Effects Of Adding a Lipid Supplement To Milk Replacer and Starter Feed In Bull Calves

SmartCalfFat Project (2021-2022)

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The aim of this project was:

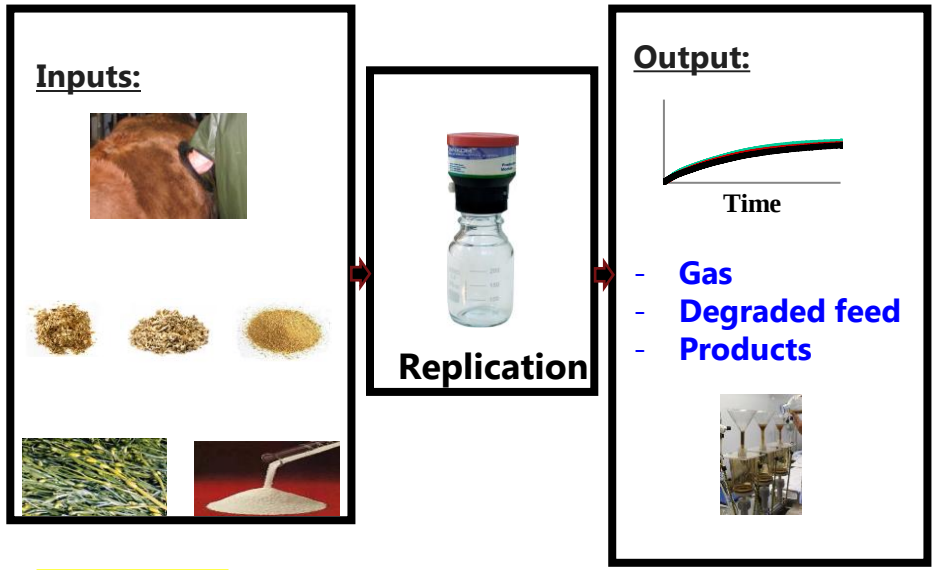
To recommend the type, amount, and time of use of fat supplements for beef calves. An increase of 10-15% in growth was expected, depending on the type, quantity, and period of fat supplementation.

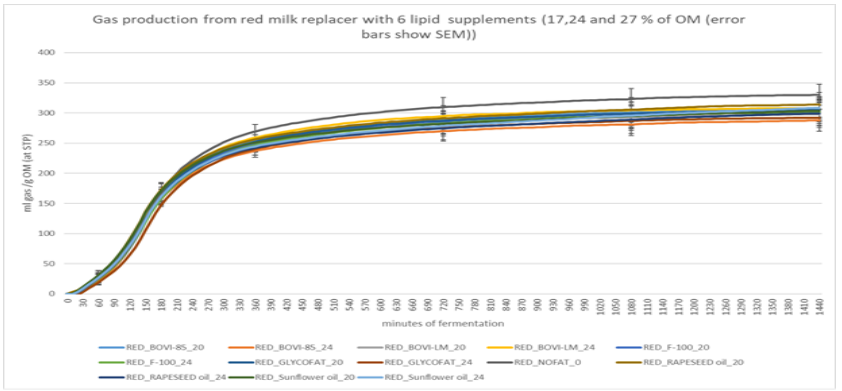
- Laboratory analyses to screen additives for usefulness
- Two on-farm tests with chosen supplements during milk replacer period and starter feed period.

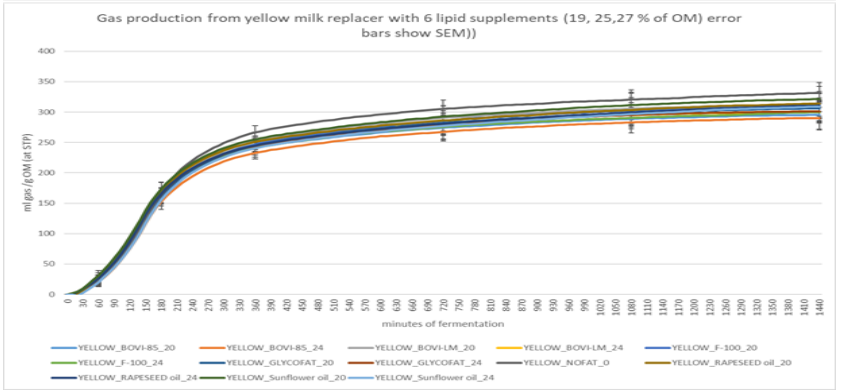
Laboratory tests- gas production, volatile fatty acids and digestibility

