Effect of solid feed intake on feeding behavior and energy metabolism in growing calves

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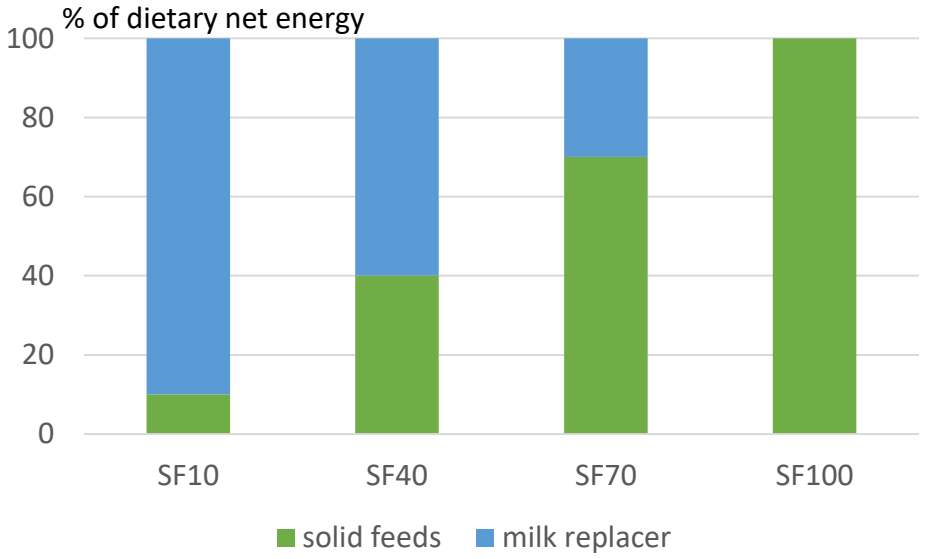
Veal calf production

- Growth of male calves from dairy herds in specialized fattening units
  - Intake of energy:
    - ~ 70% from milk replacer
      - by-products from the dairy industry, animal fat, vegetable fat, proteins and carbohydrates
    - ~ 30% from solid feeds
      - mixture of concentrates and forages
- Reach a carcass weight of 150 kg in 23 weeks

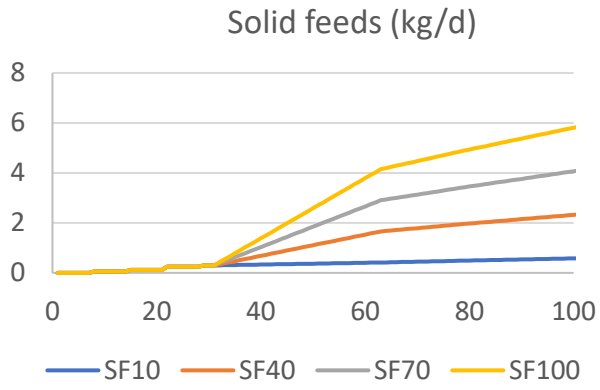
Experimental design

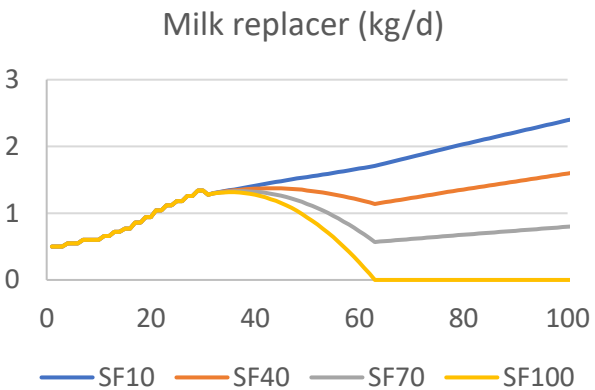
Objectives: determine the susbtitution between milk replacer and solid feeds on utilization of dietary protein and energy

- 4 dietary treatments:

