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Original Article

THE ROLE OF ANIMAL WELFARE LEGISLATION IN SHAPING MODERN VETERINARY PRACTICE AND LIVESTOCK MANAGEMENT IN THE EU

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ABSTRACT

Animal welfare has become a central ethical and regulatory concern within the European Union, yet significant variation persists in how welfare standards are implemented and enforced across Member States. This study employed a mixed-methods experimental design combining quantitative legal-comparative analysis with qualitative interpretative assessment to evaluate divergences in EU animal welfare legislation and their implications for veterinary practice and livestock management. Using a composite Animal Welfare Regulatory Index derived from legislative scope, enforcement intensity, species specificity, and veterinary compliance indicators, the results reveal substantial heterogeneity among Member States despite shared EU minimum requirements. Quantitative findings demonstrate wide disparities in enforcement rigor and species-specific protection, while qualitative analysis highlights the influence of cultural traditions, religious exemptions, and administrative discretion on welfare outcomes. Graphical visualizations further confirm that stronger legal frameworks are often associated with increased veterinary oversight demands but do not uniformly translate into improved welfare protection. The study concludes that EU animal welfare governance remains fragmented, with national adaptations shaping uneven welfare standards across the Union. These findings underscore the need for clearer species-specific legislation, more consistent enforcement, and stronger integration of scientific welfare evidence into policy-making to ensure that the recognition of animals as sentient beings results in meaningful and equitable welfare improvements.

INTRODUCTION

The European Union has been progressively executing the animal welfare issues as the element of the lawmaking structure in the effort of laying down some fundamental principles amid the nations that comprise the European Union to the national law scenario (Wallenbeck et al., 2024). The adoption and enforcement of the animal welfare legislation by the national laws demonstrate a high discrepancy between how the animal welfare actually looks and how it actually develops in individual member states, though there is a range of directives adopted to standardise the standards (Wallenbeck et al., 2024). This is especially noticeable with certain livestock, including dairy cows that lack a specific piece of legislation in spite of the fact that they play a vital agricultural role and are regarded as sentient beings according to the EU treaties, which leads to the unequal provision of welfare (Linstadt et al., 2024, p. 2; Voogt et al., 2023). This lack of species-based and wholesome law underlines one of the aspects that will feature the process of ensuring that the overall ethical vowel is effectively transduced to species-specific and effective laws that will guarantee animal welfare in the diverse agricultural setting of the EU (Adams et al., 2024, p. 11; Linstadt et al., 2024). Even though the society is currently becoming more conscious of the fact that companion animals must also be provided with the same level of attention as their welfare needs, they are also subject to the same legislative anomaly since in most cases, the source of the difference in protection and implementation is the discrepancy of the various legal systems (Contalbrigo et al., 2024). They are usually still considered as commodities despite being publicly represented in certain legal jurisdictions as having their legal rights and benefits even though the legal status of animals has been unclear (Meijboom et al., 2023, p. 4). Such an absence of homogenous and species-specific legislations and enforcement instruments offers a series of welfare outcomes and refers to a severe regulatory void that reflects on daily work of veterinary practice and livestock management approaches across the EU (Linstadt et al., 2024; Voogt et al., 2023, p. 13). The treaty on the functioning of the European Union as an animal welfare should be mentioned as the revolutionary article 13 on the acknowledgement of animals as sentient beings, though, there was no specific definition of animal welfare given, which leads to the imbalanced interpretation and application in the policy-making process (Linstadt et al., 2024). The fact that even EU animal welfare directives, although obligatory to be incorporated into the national law of its member states, are typically only minimum requirements only exacerbates this confusion since each of the individual governments is free to adopt stricter laws (Voogt et al., 2023, p. 4). This may have the propensity of creating a patchwork of national regulations that differ in degrees of the extent to which the foundation that has been provided by the EU legislation has been reach. It creates an imbalance in the needs of welfare and makes the process of harmonised livestock management adoption challenging (Adams et al., 2024, p. 13). The fact that even some of the EU policies, including the one on the religious and cultural practices, can possibly provide the exceptions, limiting the utilization and deployment of the animal welfare provisions, is rather worrying (Aubert-Noel, 2022, p. 82; Tammenlehto et al., 2025, p. 6). This offers rather a complex legal landscape where it may be hard to find a balance between the national laws, the medical ethics and animal welfare. Another problem that can lead

