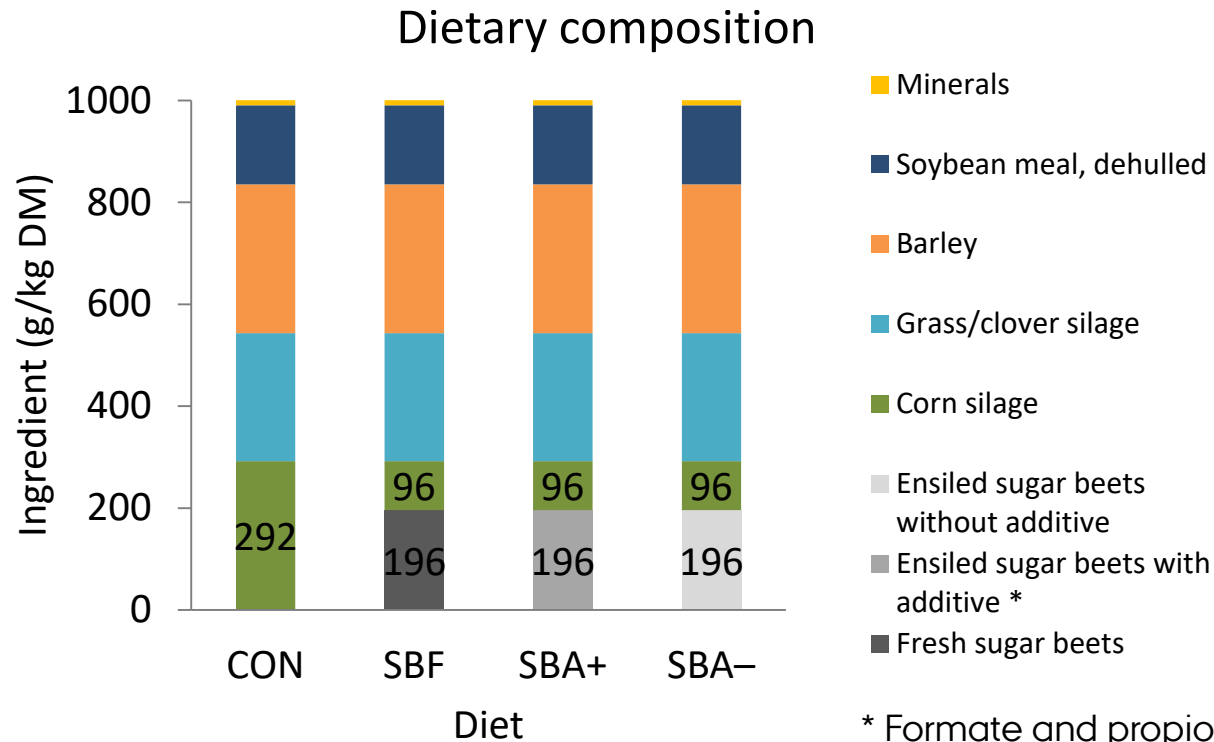


- Grows in a wide variety of soil types and climatic conditions
- Low nitrogen leaching
- “Fresh” beets → cattle feed during winter
- Ensiling beets → feeding year-round

*What about rumen fermentation and methane?*

	Sugar beets		
		Ensiled beets	
	“Fresh” beets	+ additive	- additive
Main energy source:	sugar	sugar	ethanol
Rumen fermentation:	↑ butyrate, ↑ H <sub>2</sub> , pH ↓	↑ butyrate, ↑ H <sub>2</sub> , pH ↓	-
Methane production:	↑ or ↓	↑ or ↓	↓

# DIETS



**Chemical composition**

	Diet			
	CON	SBF	SBA+	SBA-
<b>Chemical composition (g/kg DM)</b>				
DM (g/kg fresh matter)	470	417	415	421
NDF	274	229	217	221
Starch	265	205	202	229
Total sugar	43.0	135	183	83.0
Sucrose	1.82	15.5	24.2	2.06
Glucose	14.2	50.0	70.5	18.8
Fructose	14.7	50.4	71.7	46.3
Ethanol	2.82	2.08	3.10	4.71

