EFFECT OF PROTEIN QUALITY ON PRODUCTIVE PERFORMANCE OF LACTATING ANIMALS

By

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B. Sc. Agric. (Animal production) Cairo Univ., 1991

A thesis submitted in partial fulfillment
of
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Department of Animal Production
Faculty of Agriculture
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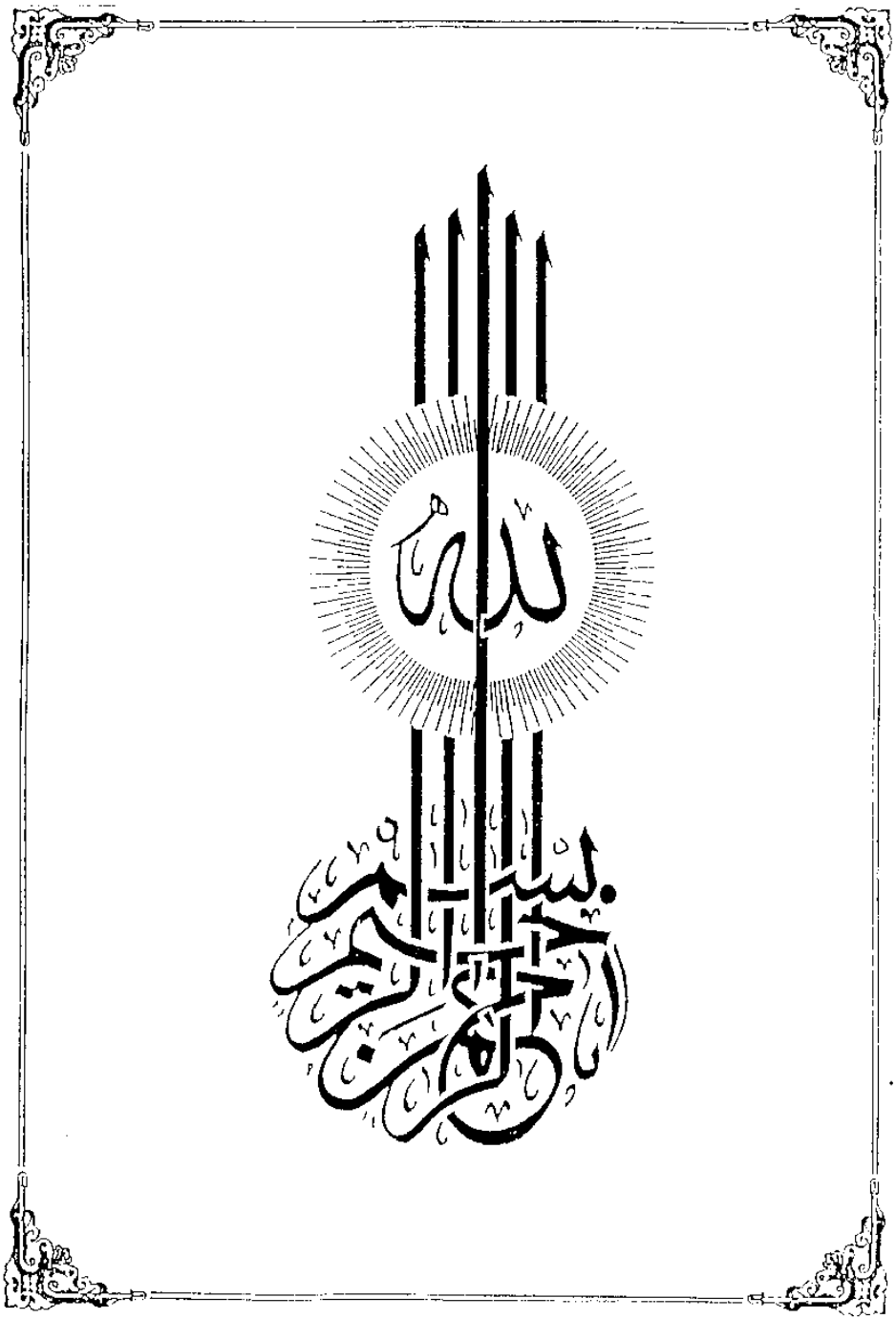

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ABSTRACT

Mohamed Mahmoud Ali Abdou. Effect of protein quality on productive performance of lactating animals. Unpublished Master of Science, University of Ain Shams, Faculty of Agriculture, Department of Animal Production, 1996.

The amino acids composition of different protein sources (concentrate feed mixture (CFM)), leucaena leaves (LL), sunflower meal (SFM), heated soybean meal (HSBM), broiler litter (BL), feather meal (FM), offal meal (OFM), and meat and bone meal (MBM) were determined. Results showed that the highest values of total amino acids were recorded for FM, Followed by MBM, SBM, OFM and then LL, while lower values were observed for SFM, BL and then CFM which showed the lowest value.

Twenty one combinations with different levels of protein (16, 18 and 20%) and different sources of CFM, LL, SFM, HSBM, BL, FM, OFM and MBM were tested for in-vitro dry matter (IVDMD) and organic matter (IVOMD) disappearances, in-vitro ammonia release at different time of incubation and in-vitro soluble nitrogen for 100% of CFM, LL, SFM, HSBM, BL, FM, OFM and MBM. Results showed that the highest values of IVDMD were recorded for all combinations of OFM at different levels of protein, while, the highest values of IVOMD were observed for all combinations of MBM at different levels of protein, while the lowest values of IVDMD and IVOMD were recorded for BL combinations at different levels of protein. Results indicated also that the highest values of ammonia release were observed for BL combinations at all tested protein levels, while the lowest values of ammonia nitrogen release were recorded for LL combinations at all levels of protein. Ammonia nitrogen gradually increased by passing of incubation time and as the level of CP increased. Also, N-Solubility was the highest value for BL, while the lowest value of N-Solubility was recorded for HSBM.

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Nine lactating buffaloes (in their early lactation season) were divided randomly among three groups (3 animals each), group1 (control), group 2 (30% leucaena) and group 3 (30% sunflower meal). Milk and blood samples were collected for analysis. Milk yield and 4% fat corrected milk were higher with leucaena treatment than those fed control and 30% sunflower meal. Chemical composition of milk showed a slightly increase in fat, TS, SNF and TP content in 30% leucaena treatment than those of control and 30% sunflower meal, also, lactose was significantly higher in the leucaena group. Daily yield of fat, Ts, TP, NPN, lactose and ash were increased insignificantly in leucaena feeding group than those of control and 30% sunflower meal. Blood serum globulin and GOT were significantly higher in leucaena treatment. Serum glucose and inorganic phosphorus were increased insignificantly in leucaena treatment. Blood serum albumin and albumin: globulin ratio were increased significantly in control than those of leucaena (T_2) and sunflower meal (T_3). Blood serum TP, creatinine, GPT, total bilirubin and direct bilirubin were slightly increased in control. Also, serum Alk-p-ase and free bilirubin were increased significantly ($P<0.05$ and 0.01) in control.

Amino acids content of milk and blood resulted from feeding of leucaena (T_2) and sunflower meal (T_3) were compared with amino acids content of milk and blood resulted from control feeding. Results showed that total essential amino acids of milk were increased in leucaena (T_2) compared with (T_1) and (T_3) wherease total non-essential amino acids were lower in T_2 than those of (T_1) and (T_3). Also, total essential amino acids of blood serum and total non-essential amino acids followed the same trend.

Key words: Protein quality, lactating buffloes, in-vitro work, milk production and composition, blood serum, amino acids profile of protein sources, blood and milk.

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