Jurnal Sain Veteriner, Vol. 44. No. 2. Agustus 2026, Hal. 208-217
DOI: 10.22146/jsv.112870
ISSN 0126-0421 (Print), ISSN 2407-3733 (Online)
Tersedia online di https://jurnal.ugm.ac.id/jsv

Perbedaan Respon Fisiologis dan Kesehatan Kuda di Dataran Rendah dan Dataran Tinggi Kabupaten Karanganyar serta Pesisir Pantai Parangtritis Kabupaten Bantul

Differences in Physiological Responses and Health of Horses in the Lowlands and Highlands of Karanganyar Regency and the Parangtritis Coast of Bantul Regency

Wari Pawestri [1*], Alya Fathintyaning Ridha Asti [2], Khali Kharismawati [2], Ari Kusuma Wati [1], Endang Tri Rahayu [1], Yuli Yanti[1]

[1]Animal Science Program Study, Faculty of Animal Science, Universitas Sebelas Maret
[2]Student Animal Science Program Study, Faculty of Animal Science,
Universitas Sebelas Maret, Surakarta, Jawa Tengah, Indonesia
*Email: wari.pawestri@staff.uns.ac.id

Naskah diterima: 5 November 2025, direvisi:5 Maret 2026, disetujui: 18 Mei 2026

Abstract

The study aims to determine the physiological condition and health of horses in lowland, highland, and coastal areas. The study was conducted from March 2023 to October 2024. The method used was a survey with purposive sampling. Data collection was carried out using interviews, observation, and literature study. The sample consisted of 30 horses (lowlands), 30 horses (highlands), and 31 horses (coastal areas). The variables observed were the physiological condition and health of the horses. Physiological conditions included heart rate, respiratory rate, and body temperature of the horses. The health variables observed were clinical examination and medical history. Clinical examination included hair loss, eye and nose discharge, and eye mucosa color. The data were processed using quantitative descriptive analysis using Microsoft Excel software and Analysis of Variance (ANOVA) using R-Studio software. The results of the study show that the horse breed commonly kept in the highlands and coastal areas is the Sandalwood horse, while in the lowlands it is the Javanese horse. The average age range of the horse is between 6-15 years. The ANOVA results show that horses in lowland areas have higher physiological responses (heart rate, respiration, body temperature) compared to those in highland and coastal areas. The health condition of horses in lowland, highland, and coastal areas is good.

Keywords: coastal areas; health; highlands; horse; lowlands; physiological

Abstrak

Penelitian bertujuan untuk mengetahui kondisi fisiologis dan kesehatan kuda di daerah dataran rendah, dataran tinggi, serta pesisir pantai. Penelitian dilaksanakan mulai bulan Maret 2023 sampai Oktober 2024. Metode yang digunakan merupakan survei dengan teknik purposive sampling. Pengumpulan data menggunakan metode wawancara, observasi, dan studi literatur. Sampel yang didapatkan sebanyak 30 ekor kuda (dataran rendah), 30 ekor kuda (dataran tinggi), serta 31 ekor kuda (pesisir pantai). Variabel yang diamati adalah kondisi fisiologis dan kesehatan kuda. Kondisi fisiologis meliputi frekuensi detak jantung, frekuensi respirasi, dan suhu tubuh kuda. Variabel kesehatan kuda yang diamati adalah pemeriksaan klinis dan riwayat penyakit. Pemeriksaan klinis meliputi kerontokan rambut, leleran mata dan hidung, serta warna mukosa mata. Data diolah menggunakan analisis deskriptif kuantitatif menggunakan software Microsoft Excel dan Analysis of Variance (ANOVA) menggunakan software R-Studio. Hasil penelitian menunjukkan bahwa bangsa kuda yang banyak dipelihara di dataran tinggi dan pesisir pantai adalah kuda Sandalwood, sedangkan di daerah dataran rendah adalah kuda Jawa. Kuda yang dipelihara rata-rata memiliki rentang umur 6-15 tahun. Hasil Anova menunjukan kuda di dataran rendah memiliki respon fisiologis

(detak jantung, respirasi, suhu tubuh) lebih tinggi dibandingkan dataran tinggi dan pesisir pantai. Kondisi kesehatan kuda di daerah dataran rendah, dataran tinggi, dan pesisir pantai menunjukkan kondisi yang baik.

Kata kunci : dataran rendah; dataran tinggi; fisiologis; kesehatan; kuda; pesisir pantai

Introduction

Horses (*Equus caballus*) are ungulate mammals that have great strength and high intelligence, so they are widely used by humans (Wibisono, Wianda, and Suatha, 2017). Horses in Indonesia are used for transportation (riding horses) and as working animals such as *bendi* pullers. A *bendi* is a two-wheeled cart pulled by a horse. Horse-drawn carts are commonly found in tourist areas. Tourists visiting these areas motivate horse breeders to earn a living.

