EFFECT OF MONENSIN ON REPRODUCTIVE PERFORMANCE AND MILK PRODUCTION IN LACTATING DAIRY COWS

Abd El-Razek[1], I.M.; A.M. Metwally[1] and A.A. Shitta[2]
[1] *Anim. Prod. Depart., Fac. of Agric., Kafr El-Sheikh, Tanta Univ.*
[2] *Anim. Prod. Res. Inst, Dokki, Giza.*

ABSTRACT

Thirty-one lactating Friesian dairy cows were used to determine the effect of monensin supplement on blood components, reproductive performance, body condition score (BCS) and milk production. Animals were divided into three groups as follows: Group 1 (n = 9) was considered as control group without monensin supplementation; group 2 (n = 12) was received 300 mg monensin/head/day for 40 days before calving and continued to day 60 postpartum and the cows in group 3 (n = 10) were received the same dose of monensin from calving till day 60 postpartum. Monensin had no significant effect on blood metabolites. BCS at calving was significantly ($P < 0.05$) increased in group 2 fed monensin compared with the other groups, but, the increase in BCS at conception was significant ($P < 0.05$) in both groups fed monensin compared with that of control group. Supplementation with monensin in group 2 significantly ($P < 0.05$) reduced the interval from calving to both first estrus and first AI and to conception as well as the length of the first estrus cycle (19.67 d). A higher pregnancy rate was recorded in group 2 (66.7%) and group 3 (50.0%) compared with that in control group (22.2%). Moreover, monensin significantly increased milk production by about 2.16 kg/d (7.2%) in group 2 but had no significant effect on milk composition. It can be concluded that monensin can be used as a feed supplement for the lactating dairy cows for 40d before calving till day 60 postpartum to improve their reproductive performance and to increase milk production without any marked changes in milk fat and other milk components.

INTRODUCTION

After parturition, energy balance is one of the common factors affecting the interval from parturition to first estrus and conception at the time of breeding in dairy cattle (Butler and Smith, 1989; Canfield and Butler, 1990). During early and peak lactation, dairy cows are unable to consume enough feed to meet the energy balance resulting in a state of negative energy balance (NEB) causing a poor reproductive efficiency (Randel, 1990). In dairy cows experiencing NEB postpartum, there is a deficiency in the release of LH rather than FSH (Beam and Butler, 1999). Thus, resumption of normal episodic LH release necessary for preovulatory follicular development has been proposed as the key event in the return to ovarian cyclicity of cows in NEB (Canfield and Butler, 1990, 1991). Early resumption of ovulatory cycles has also been shown to enhance conception rate to first insemination (Lucy *et al.*, 1992).

Monensin sodium, an ionosphore antibiotic produced by *Streptomyces cinnamonensis*, selectively modifies the ruminal flora and improves the digestive efficiency in beef and dairy cattle (Schelling, 1984). Monensin supplementation lead to increase ruminal propionate (Hegazy, 1997 and Van Der Werf *et al.*, 1998), and blood glucose concentration (Duffield *et al.*, 1998; Green *et al.*, 1999), and reduced ruminal degradation of dietary protein (Zinn and Borques, 1993). Reduced blood glucose concentration have been associated with reduced reproductive performance (Butler and Smith, 1989). Therefore, monensin may improve reproductive performance by reducing the ruminal degradation of dietary protein and increasing blood glucose. Earlier studies suggest that monensin may have some effects on pituitary and ovarian function (Randel and Rhodes, 1980 and Randel *et al.*, 1982) in beef and dairy heifers and in cows (Orluna and Carlson, 1985) and shorten the interval from calving to the return to first observed estrus in dairy cows (Abe *et al.*, 1994).

