Role of Vitamin AD3E in Pregnancy Period and Calving of Dairy Cattle Strain Friesian

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Abstract

Utilization of vitamin AD3E during three periods of pregnancy for Friesian cows by injection and non-injection at the same periods was studied in different places in Shaqlawa technical institute farm and private local farms. (Vitamin and energy requirements are covered in their feed for all groups of treatments) Nine of female cows divided into three group's three cows for each the control group (C) non-pregnancy and non-injection of vit AD3E, first group and the second group were pregnancies divided each of them in three treatments. The first group was non-injection but the second group was injection with vit.AD3E. Each of group first and second had three treatments treatment one (T1) first three months of pregnancy, treatment 2(T2) last three month of pregnancy and treatment three (T3) after two weeks of parturition. The results shows that was a significant increase ($p \leq 0.01$) and best value observed for [White blood cell(WBC)/×10 9/L in G1T1(11.97), Red blood cell (RBC)/×10 12/L in G1T3(19.90), Packed cell volume (PCV)/Fl in G2T3 (43.22), Hemoglobin (HB)/g/Dl in G1T1(77.33), Mean size cell volume RBC (MCV)/Fl in G2T3(55.96), and Mean corpuscular Hemoglobin(MCH)/pg in G1T3(16.93)]. Its concluded from this results that vitamin AD3E of a (It can be concluded from this study that vit. AD3E have useful impact on blood parameters during pregnancy and after parturition due their high demands to these vitamins)

Keywords: *Vitamin AD3E, Friesian strain, pregnancy, calving and blood parameters.*

Introduction

Composition of Vit AD3E, Contains per ml: Vitamin A, retinol palmitate 80000 IU. Vitamin D3, holecalciferol 40000 IU. Vitamin E, α-tocopherol acetate20 mg. Excipients ad1 ml. (Vitamin A is very important in the process of formation and conservation of epithelial tissues and mucous membranes functions, is essential for fertility and is fundamental for vision. Vitamin D3 controls and remedies calcium and phosphate metabolism in blood system and plays a critical role in absorption of calcium and phosphate from the digestion tracts. Particularly in young, growing animals, vitamin D3 is fundamental for the normal development of skeleton and teeth. Vitamin E is, as a fat-soluble intracellular antioxidant, involved in stabilising unsaturated fatty acids, thereby preventing toxic lipo-peroxides formation.)

Some vitamins have been recognized as having unique influence on immunity during vaccination, affecting both humoral and cell mediated response [8]. This immune- stimulatory effect reported is proven in vitamin A, E and D in livestock[9]. Several researched showed that vaccination efficacy can be more improved by supplementations especially vitamins which have effect on immune system such as vitamin A,E and D[7].

Some studies refer to that the deficiency in the vitamins & minerals may increase the incidence of retained fetal membrane (RFM) in dairy cows [3] [2]. (Injection of AD3E weekly during second stage of pregnancy before calving progressed the reproductive performance with normal placental expulsion, rapid uterine involution and increase the incidence of pregnancy protection).

Another study done by concluded that the supplementing per parturient lactating buffalo with protected fat and injecting vitamin AD3E mixture increase milk production efficiency throughout the final 100 days of lactation[6]. Fat soluble vitamins (A and E) are potently antioxidants. Ruminants cannot synthesize these vitamins in their body, therefore

supply these vitamins in feedstuff are very essential to cover physiological requirements and to preserve their high production performance) during the per-parturient period (transitional period) the concentrations of these vitamins reduce dramatically in the peripheral blood [5] and [12]. Thus, animals are venerable to different metabolic disorders, contagious diseases and a reduction in milk production and quality during this period [4]. The aim of the current study is to evaluate the effect of AD3E vitamins in blood parameters during different reproductive periods in dairy cattle.

Materials and Method

Experimental Intervention:

(The study was performed on local private farms and shaqlawa technical institute farms)

Vitamin AD3E dosage: In this study vitamin A 80,000 IU, vitamin D3 40,000 IU and vitamin E 20 mg .4 ml/50 kg per body weight were used as intramuscular injection weekly, the vitamin solution was preserved in slandered techniques.

Animals groups under experiment: The scheme and design of experiment was using nine dairy cattle were used in this study and divided in three groups, control group (C) non pregnancy, Group one (G1) Without injection Vit. AD3E and Group two (G2) With injection Vit.

(In this study, nine dairy cattle were used for the project and design of the experiment and were divided into three groups each one includes 3 animals, non-pregnancy as control group (C), first group (G1) without vit. AD3E injection and second group (G2) With vit. AD3E injection, each of G1 and G2 consists of three treatments covering various phases of pregnancy and postpartum, T1 (first three months of pregnancy), T2 (last three months of pregnancy), T3 (last two weeks of parturition) in three groups).

