EFFECT OF TREATMENT WITH VITAMIN E AND SELENIUM DURING LATE GESTATION PERIOD ON MASTITIS, RETAINED PLACENTA AND POST-PARTUM REPRODUCTIVE PARAMETERS IN EGYPTIAN BALADI COWS

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SUMMARY

The goal of this investigation is to determine the effect of treatment with vitamin E and selenium on mastitis, retained placenta and post-partum reproductive parameters in Egyptian Baladi cows during the late gestation period. Twenty-four Baladi cows were used and divided into two groups of 12 each. The first group injected with vitamin E and selenium component intramuscular at a rate of 1. 0 ml/30kg (BW) live body weight and the second group used as a control. *Injected cows received two doses of (vitamin E and selenium component) in 14 and 7 days prepartum. Cows were mated naturally following estrus symptoms manifestation. Rectal palpation was performed two months post- mating to diagnosis pregnancy. The findings showed a positive association between treated cows during late gestation with vitamin E and selenium and incidence rate of mastitis and retained placenta. Reproductive parameters in treated cows were better compared with untreated ones.* ***In conclusion****, the present study recommends that small breeders could offer vitamin E and selenium in hot months during late gestation period under the Aswan governorate environmental conditions to minimize postpartum disorders and improve their cows reproductive efficiency.*

Keywords: Vitamin E and selenium, mastitis, retained placenta, reproductive parameters, cows

INTRODUCTION

Vitamins and minerals provide a direct or indirect vital connection with farm animal's productive and reproductive health. Vitamin E is an important factor in preserving optimum immune function (Sikka *et al*., 2002 and Sikka and Lal, 2006) and as anti-stress agents (Kahlon *et al*., 2006). Selenium is regarded as a trace element which plays a critical role in animal health. Hefnawy and Tórtora- Pérez (2010), Sordillo (2013) and Eulogio *et al*. (2012) found that selenium deficiency in cattle resulted in high economic losses, such as decreased fertility, placental retention, mastitis incidence and metritis. It is observed in transitional phase (the interval extended from three weeks before and after calving during lifespan of the cows) that most reproductive disorders were more common during this time.

Spears and Weiss (2008), Wathers *et al*. (2013) and Esposito *et al*. (2014) have shown that the main cause of the weakening of the immune system in cows during the transition period is prepartum stress induced by hormonal and metabolic changes, negative energy balance, deficiency of minerals, antioxidants, and vitamins correlated with the demands of the fetus development, and the onset of lactation. Albanes *et al.* (2014), Shaheen *et al*. (2014) and Speckmann and Grune (2015) indicated that the important function of selenium is due to its role as an antioxidant to scavenge free radicals and reactive oxygen species (ROS) through activation of enzymes glutathione peroxides and reductase may help prevent cancer. Kieliszek and Błażejak (2013) stated that glutathione peroxidase and other selenium-containing enzyme are the key selenium containing internal antioxidants, which help to detoxify free radicals. Mehdi and Dufrasne (2016) reported that selenium supplementation affects cellular activity of the mammary glands innate and adaptive immune responses. Aghwan *et al.* (2016) and Maraba *et al.* (2018) indicated that vitamin E and selenium are important components of the antioxidant defense system and play vital role in animal's development, immune system, and reproductive success through their involvement in crucial enzymatic reactions.

Pavlata *et al*. (2004), Bayril *et al.* (2015) and Resum *et al*. (2016) reported a lower incidence rate of mastitis in late gestation period of dairy cows treated with vitamin E and selenium compared to control group. Rabiee *et al*. (2010), Davidov *et al.* (2012) and Khalili *et al*. (2020) found that supplementation of selenium to diets contributes to a decrease in the incidence of mastitis and somatic cell count in dairy cows.

Sattar *et al*. (2007), Resum *et al*. (2016) and Resum *et al*. (2018) reported that the incidence rates of retained placenta in dairy cows treated with selenium and vitamin E before calving were lower than control group. Bayril *et al*. (2015) and Resum *et al*. (2016) stated that the time from parturition to uterine involution was shorter in dairy cows that treated with selenium and vitamin E in late gestation than those in the control group.