In lactating cows treated with monensin, it was reported that production of milk and milk protein may be increased by reduced methanogenesis, increased propionate, and increased blood glucose (Van der Werf *et al.*, 1998; Phipps *et al.*, 2000). However, milk fat has been shown to be depressed (Phipps *et al.*, 2000; Duffield *et al.*, 2003) or unchanged (Lean *et al.*, 1994 and Duffield *et al.*, 1999) with monensin treatment. The objectives of this study were to investigate whether treatment with monensin improved reproductive performance, BCS and milk production in Friesian dairy cows.

MATERIALS AND METHODS

Animals and management:

Thirty-one multiparous Friesian cows were used in this study. They were selected based on their expected calving date from the herd located at Sakha Experimental Station, Ministry of Agriculture. The trial began in July 2003 and ended in April 2004. All animals were fed ration to meet their maintenance and milk production requirements according to the standard allowances recommended by N.R.C. (1989).

Experimental design:

Cows entered the trial at 50 days before the predicted calving date. Upon entering the trial, cows were paired according to body condition score (BCS) and calving date before being allocated randomly into three treatment groups. The first group (G_1; n = 9) was left without monensin supplementation and considered as control. The second group (G_2; n = 12) was given 300 mg monensin sodium premix per day per cow (Elancoban 200, Elanco Animal Health, division Eli Lilly Export S.A., Geneva, Switzerland) for 40 days before expected calving date and continued to d 60 post-calving. The third group (G_3, n = 10) was given 300 mg monensin/d per cow from the day of calving until d 60 post-calving.

Data collected:

All cows were scored for BCS biweekly by the same operator at the afternoon milking using a scale from 1 to 5 with quarter-point increment (1 = thin to 5 = obese; Edmondson *et al.*, 1989). Calf birth weight was also recorded for each cow. All reproductive events were recorded including the number of days from calving to the first observed estrus, first service and conception as well as number of services per pregnancy.

Pregnancy rate (PR) was defined for treated and control groups as number of cows that were pregnant divided by the total number of cows of each group. First service PR was defined for each group as the number of cows that were pregnant to their first service divided by the total number of cows for which a first service date were recorded. Cows were machine milked twice daily and milk yield was recorded. Milk samples were collected biweekly from the successive a.m and p.m. milkings and analyzed for the percentage of milk fat, protein, lactose, and SNF.

Blood samples were collected biweekly with anticoagulant and then centrifuged at 1200 x g for 20 min. Plasma was decanted and stored frozen at -20°C until glucose, albumin, cholesterol and triglycerids analysis. All cows were observed for any sign of diseases until the end of treatment.

Statistical analysis:

Data were statistically analysed using (Chi-square test) General Linear Models Procedure adapted by SPSS (1997) for User's Guide.

RESULTS AND DISCUSSION

Results presented in Table (1) indicated that supplementation of dairy cow with monensin had insignificant effect on the plasma concentration of albumin, glucose, cholesterol and triglycerides. These results are consistent with that reported by Sauer *et al.* (1989) and Hayes *et al.* (1996). However, other studies have reported an increase in plasma glucose concentration (Abe *et al.*, 1994; Duffield *et al.*, 1998 and Green *et al.*, 1999). In addition, O'Kelly and Spiers (1990) found that ruminal bacteria in steers supplemented with monensin had an increase in lipid content with an associated increase in the circulating level of cholesterol.

Table (1): Changes in some plasma metabolites in lactating dairy cows supplemented with monensin during pre and/or post-calving.

Parameters	Treatment		
	Control (G_1)	PRE (G_2)	POST (G_3)
Albumin g/L	46.45 ± 3.4	46.2 ± 3.9	46.35 ± 3.4
Glucose mmol/L	3.14 ± 0.59	3.21 ± 0.6	3.20 ± 0.6
Cholesterol mmol/L	5.13 ± 1.1	5.35 ± 1.2	5.30 ± 1.2
Triglycerids (TG) mmol/L	0.11	0.12	0.11