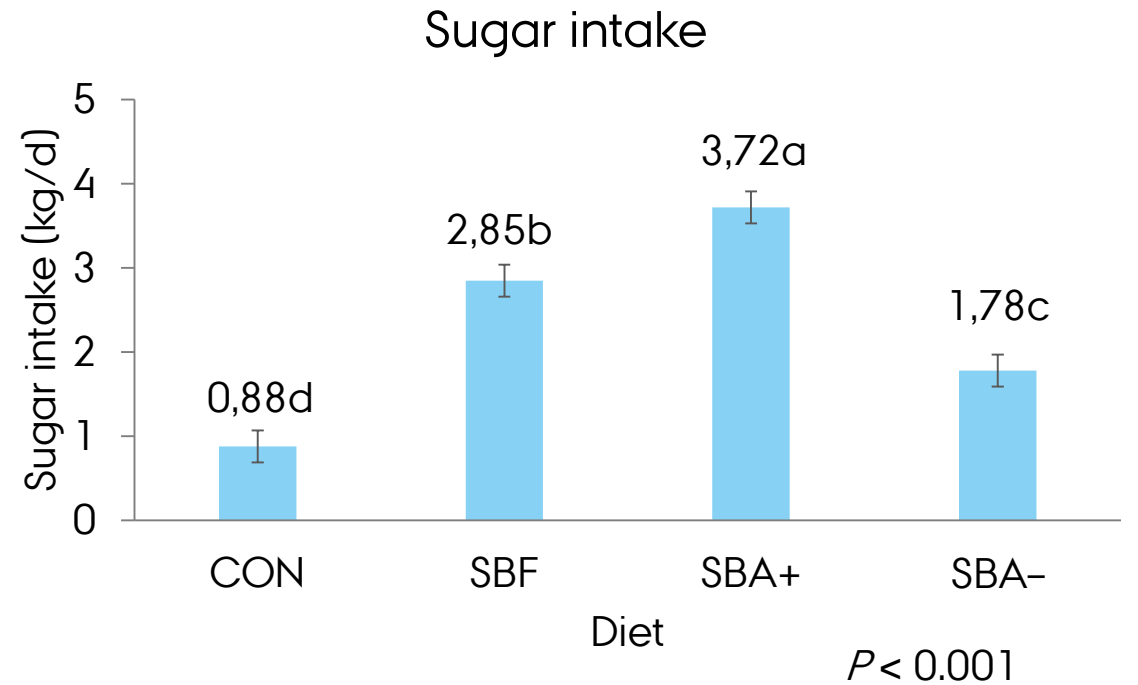
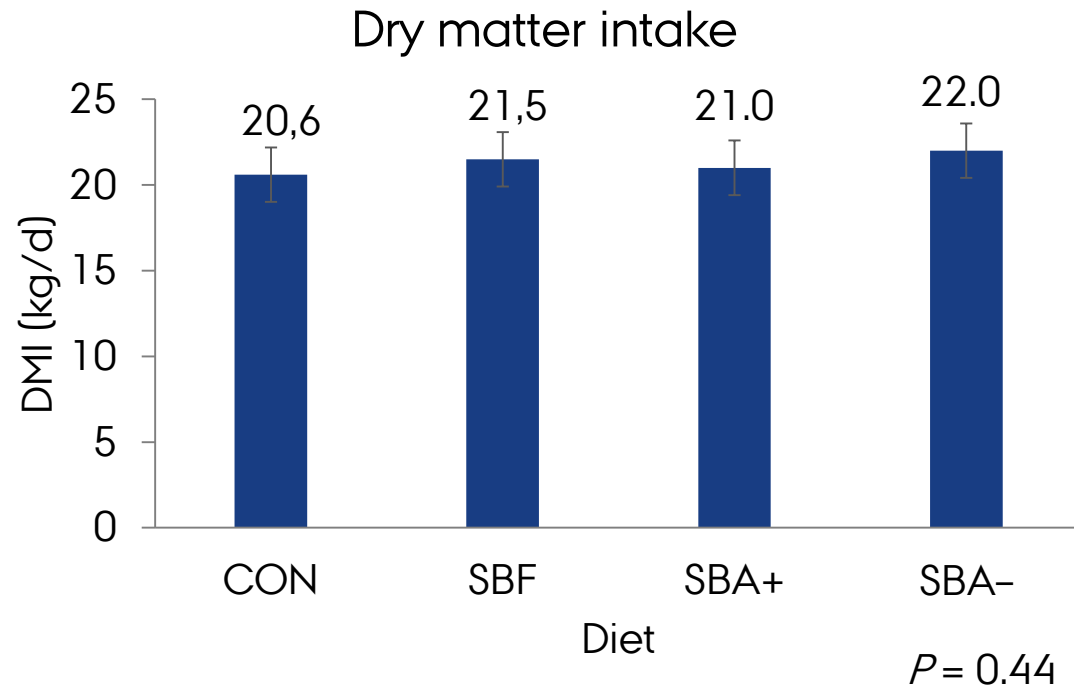
\* Formate and propionate based additive