Hoque *et al*. (2016), Kassab *et al.* (2020) and Khalili *et al*. (2020) reported that there was an association between late gestation supplementation of vitamin E and selenium and an improvement in the rates of conception in dairy and beef cows. Predominantly animals suffer from fresh green

fodder deficiency during the hot months and are essentially reliant on preserved forages, which suffer reduced vitamins. Therefore, the NRC (2001) suggests that vitamin E should be combined with dairy cattle diets while feeding on preserved forages during periods of immune suppression, such as parturition. Most reproductive disorders occur more commonly during prepartum phase in cows and the majority of small breeders living in the villages in Aswan governorate do not know about this critical knowledge. In the light of the previous information, the current research was designed to investigate the effect of treating Egyptian Baladi cows during late gestation period with vitamin E and selenium on mastitis, retained placenta and post-partum reproductive parameters.

MATERIALS AND METHODS

Position of farm and climatic conditions:

This research was carried out at a traditional farm located in the Kom Ombou region (32°, 31' 23" east and 22°, 28' 09" north), in Aswan governorate. Under typical farm conditions the cows were reared and kept in semi shaded system. Ambient temperature (°C), relative humidity (RH %) and temperature humidity index (THI) during the experimental period are presented in Table (1). The period of the experiment lasted from May to October.

Temperature humidity index (THI) was estimated according to the formula proposed by Mader *et al*. (2006) as follows**:**

THI= (0.8×T max db) + [(RH/100) × (T max db - 14.4)] +46.4

Temperature-humidity index (THI) = 0.8 x ambient temperature + [(% relative humidity) 100) x (ambient temperature -14.4)] + 46.4

Table 1. The ambient temperature (°C), relative humidity (RH %) and temperature humidity index (THI) during the experimental period

Months of calving	Average Ambient Temperature (° C)		Average Relative humidity (RH %)	THI
	Min	Max		
May	22.6	40.7	16	83.2
June	25.3	41.4	16	83.8
July	26.2	41.2	17	83.9
August	26.0	41.0	18	83.9
September	23.8	38.4	20	81.9
October	23.1	37.2	17	80.1

Experimental animals and feeding:

In the present study twenty- four Baladi cows were used. The parities of cows ranged from 3rdto 5th and live body weight at calving varied from 350 to 400 kg. During the experiment animals were fed on bran, wheat hay and concentrate feed mixture. During this period (hot months) from the year animals usually suffer from green fodder deficiency and basically reliant on preserved diets. According to the farm routine management all cows were kept in the same environmental and managerial conditions.

Design of the experiment:

The cows were divided into two groups (n= 12 cows for each group). The first group (n= 12 cows) was treated with vitamin E and selenium, while the second group (n= 12 cows) was used as a control group. Cows injected with vitamin E and selenium solution intramuscularly, 1ml/30kg live body weight as recommended by the manufacturer. Treated cows were administrated two doses (vitamin E and selenium solution) in prepartum 14 and 7 days. Vitamin E and selenium solution with 150.0 mg vitamin E (α- tocopherol acetate, 100%) and 0.5 mg disodium selenite per 1ml content.

Estimation of postpartum reproductive parameters

Uterine involution:

When both uterine horns returned to the same or nearly equivalent non-gravid size of their usual location and sit in the pelvic region, and their usual tone and quality according to Elmetwally *et al*. (2016) and Gohar *et al*. (2018), the uterine involution is called full involves

Retained placenta: cows considered have retained placenta when they did not eject the fetal membranes during 12 hours after parturition (Patel and Parmar, 2016 and Tucho, 2017)

Conception rate: It was calculated as the percentage of cows which conceived from first mating post-partum

$$\text{Conception rate} = \frac{\text{Number of conceived cows}}{\text{Number of mated cows}} \times 100$$

Diagnosis of mastitis:

Cows with clinical or sub-clinical mastitis were detected by California Mastitis Test and the manufacturing steps were followed up**:**

***California Mastitis Test (CMT*)**:

Based on the amount of gel formed, the results were labeled as negative, 1 +, 2 +, or 3 + (Esron *et al*., 2005).

