

**Bibliometric Analysis of Postgraduate Theses on Foot Diseases in Cattle in Turkey**Özmen İSTEK^{1,a}.

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Abstract: The aim of this study is to evaluate postgraduate theses on foot diseases observed in the cattle population in Türkiye within a holistic framework using the bibliographic analysis method, and to contribute to the academic studies that will follow.

As the material and method used in the research, a search was made by typing the keyword "foot diseases" in the box where search term was made in the postgraduate theses section of the official website of the National Thesis Center of the Higher Education Institution.

As a result of the search, it was determined that 16 of the n=25 theses, which were conducted between 1990 and 2024, were related to foot diseases in cattle, theses were related to foot diseases in sheep and goats, and one thesis, which was conducted in 1989, was related to medicine. In this research, the full text of 15 (93.75%) of the theses on the subject was reached, while one (6.25%) could not be reached. Twelve (75%) of the theses were found to be master's theses, and 4 (25%) were found to be doctoral theses.

It was thought that very few of the postgraduate theses on the investigation of foot diseases in cattle were published as articles, and the studies conducted remained mainly at the master's level and did not contribute much to the doctoral overlap, and the impact of the literature as a publication should be increased.

Keywords: Bibliographic analysis, Bovine foot diseases, Higher education institution, Postgraduate thesis.

Türkiye’de Sığırlarda Görülen Ayak Hastalıklarının Araştırılmasına Yönelik Yapılmış Lisansüstü Tezlerin Bibliyometrik Analizi

Özet: Yapılan çalışmanın amacı; Ülkemizdeki sığır popülasyonunda gözlemlenen ayak hastalıklarına yönelik yapılmış lisansüstü tezleri bibliyografik analiz yöntemiyle bütüncül çerçevede değerlendirip sonrasında yapılacak akademik çalışmalara katkı sunmasını sağlamaktır.

Metod: Araştırmada kullanılan gereç ve yöntem olarak; Yüksek Öğretim Kurumu Ulusal Tez Merkezi’nin resmi internet sitesinde lisansüstü tezler bölümündeki, tarama teriminin yapıldığı kutucuğa "ayak hastalıkları" anahtar kelimesi 'yazılarak arama yapıldı.

Bulgular: Yapılan tarama sonucu ulaşılan n=25 tezin; 1990 ile 2024 yılları arasında yapılan 16’sının sığırlarda görülen ayak hastalıkları ile ilgili olduğu, 8 tezin koyun ve keçilerde görülen ayak hastalıklarıyla alakalı olduğu, 1989 yılında yapılmış bir tezin ise tıpla alakalı olduğu saptanmıştır. Yapılan bu çalışmada konuyla ilgili tezlerin 15’nin (%93,75) tam metnine ulaşılmış, birine ise (%6,25) ulaşılamamıştır. Taramada saptanan tezlerin 12’si (%75) Yüksek lisans, 4’ü ise (%25) doktora tezi olarak bulunmuştur. İncelenen lisansüstü tezler araştırma metodolojisi açısından değerlendirildiğinde 9’u (%56,25) insidans, 6’sı (%37,5) prevalans, 1 tanesi (%6,25) ise karşılaştırma şeklinde değerlendirmiştir.

Sonuç: Sığırlarda görülen ayak hastalıklarının araştırılmasına yönelik yapılmış lisansüstü tezlerin çok az bir kısmının makale olarak yayınlanıp, yapılan çalışmaların daha çok yüksek lisans düzeyinde kalarak doktora çalışmalarına çok fazla katkı sağlamadığı, literatüre yayın olarak etkisinin artırılması gerektiği düşünülmüştür.

Anahtar Kelimeler: Sığır Ayak hastalıkları, Bibliyografik Analiz, Yüksek Öğretim Kurumu, Lisansüstü Tez.

Introduction

Foot diseases in cattle are one of the most critical health problems in the world, manifesting themselves with the emergence of lameness in animals and significantly affecting their quality of life. Factors such as decreased milk production and reproductive performance, medical costs, culling, mortality, and the risk of developing other diseases due to these diseases, especially in dairy cattle, are considered factors that put industrial productivity at risk economically. In addition, in meat production, besides the decrease in live weight gain in animals, economic losses are also considered as reasons that lead to the reduction in market value and product quality and undesirable situations such as high mortality and early slaughter (Dionizio et al., 2022; Whay and Shearer, 2017).

