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Research Reports

2014

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Recommended Citation

Held, J.E.; Zelinsky, R.; Bruns, K.; and Wright, C., "Effect of Vitamin E Supplementation on Reproductive Performance in Spring Mated Ewes" (2014). *South Dakota State University Sheep Research Report, 2014*. Paper 6.
http://openprairie.sdstate.edu/sd_sheepreport_2014/6

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SHEEP 2014-5

Effect of vitamin E supplementation on reproductive performance in spring mated ewes

J.E. Held, R. Zelinsky, K. Bruns, C. Wright

OBJECTIVES

To evaluate reproductive performance in commercial Polypay ewes fed supplemental vitamin E at the level recommended in the sheep NRC (1985) compared to the small ruminant NRC (2007) during spring mating.

MATERIALS AND METHODS

Mature commercial Polypay ewes (n = 81) were allocated to two treatment groups balanced by weight and supplemented with either 50 or 200 IU vitamin E for 5 weeks during the mating period (April 9 – May 14, 2008). Vitamin E was supplemented daily using a co-product based pellet fed at a rate of 1 lb per ewe. Mixed grass hay was available free-choice and the vitamin E level was 21 IU per pound. Four mature rams equipped with marking harnesses were used for each treatment group (1 ram:10 ewes). Rams selected for this study passed a breeding soundness exam including semen evaluation 2 wk prior to exposure. Breeding marks were observed daily and recorded by ewe eartag identification number. The source of ewes was from maternal lines selected for out of season reproductive success over several generations without exogenous hormones. Body weight, body condition scores, and serum vitamin E concentrations were determined prior to treatment and d 35 of the breed season. Vitamin E analyses for blood serum and feed ingredients were performed in a commercial laboratory located at a land-grant university.

Difference in least squares means for body weight, body condition scores (BCS), serum vitamin E and prolificacy that resulted from treatment were separated using the PDIFF option of SAS. Difference in least square means for reproductive performance including estrus activity and fertility data that resulted from treatment was separated by chi-square analysis.

RESULTS AND DISCUSSION

Reproductive performance data is given in Table 1. Level of vitamin E supplementation affected estrus activity (P = 0.0078) but not fertility or prolificacy. Even though estrus activity was higher for the vitamin E-50 ewes the result was a similar percent of ewes lambing and percent of lambs born and reared per ewe lambing. Out of season fertility and prolificacy data are similar to past reproductive performance results for this select line of ewes. As expected blood serum vitamin E concentration was higher (P = 0.001) for the vitamin E– 200 ewes after 5 wk, however all

treatment values were below 2 ug/ml the minimum serum vitamin E concentration suggested in the small ruminant NRC (2007) for adequacy.

The recommended vitamin E supplementation for breeding ewes using the sheep NRC (1985) is 6.8 IU per pound of dry matter, the small ruminant NRC (2007) suggests 2.4 IU vitamin E per pound of body weight for all classes of sheep. For ewes in this study the recommended daily supplemental vitamin E using sheep NRC (1985) guidelines is 34 IU and the small ruminant NRC (2007) computes to 336 IU.

Table 1. Reproductive performance of mature ewes supplemented with vitamin E at breeding

	Vit E-50	Vit E-200	SEM	<i>P</i> <
Number of ewes exposed	n = 41	n = 40		
Initial wt (lb)	137.9	137.5	2.88	0.95
(BCS)	(2.5)	(2.4)	0.04	0.78
Ending wt (lb)	146.5	145.6	2.47	0.84
(BCS)	(2.9)	(2.9)	0.04	0.89
Serum Vit. E level (µg/ml)				
Initial	0.74	0.79	0.02	0.22
Ending	0.92	1.59	0.05	0.001
Estrus Activity (%)				0.0078
None	2.5	24.4		
1 st 17d period	70.7	57.5		
2 nd 17d period	58.8	40.1		
1 st mark	(41.6)	(62.5)		
Repeated	(58.4)	(37.5)		
1 st and 2 nd period	35.0	17.1		
Fertility (%)				0.95
Open	47.5	48.8		
Lambled	52.5	51.2		
Prolificacy per ewe lambing (%)				
Lamb born	138	143	0.09	0.97
Lambs reared	133	138	0.08	0.78