Blood samples and tests: At the end of the treatment period, blood samples were collected and send to the lab to make several tests, like hemoglobin concentration, PCV, ESR, RBCs and WBCs counting.

Statistical Analysis: (The complete random design of the experiment and two groups in each group contained three treatments for statistical design and data analysis)

Treatments were determined. Data in all experiments were subjected to ANOVA procedures appropriate for a completely randomized design and the significance of differences between the means estimated using Duncan test Duncan's All statistical analyses were performed using the software SPSS 17.5 for Windows®[11].

Results

The present work was undertaken to evaluate the effect of different of Vitamin AD3E in different reproductive periods in dairy cattle, it was observed that the usage of the vitamin increased the concentration of hemoglobin, ESR, PCV, total RBCs counting, in group of after parturition and in lower rate in late pregnancy group. These findings agreed with Sarker et al[10], showing that the use of AD3E which significantly improves hemoglobin, PCV, ESR development in broilers)

WBC: From the table (1) the results of experiment shows that insignificant ($P \geq 0.01$) between T2, T3 in G1 but significant ($P \leq 0.01$) among all another treatments (G1 & G2).

(Among all other therapies, T1 G1 is considered important (G1 & G2) compared with control (T1, T3) and T2 G2 which was insignificant with T1, T3 in the same groups, but important with all G1 and control treatments).

RBC: (As the effect of Vit AD3E on the number of RBCs in two different groups depends on statistical analysis, the table shows that insignificant treatments in group 2 but significant with G1 were, on the one hand, insignificant in G1 C and T1, on the other hand, significant with each of T2 and T3 in the same group and, by looking at the accuracy of T2, T3 between them, are significant within G1unite)

PCV: (Several references have published that the standard PCV range in milk cattle blood about 40-60 depends on several variables such as diet, estrous status, hormone irrigation, pregnancy, etc. Our findings show that the lowest PCV was in T2 G1 and the high value was clearly prominent in T3 G2)

HG: Normal average of HG is around 80-150 in blood of dairy cattle the (The normal HG average in milk cattle blood is around 80-150; the lower level of this average is in C of our treatment (80.53(g/dL)); however, the function of the level of nutritional composition of this treatment may be important among all treatments in both group 1 and 2, at the start of G2.)

Table (1) Effect of vitamin AD3E on treatments

Properties/unit	Control Group No pregnancy	Group 1			Group 2		
		Without injection Vit. AD3E			With injection Vit. AD3E		
		T1	T2	T3	T1	T2	T3
		First three month of pregnancy	Last three month of pregnancy	After two week of parturition	First three month of pregnancy	Last three month of pregnancy	After two week of parturition
WBC/(×10 9/L)	*9.33±0.15 c	11.97±0.59 d	2.57±0.55 a	3.37±0.21 a	8.98±0.73 bc	8.55±0.19 b	9.54±0.30 bc
RBC/(×10 12/L)	8.97±0.49 b	8.83±0.21 b	12.40±0.80 c	19.90±0.25 d	7.18±0.17 a	7.06±0.03 a	7.55±0.37 a
PCV/(Fl)	36.53±0.50 bc	35.00±1.00 bc	24.67±1.52 a	34.57±0.59 b	37.44±0.97 c	40.82±0.37 d	43.22±1.28 d
HB/(g/dL)	80.53±0.50 d	77.33±2.51 c	30.00±1.00 b	32.00±1.10 b	11.04±0.06 a	11.12±0.16 a	12.78±0.41 a
MCV/(fL)	15.50±0.44 b	13.07±1.55 a	15.00±1.41 ab	32.83±0.21 c	50.33±0.58 d	54.93±0.32 e	55.961.16 e
MCH/(pg)	4.77±0.32 a	4.10±0.96 a	16.93±5.05 b	5.70±0.26 a	15.13±0.24 b	15.532.31 b	16.44±0.66 b

a,b,c,d,e means with different superscript within row are significantly different (P< 01)
*Values are $\bar{x}$±Std. Deviation of each treatment 3 dairy cattle

MCV: MCV mean size cell volume RBC this harmonic with decrease of Vit B12 and related with low level of iron and peroxide while some diseases infection or low level of nutrition. (The usual MCV range is between (40-60f/L) by international unit in G2 the number begins to increase as shown in T2,T3 in the same group and they are insignificant between them but significant with T1 in the same group and well level compared to measure arrangement level but at least better than G1, as shown in the table T3 significant with all G1 and G2 treatments while T2G1 insignificant with C, T1 in the same g)

MCH and MCHC: Table 1 showed that MCH in G1 was insignificantly consistent with C in T1 with the same outcomes or all treatment in G2. On C for MCH, we found a low percentage of iron in feed stuff for that cause, also insignificantly analyzed. But low than of normal percentage suppose be, at the last three month of pregnancy the cows need more of feed stuff to be keep balance for embryo so herdsman make more interesting and bring balance of feed stuff for that reason returned. According to the results showed in table (1) there is a slight elevation in WBCs counting in after parturition group while there was significant decrease in lymphocyte counting in after parturition group in comparison with other groups. Also there was a significant increase in monocyte counting in before pregnancy group and significant decrease in Neutrophil and in group after parturition on different blood parameters.

