



LEARN Seminar

Welcome to the second issue of the LEARN Newsletter!

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LEARN

LEARN is a network for exchange of information and identification of new research areas on farm animals. The objective is to cooperate on creating the sustainable agriculture of the future and to strengthen research and innovation within the animal sector.

Participants are researchers at the Swedish University of Agricultural Sciences, the agricultural industry, other universities, authorities and organisations. LEARN offers Swedish and international participants a neutral cooperation platform.

LEARN Day Conference

The next LEARN day will take place in November 2012 at the Livestock Research Centre at Lövsta-Uppsala. Your invitation will come in August.

First an invitation to the LEARN Day: The next LEARN Day Conference will take place in November 2012 at the Livestock Research Centre at Lövsta-Uppsala. Your invitation will come in August and we hope that you will be able to participate.

On the 10th May LEARN held a seminar at SLU's Livestock Research Centre at Lövsta-Uppsala. The title was "News from research on livestock – resources, results and requirements". The Dean Kerstin Svennersten Sjaunja opened the seminar with more than 40 participants. Charlotta Carlsson, the project manager for the Basic Registration project showed how important it is to supply "Accurate registrations – a prerequisite in a research centre" to secure correct data and make it possible to follow the animal from sperm and egg to steak. Researcher Erik Bongcam-Rudloff at the Section of Molecular Animal Genetics at the Department of Animal Breeding and Genetics gave a presentation on "Cross-border research opens new doors". The auditorium heard about the tremendous speed of development within this area which has led to enormous research results. After that came three presentations under the title "Application of research results – beneficial for the industry":

- Feed: Rolf Spörndly, Senior Research Officer, Department of Animal Nutrition and Management

- Poultry: Ragnar Tauson, Professor, Department of Animal Nutrition and Management
- Pigs: Claes Fellström, Professor, Department of Clinical Sciences

After the coffee break Professor Nils Lundheim at the Department of Animal Breeding and Genetics gave a presentation on "What will the future be like without Swedish pig breeding – risks with the import of genes". This is a very current issue as it became clear during the spring the Swedish pig breeding with end. CEO Lennart E. Bengtsson from Wapnö talked about "How large should a single production unit be?". Many wise words as well as thought-provoking comments were said. It all boils down to that today's farmers must be very competent and good at management. Christine Jakobsson, Senior Project Manager for LEARN, gave a presentation on "What is LEARN" and what it can offer the industry, authorities and organisations. The seminar consisted of interesting presentations, lively discussions and lots of interest from the auditorium. The day was ended with a tasty buffet and mingling. The presentations can be found on the LEARN homepage (www.slu.se/learn).

CHRISTINE JAKOBSSON, SLU

Senior Project Manager
of LEARN, Faculty of
Veterinary Medicine and
Animal Science





A total mixed ration (TMR) for sheep needs to be highly digestible and well mixed. Above a picture of a TMR from an experiment at Götala Beef and Lamb Research Centre.

Feeding TMR can increase profitability in Swedish sheep production

BL In a two-year project at Götala Beef and Lamb Research Centre, SLU Skara, the effect of chopping grass silage and of mixing grass silage with concentrate (in a total mixed ration TMR) was studied.

The aim of the experiments was to evaluate the effects of feeding strategy on feed intake, performance and profitability for the producer.

The main results were that feeding a TMR can increase the feed intake in lactating ewes and growth rate in lambs from birth to weaning, whereas chopping silage seems sufficient for increasing growth rate in lambs from weaning to slaughter.

To increase the profitability with feeding a TMR under Swedish conditions, it is crucial with a digestibility of the silage



The sheep at Götala Beef and Lamb Research Centre are kept on straw-bedding and feed is offered *ad libitum*.

and a rational feeding strategy. According to our calculations, a herd size above 300 ewes is necessary in a TMR feeding system for sheep.

CARL HELANDER
Department of Animal
Environment and Health, SLU



A good start for the pigs at Lövsta Research Centre

Pi The first half year with the pigs in the new facilities at Lövsta Research Centre near Uppsala has now passed. Anna Wallenbeck, who is the coordinator for the research and education activities in the pig facilities, is really impressed by the growth rate of the pigs in the herd. The first batch of pigs has been in the fattening stables for some weeks, and the first ones will soon be slaughtered. Until now, no big projects have been started in the unit, but 'just' some MSc-theses-studies.

One of these 'exam-works' was presented in the mid of June by Lisa Holmqvist, who has been testing a technique for automatically recording the activity of sows. She put these sensors (called accelerometers) on collars on sows in the farrowing pen. The movement of the sow was automatically recorded every 2 second, and this technique was found to generate a good estimate of the sow activity.

However, the use of this technique to distinguish between different positions of the sow (standing, lying, sitting) was however not that sharp. More studies are needed to evaluate this technique.

NILS LUNDEHEIM
SLU

Risk of rancid flavor in milk is increasing – can we do something about it?

D It has long been known that careless handling of milk and milking itself can cause damage to the milk fat and induce lipolysis which gives a rancid flavor in milk. This is a severe milk quality problem, since consumers reject milk with this faulty taste. There are indications that some of the new milking technologies and new diets that are introduced in Swedish dairy production may increase the risk of lipolysis in milk. A lipolysis project, funded by the Swedish Farmer's Association, has just started at Lövsta.

The focus of this project is on lipolysis induced by the automatic milking system (AMS) and the use of saturated fats in di-

ets for dairy cows. In addition, the project will study the mechanisms that give rise to lipolysis in milk and test a feeding strategy that could potentially reduce the problems of lipolysis in high-risk herds. The project is a joint Swedish-Danish collaboration and the involved researchers are Sabine Ferneborg (PhD student), Horacio Gonda, Sigrid Agenäs and Jana Pickowa at SLU and Lars Wiking in Denmark.

