




## ORIGINAL ARTICLE

## Three-Year Retrospective Study of Clinical Health Conditions in Ruminants and Equines at Outdoor Clinic of Gomal University, Pakistan

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## ABSTRACT

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This retrospective study was conducted at the Faculty of Veterinary and Animal Sciences (FVAS) outdoor clinic, Gomal University, to evaluate the prevalence and distribution of common surgical conditions over three years (January 2021-December 2023). A total of 340 cases were examined at the outdoor clinic encompassing conditions such as hernia, wounds, lameness, fractures, urine retention (UR), and dog bites in bovine, equine, ovine, camel, and caprine species. Descriptive statistics were applied using SPSS software to analyze the data by species, months, and types of infections. The results revealed that wounds (30.29%) and UR (30%) were the most frequent conditions, followed by lameness (24.41%), fractures (7.64%), hernia (5.58%), and dog bites (2.05%). Caprine and ovine species were found affected from UR and hernias. Wound cases were consistently high throughout the study period, particularly in bovine and caprine species. Lameness was most prevalent in equine and caprine species, especially in January, February, and December. Fractures were primarily observed in ovine and caprine species, often resulting from vehicular accidents. Although less frequent, dog bites were reported in ovine and caprine species. The study highlights the species-specific distribution of these conditions with the highest incidence recorded in February and lowest in October. These findings underscore the need for targeted interventions and improved clinical management to reduce the impact of these health issues on animal welfare and productivity.

### Introduction

The primary impediments to the production of the livestock industry are illnesses, inadequate diet, and breeding practices, which include substandard management.<sup>1</sup> The typical environmental problems that frequently affect small, large ruminants as well as equines include hernias, wounds, lameness, fractures,

urine retention (UR) and dog bites.<sup>2</sup> A hernia is the protrusion of organ from its normal cavity into abnormal cavity.<sup>3</sup> Accidental and congenital factors are the two most common causes of hernias. Hernias consists of ring, neck and body.<sup>4</sup> Common complications of hernias include decreased reproduction and production.<sup>5</sup>

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A wound is a discontinuity or breakage in the skin. The classification of wound is based on the nature of effect produced: lacerated, incised, punctured, and contused.<sup>6</sup> Wounds occur in all animals on every farm and can result from a variety of causes. They can be classified in several ways such as based on their location neck, head, chest, abdomen, or limbs. Another categorization may identify their specific types, such as crushing, lacerating, or penetrating wounds, bites from other animals, snakes, insects and cuts or burns. Wounds might be fresh, bleeding, infected, gangrenous, or bloated. Some wounds may be minor and unnoticeable while others may be enormous and potentially fatal, particularly if they affect major blood vessels.<sup>7</sup> Dog bites to domestic animals are very common and in livestock dog bites are a leading cause of traumatic injury. Domestic animals, including cattle, sheep, goats and dogs as well as cats, are most often affected. Female and young animals are often the victims of dog bites, while adult male canines are more likely to be bitten by other dogs. A wound resulting from a dog bite yields different types of injuries in small and large ruminants.<sup>8</sup> Dog bites have the potential to harm the soft tissues and the skin of the ruminants seriously. The strength of a dog's teeth and jaws can cause severe or deadly damage to internal organs, rip or crush muscles and skin, puncture the chest wall and cause lung collapse.<sup>9,10</sup> Lameness is the defect of the locomotor system that results in abnormal gait caused by either structural or functional disorder.<sup>11</sup> It happens when an animal's leg or foot pain impairs their movement and directly affects animal health and welfare, as well as production. Pain from lameness frequently restricts growth because animals may be hesitant to eat or drink.<sup>12</sup> A fracture is a disturbance or interruption in the continuity of bone tissue. It can be categorized according to their pattern, etiology, and extent of damage, including simple (closed), compound (open) and greenstick fractures.<sup>13</sup> Basic fractures are characterized by a clear break that does not penetrate the skin, whereas compound fractures have a wound that reveals the bone.<sup>14</sup> Comminuted fractures result in bone breaking into many fragments, while greenstick fractures are common in pets and small ruminants as the bone bends and cracks but remains partially intact. Complications may arise with fractures if an infection present or if surrounding tissues are damaged.<sup>15</sup> UR results in low urine passage anywhere in the urine excretory pathway. Obstruction is complete or partial, acute or chronic. UR may be due to uroliths, hemoglobin clots, urethral plug, hernia, cancerous growth, injury, or strictures. Uroliths and trauma are the most common causes of UR and lead to 100 % death of animals if not treated timely.<sup>16</sup> The purpose of this study was to evaluate the number of cases of different animals presented by animal owners on

