STUDY REGARDING THE CORTROSYN-DEPOT EFFECTS IN LACTATING EWES

Iuliana Codreanu, Gabriela Negritu, M. Codreanu, N. Dojană

Faculty of Veterinary Medicine Bucharest, Romania, iulianacod@yahoo.com

Abstract

The literature indicates a positive correlation between maternal behavior in sheep, milk production and administration of the ACTH hormone (Cortrosyn Depot as commercial product) involved in various metabolic processes (specific actions the ACTH hormone on the mammary gland in stimulating the lactopoesis).
Because an intense lactogenesis is associated with a positive maternal behavior, we considered it appropriate to study and quantify the implications of ACTH production and mammary gland development.
Thus, Cortrosyn (ACTH) was series administered in sheep, from the first day after birth until day 15 of lactation, in dose of 1 mg.
It can be observed a positive correlation between maternal behavior in sheep, milk production and administration of the ACTH hormone (in the form of commercial preparation Cortrosyn Depot).

Key words: *Cortrosyn, lactating ewes, maternal behavior.*

MATERIALS AND METHODS

In this experiment we formed two groups as follows:
- LM group - control group - consisting of 10 lactating ewes from Merino breed with their lambs;
- LEC group - experimental group - consisting of five lactating ewes from Merino breed (with their lambs), who were treated with ACTH hormone.

ACTH - based commercial product used in this experiment was Cortrosyn Depot (depot form of ACTH).Through its implications in various metabolic processes and specific actions the ACTH hormone, occurs on the mammary gland, stimulating the lactopoesis (Keller et al., 2008; Dojană, 2010).

Whereas an intense lactogenesis is associated with an intense positive maternal behavior, we studied the role of ACTH in the development of the lactogen potential of the mammary gland (Young et al., 2003; Linares et al., 2008).

Thus, Cortrosyn (ACTH) was series administered in sheep, from the first day after birth until day 15 of lactation, in dose of 1 mg.

Lambs from the control and experimental groups were weighed on days 1, 10 and 21 days after calving, calculating finally batch weaning weight and average daily gain/lamb/group (Acatincăi, 2003).

RESULTS AND DISSCUTION

To lactating ewes from experimental and control groups, we determined indirectly the maternal behavior, by establishing the average weight of lambs at birth, 21 days and at weaning, because a higher lambs weight, reflecting a higher milk production the mother-sheep, which ultimately means better maternal behavior expressed (McKusick, 2001).
An indirect determining of ACTH effect of milk secretion in sheep from this experiment, and while on maternal behavior, was performed by following the dynamics of comparative weight and daily gain of the lambs from the two groups (Codreanu, 2001).
Thus, by weighing lambs derived from experimental and control groups, and after calculating the average weight of lambs groups at birth and at weaning and the daily gain/lamb, there are some changes with statistical significance in some cases that will be mentioned below (Pugh, 2002).
Values of body weight and weight gain in lambs of control and experimental groups are presented in tables 1-2 and illustrated in figure 1.

Table 1. Average weight (kg) in lambs from control and groups treated with Cortrosyn

GROUP	Average weight (kg)			
	3 days after birth	10 days after birth	21 days after birth	weaning (50 days)
CONTROL	4.0±0.180	5.5±0.250	8.3±0.340	16.7±0.680
LEC	4.4±0.190*	6.2±0.310**	9.6±0.400**	18.4±0.860**

** p>0.05 – insignificant difference*
*** p<0.05 - significant difference*

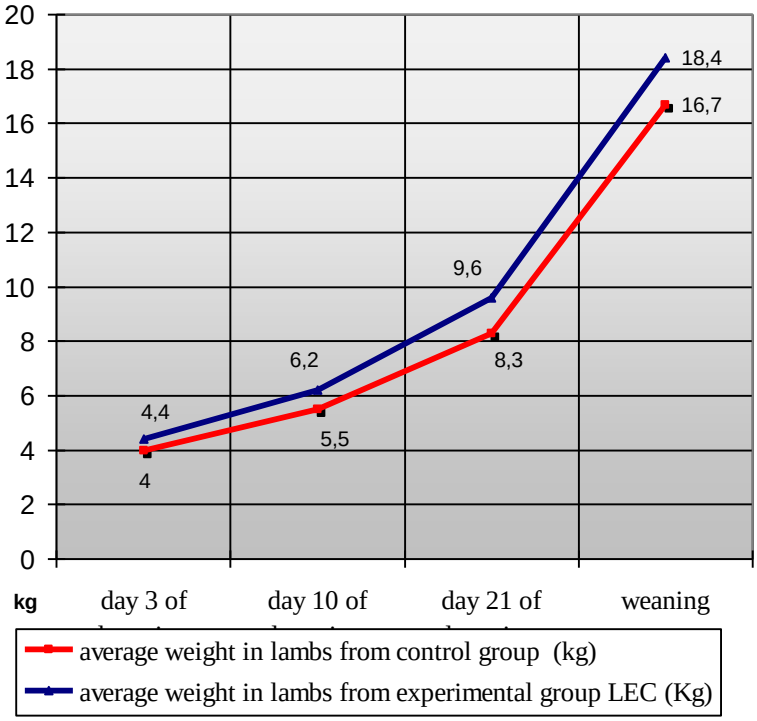
Comparing the average weight per group at weaning and average daily gain on the entire period of lactation, we can see that the lambs from experimental group, these parameters were significantly higher in statistical terms ($p<0.05$) compared with the control group.