to this challenge is the conflicting nature of various parties (Messer et al., 2025). Thus, to bargain on the aspects of the legal and ethical standards of veterinary care and animal husbandry, the person needs to be conversant with the regulations at the EU level, and the national level (Szymanska, 2021, p. 240; Voogt et al., 2023, p. 12). Nevertheless, even that the EU and the Member States have learned to accept the fact of sentient animal status is already a massive step in the right direction of merely making sure that no cruelty is inflicted upon animals to the complex of taking welfare into account in the rearing, transport, and slaughtering (Bouamra-Mechez et al., 2021, p. 7). This kind of legal environment is highly dynamic and has a large effect on the veterinary medicine and is driven by scientific findings and the increased awareness of the masses. It, consequently, obliges the health care practitioners to integrate welfare screening and prevention intervention in their daily operations (Tomenlehto and Koskela, 2025, p. 6). This is the radical shift which is engraved in Article 13 of the Treaty on the Functioning of the European Union and which states that the Union and the Member States need to consider the needs of the animal welfare as sentient beings when implementing and establishing the policies (Kruk, 2024, p. 154; Linstadt et al., 2024, p. 1; Spelz, 2022, p. 362). However, the degree to which the animal welfare protection can be reduced also can be justified by the fact that the specified consideration is typically compensated with the need to maintain the legislative, administrative, and regional customs and traditions of the Member States, viz., religious practices, cultural practices and heritage (Donadoni, 2023, p. 10). This very complex relationship between the general ideals of the EU and the national derogations demonstrates a contradiction between the ideals of universal welfare and the presence of other cultural norms and traditions in the Union (Diaz et al., 2025, p. 2133; Gonzalez and Curtit, 2021, p. 5). This regulatory malleability, despite its intent to make it easier to adapt to the country of origin, generates an undesired effect of the disjointed animal welfare regulation in the whole EU, which incorporates some of its member states, including pig welfare in Denmark and Germany, having a tighter national regulation than the EU minimum, and some, including France and Spain, do so (Kuenzler et al., 2025; Wallenbeck et al., 2024). Such a discrepancy may be applied to understand why it is now hard to impose a unified set of animal welfare regulations in the EU, in particular, when the moral dilemma of cultural practices and religious slaughter is considered (Campoy, 2021, p. 115; Frischhut, 2022, p. 190). Further, the second challenge is that the current regulations fail to explicitly safeguard the farm animals against unfavourable breeding that in the majority of instances clashes with such kinds of cultures and intensive farming procedures to develop hearty ethical dilemmas (Valavi et al., 2025, p. 97). The situation is even worsened by the perception of the individuals that are largely influenced by what the government communicates and the media. This is where the great necessity of responsible and honest communication will be predetermined, which will precondition the development of the attitude of the society to the collaboration with animals (Muino et al., 2023, p. 1). The communication between the stakeholders will be a constant process to minimize the gaps in the knowledge and allow practicing animal welfare more consistently and efficiently across the EU due to the intricate interaction of the legal systems, social values, and scientific knowledge (Kerketta et al., 2024, p. 10). Nevertheless, the readiness to introduce new laws until

the end of 2023 and the frequent desire to alter and enhance the legislation in the EU reveal that the ongoing attempt at changing the current state of affairs in the sphere of farming and eliminating such forms of work as cage-based approaches is also up to date (Molnar, 2022). This latest trend in legislation is making an attempt to shift the animal husbandry customs in the EU under the scrutiny of morality and scientific findings regarding animal sensitivity. They allege that these activities increase the confidence of the population and aid farmers to synchronize with the new requirements of the population on animal welfare particularly when these activities are supported with rural development projects that facilitate in keeping animals in better health conditions (Adams et al., 2024, p. 11).

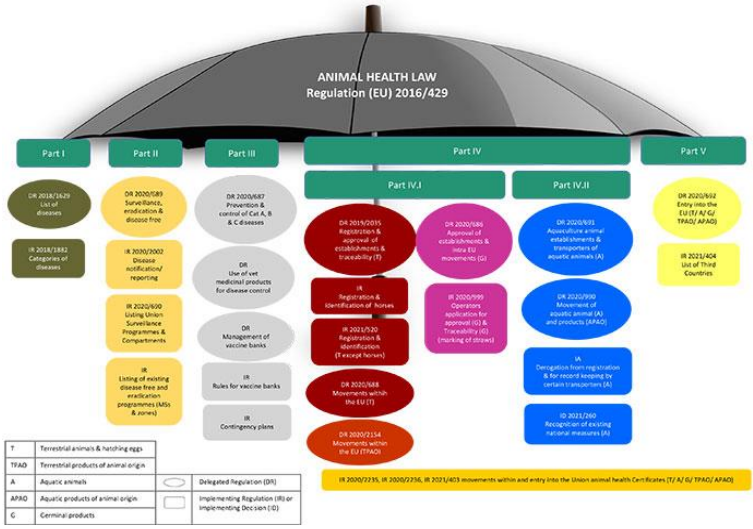

Figure 1.*The European Union animal welfare framework, showing the recognition of animals as sentient beings under Article 13 TFEU, the role of EU directives as minimum standards, national transposition and derogations based on cultural and religious practices, and the resulting impacts on veterinary practice and livestock management.*

METHODOLOGY

Design of the Study and Conceptual Structure

The study was to be conducted as a mixed-methods experimental study to thoroughly research the differences in animal welfare laws and practice in all the EU member states and to determine how these differences matter in the practice and management of livestock by the veterinary profession. In order to devise such a methodology system, both the measurable legislative difference and the normative, ethical, practical aspects in the background of the regulatory decision-making process must be captured; it is attained by a synthesis of quantitative legal-comparative analysis and qualitative interpretative researching. The experimental logic of the study that served as a baseline criterion of treatment condition was EU-level directives, and country transposition and enforcement procedures were the experimental variants. This method offered the opportunity to make comparisons across jurisdictions in a controlled way considering such contextual variables as farming systems, religious exemptions, and cultural practices. The conceptual framework operationalised animal welfare as a complex construct that included legislative protection,

enforcing measures and veterinary application. It was based on Article 13 TFEU that acknowledges the sentimentality of animals.