Bibliometric analysis has gained tremendous popularity in research in recent years. This popularity has led to the advancement, availability, and accessibility of bibliometric software such as Gephi, Leximancer, VOSviewer, and scientific databases such as Scopus Web of Science, and the spread of bibliometric methodology across disciplines from information science to business research (Donthu et al., 2021a). Scholars use bibliometric analysis to uncover emerging trends and research components in article and journal performance and to explore the intellectual structure of a particular field in the existing literature. The data that take center stage in the bibliometric analysis are usually extensive and objective. Still, their interpretation is often based on subjective assessments generated through objective and informed techniques and procedures. Bibliometric analysis is used to make sense of large volumes of unstructured data and to reveal and map its nuances. Therefore, bibliometric studies enable scholars to get a one-stop overview, derive new ideas for research, and position their intended contributions to the field (Donthu et al., 2021b).

Analyzes applied to the studies obtained from literature searches through web-based search engines will also provide added value to current approaches regarding new research and the development of cooperation between authors (Donthu et al., 2021c). The presence of thesis and articles prepared on bovine foot diseases in cattle breeding in Türkiye reveals the importance of this phenomenon in terms of both animal welfare and economic aspects. In this research, theses on bovine foot diseases were prepared from the theses on bovine foot diseases registered in the National Thesis Center on the official website of the Council of Higher Education.

The aim of this research is to make a bibliometric analysis of the theses on the subject in Türkiye and to provide different perspectives for new studies to be conducted on this subject.

Materials and Methods

The study material consisted of 16 postgraduate theses in veterinary surgery in Türkiye between 1990 and 2024, which were designed to investigate foot diseases in cattle.

Since no experimental or non-experimental intervention was used in the study, and similar published studies were used as references; no ethics committee report was needed in terms of systematic methodology.

When the research is evaluated methodologically, it aims to investigate the subject using the bibliometric analysis technique, which has started to be used in the field of veterinary surgery in Türkiye in recent years. For this purpose, on 06.01.2025, on the official website of the National Thesis Center of the Higher Education Institution on the official website of the Higher Education Institution on 06.01.2025, searches were made by typing the relevant words such as "bovine foot disease, bovine foot diseases, foot disease" in the box where the search terms were written in the postgraduate theses section, but a sufficient number of theses could not be reached. Afterward, n=25 postgraduate theses were reached by typing the keywords "foot diseases." It was determined that 16 were related to foot diseases seen in cattle between 1990 and 2024. These theses were evaluated separately in terms of year, content, institution, thesis level, scientific method, sample size, and content.

Statistically, the data obtained from the theses scanned in this study were transferred to Microsoft Excel form, and visuals were created. The percentage and frequency values of the requested analyses to be converted into statistical data were performed using SPSS for Windows 21.0 (IBM, Inc., Chicago, IL, USA).

Results

After the research, the data related to the variables obtained from n=16 theses were uploaded to the SPSS statistical program, and the averages related to the analyses were prepared in tables and figures and presented for evaluation.

Within the scope of the study, the statistical expression of the features related to the "n" number of variables in the theses made for the examination of foot diseases detected in cattle in Türkiye is shown in Table 2. It was thought that it would be appropriate to present the expressions related to these variables under a single title instead of in separate tables.

The data presented for the variables in the table above shows that the first thesis on the subject was done in 1990, and the last thesis was done in 2024, but 37.5% of these theses were presented in 2009, 2020, and 2022. It was determined that 75% of the theses were at the master's thesis level, 62.5% of the academic titles of the thesis advisors were professors, and 37.5% were conducted in the Eastern Anatolia Region in terms of the location of Türkiye where the research was conducted. It was also determined that 31.3% of the theses were studied within the Faculty of Veterinary Medicine of Firat University as the university where the thesis was prepared academically. After the examinations, it was determined that 37.5% of the theses presented were converted into articles and published in

Table 1. General distribution of the variables in the number “n” in the theses analyzed in the study