Clinical mastitis:

Is characterized by abnormal milk production (e.g., watery milk, flakes in milk, and so on) and/or mammary gland inflammation (e.g., redness, swelling, strength, and so on) (Chebel, 2007).

Sub-clinical mastitis:

Cows considered to be infected with sub-clinical mastitis while cows did not display any signs of mastitis, in both milk and udder but mastitis was

diagnosed by a detector (California Mastitis Test) (Kathiriya *et al.*, 2014).

***Detection of heat and pregnancy diagnosis*:**

Regular visual monitoring of cows was performed daily. Cows were considered in the heat phase just one of the estrus signs were demonstrated as vaginal mucus discharge or standing behavior. Sixty days (without any heat sings) after mating, pregnancy was diagnosed by rectal palpation

Blood samples analysis:

Blood samples (10 ml) were taken at estrus from the cows and 21 days next estrus from the jugular vein in heparinized tubes. For plasma processing, samples were centrifuged at 3000 rpm for 20 minutes, plasma was isolated, and stored at -18 ºC until assay time. Radioimmunoassay kit (Immunotech, France) was used to evaluate the concentration of progesterone (P4) and estradiol-17β (E2). According to manufacturer information the sensitivity values of progesterone and estradiol-17β were 0.03ng/ml and 4.0pg/ml, respectively. The coefficient of intra- assay variance for progesterone (P4) and estradiol-17β (E2) was 6.1% and 11.2%, respectively.

Statistical analysis:

The statistical design included one factor, one way-ANOVA (treatment effect) on mastitis, retained placenta and postpartum reproductive parameters. To verify the significance of percentage values, Chi Square was performed. The statistical analysis was performed using Software (SAS, 2002). The statistical model used was follows:

$$Y_{ij} = \mu + T_i + e_{ij}$$

Where:

Y_{ij}= the observation trait

μ = overall mean

T*i* =effect of treatment (treated=1 and untreated =2); and e_{ij} = experimental error

Duncan's Multiple Range test (Duncan, 1955) was used to check the significance of the differences between the means.

RESULTS AND DISCUSSION

Effect of treatment with selenium and vitamin E on mastitis (%) in Baladi cows

Figure (1) shows that the percentage of cows suffering from mastitis in untreated cows (control group) was significantly ($P < 0.05$) higher (41.6%) compared with treated cows (8.3%).The current results were in line with those reported by Pavlata *et al.* (2004), Bayril *et al.* (2015) and Resum *et al.* (2016) who showed that the incidence rate of mastitis in dairy cows treated with selenium and vitamin E at late gestation was lower than that of untreated cows. Related studies published by Zhao *et al.* (2008) and Moeini *et al.* (2009) showed a lower somatic cell count after supplementation with selenium and vitamin E in cows. In addition, Hoque *et al.* (2016) recorded a lower incidence rate of mastitis in the treated group of dairy cows with selenium and vitamin E (20.5%) than the control cows (45.1%). Khalili *et al.* (2020) reported that organic selenium supplementation led to reducing the chance of mastitis during the postpartum period in dairy cow. Treatment with selenium led to reduced prevalence of mastitis and somatic cell count in dairy cows (Cope *et al.*, 2009, Rabiee *et al.*, 2010 and Davidov *et al.*, 2012). Politis (2012) reported that late pregnancy supplementation of vitamin E is associated with a reduced risk of mastitis in dairy cows during the postpartum period. There was a strong association between the serum levels of selenium and the activity of glutathione peroxidase in cows (Pilarczyk *et al.*, 2012). Kommisrud *et al.* (2005) found a positive relationship in Norwegian dairy cows between levels of selenium in the blood and decreased incidence of mastitis post calving. Blokhina *et al.* (2003) proposed that when the neutralization between free oxygen radicals and antioxidants is disrupted oxidative stress occurs and destroy cell structures. Free radicals cause cell damage and can impair the functions of immune cells, leading to increased risk of mastitis (Politis *et al.*, 2004) .The positive response of cows to selenium and vitamin E treatment in this study may be due to the antioxidant activity of selenium and vitamin E in mammary cells and their role in the immunity of cows. LeBlanc *et al.* (2004) and Goff (2006) observed that the immunity in cows was reduced during the prepartum phase. Smith *et al.* (1997) and Moeini *et al.* (2009) reported that there was a strong association between selenium deficiency and lower activity of glutathione peroxidase (GSH-Px) in the blood of cows. Moeini*et al* .(2009) indicated that both selenium and vitamin E play a vital role in mobilizing the transition of neutrophils to cells and their function in destroying bacterial pathogens hence may lead to a reduction in mastitis incidence rates in cows.

