

Preventive Measure and Action towards Livestock disease: Law on Animal Husbandry and Animal Health

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<https://doi.org/10.25134/unifikasi.viii.9536>

ARTICLE INFO

ABSTRACT

Article History

Received: December 5, 2023

Revised: April 1, 2024

Accepted: April 24, 2024

Keywords

Animal disease prevention;

Animal health;

Policy implementation.

The research aims to examine the implementation of Law Number 18 of 2009; Animal Husbandry and Animal Health, the preventive measure and its action. The urgency of the research is to raise people's awareness on the importance of livestock health and to effectively enforce existing regulation. Thus, the potential impact to human health and the livestock economy could be mitigated. Meanwhile, to collect data, analyze difficulties, and find solutions, the researchers employed empirical-juridical approaches such as surveys, interviews with relevant parties, and field observations in Kuningan Regency. The findings revealed that the Animal Husbandry and Animal Health Law explicitly regulates preventative and remedial measures for livestock diseases, highlighting the role of both national and local governments in advancing animal health. In addition, the government regulation on veterinary authorities' states all of the topics, including preventive, action, livestock traffic, infrastructure, and facilities. The execution of the so-called policies at the regional level reveals a multitude interrelated barriers. The inability to implement policies can be attributed to a number of factors, including inconsistent regulations between regional and higher levels of legislation, a lack of qualified human resources, inadequate facilities and infrastructure, the effect of local customs and culture, and the quality of community education. To sum up, the investigation has improved our comprehension on the effectiveness of the laws. Yet, to improve the livestock's health and wellbeing and minimize its disease transmission, it is advised to enhance compliance and best practices related to livestock management.



Introduction

Worldwide challenge—the importance of central government and regional government policies, animal husbandry and animal health become critical concerns in the era of global food insecurity.¹ The maintenance of food security, which involves the supplies of animal protein like meat and dairy product, is hampered by expanding human population, climate change, and pandemics exigency.² Countries even attempt to integrate central government regulation and the regional action by encouraging sustainable farming, fortifying animal health systems to prevent the spread of disease, and providing incentives to farmers to upgrade the animal's production and its quality.³ For instance, some nations provide substantial funds for the research and development of innovative agricultural technologies

¹ Agus Maulana, "The Human Capital in Revolution Industri," *Jurnal Ilmiah Manajemen Bisnis Dan Terapan* 5, no. 1 (2021): 1-8.

² Ayusia Sabhita Kusuma, "Global Health Dan COVID-19: Tantangan Dan Adaptasi Dalam Konstelasi Hubungan Internasional," 2021, 1-140.

³ Muhammad Raffin Althafullayya and Nila Puspita Aryani, "Smart Farming: Mengintegrasikan Teknologi Pemantauan Nutrisi Untuk Meningkatkan Kesejahteraan Dan Produktivitas Hewan," *Jurnal Agro-Livestock* 2, no. 1 (2024): 45-53.

novelties, while others provide tax breaks for livestock producers who adhere to environmental and animal health regulations⁴. Furthermore, the government and corporate sector are intensifying collaboration, improving livestock access to global markets and enhance its distribution, expecting a sustainable, productive, and health-safe livestock system, which preserve global food security for the world's growing population. The action is eminent because livestock plays significant in ensuring human food security by providing animal protein sources such as beef and milk. Accordingly, food sustainability is inextricably linked to the influencing elements, intrinsic and extrinsic.

Kuningan Regency is one of the districts with a livestock barn, contributing to livestock stability, particularly as a food source. Dairy and meat cattle farming become major industry in the region. The registered population of beef cattle is 28,580 head, divided among 20 sub-districts. There are 8,538 dairy cows in the Cigugur District region.⁵ However, running a farm is a strenuous business; there are innumerable factors to consider while producing healthy cattle for human, including infections. It contributes to a negative consequence, resulting in losses and worsening the animal product.⁶ For instance, foot and mouth disease (FMD) which is a disease that affects ruminant animals.

Foot and Mouth Disease (FMD) is a highly contagious disease that affects cloven-hoofed animals including cattle, buffalo, sheep, goats, pigs, deer, camels, and elephants. Animals with FMD virus infection exhibit pathognomonic clinical signs such as blisters/lesions in the mouth and on the paws. FMD is caused by a virus that enters the animal's body. Indonesia was once infested by FMD, which was initially documented in Malang in 1887 and later spread throughout the country. FMD control was underway at the time to eradicate the disease, but it reappeared in Blora Regency, Central Java, in 1983. FMD was eventually eradicated by three years of continual immunizations. Finally, this disease was successfully treated, and FMD-free status was recognized in OIE Resolution No. PHMS), which must be monitored and averted.