# EXPERIMENT

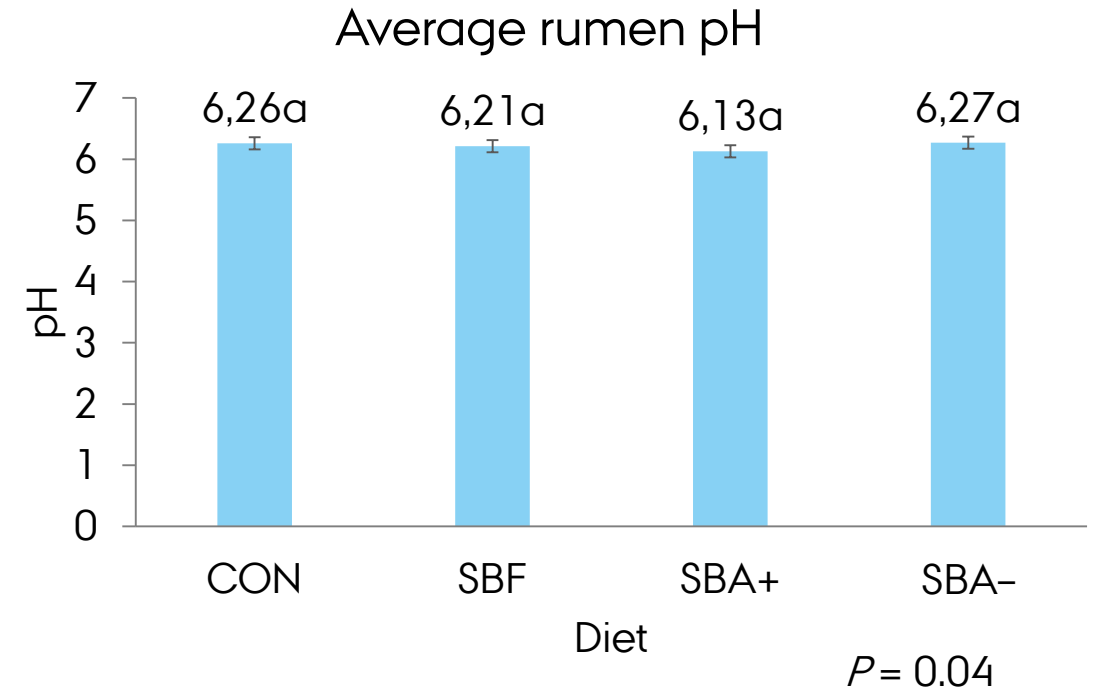
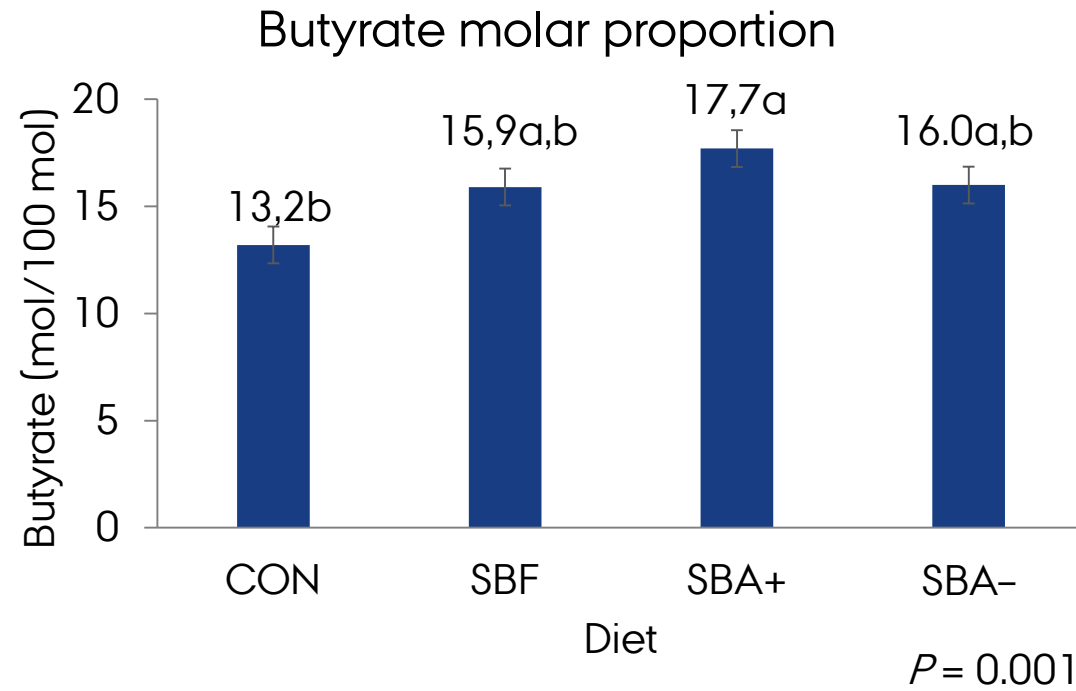
- Latin square design
- 4 cows
- Measurements:
  - Feed for DM and nutrients
  - Feed intake
  - Rumen liquid for fermentation characteristics
  - Digesta for digestibility determination
  - Respiration chambers for gas exchange