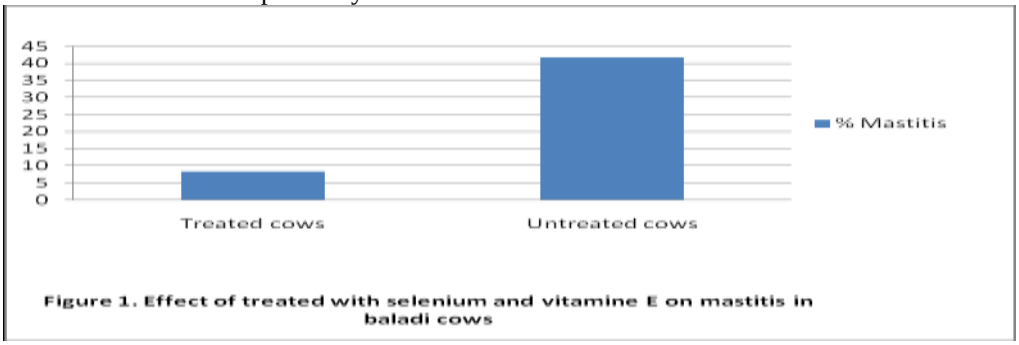

Figure 1. Effect of treated with selenium and vitamine E on mastitis in baladi cows

Effect of treatment with selenium and vitamin E on retained placenta (%) in Baladi cows:

Figure (2) shows the incidence rate of retained placenta cases was significant ($P < 0.05$) higher (50%) in untreated cows (control group) than treated cows (8.3%).The present finding is consistent with that stated by Bourne *et al*. (2008), Moeini *et al*. (2009) and Gaafar *et al*. (2010) who found a significant correlation between supplementation with selenium and vitamin E during late gestation and a reduction in the incidence rate of retained placenta in dairy cattle. Similar findings by Sattar *et al.* (2007), Resum *et al*. (2016) and Resum *et al*. (2018) showed that incidence rate of placenta retention in cows fed with selenium and vitamin E during prepartum period was lower thanthatof the control group in dairy cattle.The positive reaction of cows during late gestation as treated with selenium and vitamin E can be due to the antioxidant activity of selenium and vitamin E and their role in enhancing the immune system in cows. LeBlanc *et al*. (2004) and Goff (2006) suggested that during the late gestation the immune system in cows was weakened. Miyoshi *et al*. (2002) and Esposito *et al*. (2014) reported that the abolition of uterine immunity and hypo-motility may occur on normal parturition, fetus delivery, normal separation and expulsion of placenta in cows. Smith *et al*. (1997) and Moeini *et al*. (2009) reported that the association between selenium supplementation and the activity of GSH-Px in cows was strong. Pavlata *et al*. (2004), Bayril *et al*. (2015) and Rao *et al*. (2016) observed that during late gestation in cows and buffaloes fed with selenium and vitamin E had a lower occurrence rate of fetal membrane retention after parturition. In addition, Joksimović-Todorović and Davidović (2013), Yosathai (2014) and Khalili *et al*. (2020) proposed that the retained placenta after calving was decreased in dairy cows that treated with selenium.