In the first part of the practical work the effects of concen-

trates with a high inclusion of a fatty acid that is found in palm oil (palmitic acid) or one that is found in rapeseed oil (stearic acid) on lipolysis in milk will be investigated. The hypothesis is that the different fats will have different effect on milk fat

lipolysis and that the one that causes the lowest risk should be recommended in milking management systems that increase the risk of lipolysis. The first part of the study has just been finished and a second study will be carried out next fall.

HORACIO GONDA
SLU

PHOTO: JENNY SVENNÄS-GILLNER, SLU



Chicory as a fibre source in pig diets



In a PhD project at the Department of Animal Nutrition and Management, Emma Ivarsson has evaluated the effect of using inclusion of chicory root and forage in diets to growing pigs. Chicory (*Cichorium intybus* L.) is a perennial herb with deep roots that can be complementary to other forage crops and give more resistant and sustainable leys.

The results from the experiments shows that chicory is a palatable feed stuff that can be used to growing pigs without negative effects on growth rate and feed conversion ratio. Inclusion of chicory in a diet showed beneficial effect on both the microbial composition and the gut environment.



Chicory forage that was included in diets to growing pigs, grown in monoculture at Ekhaga, Lövsta.

Combination of chicory forage and root in a diet resulted in interesting synergistic effects with decreasing numbers of coliforms and increasing numbers of lactobacilli. Chicory root also stimulated a bacteria (*Megasphaera elsdenii*), that previously been shown to decrease the occurrence of the bacteria (*Brachyspira hyodysenteriae*) known to cause swine dysentery.

EMMA IVARSSON

Department of Animal Nutrition and Management, SLU



Swedish dairy cows are fed too much phosphorus



Phosphorus (P) is a finite resource in nature and it is neither economically sound nor environmentally defendable to feed P in excess of the animal's requirements. A surplus of consumed P ends up in the manure. A significant amount of that P eventually leaks out from the farm systems to streams, lakes and seas mainly as soluble phosphates. The environment is considered to be more vulnerable towards soluble phosphates than to other P fractions.

Maria Nordqvist has in her licentiate project studied the extent of P overfeeding in dairy cows both in organic and conventional management systems. Within the project two studies were conducted. In the first study, 42 dairy cows were fed P varying from 70 % to 200 % of their requirements and the P metabolism was monitored.

The second study was a field study comprising 290 cows representing 29 dairy



Maria Nordqvist

herds in the south-eastern area of Sweden. Half of the herds were ecologically managed while the other half was managed according to conventional routines.

The results showed that the vast majority of the cows, regardless of management system, were fed P in excess. However the extent of P overfeeding was generally less pronounced among organic herds. Provided that the 290 dairy cows in the present field study reflect the population of Swedish dairy cows in general, the overfeeding of P would be about 1800 tonnes per year. The results showed that both total P and soluble P in faeces reflected the P overfeeding of the cows and thus could be used as markers of P overfeeding in dairy cows.

KJELL HOLTENIUS

Department of Animal Nutrition and Management, SLU

How is the oocyte and embryo affected by metabolic imbalance in the mother?



High reproductive efficiency is crucial for economic and sustainable dairy production, minimizing negative effects of production on the environment. The common metabolic imbalance in dairy cows, seen as obesity in periods when nutritional demands are low, for example in non-pregnant heifers and in dry cows, and extensive tissue mobilization in early lactation causes reproductive inefficiency. Insulin is a key hormone changing in different ways during periods of metabolic imbalance – at obesity or weight loss, or during negative energy balance. When insulin is secreted it makes its way to the follicular fluid and affects the maturing oocyte (egg cell). Abnormal insulin values are found in follicular fluid in

the different types of metabolic imbalance and it is possible that the fluctuations in insulin are part of the explanation for the



Denise Laskowski is handling oocytes and embryos in the in vitro fertilization laboratory

low fertility in these animals.

The objectives of an on-going four year project lead by Hans Gustafsson at SLU are to compare the effect of different levels of insulin added to the medium for maturation of oocytes on the development of the oocytes. The oocytes are collected either after slaughter or from live heifers by vaginal ultrasound guided ovum pick up. The results will hopefully give better understanding of the link between feeding and reproduction, useful for farmers for a better feeding strategy and for the AI industry in selection of animals better coping with metabolic imbalance. The work is funded by the Swedish research council Formas.

RENEE BÅGE

SLU



LEARN recommends – Future Agriculture
These two reports are available at Future Agriculture website. [Click here to find the reports](#)

1. Future Agriculture – Livestock, Crops and Land Use.
2. Documentation (in Swedish) Rådslaget Framtidens nötköttsproduktion.

Mussel shells as a source of occupation in laying hens

P **POULTRY** Mussel meal has proven to be an excellent high quality protein source to organic laying hens. In the process of producing mussel meal the mussel shells are being discarded. From an ecological point of view also exploitation of the mussel shells would be to prefer. In an ongoing study on organic laying hens at Lövsta research facilities this matter is being investigated.

Feather pecking in laying hens remains a significant issue for the egg industry. The behaviour itself is believed to be a form of misdirected feeding behaviour arising due to lack of occupation. In order to improve the occupation rate in laying hens held in a single tier floor system, mussel shells are being thrown into the litter area. The mussel shells may also serve as a good calcium source for the hens.

The study runs during a full production cycle which continues until the hens are about 75 weeks of age. During this period parameters such as production, behaviour (both through video recordings and live), plumage condition, pecking wounds, foot health and eggshell quality are recorded.



Laying hens held in the single tier floor system at Lövsta research facilities where mussel shells are being thrown into the litter area.

The result from this study may provide valuable information about the potential use of mussel shells as a source of occupation as well as calcium in laying hens.

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