



EFFECT OF ADDING CHAMOMILE TO DIET AND WATER SPRAYING IN DENSITY AND SENSORY EVALUATION TO PASTEURIZED MILK FROM HOLSTEIN DIARY COW UNDER HEAT STRESS

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Abstract

This experiment was conducted in Iraq at Alkhalis Dairy Cattle Station in the Diyala governorate during the months July, August and September for the period from 1/7 to 1/10/2017. The experiment aimed to reduce the negative effect of heat stress on intensity and quality of milk of Holstein dairy cows by adding chamomile to the diet and spraying with water during the afternoon (3 PM). The mean of temperature-humidity index (THI) during the months of the experiment was 80.87, indicating that the cows were under the influence of heat stress. The results showed that the spraying of water and the treatment of chamomile during the heat stress period in July, August and September did not affect significantly on density and sensory evaluation of pasteurized milk.

Key words : Holstein, heat stress, Chamomile, Water Spraying, Milk Intensity, Sensory evaluation.

Introduction

Dairy cows are one of the most sensitive kinds to temperature changes and in several central and southern Iraq regions are exposed to high ambient temperatures and solar radiation for long periods. These reduce the capacity of the dairy cow to dissipate heat, resulting in heat stress (Shwayel and Al-Mafraji, 2018). Heat stress in dairy cows is caused by a combination of environmental factors such as temperature, relative humidity, solar radiation and air movement [Todoroviæ *et al.*, (2011); Gaafar *et al.*, (2011); AL-Reyad *et al.*, (2016)]. Heat stress decreased milk production 50%. It also lowers milk quality by reducing fat, protein and lactose in milk, causing significant economic losses in the livestock sector (Dunn *et al.*, 2014). Spraying with water during the afternoon, which is one of the main strategies that can be applied to reduce the adverse impact of temperature in summer on the performance of cows, as it is one of the best ways to reduce the negative impact of heat stress in many countries [Tucker *et al.*, (2005); USDA, (2010); Shwayel and Al-Mafraji, (2018)], as the chamomile is one of the important medicinal herbs. It contains a large group of

therapeutically interesting (Singh *et al.*, 2011). It also contains sedative and anti-heat compounds such as salicylates, which is one of the components of aspirin. It also improves the building of damaged tissue and enhances the efficacy of immunocompromised leukocytes (Presibella *et al.*, 2006). This research aims to study the effect of adding chamomile to the diet and water spraying on Holstein cows in terms of intensity and quality of milk of Holstein cows under heat stress.

Materials and Methods

Experimental design

This experiment was conducted at Alkhalis Dairy Cattle Station in the Diyala governorate – Iraq. During the months of July, August and September for the period from 1/7 to 1/10/2017. A total of 18 Holstein dairy cows were selected for this research. Dairy cows were selected based on the age 4 to 5 years. Since the experimental dairy cows were rearing with the other dairy cows in the dairy farm, the selected dairy cows were marked by using numbers for easy identification and taken care separately and were divided into six treatment groups, T₁ a control group (without adding chamomile and without spraying),

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T₂ and T₃ were added to diet 25 and 50 g / cow / day chamomile, respectively and T₄ Treatment of water spraying only during the afternoon (3 PM) and T₅ and T₆ represents the treatment of water spray and the addition of chamomile 25 and 50 g / cow / day respectively. the chemical compositions of concentrate diet fed to animals during the experiment are was 15.29% CP, 6.16 % CF and 6.20 % fat Addition hay and alfalfa hay, who was present when the availability of green fodder scarves, the water was always available to the animals and the Temperature and relative humidity were daily recorded by using a thermo hygrometer. Temperature-Humidity Index (THI) values were also determined during the experimental period using the following equation, as described by Mader *et al.*, (2006).

Studied traits

Milk Intensity were analyzed by using Lacto scan milk analyzer in the Ministry of Agriculture - Abu Ghraib Station in Baghdad and the Sensory evaluation of pasteurized milk samples was conducted in In the department of Food Industries – collage of Agricultural Engineering Sciences - University of Baghdad According to the following table :

- the taste and flavor (35 degrees).
- Textures (30 degrees).
- Color and appearance (15 degrees).
- Acidity (10 degrees).
- degree of admission (10 degrees).

Statistical analysis

The data were subjected to statistical analysis using Factorial Experiments (3×2) according to Randomized Complete Blocks Design were used in the analysis of experiment data to Study the effect of the treatments studied in different qualities and compared the differences between the test averages (Duncan, 1955) polynomial and use the program (SPSS, 2011) in the statistical analysis.

Results and Discussion

The average ambient temperature (°C), relative humidity (%) and temperature humidity index (THI) are shown in Table 1. The THI of July, August and September were 80.20, 81.55 and 80.87, respectively.

