

Abstract

This study was carried out at the Animal Farm pertaining to the Department of Animal Resources, College of Agriculture, University of Baghdad, using 18 multiparous Holstein Friesian cows depending on their peak milk yield. The cows were randomly divided into two main groups (with and without spraying with water). Each group was sub-divided into three sub groups including 3 cows each representing treatment of anise (0 and 30 gm of formaldehyde- treated anise as well as 30 gm formaldehyde untreated anise to the concentrate diet/cow/day). The field part of the experiment was continued for the period from 1/7/2012 to 2/10/2012 to study the effect these treatments on the productive and physiological performance under heat stress conditions in Summer. Results revealed that the experimental cows under heat stress during the experiment which negatively affected on some studied traits. The highest temperature-humidity index (THI) was 85.05 during the fourth week of July. The cow's average daily milk yield (DMY) was 11.97 kg. Anise -treated group exhibited greater ($P < 0.05$) DMY during weeks 6th, 7th, 8th and 9th as compared with the control group. At the week 10th, higher ($P < 0.05$) average DMY was noticed for formaldehyde treated and untreated anise treatments in comparison with the control group, and this effect was continued until the end of the experiment. The average DMY for water-sprayed cows in the third week was 13.16 kg, whereas for non-sprayed group being 12.00 kg. This influence was continued till the end of the experiment. The anise treatment had positive effect ($P < 0.05$) on milk components including protein, fat, lactose, ash and soluble nonfat during the last periods of the experiment recording 3.01 , 3.66 , 4.45 , 0.66 and 8.20 % respectively for anise-treated group and 2.80 , 2.18 , 4.15 , 0.62 and 7.59 % respectively for non-treated group. The spraying effect of milk fat lacked significance, while decreased ($P < 0.05$) milk protein and lactose constituents in the middle period of the experiment namely 2.84 and 4.24% respectively as compared with non-prayed group (2.96 and 4.43% respectively). This effect was continued until the end of the experiment. The milk ash and soluble nonfat percentage were significantly ($P < 0.05$) declined in spraying group at the end of the experiment. Evening rectal temperature was decreased ($P < 0.05$) as influenced of treated and non-treated anise in Third week namely 39.16° C, while being 39.36° C for control group. This effect was remain until 1/8/2012. On the other hand, the evening average respiratory rate was decreased ($P < 0.05$) for the 30gm anise –formaldehyde treated group in Third week namely 40.50 respiration/minute in comparison with the control group (42.33 respiration/minute). This effect remained with similar pattern in the week 5th. In the week 7th significant ($P < 0.05$) decreases in evening average respiratory rate was observed for treated and untreated anise groups namely 44.33 and 43.83

respiration/minute respectively as compared with the control group (49.33 respiration/minute) till the end of the experiment. Lower ($P < 0.05$) evening average pulse rate was noticed for treated and untreated anise groups in the week 7th as well as in the week 12th as compared with the control group. The water spraying decreased ($P < 0.05$) average rectal temperature, respiratory and pulse rates in comparison with non-sprayed group. Significant ($P < 0.05$) effect of anise was observed on some blood parameters (cholesterol, cortisol and thyroxin hormones). Excluding data of cortisol hormone which was declined ($P < 0.05$) in spraying group at the end of the experiment, the influence of water spraying on blood attributes lacked significant. The interaction between the anise treatment and water spraying was positively significant ($P < 0.05$) on most studied traits. The formaldehyde 30 gm/cow/day anise treated group was always better than untreated group during the experiment. It seems clear that exposure of dairy cattle to heat stress in summer had a negative effect on productive and physiological performance. The formaldehyde treated and untreated anise supplementation (30 gm/cow/ day) to concentrate diet and water spraying during afternoon led to the mitigate the adverse effect of heat stress of these cows and enhanced their performance. At the end of the experiment, the anise supplementation to the concentrate diet was also tested for local Awassi rams during the period of 4/10 to 4/11/2012 to investigate the effects of these treatments on rumen fermentation. No significant effect was noticed among groups in the rumen pH, whereas decreased ($P < 0.05$) in phenols concentrations for anise treated group as compared with control group during 3 and 9 hrs. post feeding. Furthermore, significant ($P < 0.05$) increasing in total bacterial count for anise-treated group and significant decrease ($P < 0.05$) in volatile fatty acids for anise- untreated group, 6 hrs. Post feeding. Obvious ($P < 0.05$) increasing in total bacterial count was showed for both anise groups, 9 hrs. post feeding. Significant ($P < 0.05$) decreasing in ammonia nitrogen percentage for both anise treated groups as compared with the control group revealing the absence of negative effects of formaldehyde-treated anise seeds on rumen environment. In the end using anise especially treated with spraying increase resistance dairy cows to heat stress in summer.