

Nega Tolla Koni 2006: Productive and Reproductive Responses of Lactating Dairy Cows to Different Feeding Managements in Oromia, Ethiopia. Doctor of Philosophy (Tropical Agriculture), Major Field: Tropical Agriculture, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Pravee Vijchulata, PhD. 129 pages. ISBN 974-16-1902-2

Two experiments were conducted with the overall objective to evaluate the influences of available feed resources and feeding managements on productive and reproductive responses of Holstein Friesian dairy cattle. The first trial was to study comparative performances of Holstein Friesian cows under smallholder and large scale farmers' management in central Rift Valley of Oromia, Ethiopia. This study was conducted in Central Rift Valley of Oromia at Arsi Negelle, Ziway, Adama and Lume districts of Eastern Shoa Zone. Three large scale peri-urban farms having 170 to 195 and 21 small scale urban farms having 1 to 10 heads of dairy animals were identified during the initial exploratory survey. Based on the willingness of the farm owners, the presence of dairy cows of graded Holstein Friesian genotype, known parity and stage of pregnancy two large scale farms and 12 small scale farms were randomly selected. A total of 28 animals from both large scale (14 animals average \pm std body weight 427 ± 42 kg) and small scale (14 animals average \pm std. body weight 363 ± 16 kg) were used for 28 weeks of data collection. The animals were within the parity ranging from 1 to 6. Significantly ($p < 0.001$) higher milk yield was recorded on large scale farms than on the small scale farms. Milk components and reproductive parameters measured were not statistically differed between farm scales. Milk yield, milk components and reproductive parameters were not significantly ($p > 0.05$) differed between parity classes. Although, the estimated amounts of crude protein and metabolizable energy consumed by animals were above requirements for the observed milk out put, the productivity of animals in both farm scales were below their genetic potential particularly that of small scale farms were critically low. The quality of dietary nutrients in terms of the proportion of rumen degradable to undegradable protein sources and structural and non structural carbohydrate needs further assessment for both farm scales. The second experiment was conducted at Holeta Cattle Genetic Improvement Center located 44 km to the West of Addis Ababa, to evaluate the productive and reproductive responses of lactating cows fed hay and concentrate supplement with/without cottonseed cake and/or bole. Thirty two Holstein Friesian cows with average \pm std body weight of 524 ± 54 kg were blocked by their expected due date of calving. Soon after calving animals were assigned in a randomized complete block design to four dietary treatments of either commercially formulated concentrate diet, substituting 45% of the concentrate with cottonseed cake, concentrate plus 3% bole or substituting 45% of the concentrate with cottonseed cake plus 3% bole soil for 135 days. Substituting a concentrate diet with 45% cottonseed cake improved both actual and 4% fat corrected milk yield as well as milk fat content and yield. However, milk protein content, protein yield and protein production efficiency were lower than expected. This was due to low dietary energy supply resulted from lower concentration of nonstructural carbohydrate throughout the experimental diets. Nevertheless, including 3% bole alone in concentrate diet was biologically and economically more attractive than using either concentrates alone, concentrate plus cottonseed cake, or concentrate plus 45% cottonseed with 3% bole. However, optimum levels of cottonseed cake and bole at which maximum responses can be obtained need further investigation.

Student's signature

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