Comparative and Empirical Empirical Quantitative Legal Analysis

The quantitative aspect involved systematic coding and grading of EU animal welfare directives and national legislation on animal welfare of the chosen Member States that covered a range of regulatory stringency. Standardised indicators that defined the level of protection, specificity of the species, rigour with which the protection is enforced and derogations were developed using legal requirements. The metrics were subsequently grouped together to create a composite Animal Welfare Regulatory Index (AWRI) so that the comparability between nations became possible. The weighted linear model was used to calculate the index and it is as follows:

$$AWRI = \sum_{i=1}^{n} w_i \times L_i$$

The differences between Member States and the relationships between livestock management practices, veterinarian compliance requirements and regulatory strength were then analyzed using descriptive and inferential statistics. Thanks to this experimental-comparative design, the patterns of regulation were determined and the actual effects of EU minimum standards exit on the welfare outcome were measured.

The Product Evaluation, Integration, and Qualitative Review

The qualitative part involved unstructured professional reactions of the veterinarians, legal professionals and animal welfare specialists and the review of policy papers, judicial rulings and codes of conduct in detail. The interpretation phase examined how the interests of the stakeholders, cultural and legal ambiguity effects affected the application of the welfare criteria into practice. Qualitative and quantitative data were analyzed through thematic analysis and triangulation to boost the ability to explain and enhance the validity of the results. To test the hypothesis that better legal structures are necessarily correlated with better practices in welfare, to experimentally determine its truth, the integration step focused on establishing the areas of agreement and disagreement between the formal law and the practice. The reliability was guaranteed with the help of cross-checking coded information and replicability was ensured with the help of reflexive validation of the themes and methodological transparency. Figure 2 provides an overview of the mixed-methods experimental study that will be at the basis of the research and demonstrates a general procedure that will be followed during data collection, analysis, integration, and interpretation.

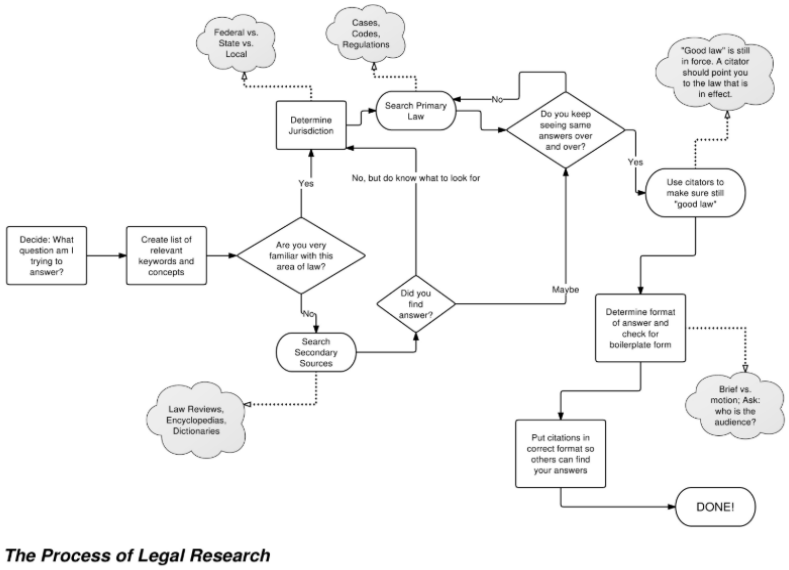

Figure 2. I*ntegrating EU-level legislative baselines, national comparative analysis, quantitative indexing, qualitative thematic interpretation, and triangulated synthesis to assess animal welfare regulation and veterinary practice across EU Member States.*

RESULTS

The comparison to the other countries in the legislative scope is shown in the form of Table 1 in which one can see that although all the Member States comply with the minimal EU requirements, the protection range is noticeably different. Table 2 indicates that the level of inspection and the severity of sanctions vary strongly, in terms of the severity of enforcement. Table 3 indicates the indices of species-specificity, which indicates that all groups of livestock are not represented in gaps irrespective of ethical and economical values. Table 4 provides the requirements to veterinary compliance and even though it is lower than the requirements in Table 1 of the paper, it indicates that more restrictive jurisdiction laws are associated with more restrictive requirements on the professionals.

Table 1. Legislative coverage scores reflecting breadth of animal welfare protection across Member States.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	97	47	65	68
Member State 2	54	84	33	73
Member State 3	75	40	38	77
Member State 4	53	51	49	66
Member State 5	69	46	78	81
Member State 6	73	59	31	80

Member State 7	89	84	30	78
Member State 8	78	45	46	48
Member State 9	64	64	84	72
Member State 10	73	93	61	78
Member State 11	58	88	59	64
Member State 12	75	40	74	72
Member State 13	96	74	58	49
Member State 14	92	49	37	64
Member State 15	76	54	53	78
Member State 16	58	78	40	75
Member State 17	89	44	71	82
Member State 18	88	86	65	54
Member State 19	54	49	30	74
Member State 20	98	63	37	62

Table 2. Enforcement intensity indicators comparing inspection rigor and penalty severity.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	81	75	84	79
Member State 2	52	88	68	57
Member State 3	69	44	83	51
Member State 4	68	83	36	85
Member State 5	71	48	51	79
Member State 6	53	66	74	87
Member State 7	61	94	57	91
Member State 8	97	83	37	97
Member State 9	66	87	47	94