NO	THE NATIONAL THESIS CENTER THESIS NO	YEAR	TYPE OF THESIS	SUPERVISOR TITLE	REGION OF EXECUTION	UNIVERSITY OF EXECUTION	THE YEAR THESIS WAS CONVERTED INTO AN ARTICLE	NAME OF THE JOURNAL IN WHICH THE ARTICLE WAS PUBLISHED	NUMBER OF CITATIONS RECEIVED BY THE ARTICLE	THE NUMBER OF ANIMALS EXAMINED	NUMBER OF FOOT DISEASES DETECTED	NUMBER OF DEFORMED NAILS DETECTED	NUMBER OF FEMALE ANIMALS DIAGNOSED WITH DISEASE	NUMBER OF MALE ANIMALS WITH DISEASE DETECTED	NUMBER OF DISEASES DETECTED THE FRONT FOOT	NUMBER OF DISEASES DETECTED IN THE HIND FOOT	NUMBER OF DISEASES BY SEASON				NUMBER OF DISEASES BY BREED			NUMBER OF AGE-RELATED DISEASES				
																	SPRING	SUMMER	AUTUMN	WINTER	CULTURE BREED	LOCAL BREED	HYBRID BREED	ONE YEAR OLD	TWO YEARS OLD	THREE YEARS OLD	FOUR YEARS OLD	FIVE YEARS AND OLDER
1	905126	2024	MD	Prof. Dr.	MR	Bingöl	-	-	-	2592	596	-	-	-	-	-	113	47	161	275	-	-	-	-	-	-	-	
2	744387	2022	MD	Assist. Prof.	CA	Kırıkkale	-	-	-	3047	100	57	-	-	38	62	-	-	-	-	84	16	-	-	-	-	-	
3	724925	2022	MD	Prof. Dr.	EAR	Fırat	-	-	-	4000	383	145	292	73	-	-	-	-	-	-	324	3	38	-	-	-	-	
4	676863	2020	MD	Prof. Dr.	EAR	Yüzüncü Yıl	-	-	-	1560	215	110	146	69	-	-	-	-	-	-	180	13	22	-	-	-	-	
5	616214	2020	MD	Prof. Dr.	EAR	Kafkas	-	-	-	1303	45	51	-	-	10	49	-	-	-	-	32	3	-	5	13	13	9	5
6	536105	2019	MD	Prof. Dr.	SAR	Fırat	-	-	-	6000	332	432	465	97	104	459	124	64	77	297	528	3	31	-	-	-	-	
7	428897	2016	MD	Prof. Dr.	GAB	Fırat	2016	Fırat Univ. Health Sci. Vet. Journal	18	1912	213	235	209	4	31	182	52	26	37	98	209	3	1	5	47	54	42	65
8	448902	2015	MD	Prof. Dr.	GAB	Harran	-	-	-	570	43	14	-	-	16	27	-	-	-	-	28	2	13	-	-	-	-	-
9	532178	2009	MD	Assoc. Prof.	MR	Yüzüncü Yıl	-	-	-	1344	81	-	-	-	-	-	-	-	-	-	26	26	29	-	-	-	-	-
10	532177	2009	MD	Prof. Dr.	AR	Yüzüncü Yıl	-	-	-	1090	71	-	-	-	-	-	-	-	-	-	35	20	16	-	-	-	-	-
11	193492	2007	MD	Assist. Prof.	AR	Kocatepe	2009	Kocatepe Veterinary Journal	23	1800	117	175	-	-	25	170	-	-	-	-	150	20	25	-	-	-	-	-
12	157558	2004	PhD	Assoc. Prof.	SAR	Fırat	2004	Fırat Üniv. DAUM Journal	17	1638	232	277	184	48	39	189	130	34	53	104	126	55	51	11	14	21	43	123
13	108176	2001	MD	Assoc. Prof.	SAR	Yüzüncü Yıl	2001	Yüzüncü Yıl Un. Health Sci Inst J	21	1800	321	1450	-	-	-	-	85	236			267	54	-	-	-	-	-	
14	99113	2000	PhD	Assoc. Prof.	SAR	Fırat	2002	Fırat Univ. Health Sci. Vet. Journal	25	1688	153	239	144	65	32	207	109	26	47	83	123	53	33	13	23	32	29	106
15	40426	1995	PhD	Prof. Dr.	MarR	Uludağ	-	-	-	1798	262	-	-	-	19	250	-	-	-	-	-	-	-	-	-	-	-	-
16	18102	1990	PhD	Prof. Dr.	MarR	İstanbul	-	-	-	2000	69	97	44	25	10	59	22	6	22	19	65	-	4	6	19	6	7	32