The performance of draft horses can be influenced by physiological conditions and health. One factor that can affect the physiological conditions and health of horses is the environment. Differences in temperature and humidity can be influenced by the geographical conditions of a place. The altitude of the terrain and the environmental temperature of a location are relevant to the physiological condition and health of livestock (Saefullah, Prayoga, and Yulianti, 2016).

Karanganyar Regency and Bantul Regency are examples of locations that illustrate differences in geographical conditions. Karanganyar Regency has an area of 76,778.64 ha, with an altitude of 80-2000 meters above sea level (BPS, 2022). The difference in altitude in Karanganyar Regency causes differences in environmental temperature. The lowlands have a temperature of 20-34°C, while the highlands have a temperature of 12-21°C (BMKG, 2025). Bantul Regency is an area located in the southern part of the Special Region of Yogyakarta Province. The geographical conditions of this location are lagoons and sandy beaches. Parangtritis Beach has a temperature of 24 to 32°C and humidity of 65 to 85% (Nurhidayat, Maryani, and Darwani, 2020).

Research on the effect of environmental temperature on the physiological condition of horses in Katikuna District, Central Sumba Regency, with geographical conditions consisting of rice fields and hills, has been conducted by (Langobelen, Datta, and Sanam, 2021). A study on horse health based on maintenance management at Parangtritis Beach was conducted by Pranaja *et al*. (2024). Research related to the physiological response and health of horses at different altitudes and environmental temperatures has not been conducted. This study aims to determine the differences in the physiological response and health of horses in Karanganyar Regency and the coast of Parangtritis Beach.

Materials and Methods

The research was conducted from March 2023 to October 2024. The research was conducted using a survey method. The location and sample were determined using purposive sampling. The selected locations were tourist areas with many horse-drawn carriages. Another basis for selecting the locations was the different geographical conditions of each location. Karanganyar Regency (76,778.64 ha) was selected because, based on data from the Central Statistics Agency (2002), it has lowland and highland areas. The lowlands of Karanganyar Regency have an altitude of 133 meters above sea level and an average temperature of 33.25°C, while the highlands have an altitude of 1683 meters above sea level and an average temperature of 23.81°C. The Parangtritis Beach coastline was selected based on its tourist location. Parangtritis Beach in Bantul Regency has an ambient temperature of 22 to 24°C.

The total sample used in this study consisted of 91 horses and 67 breeders. In Karanganyar Regency, 30 horses and 16 breeders were sampled in the lowlands, and 30 horses and 28 breeders were sampled in the highlands. The samples obtained on the coast of Parangtritis Beach were 31 horses and 23 farmers. The criteria used in this study were that the farmers were members of the horse association, were willing to be respondents, and allowed direct checks on their livestock. This study has obtained approval from the ethical clearance team of the Faculty of Veterinary Medicine, Gadjah Mada University, with Number: 106/EC-FKH/Eks./2023.

Data Collection Techniques

1. Interviews with farmers

Interviews were conducted with 67 farmers using a questionnaire. The questionnaire contained questions to obtain information related to farmer and livestock characteristics, health management, and livestock disease history.

2. Livestock observation

a. Heart rate

Heart rate measurements were taken using the auscultation method with an *ABN* stethoscope. Heart rate measurements in livestock were calculated by auscultation in the left chest cavity (Frans, Datta, and Simarmata, 2020). The heartbeat sounds of horses (lup and dup) were counted for 15 seconds, repeated 3 times. The results of the examination were recorded and averaged.

b. Respiratory rate

Respiration measurements were taken using the inspection method. This method was carried out by directly observing the movements of the thoracic and abdominal walls (Hina, Simarmata, and Laut, 2019). Movements such as the expansion and contraction of the horse's abdomen were observed and counted for 15 seconds and repeated three times. The results of the examination were recorded and averaged.

c. Body temperature

Body temperature was measured using a *Beurer* digital thermometer. The thermometer was sterilized before use with 70% alcohol, then inserted into the rectum approximately one-third of the way (Frans, Datta, and Simarmata, 2020). The thermometer was turned on and waited until it beeped. The temperature was measured three times, then the results were recorded and averaged.

d. Evaluation of health conditions

Health condition evaluation is carried out through clinical examination and medical history of livestock. Clinical examination includes hair loss, eye and nose discharge, and eye mucosa color. Hair loss is checked by rubbing the hair and seeing if there is any hair loss. Eye and nose discharge is checked by seeing if there is any discharge in the eyes and nostrils of horses. The color of the mucosa is observed on the conjunctiva of the eye.

Data Analysis

Data related to farmer characteristics, livestock characteristics, and horse health profiles were analyzed descriptively and processed using Microsoft Excel software. Data on the physiological conditions of horses in the lowlands and highlands of Karanganyar Regency, as well as the coast of Parangtritis Beach, were analyzed using Analysis of Variance (ANOVA) with R-Studio software (R Core Team, 2024).