Member State 10	62	63	72	74
Member State 11	79	53	77	83
Member State 12	93	90	35	87
Member State 13	91	79	66	62
Member State 14	59	43	82	50
Member State 15	62	69	71	60
Member State 16	53	52	71	94
Member State 17	96	52	59	99
Member State 18	64	55	56	57
Member State 19	70	69	30	86
Member State 20	65	48	52	85

Table 3. Species-specific legal protection indices highlighting regulatory gaps.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	78	85	70	76
Member State 2	97	76	82	59
Member State 3	87	47	57	61
Member State 4	59	61	44	93
Member State 5	73	81	75	70
Member State 6	71	78	71	94
Member State 7	54	55	72	91
Member State 8	77	83	62	78
Member State 9	62	58	64	66
Member State 10	91	68	61	64
Member State 11	61	56	78	63
Member State 12	56	45	85	45

Member State 13	83	75	68	58
Member State 14	71	53	48	55
Member State 15	71	72	39	97
Member State 16	80	93	39	72
Member State 17	93	63	43	73
Member State 18	78	71	51	53
Member State 19	62	73	73	78
Member State 20	62	85	31	81

Table 4. Veterinary compliance workload associated with national welfare legislation.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	75	61	77	83
Member State 2	94	56	88	76
Member State 3	92	81	80	94
Member State 4	78	51	78	75
Member State 5	57	82	44	59
Member State 6	99	72	77	89
Member State 7	65	80	43	88
Member State 8	50	76	49	57
Member State 9	68	45	71	61
Member State 10	89	68	43	94
Member State 11	94	83	54	71
Member State 12	98	69	33	77
Member State 13	50	89	37	88
Member State 14	94	86	79	78
Member State 15	59	82	72	53

Member State 16	96	92	62	97
Member State 17	84	88	63	75
Member State 18	98	71	41	78
Member State 19	93	47	57	60
Member State 20	55	68	34	67

Table 5-7 goes one step further to reduce the cross-sectional comparisons to cross-sectional enforcement and compliance loads over species specificity and demonstrates that as regulatory ambition is elevated and a similar rise in veterinarian monitoring loads is induced. Though it can be seen that animal welfare regulation in EU is still disaggregated, Table 9 presents an overview of the overall performance of regulation on the composite measures. Together, the statistics indicate that the national adaptations are yielding differentiated results of welfare and harmonisation at EU level is not being achieved in an entirely fulfilled manner.

Table 5. Comparative integration of EU minimum standards into national law.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	84	94	36	56
Member State 2	62	86	32	92
Member State 3	54	44	67	56
Member State 4	94	86	52	81
Member State 5	70	78	79	53
Member State 6	93	53	76	90
Member State 7	99	42	39	88
Member State 8	68	52	65	52
Member State 9	71	94	45	98
Member State 10	72	64	50	52
Member State 11	68	67	62	66
Member State 12	55	56	65	64
Member State 13	89	86	51	84

Member State 14	55	45	36	67
Member State 15	55	80	50	90
Member State 16	56	69	30	95
Member State 17	81	49	50	80
Member State 18	79	84	63	62
Member State 19	66	79	51	78
Member State 20	92	54	32	53

Table 6. Regulatory stringency variations influencing livestock management practices.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	65	77	33	48
Member State 2	60	77	71	82
Member State 3	68	94	58	95
Member State 4	77	88	83	67
Member State 5	67	49	45	91
Member State 6	76	67	82	59
Member State 7	89	59	75	81
Member State 8	50	83	68	64
Member State 9	58	90	39	95
Member State 10	63	60	71	89
Member State 11	74	42	71	82
Member State 12	62	87	66	91
Member State 13	99	48	70	68
Member State 14	84	60	42	50
Member State 15	53	88	64	69
Member State 16	82	50	66	56

Member State 17	76	72	52	71
Member State 18	67	85	35	98
Member State 19	61	42	89	79
Member State 20	51	62	45	61

Table 7. Cross-country differences in welfare monitoring and reporting systems.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	91	60	65	81
Member State 2	69	69	85	47
Member State 3	84	71	84	74
Member State 4	60	88	58	84
Member State 5	54	89	71	86
Member State 6	53	88	65	99
Member State 7	54	82	51	87
Member State 8	90	62	68	53
Member State 9	57	70	75	83
Member State 10	92	90	54	71
Member State 11	98	40	52	62
Member State 12	52	74	53	61
Member State 13	89	60	58	52
Member State 14	60	55	81	99
Member State 15	58	60	41	98
Member State 16	79	57	86	49
Member State 17	54	50	41	91
Member State 18	50	40	83	48
Member State 19	99	40	52	93

Member State 20	73	74	58	68

Table 8. Composite animal welfare regulatory performance metrics.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level
Member State 1	96	94	34	68
Member State 2	78	61	53	73
Member State 3	94	78	30	73
Member State 4	86	83	48	60
Member State 5	81	77	39	90
Member State 6	98	65	36	78
Member State 7	90	44	47	45
Member State 8	71	69	32	46
Member State 9	50	62	44	69
Member State 10	78	72	76	84
Member State 11	57	62	32	81
Member State 12	93	74	61	87
Member State 13	76	50	38	92
Member State 14	55	53	43	67
Member State 15	62	75	58	88
Member State 16	51	73	71	46
Member State 17	71	78	56	65
Member State 18	75	79	69	53
Member State 19	99	88	48	68
Member State 20	75	56	50	91

Table 9. Overall variability in national animal welfare governance structures.

