



REVIEW OF STRAY DOG MANAGEMENT: DOG DAYS IN THE EUROPEAN COUNTRIES

TH. PAPAVALI¹, A. KONTOGEORGOS¹, A. MAVROMMATI¹,
E. N. SOSSIDOU² & F. CHATZITHEODORIDIS³

¹Department of Agricultural and Food Business Management, University of Patras, Agrinio, Greece; ²Ellinikos Georgikos Organismos-DIMITRA, Veterinary Research Institute, Thessaloniki, Greece; ³Department of Regional and Cross Border Development, University of Western Macedonia, Kozani, Greece

Summary

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Western societies face a major challenge to control their stray dog population due to its uncontrolled propagation and abandonment. Despite the management programmes implemented in many European countries, the reduction of the stray dog population has not been achieved. This is not only related to dogs' well-being, but also to their coexistence with humans, especially in urban areas. Problem-solving approaches vary in different countries, as there is no common legislation in the European Community dealing with stray dog control. To realise this research study, data from secondary sources, as well as data collected from thirteen European countries were analysed. A comparative overview of policies and measures was examined to show that stray dog population management depends on the policy implicated by each country. In contrast to countries of northern Europe, significant problems were faced mainly by the countries of southern Europe and the Balkans. The purpose of this paper was to present the legal framework of management for the stray dog population in accordance with what is implemented in different EU countries and to unveil the need for action for a common European Community Directive or Regulation dealing with stray dog control.

Key words: European countries, population management, stray dog

INTRODUCTION

For the past thirty years, the term "animal welfare" has been used to describe the "well-being" of an animal: a quality term that can be measured scientifically and varies over a range from very good to very poor (Broom, 2011) while Mellor (2014) explains animal welfare based on their positive emotions. The Food and

Agriculture Organization (FAO) has developed an Animal Health Action Framework in conjunction with the "One Health Concept" programme and set out a new global scientific cooperation, looking at improving the health and well-being of animals, humans, and the environment for the purpose of integrated health care for

all (Monath *et al.*, 2010; Karesh, 2014; Häsler *et al.*, 2014). At the same time, the World Organization for Animal Health (former OIE) has set "well-being" standards (health, comfort, food, safety, pain-free, and fear-free), as well as more specific guidelines for managing stray dogs populations in relation to human health.

The welfare of animals, a biologically definable measure of quality as explained above, is also an ethical issue because most people consider that animals are moral entities with an intrinsic value (Broom, 2003; Aaltola & Wahlberg, 2015).

Domestic animals are animals adapted to live next to humans and depend on them, they cannot survive on their own and their role is very important in relation to meeting human needs such as safety and companionship (Morters *et al.*, 2014; FAO, 2014). Pet ownership is mainly related to demographic factors (urban/rural area, educational level, age, family structure, income). The pet population in EU countries has increased significantly in recent decades, as a significant portion of the human population adopts dogs or cats (Bedford, 2020a), while the recent Covid-19 pandemic has fueled the trend of adopting pets. According to Dalla Villa *et al.* (2010), there are more than one hundred million pets across the EU providing significant psychological and physiological benefits to their owners. The European Pet Food Industry verifies this, as it has been estimated that approximately 80 million households in Europe own at least one pet (FEDIAF, 2018). The coexistence of humans and pets is clearly more intensive and ever-increasing in urban areas (Urbanik & Morgan, 2013), although cities are not usually designed to meet the needs of animals (Sanders, 2011). It should be emphasised that in addition to the social importance of pets, their breeding and trade represent an important sec-

tor of economic activity with a particularly high turnover worldwide. In Europe, the population of domestic dogs increased by 11 million between 2010 and 2019 and reached a total of 87.5 million in 2019 (Bedford, 2019; 2020b).

However, in addition to the domestic dog population, there is an even larger population of stray dogs estimated to account for about 75% of the global dog population (WAP, 2022b). For the EU, the stray animal population is estimated to be as high as that of domestic-owned pets, causing significant problems in both urban and non-urban areas (ESDAW-EE, 2020). An important reason for the existence and increase of the population of stray dogs is the abandonment of domestic dogs mainly due to the high cost of ownership and maintenance (Stregowski, 2021). According to Weliver (2019), the cost of a pet can reach \$1,000 in the first year and over \$500 for each additional year. Especially, during the global economic crisis, the abandonment of domestic dogs has increased significantly, resulting in an increase in the population of stray dogs in some countries (mainly in urban areas), threatening public health as well as the well-being of the animals themselves. During this period, as the cost of pets weighs heavily on the household annual budget, the issue of stray dog overpopulation was considered a "second priority". However, the problem of the existence of stray dogs is a major problem for societies and has been recognised as one of the three most important priorities for the United Nations. This has led to regional population management control initiatives in both the Balkans and Western Eurasia, not only for the benefit of the well-being of stray dogs but also for humans in terms of public safety and health. Stray dogs are associated with the transmission of several zoonotic pathogens,

such as rabies, and are responsible for pathogen pollution, dog bite injuries, road traffic accidents, the killing of livestock, but also for their own uncontrolled reproduction (OIE, 2016; Hild & Schweitzer, 2019; Bedford, 2020a).

Studies have been conducted in many countries around the world to predict future population trends for both pets in general and stray dogs, as well as for the management of diseases associated with these animals (Murray *et al.*, 2010; Westgarth *et al.*, 2010; Downes *et al.*, 2011). The existence and increase, in some cases, of the stray dog population create the need to evaluate the management programmes implemented in terms of their effectiveness in solving the problem.

This paper aims to present and critically evaluate the management framework for stray dogs in accordance with what is in force and implemented in the EU countries. It defines as stray dogs those without owners or human supervision, lost or abandoned dogs, those roaming in residential and uninhabited areas, and sometimes wild dogs. The originality and contribution of this work, although limited, focus on the presentation of the European legislation mosaic and programmes for stray dogs to understand the need for a common and horizontal European strategy on this issue.

