

1 **Appendix A Temperature and humidity for the dairy cows used in the study**

Item		HS-free			HS		
		Temp. (°C)	RH (%)	THI	Temp. (°C)	RH (%)	THI
Day 3	06:00	7.7	65.3	48.3	26.0	94.9	78.2
	14:00	15.2	54.8	59.2	29.3	93.9	83.9
	22:00	9.6	62.5	51.2	28.1	93.9	81.8
Day 2	06:00	7.5	67.1	47.9	26.3	94.9	78.8
	14:00	14.9	56.2	58.8	28.6	93.9	82.7
	22:00	9.2	65.2	50.5	28.1	93.9	81.8
Day 1	06:00	7.1	66.4	47.4	26.4	94.9	78.9
	14:00	14.1	57.3	58.0	28.7	93.9	82.8
	22:00	9.1	64.7	50.4	27.8	93.9	81.3

2 Day 3, day2, and day 1 are respective time points before sample collection of dairy cows.

3 RH, relative humidity; Temp., temperature.

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5 **Appendix B Rectal temperature and respiration rate of dairy cows**

Parameters	HS-free	HS	<i>P</i> -value
Rectal temperature (°C)			
06:00	38.12±0.05	39.17±0.05	< 0.01
14:00	38.46±0.06	39.53±0.06	< 0.01
22:00	38.31±0.06	39.37±0.06	< 0.01
Respiration rate (breaths min ⁻¹)			

06:00	42.6±1.35	71.5±2.03	< 0.01
14:00	48.7±1.44	75.8±2.18	< 0.01
22:00	44.2±1.39	72.6±2.12	< 0.01

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7 **Appendix C Serum hormone parameters of dairy cows**

Parameter	HS-free	HS	<i>P</i> -value
Prolactin (uIU ml ⁻¹)	184.25±6.95	132.43±6.54	< 0.01
Insulin (ng ml ⁻¹)	0.44±0.04	0.51±0.05	0.11

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