



Animal Production Department

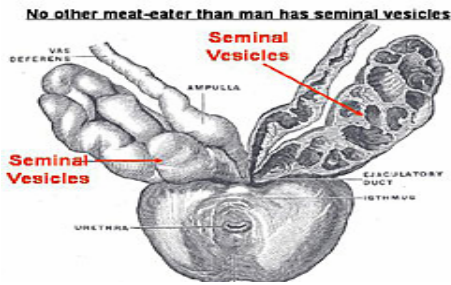


Physical and biochemical characteristics of semen from rams treated with recombinant bovine somatotropin (rbST)

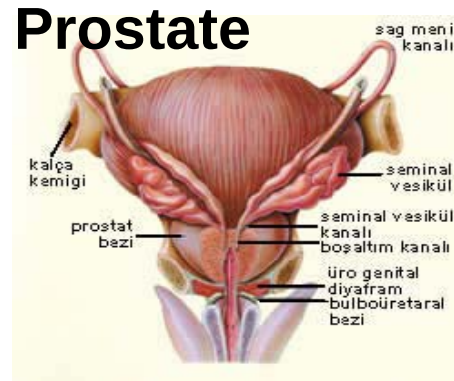
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- Somatotropin may play a role in controlling of spermatogenesis and steroidogenesis. **Schallenberger *et al.* (1993)** found that the **sperm concentration** and **sperm motility** increased in treated-bulls with rbST. **EL-Hairiry (2000)** found that the **ejaculate volume**, **live sperm**, **sperm concentration** and **sperm output** were higher ($P < 0.05$), but the **sperm abnormalities** were lower ($P < 0.05$) in rbST treated rams.

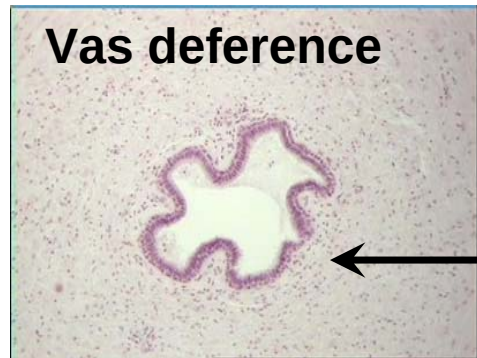
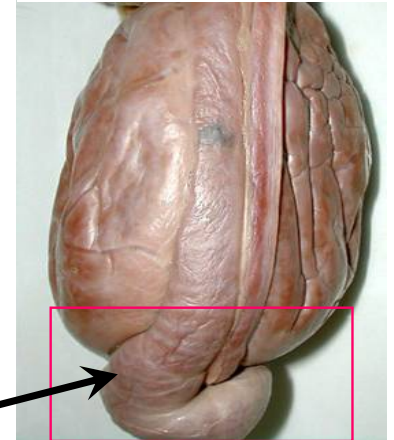