*CHE: Conuncill of Higher Education *MD: Master's Degree, PhD: Doctorate ***MR: Mediterranean Region, EAR: Eastern Anatolia Region, CA: Central Anatolia Region, SAR: Southeastern Anatolia Region, AR: Aegean Region, MarR: Marmara Regi

Table 2. Statistical analysis of some variables obtained from the post-research thesis

Features	n	%
<u>Thesis year</u>		
1990	1	6,3
1995	1	6,3
2000	1	6,3
2001	1	6,3
2004	1	6,3
2007	1	6,3
2009	2	12,5
2015	1	6,3
2016	1	6,3
2019	1	6,3
2020	2	12,5
2022	2	12,5
2024	1	6,3
<u>Thesis type</u>		
MD	12	75
PhD	4	25
<u>Consultant title</u>		
Assistant. Prof. Dr.	2	12,5
Assoc. Prof. Dr.	4	25
Prof. Dr.	10	62,5
<u>The region where the thesis is conducted</u>		
Mediterranean Region	2	12,5
Marmara Region	2	12,5
Aegean Region	2	12,5
Eastern Anatolia Region	6	37,5
Southeastern Anatolia Region	3	18,8
Central Anatolia Region	1	6,3
<u>University where the thesis was done</u>		
Fırat	5	31,3
Bingöl	1	6,3
Harran	1	6,3
Uludağ	1	6,3
İstanbul	1	6,3
Kırıkkale	1	6,3
Kafkas	1	6,3
Afyon Kocatepe	1	6,3
Van Yüzüncü Yıl	4	25
<u>From thesis to article</u>		
Yes	6	37,5
No	10	62,5
<u>The journal in which the article was published</u>		
National Journal	6	100
Number of article citations (min-max): 17-25		X±SS= 20.80±3,34

journals. It was seen that all of the articles of these completed theses were published in national journals but not in international journals such as SCI and SCI-Expand. The average number of citations (min:17-max:25) of these articles published in national journals was 20.80±3.34.

The findings regarding the evaluation of the theses obtained after the research in terms of foot diseases are presented in Table 3. Accordingly, it was determined that the average number of animals examined was 2133,87±1303,83,

the average number of foot diseases was 202,06±151,28, and the average number of deformed nails was 273,50±388,44. In addition, the average number of female animals was 212±134,41, and the average number of male animals was 54,42±31,44. In addition, the average number of foot diseases in the front feet was 36.54±29.32, and the average number of foot diseases in the hind feet was 176.27±127.93. When the distribution of the cases according to the seasons was analyzed, it was determined that foot