After the brief review of the introduction, we present a section that includes the current situation of the elements/factors of the management frameworks for the stray dogs of the EU countries, the discussion, and finally the conclusions.

METHODOLOGICAL APPROACH

This study tries to describe the management framework of the stray dog population in EU countries. The current situation and the legal framework are described in

the literature review, while via email, telephone conversations, and interviews as well as through a questionnaire, the positions, and experiences of the competent, involved authorities in thirteen EU countries were recorded. In this way, the problem of dealing with the population of stray dogs due to their uncontrolled reproduction and abandonment was approached.

To achieve the purpose of this paper, it was deemed necessary to attempt to describe the management framework both through the key stages, and the critical elements of the strategy implemented, as well as its evaluation (Ansoff *et al.*, 2018). In particular, Fig. 1 shows the management framework consisting of the relevant legislation on pets and stray animals of each country, the policies and practices adopted and followed by each country, the stakeholders/competent authorities that implement the policies/management programmes, and finally the implementation and evaluation of implemented programmes, which provides feedback on the legislation and policies implemented, based on the results and the need to change or modify stray dog population management programmes.

The research was carried out in two phases. In the first phase, part of the problem was investigated by collecting and studying the relevant literature and secondary data (Gummesson, 2006). The purpose of this paper was to identify the dimensions of the studied subject, mainly through the legislation, its dynamics, as well as the strategies and practices implemented (Mason, 2002).

After collecting, studying, and analysing the secondary data, communication via email or telephone (where possible) with the competent authorities of the EU countries was realised. During this survey, due to the Covid-19 virus pandemic

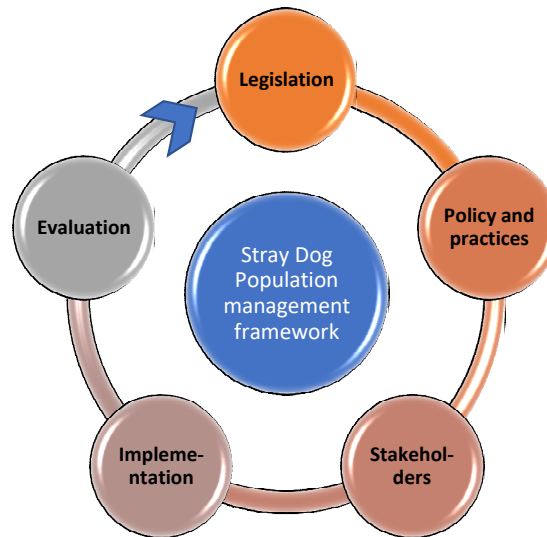


Fig. 1. Stray dog population management framework.

and its limitations, an in-depth investigation was not possible through the Delphi approach, designed for this purpose and a questionnaire was drawn up for this reason. The questionnaire was emailed to the competent national authorities (local/municipal authorities, animal welfare organisations, and shelters for stray animals), in 28 EU countries (including the United Kingdom), with a request to be answered only by those involved institutionally in stray dog management. The need to use the questionnaire was indicated by difficulties in direct communication with the authorities, and by the many differences in the management of each country, the different competent bodies from country to country, and the general lack of common legislation. The questionnaire was not randomly addressed to respondents but had to be answered by special officers/representatives of the competent services of the 28 EU Member States, and the answers were treated as expert answers to open-ended questions and as absolute positions of states (mainly in

closed-ended answers or those related to institutional issues).

The structure of the questionnaire included sections devoted to the competent services of each country, the existence of problems related to stray dogs in the current legislation of each country at the level of property, obligations, penalties, adoption, the management stages of stray dogs in matters of cooperation with other stakeholders, in financial support and finally in the results and proposals to reduce the number of stray dogs. The configuration of the questionnaire has considered existing ethical and legal approaches for animal protection. Questionnaires were submitted online in the second quarter of 2020.

Sixteen (16) countries responded through their competent body (16 questionnaires). Of the sixteen questionnaires, 13 were considered fully completed and concerned 13 different countries (Greece, Cyprus, Malta, the Netherlands, Denmark, Portugal, Belgium, Slovenia, Bulgaria, Lithuania, Croatia, the Czech Republic,

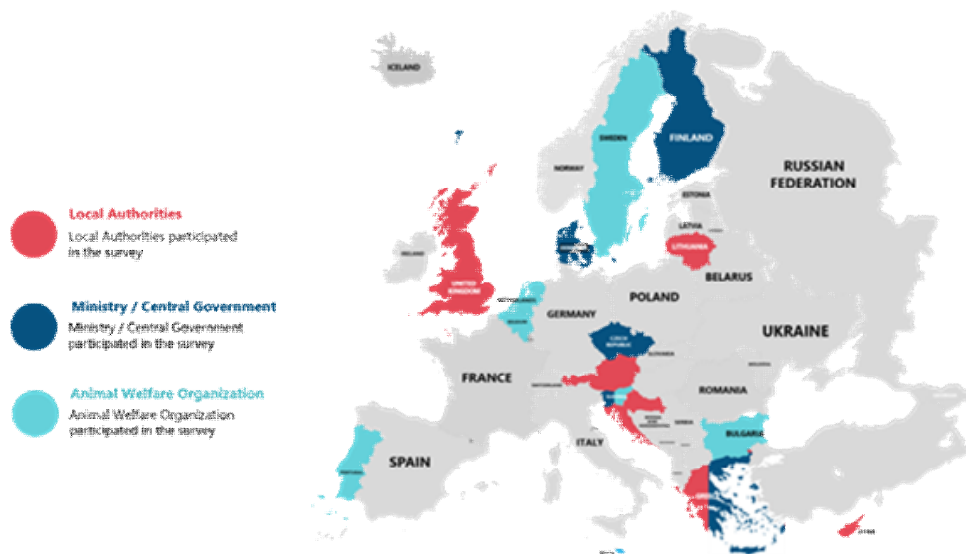


Fig. 2. Geographical distribution of the countries that participated in the survey.

and the United Kingdom). The remaining three (3) countries (Finland, Sweden, and Austria) replied that due to the management model they apply, problems in managing the stray dog population in their territory were not faced resulting in not completing the questionnaire. The geographical distribution of countries that responded to the questionnaire is shown in Fig. 2.