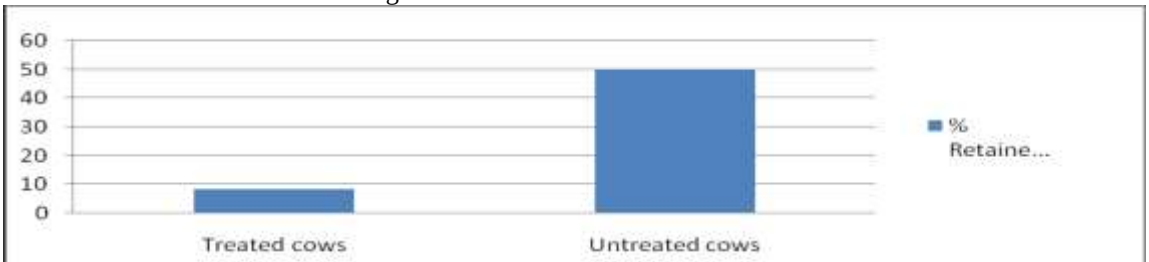

Figure 2. Effect of treated with selenium and vitamin E on retained placenta in baladi cows

Effect of treatment with selenium and vitamin E on uterine involution period (day) in Baladi cows:

Table (2) shows that the period from calving to uterine involution in untreated cows (control group) was significantly ($P < 0.05$) greater (41.4 ± 3.6, day) compared with treated cows (31.5 ± 3.7, day).The present findings agree with those stated by Sattar *et al*. (2007), Bayril *et al*. (2015) and Resum *et al*. (2016) who found that in dairy cows the interval from calving to uterine involution time was shorter in cows treated with vitamin E and selenium in late gestation than those in the control group. Similar results obtained by Shivhare *et al*. (2018) revealed that there was a beneficial impact of selenium and vitamin E treatment during late gestation on the uterine involution in cows. Furthermore, Khan *et al*. (2015) recorded that in buffaloes treated with vitamin E and minerals, the period from parturition to uterine involution was lower than those in the untreated buffaloes. In this study, the positive effect of late gestation treatment with vitamin E and selenium may be attributable to the antioxidant effect of selenium and vitamin E and their enhancing role immune system in cows. LeBlanc *et al*. (2004) and Goff (2006) proposed occurrence weakening of the immune system in cows during late pregnancy. Smith *et al.* (1997) and Moeini *et al*. (2009) reported that a strong association between the selenium and glutathione peroxidase (GSH-Px) activity in the blood of cows. Sikka *et al*. (2002) and Sikka and Lal (2006) stated that vitamin E is necessary to preserve optimum immune function in buffaloes. Wichtel *et al*. (1996) reported that selenium supplementation had a positive effect on uterine involution by affecting the immune system, uterine contractility and prostaglandin synthesis

Table 2. Effect of treatment with selenium and vitamin E on reproductive parameters in Baladi cows

Items	Untreated cows	Treated cows
Uterine involution period (day)	$41.4^{a} \pm 3.6$	$31.5^{b} \pm 3.7$
The time from calving to 1st estrus (day)	$76.6^{a} \pm 7.5$	$55.4^{b} \pm 8.1$
The time from calving to 1st service (day)	$86.4^{a} \pm 6.3^{x}$	$63.2^{b} \pm 5.2$
The time from calving to conceived (day)	$143.2^{a} \pm 16.2$	$108.2^{b} \pm 14.1$
Number of service per conception	$2.3^{a} \pm 0.4$	$1.6^{b} \pm 0.2$

a, b: values within the same row having different superscripts are significantly different at (P <0.05)

Effect of treatment with selenium and vitamin E on the time from calving to 1st service (day) in Baladi cows:

