ABSTRACT

DEDEN SUDRAJAT. Production and Reproduction Performances of Garut Sheep Fed with Different Levels of Chromium, Calcium and Cation-Anion Balance. Supervised by TOTO TOHARMAT, ARIEF BOEDIONO, IDAT G. PERMANA, and R. IIS ARIFIANI.

Chromium (Cr) is an essential mineral for ruminants. Its metabolism and interactions with other minerals has not been widely known. Besides that chromium mineral and cation-anion balance in ration affects acid-base balance and mineral metabolism in body liquid. Changes in the acidity of body liquid indirectly affect the characteristics of animal production and reproduction. Two experiments were conducted to assess the production and reproduction performance of Garut sheep offered rations with different dietary cation anion balance (DCAB) and supplemented with chromium (Cr) and calcium (Ca). In the first experiment four dietary treatments, namely: R0 (basal diet); R1 (R0+Cr 3 ppm), R3 (R0+ Ca); R3 (R2+ Cr 3 ppm), were allocated in twenty four of 1.5-2 years old Garut grade rams in a randomized block design. Albumin separation method was used to separated X and Y spermatozoa of Garut sheep. In the second experiment, treatments consisted of combinations of mating patterns and pre-gestating rations, namely: Ram R3 (Cr + DCAB 0) x Ewe R0 (DCAB +14) (RJA); Ram R1 (Cr+ DCAB+14) x Ewe R2 (Cr + DCAB-10) (RBA); Ram R0 (DCAB+14) x Ewe R0 (DCAB+14) (RJBB). In the first experiment, the results showed that Cr supplementation in rations containing different levels of Ca did not affect feed intake, body weight gain, and dry matter digestibility, but reduced the absorption of Cr and also the absorption of Ca of the low Ca diet. The increased of Cr intake decreased the absorption of Cr. Supplementation of Cr had no effect on Cr, Ca, Zn, and Mg status in blood and semen of the rams. Intake of Cr and Ca were not related to the semen Cr and Ca levels. However Level of Cr intake tended to correlate negatively with the Cr absorption and correlate positively with blood Cr levels. There was a positive relationship between the level of Ca intake with the Ca and Mg absorption and blood Ca and Zn levels. The results showed that Cr supplementation in the ration with different levels of Ca and dietary cation anion balance (DCAB) not affect the rectal temperature as well as in respiration rate of Garut rams. Supplementation of Cr in the ration does not affect semen quality of Garut rams either macroscopically or microscopically. Supplementation of Cr in ration containing acid DCAB reduced semen pH and membrane integrity the lower fraction spermatozoa on day 49. In the second experiment, results showed that there was a close relationship between gestational periods and body weight gain of gestating ewes. Cr supplementation and DCAB reduction in ram and ewe pre-gestating rations did not affect gestational periods. Lambs number of the same birth from Cr and DCAB10-supplemented ewes mated with Cr-supplemented rams tended to increase. Sex ratio of offspring from ewes mated with Cr and DCAB 0-supplemented rams tended to decrease.

Key words: Chromium, dietary cation-anion balance, sex ratio of offspring