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Proceedings of the Second International
Research-to-Practice Conference



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16-18 April 2025

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FACULTY OF HYDROMETEOROLOGY AND ENVIRONMENTAL SCIENCE



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The Proceedings of the Second International Research-to-Practice Conference on 'Climate Services: Science and Education' are presented in the collected volume. The presented materials highlight the current challenges and achievements in the development and implementation of climate services in climate-sensitive sectors of the economy. Special attention is given to the growing role of education in building capacity for climate-informed decision-making through interdisciplinary learning and professional training. The reports also cover issues of climate risks and adaptation strategies implemented at regional and local levels. Published studies reflect the author's vision of the problems of climate change and climate service. Materials are submitted in the author's editorial office.

The publication is intended for applicants, pedagogical, scientific and scientific-pedagogical employees of educational and scientific institutions.

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INFLUENCE OF AIR TEMPERATURE ON PHYSIOLOGICAL INDICATORS OF GOATS

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Warming and climate change are a global challenge. Among farm animals, goats are less sensitive to heat stress, so their use is promising [1]. The main indicators of heat stress in goats are increased body temperature, respiratory rate and pulse rate [2].

In goats, the normal body temperature is about 39 °C, the respiratory rate is 10–20 breaths/min, and the pulse rate in goats at rest is 60–80 beats/min [3, 4]. Under heat stress, an increase in respiratory rate and rectal temperature is an adaptive response that helps to remove excess heat from the centre to the periphery [3, 5], and an increase in pulse rate promotes more intense blood flow, which transfers heat to the body surface, ensuring effective thermoregulation [3]. In view of the above, the **aim** of this study was to investigate the physiological parameters of goats depending on the ambient temperature.

The work has been carried out in a herd of Saanen dairy goats on the farm “Babyny Kozy”, Kyiv region (Ukraine). The animals have been kept year-round in free-range housing with free access to feed and water (supplied by automatic drinkers). Information on air temperature in June 2024 was obtained from the State Hydrometeorological Service of Ukraine.

The research has been conducted over a period of 10 days (June 21–30, 2024). The experimental group has included 15 second lactation goats. The respiratory rate, pulse rate, and rectal temperature of goats have been assessed daily at 6:00, 12:00, and 18:00 according to generally accepted methods [4]. The results have been statistically processed using the “Statistica” software.

It has been found that the average daily air temperature during the study period was $21,2 \pm 0,71$ °C, with fluctuations from 18,6 to 24,4 °C. The lowest temperature was observed at 6:00 a.m., averaging $14,1 \pm 0,61$ °C, and by 12:00 it increased by 12,9 °C to 27,0 °C on average. By 18:00, the air temperature was expected to decrease (Fig. 1).

It has been found that at 6:00, when the average ambient temperature was $14,1 \pm 0,61$ °C, the physiological parameters of goats were at the following level: rectal body temperature – $39,0 \pm 0,08$ °C, respiratory rate – $17,9 \pm 0,31$ breaths/min, pulse rate – $71,8 \pm 0,35$ beats/min. At 12:00, when the average temperature was 27,0 °C, the physiological parameters of the goats have increased significantly; in particular, the rectal body temperature has increased by 0,6 °C; respiratory rate by 4,1 breaths/min; pulse rate by 10.9 beats/min ($P < 0,001$ in all cases). By 18:00, the studied physiological parameters of goats have decreased, but have remained higher compared to those at 6:00,

respectively, by 0,3 °C ($P < 0.05$), 1.6 breaths/min ($P < 0,01$), and 2,7 beats/min ($P < 0,001$). It has been calculated that the effect of ambient temperature on the physiological parameters of goats has been reliable and of medium strength ($\eta^2x = 48,8-64,6 \%$; $P < 0,01$ i $P < 0,001$).

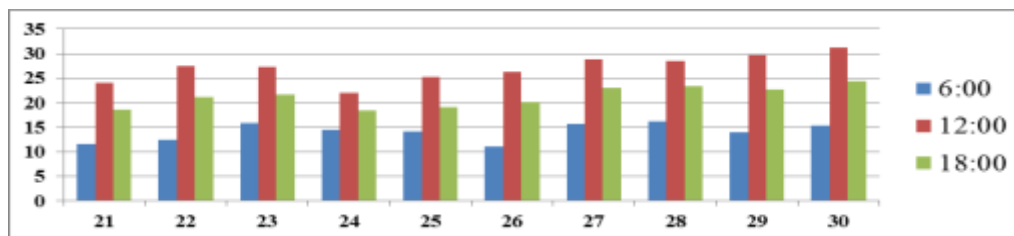


Fig. 1. Changes in air temperature during the day in 21-30 June, 2024.

Physiological parameters of goats varied depending on the time of day and ambient temperature. The highest rectal temperature, respiratory rate and pulse rate were observed at 12:00, i.e. at the highest ambient temperature (Table 1).

Table 1. Physiological parameters in goats depending on the time of day, $x \pm S.E$

Indicator	Time of day:		
	6:00	12:00	18:00
Rectal temperature, °C	39,0 ± 0,08	39,6±0,12 ³	39,3±0,12 ¹
Respiratory rate per minute	17,9± 0,31	22,0± 0,40 ³	19,5± 0,34 ²
Pulse rate per minute	71,8± 0,35	82,7± 0,48 ³	74,5± 0,40 ³

Note: difference compared to the values obtained at 6:00, ¹ – $P < 0.05$; ² – $P < 0.01$; ³ – $P < 0.001$.

Conclusion. In Saanen dairy goats, the values of physiological parameters (respiratory rate, pulse rate and rectal temperature) have increased with increasing air temperature. In the hottest period of the day (12:00), these parameters have exceeded the accepted physiological norms.

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