Results and Discussion

Physiological conditions are an indication of livestock health. Physiological responses can be influenced by environmental conditions, including differences in terrain and temperature. Karanganyar Regency and Parangtritis Beach are tourist areas with different environmental conditions. Horses are used by tourists to enjoy the beauty of nature. The physiological conditions and health of these horses must be taken into account in order to maintain their performance.

Characteristics of horses

Livestock characteristics are the traits or distinctive features of livestock. These are factors that can affect horse performance. Data on horse characteristics, which are the main objects of this study, including breed and age, are presented in Table 1.

Horse breed

The horsess commonly used for tourism in Karanganyar Regency and the Parangtritis coast are Sandalwood, Thoroughbred, Sumbawa, Java, Tokol, and Banyuwangi horses, as shown in Figure 1. These horses are domesticated horses that are often bred. This indicates that these horses will find it easier to achieve homeostasis compared to imported horses (Syarifuddin *et al*., 2025). The basis for breeders choosing horses for work is the horse's performance and price. Breeders report that they select horses according to their needs, performance, and price.

The results of the study in Table 1 show that the most used breed of horse in Karanganyar Regency in the lowlands is the Banyuwangi horse, while in the highlands and along the Parangtritis coast, it is the Sandalwood horse. The difference in the use of these breeds is related to the different uses of horses in these areas. Farmers in the lowlands report that Banyuwangi horses have a posture that is suitable for the size of bendi carts, making them easy to control.

Table 1. Characteristics of horses in the study

Livestock characteristics	Highlands (%)	Lowlands (%)	Coastal Beach (%)
a. Horse breed			
Sandalwood	93.3	26.7	74.2
Thoroughbred	0.0	0.0	9.7
Sumbawa	6.7	0.0	12.9
Java	0.0	0.0	3.2
Tokol	0.0	10.0	0.0
Banyuwangi	0.0	63.3	0.0
b. Age (years)			
1) <5	26.7	50.0	29.0
2) 6-15	66.7	50.0	71.0
3) 16-29	6.6	0.0	0.0

Source: Processed data, 2025

Highland and coastal farmers tend to choose Sandalwood horses, which are more suitable for use as riding horses. Coastal farmers also use horses alternately as cart pullers or riding horses. This is because Sandalwood horses are tall and large, perform well, are easy to obtain, and are relatively inexpensive. Farmers report that Sandalwood horses are often used as working animals. Randu and Hartono (2018) state that Sandalwood horses are widely bred by farmers in East Nusa Tenggara because they perform well in terms of production and reproduction.

Horse Age

Based on the results of the study in Table 1, it shows that horses in Karanganyar Regency and the Parangtritis coast are mostly aged between 6 and 15 years, which is their productive age. Horses in their productive age range have better physical endurance for work compared to those over 15 years old. The age range of 3-7 years marks the onset of adulthood for horses (Lestari, Makkawaru, and Mutmainna, 2023).

Farmers report that before being put to work, horses are trained first. Horses are trained from the