Postpartum reproductive parameters for cows supplemented with monensin are presented in Table 2. The results showed a significant ($P < 0.05$) reduction in postpartum interval to both first estrus and first AI in cows fed monensin pre-calving (46.5; 58.5 d) compared to that of cows in control group (63.4; 73.0 d). However, the interval in group 3 which started monensin treatment post-calving (54.9; 66.7 d) was intermediate and did not significantly different than that of the other two groups. These results are in agreement with those of Tallam *et al.* (2003) and Heuer *et al.* (2001) who reported that the interval from calving to first estrus or ovulation occurred earlier in cows fed monensin than control cows. Additionally, Hegazy (1997) also reported that the interval from calving to first estrus was significantly decreased by 26 days in buffalo cows supplemented with monensin pre-calving than in the control group.

On the contrary, Lean *et al.* (1994) reported that there was no effect of monensin on the time of first estrus in lactating dairy cows despite the increased of glucose concentration. The present study indicated that, Monensin had only a significant ($P < 0.05$) effect on the length of first estrus cycle for cows in G_2 as compared to that in control one (Table 2). This finding is consistent with that of Tallam *et al.* (2003) who reported that supplementation with monensin resulted in a shorter duration of first estrus cycle than control cows. The shorter postpartum interval to first estrus in cows fed monensin suggests earlier resumption of normal ovarian activity. The reduction of this interval may be due to the metabolic effects of monensin through various metabolic signals which may have a positive influence on hypothalamic-pituitary function resulting in accelerated ovarian recovery postpartum (Randel and Rhodes, 1980; Randel *et al.*, 1982 and Tallam *et al.*, 2003). One of the effect of monensin feeding is the increased propionate: acetate production in the rumen (Hegazy, 1997). Infusion propionate into rumen has shown to enhance the secretion of LH in response to GnRH challenge in beef heifers (Rutter *et al.*, 1983). Therefore, the increases in ruminal propionate by monensin supplementation would have positive effects on LH release. The timing of monensin treatment may also explain the occurrence of earlier first estrus in the cows in group 2 by modifying the pituitary-ovarian axis before calving (Tallam *et al.*, 2003).

Table (2): Postpartum reproductive parameters of cows in response to monensin feeding.

Parameters	Treatment		
	Control (G_1)	PRE(G_2)	POST(G_3)
No. cows	9	12	10
Interval from calving to first estrus, d	63.4 ± 5.6^a	46.5 ± 2.46^b	54.9 ± 4.04^{ab}
Interval from calving to first AI, d	73.0 ± 6.09^a	58.5 ± 2.1^b	66.7 ± 4.15^{ab}
Length of first estrus cycle, d	21.33 ± 0.44^a	19.67 ± 0.47^b	20.38 ± 0.46^{ab}
Interval from calving to conception, d	113.78 ± 5.19^a	83.83 ± 8.49^b	93.8 ± 8.85^{ab}
Service/pregnancy (n)	2 ± 0.00	1.5 ± 0.19	1.4 ± 0.24
Pregnancy/1st service %	1/9 (11.11)^a	4/12 (33.33)^b	3/10 (30.0)^b
Pregnancy rate %	2/9 (22.2)^a	8/12 (66.7)^c	5/10 (50.0)^b

^{a,b} values within each row carrying different superscripts differ ($P < 0.05$)
^{b,c} value within each row carrying different superscripts differ ($P < 0.05$)
^{a,c} values within each row carrying different superscripts differ ($P < 0.01$).

