



# THE EFFECT OF CAMEL COLOSTRUM EXTRACT FEEDING ON THE ESTROGEN AND PROGESTERONE LEVELS IN RATS

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## Abstract

Colostrum is one of the richest fluids produced by mammals immediately after birth. Iraqi camel colostrum 30 ml. has been collected post-parturition at 0, 6, 12 hours respectively in sterile containers and sent directly in ice box to the laboratory. The colostrum samples have been double centrifuged at 5000 rpm for 10 minutes. The supernatants have been difiltrated by microfiltration system with microfiltration membrane 0.22  $\mu\text{m}$ , and the extracts have been refrigerated at 4°C until use. Twenty albino rats with a mean weight 256.3 $\pm$ 2.02. The animals have been grouped randomly into four with each group contain five rats. The groups details are as follows: Group- 1 (G1): Rats have been treated daily 0.1 ml. orally, of 0 hour colostrum extracts for one. Week Group- 2 (G2): Rats have been treated daily 0.1 ml. orally, of 6 hours colostrum extracts for one week, Group- 3 (G3 ): Rats have been treated daily 0.1 ml. orally, of 12 hours colostrum extracts for one week Group-4 (G4): Rats have been given daily and orally tap water only. Blood samples have been collected from the heart of each rat at 1,2,3, and 4<sup>th</sup> weeks under routine aseptic conditions, centrifuged directly at 3000 rpm/5 minutes to collect the serum, which preserved at 4°C. The estrogen and progesterone levels have been measured by Reflotron® Plus with traditional kits. The first group is superior than the other groups as for estrogen which is 62.290 $\pm$ 0.760, and as for progesterone which is 0.903 $\pm$ 0.014. The highest concentration of estrogen has been recorded in the second week of the second group which is 81.920 $\pm$ 1.433 ng / ml while the lowest concentration of the fourth group which is 45.660 $\pm$ 1.432 ng / ml. The highest concentration of progesterone has been recorded in the first week of the second group which is 1.632 $\pm$ 0.031 ng / ml while the lowest concentration of the fourth group which is 0.430 $\pm$ 0.025 ng / ml.

**Key words:** Camel; Colostrum; Extract; Feeding; Estrogen; Progesterone; Rats.

## Introduction

Colostrum is one of the richest fluids produced by mammals immediately after birth. It contains many immune compounds and growth factors, which is very different from whole milk. camel colostrum contains a high percentage of protein, non-protein nitrogen, ash, vitamins and minerals. It also contains a large amount of ingredients, which are natural antagonists that build the immune system of camel calves (Jard *et al.*, 2015). colostrum is available as a food supplement and not only a source of carbohydrates, protein, fat, and minerals but also contains high concentrations of growth and immune factors such as insulin-like growth factors I and II, immunoglobulins, lactoperoxidase, lactoferrin, and several

cytokines (Kelly, 2003; Stelwagen *et al.*, 2009). Colostrum is able to help the local defense (immunoglobulin A); modulate the immune response (immunoglobulin E, M, G); promote antibacterial and antiviral action (lactoferrin and transferrin); modulate the inflammation factors (cytokine, interleukin); promote normal cell growth, normal cell activities, cell migration and proliferation, and tissue repair (transforming growth factor alpha and beta; epidermal growth factor); stimulate the mucosal restore; and accelerate wound healing insulin-like growth factors (IGF-1 and -2). In particular, IGF-1 is involved in the regulatory feedback of growth hormone (Uruakpa *et al.*, 2002) and interferes with insulin-like growth factor binding proteins (Donovan and Odle, 1994). The use of Bovine colostrum as a dietary supplement has increased substantially over the past decade. Unlike some dietary

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supplements whose composition are precisely defined chemically, and hence could be expected to be similar in composition irrespective of the brand, BC does not have a typical composition profile. Multiple factors influence the composition of Bovine colostrum, including the breed and health status of the cow, feeding practices, and time collected post-parturition. For example, a product which is made from BC collected during the first 24 hours post-parturition would be expected to have a higher concentration of immunoglobulins (Ig) and growth factors than a product made from BC collected from the same cows during the first three days post-parturition (Kelly, 2003). Another study assessing the impact of eight weeks of supplementation with 10g colostrum on cortisol during a five day road race noted an increase in morning cortisol concentrations from baseline up to the first day of the race, indicating that colostrum supplementation caused a modest increase in resting cortisol levels (Shing, 2013). The aim of the study is to demonstrate the effect of Camel Colostrum on estrogen and progesterone in rats.

### Materials and methods

The study has been conducted at the Animal Production Department, Agriculture College, Al-Qadisiyah University from December 2016 to January 2017.

#### Experimental design:

Iraqi camel (*Camelus dromedarius*) colostrum 30 ml. has been collected post-parturition at 0, 6, 12 hours respectively in sterile containers and sent directly in ice box to the laboratory.

The colostrum samples have been double centrifuged at (5000 rpm for 10 minutes). The supernatants have been filtered by microfiltration system (Vacuum Membrane Filter Funnel Apparatus, ShaoxingWorner Lab Equipment CO.LTD, Shanghai, China) with microfiltration membrane (0.22  $\mu$ m), and the extracts have been refrigerated at 4°C until use. Twenty albino rats (*Rattus norvegicus*) with a mean weight 256.3 $\pm$ 2.02gm. are obtained from the Animal Holding Unit of the Department of Physiology of the College of Veterinary Medicine/University of Al-Qadisiyah.

The animals have been grouped randomly into four, each group contains five rats. The groups details are as follows:

Group-1 (G1): Rats have been treated daily 0.1 ml. orally, of 0 hour colostrum extracts for one week.