Foot and mouth disease in livestock has resurfaced in Indonesia and spread to several places, including Kuningan Regency.⁷ According to data from the Kuningan Regency Fisheries and Livestock Service, FMD incidences are increasing. There were 1,667 cows exposed to FMD. 310 cows recovered, but 1,231 cows remained infected. In fact, 47 cows died and another 79 had to be conditionally slaughtered after contracting FMD. FMD are scattered among 35 villages and 18 sub-districts. Cibingbin, Cigugur, Garawangi, Cilebak, Kramatmulya, Lebakwangi, and Luragung.⁸ As a result, milk production, body weight, and growth rates decline. FMD spreads rapidly through various transmission, including direct or indirect contact with infected animals (droplets, nasal discharge, or skin flakes), vectors, and the air. It will cause significant economic losses for the community and dairy farmers.

⁴ Retno Mulyaningrum, "Perlindungan Hukum Dalam Peternakan Yang Berdampak Pada Resesi 2023," in *Prosiding Seminar Nasional Cendekia Peternakan 2 Tema "Strategi Sub Sektor Peternakan Untuk Menghadapi Isu Resesi Global, 2023*, 5-10.

⁵ "Dinas Perikanan Dan Peternakan Kabupaten Kuningan," 2023.

⁶ Rini Pebrianti, "Peran Dinas Perikanan, Kelautan, Dan Peternakan Dalam Penyuluhan Pemeliharaan Ayam Boiler di Desa Tanrara Kecamatan Bontonompo Selatan Kabupaten Gowa" (2014).

⁷ Rendika Ferri Kurniawan Alinda Hardiantoro, "Penyakit Mulut dan Kuku Menyebar di Indonesia Diduga Melalui Ini..." https://www.kompas.com/tren/read/2022/05/16/183000765/penyakit-mulut-dan-kuku-menyebar-di-indonesia-diduga-melalui-ini-#google_vignette (2022).

⁸ "Kompas.Id, Nusantara, <https://www.kompas.id/baca/nusantara/2022/06/15/sebanyak-1667-sapiterpapar-pmk-pmkab-kuningan-siapkan-dana-rp-500-juta>, Diakses Pada 20 November 2022. 8RM Abdul Adjid, Op,Cit," n.d.

Previous research on animal husbandry and health policies has addressed a wide range of issues, from enhancing livestock wellbeing to reducing the spread of animal diseases.⁹ These studies frequently include evaluation, implications, and the strategies to improve the effectiveness of existing policies.¹⁰ Several studies have investigated the impact of policies on housing standards and animal care; livestock productivity and health.¹¹ Other research attempts to identify factors that influence farmer compliance with animal health standards and analyze the effectiveness of incentive programs to enhance such compliance.¹² Furthermore, various studies emphasize the necessity of cross-sector collaboration in formulating comprehensive policies, involving the government, livestock breeders, scientists, and civil society organizations.¹³ These studies provide useful insights into the complexities and problems in animal husbandry and animal health, emphasizing the significance of a long-term and coordinated strategy to accomplishing these policy objectives.

The research identified untapped investigation beyond the role of central and regional government, policy-making in animal husbandry and animal health. Existing research focus more on evaluating the implementation of existing policies rather than on developing new strategies to optimize the policy. The primary contribution of this study is a better understanding of the complexities, the relationship between central and regional governments in livestock and animal health policies, as well as the novel solutions for the existing challenges. Accordingly, three research questions are formulated as follows: (1) What is the Indonesian government's policy for livestock and animal health? (2) How are livestock and animal health policies implemented in the region? (3) What steps is the Regional Government of Kuningan Regency taking to improve the effectiveness of animal husbandry and health policies? The study is likely to yield substantial new insights into how central and regional governments might work together more effectively to ensure the effectiveness of livestock and animal health policies.