Table (2) clarifies the time from calving to first service was significantly ($P < 0.05$) lower (63.2±5.2, day) in treated cows than those in untreated cows (86.4±6.3, day). The present finding is consistent with that reported by Qureshi *et al*. (1997), Panda *et al*. (2006) and Sattar *et al.* (2007) who found that the buffaloes and cows being treated with vitamin E and selenium during late pregnancy the interval from calving to first insemination was lower than those in control group. Khalili *et al.* (2020) showed that the time to first insemination was lower indairy cows that treated with selenium during late pregnancy than that of the control group. Khan *et al.* (2015) suggested that buffaloes supplemented with vitamin E and the minerals during late pregnancy had a lower time from calving to first service than those in control group. Current findings attributed a reduction in the period from calving to first service to the lowered interval from calving to uterine involution and cow recycling.

Effect of treatment with selenium and vitamin E on the time from calving to conceive (day) in Baladi cows:

Table (2) indicates the time from calving to conceive (day)was significantly ($P< 0.05$) lower (108.2±14.1, day) in treated cowsthan those ofuntreated ones (143.2 ±16.2, day). The current results are consistent with those reported by Vanegas *et al*. (2004), Moenini *et al.* (2009) Khalili *et al.* (2020) found that dairy cows receiving vitamin E and selenium in late pregnancy displayed a decline in time from calving to conceiving relative to control group. Related results published by Kommisrud *et al*. (2005), Amer and Hashem (2008) and Resum *et al*. (2016) suggested that vitamin E and selenium supplementation in the late gestation of dairy cows contribute to declining days open relative to control group. Furthermore, Panda *et al.* (2006), Sattar *et al*. (2007) and Shivhare *et al.* (2018) observed that buffaloes and cows being treated with vitamin E and selenium during the prepartum period showed a decrease in days open relative to the control group. In the present research, reducing the time from calving to conceiving in treated cows could be due to faster uterine involution and initiation of recycling than untreated cows.

Effect of treatment with selenium and vitamin E on the number of service per conception in Baladi cows:

Table (2) indicates the number of services per conception was significantly ($P < 0.05$) lower (1.6±0.2, service) in treated cows than those of untreated ones (2.3±0.3, service). The present result is in agreement with that stated by Kommisrud *et al.* (2005), Molina *et al.* (2009) and Kassab *et al*. (2020) who found that vitamin E and selenium supplementation of dairy and beef cows during the prepartum period led to decrease number of services per conception compared to untreated cows. Similar results reported by Vanegas *et al*. (2004), Sattar *et al.* (2007) and Bayril *et al*. (2015) who found that in late gestation, dairy cows that treated with vitamin E and selenium demonstrated fewer number of services per conception compared with control group. On the other hand Moenini *et al*. (2009) and Hoque *et al.* (2016) reported that no significant effect of treatment with vitamin E selenium on number of service per conception in dairy cows.

Effect of treatment with selenium and vitamin E on conception rate in Baladi cows:

Figure (3) shows the conception rate from first service was significantly ($P < 0.05$) higher (50%) in treated cows than those of untreated ones(25%). The present result is close to that reported by Hoque *et al*. (2016) and Khalili *et al*. (2020) who found that in cows which supplemented with vitamin E and selenium in late pregnancy conception rates from the first service ranged between (25 to 31%) in the control group and (50 to 52 %) in treated dairy cows. Similar pattern reported by Qureshi *et al.* (2010) and Rao *et al.* (2016) was observed when vitamin E and selenium supplementation in late pregnancy of buffaloes was lower in the control group and ranged between (45-50%) but higher in the treated group (60-66%). Kommisrud *et al*. (2005) Sattar *et al.* (2007) and Bayril *et al*. (2015) proposed that vitamin E and selenium supplementation in late gestation increased pregnancy rate in dairy cows. Vanegas *et al*. (2004) and Kassab *et al*. (2020) stated that during late gestation there was a beneficial association between treated cows with vitamin E and selenium, and the rates of conception in dairy and beef cows were improved. Bayril *et al*. (2015) stated that immuno-potentiation with vitamin E and selenium improves the reproductive efficiency of cows attributed to lowering the time of uterine involution and calving to the estrus period. The positive impact for treated of cows with vitamin E and selenium during the late of gestation in the current study may be due to the effects of vitamin E and selenium on early uterine involution and prepare for conception. Guérin *et al.* (2001) reported that the embryo metabolism releases reactive oxygen species (ROS), which can modify most cellular molecules and cause developmental blockage and embryo retardation. Scholl *et al.* (2006) discovered a strong association between late gestation maternal concentrations of vitamin E and fetal development. Mehdi and Dufrasne (2016) suggested that improved fertility could be due to decreased embryonic death in early development where excess selenium is present.