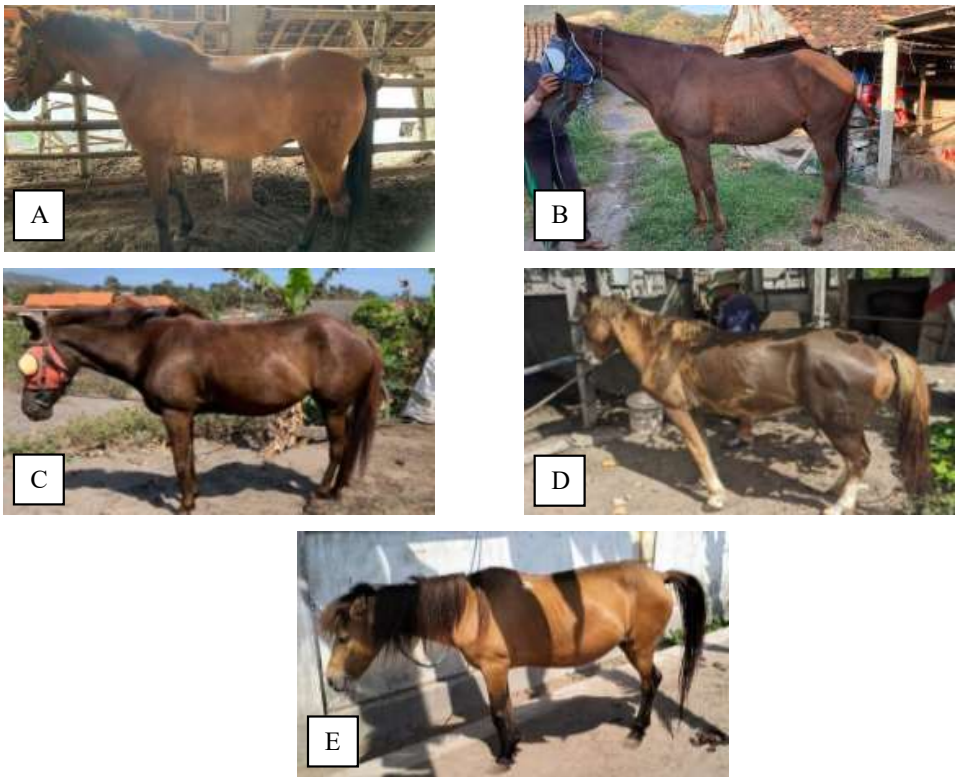


Figure 1. Horse breeds in the study: Sandalwood (A), Thoroughbred (B), Sumbawa (C), Java (D), and Banyuwangi (E)

Table 2. Physiological responses in horses

Physiological Response	Physiological Response Values			
	lowlands	Highlands	Coastal area	P Value
Heart rate (beats/minute)	47,42±10,06[a]	40,62±8,74[b]	45,81±8,34[a]	0,0131
Respiratory rate (breaths/minute)	42,84±11,62[a]	29,28±9,61[b]	27,95±8,54[b]	7,95e-08
Body Temperature (°C)	36,94±0,36[a]	36,86±0,39[a]	36,55±0,59[b]	0,0028

age of 1-2 years, and those that perform well begin working at the age of 2 or 3 years. Horses that are put to work may experience a decline in work performance, so farmers will usually sell their horses starting at the age of 15. This happens because age affects the decline in a horse's health performance, such as susceptibility to disease, injury, decreased physical ability, and reproductive ability.

Heart rate

The results of the study show that the heart rate in highlands is 40.62±8.74 beats/minute lower than in lowlands (47.42±10.06 beats/minute) and coastal areas (45.81±8.34 beats/minute). The results of the study on heart rate in highlands, lowlands, and coastal areas are within the normal range. Anggraeni and Muhammad (2024) state that the normal heart rate for horses is in the range of 40-60 beats per minute.

Heart rate in lowlands and coastal areas is higher than in lowlands because the heart works faster to lower body temperature when the ambient temperature is high. The process of adjusting body temperature to remain normal in response to environmental temperature is called thermoregulation. Environmental heat stress stimulates the anterior hypothalamus to perform thermoregulation (Hina, Simarmata, and Laut, 2019). Livestock perform thermoregulation to maintain their bodies in a comfortable condition.

Respiratory rate

Respiratory rate in lowland areas (42.84±11.62 times/minute) was higher than respiratory rates in highland areas (29.28±9.61 times/minute) and coastal areas (27.95±8.54 times/minute). The respiratory rates from these three locations are within the normal range. Normal respiratory rates are in the range of 14-48 times/minute (Saefullah, Prajoga, and Yulianti, 2015).

The results of the analysis show that lowlands differ significantly from highlands and coastal areas. This may be because lowlands have higher temperatures and humidity than highlands and coastal areas. Langobelen, Datta, and Sanam (2021) stated in their study that increased respiratory rate is a way for livestock to release body heat when the ambient temperature is high. Horses in lowlands must maintain their physiological functions by increasing their respiratory rate to the upper limit of normal. The respiratory rate in highlands and coastal areas does not differ significantly. This is thought to be because the high humidity in coastal areas can inhibit body heat evaporation, so livestock do not need to increase their respiratory rate.

Body temperature

The results of the physiological examination of the horses showed that they had undergone a successful thermoregulation process. This is indicated by the body temperature of horses in lowlands (36.94±0.36°C), highlands (36.86±0.39°C), and coastal areas (36.55±0.59°C), which is normal within the range of 36.8-38.6°C (Textor and Tablin, 2013). Horses are homeothermic animals that have temperature receptors in the central nervous system to adapt to the environment (Reece *et al*., 2015).

The analysis results show that body temperature in lowlands is higher than in highlands and coastal areas, while lowlands and highlands do not differ significantly. This is the result of horses adapting to their environment. Horses, as homeothermic livestock, can adapt to diverse environments (Santoso *et al*., 2023). Changes in environmental temperature and humidity are one of the factors that cause horses to perform thermoregulation to maintain their physiological conditions normal. Horses will increase or decrease their heart rate and respiration frequency to keep their body temperature normal and comfortable for livestock. The increases and decreases that occur are in accordance with environmental conditions and are still within the normal range, both upper and lower limits.