LITERATURE REVIEW

The “problem” of the stray dogs and the management practices

The number of stray dogs in an area is determined by its carrying capacity, that is, the maximum number of stray dogs that can be maintained in the area based on available resources (food, water, shelter). If adequate resources are available, populations will increase steadily until they arrive at the maximum carrying capacity of the area and the maximum number of members (Amaku *et al.*, 2010; Sternheim,

2012; Baquero *et al.*, 2015). A stray female dog, on average, gives birth to four puppies every six months and having enough nutrition can bear more than 5,000 offspring over a five-year period. If there are sufficient resources, then every dead stray dog gets another stray dog, continuously increasing their population.

The stray dog population ends up in this state for specific reasons (Hild & Schweitzer, 2019; Vučinić *et al.*, 2011) such as:

- Irresponsible pet owners, who usually provide inadequate care to their animals or avoid neutering them, while abandoning them under certain circumstances,
- The existence of humans who either do not know or have limited knowledge about animal welfare,
- The uncontrolled reproduction,
- The abandonment of pets due to financial difficulties of the owners,
- The relocation of owners or other events (e.g., absence for holidays) lead

the irresponsible owners to abandon their pets.

- Human intervention mainly through the production of plenty of food, also causes overpopulation of stray dogs as it creates conditions for their number to increase.

The competent authorities (municipalities, regions, states) have a responsibility to address both the problem of stray dogs and their growing population, through programmes that serve specific strategies for each country. As a typical example, Teramo (Italy) can be reported for the significant presence of stray dogs, which is the result of such behaviours, as dog owners either abandon pets or let them roam the streets, leading the competent authorities to enforce "responsible property" legislation (Slate *et al.*, 2008).

However, a management programme focusing exclusively on the symptoms that do not investigate or address the real cause of the increase in stray dogs may have short-term effects which ultimately do not lead to a sustainable solution to the problem (Slate *et al.*, 2008).

The effectiveness of stray dog management programmes from the "DogsTrust" data which has carried out annual surveys of stray dogs in both the United Kingdom and Ireland since 1997 can be realised. According to its researchers, there were around 136,500 stray dogs in the United Kingdom in 1997 (of which 21,840 were euthanised by local authorities) while in 2018 they decreased by 59% reaching approximately 56,043 stray dogs (only 1,462 have been euthanised, reducing euthanasia by 93% since 1997) (DogsTrust, 2018). Within one year (April 2018 – March 2019) 7,778 dogs in the UK were reunited with their owners compared to 5,080 dogs reconnected in the previous year (DogsTrust, 2019). In Ireland, there is also a significant decrease

from 2005 to 2017 in the accommodation of stray dogs in shelters, and a significant reduction in euthanasia (40% between 2016 and 2017) because of their comprehensive management programmes (DogsTrust, 2018).

Conversely, in areas such as Bucharest in Romania, where the number of stray dogs in 2014 was estimated at 65,000, their rapid reproduction and increase, endanger human health. About 15,000 people are vaccinated in Bucharest each year because they have been bitten by mostly stray dogs. For this reason, since 2013, Romania has enacted a law allowing euthanasia of dogs staying in shelters for more than 14 days, causing many reactions in Northern and Western Europe (Mörner, 2014). In Cyprus, according to Nikolaou (2020), a few local authorities have proceeded to the compulsory registration of dogs and even fewer apply current dog legislation in its entirety. In 2019, 4,791 stray dogs were sent abroad for adoption, an increase in comparison with previous years, while in the last five years the number of abandoned dogs adopted abroad reached 20,257 according to animal welfare organisations.

The relevant legislation is generally addressed, and one would say more to the animals themselves and less to their owners and to the citizens. This suggests that both governments and other public authorities do not have a substantial interest or political will to solve the problems posed by stray dogs (ESDAW-EU, 2020), as stray dog management is not subject to specific or uniform legislation in the EU meaning that control over them remains the sole responsibility of each Member State. The EU, for its part, has actively supported the establishment of international guidelines and standards from the World Organization For Animal Health (known as OIE) for the control of stray

dogs as they pose a threat to human health (Dakkak, 2010). The purpose of these OIE international standards is to improve the welfare of animals worldwide, regardless of socio-economic status, religious or cultural background, by creating national high-quality veterinary services. This purpose is reviewed and approved annually by 180 Member States of the World Organization For Animal Health (former OIE), recorded in codes and manuals, published by the OIE (Mazzoni, 2012; OIE, 2016), and recognised by the World Trade Organization (WTO). Finally, the guidelines of OIE and FAO emphasise the need for parallel approaches to control stray dog populations and require their euthanasia to be done in a specific way only, when necessary, while arguing that the implementation of euthanasia without other parallel actions is not sustainable. The EU is fully aware of the continuing cruelty – for both pets and stray dogs – in Europe and argues that the OIE is an organisation that no Member State recognises and therefore does not fully comply with its guidelines (ESDAW-EU, 2020).