Seminal vesicles

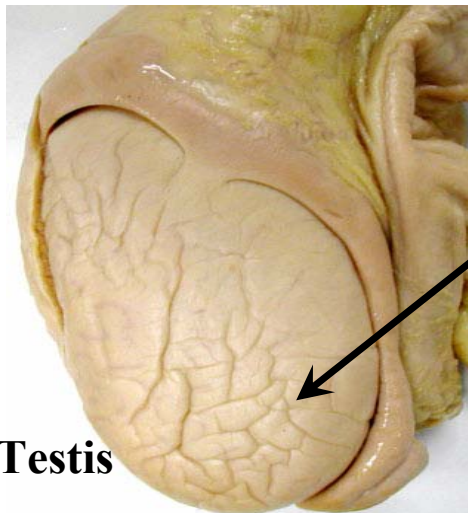


Prostate

Epididymis



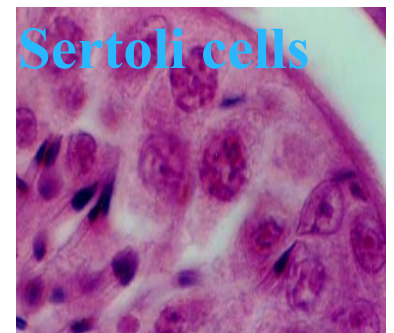
Vas deference



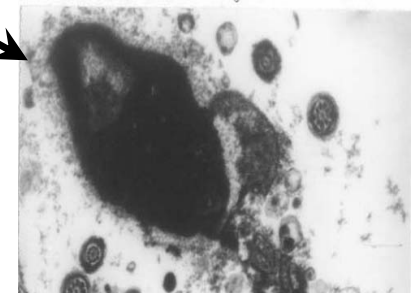
Testis



Spermatids



Sertoli cells



Acrosomal region

**GH and IGF-1
receptors**
Lobie et al., (1990)

The objective

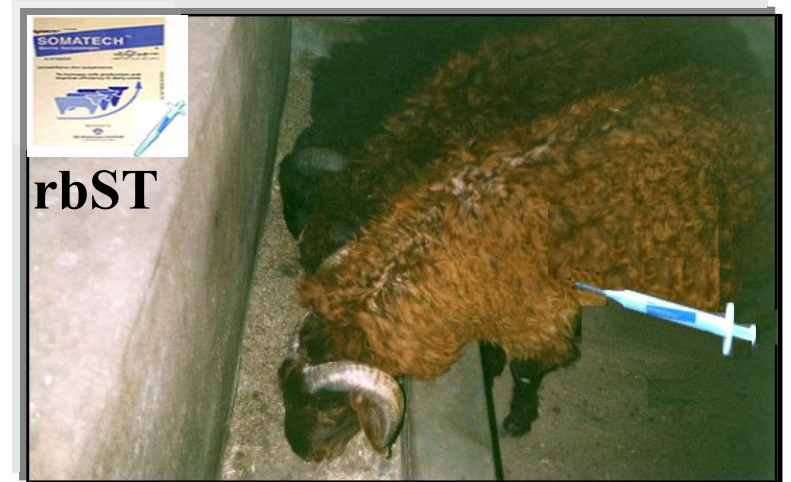
- The aim of this study is to evaluate the effect of recombinant bovine somatotropin (rbST) on physical and biochemical semen characteristics and blood hormones of Rahmani lambs.

Experimental design

24 Rahmani lambs
 31.5 ± 0.63 kg

Control

rbST treated rams
(100 mg /14 days)



***** All groups was isonitrogenous (14% CP)**

Table (1). Effect of rbST treatment on blood plasma hormones ($\bar{X} \pm SE$) of Rahmani rams

Blood hormones	Experimental groups	
	Control	rbST
IGF-1 (ng/ml)	578.71 ^b $\pm$ 90.63	$\uparrow$ 776.00 ^a $\pm$ 118.30
Testosterone (ng/ml)	5.62 ^a $\pm$ 0.10	$\downarrow$ 2.71 ^b $\pm$ 0.70

a, b,.....Means having different superscript letters in the same row differ significantly ($P < 0.05$).

- The concentration of blood plasma IGF-1 was higher ($P < 0.05$) by 34.09 % in rbST treated rams compared to the control rams (776.00 vs. 578.71 ng/ml, respectively).
- The concentration of blood plasma testosterone was lower ($P < 0.05$) in rbST treated rams by 51.78 % compared to the control rams (2.71 vs. 5.62 ng/ml).

Fig. (1) Effect of rbST treatment on blood plasma IGF-1 during the experimental period

