



Annals of *Spiru Haret* University

Veterinary Medicine Series



Year XXV, no. 25, volume 2, 2024

Annals of Spiru Haret University

Veterinary Medicine Series
Year XXV, no. 25, volume 2, 2024

EDITURA FUNDAȚIEI ROMÂNIA DE MÂINE
BUCHAREST



Editorial Board

Mădălina Belous, Assoc. Prof., DVM, PhD, *Spiru Haret* University, Faculty of Veterinary Medicine

Livia - Cătălina Bercea, Assist. Prof., DVM, PhD, *Spiru Haret* University, Faculty of Veterinary Medicine

Daniel Lescai, Assist. Prof., DVM, PhD, *Spiru Haret* University, Faculty of Veterinary Medicine

Ana-Maria Coman, Assist. Prof. DVM, PhD, *Spiru Haret* University, Faculty of Veterinary Medicine

Raluca Zvorășteanu, Assist. Prof. DVM, PhD, *Spiru Haret* University, Faculty of Veterinary Medicine

Advisory Board

Dănuț Turcu, Prof. DVM, Ph.D., *Spiru Haret* University Bucharest, Faculty of Veterinary Medicine

Adriana Amfim, Assoc. Prof. DVM, Ph.D., *Spiru Haret* University Bucharest, Faculty of Veterinary Medicine

Ioana Andronie, Assoc. Prof. DVM, Ph.D., *Spiru Haret* University Bucharest, Faculty of Veterinary Medicine

Viorel Andronie, Assoc. Prof. DVM, Ph.D., *Spiru Haret* University Bucharest, Faculty of Veterinary Medicine

A Publishing House classified by the *Ministry of National Education and Scientific Research, by the National Council of Scientific Research, Category C (areas Philology, Philosophy, History and Cultural Studies, Architecture and urbanism, Performing Arts)*

© Editura Fundației *România de Măine*, 2018

<http://www.edituraromaniademaine.ro>

ISSN-L: 1454-8283; ISSN 2501-7780 (online)

The total or partial reproduction, in any form or any technical means,
is strictly forbidden and will be punished by law.

The responsibility for the text content and originality exclusively belongs to the authors.

CONTENTS

Andronie Ioana, Al-Khalaileh Murad Vlad, Andronie Viorel, Soare Marian, <i>Short-term road transport and the broilers welfare</i>	5
Barac Alina, Cucă Daniel, <i>Avian eimeriosis and its effect on the productive performance of broilers</i>	14
Geru Vaeronica – Mădălina, Soare Marian, <i>The prevalence of hepato-biliary neoplasma in dogs</i>	21
Mihalache Mădălina, Cucă Daniel, <i>Dynamics of the immune response against Newcastle disease in broiler flocks with reoviral infections</i>	27
Mocanu Maria, Soare Marian, <i>Clinical and radiological aspects in musculoskeletal disorders in dogs</i>	32
Bădic Luiza, Murgu Alina Mariana, <i>Transportation of pets within the European Union</i>	38
Moşescu Ştefan, Daneş Mihai, <i>Aspects regarding embryo transfer in horses</i>	43

SHORT-TERM ROAD TRANSPORT AND THE BROILERS WELFARE

**Ioana ANDRONIE, Murad Vlad AL-KHALAILEH,
Viorel ANDRONIE, Marian SOARE**

Spiru Haret University, Faculty of Veterinary Medicine,
256 Basarabia Ave., 30352, Bucharest
e-mail: ushmv_andronie.ioana@spiruharet.ro

Abstract

Our study aimed to identify risk factors during the transport of broilers to the slaughterhouse, by establishing the incidence of mortality and injuries, which alter the welfare of the birds. Observations focused on bird loading methods, vehicle loading of containers, travel and unloading of broilers at the slaughterhouse, where we monitored and assessed percent mortality (DoA) and injuries at destination. The results obtained showed a mortality rate of 0.340%, in the transport of chickens that left in the morning at the latest (at 6:46 a.m.) and in which the thermal stress experienced by the first birds loaded into the vehicle as well as exceeding the boarding area was high. The percentage of injuries varied due to improper methods of catching and boarding the chicks in the transport containers, mechanical failures in the containers and delayed unloading in two of the monitored transports. The incidence of broiler mortality and injury at destination recorded during the monitored period was associated with impaired broiler welfare in the studied short-term transports. The competence in the field of animal protection and welfare during transportation of all those involved in the transportation of animals shows the quality of their welfare at the destination.