Table 2. Showed Effect of adding Chamomile to Diet and Water Spraying on the Milk density of Holstein Dairy cow. It is noted from the table that there is no significant effect on Milk density during July, August and September Where she recorded 1.27, 1.29 and 1.29 in the treatment without water spray and 1.28, 1.28 and 1.29 in treatment

with water spray during July, August and September, respectively and The milk density was 1.28, 1.30 and 1.29 in the treatment of control compared with 1.27, 1.27 and 1.28 in Treatment of add chamomile 25 g / cow / day and 1.28, 1.29 and 1.30 in Treatment of add chamomile 50 g / cow / day during July, August and September, respectively. So as to interaction between the treatments of add Chamomile and water spray there was no significant effect on Milk density during this months.

T₁ a control group (without adding chamomile and without spraying), T₂ and T₃ were added to diet 25 and 50 g / cow / day chamomile, respectively and T₄ Treatment of water spraying only during the afternoon and T₅ and T₆ represents the treatment of water spray and the addition of chamomile 25 and 50 g / cow / day respectively.

And It is noted from the table 3 that there is no significant effect of water spray and addition of

Table 1: The average of Ambient temperature (°C) and relative humidity (%) during the experiment period.

THI °	Average relative humidity %	Average Temperature °C	Months
80.20	12.17	39.17	July
81.55	14.87	37.17	August
80.87	15.90	33.76	September
80.87	14.31	36.73	mean

* Temperature-Humidity Index according to Mader *et al.*, (2006).

Table 2: Effect of adding Chamomile to Diet and Water Spraying on the Milk density of Holstein Dairy cow (mean±SE).

September	August	July	Treatment
Effect of water spraying			
1.29±0.72	1.29±1.31	1.27±0.53	without water spray
1.29±0.89	1.28±0.40	1.28±0.37	water spray
Effect of chamomile			
1.29±0.88	1.30±0.81	1.28±0.54	0 g/cow
1.28±0.64	1.27±0.82	1.27±0.80	25 g/cow
1.30±1.24	1.29±0.34	1.28±0.23	50 g/cow
Water spraying x chamomile			
1.29±0.90	1.32±2.98	1.28±0.68	T ₁
1.28±1.41	1.26±1.60	1.26±1.18	T ₂
1.30±1.62	1.29±0.54	1.28±0.38	T ₃
1.28±1.59	1.27±1.06	1.28±0.94	T ₄
1.28±0.21	1.28±0.27	1.29±0.74	T ₅
1.31±2.18	1.29±0.48	1.28±0.31	T ₆

T₁ a control group (without adding chamomile and without spraying), T₂ and T₃ were added to diet 25 and 50 g / cow / day chamomile, respectively and T₄ Treatment of water spraying only during the afternoon and T₅ and T₆ represents the treatment of water spray and the addition of chamomile 25 and 50 g / cow / day respectively.

Table 3: Effect of adding chamomile to Diet and Water Spraying on Sensory evaluation of pasteurized milk of Holstein Dairy cow (mean±SE).

Treatment	Taste and flavor	Textures	Color and appearance	Acidity	Degree of admission
T ₁	34.75 ±0.25	0.00±15.00	0.47±29.25	0.01±10.00	0.01±10.00
T ₂	3.14±26.25	1.25±13.75	1.75±28.25	1.03±8.25	0.85±7.75
T ₃	1.22±32.00	10.0±15.00	0.50±29.50	0.01±10.00	0.47±9.25
T ₄	1.03±32.25	0.50±14.50	0.94±28.75	0.25±9.75	0.47±9.25
T ₅	±27.00 4.26	14.75±1.25	27.75±1.10	8.00±1.68	0.75±8.75
T ₆	31.00±2.44	14.75±0.25	28.25±1.18	±9.500.50	0.75±8.75
P-value	NS	NS	NS	NS	NS

-T₁ a control group (without adding chamomile and without spraying), T₂ and T₃ were added to diet 25 and 50 g / cow / day chamomile, respectively and T₄ Treatment of water spraying only during the afternoon and T₅ and T₆ represents the treatment of water spray and the addition of chamomile 25 and 50 g / cow / day respectively.

-NS mean non-significant effect.

chamomile on Sensory evaluation of pasteurized milk, which include taste and flavor, Textures, Color and appearance, Acidity and degree of admission. The results of this experiment there was no negative effect for add Chamomile to diet and Water Spray in milk Quality product from Holstein Cow under heat stress.

Conclusions

From the above we conclude that spraying with water and treatment with chamomile during heat stress period in July, August and September did not effect on density and Sensory evaluation of pasteurized milk of Holstein Dairy cow.

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