routine basis with clinical health conditions in the outdoor clinic, of Faculty of Veterinary and Animal Sciences (FVAS), Gomal University, during January 2021 to December 2023.

## Materials and Methods

The study was carried at outdoor clinic of FVAS, Gomal University, Pakistan. For this study, passive data from clinic record registers were utilized. The recorded data for the years 2021-2023, was carefully analyzed, reorganized and grouped based on species, disease and months. Cases were categorized into hernia, wounds, lameness, fractures, UR and dog bites.

## Statistical Analysis

The data were entered into a Microsoft Excel sheet version (2016). Descriptive statistics were applied using SPSS software (version 23.0) to evaluate the prevalence of the previously mentioned health issues by species and month across the entire study period. The statistical hypothesis test concludes by comparing the significant probability value, fixed at  $p < 0.05$ .

## Results

A total of 340 different animal cases were reported over three years (2021-2023) including 19 cases of hernia (5.58%), 103 (30.29%), 83 cases of lameness (24.41%), 26 cases of fractures (7.64%), 102 cases of UR (30%) and 7 cases of dog bites (2.05%) (Figure 1). The distribution of hernia cases varied among species, with ovine reporting 9 cases, caprine 7, equine 2 and bovine 1, while camel had no reported cases. Wound cases exhibited a parabolic distribution among different species, with equine experiencing a resurgence, reporting 31 cases, followed by bovine with 29, caprine with 27, ovine with 13, and camels with only 3 reported cases. Lameness differs significantly between species, with caprine reporting the highest number 41, followed by equine 21, ovine 13 and bovine 8. Camels did not show any instances of lameness reporting zero. Ovine species experience the most fracture 14, followed by caprine 9, bovine 2, equine 1 and camels which reported zero cases. Caprine species encountered the highest number of UR cases 47, followed by ovine 28, bovine 19, equine 8 and camels reported zero. Dog bites were most commonly observed in caprine 4 cases, followed by ovine 3, while bovine, equine and camel's species reported no dog bites (Figure 2). The distribution of cases by species and their corresponding percentages are shown in Table 1.

Hernia was more frequently reported and diagnosed with ovine species in the months of February and March. The statistical analysis revealed a significant increase in hernia cases during these months ( $p < 0.05$ ). Wound cases presented a significant trend across species,