The postpartum interval from calving to conception was significantly ($P < 0.05$) decreased in cows supplemented with monensin pre-calving (83.83d) than in the control group (113.78 d). This interval in cows given monensin post-calving (93.8 d) was intermediate and did not significantly differ than that in the other two groups. These findings disagree with that previously reported by Duffield *et al.* (1999) and Heuer *et al.* (2001) but are close to that of Beckett *et al.* (1998) in dairy cows and Hegazy (1997) in buffalo cows. A higher pregnancy rates/first service (33.33 and 30%; $P < 0.05$) were recorded for cows fed monensin (G_2 and G_3) than control cows (11.11%). These results confirm an earlier report that improving energy balance by monensin supplementation increases the conception rate at first service (Senatore *et al.*, 1996). The present finding is also consistent with that of Hayes *et al.* (1996) who reported that monensin might improve reproductive performance of cows if administration was started early enough to remove the negative effect of reduced feed intake. On the contrary, the present result disagrees with that of Duffield *et al.* (1999) who reported that treatment with monensin had no significant effect on any measure of reproductive performance. Moreover, Beckett *et al.* (1998) found that monensin supplementation did not alter the pregnancy or first service pregnancy rates. Pregnancy rates (Table 2) were higher in group 2 (66.7%; $P < 0.01$) and group 3 (50%; $P < 0.05$) fed monensin as compared with that in control group (22.2%).

The higher percentage of fertility in the cows supplemented with monensin may be due to monensin altered the follicular population, the size of second follicle on either side of ovaries and increased the number of follicular waves than control one (Reed and Whisnant, 2001). On the other hand, the lowest pregnancy rate shown in control group may be explained by the findings of Kendriek *et al.* (1999) that low energy intake was associated with poor quality of oocytes collected between day 30 and 100 of lactation causing low fertility.

Determination of BCS for cows in the three treatment groups (Table 3, Fig. 1) indicated that the values are similar at the start of treatments, thereafter, feeding monensin was significantly ($P < 0.05$) increased the BCS to reach 4.45 at calving for the cows supplemented with monensin pre-calving as compared with 4.14 and 4.18 for control cows supplemented with monensin post-calving, respectively. BCS was also significantly ($P < 0.05$) higher at conception for cows in the second group (3.65) and third group (3.45) which were treated with monensin compared with that of cows in control group (3.22). This finding confirms our suggestion that monensin improve energy utilization (Hegazy, 1997).

Table (3): Effect of monensin supplementation on BCS of the experimental cows and their calf birth weight.

Parameters	Treatment		
	Control (G_1)	PRE(G_2)	POST(G_3)
BCS at:			
Initial	3.81 ± 0.15^a	3.85 ± 0.05^a	3.80 ± 0.12^a
Calving	4.14 ± 0.1^a	4.45 ± 0.05^b	4.18 ± 0.07^a
Conception	3.22 ± 0.08^a	3.65 ± 0.06^b	3.45 ± 0.07^b
Calf birth weight (kg)	31.89 ± 0.7	34.58 ± 1.12	32.00 ± 1.26

[a, b] values within each row carrying different superscripts differ ($P < 0.05$)

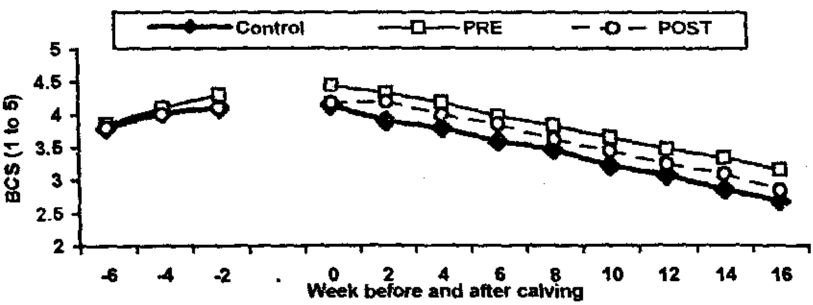

Fig. (1): Changes in BCS of lactating dairy cows during and after the treatment with monensin.