Health Indicators

Table 3. Horse health indicators

Health indicators	lowlands (%)	Highlands (%)	Coastal area (%)
1. Hair loss	40.0	63.3	22.6
2. Discharge			
a. Eye	3.3	0.0	0.0
b. Nose	6.7	3.3	0.0
3. Mucosa			
a. Normal (pink)	53.4	70.0	83.8
b. *Anemis* (pale)	43.3	26.7	6.5
c. Hyperemis (red)	3.3	3.3	9.7
d. Cyanosis (bluish)	0.0	0.0	0.0
e. Ikterus (yellowish)	0.0	0.0	0.0

Source: Processed data, 2025

Hair loss

The results of the study show that horsehair loss in lowlands is 40%, in highlands is 63.3%, and on the coast is 22.6%. The percentage of horsehair loss is highest in the highlands. The cause of this hair loss is due to the low ambient temperature in highland areas. Moist hair conditions in horses cause hair to fall out easily (Jorgensen, Mejdell, and Boe, 2020). Sjaastad, Sand, and Hove (2016) also stated that heat evaporation in horses living in colder environments is less effective, thus causing horses to have moist hair that falls out easily.

Hair loss can also be caused by poor sanitation, such as bathing or combing horsehair. Horsehair care is a way to maintain quality and prevent hair loss in horses (Mejdell, Boe, and Jorgensen, 2020). Excessive hair loss can also indicate the presence of worms in the horse's digestive tract (Belay, Teshome, Abiye, 2016).

Eye and Nose Discharge

Table 3 shows that eye discharge only occurred in horses in lowland areas with a percentage of 3.3%. The results of the study indicate that this discharge may occur due to eye irritation caused by friction with the head protection mask. Larasati *et al*. (2021) stated that eye discharge in horses can be caused by foreign objects hitting the eyes, namely friction from the horse's head protection mask. The difference in the frequency of horses working is related to the length of time the horse mask is used, so each location has different results. The use of horse masks also protects the eyes from dust or dirt, thereby minimizing eye discharge.

Research results on nasal discharge in horses in lowlands showed a result of 6.7% and in highlands 3.3%. The discharge that occurred in horses in highlands and lowlands was still in the normal category, because the mucus was clear, the amount of discharge was small, and the livestock were in good health. Widhowati, Hidayah, Wardhani. (2022) stated that nasal discharge in livestock with a small amount and livestock in good health is classified as normal. Another factor causing nasal discharge is open stables, which cause horses to experience significant temperature changes between daytime and nighttime environmental temperatures. Horses on the coast do not experience eye and nasal discharge. This is because farmers routinely maintain the cleanliness of the horses' bodies to avoid factors that can cause eye discharge (dust and friction wounds) and nasal discharge (viruses).

Eye Mucosa

The results of research on the majority of eye mucosa colors in lowlands, highlands, and coastal areas showed normal results. The normal color of mucosa in livestock is pink (Sambodo *et al*., 2020). Table 3 shows that 3.3% of horses in lowlands and highlands have hyperemic mucosa color. Hyperemic eye mucosa color is an indication of increased blood volume. Dilated blood vessels are one of the factors that can cause hyperemic coloration of the eye mucosa (Bakri, Balqis, and Rachmatika, 2018).

Pale mucosa color is more common in horses in lowlands (43.3%) than in horses in highlands (26.7%) and coastal areas (6.5%). Horses with pale mucosa color in lowlands are caused by a diet consisting mainly of dry peanut straw with little green grass, which is rarely provided by farmers. Anemia in livestock can be influenced by a lack of nutrients such as iron, copper, vitamin E (Kim *et al*.

2016), and the presence of parasites, namely worms in the digestive tract (Hartono *et al*., 2019).

Horse Diseases

The results of the study in Table 4 show that horses experienced colic at three locations. The percentage results show that the highest incidence of colic was on the coast at 16.1%. Colic is a common disease in horses. Horses with colic experience pain in the abdomen (Sari *et al*., 2018). Farmers reported that they did not know the exact cause of colic in their horses. Owen, Jagger, and Quan-Taylor (2001) stated that colic is related to tapeworm infection in horses. A case study in the United Kingdom by Proudman, French, and Trees (1998) showed a significant result between Anoplocephala perfoliata tapeworm infection and colic. Farmers reported that horses would show symptoms of colic such as rolling, kicking the abdomen, and loss of appetite. Farmers followed up by resting the horse, not feeding or watering it, and contacting a veterinarian if further symptoms occurred.

Horses employed as cart pullers often have scabs on their bodies. These scabs are caused by friction from the cart equipment. Prolonged use of cart equipment without proper care can cause injuries to the horse's body (Turangan, 2017). If these wounds are not treated immediately, they will cause irritation. Irritation can cause scabs or sores (Suartha, Septyawati, and Gunata, 2014). The results of the study show that sores do not occur in horses in the highlands. This is because horses in the highlands are only used as riding horses. Interviews with coastal farmers revealed that some horses were hit by carts and their knees were injured during training. The wild nature of newly trained horses puts them at risk of injury (Olofsson *et al*., 2016). Farmers provide special care such as applying fly repellent spray and vitamin B complex.