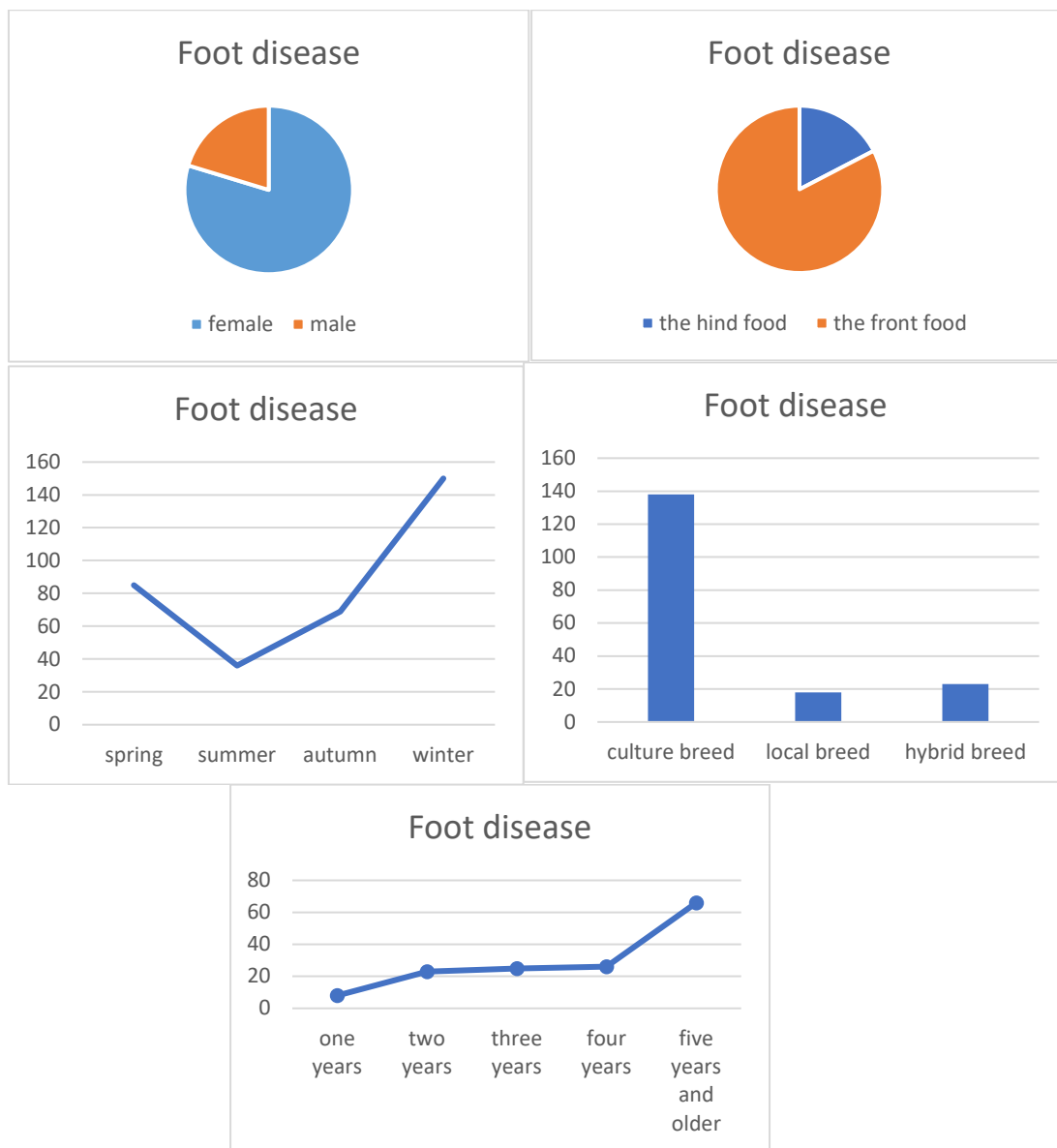


Figure 1. Graphical distribution according to variables causing foot diseases

diseases were most common in winter ($149,50 \pm 97,25$) and least common in summer ($35,50 \pm 17,15$). When the animals in the studies were evaluated in terms of breed characteristics, it was found that the animals with the disease were mostly seen in cultivated cattle ($137,71 \pm 142,27$) and the least in local cattle ($18,07 \pm 17,91$). In the theses examined, it was determined that the most common foot disease in cattle was observed in animals aged five years and over ($66,20 \pm 49,31$) and the least in animals aged one year ($8 \pm 3,74$) (Table 3) (Figure 1).

Discussion

Bibliometric analysis presents the intellectual structure and emerging trends in a topic or research area by summarizing large amounts of data, using qualitative and quantitative techniques, making it possible to apply them to the data. Although this type of analysis efficiently summarizes and synthesizes data from the literature, it has

some limitations. First, given that it considers articles published in the languages in which the analysis is

conducted, this research will consider articles with abstracts or keywords. The other limitation is that the data obtained from the databases is not produced exclusively for this type of analysis and contains errors that may affect the analysis results, such as duplicate data and incorrect entries. Therefore, researchers should consider standardizing and structuring the data to reduce such errors. Another limitation is that qualitative data are highly subjective, and researchers should carefully support the results with appropriate analysis (Donthu et al., 2021c). Despite this analysis's limitations, detailed knowledge and rigorous data standardization make it possible to efficiently interpret large amounts of data, which can be very useful in research. Foot diseases in cattle are of great importance in the sectoral sense, especially in terms of cattle breeding, as they cause losses in terms of both animal welfare and economic value. In the search made on the official website of YÖK National

Thesis Center, it was determined that 16 studies were conducted at the postgraduate thesis level between 1990 and 2024. When the number of thesis on the subject is generally examined, there is a linearly increasing trend.

When the results of 53 studies on foot diseases from 6 continents focusing mainly on Europe and North America over about 30 years were examined, it was found that the prevalence of those who had problems due to foot disease

Table 3. Evaluation of thesis in terms of foot diseases.