EU citizens, non-governmental organisations (NGOs), and members of the European Parliament have called for pet protection across the EU, while an evaluation of EU animal welfare policy concluded that pet welfare can only benefit from uniform legislation. In 2010, the Council called on the Commission to launch a campaign on the "responsible ownership" of dogs and cats, and later the European Parliament pushed for a single EU legal framework for the protection of pets and stray animals. The Commission also adopted the EU's overall animal welfare strategy in 2012, while in 2014 it approved a study on the welfare of dogs and cats associated with commercial practices. In this context, during the first European Conference on "The well-being of

dogs and cats" held in Brussels on 28 October 2013 to promote pet welfare inside and outside the EU, it was observed that "The rise in the lucrative trade of dogs and cats has brought problems of its own: genetic selection, puppy farming, mutilation, and inhumane disposal have far-reaching consequences but to date, there is no harmonised EU legislation to address the welfare concerns" (EC, 2015).

Since 2014, eleven (11) Balkan countries and territories have agreed to comply with Chapter 7.7 of the OIE Animal Health Code on the control of stray dog populations by 2025, recognising that this will primarily eliminate rabies caused by dogs. In 2016, OIE launched the "Become His Hero" campaign, mainly in the Balkans, aimed at future dog owners, to reduce the number of stray dogs and the problems they create by reducing pet abandonment on the road. Along with moves for uniform legislation in the EU, integrated stray dog population management (DPM) programmes implemented mainly in urban areas, aim both at neutering populations through reducing births, as well as improving the well-being of citizens as they help in more effective control of rabies. However, these programmes are usually not funded by governments, causing concerns about their long-term viability (Taylor *et al.*, 2017). Many DPM programmes are based on a model where stray dogs are collected by competent authorities, transported to shelters, and remain there until their adoption or their natural death, or even until their euthanasia. In practice, the number of dogs entered to shelters usually exceeds their capacity (Dias *et al.*, 2015) and when the shelters are full, the living standard of the animals in them is low (ICAM, 2019). In areas where the shelters are full or resources are limited, euthanasia remains the only solution to the over-

population of stray dogs, even in high-income countries. In the United Kingdom about 10% of stray dogs are euthanised (Stavisky *et al.*, 2012). Both the killing of a stray dog and its collection in a shelter reduces the problem for a certain period and does not lead to long-term population reductions (Sternheim, 2012; Dias *et al.*, 2015; ICAM, 2019).

According to Dalla Villa *et al.* (2010) "less expensive methods of controlling stray dogs, such as killing, the use of poisoned baits, and the shots have a small or no effect at all on population reduction". Stray dog shelters with limited use of euthanasia are referred to as an important but also an expensive tool for controlling stray dogs that developing countries cannot afford. Trapping-neutering-return (TNR) systems are characterised as less accurate, humane, and effective methods to control stray dog populations. In fact, a country's economic development is closely linked to existing infrastructure, and therefore "health and waste management systems are often inadequate in less developed countries, which increases the availability of food for stray dogs and the problem is growing". According to Sternheim (2012), a "Collection-neuter-vaccination-return" (CNVR) programme essentially helps reduce stray dogs, although most countries seem to apply the Collect-Neuter-Return (CNR) method whose efficiency is limited, as is not aimed at the heart of the problem. Another, more traditional approach is the "Collection-Shelter-Adoption/Euthanasia" combination (RAWC, 2014). Since 1990, the World Health Organization considers the combination of neutering (at least 70% of dogs), owner training (responsible dog ownership), and microchip placement (identification of animal with owner) as the most effective method of controlling stray dog overpopulation. According to

Amaku *et al.* (2010), the success of both neutering and euthanasia as policies to control stray dog overpopulation depends mainly on the dog abandonment rate. If all stray dogs in an area are not required to be sheltered, then society will recognise the seriousness of the problem and will have to take appropriate precautions to prevent their overpopulation (OIE, 2009). In addition, adopting dogs abroad does not help reduce the number of stray dogs as the adopted ones will be replaced by new dogs abandoned by their owners (Sternheim, 2012). Table 1 presents all the implemented programmes/management policies for stray dogs, as well as their effectiveness.

EU Legislation framework

From the EU point of view, the commercial circulation of animals must comply with Directive 92/65/EEC33 and the non-commercial movement of pets in the Member States, with Regulations (EU) 576 and 577/2013. Transporting dogs and cats for commercial purposes within the EU must comply with Regulation (EC) 1/2005. Hence, to date, there is no harmonised legislation in the EU on the management of stray dogs, although creating a single line is supported by the World Organization for Animal Health to control their population (Nikolaou, 2020). In fact, stray dog management programmes remain the responsibility of each Member State (ESDAW-EU, 2020), which has led to problems possibly exacerbated by differences between the relevant legislation of each Member State (EENAWLC, 2013). Most laws, EU directives, and regulations are almost exclusively concerned with the proper treatment of commercial animals, and the European Commission, realising the legislative gap, decided to fund further research on animal welfare (EU, 2017). At the same time, scientific

Table 1. Integrated stray management programmes/effectiveness

Integrated stray management programmes	Effectiveness
Use of poisoned baits and shots	Little or no effect on population density
Shelters for stray dogs with limited use of euthanasia	Important but expensive tool that developing countries cannot afford
Trapping-Neutering-Return (TNR)	Less accurate, humane, and effective methods of controlling the number of stray dogs
CNVR (Collect-Neuter-Vaccinate-Return)	Available always and helps reduce stray dogs.
Collect–Shelter-Adoption/Euthanasia	Traditional approach
Neutering-responsible dog ownership-Microchipping	The most effective method of controlling the stray dog population
Euthanasia of healthy and capable animals	Hides the problem while allowing it to continue.
Shelters for all stray dogs	Society is unaware of the seriousness of the problem and believes that to prevent the overpopulation of stray dogs all stray dogs should be admitted to shelters (impossible goal because shelters will be less than required) - the goal is to create shelters and not the reduction of the stray population

evidence shows that European citizens are concerned about animal welfare within and outside the EU (EU, 2017) and that the illegal trafficking and importation of dogs and cats from third countries could endanger people’s health and the animals themselves (EENAWLC, 2013).