Diarrhea in horses occurs in both highland and lowland areas. The number of horses experiencing diarrhea in lowland areas is 25.0% and in highland areas is 3.6%. Hartono *et al*. (2019) stated that parasitic infections can cause diarrhea and anemia in livestock. Farmers reported that diarrhea is characterized by softer and more watery horse feces. Valle, Gandini, and Bergero (2013) stated that horses with diarrhea produce watery feces in larger quantities. Based on interviews with farmers, they are still not sufficiently aware of the importance of administering deworming medication to their livestock on a regular basis.

Influenza in horses is more prevalent in lowlands (25.0%) than in highlands (3.6%). Farmers report that the most common symptoms of influenza in livestock are nasal discharge, fever, and loss of appetite. Bambra *et al*. (2020) stated that the clinical signs in horses with influenza are fever and nasal discharge. Vaccination is one of the factors that determine whether or not influenza occurs in lowland areas. Webster (2011) stated that in 2007, influenza was prevalent in Australia among unvaccinated horses.

Bloating in horses in lowlands can occur due to inconsistent feeding and watering patterns. Farmers usually feed horses after they work, with inconsistent times each day. Franco *et al*. (2023) state that feeding and watering patterns can cause bloating in livestock. Bloating in horses in highlands occurs due to feeding wet forage. Some farmers have a habit of grazing in the morning before they work and do not pay attention to whether the grass is completely dry or not when it is given. Streeter (2009) states that feeding grass or forage in wet conditions due to dew can cause bloating in livestock.

Conclusion

The heart rate, respiratory rate, and body temperature of horses in lowlands showed higher results than those in highlands and coastal areas. Diseases that often appear in horses in this study are colic, wounds, diarrhea, influenza, and bloat. Horse management in the lowlands requires better environmental management and maintenance to reduce physiological stress and maintain horse health.

Table 4. Horse diseases in the study (%)

Disease	lowlands (n=30)	Highlands (n=30)	Coastal area (n=31)
Colic	3.6	12.5	16.1
Wound	0.0	6.3	9.7
Diarrhea	3.6	25.0	0.0
Influenza	3.6	25.0	0.0
Bloat	14.3	25.0	0.0

Acknowledgments

Authors thanks LPPM UNS and RG Research for funding this publication with contract number 371/UN27.22/PT.01.03/2025.

References

Anggraeni, H. E., & Muhammad, I. (2024). A study on the physiological status of dressage horses before and after training at Anantya Riding Club Bogor. *Jurnal of Animal and Veterinary Science*, 5(1), 83–86. https://doi.org/10.20473/javest.V5.l1.2024.83-86

Badan Meteorologi Klimatologi dan Geofisika. (2024). Informasi iklim Indonesia. Retrieved May 8, 2025, from https://www.bmkg.go.id

Badan Pusat Statistik Bantul. (n.d.). Populasi ternak besar menurut kecamatan. Retrieved November 17, 2024, from https://bantulkab.bps.go.id/id/statisticstable/2/ODYjMg==/populasi-ternak-besar-menurut-kecamatan.html

Bakri, M., Balqis, U., & Rachmatika, N. (2018). Gambaran histopatologi limpa babi hutan (*Sus scrofa*) yang terinfeksi parasit internal di kawasan Lhoknga Aceh Besar. *Jurnal Ilmiah Mahasiswa Veteriner*, 2, 515–523. https://doi.org/10.21157/jimvet.v2i4.9282

Bambra, W., Daly, J. M., Kendall, N. R., Gardner, D. S., & Kydd, J. H. (2020). Equine influenza vaccination as reported by horse owners and factors influencing their decision to vaccinate or not. *Preventive Veterinary Medicine*, 180, 1–11. https://doi.org/10.1016/j.prevetmed.2020.105011

Belay, W., Teshome, D., & Abiye, A. (2016). Study on the prevalence of gastrointestinal helminthes infection in equines in and around Kombolcha. *Journal of Veterinary Science and Technology*, 7, 367–372. https://doi.org/10.4172/2157-7579.1000372

Franco, A. M., da Silva, A. E. M., Hurtado, P. J., de Moura, F. H., Huber, S., & Fonseca, M. A. (2023). Comparison of linear and non-linear decision boundaries to detect feedlot bloat using intensive data collection systems on Angus × Hereford steers. *Animal: The International Journal of Animal Biosciences*, 27(5), 1–8. https://doi.org/10.1016/j.animal.2023.100809

Frans, H. J. C., Datta, F. U., & Simarmata, Y. T. R. M. R. (2020). Deskripsi parameter fisiologis normal ternak sapi Bali (*Bos sondaicus*) di Desa Pukdale Kecamatan Kupang Timur Kabupaten Kupang. *Jurnal Veteriner Nusantara*, 3(2), 120–129. https://doi.org/10.35508/jvn.v3i2.3416