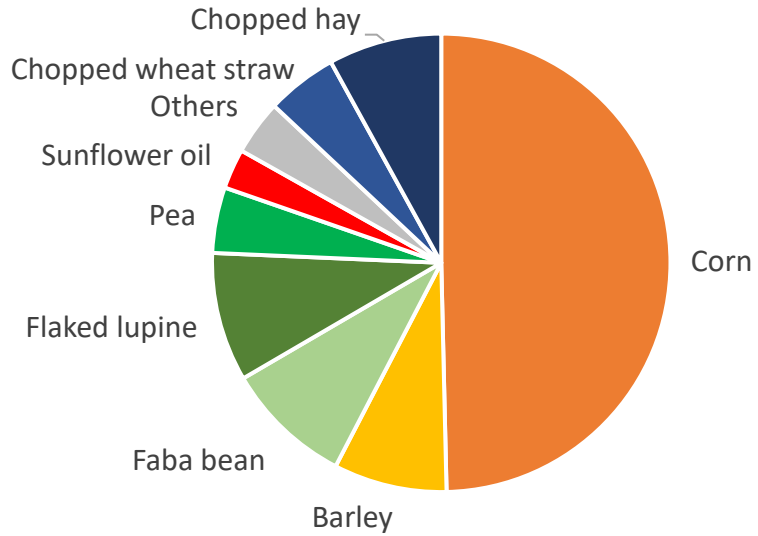


Adaptation during 100 days





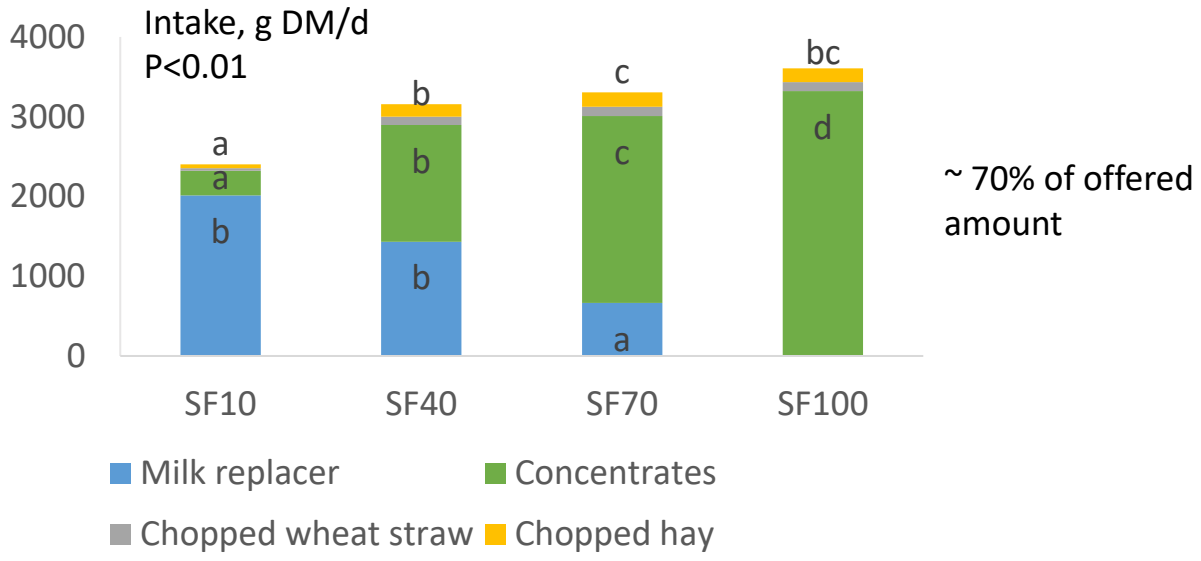
	Milk replacer	Solid feeds
Gross energy (MJ/kg DM)	20.32	18.60
Crude protein (% DM)	18.76	12.86