Research Methods

The research took an empirical juridical or socio-legal method, concentrating on livestock and animal health policies in Kuningan Regency, Indonesia.¹⁴ The research drew on several data sources, interviews with related parties (central and regional government officials), legal practitioners, and direct observations in the field. In addition, a literature review was also included to gather pertinent secondary data. The data were evaluated qualitatively, through content analysis, to identify emerging patterns and themes. Research protocols were followed in conformity with research ethical guidelines, including the confidentiality of

⁹ Hongyu Yang, "Economic Analysis of Animal Epidemic Prevention and Control," *Revista Científica de La Facultad de Ciencias Veterinarias* 30, no. 4 (2020): 1798–1807.

¹⁰ Yanti Devi, . "Efektifitas Program Bantuan Ternak Sapi Potong Sebagai Salah Satu Strategi Penanggulangan Kemiskinan Di Kabupaten Padang Pariaman," *Diss. Universitas Andalas*, 2022.

¹¹ and Abdul Haris Semendawai Permana, Idat Galih, *Perlindungan Hukum Terhadap Hewan Peliharaan (Non Ternak): Ditinjau Dari Perspektif Kepastian Hukum*. (Penerbit NEM, 2023).

¹² Emmanuel K. Bunei, Elaine Barclay, and Bernice Kotey, "Understanding Factors Leading to Farmer Non-Compliance with Agri-Food Safety Regulations in Kenya: A Quantitative Analysis," *International Journal of Rural Criminology* 8, no. 1 (2023): 59–81, <https://doi.org/10.18061/ijrc.v8i1.9564>.

¹³ Sandra Waddock, "The Wicked Problems of Global Sustainability Need Wicked (Good) Leaders and Wicked (Good) Collaborative Solutions," *Journal of Management for Global Sustainability* 1, no. 1 (2013): 7.

¹⁴ and Muhamad Azhar Benuf, Kornelius, "Metodologi Penelitian Hukum Sebagai Instrumen Mengurai Permasalahan Hukum Kontemporer," *Gema Keadilan* 7, no. 1 (2020): 20–23.

respondent and observation subject data. The research findings are presented in a thorough report that includes methodology, findings, analysis, and suggestions for key stakeholders.¹⁵

Results and Discussion

1. *Legislative Policies for Animal Husbandry and Health*

The policy for preventing and treating foot and mouth disease in livestock is governed by Law of the Republic of Indonesia Number 18 of 2009; Animal Husbandry and Health. The formation of this regulation was driven by the fact that animals, as God Almighty's gift and mandate, play an important part in the production of animal-derived food and other animal products, as well as human services, the usage of which must be oriented at social welfare. As a result, providing animal health that protects the health of humans, animals, and their ecosystems is vital as a requirement for advanced, competitive, sustainable animal husbandry, as well as safe, healthy, whole, and halal food that may be used to benefit society and its welfare. Law No. 18 of 2009 established an important legal framework for regulating and safeguarding animals, as well as maintaining animal and human health. This law governs a wide range of issues, including livestock management, protection, supervision, and emergency response.

Aside from Law Number 18 of 2009, there is also Law Number 21 of 2019 on Animal, Fish, and Plant Quarantine, which is critical in guaranteeing the safety and health of animals, fish, and plants on a domestic and worldwide scale. This law regulates quarantine, illness prevention, animal movement supervision, and the treatment of animal diseases that endanger human and animal health. Aside from that, the examination focuses on government regulations, such as Government Regulation Number 29 of 2023, which implements the rules of Law Number 21 of 2019 on Animal, Fish, and Plant Quarantine. This rule outlines the procedures for quarantine, disease control, and animal, fish, and plant emergencies. The analysis attempts to evaluate the effectiveness of the regulated policies and find any flaws in their implementation. For example, while adopting current regulations, it is necessary to evaluate resource availability, collaborate with relevant agencies, and ensure community compliance. Furthermore, animal safety must be prioritized throughout the production process, from maintenance and transportation to slaughter. Furthermore, law enforcement is required to prevent infractions of existing regulations.¹⁶

Animal quarantine is designed to control the entry and exit of animals from within the country to abroad, and vice versa. It is done to avoid the spread of infectious diseases carried by animals that enter or leave Indonesia. The Republic of Indonesia Government Regulation Number 29 of 2023 concerning Implementing Regulations of Law Number 21 of 2019; Animal, Fish, and Plant Quarantine was issued as the law's implementer. Quarantine law oversees the import, export, and transit of carrier medium, food, feed, PRG, SDG, Agensia Biology, Invasive Foreign Species, Wild Plants and Animals, Rare Plants and Animals, and organizations responsible for Quarantine implementation. The Quarantine Law cannot stand alone; government rules are essential to ensure that these laws and regulations are carried out efficiently. As a result, the Quarantine Law mandates that the substance of following regulations be governed by the Republic of Indonesia's Government Regulation Number 3 of

¹⁵ Noor Muhammad Aziz, "Urgensi Penelitian Dan Pengkajian Hukum Dalam Pembentukan Peraturan Perundang-Undangan." *Jurnal Rechtsvinding*, *Jurnal Rechtsvinding* 1, no. 1 (2012): 17-32.