Hartono, M., Elisa, Siswanto, S., Surharyati, S., Santoso, P. E., & Sirat, M. M. P. (2019). Profil darah pada sapi Simmental–Peranakan Ongole akibat infestasi cacing trematoda di Desa Labuhan Ratu, Kecamatan Labuhan Ratu, Kabupaten Lampung Timur, Provinsi Lampung. In *Prosiding Seminar Nasional Teknologi Peternakan dan Veteriner* (pp. 201–213). http://dx.doi.org/10.14334/Pros.Semnas.TPV-2019-p.201-213

Hina, C. Y., Simarmata, Y. T. R. M. R., & Laut, M. M. (2019). Gambaran fisiologis domba di Desa Oesao Kecamatan Kupang Timur Kabupaten Kupang. *Jurnal Veteriner Nusantara*, 2(2), 153–160. https://doi.org/10.35508/jvn.v2i2.1842

Holcomb, K. E., Tucker, C. B., & Stull, C. I. (2013). Physiological, behavior and serological responses of horses to shaded or unshaded pens in a hot, sunny environment. *Journal of Animal Science*, 91(12), 5926–5936. https://doi.org/10.2527/jas.2013-6497

Jorgensen, G. H. M., Mejdell, C. M., & Boe, K. E. (2020). Effects of hair coat characteristics on radiant surface temperature in horse. *Journal of Thermal Biology*, 87, 1–33. https://doi.org/10.1016/j.jtherbio.2019.102474

Kim, T., Choi, S. H., Cheatham, N. L., Xu, Z., Kritchevsky, J. E., Bertin, F. R., & Kim, Y. L. (2016). Toward laboratory blood test-comparable photometric assessments for anemia in veterinary hematology. *Journal of Biomedical Optics*, 21(10), 1–9. https://doi.org/10.1117/1.JBO.21.10.107001

Langobelen, H., Datta, F., & Sanam, M. (2021). Parameter kuda Sandalwood di Kecamatan Katikutana, Kabupaten Sumba Tengah. *Jurnal Veteriner Nusantara*, 4(1), 7. https://doi.org/10.35508/jvn/vol4iss1pp7

Larasati, A., Nurmaningdyah, A. A., Suradi, A. A., Virgiantari, C. W., Aulia, I. Y., & Nugroho, H. S. (2021). Laporan kasus: Spontaneous

chronic corneal epithel defects (SCCED) pada kucing domestik. *Media Kedokteran Hewan*, 32(1), 19–28. https://doi.org/10.20473/mkh.v32i1.2021.19-28

Lestari, A., Makkawaru, F., & Mutmainna, A. (2023). Studi karakteristik warna tubuh dan morfometrik kuda di Pasar Kuda Jeneponto. *Jurnal Peternakan Indonesia*, 25, 298–305. https://doi.org/10.25077/jpi.25.3.298-305.2023

Mejdell, C. M., Boe, K. E., & Jorgensen, G. H. M. (2020). Caring for the horse in a cold climate: Reviewing principles for thermoregulation and horse preferences. *Applied Animal Behavior Science*, 231, 1–8. https://doi.org/10.1016/j.applanim.2020.105071

Nurhidayat, E., Maryani, Y., & Darnawi, D. (2020). Pengaruh pupuk kandang dan penyiraman terhadap pertumbuhan dan hasil kacang hijau (*Vigna radiata* L.) di lahan pasir. *Jurnal Ilmiah Agroust*, 4(2), 139–149.

Olofsson, T. C., Butler, É., Lindholm, C., Nilson, B., Michanek, P., & Vásquez, A. (2016). Fighting off wound pathogens in horses with honeybee lactic acid bacteria. *Current Microbiology*, 73, 463–473. https://doi.org/10.1007/s00284-016-1080-2

Owen, R. A. R., Jagger, D. W., & Quan-Taylor, R. (1989). Caecal intussusceptions in horses and the significance of *Anoplocephala perfoliata*. *Veterinary Record*, 123, 562–563.

Pranaja, M. R. S., Amperawati, Y., Faiza, A. N., Aliyyah, N. S. N., Wenni, A. H., Savitri, A. P., Najwa, N. F., Agatha, N. L., Annisa, S., & Budiariati, V. (2024). Karakteristik pemeliharaan kuda andong di Pantai Parangtritis dan Malioboro. *Jurnal Sain Veteriner*, 42(3), 471–482. https://doi.org/10.22146/jsv.100737

Proudman, C. J., French, N. P., & Trees, A. J. (1998). Tapeworm infection is a significant risk factor for spasmodic colic and ileal impaction colic in the horse. *Equine Veterinary Journal*, 30(3), 194–199. https://doi.org/10.1111/j.2042-3306.1998.tb04487.x

R Core Team. (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing.