Art. 13 of the EU Functioning Treaty requires full compliance with animal welfare rules both in the formulation and implementation of its policies (EP, 2014). However, due to many reports by EU citizens, calling for a single legal framework for the protection of pets and stray animals (1613/2010; 1274/2011; 1321/2011; 1377/2011; 1412/2011), the European Parliament, on 4 July 2012, adopted no. 2670RSP decision on the strategy for the protection and welfare of animals in the period 2012–2015 in the EU. This resolution contains rules for the identification and registration of animals, for stray animal management strategies (vaccination and neutering programmes), promoting responsible animal ownership, prohibiting

unauthorised shelters, prohibiting the killing of stray animals without medical advice, for information and education programmes in schools about animal welfare, and severe penalties in the event of non-compliance by the Member States. Finally, the European Parliament resolution calls on the EU Member States to ratify the European Convention for the Protection of Animals and incorporate it into their national legislation, while providing for some severe penalties for the non-compliant Member States (EP, 2012). In 2013, an EU conference on the welfare of dogs and cats was held in Brussels, noting that the trade with these animals is very profitable while, at the same time, creates many problems (e.g., breeding of unwanted puppies) (EENAWLC, 2013). OIE held the third regional workshop for stray dog populations in the Balkans (13–15 June 2018, Belgrade, Serbia) with the participation of 9 countries (Bosnia and Herzegovina, Bulgaria, Former Yugoslav Republic of Macedonia, Greece, Kosovo,

Montenegro, Romania, Serbia, and Turkey) in order to fully comply with the OIE standard for the control of stray dog populations (and consequently rabies) by 2025, with particular emphasis on the development of a national control programme for these populations (OIE, 2018). However, stray dog management in most countries, especially in the Balkans, belongs to the municipal authorities, without the appropriate infrastructure.

The fact that there is no monitoring or evaluation of implemented stray dog management programmes (none of the Balkan countries collects its data systematically) suggests that none of these programmes can be considered effective (EENAWLC, 2013). Many countries have laws that deal closely with dogs and humans, which are often not adequately implemented. There may also be differences in dog management practices between rural and urban areas, or dog owners of different religions or socioeconomic backgrounds (FAO, 2014).

The most developed countries (mainly in northern Europe) implement broader stray dog control programmes, while the less developed countries, usually use killing methods (including poisoned baits) when implementing dog control programmes (Dalla Villa *et al.*, 2010).

In the United Kingdom, dog legislation has two objectives: a) to control the dog population and b) to protect them, trying to regulate the dog-human relationship in terms of human interests (e.g., security and economy) and, at the same time, ensure the welfare of the dogs themselves. Dog abandonment has been a serious offense since 1960, and a fine is imposed under the Environmental Protection Act (1990), both by the local authorities and by the police, on owners who have lost their dogs. The Clean Neighborhoods and Environment Act (2005) empowers

local authorities to deliver stray dogs to shelters or euthanasia if their owner is not found, while the Animal Welfare Act (2006) requires people to provide them with shelter, sufficient nutrition, and protection against pain and illness (Srinivasan, 2013). When a stray dog is identified with its owner, it must be returned to him. If not, or if its owners are unable to maintain it, the dog is transported to the centers of the Royal Society for the Prevention of Cruelty to Animals (RSPCA) where it will remain for seven (7) days. If the owner wants his dog within seven days, it will be returned to him, after payment of a residence fee, while after seven days the dog will become the property of the RSPCA and may even be euthanised (APGAW, 2012). Dogs, whose health and fitness are not good, are euthanised. England is considered a nation that supports animal welfare and animal well-being laws and practices have been influenced by similar legislation in other countries, such as India. England, Scotland, and Wales have their own rules, however, on April 6, 2016, compulsory microchipping has been introduced in dogs over 8 weeks of age (Anonymous, 2016). The basic animal protection laws of these countries are similar, with small differences to be considered (McClintock, 2016).

In Italy, there is state protection of pets and the prevention of stray dogs (Law 281/91), and municipalities are required to collect stray dogs and keep them in shelters until their natural death unless dangerous or seriously ill (Nardoia *et al.*, 2019). The fact that the standards for managing these dogs are set by regional rules, creates a wide variety of approaches throughout the country and despite the efforts of the competent authorities, stray dogs still affect health, prosperity, and public expenditure (Barnard *et al.*, 2015).

A large number, mainly of small Italian municipalities, are unable to maintain and manage municipal shelters and thus are forced to enter into agreements with private facilities for cost reduction (Adriani *et al.*, 2011). Although the legislation in Italy requires the installation of microchips and recording dogs to limit their abandonment, the results are poor. About 25% of all pets (150,000 dogs) are abandoned despite the creation of regional dog registers, while 4,000 road accidents have been caused by stray dogs in the last 10 years (Voslarova & Passantino, 2012). The Czech Republic is in the same spirit as Italy, where dogs, by law, are protected in shelters and remain there until their natural death.

The 2004 Austrian Animal Welfare Act prohibits the killing of stray dogs (Art. 6) while in case a dog has been abandoned or it is not possible to return it to its owner, then the competent authorities should take care of the welfare of this animal (Art. 30) (WAP, 2022a). Online advertising for dog sales was gradually abolished in 2017, while the Austrian government promotes responsible ownership programmes.

The problem of stray dogs in Bosnia and Herzegovina is dealt with different approaches and with the involvement of public health services, the creation of shelters, and the active participation of hunting clubs. The efforts in this country to reduce the large numbers of stray dogs, according to Katica *et al.* (2017), require action and measures such as the adoption of a stable and sustainable legal framework, educating citizens about responsible dog ownership, neutering and euthanasia of sick and aggressive dogs, as well as their installation in shelters.