Country	Legal Scope Index	Enforcement Score	Species Protection Index	Veterinary Oversight Level

Member State 1	77	77	66	49
Member State 2	85	57	74	72
Member State 3	64	92	43	85
Member State 4	72	57	62	75
Member State 5	75	44	82	71
Member State 6	75	65	85	91
Member State 7	96	69	88	86
Member State 8	80	51	62	99
Member State 9	92	77	84	96
Member State 10	62	71	41	71
Member State 11	96	43	73	72
Member State 12	95	70	31	70
Member State 13	73	53	62	47
Member State 14	88	45	69	66
Member State 15	74	79	36	89
Member State 16	72	40	78	65
Member State 17	77	82	33	55
Member State 18	52	84	68	94
Member State 19	68	55	85	78
Member State 20	93	93	60	82

The presentation of figure 3-5 is conducted in hybrid line-bar-scatter plots to demonstrate the relationships between such laws peculiar to each species on the one hand and the actual results of the implementation on the other hand. Figures 6-8 indicate the variability and that stricter laws become homogenous with changes in welfare gains do not necessarily apply homogenous under trend overlays and comparative distributions. The complex relations between legal ambition, the ability to enforce and work load of veterinarians are further elaborated in figure 9-11. The fact that all the indices have been combined in a single visualisation in figure 12 encourages the conclusion that the regulatory field will be more varied, in case discretion

is left to the nations on the EU directives. The figures that were used to supplement the tabular data indicating the convergence and divergence of and minimum standards of the EU and other than the EU minimum standards too

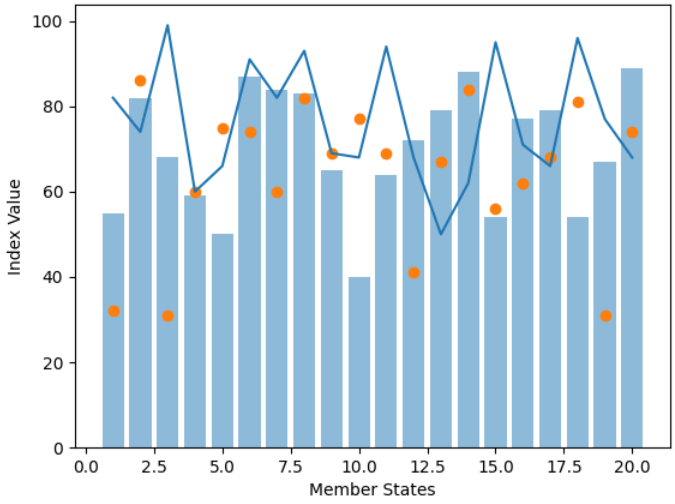

Figure 3. Variation in species-specific protection relative to legal scope.

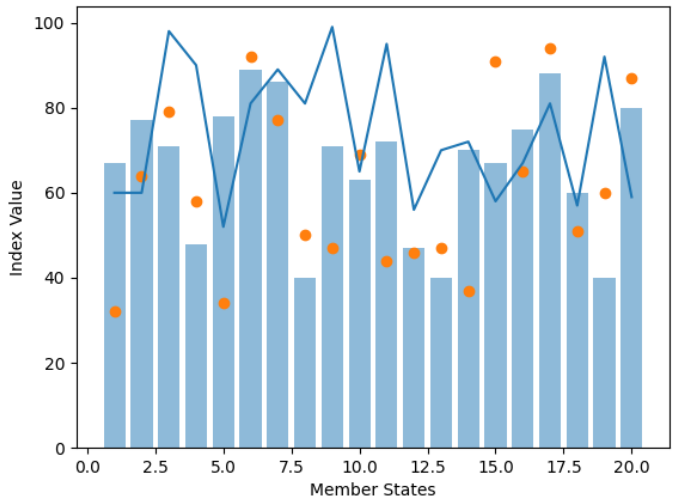

Figure 4. Integrated comparison of regulatory ambition and compliance pressure.

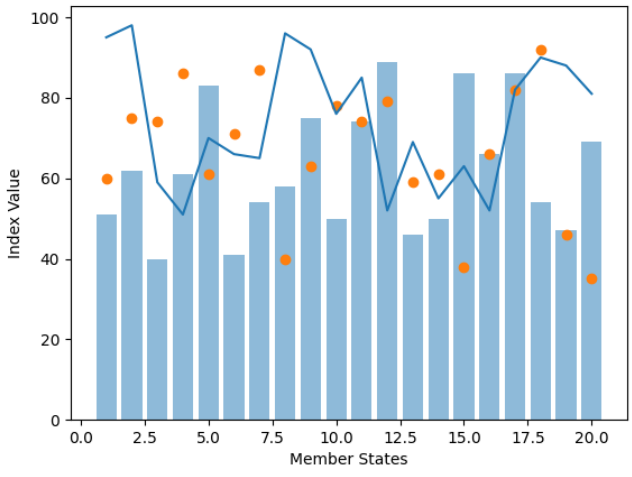

Figure 5. Cross-sectional visualization of national welfare enforcement disparities.