In contrast to the present results, Tallam *et al.* (2003) reported that monensin did not result in improvement in late prepartum body condition or at calving. However, the present results are in agreement with that of Hegazy (1997). Thereby, BCS at calving and postpartum nutrition influenced the percentage of cows with luteal activity or the occurrence of luteal activity (Vizcarra *et al.*, 1998) and consequently affect the pregnancy rates and postpartum interval to estrus in cows (Richards *et al.*, 1986). In agreement with the results of the previous studies (Duffield *e al.*, 1998 and Wagner *et al.*, 1999) monensin feeding reduced the loss of BCS after calving with increasing weeks of lactation than control cows (Fig. 1). It is previously noticed that the loss of body condition had negative impacts on the success of breeding (Duffield *et al.*, 1999) and strongly related to reproductive performance (Pryce *et al.*, 2001). Therefore, we suggest that BCS scored once biweekly can be used for either management and in a breeding program as an indirect selection criterion for fertility. Monensin supplementation during pre-calving period (G_2) resulted in a slight increase in birth weight of calves born than that of the other two groups (Table 3). These results were close to that of Hegazy (1997) and Vallimont *et al.* (2001).

Supplementation with monensin increased milk yield by about 2.16 kg/d (7.2%) in group 2 and 1.26 kg/d (4.49%) in group 3 compared to group 1 (control), but this increase was significant ($P < 0.05$) only in group 2 (Table 4). In agreement with the current results, monensin increased milk production in lactating dairy cows and magnitude of this increase was 7% (Van Der Werf *et al.*, 1998) and 6.5% (Ruiz *et al.*, 2001). In contrast Tallam *et al.* (2003) reported that monensin had no effect on milk yield.

Table (4): Milk yield and composition in the first 120 d of lactation for cows treated with monensin pre or post-calving.

Items	Treatment		
	Control (G_1)	PRE (G_2)	POST (G_3)
No. cows	9	12	10
Milk yield kg/d	13.4 ± 0.51^a	15.56 ± 0.58^b	14.66 ± 0.53^{ab}
Fat %	3.15 ± 0.46	3.16 ± 0.36	3.13 ± 0.4
Protein %	2.68 ± 0.42	2.61 ± 0.33	2.5 ± 0.35
Lactose %	4.28 ± 0.53	4.32 ± 0.42	4.32 ± 0.46
SNF %	7.54 ± 0.7	4.54 ± 0.56	7.48 ± 0.6
SCC, cells/ml*1000	228.4 ± 3.7	230.5 ± 3.1	229.8 ± 3.3

$^{a, b}$ values within each row carrying different superscripts differ ($P < 0.05$)

The increase in milk yield (Table 4) from cows treated with monensin may be due to that monensin increased the supply of glucogenic precursors resulting from changes in pattern of rumen fermentation (Lean and Wade, 1997). It was reported that the addition of monensin to the diet may compared with an increase in concentrate components of the diet because both lead to an increase in ratio of propionic to acetic and butyric acid resulting in increased milk production (Van Der Werf *et al.*, 1998). The negligible effects of monensin on milk composition are similar to that of a previous studies (Beckett *et al.*, 1998; Vallimont *et al.*, 2001) and disagree with that of others (Phipps *et al.*, 2000 and Duffield *et al.*, 2003).

In conclusion: the present study indicates positive effects of monensin use on dairy cows when monensin is fed for 40d before calving and continued 60 d post-calving. Monensin supplementation improved BCS, reproductive performance, fertility rate and increased milk yield in lactating dairy cows without any changes in milk components.

REFERENCES

Abe, N.; I.J. Lean; A. Rabiee; J. Porte and C. Graham (1994). Effect of sodium monensin on reproductive performance of dairy cattle. II. Effects on metabolites in plasma, resumption of ovarian cyclicity and oestrus in lactating cows. Aust. Vet. J. 71: 277-281.

Beam, S.W. and W.R. Butler (1999). Effect of energy balance on follicular development and first ovulation in postpartum dairy cows. J. Reprod. Fertil. 54 (Suppl.): 411-424.