In Romania, the law on the management of stray dogs allows local councils to establish shelters for stray dogs where

they will stay for 14 days and then (unless their owners are found or adopted) will be euthanised. Nevertheless, in Romania, stray dogs are killed as a strategy to control their population and clean up the streets. The people of Romania, after the mismanagement and abuse of stray dogs in their country, turned to the EU, which states that the welfare of stray animals is not governed by EU rules and remains the sole responsibility of each Member State (Alison, 2020). The killing of stray dogs in Romania has been ongoing since 2001 and is regularly approved by the country's parliament (Save the Dogs, 2021).

In Greece, the Municipalities are responsible for the implementation of the basic legislation (Law 4039/2012) for the protection of both pets and stray dogs (GGHR, 2012). However, only a limited number of municipalities have shelters, while many others have implemented stray dog management programmes in their area with key points: their collection, microchipping, neutering, adoption, or re-entry into their natural environment. Citizens' education programmes on "responsible pet ownership" and "adoption of a stray dog" are implemented both by the municipalities, as well as by animal welfare organisations (OIE, 2016).

In Cyprus, based on the "Law on Dogs" (184 (I) / 2002) no one can own a dog unless authorised by a competent authority. The license is valid for one year, from the date of issue, and the dog owner is obliged to renew it every year, after presenting an animal health certificate or booklet (issued by an authorised veterinarian) to the competent authorities, fifteen (15) days before the expiration of the existing license and pay the prescribed fees. The competent authority must also maintain a register of dog owners including the name, identity, address, telephone,

and the occupation of any person licensed to own a dog (CYLAW, 2002).

Malta has adjusted European legislation, without visible improvement in control of stray dog overpopulation. According to the Malta Animal Husbandry Association, animal welfare focuses mainly on caring for injured animals and not abandoned ones, chained or stray dogs. Many stray dogs that end up in shelters usually come from illegal farming. The fact that the abandonment of dogs in Malta is constantly increasing, leads to the search for new solutions to reduce the stray dog population (Cilia, 2018).

EU Directive 2011/83, of the European Parliament and of the Council (25 October 2011) on consumer rights requires traders to provide consumers with the information they need to make informed decisions and prohibits deceptive practices. In accordance with this Directive, a "product" must be "definitely good", including cats and dogs. Relevant legislation on pet ownership applies in Belgium, while breeders and pet shops are required to provide a pet warranty certificate to the buyer, valid for two or more years from the date of purchase. In France, consumer protection law is included in the Civil Code (Code Civil; Protection du consommateur) while in Code Rural there are additional guarantees for obtaining a dog or cat, and it is forbidden to sell a dog or cat suffering from infectious diseases. In Italy, consumers are protected by the Civil Code, which regulates the purchase of all animals. Consumer protection provisions are general and not sufficiently detailed and so Italian consumers have no specific guarantees for the health of dogs. In the Netherlands, there is a general consumer protection law while the last pet law of 2014, focuses essentially on animal welfare. It requires the seller to provide the buyer with "all relevant information

concerning the state of health of the animal and the vaccination status of the animal". In Spain, consumer protection is based on a 2007 general law, while the 2009 amendments provide for more protection rules and the care and maintenance of animals. In Ireland, the animal welfare laws of 2006 and 2011 impose legal obligations on pet owners and sellers to ensure their welfare. In Latvia and Lithuania, breeders are not legally permitted to sell animals with underlying problems to consumers. Practically, research on the welfare of dogs involved in commercial practices indicates that the citizens of most European countries have low compliance with relevant laws (EC, 2015). In contrast, in Belgium, France, and the Netherlands, high compliance seems to exist among citizens with the laws for the welfare of dogs.

The European Convention for the Protection of Pet Animals (Council of Europe, 1987), ratified in March 2019 by 24 European countries, stipulates that owners of all animals must issue ownership documents, shelters must record information on the animals they keep, and stray animals should be collected with as little pain as possible for these animals.

RESULTS

Competent authorities in the EU countries

According to the thirteen (13) countries that responded to the questionnaire, the competent authority for the management of stray dogs differs depending on the policy implemented in each country. Specifically, in eight (8) countries, competent authorities are the municipal authorities (Bulgaria, Croatia, Cyprus, Greece, Lithuania, the Netherlands, Slovenia, and the United Kingdom), in five (5) countries responsible authorities are Animal Wel-

fare Organisations – usually NGOs (Belgium, Czech Republic, Malta, the Netherlands, and Portugal) while in four (4) countries the competent authority is the government through one of its ministries (Bulgaria, Denmark, Malta, and Slovenia). In some countries, as shown by the flags in Fig. 3, the competent authorities are more than one, e.g., state, and municipal authorities in the case of Bulgaria and Slovenia. In Malta, responsibilities are shared between government authorities and animal welfare organisations and in the Netherlands, municipal authorities share responsibilities with animal welfare organisations.

All countries that responded to the questionnaire through their competent services agree that the existence and growth of stray dogs is a serious public health problem, while almost all of them (12 out of 13 countries) link the existence and increase in stray dogs’ population with the education of citizens while char-

acterising it as a moral and political problem. It is associated with several problems, such as road accidents, environmental problems mainly in urban areas, security issues (attacks on civilians), injuries, and hygiene problems. However, the Municipality of Athens poses the problem in another dimension: the problems concern primarily the animals themselves (abuse, injuries) and secondarily the humans, while the competent Greek ministry states that the non-enforcement of stray dogs by the municipalities leads to public safety problems.