Randu, M. D., & Hartono, B. (2018). Keragaan pengembangan kuda Sandalwood di Wilayah Pasola Kabupaten Sumba Barat Daya. *Sains Peternakan: Jurnal Penelitian Ilmu Peternakan*, 16(2), 54–62. https://doi.org/10.20961/sainspet.v16i2.21776

Reece, W. O., Erickson, H. H., Goff, J. P., & Uemura, E. E. (2015). *Dukes' physiology of domestic animals*. John Wiley & Sons.

Saefullah, Y. Y., Prajoga, S. B. K., & Yulianti, A. A. (2015). Keadaan faali kuda Sumba sebelum dan sesudah pertandingan (perlombaan pacuan kuda di lapangan Rihi Eti, Kabupaten Sumba Timur, Provinsi Nusa Tenggara Timur). *Jurnal Universitas Padjajaran, 1*(1), 1–11.

Sambodo, P., Widayati, I., Nurhayati, D., Baaka, D., & Arizona, R. (2020). Pemeriksaan status kesehatan hewan kurban dalam situasi wabah COVID-19 di Kabupaten Manokwari: Monitoring the health status of qurban animal in a COVID-19 outbreak situation in Manokwari Regency. *Jurnal Pengabdian Masyarakat, 1*(1), 7–13. https://doi.org/10.46549/igkojei.v1i1.140

Santoso, K., Hendika, R. Y., Ulum, M. F., Arif, R., Suprayogi, A., & Seminar, K. B. (2023). Pemetaan pola suhu permukaan tubuh kuda menggunakan kamera termal inframerah. *Jurnal Sain Veteriner, 41*(1), 11–21. https://doi.org/10.22146/jsv.66859

Sari, N., Abrar, M., Wardani, E., Fakhrurrazi, & Daud, R. (2018). Isolasi dan identifikasi *Salmonella* sp. dan *Shigella* sp. pada feses kuda bendi di Bukittinggi Sumatera Barat. *Jimvet, 2*(3), 402–410.

Sjaastad, O. V., Sand, O., & Hove, K. (2016). Regulation of body temperature. In *Physiology of domestic animals* (3rd ed., pp. 767–794, 891). Oslo: Scandinavian Veterinary Press.

Streeter, R. N. (2009). Bloat or ruminal tympany. In *Food animal practice* (5th ed., pp. 9–12). https://doi.org/10.1016/B978-141603591-6.10005-3

Suartha, I. N., Septyawati, R., & Gunata, I. K. (2014). Bentuk dan sebaran lesi demodekosis pada sapi Bali. *Jurnal Veteriner, 15*(3), 395–400.

Syarifuddin, M. A., Pawestri, W., Wati, A. K., Rahayu, E. T., Yanti, Y., & Kharismawati, K. (2024).

Physiological conditions of bendi horse in Surakarta City. In *International Conference on Food and Agriculture Conference Series: Earth and Environmental Science* (pp. 1–6). https://doi.org/10.1088/1755-1315/1446/1/012048

Textor, J. A., & Tablin, F. (2013). Intra-articular use of a platelet-rich product in normal horses: Clinical signs and cytologic responses. *Veterinary Surgery, 42*(5), 499–510. https://doi.org/10.1111/j.1532-950X.2013.12015.x

Turangan, S. H. (2017). Penampilan ternak kuda bendi di Kecamatan Tompaso Kabupaten Minahasa. *Zootec, 37*(1), 186. https://doi.org/10.35792/zot.37.1.2017.15200

Valle, E., Gandini, M., & Bergero, D. (2013). Management of chronic diarrhea in an adult horse. *Journal of Equine Veterinary Science, 33*(2), 130–135. https://doi.org/10.1016/j.jevs.2012.05.061

Webster, W. R. (2011). Overview of the 2007 Australian outbreak of equine influenza. *Australian Veterinary Journal, 89*(1), 3–4. https://doi.org/10.1111/j.1751-0813.2011.00721.x

Wibisono, H. W., Wandia, I. N., & Suatha, I. K. (2017). Morfometri kuda (*Equus caballus*) jantan dewasa yang dipelihara di Kabupaten Lombok Timur Nusa Tenggara Barat. *Indonesia Medicus Veterinus, 6*(1), 55–61. https://doi.org/10.19087/imv.2017.6.1.55

Widhowati, D., Hidayah, N., & Wardhani, L. D. K. (2022). Kasus fascioliasis dan paramphistomosis pada pemeriksaan hewan kurban di Masjid Nurul Iman Surabaya. *Jurnal Ilmiah Filia Cendekia, 7*(2), 141–144. https://doi.org/10.32503/fillia.v7i2.2551