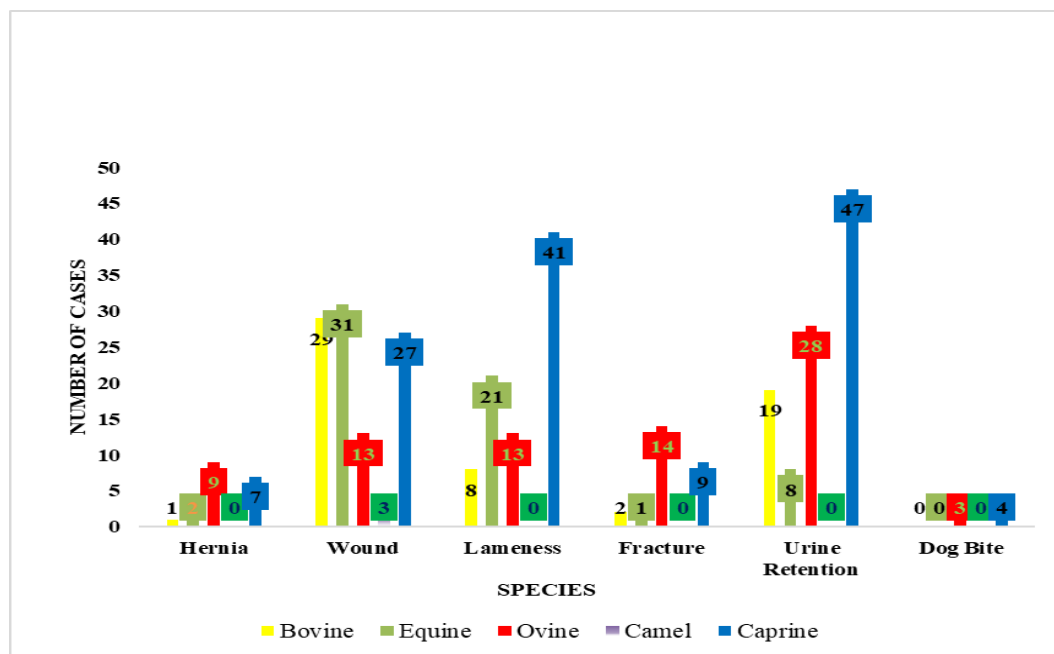


Figure 1. Comparative incidence of clinical cases in various species.

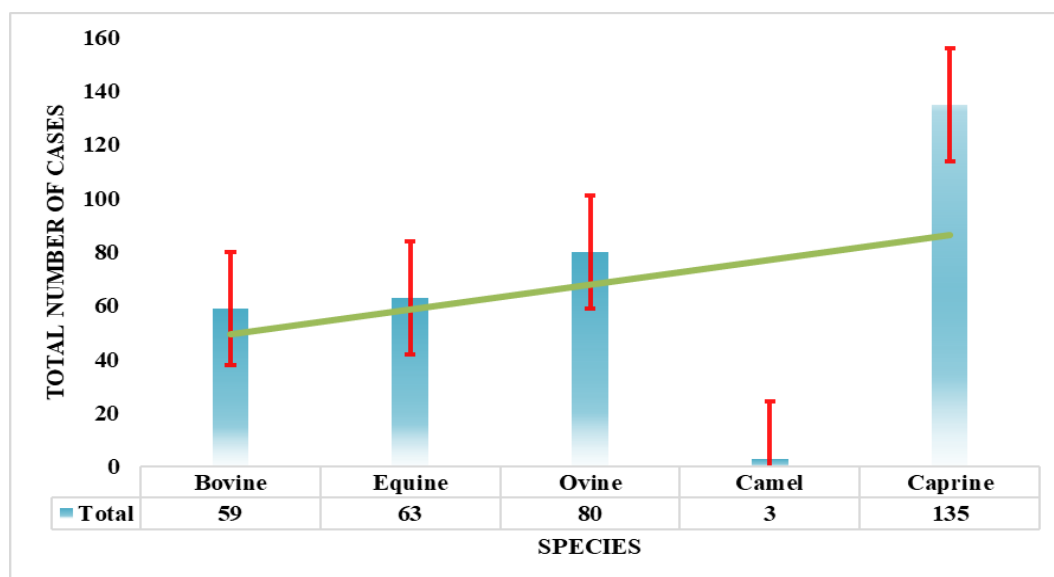


Figure 2. Clinical case patterns in various species.

Table 1. Distribution of species according to cases and percentage.

Name of Cases	Species										
	Bovine	(%)	Equine	(%)	Ovine	(%)	Camel	(%)	Caprine	(%)	Total
Hernia	1	5.26	2	10.52	9	47.36	00	00	7	36.84	19
Wound	29	28.15	31	30.09	13	12.62	3	2.91	27	26.21	103
Lameness	8	9.63	21	25.30	13	15.66	00	00	41	49.39	83
Fracture	2	7.69	1	3.84	14	53.84	00	00	9	34.61	26
Urine Retention	19	18.62	8	7.84	28	27.45	00	00	47	46.07	102
Dog Bite	00	00	00	00	3	42.85	00	00	4	57.14	7
<b>Total</b>	59		63		80		03		135		340

particularly in equine, bovine and caprine with a notable peak during February and May ( $p < 0.05$ ), followed by a moderate incidence rate maintained throughout the duration. Lameness cases were predominantly reported in caprine and equines, with a peak incidence noted in January, February and December. However, a statistically

significant increase in lameness cases was observed in these months ( $p < 0.05$ ). Fractures were predominantly seen in ovine and caprine species and increased continuously from January to December due to environmental hazards during transportation and road accidents. The monthly variation in fractures showed no

significant differences ( $p \geq 0.05$ ). UR reported in caprine, ovine, and bovine species with peak incidences in February, August, and September. Statistical analysis indicated a significant increase during these months ( $p <$

