

## Topics for master thesis 2021/2022 – Ruminant nutrition and physiology

### Ruminants

#### Evaluation of various methods for measurement of enteric methane production in ruminants

Contact persons: *Angela Schwarm, Ingjerd Dønnem and Margrete Eknæs*

#### Feed technology for ruminants

Contact person: *Egil Prestløkken*

#### Effects of silage characteristics on feed degradation in situ and in vivo.

A database of silage samples from 80 round bales is already established by TINE. The round bales are collected from all over the country. The round bales have been characterized by chemical analyses (nutrition content and fermentation quality), NDF degradation profile determined in situ, and in vivo digestibility. The aim of this master thesis is to use the data already collected to explore how different silage characteristics affects the feed degradation in ruminants.

Contact person: *Ingjerd Dønnem*

### Dairy cows

#### Feed management in modern dairy production

Contact person: *Egil Prestløkken, TINE/Mimiro*

#### Automatic milking systems (AMS)

Key words: Feeding, Milk production and quality

Contact persons: *Egil Prestløkken, Sabine Ferneborg, TINE/Mimiro*

#### Eating and rumination behavior in dairy cows given TMR

Contact persons: *Alemayehu Kidane Sagaye and Phil Pope*

#### Variation in chemical composition of milk sampled from automatic milking systems throughout day and night

Contact persons: *Clementina Alvarez, Sabine Ferneborg, Egil Prestløkken, TINE/Mimiro*

#### Forage preservation for premium protein quality

The overall objective of the project is to improve the quality of protein from grassland, which will increase the utilization of forage protein in ruminant diets and ensure usage of Norwegian grown feeds.

Contact person: *Egil Prestløkken*

#### Methane mitigation by feeding pomegranate by-products to Brown Swiss dairy cows

Contact person: *Angela Schwarm and Puchun Niu*

Assessment of feed intake, digestibility and feed utilization in dairy cows based on manure samples and marker technique

The thesis will be based on analysis of already collected feces samples from experiments with dairy cows carried out in Foods Norway.

*Contact persons: Alemayehu Kidane Sagaye and Egil Prestløy*

Keeping cow and calf together in modern dairy production

Possibilities for several master theses regarding physiology, nutrition, behaviour, milking, production etc.

*Contact person: Sabine Ferneborg*

Relationship of methane emissions and the rumen microbiome in dairy cattle

Methane and carbon dioxide emission from Norwegian Red cows will be measured with the GreenFeed System in the barn. High and low methane emitting cows will be selected to perform a rumen swap and study the degree of reconstitution of the original phenotypes in terms of methane level and rumen microbial community.

*Contact persons: Puchun Niu and Angela Schwarm*

Sustainable production of animals by optimizing the feed-microbiome-host-axis

Human population growth is driving a rise in cattle production for food, which necessitates more efficient and sustainable practices. One promising route to achieve this, is to unravel the connection between the feed cows eat, their bodily function and the microbes in their gut, not only to optimize nutrition but also to reduce the emission of greenhouse gases (methane).

*Contact persons: Phil Pope and Thea Os Andersen*

The use of alkaline grain in concentrates for dairy cows- effects on milk yield and rumen pH

The experiment will be conducted in 2021-22 with submission of thesis earliest December -22.

*Contact persons: Alemayehu Kidane Sagaye and Margrete Eknæs*

## Sheep

Evaluation of PAC chambers for measurement of enteric methane production in sheep.

*Contact person: Ingerd Dønnem*

## Goats

Iodine content in milk from dairy goats fed diets based on Norwegian feed resources

Iodine is an essential component of thyroid hormones and its deficiency is considered as the most common cause of preventable brain damage. During the recent years, iodine deficiency has been detected in Norway, especially among pregnant women. Norwegian goat milk is a good source of iodine.

Locally produced rapeseed products are promising replacements for imported ingredients as fat and protein supplements to dairy goats. However, rapeseeds contain glucosinolates that reduce iodine transfer to milk. On the other hand, seaweeds are rich in iodine and other minerals and may substitute part of not only imported but also local land based feed resources.

The aim of this study is to quantify iodine and selenium contents in milk samples from goats fed different concentrates based on different national feed resources, i.e rapeseed and sea weed.

*Contact persons: Margrete Eknæs and Alemayehu Kidane Sagaye*

## Topics for bachelor thesis 2021/2022 – Ruminant nutrition and physiology

### Ruminants

#### Use of alternative feed resources in ruminants

Recourses and possible treatments to improve feeding potential.

Contact persons: Egil Prestløkken and Margrete Eknæs

#### Evaluation of various methods for measurement of enteric methane production in ruminants

Contact persons: Ingjerd Dønnem, Angela Schwarm and Margrete Eknæs

#### Actions to reduce greenhouse gas emissions in ruminants

Contact persons: Ingjerd Dønnem, Angela Schwarm and Margrete Eknæs

#### Animal vs Microbe: how can we reduce methane emissions in animal production?

Methane that is generated by ruminants ultimately comes from its resident “rumen microbiome”, which digests its food and supplies energy to the host animal. Today, there are two exciting hypotheses being explored by scientists to reduce the amount of methane that an animal produces, including:

(1) Feed based mitigation strategies, can we introduce supplements to influence digestion and methane production?

(2) Host genetics affects the rumen microbiome, and thus can influence rumen microbial methane production. Can we breed animals to produce less methane and how do they do it?

Contact person: Phil Pope

### Dairy cows

#### Phosphorus – physical role and requirement

#### Magnesium – physical role and requirement

#### Calcium – physical role and requirement

#### Sulphur – physical role and requirement

#### Relationship between dietary cation/anion balance and milk fever

Contact person: Egil Prestløkken

#### Enteric methane emission in dairy cows

Contact persons: Ingjerd Dønnem, Angela Schwarm and Margrete Eknæs

#### Roughage related factors affecting enteric methane emission in ruminants

Contact persons: Ingjerd Dønnem, Kim Viggo Weiby and Angela Schwarm

#### Influence of harvesting time on feeding value of forage

Contact person: Egil Prestløkken

#### Grass as protein source for milking cows

Contact person: Egil Prestløkken

## Dairy cows and calves

Keeping cow and calf together – a possibility for Norwegian dairy production?

Effects of early and late cow-calf separation on feed intake and health parameters in calves.

Effects of diet on ruminal development in calves

Effects of calf management on subsequent milk production

*Contact person: Sabine Ferneborg*

## Goats

Somatic cell count in goats

*Contact person: Margrete Eknæs*

Minerals to goats – role and requirements

*Contact person: Margrete Eknæs*

## Sheep

Evaluation of PAC chambers for measurement of enteric methane production in sheep.

*Contact person: Ingjerd Dønnem*

Minerals to sheep - role and requirements.

*Contact person: Ingjerd Dønnem*