ABSTRACT

Mohamed Abd El-Fatah Basuony El-Samahy: Effect of Growth Prompting on Productive and Reproductive Performance of Heifers. Unpublished M.Sc. Thesis, Department of Animal Production, Faculty of Agriculture, Ain Shams University, 2010.

The objective of this experiment was to evaluate the effects of altered forage: concentrate ratio and DL-methionine analog supplementation on growth performance of growing heifers until confirmed pregnant. Twenty-four Holstein heifers with an average of age 5.6 ± 0.36 mo and weight 116 ± 6 kg, were fed restricted intakes formulated to allow for 800 g/d (NRC, 1989). Experimental diets were formulated to contain either 50: 50 (low forage) of 75: 25 (high forage) forage: concentrate ratio diets (DM basis). Forage comprised of corn silage and constant amounts of berseem hay (1.5 and 2 kg/ h/ d for low and high forage, respectively). Treatments were fed with or without methionine hydroxy analog supplementation (MHA, 2.1 g / day/ 100 kg BW). Live body weight was taken biweekly, while some body measurements and blood samples were taken monthly. Blood plasma was taken twice weekly after insemination to determine the plasma progesterone concentration. Digestibility trial was performed at 370 kg BW, during the digestibility trial heifers were fed individually in tie-stall. Actual intakes of nutrients were lower than expected intakes due to lower corn silage DM ratio. DM, OM, CP, and NFE digestibility were significantly ($P < 0.05$) improved by reducing the forage portion of the diet, hoverer CF digestibility had a significant ($P < 0.05$) opposite direction. While, supplementation of MHA resulted in trends toward increased DM digestibility. Ruminal TVFA were significantly higher in low forage groups, however, ruminal PH was higher in low forage groups,while MHA trend to decreased TVFA only.Insignificant differences were observed for

plasma total protein triglyceride, creatinine, urea, in addition to negligible difference for albumin, globulin, and A/G ratio, while significant ($P < 0.05$) decreasing in plasma cholesterol was recorded for low forage without MHA treatment, also high forage without MHA group showed a trend to decreased plasma urea. Throughout the feeding period, ADG was not affected across all treatment rations (0.681 LF, 0.685HF, 0.695 LFM, and 0.663 HFM, SE ± 0.033 kg/d). Gain of heifers body weight and measurements were not different among treatments. However, low forage groups had better feed-conversion for DM, MEand TDN, while CP and DCP conversion were better in high forage groups. Age at 330 kg BW was recorded an average of 15.98 mo (15.85 LF, 16.26 HF, 15.41 LFM, and 16.38 HFM, SE ± 0.53 mo), as well asBW at age 14 mo and age and BW at AI, or conception not affected by treatments. Total and daily feed cost for high forage groups was significantly ($P < 0.05$) better than low forage groups, but total and gain feed cost from 150 to 330 kg BW did not affect by treatment may be due to the deep gap within treatments, especially in high forage groups. Thus, we can feed growing heifers in this tested forage strategy under quality recommended for feedstuffs, and used satisfactory method for feeding. Notwithstanding, MHA addition did not has effect on growing heifers performance, nevertheless MHA addition may has influences on DM digest and blood metabolism, and may be the amount used under this experimental was not enough to improve growth performance.

Keywords: growing heifers, forage: concentrate ratio, DL-methionine, forage strategy, nutrients digestibility, rumen parameters, blood plasma parameters, growth and reproductive performance, plasma progesterone.

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ARABIC SUMMARY

LIST OF ABBERVIATIONS

A/G ratio	Albumin /Globulin ratio
AA	Amino Acid
ADF	Acid Detergent Fiber
ADG	Average Daily Gain
AFC	Age at First Calving
AI	Artificial Insemination
AST	Aspartate Amino Transferees
BCS	Body Condition Score
BHBA	beta-hydroxybuterate
bST	Bovine Somatotropin
BW	Body Weight
$BW^{0.75}$	Metabolic Body Weight
BWG	body weight gain
Ca	Calcium
CF (DCF)	Crude Fiber (CF digestibility)
CFM	Concentrates Feed Mixture
CP (DCP)	Crude Protein (CP digestibility)
CS	Corn Silage
d	Day
DM (DMD)	Dry Matter (DM digestibility)
DMI	Dry Matter Intake
EE (DEE)	Ether Extract (EE digestibility)
F:C	Forage: Concentrate ratio
g	Gram
HF	High forage /group two
HFM	High forage plus MHA/group four
HMB	D,L-2-Hydroxy-4-(Methylthio)-Butanoic acid
HMBi	Isopropyl-2-Hydroxy-4-(Methylthio)-Butanoic acid
LBW	Live body weight

LF	Low forage /group one
LFM	Low forage plus MHA/group three
ME	Metabolizable Energy
Met	Methionine
mg/dl	milli gram /deciliter
MHA	Methionine hydroxy analog
mo	Month
NDF	Neutral Detergent Fiber
NEFA	Non-Esterified Fatty Acids
NFE (DNFE)	Nitrogen Free Extract (NFE digestibility)
ng/ml	Nano gram/ Milli liter
OM	Organic Matter
P4	Progesterone
RPMet / RPM	Rumen Protected Methionine.
RUP	Rumen Undegradable Protein
SAA	sulfur-containing amino acids
SBM	Soybean Meal
TDN	Total Digestible Nutrient
TMR	Total Mixed Ration
TVFA	Total Volatile Fatty Acids
U/L	Unit /Liter
UIP	Undegradable Intake Protein
vs.	Versus
yr.	year