0.05). Dog bites were reported infrequently, with a low incidence, especially in ovine and caprine; not more than 4 cases and a maximum of 7 cases were reported in three years, 2021-2023, as shown in Figure 3 and Table 2.

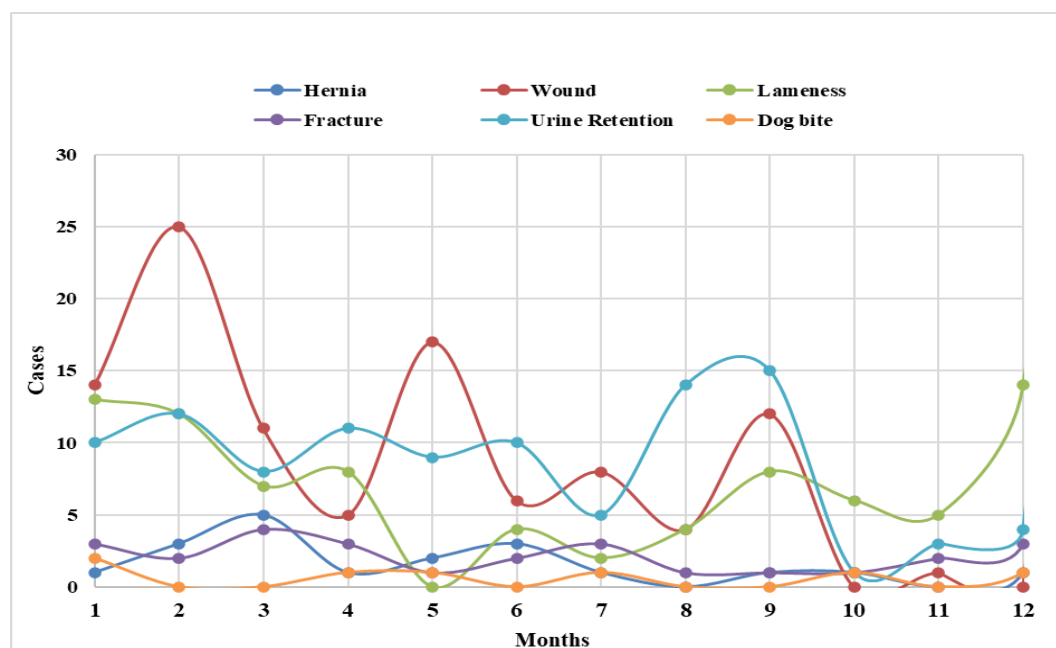


Figure 3. Trends in reporting of different cases from January 2021-December 2023.

Table 2. Distribution of three years data of different cases from the month of January 2021 to December 2023 in ruminants and equines.

Months	Cases						Total	%
	Hernia	Wound	Lameness	Fracture	Urine Retention	Dog Bite		
January	01	14	13	03	10	02	43	12.64
February	03	25	12	02	12	00	54	15.88
March	05	11	07	04	08	00	35	10.29
April	01	05	08	03	11	01	29	8.52
May	02	17	00	01	09	01	30	8.82
June	03	06	04	02	10	00	25	7.35
July	01	08	02	03	05	01	20	5.88
August	00	04	04	01	14	00	23	6.76
September	01	12	08	01	15	00	37	10.88
October	01	00	06	01	01	01	10	2.94
November	00	01	05	02	03	00	11	3.23
December	01	00	14	03	04	01	23	6.76
<b>Total</b>	<b>19</b>	<b>103</b>	<b>83</b>	<b>26</b>	<b>102</b>	<b>07</b>	<b>340</b>	<b>100</b>