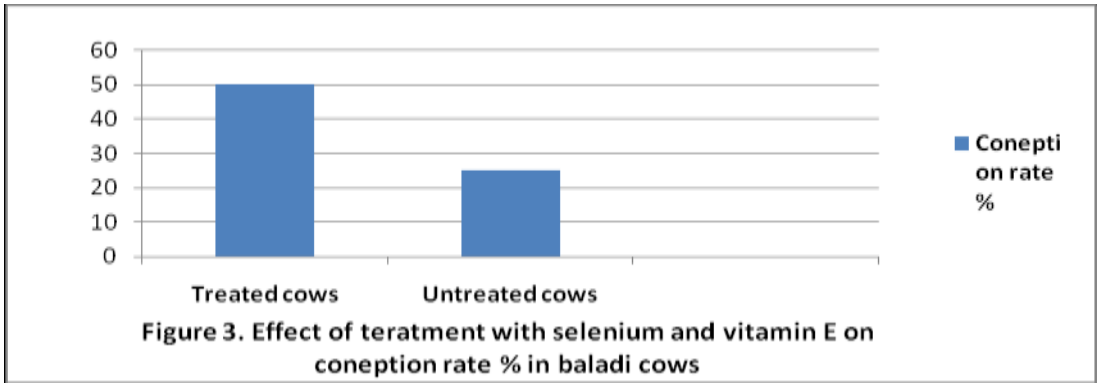

Figure 3. Effect of teratment with selenium and vitamin E on coneption rate % in baladi cows

Concentrations of progesterone and estradiol at estrus and 21 day post-mating in Baladi cows

Concentrations of progesterone and estradiol at estrus were significantly ($P < 0.05$) higher in conceiving cows than non-conceived (Table 3). The current findings agreed with those reported by Waldman *et al.* (2001) who stated that there was a strong inverse correlation between the probability of non- return and progesterone concentration at the time of mating in cows. Busch *et al*. (2008) indicated that gravid cows had a higher incidence of d 10 post-mating progesterone concentration compared with non-gravid cows. Concentrations of progesterone on 21 day post-mating was higher in treating cows than untreated cows (Table 3), this may demonstrate and explain why the conception rate was higher in treated cows than untreated cows. The present findings match with those reported by Lemley *et al*. (2010) who stated that progesterone increase after mating was correlated with improvement in embryonic development. Rivera *et al*. (2011) suggested that low cow embryo quality production was attributed to decline progesterone concentrations during follicle growth in lactating dairy cows. Cerri *et al*. (2011) reported that higher pre and post-mating progesterone concentrations were correlated with improved fertility. Progesterone modifies ovarian and uterine function by direct or indirect effect on conception and early stages of embryo development. Kassab *et al.* (2020) stated that concentrations of estradiol during estrus were higher in beef cows which supplemented with selenium and vitamin E relative to those in control group. González-Maldonado *et al*. (2019) reported that in those cows treated with vitamin E and C, plasma estradiol concentrations were higher compared to control cows. Kamada and Hodate (1998) and Kamada (2017) observed that during the estrous cycle, supplementation of selenium to pre and postpartum cows increased their plasma progesterone concentration levels. Inskeep (2004) and Pursley and Martins (2011) indicated that decreasing plasma progesterone levels during ovulatory follicle development is associated with lower fertility rates and hinder embryo survival rates during early gestational periods. Staples *et al*. (1998) and Ihsanullah *et al.* (2017) stated that selenium supplementation led to a significantly higher serum progesterone concentration in the treated groups compared to control and that cows with elevated postpartum plasma progesterone had a better rate of conception. Kenyon *et al.* (2013) and Randi *et al.* (2015) reported that a high amount of progesterone influences pregnancy by causing asynchrony between the uterine system and embryos, but a less progesterone uterine system would not cause essential changes to host and sustain embryos in dairy cows. Sales *et al*. (2008) suggested that injecting the cows with lower doses of vitamins A and E led to good quality embryos and surviving and establishing gestation in a uterine environment with low progesterone concentrations. Richardson *et al*. (2008) stated that supplementation of vitamin E had a positive impact on pregnancy rate in beef cows.