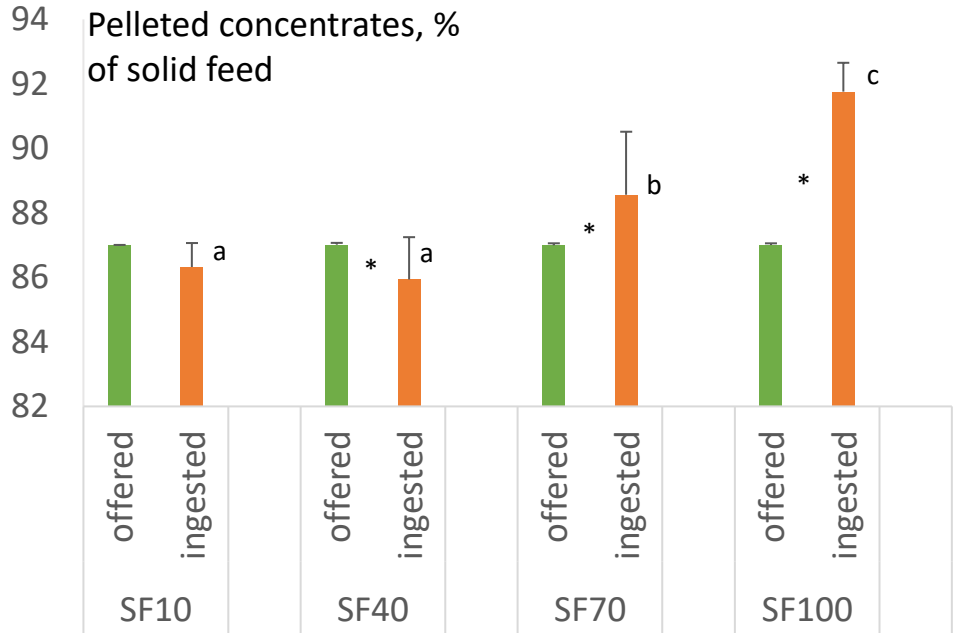
Animals and measurements

- 5 calves (159 kg BW) per treatment
- Housed during one week in an open-circuit respiration chamber
  - Measurement of milk replacer and solid feed intake
  - Feeding behavior
  - Physical activity
  - Total collection of feces and urine
  - Gas exchanges (O_2, CO_2 and CH_4) to calculate heat production
  - Water evaporation to partition between latent and sensible heat loss
- Calculation of nitrogen and energy balance and nutrient deposition

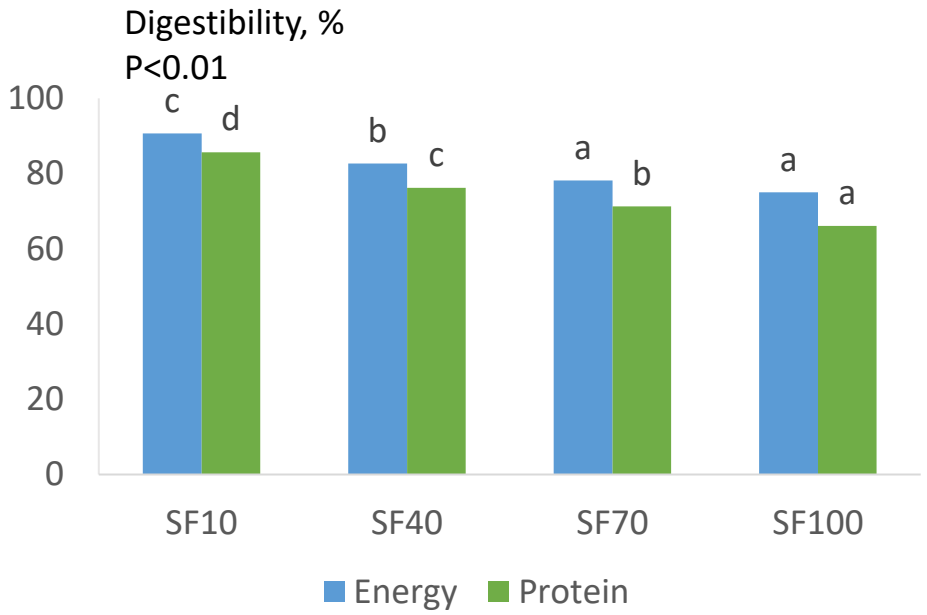
Feed intake and composition of solid feeds