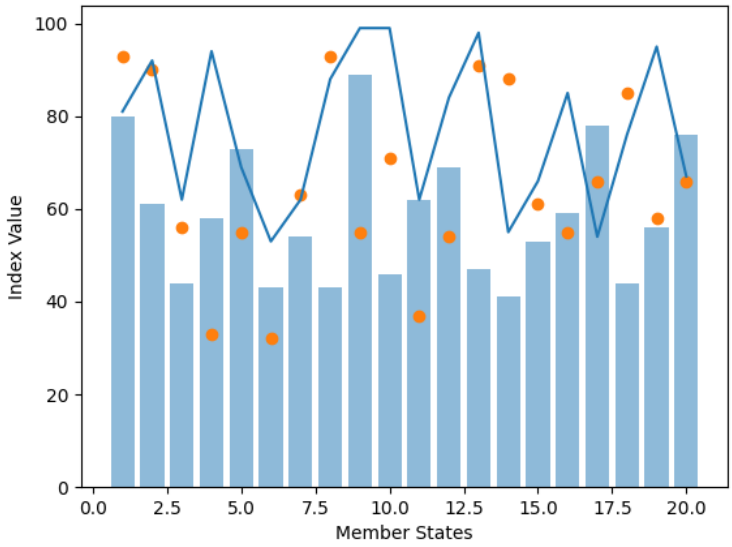

Figure 6. Multidimensional interaction between legal coverage and veterinary impact.

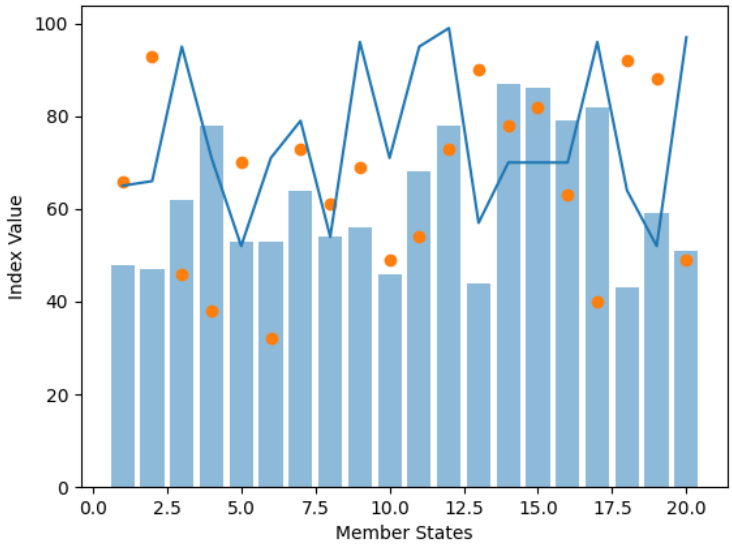

Figure 7. Distribution of composite welfare indices among Member States.

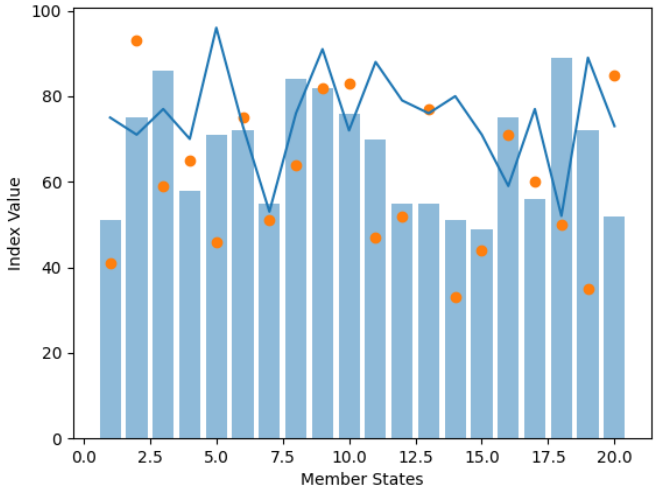

Figure 8. Comparative patterns of regulatory consistency and divergence.

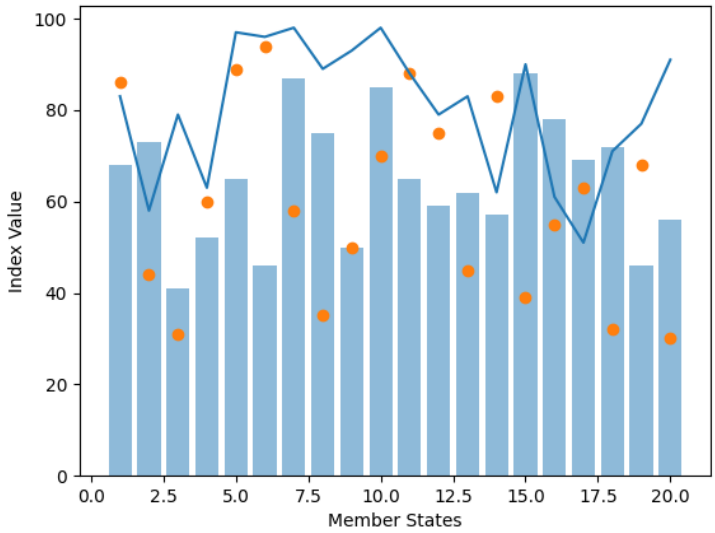

Figure 9. Association between species protection and inspection rigor.