Table 3. Concentrations of progesterone and estradiol-17β at estrus and 21 day post-mating in treated and untreated Baladi cows

Hormones	Untreated cows		Treated cows	
	Pregnant	Non-pregnant	Pregnant	Non-pregnant
Progesterone (ng/ml):				
At estrus	$0.27^{a} \pm 0.05$	$0.18^{b} \pm 0.04$	$0.37^{a} \pm 0.09$	$0.24^{b} \pm 0.04$
21 day post-mating	$5.13^{a} \pm 0.12$	$0.24^{b} \pm 0.01$	$7.21^{a} \pm 0.12$	$0.30^{b} \pm 0.01$
Estradiol-17β (pg/ml):				
At estrus	$20.5^{a} \pm 0.34$	$14.6^{b} \pm 0.32$	$24.2^{a} \pm 0.21$	$16.3^{b} \pm 0.41$

[a, b]: values within the same row having different superscripts are different at (P <0.05)

CONCLUSION

The present study recommends that small breeders could offer vitamin E and selenium in hot months during late gestation period under the Aswan governorate environmental conditions to minimize postpartum disorders and improve their cows reproductive efficiency.

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تأثير المعاملة بفيتامين هـ والسلينيوم أثناء الفترة الأخيرة من الحمل على إلتهاب الضرع، إحتباس المشيمة والمقاييس التناسلية بعد الولادة فى الأبقار البلدية المصرية

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أُجرى هذا البحث لتقدير تأثير المعاملة بفيتامين E و السلينيوم أثناء الفترة الاخيرة من الحمل على التهاب الضرع, وإحتباس المشيمة والمقاييس التناسلية بعد الولادة فى الابقار البلدية المصرية. استخدم فى الدراسة عدد ٢٤ بقرة بلدى , قسمت الابقار الى مجموعتين كل مجموعة تحتوى على ١٢ بقرة . المجموعة الاولى حقنت بمركب فيتامين E و السلينيوم بمعدل ١ مللتر/٣٠كجم وزن حى فى العضل والمجموعة الثانية استخدمت كمجموعة كنترول. أعطيت الابقار المعاملة جرعتين من مركب فيتامين E و السلينيوم فى اليوم الرابع عشر واليوم السابع قبل الولادة. كانت الابقار تلقح طبيعيا بمجرد ظهور علامات الشياع عليها. أستخدم الجس المستقيمى لتشخيص الحمل بعد شهرين من التلقيح. أظهرت النتائج وجود ارتباط ايجابى بين الأبقار المعاملة بمركب فيتامين E و السلينيوم خلال الفترة الاخيرة من الحمل و معدل حدوث التهاب الضرع و إحتباس المشيمة. لوحظ تحسن فى المقاييس التناسلية فى الابقار المعاملة بالمقارنة بالأبقار غير المعاملة. توصى الدراسة الحالية صغار المربين بإعطاء فيتامين E و السلينيوم خلال أشهر الصيف أثناء الفترة الاخيرة من الحمل تحت الظروف البيئية لمحافظة أسوان لتقليل الإضطرابات بعد الولادة وتحسين الكفاءة التناسلية لأبقارهم.