- **two milk replacers**
  - 19% and 25 % (yellow) fat and protein in OM
  - 17% and 26% (red) fat and protein in OM
- **two starter feeds**
  - 3.51 and 22,% fat and protein (under 3 months)
  - 3.16 and 20% fat and protein (over three months)
- **3 doses** (0, “20”, and “24” % additive in milk replacer and 0, “7” and “10” fat additive in starter feed.
- **6 lipid additives**
  - Rapeseed oil (unsaturated; high content of linoleic acid)
  - BoviLM (saturated; calcium-saponified palm fatty acid)
  - Bovi85
  - F-100
  - Sunflower oil
  - Glycofat

RESULTS







Milk replacer with least fat/most protein

additive	Degraded OM
NOFAT	81.3%
BOVI-85	78.4%
BOVI-LM	78.1%
F-100	78.4%
GLYCOFAT	77.9%
RAPESEED oil	80.1%
Sunflower oil	79.7%

Milk replacer with most fat/least protein

Additve	Degraded OM
NOFAT	93.9%
BOVI-85	85.4%
BOVI-LM	87.2%
F-100	86.4%
GLYCOFAT	85.5%
RAPESEED oil	89.4%
Sunflower oil	89.0%

Starter feed

Additive	Degraded OM
NOFAT	81.0 %
BOVI-85	78.5%
BOVI-LM	78.0%
F-100	78.5%
GLYCOFAT	78.2%
RAPESEED oil	80.1%
Sunflower oil	79.5%

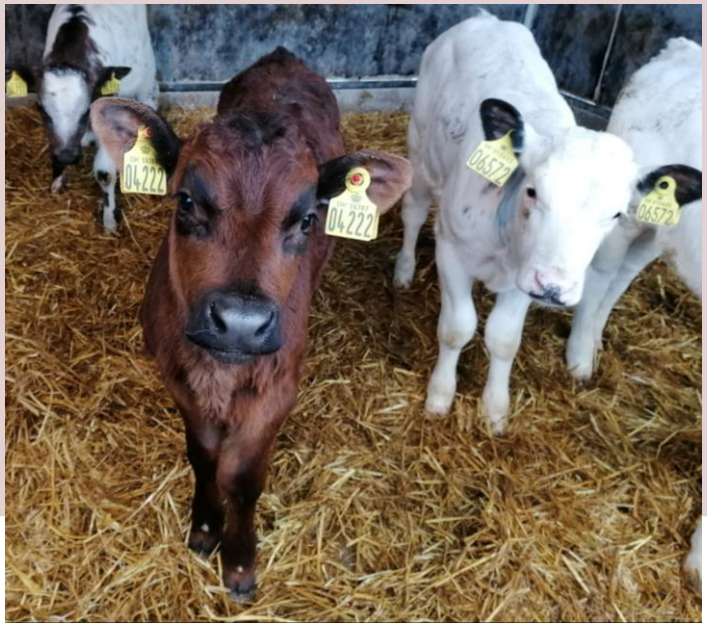
Laboratory results

- **Least dose of additive was always more degraded than highest dose additive**
- **Least fat/most protein milk replacer was more degraded than most fat/least protein replacer.**
- **Oil additives <u>always</u> more degraded than dry lipid additives**
- **Nofat control always had the greatest degradation**
- **BOVI85 and BOVILM greater degradation than F100 and Glycofat.**

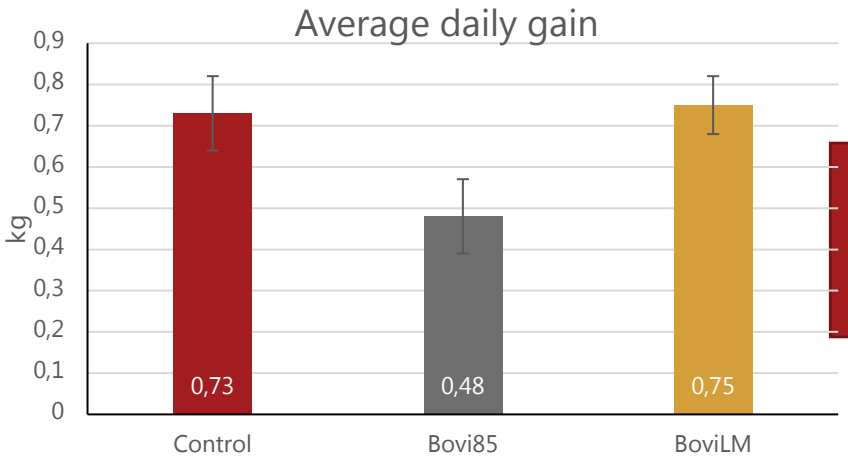
First on-farm trial (MSc theses- two students)

