

English version:

Topics for master thesis– 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

Use of alternative feed resources in ruminants

Recourses and possible treatments to improve feeding potential.

Contact persons: Egil Prestløkken and Margrete Eknæs

Feed technology for ruminants

Contact person: Egil Prestløkken

Dairy cows

Use of 3-NOP to reduce methane emissions from dairy cows

Contact person: Margrete Eknæs

Feed management in modern dairy production

Contact person: Egil Prestløkken, Sabine Ferneborg, TINE/Mimiro

Automatic milking systems (AMS)

Key words: Feeding, Milk production and quality

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

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

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

Validation of feed intake, digestibility and feed utilization in dairy cows based on feces samples and marker technique

The work will be based on analysis of collected feces samples from an experiment with dairy cows in Foods of Norway.

Contact persons: Alemayehu Kidane Sagaye and Egil Prestløkken

Possible thesis if applied projects get funded: Reduction of imported feed ingredients in ruminant diets by use of locally produced alkali treated grain.

Funds have been applied for a project that aims to generate knowledge that helps increase the total amount of Norwegian feed in rations to ruminants by replacing imported protein and carbohydrate raw materials such as soy, maize and beet pulp with a newly developed raw material based on locally produced alkaline grain. If the project is approved, *in vitro* experiments will be carried out (autumn 2020). It will then be possible with a master thesis based on data from this experiment (gas production, digestibility of nutrients using the Ankom gas production system)

Contact persons: Alemayehu Kidane Sagaye and Margrete Eknæs

Possible master thesis projects if applied projects get funding; Keeping cow and calf together in modern dairy production

We have applied for funding for a project on keeping cow and calf together in modern dairy production. If the project is funded, experiments will be conducted at SHF, and there will be possibilities for several master theses regarding physiology, nutrition, behaviour, milking, production etc.

Contact person: Sabine Ferneborg

Relationship of feed efficiency, methane and carbon dioxide 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. Methane production will be scaled to carbon dioxide production to estimate efficiency. 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

Sheep

Factors with sheep production affecting the lamb mortality.

High neonatal lamb mortality is a great challenge for the NKS breed. The task of this thesis will be to collate data about lamb mortality from three experiments performed in the project “Ewe nutrition for lamb viability and growth. A literature survey, and possibly working with data from “Sauekontrollen”, will be a part of the thesis.

Contact person: Ingjerd 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

Tolerance limits for the use of cereals to dairy goats

Increasing the use of Norwegian cereals in commercial concentrate for goats is interesting when attempting an effective and sustainable goat milk production based on national feed resources. However, a high proportion of rapidly degradable carbohydrates in the diet and low concentration of cell wall carbohydrates, are likely to have a negative effect on rumen conditions and even initiate rumen acidosis. The aim of this study is to determine the limits for optimum starch intake under Norwegian production conditions, ensuring a good nutrient utilization and maintaining healthy goats. Data for this study will be provided from an experiment with rumen cannulated goats carried out in 2018.

Contact person: Margrete Eknæs

Use of milk urea as a tool for controlling the energy and protein balance in high yielding dairy goats

Overfeeding protein is unfavourable both for the animal and the environment. A high concentration of urea in blood, milk and urine indicate an ineffective utilization of feed protein. The relation between urea in blood, milk and urine is clear, and measurements of milk urea level (MUL) is an important tool to balance the feed rations to ensure good utilization of energy and protein throughout the lactation. By use of data from earlier Norwegian studies (energy and protein intake, milk yield, milk composition and milk urea concentration) it is possible to formulate target MUL intervals for lactating goats under Norwegian conditions.

Contact person: Margrete Eknæs

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Ruminants

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 (phil.pope@nmbu.no)

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

Rumen acidosis in dairy goats

In Norwegian goat herds with high feeding intensity, diarrhea and digestion problems are very common. These symptoms are often related to rumen acidosis. The aim of this study is to examine available literature and describe causes and alternative strategies to prevent this disease.

Contact person: Margrete Eknæs