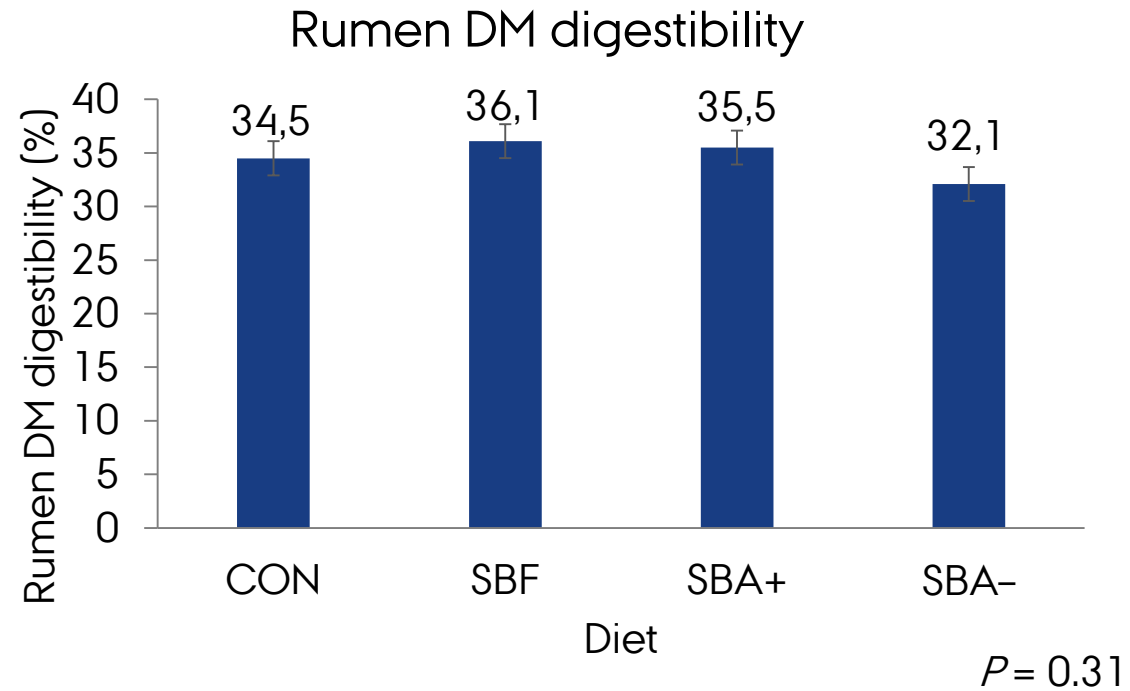
# INTAKE



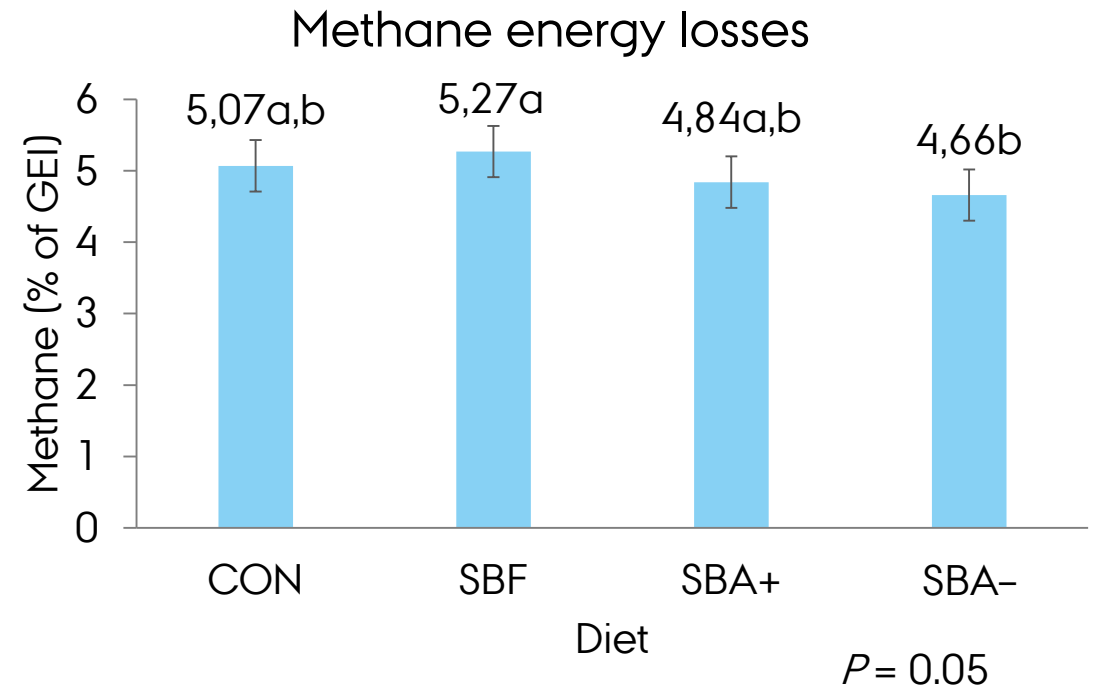
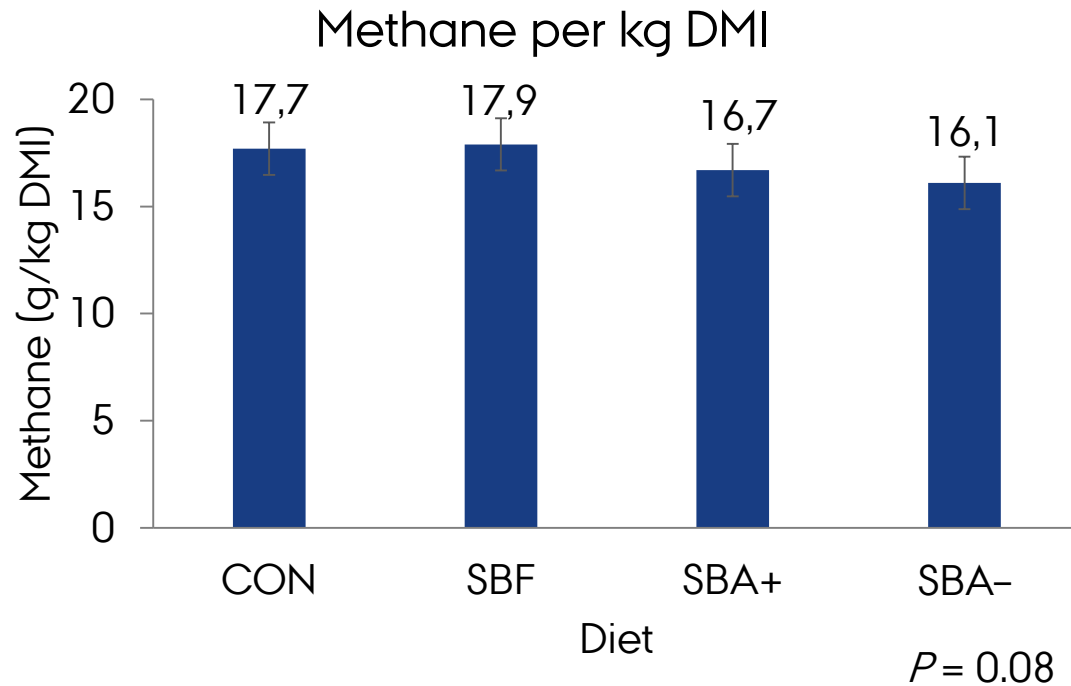
# RUMEN FERMENTATION



# DIGESTIBILITY



# METHANE EMISSION





# CONCLUSIONS

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- 1) Sugar beets can replace corn silage in dairy cattle rations
- 2) Sugar beets ensiled without additive can lower enteric methane emission compared to feeding fresh beets.

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