Given the assessment of the competent authorities that the growing abandonment of pets, as well as the uncontrolled reproduction of strays, seems to be the main reason for the increase in stray dogs in the countries surveyed, efforts have been made to record stray dogs in 11 of the 13 countries. In six countries (Denmark, Portugal, Belgium, Slovenia, Bulgaria, and Greece) a single database for electronic

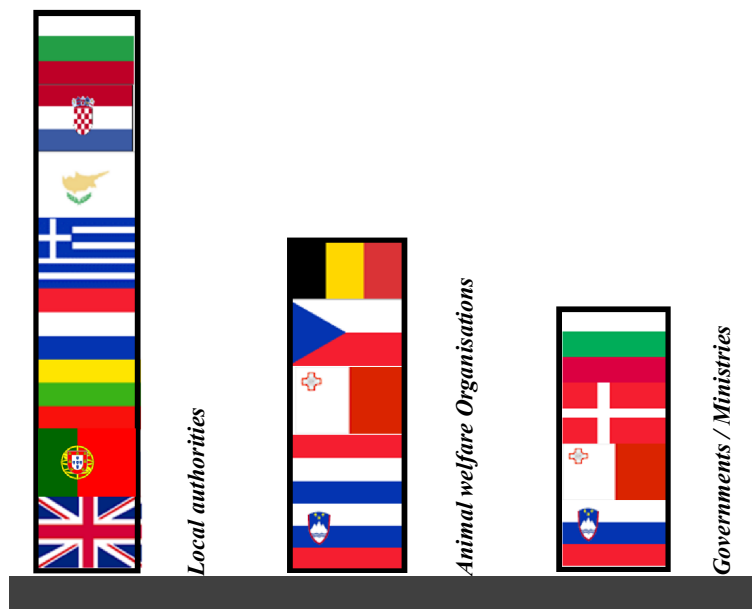


Fig. 3. Competent authorities for the stray dog management at the EU countries.

data logging has been created for both pets and their owners controlled by competent authorities. In contrast, in the Netherlands, there are nine organisations that maintain corresponding databases.

According to the competent authorities of the countries participating in the investigation, stray dog shelters are maintained by municipal authorities and stray dog care organisations in the Netherlands, Greece, Portugal, Cyprus, Lithuania, Malta, Slovenia, Bulgaria, and the Czech Republic, while some countries also have private shelters (Netherlands, Portugal, Malta, and Slovenia). In the United Kingdom, only animal welfare organisations can maintain shelters, while in Belgium and Croatia there are no similar shelters.

Stray dog management programmes

Stray dog management programmes have usually defined procedures in place for each dog case. Thus, a stray dog can be described as "seriously ill", "dangerous" or "aggressive dog" by the competent veterinary authorities (Lithuania, Cyprus), by dog trainers (United Kingdom), or by the 5-member committee (Greece). However, in Lithuania, there are no standard procedures for these cases, while in Croatia the staff specialises in the management of "dangerous" or "aggressive" dogs.

The common characteristics of the thirteen (13) countries surveyed are the following:

- Collection of stray dogs (information on the existence of stray dogs is given by competent municipal officials, citizens, and animal welfare organisations) and transport them in shelters (municipal, private, or animal welfare organisations) or to partner veterinarians.
- Veterinary check (microchipping, health check, vaccination, neutering, and surgery if required).

- Accommodation in shelters (if they exist) and trying to adopt them. If not adopted, they remain in shelters until their natural death or for 7 to 14 days (usually) and then are euthanised, or finally return to their "natural" environment.

The Netherlands, Belgium, and Denmark report that implementing stray dog management programmes has led to the control of these populations. In particular, the Netherlands and Belgium estimate that the number of stray dogs has decreased due to mandatory pet microchipping. However, in most countries, there is a shortage of qualified staff, appropriate equipment, and financial resources. In only 5 of the 13 countries under investigation, the competent authorities receive financial assistance from the government/state to implement management programmes to control the stray dog population, while in the other eight countries, the competent authorities replied that they did not receive it.

According to the responses, animal welfare rules exist in all thirteen (13) countries in the sample, while by law penalties are imposed on pet owners when they violate them (fine, imprisonment, ban on dog ownership, possible prosecution for abandonment). In most cases, however, the law, although in force, is not complied with.

Although stray dog management requires joint action, the competent authorities of only 5 countries: Croatia, Malta, Portugal, Belgium, and Bulgaria, did take joint initiatives (e.g., an agreement between municipalities and animal welfare organisations for neutering and treatment or compulsory microchipping). However, campaigns for pet "responsible ownership" take place in 8 of the 13 countries (Malta, Denmark, the Netherlands, Portugal, Belgium, Slovenia, Bulgaria, and

Greece), mainly through information campaigns including TV spots/shows, brochures, and printed material, messages through social networks and announcements on the websites of the competent authorities or ministries. In addition, adoption of a stray dog is promoted by most countries and is described as a relatively easy process in 12 of the 13 countries surveyed (excluding Denmark where it is considered a more time-consuming process), while the competent authorities of all countries encourage citizens to adopt a stray dog instead of buying it. Adopting a stray dog is a free service and all the dogs adopted have microchips, are vaccinated against rabies, are neutered, and treated against parasites (Table 2).

Euthanasia of stray dogs is allowed in all thirteen countries based on the strategy implemented by each country. In some countries, it is compulsory after the accommodation of a stray dog in a shelter for 7–14 days (United Kingdom) or by decision of the 5-member committee (Greece) or veterinarian (Cyprus).