## Discussion

Animal sentience refers to their ability to experience both pleasant and negative emotions, such as pain. Veterinary health practitioners have a medical and ethical duty to alleviate pain to the best of their ability.<sup>17</sup> Hernia, wounds, lameness, fractures, UR and dog bite is a common and neglected phenomenon in livestock sector. This study evaluated the prevalence of these clinical conditions with notable trends including hernia cases which reached a total of 19 (5%), with higher incidence

observed in ovine and caprine as compared to other species over a three years period. A Similar study on the early investigation of hernias in domestic animals reported a prevalence rate of (3.5%) 16 of 459, with bovines showing the highest frequency, followed by ovine animals which had an estimated prevalence of 5.9%.<sup>18</sup> This contrasts with a decline in hernia cases observed in other species, highlighting species-specific susceptibilities or management practices influencing hernial incidence.<sup>19</sup> Increased open and closed wounds cases in equines 31 (30.09%), bovine 29 (28.15%) and

caprine 27 (26.21%) representing a significant difference compared to other species. A similar cross sectional survey of 470 equine was conducted from October 2016 to January 2017 found a wound prevalence of (63.61%) among 299 horses.<sup>20</sup> In comparison, no significant difference was observed in the occurrence of wound in equines between these two studies. However, the incidence and prevalence rate were still influenced by the number of reported cases. The distinct rise in open wounds in bovine and equine cases could likely, be attributed to higher exposure to environmental hazards or specific management practices.<sup>21</sup> Lameness is typically associated with a reduction in weight-bearing capacity; however, it can be a combination of factors. Trauma and orthopedic illness are the most common underlying causes of lameness. In our study lameness instances were particularly high in caprine 41 (49.39%) and equine species 21 (25.30%). In contrast a retrospective study was found the incidence of lameness to be (21%) in equines and (7%) in caprine.<sup>22</sup> Most fractures occur unexpectedly, as a result of a traumatic event such as getting hit by a car or falling from a height. The monthly variation in fractures cases showed no significant differences, but species-specific trends were evident. For instance, the total number of ovine cases 14 (53.84%) and caprine cases 09 (34.61%) showed significant differences compared to other species. A similar study found that out of 276 fracture cases in both ovine and caprine species, reported an incidence of (69.21%) and (30.79%) respectively.<sup>23</sup> UR, which refers to the blockage that partially or completely prevents urine from leaving the bladder or urethra, or the inability of the bladder to contract strongly enough to discharge all urine, was more significantly reported in our study.

Caprine cases 47 (46.07%) and ovine cases 28 (27.45%) were particularly prevalent during the months of August and September over three years. A similar study conducted at the Veterinary Teaching Hospital of Bangladesh Agricultural University in Mymensingh reported UR in goats, with an overall frequency of (63%) out of 115 cases.<sup>24</sup> Another study on UR incidence documented (100%) of 20 sheep suffering from UR.<sup>25</sup> This demonstrates that UR is significant clinical illness in goats and sheep population, with physiological effects linked to management practices, dietary factors, and seasonal variations. The incidence of dog bites reported over the three years was relatively low, with only 7 documented incidents, which was not statistically significant.

This pilot study has some limitations. The impact of diet and feeding status could not be investigated, as this information was often missing from the Veterinary records.

In conclusion, this retrospective study found that the most common issues investigated at the outdoor clinic of

FVAS were wounds and UR, followed by lameness. These results highlight the importance of tailoring treatment strategies to specific species and adjusting clinical management approaches accordingly. Different species exhibit varying sensitivities to specific conditions, emphasizing the need for species-specific interventions. To strengthen these findings, further research into a larger sample size is recommended. Such studies could help validate the results, support the development of targeted preventive and therapeutic strategies, and provide deeper insights into the etiological factors and treatment outcomes. Ultimately, these efforts could contribute to the creation of optimized preventive health protocols.

### Conflict of Interest

There were no conflict of interests to declare. No funding was received for this study.

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