Determine the effects of feeding a saturated and unsaturated lipid supplements in milk replacers productive traits:

- First Student
  - Body weight gains
  - Body condition scores (BCS)
  - Biometrical measures
  - Fecal scores
  - Body temperature
  - Feed intake
- Second Student
  - Fecal Microbiome



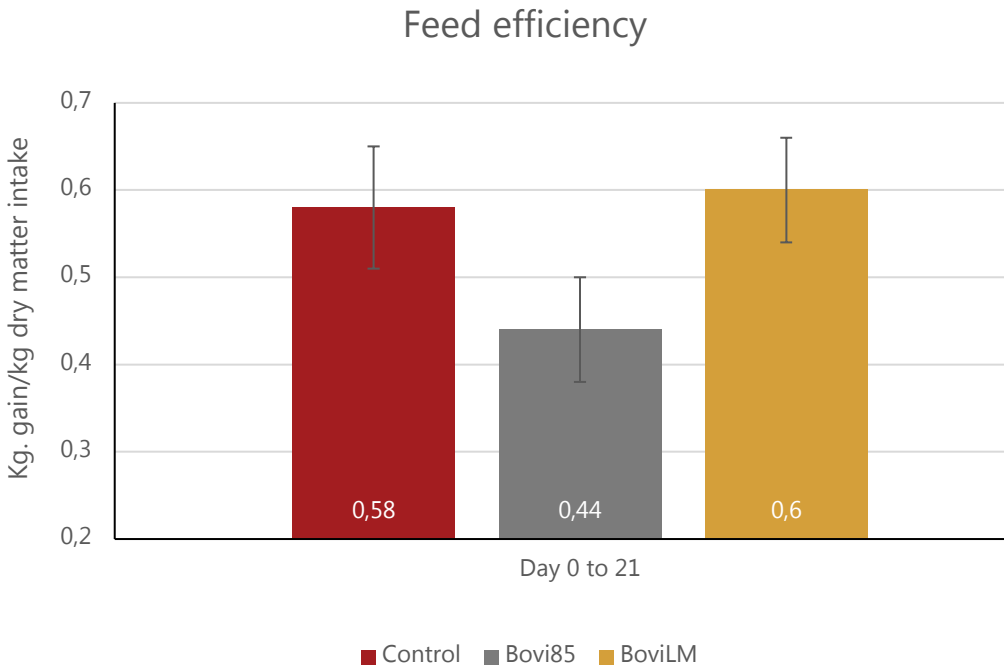
Results



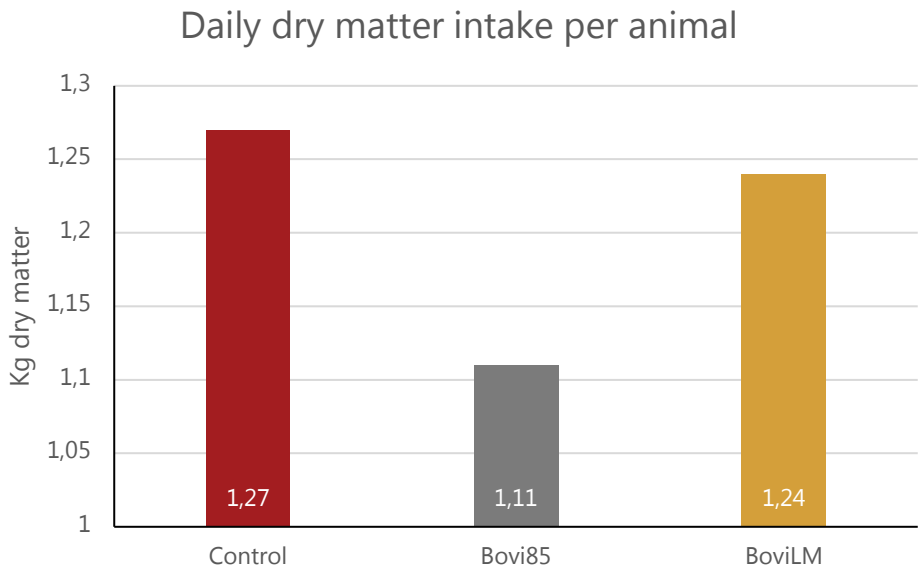
Growth rates were not significantly affected by fat supplementation

Feed efficiency was not affected by fat supplementation

- Because dry matter intake was not different
- And weight gain was not different