Given the lack of a single piece of legislation to address the problems of stray

dogs, the policy applied in each European country to address this problem is different. Some implement human-oriented programmes (Belgium, the Netherlands), others law-oriented (Denmark, Bulgaria), programmes focusing on the animal itself (Slovenia), or giving priority to public health (Malta, Bulgaria). In many cases, combinations of different policies seem to apply to achieve maximum positive results – for example, a combination of anthropocentric orientation and orientation toward public harassment in Malta, while in Slovenia – a policy oriented toward law, public health, and the animal itself. However, despite the policy implemented in each country to reduce the population of stray dogs, during the decade 2008–2018, only a few countries managed to reduce the population of these animals. Among the thirteen (13) countries that have described their management frameworks, seven (7) managed to reduce the number of stray dogs (Malta, the Netherlands, Belgium, Slovenia, Bulgaria, Croatia, and the United Kingdom). In Malta, there was a decrease of around 80–90%, in Slovenia around 80%, in the United

Table 2. Joint actions of stakeholders and adoption by country

Country	Joint Action	Campaigns for "responsible ownership"	Adoption of a stray dog is easy process
1 Belgium	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2 Netherlands		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3 Denmark		<input checked="" type="checkbox"/>	
4 Greece		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5 Portugal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6 Cyprus			<input checked="" type="checkbox"/>
7 Lithuania			<input checked="" type="checkbox"/>
8 Malta	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9 Slovenia		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10 Czech Republic			<input checked="" type="checkbox"/>
11 Bulgaria	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12 Croatia	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
13 United Kingdom			<input checked="" type="checkbox"/>

Kingdom by 50%, and in Bulgaria: 15%. Initially, the neutering of both pets and stray dogs was proposed by all countries as an appropriate and effective solution to be applied to solve the problems they cause, except for the Czech Republic considering that this measure should only apply to stray dogs.

DISCUSSION

Both from this study and related studies, pet owners seem to be mainly responsible for the increase in the number of stray dogs in some EU countries, after abandoning their pets, which usually are not neutered, mainly due to financial difficulties (Slate *et al.*, 2008; Weliver, 2019). This phenomenon is particularly observed in the Balkan countries (Greece, Romania, Bulgaria) and southern European ones (Italy, Spain, Cyprus), where significant populations of stray dogs are recorded in relation to the rest of the EU countries (Vučinić *et al.*, 2011; Hild & Schweitzer, 2019). The lack of knowledge and responsibility of the citizens of these countries seems to be the reason for abandoning dogs, in parallel with their traditional perceptions of pets, but also the lack of guidance from competent authorities. Similar research and principles agree with this finding (ESDAW-EU, 2020).

EU policies relating to the welfare of animals mainly concern productive/farm animals while the crucial issue of pets and stray animals is left to national, regional, and local policies which often deviate from the goal. The lack of "common" legislation between EU countries on pets and stray animals has resulted in different competent authorities for the management of stray dogs. The municipal authorities, inter-municipal enterprises, government agencies, and ministries, as well as animal welfare organisations (mainly non-

governmental), are indicative of competent authorities, which, in accordance with national law, undertake the management of stray dogs and the implementation of relevant programmes (one or in combination or rarely in collaboration, two or three of them). This fact, in combination with the financial status of each competent authority, creates unequal management of stray animals from region to region, even within the state itself, as, in many cases, the financial support of governments/ministries to these authorities (based on answers), are limited or non-existent.

The current population management strategy of these dogs, between EU countries, is based on programmes for both their protection and their release from captivity, however, according to relevant studies, but also with the findings of this paper, not enough to deal with the phenomenon of stray dogs (Barnard *et al.*, 2015). On the contrary, as dogs are closely associated with human activity, their effective control may be associated with similar changes in human behaviour. Besides, almost all competent authorities consider that "responsible dog ownership" can reduce the suffering of stray dogs, as well as the costs associated with management programmes, which will lead to a reduction in the stray dog population, a position supported by research (Høgåsena *et al.*, 2013).

The logic of these management strategies applied to stray dogs should be integrated, as suggested by this paper, into a common European legislative framework. This common legal framework should be transposed by each member/state into national law and on this basis, the management of stray dog populations should be entrusted to specific authorities – the same in all EU countries. This will lead to more systematic cooperation at the Euro-

pean level, proper management of available financial resources, efficiency in recording dogs, and the implementation of stray animal management programmes, independent of the culture and development of each European country. This common framework should promote both educating citizens on how to deal with pets and stray dogs, as well as the ethical treatment of stray dogs with the goal of reducing their population and their welfare.

This paper is coming as continuation of previous surveys related to the management of stray dogs (Voslarova & Passantino, 2012; Sietou *et al.*, 2013) and as a macroscopic view of the issue. It points out some weaknesses, but also good actions/practices of the implemented management programmes, so that competent authorities improve their own plans or adopt existing successful actions for making their programmes more effective. However, the main contribution of the paper is the emergence of the relevant legal fragmentation and the ineffectiveness of individual national strategies and programmes by EU countries, and the need for common "European" legislation and stray animal policy, with animal welfare as a key element.

This document has certain limitations. Although started as a literature review, it was deemed necessary to consider the positions and views of responsible authorities for the management of stray dogs at the European level. Due to the Covid-19 pandemic, methods of research were limited, and the questionnaire distributed was fully answered by about half of the countries sent. The data obtained were collected by stakeholders responsible for managing stray dog populations and may contain a degree of subjectivity or inaccuracy, as they were difficult to control. Further study and in particular research is

required to record the positions of all stakeholders in the management and care of stray dogs either at the level of states with particular problems with stray dogs or at the state level where data show that they have tackled the problem of stray dogs successfully. It would also be interesting to investigate the problem from the citizens' point of view, as it is estimated that they also are at the heart of solving a problem with many significant effects on health, society, the urban environment, and the welfare of the stray dogs.

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Correspondence:

Fotios Chatzitheodoridis
Professor of Regional Economics,
Department of Regional and
Cross Border Development,
University of Western Macedonia,
Koila Campus, Kozani 50100, Greece,
phone: +30 24610 68113
e-mail: fxtheodoridis@uowm.gr