Group-2 (G2): Rats have been treated daily 0.1 ml. orally, of 6 hours colostrum extracts for

one week.

Group-3 (G3): Rats have been treated daily 0.1 ml. orally, of 12 hours colostrum extracts for one week.

Group-4 (G4): Rats have been given daily and orally tap water only.

#### Blood analysis :

Blood samples have been collected from the heart of each rat at 1,2,3, and 4<sup>th</sup> weeks under routine aseptic conditions, centrifuged directly at 3000 rpm/5 minutes to collect the serum, which preserved at 4°C. The estrogen and progesterone levels have been measured by Reflotron® Plus (Roche Diagnostics GmbH Mannheim – Germany) with traditional kits.

#### Statistical analysis:

The results have been analyzed with one way ANOVA program and variances were regarded significant at P= 0.05.

### Results and discussion

Table 1 shows significant differences (P=0.01) between the groups during the experiment period. The first group is superior than the other groups for estrogen and progesterone. The concentration of estrogen (ng/ml) is 62.290 $\pm$ 0.760 and there are no significant differences between the third and fourth groups. While the highest concentration of progesterone (ng/ml) is 0.903 $\pm$ 0.014 and the lowest concentration is recorded for the fourth group. The overall mean estrogen is 51.294 $\pm$ 0.353 (ng/ml) while the overall mean of progesterone is 0.611 $\pm$ 0.007 (ng/ml). This may be due to the effect of colostrum on the flow of vaginal blood and on the size of the ovary (Silvia *et al.*, 2013). The results of this study are not conformed to (Anttimero *et al.*, 1997).

**Table 1:** The Mean Values  $\pm$  SE of Estrogen and Progesterone (ng/ml).

Group	Estrogen	Progesterone
G1	62.290A $\pm$ 0.760	0.903A $\pm$ 0.014
G2	51.110B $\pm$ 0.703	0.607B $\pm$ 0.013
G3	47.710C $\pm$ 0.704	0.501C $\pm$ 0.013
G4	44.065C $\pm$ 0.704	0.434D $\pm$ 0.014
General Average	51.294 $\pm$ 0.353	0.611 $\pm$ 0.007

Different letters mean significant variances at P $\leq$ 0.01.

As shown in table 2 the highest concentration of estrogen has been recorded in the second week of the second group 81.920 $\pm$ 1.433 ng/ml while the lowest concentration of the fourth group 45.660 $\pm$ 1.432 ng/ml. There are no significant differences between the second and third groups in the second and third weeks. There

**Table 2:** The mean values  $\pm$  SE of estrogen(ng / ml)within four weeks.

Week / Group	1	2	3	4
G1	59.920 a $\pm$ 1.411	51.140 f $\pm$ 1.433	45.840 d $\pm$ 1.434	43.500 d $\pm$ 1.400
G2	81.920 b $\pm$ 1.433	55.820 f $\pm$ 1.434	53.360 f $\pm$ 1.445	44.040 d $\pm$ 1.401
G3	61.660 c $\pm$ 1.423	53.600 f $\pm$ 1.444	49.000 f $\pm$ 1.431	44.500 d $\pm$ 1.411
G4	45.660 d $\pm$ 1.432	43.880 d $\pm$ 1.392	42.640 d $\pm$ 1.389	44.220 d $\pm$ 1.412

Different letters mean significant variances at  $P \leq 0.05$ .

are also no significant differences between the first and fourth groups in the third week. There are no significant differences between all groups in the fourth week. Results show that the fourth group (control group) did not register significant differences During the experiment period .In general, the superiority of the second group (arithmetically) is observed over the rest of the groups throughout the experiment. This can be attributed to the presence of other factors in colostrum other known factors such as betaine, sericin, and panthenol (Aramvir and Sangcakul, 2007; Ebner *et al.*, 2002). Or it may be because the colostrum collected in the early hours after birth contains high concentrations of certain compounds such as growth factors, cytokine, oligosaccharide and nucleotides, which has a maximum concentration of the first 24 hours after birth (Kelly, 2003).

**Table 3:** The Mean Values  $\pm$  SE of Progesterone(ng / ml) within Four Weeks.

Week / Group	1	2	3	4
G1	0.644 a $\pm$ 0.027	0.554 e $\pm$ 0.026	0.444 d $\pm$ 0.023	0.428 d $\pm$ 0.024
G2	1.632 b $\pm$ 0.031	0.662 f $\pm$ 0.026	0.556 e $\pm$ 0.024	0.448 d $\pm$ 0.023
G3	0.904 c $\pm$ 0.030	0.788 f $\pm$ 0.028	0.580 e $\pm$ 0.023	0.438 d $\pm$ 0.024
G4	0.430 d $\pm$ 0.025	0.424 d $\pm$ 0.022	0.428 d $\pm$ 0.025	0.422 d $\pm$ 0.023

Different letters mean significant variances at  $P \leq 0.05$ .

As shown in Table 3 the highest concentration of progesterone has been recorded in the first week of the second group which is  $1.632 \pm 0.031$  ng/ml while the lowest concentration of the fourth group which is  $0.430 \pm 0.025$  ng/ml. There were no significant differences between the second and third groups in the second and third weeks. No significant differences have been recorded between all groups in the fourth week. The fourth group (control group) does not register significant differences throughout the experiment period .The results of this study are not conformed to (Foisnet *et al.*, 2014) who links hormonal changes before parturition. The increase in the concentration of progesterone in the first week can be attributed to the effect of growth factors found in colostrum such as paracrine and autocrine, which stimulate cell growth, which works especially on the endocrine hormones through blood. (Donovan and Odle, 1994; Humbel, 1990).

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