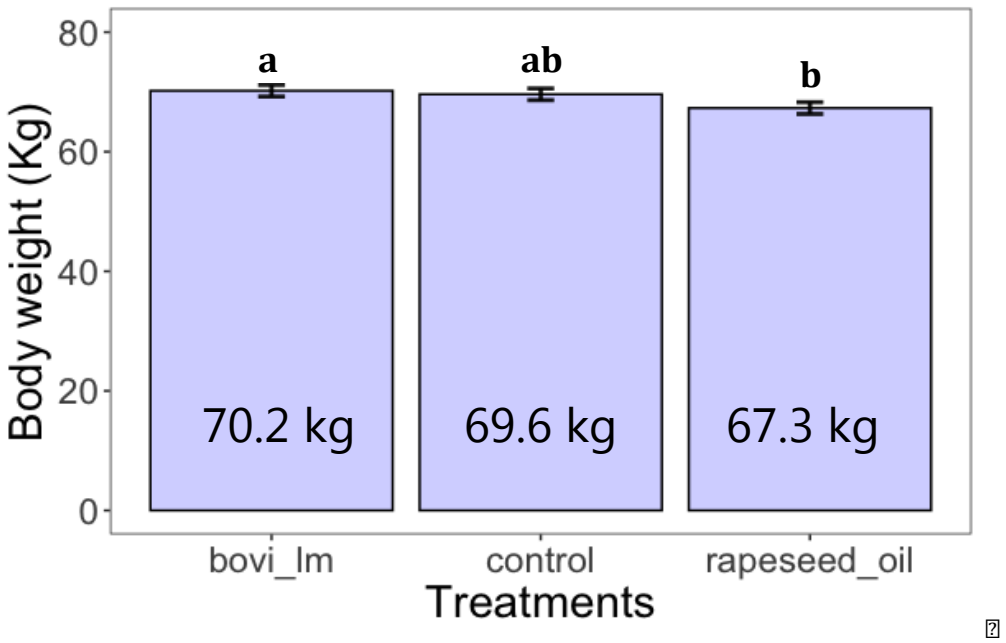
Dry matter intake was not affected by fat supplementation



Effect of fat supplementation on body weight gain (Milk Replacer)

Calves fed BoviLM had the same weight gain as the non-supplemented calves

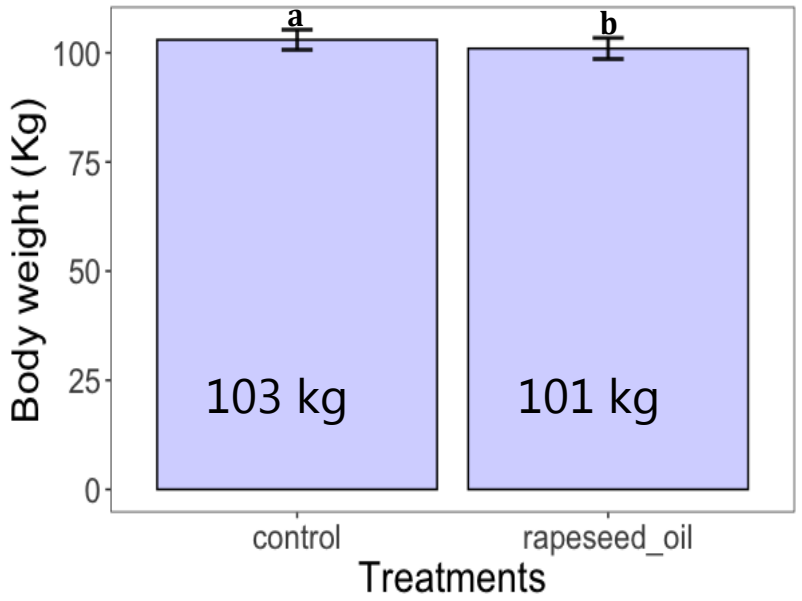
Calves fed rapeseed oil gained less weight than the non-supplemented calves



No significant difference between unsaturated and saturated fats

Effect of fat supplementation on body weight gain (Starter Feed)

Calves fed rapeseed oil gained less weight than the non-supplemented calves



P < 0.05

Conclusions

- Saturated and unsaturated lipid supplementation in the tested doses did not increase degradation, or change the products of fermentation.
- Saturated and unsaturated lipid supplementation did not increase weight gains in pre-weaned calves.
- Saturated and unsaturated lipid supplementation did not increase weight gains in post-weaned calves.
- Saturated and unsaturated lipid supplementation did not improve calf health based on blood metabolites.
- Saturated and unsaturated lipid supplementation did not change the microbiome composition and diversity.

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Thanks for the collaboration!