Quantitative morphometric analysis of the utero-placental vascular network and angiogenic effects of tocopherols in late pregnant ewes
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Objective
To compare angiogenic morphometric parameters of the utero-placental vascular network of late pregnant ewes supplemented with tocopherol or placebo.

Design
Clinical trial.

Subject
18 late pregnant ewes, crossbred; 2 to 6 years of age.

Interventions
Oral supplementation of 500 mg of alpha tocopherol (aT; N=6) or 1000 mg of gamma tocopherol (gT; N=7) or placebo (CON; N=5).

Methods
Ewes were supplemented daily from 100 to 137 days of gestation. At the end of the supplementation, all ewes were euthanized and placentomes near the umbilicus were collected. Uterine and placentomal tocopherol concentrations were estimated by HPLC procedure. Placentomal sections were stained with hematoxylin and eosin for morphometric evaluation. Image processing and analysis were performed using ImageJ 1.42q (NIH, USA) to evaluate the fractal dimension and lacunarity. Kruskall-Wallis analysis was used to compare the differences between treatment groups.

Results
The median aT concentration (mg/kg) in placentome (9.19) and uterus (5.23) was greater in ewes supplemented with aT compared to ewes in gT and CON groups (P<0.05). The median gT concentrations (µg/kg) in placentome (607) and uterus (737.7) were greater in ewes supplemented with gT compared to ewes in the aT and CON groups (P<0.05). Increased fractal dimension and decreased lacunarity were observed in tocopherol treated ewes compared to placebo treated ewes (Figure 1; P<0.05).

Conclusion
The placentomal morphometric analysis of late pregnant ewes supplemented with aT or gT showed an increase in angiogenic parameters in utero-placental vascular units.

Keywords: Sheep, vitamin E, feto-maternal unit, fractal dimension, lacunarity