

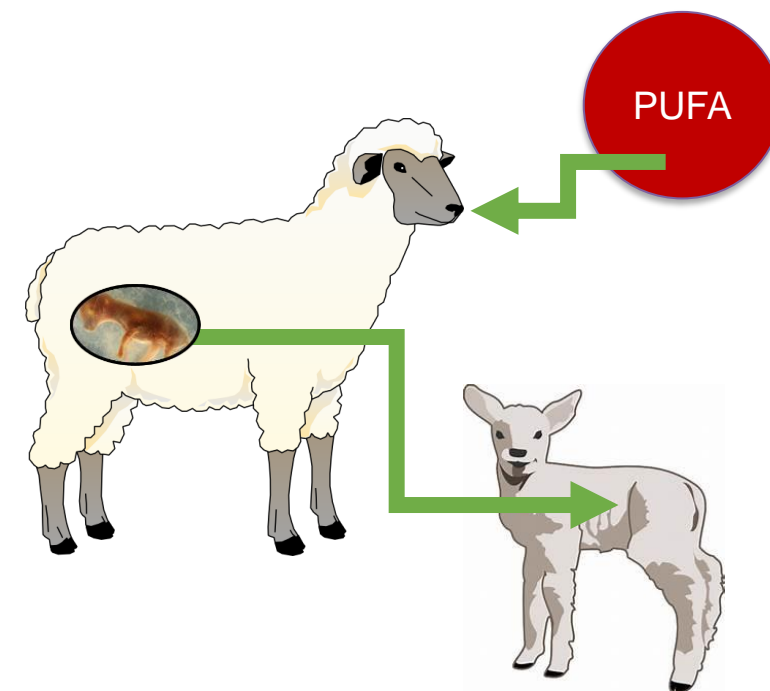
Maternal dietary supplementation of fatty acids during late gestation on offspring's growth, carcass characteristics and energy metabolism in sheep

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INTRODUCTION

- Growth is an important factor that drives animal production, and it can be manipulated through maternal nutrition.
- In ruminants, previous studies suggested that maternal nutrition during late gestation with polyunsaturated fatty acids (PUFA) altered growth, energy metabolism, muscle development, and body composition of the offspring.



Maternal supply of PUFA impacts offspring's growth and physiology by increasing:

- Final body weight
- Average daily gain
- Dry matter intake
- Plasma glucose concentration
- Carcass characteristics

(Carranza-Martin et al. 2018; Marques et al. 2017; Nickles et al. 2019)

AIM

Evaluate the effect of supplementing different sources of fatty acids (FA) to ewes during late gestation on offspring growth, feed intake (FI), carcass composition, and glucose and insulin metabolism by conducting a glucose tolerance test (GTT).

HYPOTHESIS

Maternal supplementation with PUFA during late gestation increase offspring's growth, DMI, insulin sensitivity, and improve carcass characteristics.

METHODS

Fifty-four ewes (n=18/treatment) were blocked by age, and BW; and within each block randomly assigned to one of three treatments fed from day 100 gestation until lambing.

