FETAL SUPPLEMENTATION WITH VITAMINS C AND E, VIA MATERNAL INTAKE, IMPROVES ANTIOXIDANT STATUS

Parraguez VH[1, 2, 3], Sales F[3], Peralta OA[1], Serendero C[1], Peralta G[1], McCoard S[4], González-Bulnes A.[5]

[1]Faculty of Veterinary Sciences, [2]Faculty of Agricultural Sciences, University of Chile; [3]INIA-Kampenaike, Chile; [3]AgResearch Grasslands, New Zealand; [5]INIA-Madrid and Veterinary School, Complutense University of Madrid, Spain. E-mail: vparragu@uchile.cl

INTRODUCTION

- Twin pregnancies are essential to improve profitability in the sheep industry.
- Chilean Patagonia, concentrates over 55% of the country sheep population, characterized by low quality pastures which fail to meet nutrient requirements during pregnancy.
- In sheep, undernutrition and/or twining results in intrauterine growth restriction (IUGR), associated with fetal hypoxemia and oxidative stress.
- A possible strategy for counteracting oxidative stress of the feto-placental unit and thus IUGR is the maternal supplementation with antioxidant vitamins C and E.

AIM

To determine if vitamins C and E are adequately transferred from the ewe to the fetus and to evaluate their effect on fetal antioxidant capacity.

MATERIAL AND METHODS

- **Location:** INIA research farm, 65 km north from Punta Arenas, Magellan Region, Chilean Patagonia (Lat 52º 36'; Lon 70º 56').
- **Animals:** Corriedale single- (n=32) and twin-bearing (n=32) ewes were maintained under natural prairie, covering ~70% of NRC requirements. Half of the animals in each gestation rank received, in addition, daily supplementation with concentrate to satisfy ~100% of NRC requirements.

  Half of the ewes from each group received daily oral administration of vitamin C (10 mg/kg) and vitamin E (9 IU/kg) from 30 days after mating.

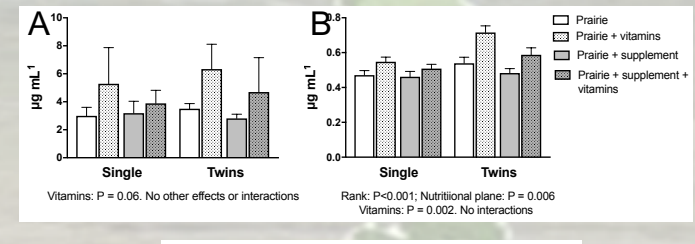
Photos: Oral supplementation of vitamins C and E in pregnant ewes

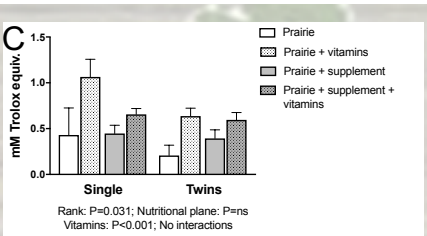
- At 140 days of pregnancy, maternal jugular and umbilical vein blood samples were taken for evaluation of vitamin C and E, and total antioxidant capacity (TAC).
- Data were analyzed by ANOVA in a factorial model, considering rank (single or twin), nutritional plane (with or without supplementation) and vitamins supplementation. Differences were considered when $P \leq 0.05$. Data are presented as mean ± SEM.

RESULTS

Peripheral blood plasma concentrations of vitamins C (panel A) and E (panel B) in single- and twin-bearing ewes

Umbilical cord blood plasma concentrations of vitamins C (panel A) and E (panel B), and total antioxidant capacity (panel C) in single- and twin-bearing ewes





CONCLUSION

It is concluded that maternal supplementation with vitamins C and E increased the vitamins delivery to the fetuses and improved their redox status. This research contributes to potential future strategies to prevent IUGR.

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