Keywords: *broiler, injuries, mortality, short transport, welfare*

Introduction

The development of intensive animal breeding systems led to the expansion of their transportation to achieve objectives such as populating and depopulating farms, slaughtering, participating in sports competitions, animal exhibitions, etc. Globally, every year 70 billion broilers are slaughtered (FAOSTAT 2020 1) and during transport to the slaughterhouse they are exposed to a multitude of stressors that degrade their welfare. Nowadays, transport is an important link in keeping the welfare of loaded animals, involving many factors such as the new environment they have to face, the methods of movement to be loaded/unloaded, the breaking of social relationships, deprivation of food and water, non-compliance with the loading surface, the presence of noise, the technical condition of the means of transport, etc. Environmental conditions can be a major cause of animal mortality at destination through the effect that temperature, relative humidity and ventilation have on animals at different times of the year and

geographical areas [1,2,6,11,15,19]. During their life cycle, broilers are transported at least twice, from hatchery to farm and from farm to slaughterhouse, over short distances or long journeys of several hours. For trappers, it is essential to know the correct methods of catching and placing them in shipping containers to ensure the welfare of the birds until they reach their destination. Welfare deterioration is much affected and visible by bruising on the wings, legs and carcass [4,13]. These can occur not only during the capture of the birds, but also during transport, when the birds are exposed to environmental factors and crowd into cages/containers for transport [3,7,10]. The practices and procedures involved in the transport of broilers, transport containers/cages and vehicles generate varying degrees of stress on broilers, affecting their welfare, health and productivity [9,12,14]. The incidence of broiler mortality and injury at destination as welfare indicators is influenced by the quality, duration, season and time of day of transport.

Transport of animals by road involves several organizational, sanitary, veterinary, legal and economic problems, regulated at international and national levels. Council Regulation (EC) No 1/2005, on the protection of animals during transport and related operations and amending Directives 64/432/EEC, and 93/119/EC and Regulation (EC) No 1255/97, regulates the transport of live animals within the European Union (EU) when it is carried out in the framework of economic activity. This Regulation reinforces the legislation on the welfare of animals during transportation and ensures that the risk of injury and unnecessary suffering is avoided by ensuring that appropriate conditions are in place to meet their needs.

Material and method

The objectives of our study were to identify risk factors during the transportation of broilers to the slaughterhouse by determining the incidence of mortality and injuries.

Transport organization and planning

The transport of broilers was organized according to market demand, which determines the number and destination of transport, and planning was done weekly. The means of transportation belonged to the commercial company where we carried out the investigations. The transports were carried out with tractor-head semi-trailers, registered for short-term transportation of animals, on county and national roads. Preparing and planning the transport of broiler chickens, one of the main stages of the journey that is the key to successful broiler transportation, covered a wide range of actions from securing and inspecting the means of transport, scheduling the journey, preparing and checking the transport

documentation, and so on. Planning was carried out by the commercial company (with his staff: drivers/animal attendants) by the legislation in force. The vehicles used in the study were tractor-pulled semi-trailers with a capacity of 22 containers, each container with eight drawers, the surface area of a drawer being 13.207 cm². The total transportation area was 2.324.432 cm².

Animals

The measurements were carried out over one year, in the warm season (June - August with temperatures over 30°C), during which time we tracked 43.724 Ross308 broiler chickens, organized in 10 transports from three farms of the company, transported to the slaughterhouse (table 1). The birds at the end of the production cycle (45-50 days) were trapped in the rearing houses, loaded into containers/cages and then loaded into the transportation vehicle. The catching of broilers was carried out by farm employees who had not been trained before on how to catch the birds and put them into the cages. The duration of the transports taken in the study averaged two and a half hours. During this time, we followed the entire process from the boarding of the chickens to the journey itself and then to their unloading at the slaughterhouse, monitoring the incidence of destination mortality (DoA) and broiler injuries as effects of improper conditions encountered during transportation.