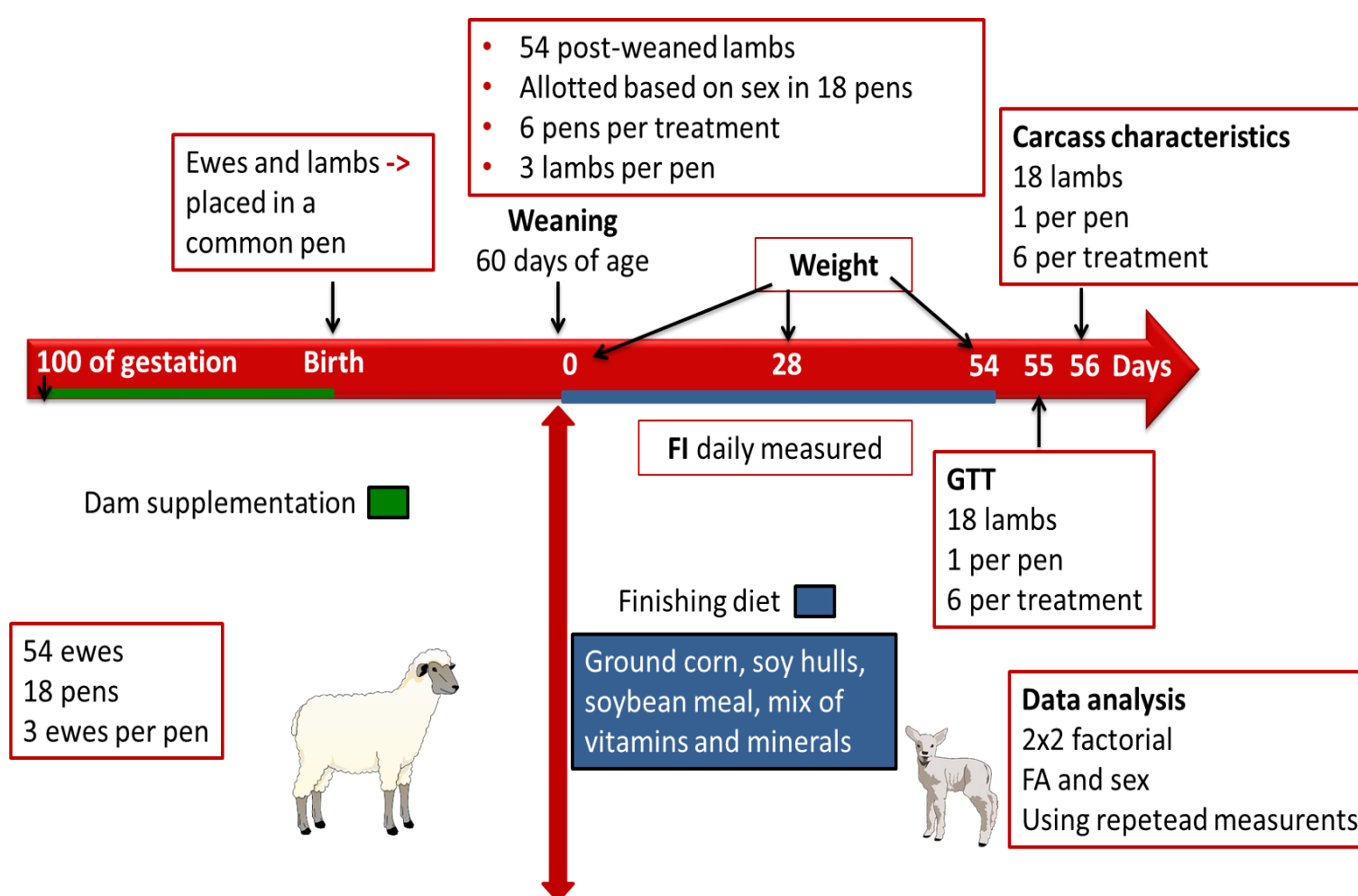
Dam treatments:

No supplementation (CONT)

Monounsaturated FA supplementation (MUFA) -> 1% FI (EnerGII, Virtus Nutrition)

PUFA supplementation (PUFA) -> 1% FI (Strata G113, Virtus Nutrition)

