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ActiSaf

Increasing feed efficiency of early lactation dairy cows

Objective: To quantify the effects of a 10 gram (100 billion cfu) daily supplementation of Actisaf on early lactation dairy cow performance

Trial design:

Comparative experimental study with a continuous trial design

Location: University of Nottingham Centre for Dairy Science Innovation (CDSI), United Kingdom

Species/Life Stage

50 early lactation Holstein-Friesian cows

Main Criteria

Milk yield and composition, dry matter intake (DMI), rumination time, methane emissions, faecal digestibility, liveweight and body condition score (BCS), fertility, NEFA, BHB, glucose, milk progesterone and insulin

Reference

On file

Protocol

Control: 25 cows received base diet, plus placebo

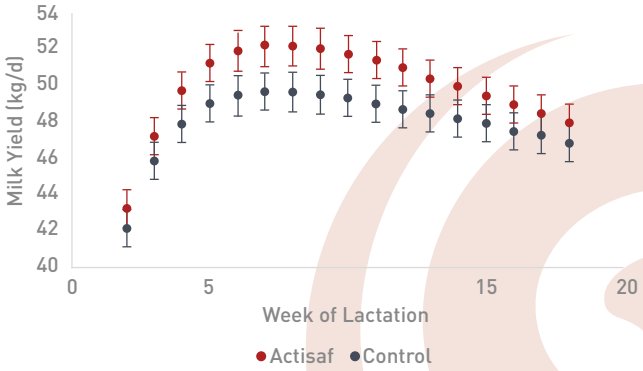
Treatment: 25 cows received base diet, plus 10g Actisaf per day

7 to 128 days in milk (DIM)

Main Results

Effects of Actisaf:

- Significant 2.8kg increase in energy corrected milk yield in treatment group (+5.9%)
- Feed efficiency improved by 5.5%
- No increase in DMI
- No change in live weight or BCS
- Grams of Carbon / kg ECM reduced from 1.016 g CO_2 equivalent per kg ECM to 0.96 CO_2 equivalent per kg ECM (- 5.5%)



Conclusion

This study demonstrates that dietary supplementation with 10 grams of Actisaf per day (100 billion CFU) significantly increases the yield of energy corrected milk with no associated lift in DMI thereby significantly improving feed conversion efficiency. This improvement in performance had no negative effects on body condition score, health, methane emissions or fertility whilst it resulted in a reduction of carbon emissions per litre of energy corrected milk.

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Introduction

This study evaluated the effect of Actisaf on cow performance of a high-performing dairy herd in early lactation. Actisaf's known effect on rumen function, NDF digestibility, rumen lactic acid levels and production of volatile fatty acids (VFA) supported the study hypotheses that it would improve parameters for milk production and feed conversion efficiency.

Materials and Methods

Cows were paired pre-calving according to parity, predicted milk yield and live weight, then allocated to either the control or treatment group. Both groups were fed the same base diet, with the treatment group receiving 10g/day of Actisaf.

Cows were kept in loose housing with sand bedded cubicles, robotic milking and ad libitum access to feed and water, compliant with best practice animal welfare guidelines.

Results and Discussion

Cows fed on Actisaf had higher yields of milk, energy-corrected milk, fat corrected milk and milk fat, with strong tendencies for higher yields of milk protein and lactose when compared to control cows.

	Control	Actisaf	Diff.	p-Value
Milk yield, kg/d	47.5	50.1	+2.6	0.033
Energy-Corrected Milk, kg/d	47.7	50.5	+2.8	0.009
Fat-Corrected Milk, kg/d	46.3	49.2	+2.9	0.008
Fat, g/d	1823	1945	+122	0.022
Protein, g/d	1521	1593	+72	0.06
Lactose, g/d	2236	2342	+106	0.066

Digestibility	Control	Actisaf	p-Value
Dry matter	0.773	0.798	0.034
NDF	0.665	0.706	0.020
Nitrogen	0.759	0.786	0.052

(kg/day)	Control	Actisaf	p-Value
DMI	23.9	24.0	0.929
PMR intake	17.1	17.1	0.938
Concentrate intake	6.8	6.9	0.745

There was no effect of treatment on:

- total dry matter intake, intakes of partial-mixed ration or concentrates,
- methane production (g/d), methane yield (g/kg DMI) or methane intensity (g/kg ECM).
- live weight, body condition score, or rumination time
- blood parameters such as NEFA or BHOB
- somatic cell count
- fertility parameters

	Control	Actisaf	p-Value
BHOB, mmol/l	0.79	0.84	0.389
NEFA, mmol/l	0.22	0.21	0.873

Conclusion

The main finding of this study was that Actisaf increased energy corrected milk yield by an average of 2.8 kg/d with no difference in dry matter intake or live-weight change and increased feed efficiency by 5.5%. This increased yield was achieved without any detrimental effect on fertility, health or methane emissions.

Dry matter intake was not affected by treatment in this study. Instead, increased milk yield can be attributed to increased digestibility, which would effectively increase metabolisable energy (ME) supply to cows.

An increase in milk production coupled with no resulting increase in methane emissions translated into a decreased carbon footprint of the treatment group, which was reduced by 5.5% from 1.016 to 0.96g CO_2 /kg of Energy Corrected Milk.

This study supports the ability of Actisaf to increase milk production from forage through increased NDF digestibility. The results indicate that Actisaf has a significant role to play in helping cows reach their genetic potential, improving profitability and reducing the environmental impact of milk production.

Keywords Actisaf, feed conversion efficiency (FCE), early lactation, milk yield, carbon footprint, methane emissions, fibre digestibility, dairy cows, body condition scoring (BCS), live weight, dry matter intake (DMI), metabolisable energy (ME).