

# A Study on Pregnancy Toxemia in Sheep

Optimizing diets for late gestation prolific ewes and newborn lambs to reduce the neonatal mortality rate

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## INTRODUCTION

Late gestation is a critical period in sheep production. If feed rations do not meet the energy demand, ewes must convert fat into energy, which produces ketone bodies. The accumulation of these metabolic wastes causes pregnancy toxemia<sup>1,2</sup>. Some affected ewes will die, while others may have lambing difficulty, retained placentas, decreased quality and quantity of colostrum<sup>3</sup> and poor lactation, which can then increase the mortality rate of lambs<sup>4</sup>. Furthermore, some experts suggest that the needs proposed in National Research Council (NRC) tables used in feed formulation programs may be underestimated<sup>5</sup>. In this context, it is likely that prolific ewes will not be able to meet their actual late gestation needs at this time and are more likely to have metabolic disorders such as pregnancy toxemia<sup>1,2</sup>.

## OBJECTIVES

This project aimed to study the effects of diets in order to optimize animal performance and colostrum production, reduce ewes' metabolic problems and lambs' mortality and identify the best time to detect pregnancy toxemia.

## MATERIALS & METHODS

During pregnancy, 90 mature Romanov (RV) ewes and 42 F1 ewe lambs (Dorset x Romanov [DPxRV]) were randomly assigned to the following treatments:

- **Control diet** (follows NRC 2007 tables);
- **T-Adjust diet** (based on NRC 2007 tables adjusted with real DMI [dry matter intake]);
- **Energy diet** (based on NRC 2007 tables adjusted with real DMI + energy increased by 15 %).

Feed consumption tests were done every two weeks starting 8 weeks before lambing to adapt diets of **T-Adjust** and **Energy** groups.

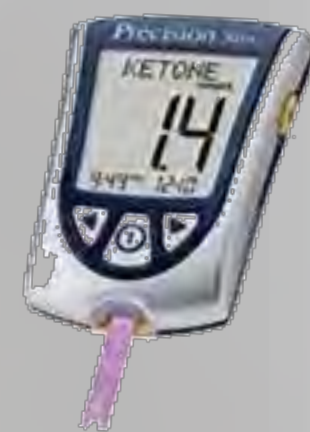
### Data collected the day before starting consumption test:

- ✓ Blood collection for metabolic profiles
- ✓ BHB & Glucose levels (using pharmaceutical strips)

### Data collected after lambing:

#### For ewes:

- ✓ Blood collection within 24h after lambing
- ✓ BHB & Glucose levels
- ✓ Weight and body score
- ✓ Colostrum evaluation using Brix refractometer



#### For lambs:

- ✓ BHB & Glucose levels at birth
- ✓ Blood collection within 24h-36h & 21d after birth

## CONCLUSION

### What did we learn from this study?

- ✓ NRC tables overestimated DMI, so evaluate actual DMI in the barn to correctly adjust the diet. Forage under 30 % of fiber should be used to feed pregnant prolific ewes to enhance their DMI.
- ✓ Use of BHB strips is recommended to detect sub-clinical cases of toxemia. It is reliable and easy to use by producers.
- ✓ Brix refractometer is a good tool to use in barn to evaluate colostrum quality of females and IgG concentration of commercial colostrum.

## RESULTS

- ✓ NRC 2007 tables **overestimated** the prolific mature ewes' DMI during gestation (+ 37 %), especially 8 and 6 weeks before lambing (figure 1). But there is no significant difference between treatments.