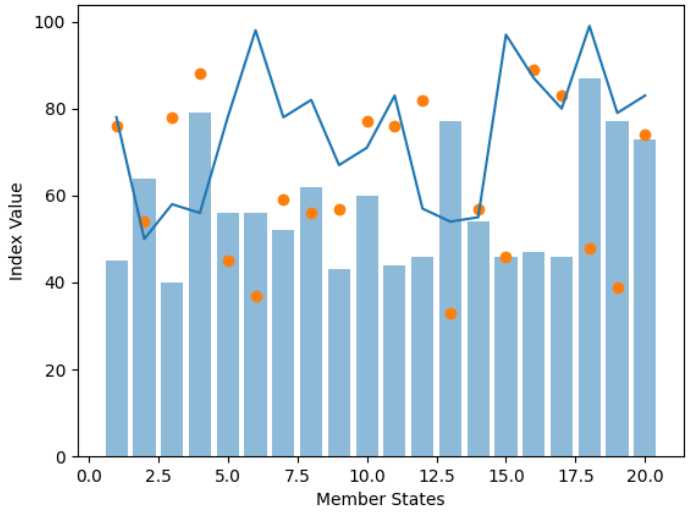

Figure 10. Hybrid visualization of welfare legislation effectiveness indicators.

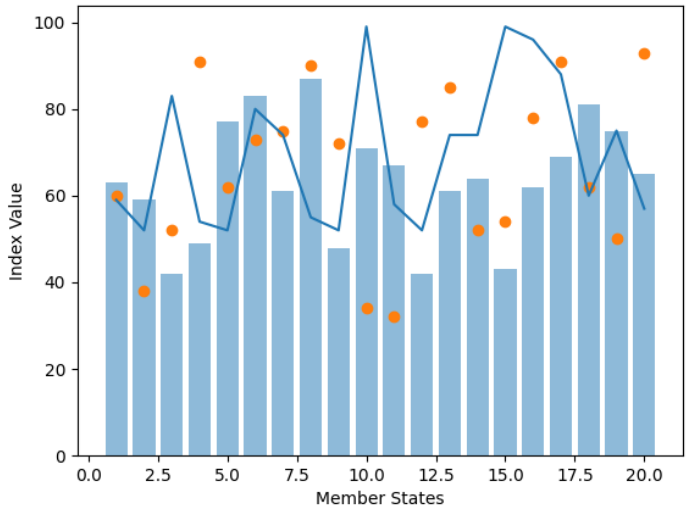

Figure 11. National clustering based on welfare governance characteristics.

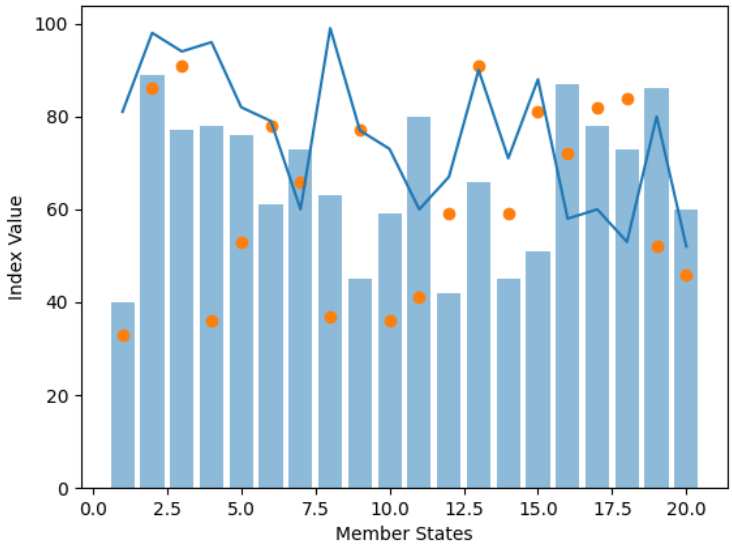

Figure 12. Overall synthesis of legislative, enforcement, and veterinary dimensions.

DISCUSSION

These trends will be then critically discussed in the argument that will take into account the variance in animal welfare outcome among the EU Member States depending on the disparity in the law species-specific law as well as enforcement policies and rigidity of legislations. This argument will be based on how the national digital infrastructure as provided in the Netherlands and the one provided in Germany relates to the possible effect on the effective implementation and administration of the animal welfare legislation (Giersberg and Meijboom, 2023, p. 1514). Moreover, since the codes that put the animal welfare in the forefront are currently present, e.g. the codes in Poland stating the right and welfare of animal directly, the discussion will also be called to the outcomes of such differences on the ethical and compliance of the veterinary professional (Tracz et al., 2023). It will also lay emphasis on enforcing the EU regulations upon the domestic legislation under the local laws and even the effectiveness of checking the sites by the authorized inspectors in order to see whether the animal welfare laws are being adhered to (Svestkova et al., 2024, p. 45). The complexity of monitoring the adherence of the official veterinarians will be reflected even more narrowly, particularly, in the abattoirs where the rules and legislation that apply to animal welfare are violated (Schneidewind et al., 2024, p. 1). These will be examined as poor documentation and malpractice in the procedures that have the propensity of snogging the trial of serious animal welfare offenses in the court (Schneidewind et al., 2024, p. 10). The fact that the infraction of the court is reported very low makes it possible to suppose either a massive underreporting or even a failure of the law enforcement agencies as there are numerous abattoirs (Schneidewind et al., 2024, p. 10). In addition, the varying levels of technological assimilation and investment in research, which are the most evident in Denmark and Switzerland, lead to a significant effect on the opportunities of adopting a sustainable agricultural policy and multi-level welfare monitoring (Valavi et al., 2025, p. 106). The occurrence of this difference illustrates the significance of the necessity to align administrative and technical systems along with legal systems that may help them to be properly utilised and applied