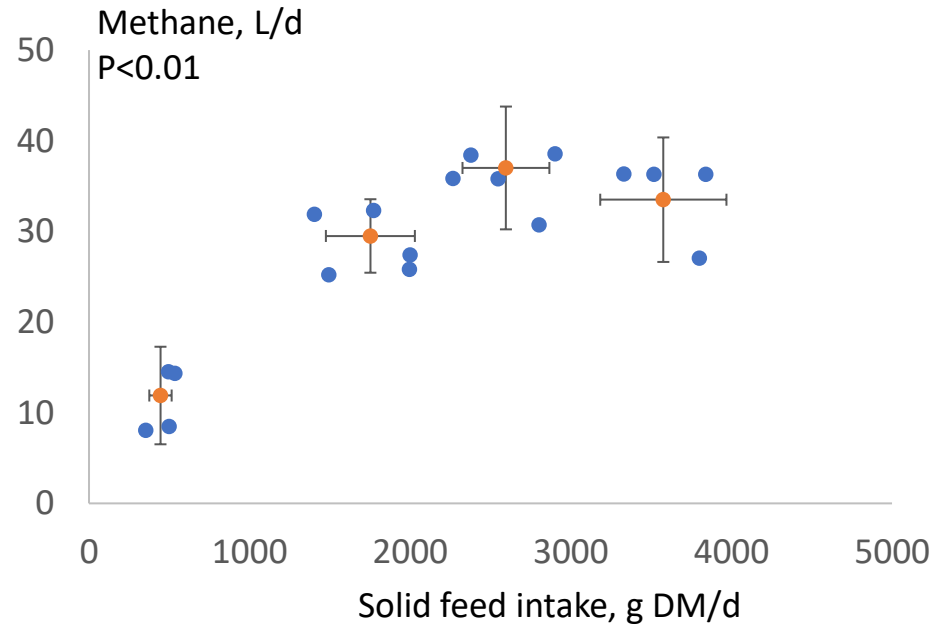


~ 70% of offered amount

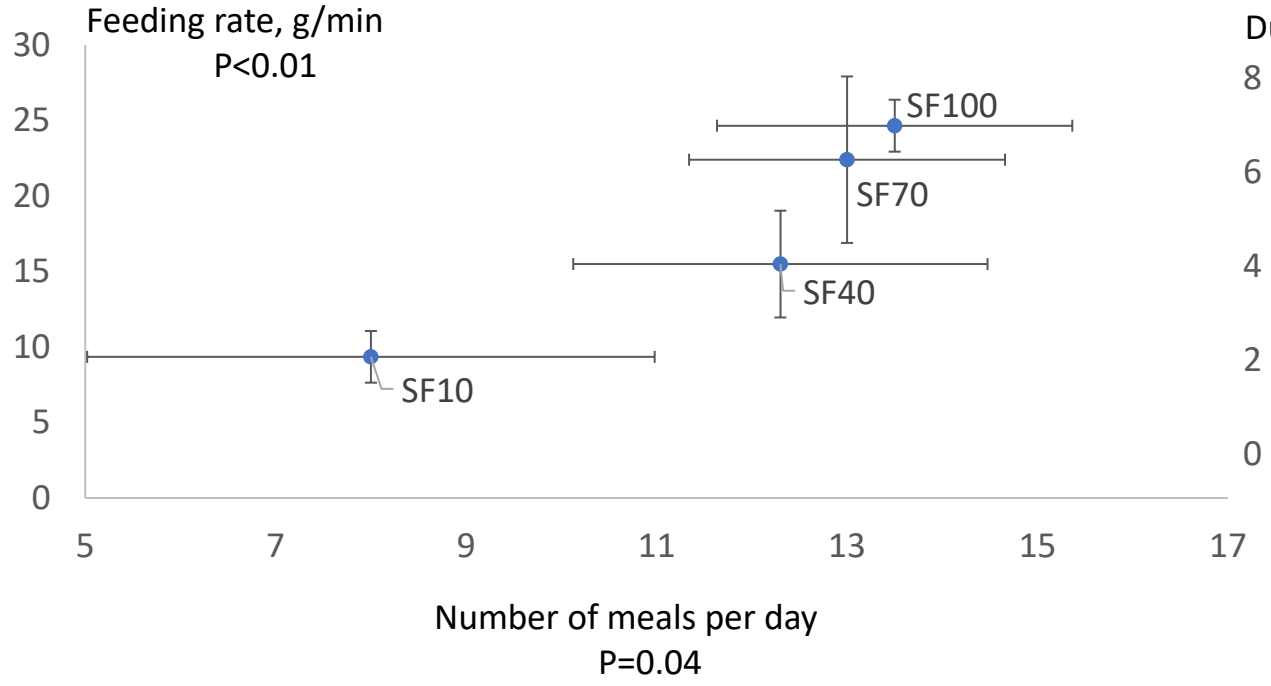


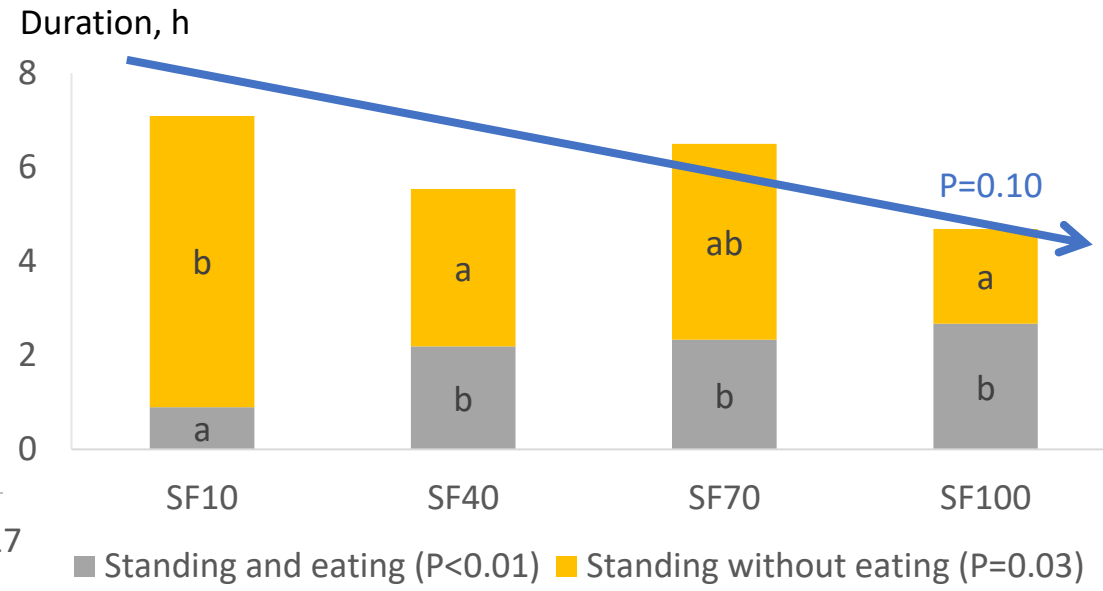
Digestibility and methane production



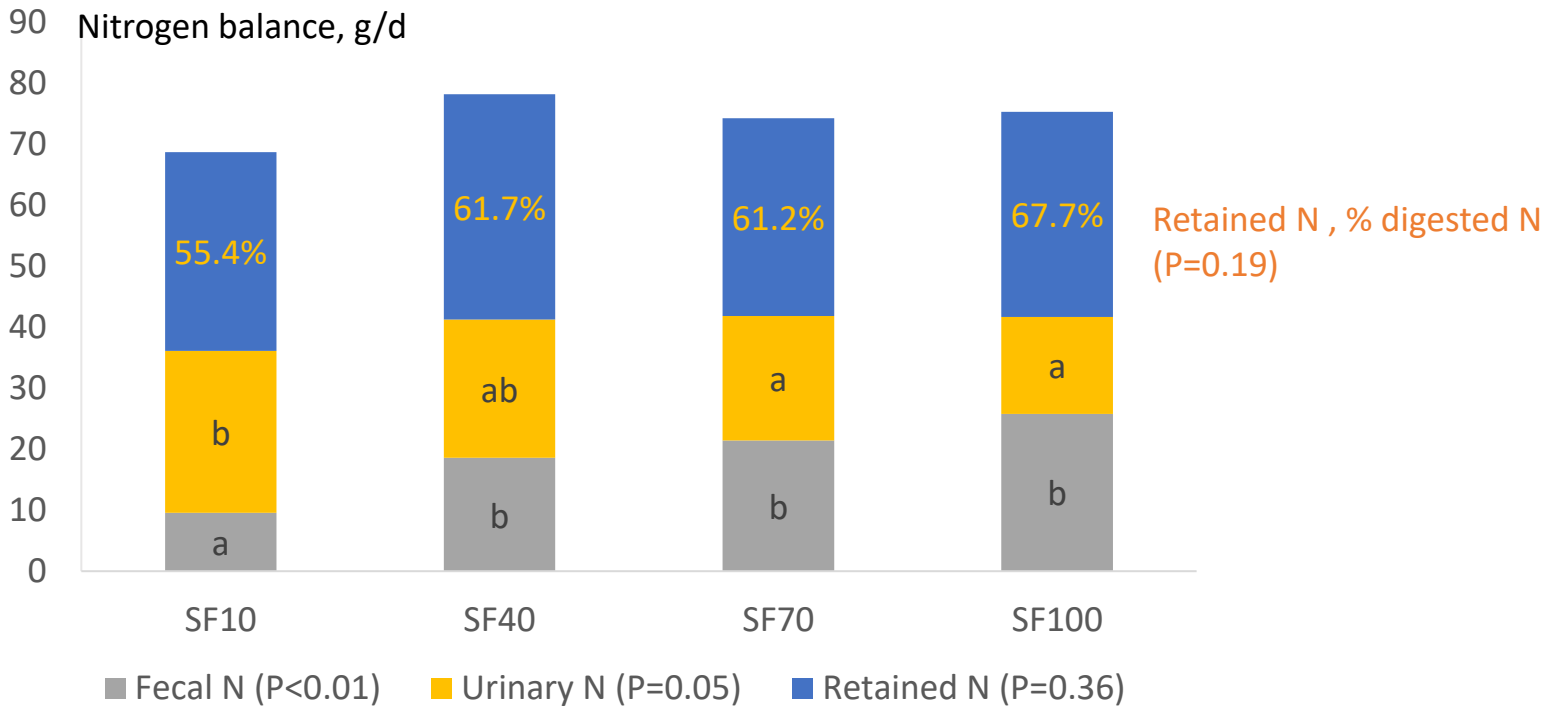