¹⁶ K. C Rudra, "Assessment of Animal Welfare Status during Transportation and Slaughtering of Ruminant Animals at Local Slaughter Houses in Bangladesh," *J. Vet. Med. OH Res* 1, no. 1 (2019): 85-98.

2017: Veterinary Authorities for the Implementation of Animal Health throughout the Territory of the Unitary State of Indonesia. The Central and Regional Governments must increase their duties and powers, as well as the Veterinary Authority, which is in charge of making the most critical technical decisions affecting animal welfare. The Veterinary Authority's role is to formulate and implement policies in the execution of animal health, referring to the National Animal Health System (Sikeswanas) established by the president.¹⁷ The Republic of Indonesia's Government Regulation Number 3 of 2017 specifies extra technical requirements for veterinary authorities at the district/city level. For example, the regional government of Kuningan Regency issued Regent Regulation Number 71 of 2019 on Position, Organizational Structure, Main Duties, Functions, and Job Descriptions, as well as Work Procedures for Fisheries and Livestock Service, which includes policy preparation, implementation, technical guidance, monitoring, and evaluation of the livestock sector.

To sum up, the analysis reveals a strong framework for protecting animals while ensuring public health. However, practical issues remain, such as increasing the scope of surveillance, enhancing public awareness, and improving law enforcement effectiveness. As a result, collaboration among the government, relevant organizations, and the community is essential to enable its successful implementation and to strike a balance between sustainable livestock development and animal and society health.

2. Implementation of Regional Animal Husbandry and Health Policies

The findings on the regional implementation of livestock and animal health policies, employing Lawrence Friedman's legal system theory, show a number of factors influence the difficulty of implementing these policies. These elements can be divided into three categories: substantive considerations (legislative factors), structural factors (institutions, facilities, infrastructure, and apparatus), and cultural factors (community culture).¹⁸ *First*, substantive factors which refers to the obstacles. Even though there is a very comprehensive legal framework, its implementation at the regional level frequently falls short. One of the most significant barriers is the disparity between regional and statutory legislation, which frequently results in ambiguity. Furthermore, some regulations may be insufficiently clear or contain ambiguous elements, making it difficult for relevant parties to understand and effectively apply them.¹⁹ *Second*, structural considerations include institutional, facility, and infrastructure limitations, as well as officials' desire to implement regulations. Regionally, there is often a scarcity of qualified and skilled human resources in animal husbandry and health. A lack of adequate facilities and infrastructure, such as animal disease testing laboratories, further complicates disease monitoring and control operations. Aside from that, regional law enforcement officials are not always sufficiently informed or motivated to carry out their duties efficiently. *Third*, cultural variables refer to features of society's culture that affect policy implementation. Local culture, customs, and community behaviors might make it difficult to accept new livestock and animal health practices. Traditional livestock practices, for example, that do not prioritize animal welfare may be difficult to modify since they have

¹⁷ LestariningsihBriliant: Jurnal Riset dan Konseptual Lestariningsih, "Peranan Nomor Kontrol Veteriner Terhadap Jaminan Mutu Keamanan Produk Hasil Peternakan," *Briliant: Jurnal Riset Dan Konseptual* 5, no. 1 (2020): 180-188.

¹⁸ Asmaul Husna, "Penindakan Hukum Terhadap Pemilik Hewan Ternak Yang Berkeliaran Di Jalan Menurut Peraturan Bupati Aceh Besar No. 5 Tahun 2021 Tentang Tata Cara Penertiban Hewan Ternak (Studi Kasus Di Kecamatan Darul Imarah Kabupaten Aceh Besar)." (UIN Ar-Raniry, 2022).