Discussion

WBC: For results in table 1 observed about WBC This can be attribute by the again in dairy cattle by effect of release estrogen hormone be incentive of LH, FSH and prolactin hormones to be sensitive of strange body so increase of WBC at first period of pregnancy after that build of corpse luteum the percentage of WBC come back, this case without injection of Vit AD3E but in G2 established of percentage just calcite differs but insignificant, this clearly shows of role Vit AD3E to arrangement of incentive hormones while ovulation, these result agree with[6].

RBC: For results showed on RBC in same table. It can be explain this phenomenon at the growth of embryo need more of hemoglobin and o2 for burn energy by increasing of growth hormone so increase of RBC while in opposite we noticed regaled of RBC in G2 but by investigated of the reasons we discovered the low level of nutrient in feedstuff which bring to G2 (after seeking on real with farmer) even it treat by injection of Vit AD3E. Because suppose must be increased we did not find another reason while this group in accept situation of health [10].

PCV: Results of range number PCV compared with range number of many studies can be says in our experiment this can be explain role of Vit AD3E to returned from uterus to normal situation after two week of parturition while in other side table shows significant for G1 especially in T2 as significant with other treatment

of all treatment in both groups 1 and 2, the T1,T2 G1 were insignificant even they in low level of range but not effected of decrease PCV but in last period of pregnancy was clear affected this can be attribute of growth embryo need a huge of RBC [3]. This state agree with results of [7] while they studies on effect of vitamin AD3E supplementation for hemorrhagic septicemia vaccine in laboratory mice. The animals were also different, but the percentage of PCV in the blood had the same effect. On the other hand, the role of VitAD3E injection in all G2 treatments was significantly increased.

HG: The level of HG decrease related with advance time of pregnancy more less than in G1 even all treatment in this group are insignificant just calculated simple differs,the same insignificant between T2,T3 G1.These results explained same reason and agree reached results of [11].

MCV: The results of MCV clearly shown role of Vi AD3E in G2 and low level of iron content in feedstuff of G1 these results agree with results of [6].

MCH and MCHC: (Analysis (MCH) or what is known as the pellet average of himocalobin (Mean Corpuscular Hemoglobin) is an analysis based on a blood test to assess the average amount of hemoglobin in a blood sample by averaging the mass of hemoglobin in the red blood cells separately, therefore, is an important measure of the iron content of the blood that is part of the blood that serves as president in oxygencarrying, as is this analysis, and that also gives red blood cells their color, and in the same way, this analysis is part of the CBC or full blood count analysis)

The results indicate a decrease in the levels of hemoglobin Central pellet under the normal range iron-rich feed stuff. But if the results indicate an increase in the levels of hemoglobin pellet average above normal (normal average in airy cattle 11.0-17.0pg) it may be due to the incidence of certain other types of anemia, which may also indicate the existence of problems in the thyroid gland, which is mainly engaged in work on the secretion of important of the various hormones and functions of the body organs. It involves an analysis of hemoglobin pellet Usually divided this type of analysis within the analysis of a complete blood count (CBC) along with white blood cells, red blood cells, red pellet size (MCV), hemoglobin concentration of particulate matter (MCHC), platelet size. The normal level of hemoglobin pellet average is between 26 and 33 pg, but if the level of more than 34, considered this too high, due usually to a large poverty in the blood due to a lack in levels of vitamin B12 or folic acid, which leads to disorder in the blood works on not produce enough red blood cells.

(But if the average level of hemoglobin pellets is less than 26, it is known to be very poor, owing to long-term blood loss, due to the incidence of poverty in microscopic blood, which means that small red blood cells are abnormally compared to other red blood cells, which means smaller quantities of hemoglobin. Thus, the attribute of loose hug of blood with parturition can be relied on or results with this specific scientific knowledge. Such findings agree with the outcomes of [8].

Conclusion

Role of vit AD3E in period of last three month of pregnancy will helpful for well growth embryo and for easy born calve further that increase of blood content especially WBC but in condition care of type nutrition.

Recommendation: On depended the results we recommend

1. At the last of 3 months pregnant must the raiser take more care of management, nutrition and by Follow program of veterinary vaccination.
2. It can be make more experiment on different type genetic of dairy cattle under on condition they have same period of pregnancy and prefer same age with same number of pregnancy.
3. Vit AD3E as a co-enzyme prefer to do may experiment with different level injection to find effected on blood parameter.

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