Beckett, S.; I.J. Lean; R. Dyson; W. Tranter and L. Wade (1998). Effect of monensin on reproduction, heath and milk production of dairy cows. J. Dairy Sci. 81: 1563-1573.

Butler, W.R. and R.D. Smith (1989). Interrelationships between energy balance and postpartum reproductive function in dairy cattle. J. Dairy Sci. 72: 767.

Canfield, R.W. and W.R. Butler (1990). Energy balance and plus LH secretion in early postpartum dairy cattle. Domest. Anim. Endocrinol. 7: 323-330.

Canfield, R.W. and W.R. Butler (1991). Energy balance, first ovulation and the effects of naloxon on LH secretion in early postpartum dairy cows. J. Anim. Sci. 69: 740-746.

Duffield, T.; R. Bagg; D. Kelton; P. Dick and J. Wilson (2003). A field study of dietary interactions with monensin on milk fat percentage in lactating dairy cattle. J. Dairy Sci. 86: 4161-4166.

Duffield, T.F.; K.E. Leslie; D. Sandals; K. Lissemore; B.W. McBride; J.H. Lumsden; P. Dick and R. Bagg (1998). Effect of prepartum administration of monensin in a controlled-release capsule on postpartum energy indicators in lactating dairy cows. J. Dairy Sci. 81: 2354-2361.

Duffield, T.F.; K.L. Leslie; D. Snadals; K. Lissemore; B.W. McBride; J.H. Jumsden; P. Dick and R. Bagg (1999). Effect of a monensin controlled release capsule on cow health and reproductive performance. J. Dairy Sci. 82 2377-2384.

Edmondson, A.J.; I.J. Lean; L.D. Weaver; T. Farver and G. Webster (1989). A body condition scoring chart for Holstein dairy cattle. J. Dairy Sci. 72: 68.

Green, B.L.; B.W. McBride; D. Sandals; K.E. Leslie; R. Bagg and P. Dick (1999). The impact of a monensin controlled-release capsule on subclinical ketosis in the transition dairy cow. J. Dairy Sci. 82: 2820-2833.

Hayes, D.P.; D.V. Pfeiffer and N.B. Williamson (1996). Effect of intraruminal monensin capsules on reproductive performance and milk production of dairy cows fed pasture. J. Dairy Sci. 79: 1000-1008.

Hegazy, M.A. (1997). Influence of monensin on blood metabolite and reproductive performance of suckled buffalo-cows. Assiut Vet. Med. J. 36(72): 313-325.

Heuer, C.; Y.H. Schukken; L.J. Jonker; J.I.D. Wilkinson and J.P. T.M. Noordhuizen (2001). Effect of monensin on blood ketone bodies, incidence and recurrence of disease and fertility in dairy cows. J. Dairy Sci. 84: 1085-1097.

Kendrick, K.W.; T.L. Bailey; A.S. Garst; A.W. Pryor; A. Ahmedzade; R.M. Akers; W.E. Eyeston; R.E. Pearson and F.C. Gwazdauskas (1999). Effect of energy balance on hormones, ovarian activity, and recovered oocytes in lactating Holstein cows using transvaginal follicular aspiration. J. Dairy Sci. 82: 1731-1740.

Lean, I.J. and L. Wade (1997). Effect of monensin on metabolism, production, and health of dairy cattle. Pages 50-70 in Usefulness of ionophores in lactating dairy cattle. K.L. Leslie, ed. Univ. Guelph, Canada.

Lean, I.J.; M. Curtis; R. Dyson and B. Lowe (1994). Effect of sodium monensin on reproductive performance of dairy cattle. I. Effects on conception rates, calving to conception intervals, calving to heat and milk production in dairy cows. Aust. Vet. J. 71(9): 273-277.

Lucy, M.C.; C.R. Staples; W.W. Thatcher; P.S. Erickson; R.M. Cleale; J.L. Firkins; M.R. Murphy; J.H. Clark and B.O. Brodie (1992). Influence of diet composition, dry matter intake, milk production, and energy balance on time of postpartum ovulation and fertility in dairy cows. Anim. Prod. 54: 323-331.