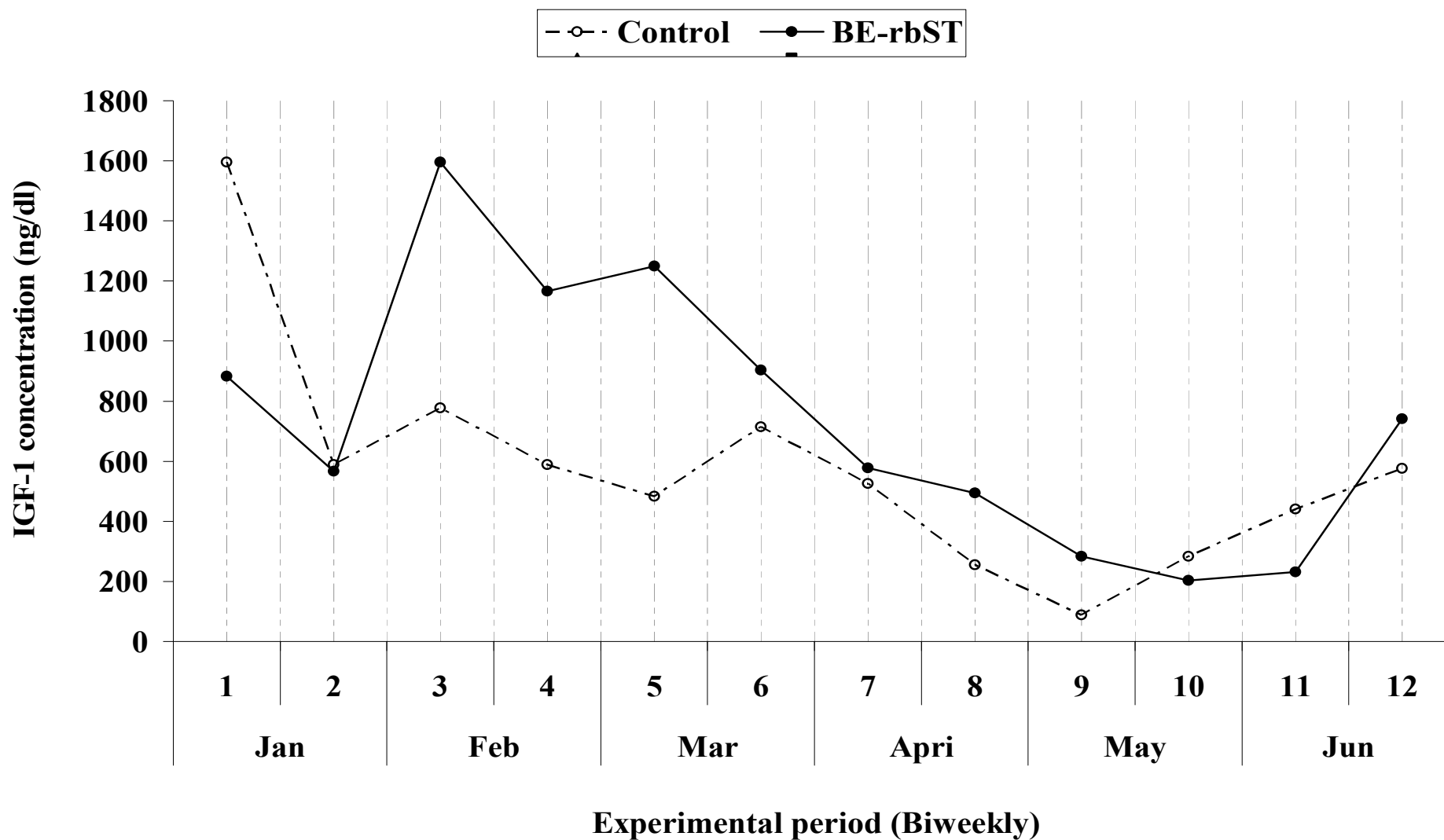
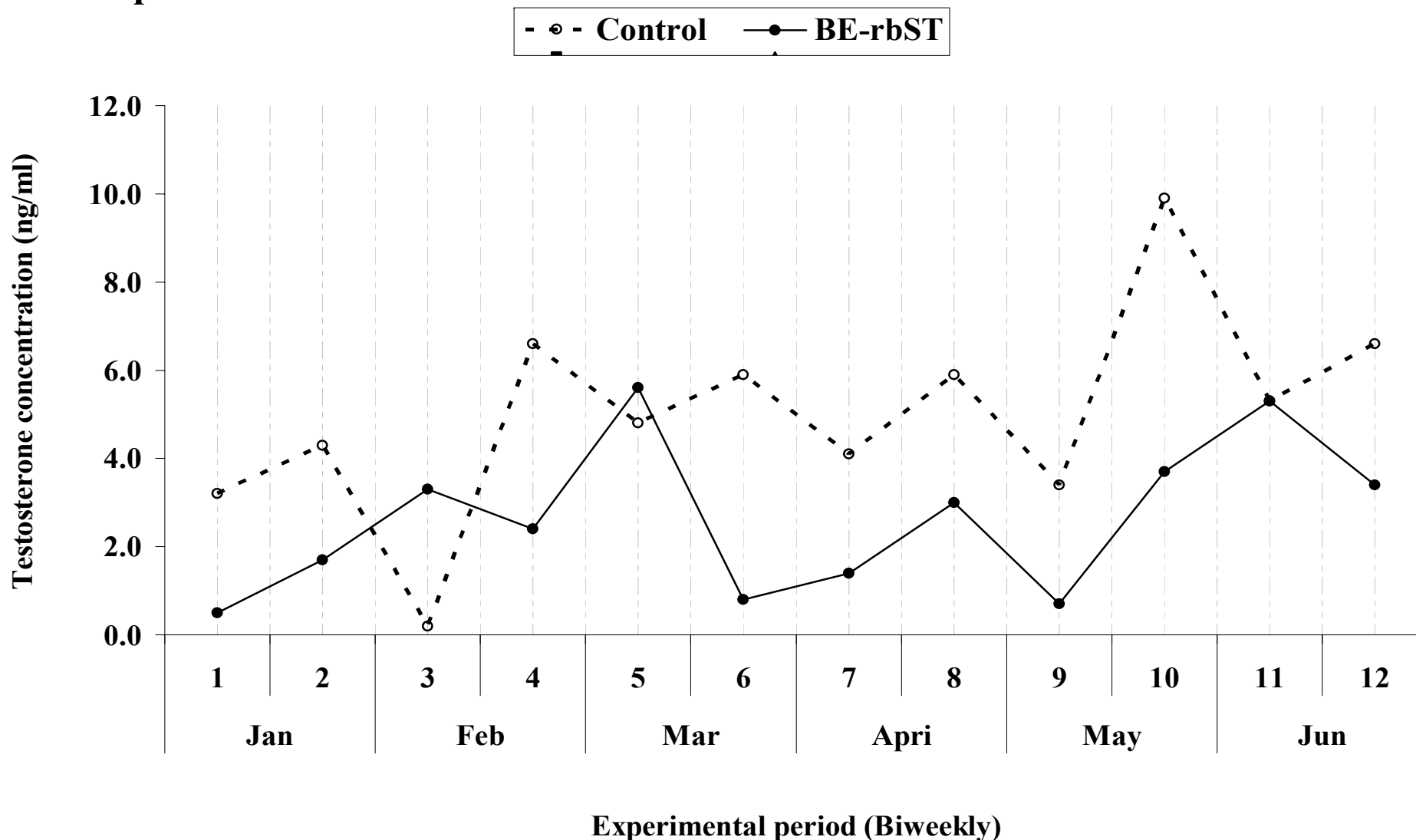