¹⁹ Lalu Wira Agung Mulajati, "Implementasi Kebijakan Penertiban Hewan Ternak Di Kecamatan Sumbawa Kabupaten Sumbawa" (Diss. Institut Pemerintahan Dalam Negeri, 2023).

been ingrained in the local's cultural identity. Furthermore, the level of education and public awareness about the importance of animal health influences participation and compliance with present regulations.²⁰

According to Lawrence Friedman's legal system theory, these factors combine to create a complex system that determines regional livestock and animal health policy implementation. Effective problem solving necessitates a comprehensive strategy that considers not only legal (substantive) aspects, but also the institutional structure and culture of the community. Efforts to improve the policy's implementation must engage a wide range of stakeholders, including local governments, affiliated institutions, local communities, and the corporate sector, while also taking into account each region's particular situation. It is envisaged that this approach would result in more effective and long-term solutions for sustaining animal health and enhancing cattle welfare at the regional level.

3. *The Efforts to Improve the Effectiveness of Animal Husbandry and Health Policies: Kuningan Regency Government's.*

Animal illnesses are structural or functional alterations to a health concerns. Individual animal diseases can also be infectious to another animal or between animals and humans. Animals serve numerous services for people, one of which is to assure food supply and economic stability; hence, livestock health problems can result in economic losses and health consequences for humans. Animal sickness has a wide range of consequences, the most evident of which is the influence on animal health and welfare; the quality of life of infected animals can be compromised. Diseases can have an impact on the overall population. Foot and mouth disease epidemics in cloven-hoofed animals, for example, can reduce food production and hinder animals' movement and animal products across regions and countries.²¹

Foot and mouth disease, or FMD, is an infectious disease that affects animals. The transmission of FMD in animals is rapid and can span national boundaries. Kuningan Regency is listed in Indonesia's FMD-prone zone. According to the Kuningan Regency Fisheries and Livestock Service, additional statistics on the areas labeled as PMK, notably:²²

Table 1: PMK indicated areas according to the fisheries and livestock service

No	Sub-district	Types of livestock					quantity
		beef cattle	Dairy cows	Buffalo	Sheep	Goat	
1.	Cibeureum	3					3
2.	Cilebak	33					33
3.	Garawangi	4		2			6
4.	Kuningan	8	9				17
5.	Cigugur	4	2940				2944
6.	Luragung	13		20			33

²⁰ Guntoro, *Budi. Animal Based Tourism Dan Isu Kesejahteraan Hewan* (UGM PRESS, 2021).

²¹ Fajar R B Putra, Abdul Fadlil, and Rusydi Umar, "Analisis Metode Forward Chaining Pada Sistem Pakar Diagnosa Penyakit Hewan Sapi Berbasis Android," *Jurnal Sains Komputer & Informatika (J-SAKTI)* 5, no. 2 (2021): 1034-44.

²² Data from Kuningan District's Fisheries and Livestock Service, 2023 (n.d.).

7.	Cibingbin	835	182			1035	
8.	Cilimus	30				30	
9.	Subang	93				93	
10.	Cidahu	22	10			32	
11.	Kramatmulya	3				3	
12.	Kadugede	7	3			10	
13.	Lebakwangi	9				9	
14.	Ciawigebang	4	22			26	
15.	Cimahi	46	54			100	
16.	kalimanggis	7				7	
17.	Cigandamekar	4				4	
18.	Maleber	121	1			122	
19.	Sindangagung	3	1			4	
20.	Selajambe	5				6	
21.	Jalaksana		7			7	
22.	Japara		11			11	
23.	Pasawahan	6				6	
	TOTAL	1279	2957	305	0	0	4541

Table 01 explains that Foot and Mouth Disease (FMD) is an infectious disease in animals that spreads rapidly and can cross national borders. Kuningan Regency in Indonesia has been identified as an FMD-prone zone. Data from the Kuningan Regency Fisheries and Livestock Service show both the PMK-indicated areas and the number of livestock. The table displays the number of beef cattle, dairy cattle, buffalo, sheep, and goats in various sub-districts. For example, Cibeureum has three dairy cows and three goats, while Cigugur has 2,940 dairy cows and 2,944 goats. The total livestock in the table numbered 4,541, with dairy cattle accounting for the most (2,957), followed by beef cattle (1279) and buffaloes (305). This information is crucial for monitoring and treating the disease, preventing its spread.