Variables	Minimum	Maximum	X±SS
Number of animals examined	570	6000	2133,87±1303,83
Foot disease	43	596	202,06±151,28
Deformed nail	14	1450	273,50±388,44
Female animal	44	465	212±134,41
Male animal	4	97	54,42±31,44
The front foot	10	104	36,54±29,32
The hind foot	27	459	176,27±127,93
Spring	22	130	85,25±41,12
Summer	6	64	35,50±17,15
Autumn	22	161	68,75±46,07
Winter	19	297	149,50±97,25
Culture breed	18	528	137,71±142,27
Local breed	2	55	18,07±17,91
Hybrid breed	1	51	23,41±14,24
One year old	5	13	8±3,74
Two years old	13	47	23,20±13,89
Three years old	6	54	25,20±18,78
Four years old	7	43	26±17,34
Five years and older	5	123	66,20±49,31

in the study group, including 414950 cows from 3945 herds varied between 5.1% and 45%. The average prevalence was 22.8% (Thomsen et al., 2023). Silva et al. (2020) reported that digital dermatitis was the most studied worldwide when they analyzed the studies on bovine foot diseases and hoof deformities published in the Scopus database over approximately 50 years. The statistical study showed that studies on bovine foot and hoof diseases among disease groups have gradually increased. Since the 1980s, they have been studied much more than infectious diseases (Silva et al., 2020).

The fact that studies on foot diseases are published in reputable journals with high impact factors, such as Preventive Veterinary Medicine, Animals, and Veterinary Journal, can be considered an indication of the global interest in the studies carried out in the field. This international interest has also encouraged researchers to conduct new studies to discover treatment and prevention methods in this field (Fürmann et al., 2024; Koflerü et al., 2024; Magrin et al., 2020).

Although the published research articles emphasized the importance of factors such as age, seasonal effect, and gender, which were included as variables in the thesis and play a role in the etiology of foot diseases, it was observed that some theses did not examine these factors much.

The academic studies examined in the literature reviews conducted to emphasize the importance of the

variables in the theses in terms of foot diseases revealed that the diseases are more common, especially in winter and autumn months (Garvey, 2022; Jury et al., 2021; Magrin et al., 2020). Our study determined that the effect of seasons on diseases was most common in winter and least common in summer.

Academic studies emphasize that cattle are more frequently exposed to foot diseases due to the decrease in the structural features of the hooves of older animals due to age (Browne et al., 2022; Fürmann et al., 2024; Sadiq et al., 2021). The study observed that older animals aged 5 years and older were more frequently affected by foot diseases than young animals.

The articles emphasized that foot diseases were more common in female animals than in male animals (Erickson et al., 2024; Griffiths et al., 2018; Mahd-Gharehbagh et al., 2020). In the theses examined in this study, foot diseases were more common in female animals than male cattle.

Studies have stated that foot diseases in animals are localized, especially in the hind feet (Beaver et al., 2021; Rukol et al., 2021). The study determined that foot diseases in cattle are generally more common in the hind feet than in the front feet.

Academic studies have reported that foot diseases detected in cattle are much more common in animals belonging to high-yielding breeds (Islam et al., 2020; Roziyev et al., 2022; Zavadilová et al., 2021). The theses found that

the disease cases were mostly seen in cultivated animals and the least in local animals.

Conclusion

This study will be a reference source for researchers interested in foot diseases in cattle. However, it should not be ignored that this research has some limitations, such as that it was conducted from a single database and only Turkish theses were included in the data set. In addition, as a result of the examination of the theses reached as a result of the research, the relevant ones were used, while the irrelevant ones were excluded from the study. The data obtained from the study will be a template for determining future trends on the subject. Especially if these research institutions develop appropriate policies on the study of the subject and support it with resources, it will draw more attention to the subject and help to increase interest. This will provide added value in the fight against foot diseases in cattle for both animal welfare and economic losses.

Conflict of Interest

None.

Ethical Permission

Since experimental animals were not used in this study, HADYEK was not required.

Similarity Rate

We declare that the similarity rate of the article is 13% (Ithenticate) as stated in the report uploaded to the system.

Author Contributions

Idea/Concept/Design/Supervision/Consultancy/Data Collection and/or Processing/Analysis and/or Interpretation/Source Scan/Writing of the Article/Critical Review/: Öİ

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