N.R.C. (1989). Nutrient requirements of dairy cattle (6th Rev. Ed.). National Academy of Science, Washington, D.C.

O'Kelly, J.C. and W.G. Spiers (1990). Rumen microbial lipid content and synthesis in cattle: Effect of breed, monensin and methionine, J. Anim. Nutr. 63: 280-289.

Orluna, A.M. R.L. Carlson (1985). The effect of dietary monensin sodium upon superovulation and embryo viability in mature cows. Theriogenology. 23: 743-752.

Phipps, R.H.; J.I.D. Wilkinsont; L.J. Jonker; M. Tarrant; A.K. Jones and A. Hodge (2000). Effect of monensin on milk production of Holstein-Freisian dairy cows. J. Dairy. Sci. 83: 2789-2794.

Pryce, J.E.; M.P. Coffey and G. Simm (2001). The relationship between body condition score and reproductive performance. J. Dairy Sci. 84: 1508-1515.

Randel, R.D. (1990). Nutrition and postpartum rebreeding in cattle. J. Anim. Sci. 68: 853-862.

Randel, R.D. and R.C. Rhodes (1980). The effect of dietary monensin on the LH response of pre-pubertal heifers given a multiple GnRH challenge. J. Anim. Sci. 51: 925-931.

Randel, R.D.; L.M. Rutter and R.C. Rhodes (1982). Effect of monensin on oestrogen induced LH surge in pre-pubertal heifers. J. Anim. Sic. 54: 806-810.

Reed, B.K. and C.S. Whisnant (2001). Effects of monensin and forage: concentrate ratio on feed intake, endocrine and ovarian function in beef heifers. Anim. Reprod. Sci. 67: 171-180.

Richards, M.W.; J.C. Spitzer and M.B. Warner (1986). Effect of varying levels of postpartum nutrition and body condition at calving on subsequent reproductive performance in beef cattle. J. Anim. Sci. 63: 300-306.

Ruiz, R.; G.L. Albrecht; L.O. Tedeschi; G. Jarvis; J.B. Russell and D.G Fox (2001). Effect of monensin on the performance and nitrogen utilization of lactating dairy cows consuming fresh forage. J. Dairy Sci. 84: 1717-1727.

Rutter, L.M.; R.D. Randel; G.T. Schelling and D.W. Forrest (1983). Effect of abomasal infusion of propionate on GnRH-induced luteinizing hormone release in prepuberal heifers. J. Anim. Sci. 56: 1167-1173.

Sauer, F.D.; J.K.G. Kramer and W.J. Cantwell (1989). Antiketogenic effects of monensin in early lactation J. Dairy Sci. 72: 436-442.

Schelling, G.T. (1984). Monensin mode of action in the rumen. J. Anim. Sci.: 58: 1518-1527.

Senatore, E.M.; W.R. Butler and P.A. Oltenacu (1996). Relationship between energy balance and post-partum ovarian activity and fertility in first lactation dairy cows. Anim. Prod. 62: 17-23.

SPSS (1997). SPSS base 7.5 for Windows, User's Guide; SPSS Ind.

Tallam, S.K.; T.F. Duffield; K.E. Leslie; R. Bagg; P. Dick; G. Vessie and J.S. Walton (2003). Ovarian follicular activity in lactating Holstein cows supplemented with monensin. J. dairy Sci. 86 3498-3507.

Vallimont, J.E.; G.A. Varga; A. Arieli; T.W. Cassidy and K.A. Cummins (2001). Effect of prepartum somatotropin and monensin on metabolism and production of periparturient Holstein dairy cows. J. Dairy Sci. 84: 2607-2621.

Van der Werf, J.H.J.; L.J. Jonker and J.K. Oldenbroek (1998). Effect of monensin on milk production by Holstein and Jersey cows. J. dairy Sci. 81: 427-433.