Table 2. Comparative results of average daily gain of lambs from control group and experimental group treated with Cotrosyn, during lactation period (g/day)

Group	**Daily gain (g)**		**Average daily gain (g)**
	0-21 zile	*21- 50 zile*	
Control	210±19.2	190±18.8	**200±19.0**
LEC	265±20.2**	225±18.0*	**245±19.4****

** p>0.05 – insignificant difference*
*** p<0.05 - significant difference*

Figure 1. The dynamics of the average weight (kg) in lambs from control group and experimental group treated with Cortrosyn



Cortrosyn Depot administration in sheep from experimental group, is a clear demonstration of the lactogenic role of the ACTH in this species and in the requirement that maternal behavior (Dojană, 2010).

After dosing the biochemical parameters in sheep from the control and experimental groups, revealed the existence of significant increases in average values of albumin, total lipids and triglycerides in sheep from experimental group, increases which probably reflected in milk composition of these sheep (table 3).

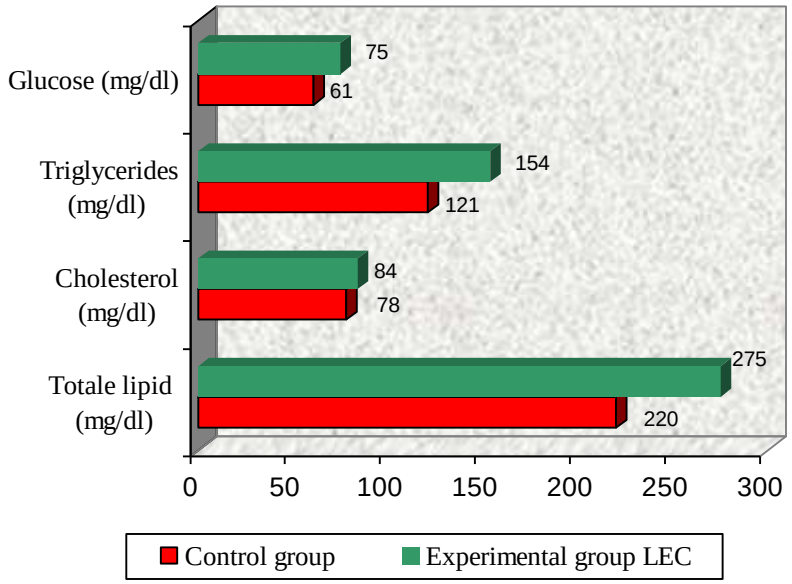
Values of proteic and energetic profiles in ewes, from control and experimental groups, are presented in tables 3 and illustrated in figure 2.

Table 3. Average values of proteic and energetic profiles in ewes from control and experimental group treated with Cortrosyn

PARAMETER		**Group**	
		CONTROL	EXPERIMENTAL
PROTEIC PROFILE	Total protein *(g/dl)*	6.8±0.39	7.2±0.42*
	Albumin *(g/dl)*	3.3±0.19	3.9±0.25**
	Globulin *(g/dl)*	3.5±0.21	3.3±0.19*
	Report Albumin/ Globulin	0.970	1.181*
ENERGETIC PROFILE	Total lipid *(mg/dl)*	220±12.8	275±13.5**
	Cholesterol *(mg/dl)*	78±5.2	84±4.8*
	Triglycerides *(mg/dl)*	121±6.4	154±8.1**
	Glucose *(mg/dl)*	61±4.4	75±4.0*

** p>0.05 – insignificant difference*
*** p<0.05 - significant difference*

Figure 2. The dynamics of average values of proteic and energetic profiles in ewes from control and experimental group treated with Cortrosyn



It can be observed a positive correlation between maternal behavior in sheep, milk production and administration of the ACTH hormone (in the form of commercial preparation Cortrosyn Depot).

CONCLUSIONS

Treatment with Cortrosyn Depot in ewes from experimental group leads indirectly to the improvement of maternal behavior.

Comparative analysis of average weight/group at weaning (18.4 kg) and average daily gain thus the entire period of lactation (245 g/day), we can see that by lambs from the experimental group, these parameters were significantly higher ($p<0.05$) than lambs from the control group (16.7 kg, respectively, 200 g/day).

Although administration of Cortrosyn Depot in ewes has not generated clinical changes of any treated sheep was found, however we observed significant increases of average values of serum biochemical parameters ewes from experimental group (albumin, total lipids and triglycerides).

The other serum parameters (globulin, glucose, cholesterol) in ewes from experimental group were within in normal limits of the species and physiological state, which shows that the ACTH, does not alter the physiological balance animals.
Cortrosyn Depot administration in sheep from experimental group, is a clear demonstration of the lactogenic role of the ACTH in this species and in the requirement that maternal behavior.

REFERENCES

Acatincăi S., 2003. Etologie – Comportamentul animalelor domestice – ed. Eurobit, Timişoara

Codreanu Iuliana, 2001. Elemente de fiziologie a comportamentului matern la animale, Ed. Monitor, Bucureşti

Dojană, N., 2010. Fiziologia animalelor domestice, Ed. Printech, Bucureşti

Keller-Wood M, Wood CE. 2008. Regulation of maternal ACTH in ovine pregnancy: does progesterone play a role? Am J Physiol Endocrinol Metab. Oct;295(4):E913-20.

Linares M., R. Bórnez, H. Vergara, 2008. Cortisol and catecholamine levels in lambs: Effects of slaughter weight and type of stunning, Livestock Science. Volume 115, Issue 1, May 2008, Pages 53-61

McKusick BC, Thomas DL, Berger YM., 2001. Effect of weaning system on commercial milk production and lamb growth of East Friesian dairy sheep. J Dairy Sci.;84 (7):1660-8.

Pugh G., 2002. Sheep & goat medicine. Elsevier Health Sciences

Young S., J. Rose, J. Schwartz, 2003, Ontogeny of Corticotropin-Releasing Hormone Binding in Anterior Pituitaries of Fetal Sheep, Reproductive Sciences, April 1, 2003; 10(3): 130 - 135.