Study timeline



RESULTS

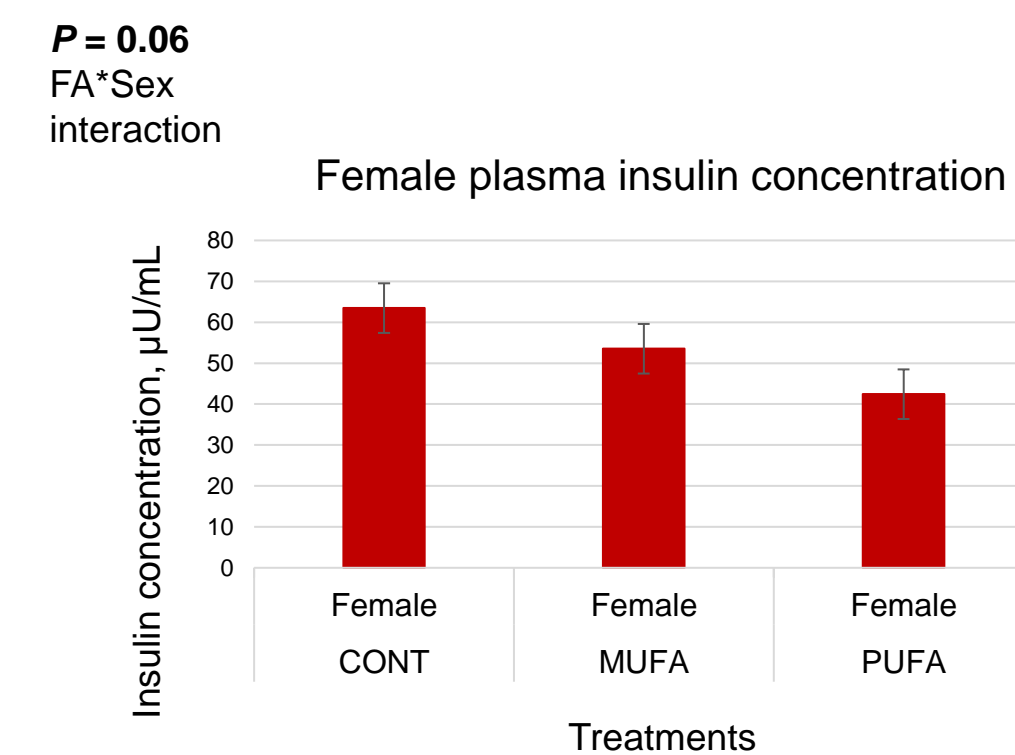
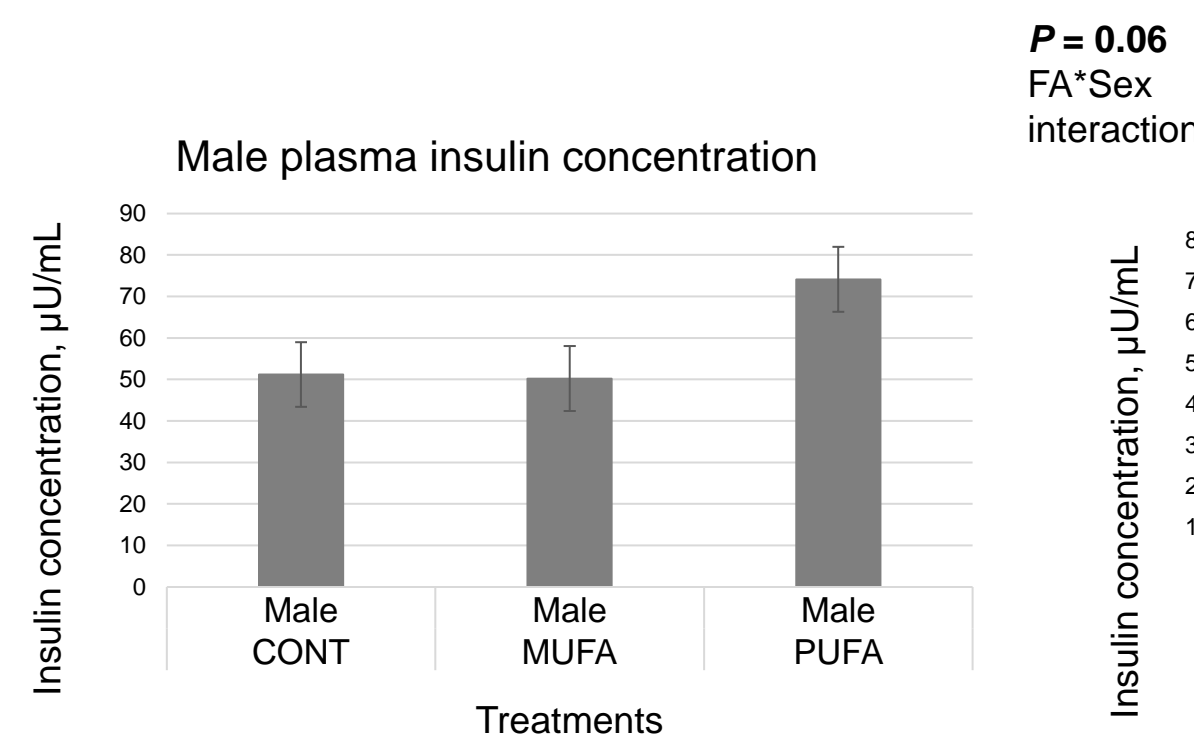
Growth performance

- No differences in feed intake
- There was no FA*Day, Day*Sex, or FA*Day*Sex interactions

Days after weaning	Lamb body weight, kg						SEM	P value		
	0		28		54			FA	Sex	FA*Sex
Sex	F	M	F	M	F	M	4.08	0.08	<0.01	0.08
CONT	32.84	32.06	41.02	40.45	48.56	48.33				
MUFA	31.45	29.21	39.59	37.70	47.02	46.09				
PUFA	31.93	34.45	39.24	42.86	46.82	50.30				

Glucose tolerance test

- No differences in glucose concentration



Carcass characteristics

Sex	CONT		MUFA		PUFA		SEM	P value		
	H	M	H	M	H	M		FA	Sex	FA*Sex
HCW, kg	27.81	28.26	27.81	26.07	26.14	30.30	3.45	0.49	0.33	0.07
REA, cm ²	15.55	17.10	14.71	16.19	13.29	17.16	0.17	0.47	<0.01	0.35

HCW, hot carcass weight; REA, rib eye area

CONCLUSIONS

- Maternal FA supplementation during late gestation modified growth, insulin sensitivity, and HCW in lambs.
- These changes depended on the FA unsaturation degree of the supplement and lamb sex.

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