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Eugene, M; Masse, D; Chiquette, J; Benchaar, C 2008 Meta-analysis on the effects of lipid supplementation on methane production in lactating dairy cows
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Background and objective

Nutritional strategies have been suggested to mitigate enteric methane (CH₄) production by ruminants. Supplementation of dairy cow diets with lipids is widely used to increase the energy content of the diet and to enhance energy utilization for milk production. Moreover, lipids inhibit CH₄ production, but the effects are variable due to the level of lipid supplementation, the chain length of fatty acids, and the interactions between lipids and the basal diet composition. A meta-analysis was conducted to statistically determine the effects of lipid supplementation on CH₄ production, milk production, and milk composition of lactating dairy cows. Here, results on milk production are reported.

Search strategy and selection criteria

Seven publications (reporting 25 diets) available in the literature on the effects of lipid supplementation on CH₄ production, milk production, and milk composition of dairy cow were used to build the database. 1) In each selected study, there was a control diet [i.e., lower ether extract (EE) content] consisting of a basal diet, and a lipid-supplemented diets (i.e., higher EE content) as dietary treatments; 2) In all studies, control and lipid-supplemented diets were fed for ad libitum intake.

Data and analysis

Data were analyzed using the MIXED procedure of SAS software. The linear model included lipid supplementation as a fixed, categorical effect and the study effect and its interaction effects as random components of the mixed model. The data were weighed by the square root of the number of animals using the weigh statement of SAS software.

Number of papers	Population	Intervention	Comparator	Outcome	Quality score
7	Dairy cattle	Lipids supplementation	No lipid supplementation	Metric: 1) Dry matter intake (DMI); 2) Feed efficiency; 3) Milk production; Effect size: not applicable	37.5

Results

- Lipid supplementation decreased dry matter intake by 6.4% compared with control diets (17.4 vs. 18.6±1.58 kg/d, respectively).
- Feed efficiency and production of milk were not significantly changed.
- NULL
- NULL
- NULL

Factors influencing effect sizes

- No factors influencing effect sizes to report

Conclusion

Overall, lipid supplementation improves feed efficiency (expressed as kg 4% fat corrected milk per kg dry matter intake) by 7%.