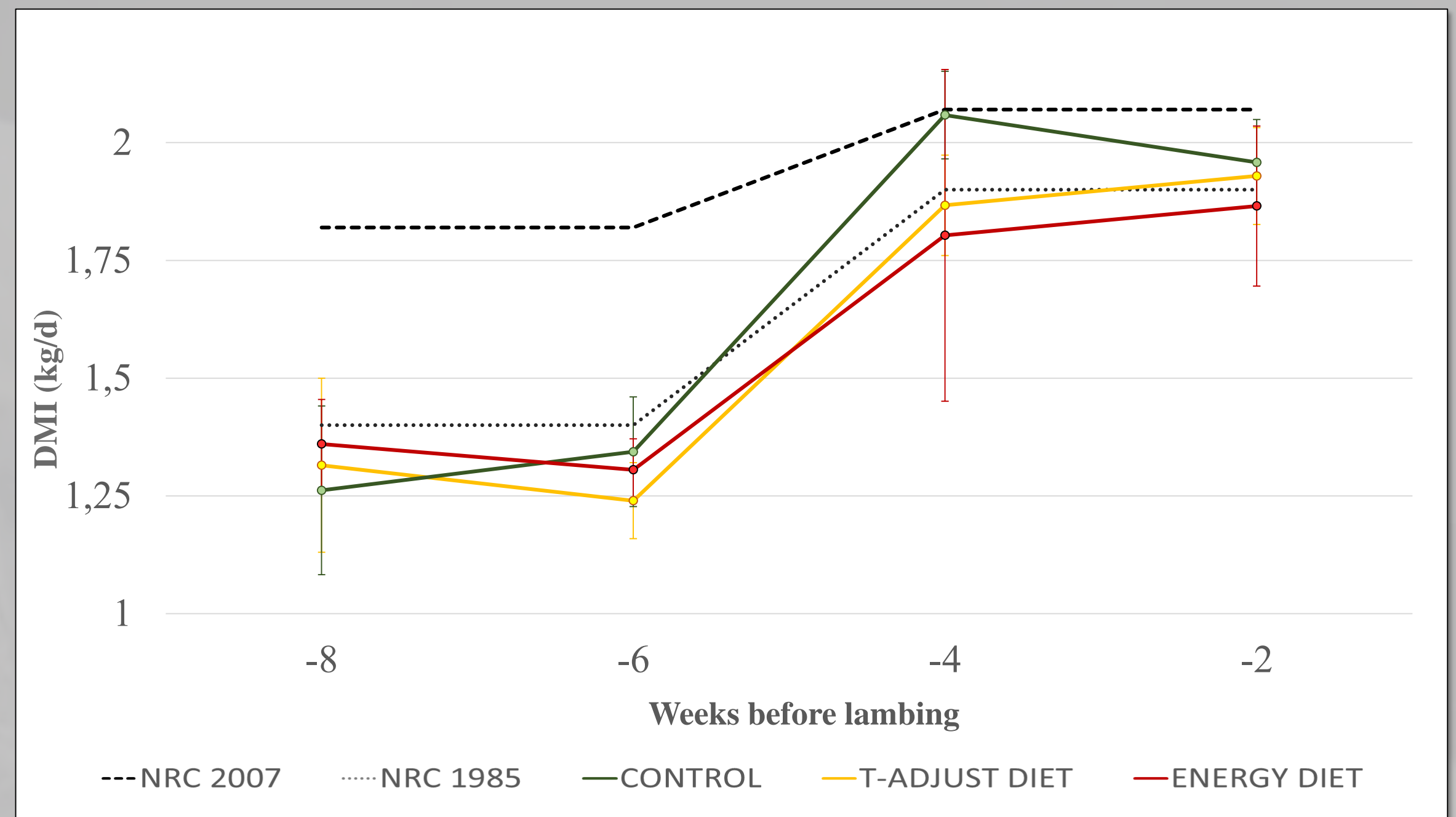


Figure 1. Dry matter intake (DMI, kg/d) of mature RV ewes weeks before lambing

- ✓ Forage under 30 % of fiber is desirable during the last 4 weeks of gestation to increase DMI as shown in figure 1.
- ✓ BHB values from pharmaceutical strips are **significantly correlated** to metabolic profile results. **Then, using strips in barn is a fast and reliable measure for detecting sub-clinical cases of toxemia. Standard value is < 0.8 mmol/L of BHB.**
- ✓ Glucose level using pharmaceutical strips is not accurate. No significant correlation was found.
- ✓ No significant difference for mortality rate was found between diets but 43 % of all deaths come from **Energy diet** group. The high energy diet increases costs, does not show a significant advantage and could contribute to high mortality rate.

Table 1. Brix index of ewe lambs and mature ewes.

	Brix index (%)		
	Mean	Min	Max
Ewe Lambs	23.0 ± 8.3	4.6	36.0
Energy diet	22.9 ± 8.1	7.7	34.5
T-Adjust diet	23.3 ± 7.5	12.8	34.0
Control diet	22.9 ± 9.7	4.6	36.0
Mature Ewes	22.4 ± 9.8	3.6	38.7
Energy diet	23.2 ± 10.4	4.9	38.7
T-Adjust diet	23.5 ± 9.1	4.0	35.0
Control diet	20.6 ± 10.0	3.6	37.3

A good Brix index > 22.0 and correspond to a colostrum concentration of 50 g/L of IgG



- ✓ No significant effect was shown for treatments and age of female, in regards to colostrum quality (table 1).

## REFERENCES

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