

# Purebred Sheep Breeders Association of Nova Scotia- November, 2020 AGM Research Update - By David Barrett, Faculty of Agriculture

Below, I have tried to summarize the new results of our experiments. Should any of the members have any questions I would be happy to address them. They should feel free to email (david.barrett@dal.ca) or call (902-896-2305) me. I am always open to hearing your ideas regarding the direction of research.

## *Out-of-Season Breeding Project*

There are five experiments in this project- 2009, 2012, 2013/15, 2016, and 2019 experiments. The overall objective is to fully test modified heat synchronization protocols for improving overall productivity and AI/embryo transfer (ET).

2009 Experiment- No new results to report. Partial financial support of this experiment was kindly provided by your association.

2012 Experiment- No new results to report. Partial financial support of this experiment was kindly provided by your association. Support of this experiment was also kindly provided by the Browns and Jeff Grant.

2013/15 Experiment- No new results to report. Support of this experiment was kindly provided by the Sanfords and Sinclairs.

## 2016 Experiment

The objectives of this study were to compare heat, ovulation, pregnancy, hormonal response and ovarian follicle (egg-bearing structure) and luteal (refers to progesterone (P<sub>4</sub>; “anti-heat” and pregnancy hormone) development of seasonally anestrous ewes treated with CIDR-estradiol-Folligon or CIDR-Estrus-Folligon. Estradiol (E<sub>2</sub>) is a type of estrogen that has been examined in many of our previous studies in NS (more details of these studies are in the PSBANS 2016-17 AGM Research Updates) and SK. Folligon is PMSG (pregnant mare serum gonadotropin) or eCG (equine chorionic gonadotropin). Estrus (estradiol cypionate or ECP; a type of estrogen) is a commercially available form of estrogen and a low and high dose of it were tested in this experiment. The animal handling phase of this project was May to July 2016.

For the 2017, 2018 and 2019 AGMs, I provided heat, follicle, ovulation, pregnancy, and luteinizing hormone (LH) results. Data analysis is almost complete. My MSc student, Zohreh Dehghani Madiseh, was going to determine the P<sub>4</sub> concentrations after ovulation, but due to the COVID-19 pandemic, this work was delayed and she will be starting this in November 2020.

**Conclusion:** It is unclear if ECP can be used as a replacement of E<sub>2</sub> in the hormone protocol. Perhaps a dose of ECP between the high and low dose will work.

Partial financial support of this experiment was kindly provided by your association.

## 2019 Experiment

The objectives of this study were to examine the effects of a non-super-stimulatory (non-MOET) dose of sheep follicle stimulating hormone (FSH) during a heat synchronization protocol on heat, ovulation, hormones, ovarian structures, pregnancy, and lambing in seasonally anestrous ewes. Pig FSH is used to stimulate many follicles to grow in multiple ovulation and embryo transfer (MOET) programs, but has not been used to synchronize the age of the eggs to be just right for fertilization. However, injectable sheep FSH can synchronize the age of the eggs to be just right for fertilization at practically any time in and out of the breeding season in ewes. Interestingly, using sheep FSH in this manner during a heat synchronization protocol has not been attempted in the ewe.

One group of ewes was treated with a CIDR and Folligon, while the other group was treated with a CIDR, Folligon, and sheep FSH. For the 2019 AGM, I provided heat, follicle, ovulation, pregnancy, and lambing results. Hormone analysis is not yet complete, but we can report that the FSH concentrations and patterns that were examined were not different between the groups of ewes.

**Conclusion:** The sheep FSH treatment in this study does not appear to effect heat, ovulation, pregnancy, lambing, or blood FSH when used in a CIDR-Folligon heat synchronization protocol for seasonally anestrous ewes.

Trainees- one Dalhousie undergraduate honours student, Kate Nason, two Dalhousie undergraduate students, one visiting graduate student, one Dalhousie graduate student, and three research assistants.

Initially accepted for presentation at the International Congress on Animal Reproduction 2020 (Bologna, Italy). However, due to the pandemic, this was presented at the Society for the Study of Reproduction Virtual Meeting in July 2020.

Partial financial support of this experiment was kindly provided by your association. I have been requesting the Year 2 matching funding from partnering producer associations. The total request for Year 2 matching funding from your association is \$750.

### *Potential Future Research Directions*

1. The long-term and multigenerational effects of feeding red clover pasture and hay on ewe and lamb health and performance- planning with Agriculture Canada and Dalhousie University researchers.
2. Manipulation of hormones to improve out-of-season breeding.

### *Research Funding Opportunities*

Ontario Sheep Farmers- “The long-term and multigenerational effects of feeding red clover pasture and hay on ewe and lamb health and performance” proposal was submitted in September, 2020

NS Canadian Agricultural Partnership Program- started in July 2018.

Industry matching funding required for Industry Driven Research and Innovation Program is 25%. I will be seeking matching funding from producer associations in 2021- total amount of approx. \$3000 X 2 years per research proposal, but will depend on the proposal.

As you know, there are other programs under the Canadian Agricultural Partnership Program umbrella that would also be applicable.

NSBI Productivity and Innovation Voucher Program (PNI Voucher)- The Voucher Program is offered once each fiscal year, with applications accepted from July to August. Industry matching funding is not required. For more information: <https://www.novascotiabusiness.com/export/productivity-and-innovation-voucher-program>