Feeding behavior and physical activity

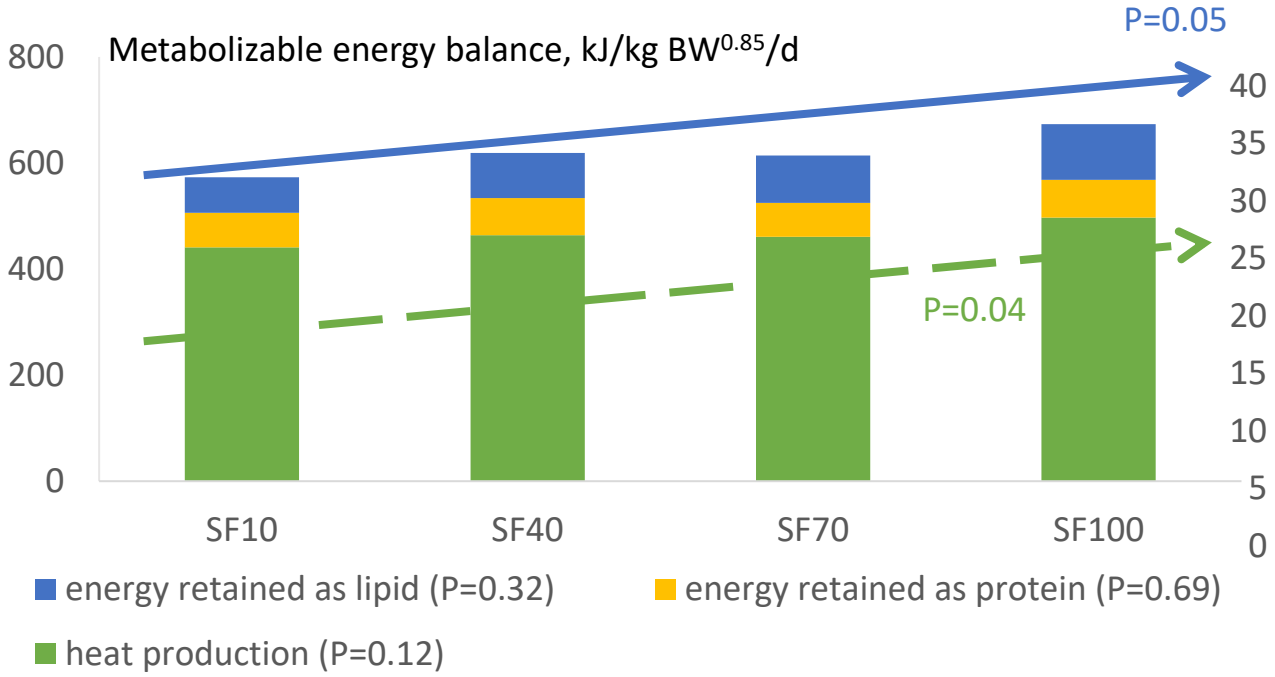


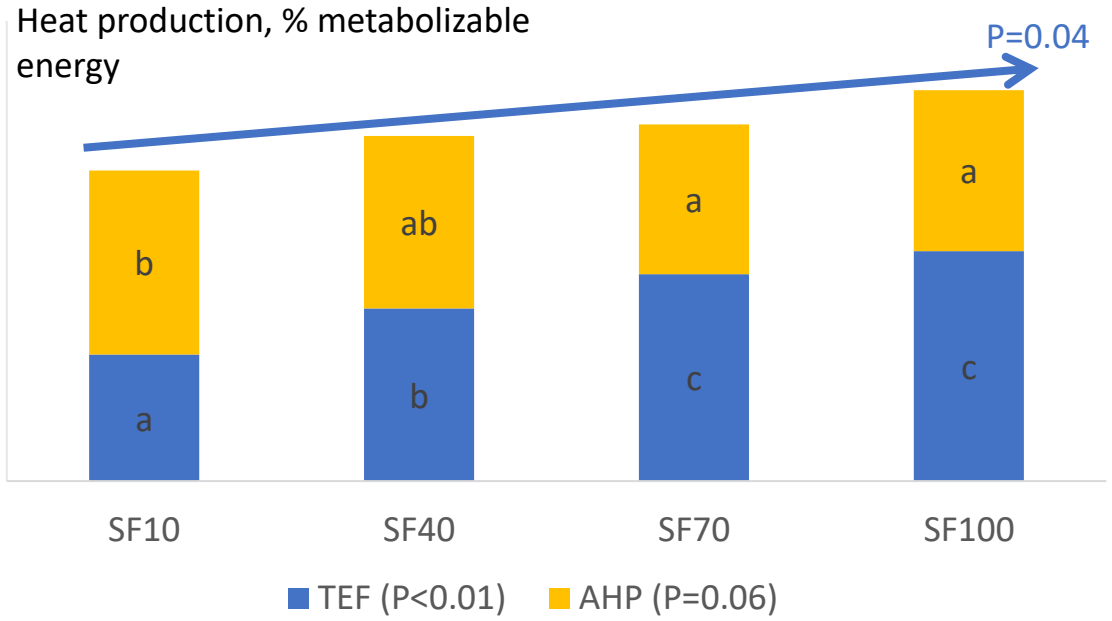


Utilization of dietary protein

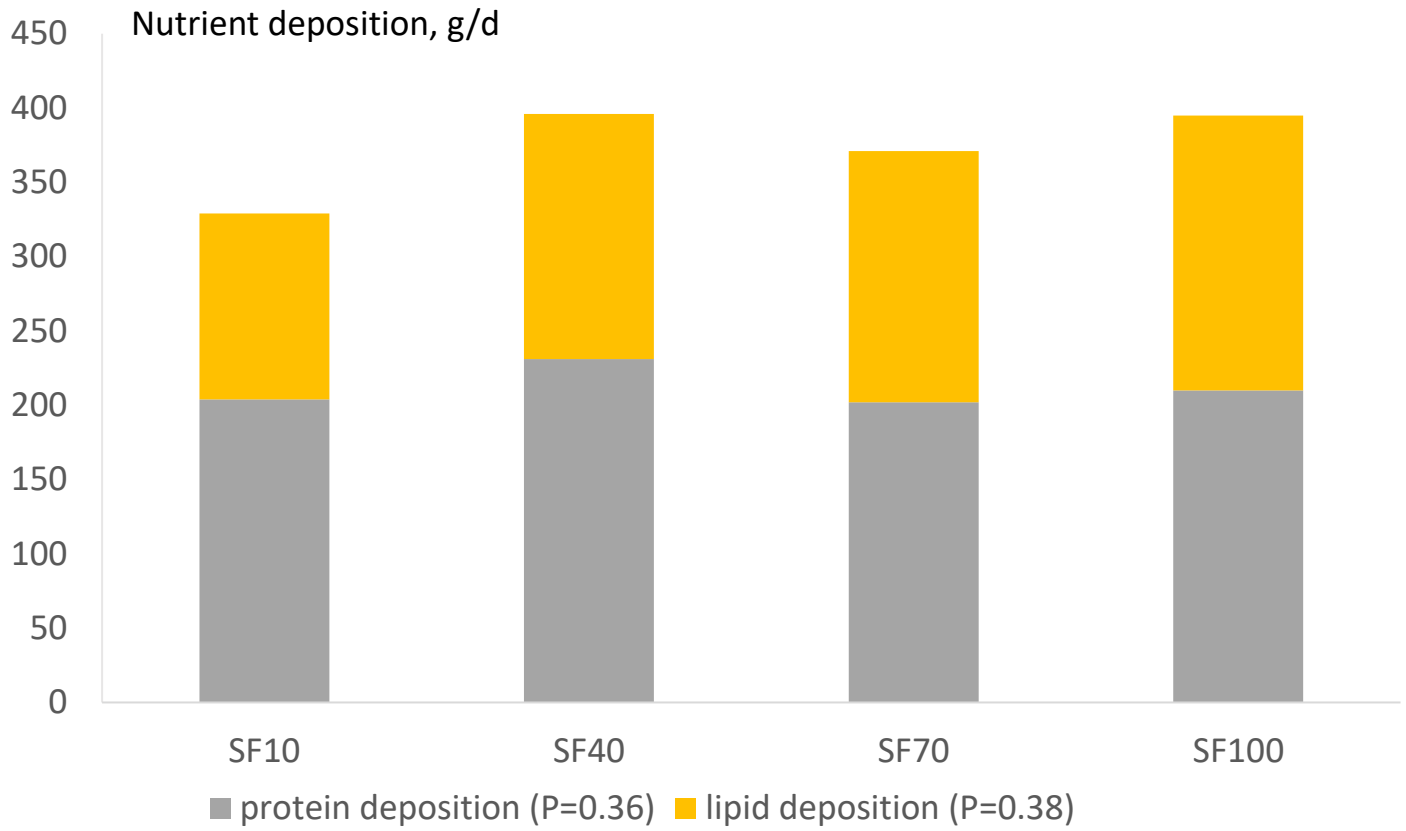


Utilization of dietary energy