The Fisheries and Livestock Service is responsible for formulating policies, determining and implementing regional policies, administering government affairs and public services, developing the fisheries and livestock sector, coordinating facilitation and control of the implementation of official duties, developing the agency's technical implementation units, and carrying out other functions assigned by the regent. In Kuningan Regency, the animal husbandry sector is in charge of animal care. Based on the Kuningan Regent's Regulation Number 71 of 2019. The work procedures involve designing a program strategy, preparing policy papers, preparing materials for assembling a list of recommended activities, applying guidelines for boosting livestock output, monitoring and assessing livestock production, offering suggestions and considerations, as well as information, to the leadership regarding general livestock sector determinations/policies, reporting on the results of its actions,

reviewing and reporting materials, and performing other official tasks assigned by the Head Service. Meanwhile, the duty and power to prevent and treat foot and mouth disease in livestock is to first form a task force made up of various authorities, curing and preventing foot and mouth disease. Second, facilitating the procurement of medicines, disinfectants, and equipment needed to prevent and treat FMD; third, collaborating with animal husbandry and livestock testing centers outside of Kuningan Regency; and fourth, issuing circulars to each regional head whose area are in livestock zone, such as issuing letter prohibiting livestock entry.

The emergence of animal foot and mouth disease is an infectious epidemic; therefore, the establishment of Law Number 18 of 2009; Animal Husbandry and Animal Health may have a favorable impact on animal, Kuningan Regency, and livestock producers. Such regulation establishes a legal foundation for guidelines, FMD prevention and treatment, and protects the sustainability of producers' animals. Various issues arose throughout the implementation of the Fisheries and Livestock Service's program. The first hurdle was breeder resistance, which stemmed from hoaxes or disinformation about vaccinations claiming that they did not treat animals but instead made them sick. However, the fisheries and livestock department continues to persuade breeders via information, communication, and education. The second constraint is insufficient facilities and infrastructure, such as insufficient procurement from relevant agencies. The innovative efforts are projected to improve the effectiveness of animal husbandry and animal health policies while also strengthening the overall animal health monitoring and protection system. Collaborative efforts by the government, society, and the commercial sector will be critical to preserving animal health and enhancing cattle welfare in Indonesia.

Conclusion

Law Number 18 of 2009 on Animal Husbandry and Animal Health details regulations for preventing and treating diseases in livestock, confirming that the government and regional governments are responsible for animal health. The Republic of Indonesia Government Regulation Number 3 of 2017 on Veterinary Authorities covers all aspects, including preventive, handling, transportation, facilities and infrastructure, management, and animal health. The Veterinary Authority is a national or regional government agency that manages animal health and other technical criteria set by the regional government.

The implementation of such programs at the regional level offers a number of interconnected challenges. Inconsistencies between regional regulations and higher levels of legislation, a lack of qualified human resources, facilities, and infrastructure, as well as the impact of local culture, customs, and community education, all contribute to policy implementation capacity. To address these issues, a multifaceted approach involving collaboration between local governments, related institutions, local communities, and the private sector is required, by also considering each region's particular context and characteristics. The goal is to create more effective and long-term solutions that preserve animal health and welfare at the regional level.

The effort from Kuningan Regency plays an important role in preventing and managing animal diseases, including the task force formation, the acquisition of medicines and equipment, and collaboration with related agencies. Regulations, such as the Animal Husbandry and Health Law, serve as a legal foundation for the implementation of

preventative measures. However, difficulties such as breeder resistance and limited facilities and infrastructure must continue to be addressed. Furthermore, collaboration across the government, community, and corporate sectors is critical for improving the effectiveness of Indonesia's livestock and animal health legislation, as well as boosting the entire animal health monitoring and protection system.

Suggestion

The government should strengthen collaboration and coordination among key entities responsible for policy monitoring and enforcement. It can be accomplished by establishing a cross-sector coordination forum or mechanism, such as the Livestock and Animal Health Monitoring Coordination Team, which comprises members from important ministries, institutions, and local governments. The government can provide more financing for supporting facilities and infrastructure, such as animal disease testing laboratories, quarantine centers, and veterinary clinics. Furthermore, targeted training and education programs must be established at both the national and regional levels to increase the number and qualified of technical workers. Information and communication technologies can lead to novel solutions and can monitor and report precisely and quickly. Furthermore, the adoption of mobile applications for livestock data collection, animal health information provision, and disease occurrence can boost farmer engagement and speed up response time to animal health issues.

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How to Cite :

Budiman, Haris, et.all. "Preventive Measure and Action towards Livestock disease: Law on Animal Husbandry and Animal Health". *Unifikasi: Jurnal Ilmu Hukum* 11.1 (2024): 1-10.