Vizcarra, J.A.; R.P. Wetteman; J. C. Spitzer and D.G. Morrison (1998). Body condition at parturition and postpartum weight gain influence luteal activity and concentrations of glucose, insulin and nonesterified fatty acids in plasma of primiparous beef cows. J. Anim. Sci. 76: 927-936.

Zinn, R.A. and J.L. Borques (1993). Influence of sodium bicarbonate and monensin on utilization of a fat supplemented, high energy growing finishing diet by feedlot steers. J. Anim. Sci. 71: 18.

تأثير الموننسين على الكفاءة التناسلية وإنتاج اللبن لأبقار اللبن الحلابة

[١] ابراهيم محمود عبد الرازق – [١]عبد السلام موسى متولى
[٢]عبد الستار عبد العزيز شتا
[١] قسم الانتاج الحيوانى – كلية الزراعة – كفرالشيخ – جامعة طنطا
[٢] معهد بحوث الانتاج الحيوانى – الدقى – جيزة

الملخص العربى

استخدم فى هذه الدراسة ٣١ بقرة فريزيان لدراسة تأثير الموننسين على بعض مكونات الدم ، الكفاءة التناسلية ، درجة امتلاء الجسم (BCS) وإنتاج اللبن حيث تم تقسيمها الى ثلاث مجموعات كالتالى: المجموعة الأولى (٩ بقرات) وقد اعتبرت كمجموعة ضابطة غير معاملة. أما المجموعة الثانية (١٢ بقرة) فقد اعطيت ٣٠٠مجم موننسين/رأس/يوم لمدة ٤٠ يوم قبل الولادة المنتظرة استمرت حتى ٦٠ يوم بعد الولادة ، فى حين أن المجموعة الثالثة (١٠ بقرات) قد اعطيت نفس جرعة الموننسين المستخدمة فى المجموعة الثانية عقب الولادة وحتى ٦٠ يوم بعد الولادة.

أظهرت النتائج أنه لم يكن للموننسين أى تأثير معنوى على مكونات الدم المدروسة ، أدت الى ظهور تحسن معنوي فى الـ BCS للمجموعة الثانية عند الولادة مقارنة بالمجاميع الاخرى بينما تحسن الـ BSC عند حدوث الحمل فى المجموعة الثانية والثالثة مقارنة بالمجموعة الضابطة. إعطاء الموننسين أدى إلى انخفاض معنوى فى طول الفترة من الولادة وحتى أول شياع وأول تلقيحه وكذا حتى حدوث الحمل ، كما أدى أيضا إلى انخفاض معنوى فى طول أول دورة شياع وذلك بالنسبه لأبقار المجموعة الثانية مقارنة بالمجموعة الضابطة. كما أدى الموننسين إلى تحسين معنوى فى نسبة الحمل المتحصل عليها فى المجموعة الثانية (٦٦,٧%) وفى المجموعة الثالثة (٥٠%) مقارنة بالمجموعة الضابطة (٢٢,٢%). فضلا عن ذلك قد أدت المعاملة بالموننسين إلى زيادة كمية اللبن المنتجة زيادة معنوية بمقدار ٢,١٦ كجم/يوم (٧,٢%) فى المجموعة الثانية مقارنة بالمجموعة الضابطة وذلك دون أى تغيير فى نسبة دهون اللبن او مكونات اللبن الأخرى. وعليه فإنه يمكن استخدام الموننسين كإضافة غذائية لأبقار الفريزيان الحلابة خلال فترة الـ ٤٠ يوم قبل الولادة وحتى ٦٠ يوم بعد الولادة لتحسين كفائتها التناسلية ومعدل الخصوبة بها وكذلك زيادة إنتاجيتها من اللبن دون حدوث أى تغيير فى نسبة دهون اللبن ومكونات اللبن الأخرى.