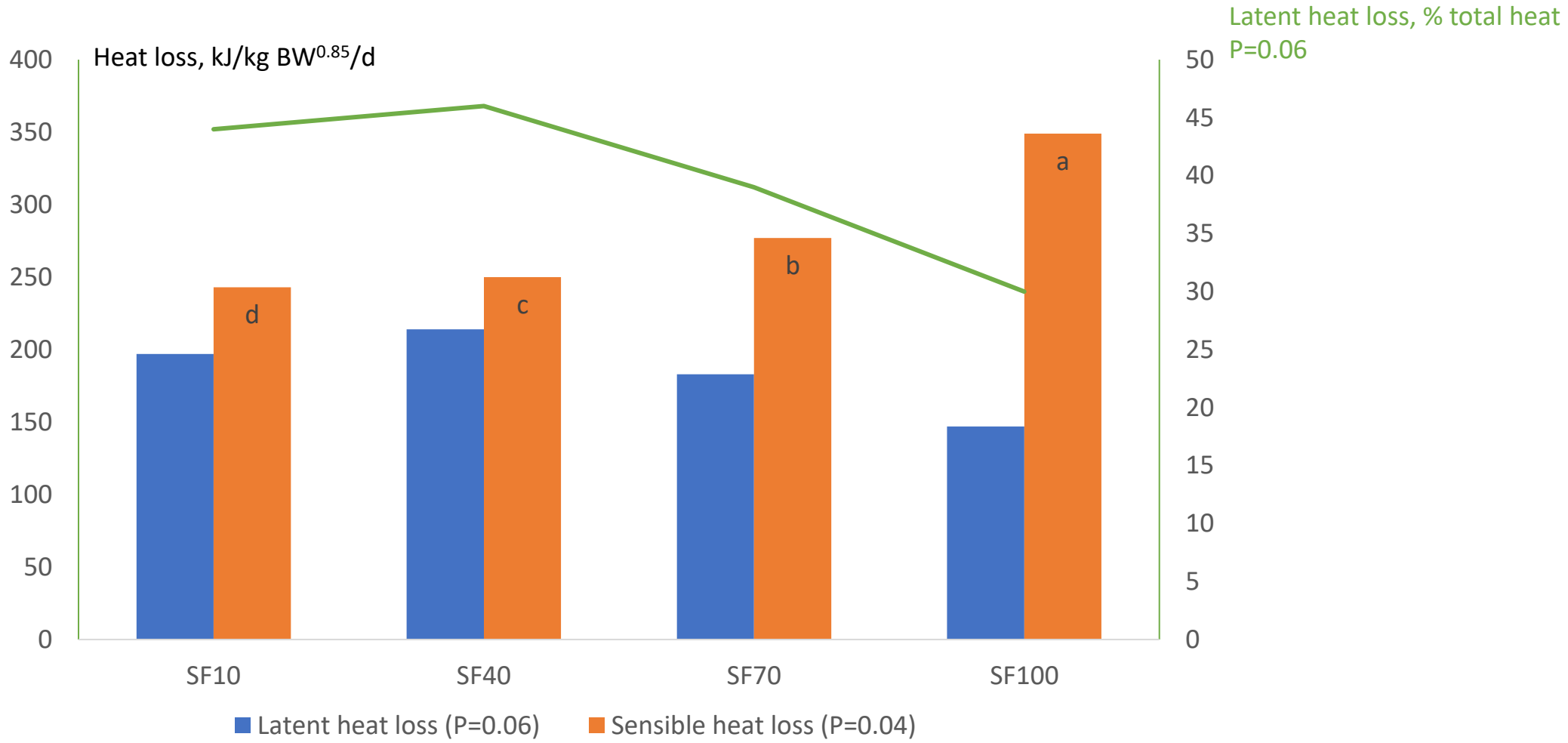




Deposition of nutrients



Routes of heat dissipation

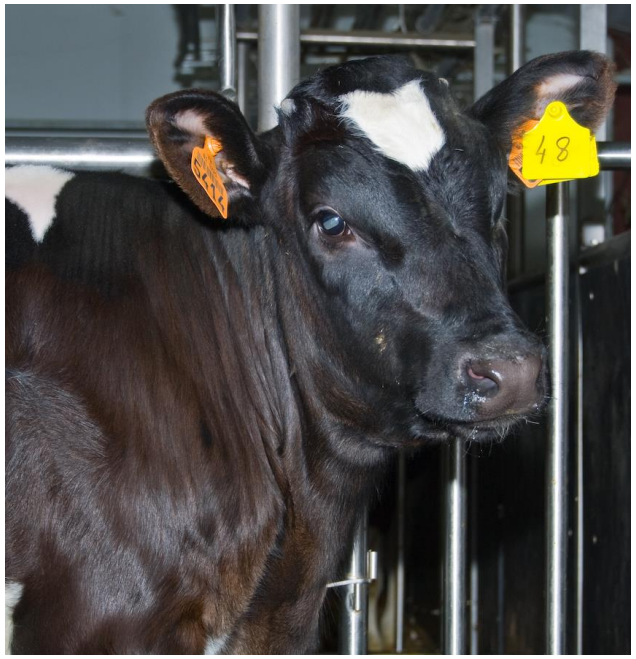


Conclusions

Substitution between milk replacer and solid feeds in calves

- Modified feeding behavior and physical activity
- Decreased digestibility of nutrients
- Maintained nutrient deposition
- Modified partitioning of heat production between thermic effect of feeding and physical activity
  - How including behavior value of solid feed in their nutritional value?
- Modified partitioning between latent and sensible routes of heat losses
  - Interaction with ambient temperature?

Thank you for your attention



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