Fig. (2) Effect of rbST treatment on blood plasma testosterone during the experimental period





Seminal plasma constituents

Results



- There were not significant differences due to the rbST treatment on seminal plasma constituents compared to the control rams.



Seminal plasma constituents Results



Table (3). Effect of rbST treatment on seminal plasma characteristics ($\bar{X} \pm \text{SE}$) of Rahmani rams.

Biochemical seminal plasma	Experimental groups	
	Control	rbST
Total protein (g/dl)	6.64 ± 0.24	6.45 ± 0.24
Albumin (g/dl)	$3.18^{ab} \pm 0.09$	$3.37^a \pm 0.09$
Globulin (g/dl)	3.46 ± 0.23	3.09 ± 0.23
A/G ratio	1.15 ± 0.10	1.19 ± 0.10
Total lipids (g/dl)	$0.87^{ab} \pm 0.03$	$0.92^a \pm 0.03$
Triglycerides (mg/dl)	235.50 ± 8.36	232.76 ± 7.33
Cholesterol (mg/dl)	$202.20^{ab} \pm 6.08$	$214.47^a \pm 6.16$
AST (RFU/L)	76.64 ± 4.97	73.75 ± 6.12
ALT (RFU/L)	$64.79^{ab} \pm 8.10$	$58.31^b \pm 3.92$
AST/ALT ratio	1.40 ± 0.17	1.33 ± 0.11

a, b,.....Means having different superscript letters within the same row differ significantly ($P < 0.05$).



Semen characteristics

Results



- Effect of rbST treatment on ejaculate volume, mass motility, advanced motility, live sperm, sperm output and total output live sperm was **slightly higher** but did not differ significantly ($P > 0.05$) compared to the control rams. On the other hand, the sperm concentration in rbST treated rams was slightly lower but did not differ significantly compared to the control rams (2.8 vs. 3.2 109/ml, respectively).

Table (2). Effect of rbST treatment on semen physical characteristics ($\bar{X} \pm \text{SE}$) of Rahmani rams.

Semen characteristics	Experimental groups	
	Control	rbST
Ejaculate volume (ml)	$1.00^{ab} \pm 0.04$	$1.18^a \pm 0.07$
Mass motility (score; 0-5)	4.88 ± 0.06	4.94 ± 0.03
Advanced motility (%)	79.22 ± 1.51	80.10 ± 1.34
Live sperm (%)	84.14 ± 1.31	84.30 ± 1.15
Total abnormalities (%)	16.20 ± 0.99	16.32 ± 0.98
Sperm concentration ($10^9/\text{ml}$)	$3.2^a \pm 0.17$	$2.8^{ab} \pm 0.17$
Sperm output ($10^9/\text{ejaculate}$)	$3.2^{ab} \pm 0.28$	$3.3^a \pm 0.28$
Total output live ($10^9/\text{ejaculate}$)	2.7 ± 0.26	2.8 ± 0.26

a, b,.....Means having different superscript letters within the same row differ significantly ($P < 0.05$).

- Use of rbST slightly improves the semen characteristics of Rahmani rams.
- The treatment with rbST in rams dose not have an adverse effect on semen characteristics



rbST



Semen

Thanks