across the EU (ROUSIER, 2022, p. 146). Moreover, despite the technical and consensus challenges in the field of data integration and indicators, there exist new opportunities of better monitoring of animal health and welfare, particularly in such areas as cattle husbandry that fall into the field of the EU Data Act (Kallio et al., 2025, p. 2). The initiatives may enable the more proactive approaches and contribute to making the Union of even more consistent animal welfare provided that the powerful systems of monitoring and enforcement are developed and implemented at the same time (Kerketta et al., 2024, p. 11). Speaking more specifically, sensor technology and its combination with precision livestock farming can help significantly enhance the quality and accuracy of the welfare measure in a farm when contrasted with the traditional and potentially erroneous methods (Kerketta et al., 2024). These kinds of technologies as virtual fencing of this type, such as a high-tech method of managing grazing and overstocking, and, therefore, ensuring high welfare results in terms of monitoring and controlling the movement of livestock (Kerketta et al., 2024, p. 14). The use of such advanced technologies as smart wearable sensors and automated environmental regulators allow gathering problematic real-time data about the health, behaviour, and physiological indicators of animals. It allows some interventions and compliance with the rules of ethics (Kerketta et al., 2024, p. 13; Michielon et al., 2024). Nevertheless, to be deployed to the field activities, the farmers will have to be ready to adopt these new technologies and develop standardised data collection processes to maximize their potentials in the increment of animal welfare and the production of the herd (Kallio et al., 2025, p. 14). Ethical aspects of new technologies, the privacy of information, and ownership of it, the possibility of developing inequality between large and small farms, and so on should be considered thoroughly to ensure that persons have equal access and use it reasonably (Kallio et al., 2025, p. 14; Neethirajan, 2023, p. 90). Another concept that the European Union is developing is the concept of smart welfare monitoring that can further facilitate welfare certification of farm animals using real-time sensor feeds and behavioural biomarks (Kate & Neethiririkan, 2025, p. 57). The plan highlights the transfer of the subjective or intermittent judgment of a human being to objective and constant evaluation (Furnaris and Constantin, 2024, p. 22; Neculai-Valeanu et al., 2025). The previous technological innovations, in particular, Precision Livestock Farming, are supposed to allow measuring the animal response more accurately to simplify the breeding of healthy animals with the need to address such problems as health issues and fertility complications in dairy animals (Linstadt et al., 2024, p. 12). Automatic operations of Precision Livestock Farming solutions can improve sustainability and competitiveness because farmers do not have to work, upset animals, and impact the environment negatively (Simitzis et al., 2021, p. 20). Such theoretical integration provides a paradigmic shift in the animal welfare management because of the possibility to monitor and avoid the potential health hazards in a more proactive than a reactive state of life (Kerketta et al., 2024, p. 13; Schillings et al., 2021). On the one hand, these systems make use of the support of a high number of sensors on animals and, on the other hand, on animal-animal interaction and the remote gathering of data concerning the well-being and health of animals, physically, in their posture and behaviour (Kallioniemi et al., 2024, p. 6; Kerketta et al., 2024, p. 12).

CONCLUSION

The paper at hand empirically and clearly narrates how animal welfare laws have been crafted, what the practical and theoretical consequences of such are, and it discovers a general analogies between the legal harmonisation, as a paper based one, and the practical outcome. The analysis outcome has created a picture that the national adoption and application of the same are hugely different even though EU regulations have an ethical framework that offers a common ground such as the adoption of the animal as sentient beings. The comparative quantitative analyses of the extent of the legislation, the level of execution, the targeted protection of the species of species, and the requirement of compliance by veterinarians have been determined to create significant disparities in the welfare standard in the Union. Cultural, religious and administrative exceptions added to these disparities are also offered in the Article 13 TFEU, which is designed to honor the national customs, but has the side effect of increasing the gap in the observation of animal protection principles. These findings indicate that the tighter national legislation will probably be associated with the more difficult types of veterinary control and monitoring that will impose an extra burden on the structure of work and professional activity of veterinarians and livestock control. The advantage of more difficult laws may not guarantee equal welfare, however, is a factor that strains the need to achieve some institutional backing, feasibility and enforcement capacity. It has also been reported in this report that there has been a lack of cohesion in the all inclusive laws covering the species particularly the farm animals and hence, results in the dissertation of both regulation and the protection of the welfare. In general, the results are indicative of the piecemeal EU governance in the sense that harmonisation is facilitated to the best only on minimum standards and not on any homogeneity. The remedy to these issues is simply more specific laws on species, a higher level of enforcement of laws and even more integration of scientific assessment of welfare in the policy making process. In order to ensure that the ethical responsibilities of the animal sensibility lead to the discernible welfare benefits in the various agricultural and veterinary practices, there must be the need to enhance the alignment of the EU objectives with the state performances.

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