Table 1.

The transports and the number of loading chickens taken into the study

Truck	Total weight allowed /kg	The number of chickens
transport 1	176 drawers / < 11.170 kg	6160
transport 2	96 drawers / < 11.170 kg	3360
transport 3	176 drawers / < 11.170 kg	6160
transport 4	176 drawers / < 11.170 kg	3920
transport 5	176 drawers / < 11.170 kg	4410
transport 6	176 drawers / < 11.170 kg	3360
transport 7	176 drawers / < 11.170 kg	3360
transport 8	176 drawers / < 11.170 kg	4200
transport 9	176 drawers / < 11.170 kg	6160
transport 10	176 drawers / < 11.170 kg	6160

Statistical analysis

To be able to draw conclusions, the obtained data were processed statistically using the t-test and Microsoft Office Excel 2007 (Microsoft Inc, USA), to see the mortality incidence and broiler injuries of destination.

Results and discussion

Tracking the number of chicks loaded and those arriving at the slaughterhouse (table 2), we found a difference between the incidence of injured and dead chicks in the monitored shipments.

Table 2.

**The injuries and mortality at the destination of broiler chickens
in transport**

Truck	Injured chickens	Dead chickens
transport 1	11	5
transport 2	9	3
transport 3	20	21
transport 4	9	5
transport 5	20	11
transport 6	14	7
transport 7	19	7
transport 8	21	8
transport 9	16	6
transport 10	28	13

Thus, the incidence of mortality at the destination (figure 1) varied between 0.081%-0.340% in the monitored transports. The average of 8.6 dead chickens was due to several causes such as: incorrectly catching and handling the birds and putting them in the drawers of the containers caused trauma leading to injuries and to the death of the chicks.

Throughout the loading of the containers into the vehicles, in two of the transports, the chicks that arrived in the drawers of the first containers

showed signs of heat stress as they waited without ventilation until the vehicle was loaded and ready to leave.

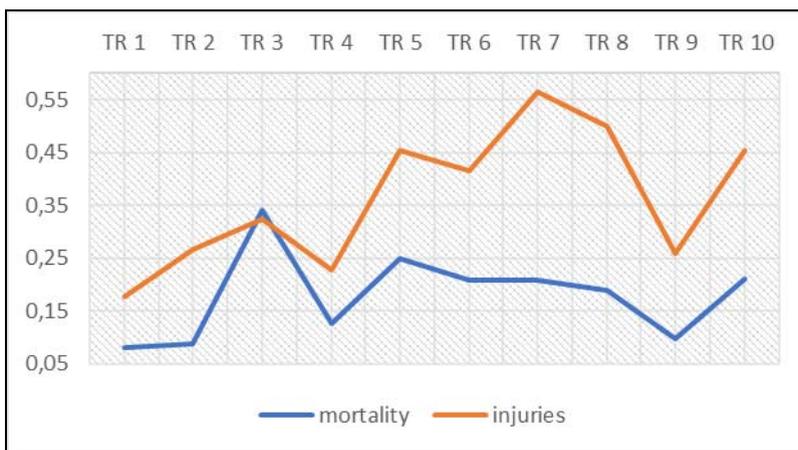


Figure 1. Incidence of broiler chicken mortality (%) at the destination

During transportation, birds can be exposed to a variety of potential stressors, including the thermal demands of the transport environment, acceleration, vehicle movement, the impact of dietary fasting, water deprivation, social disturbance and noise. Of these factors, heat stress is a vital threat to the welfare and productivity of birds.

Installation of heat stress in birds during transportation leads to poor welfare through increased mortality at the destination and induced pathology, including muscle damage and associated changes in finished product quality [1,3,4,6]. After handling, some researchers remark that the body temperature of broilers may increase, making them more susceptible to hyperthermia and increased mortality at the destination [5,16]. In the Czech Republic, Vecerek (2006) found a high mortality of broilers transported for slaughter in summer and winter compared to spring and fall transports. Vieira et. all (2011) in their study results, show that the incidence of mortality on arrival may more readily indicate cumulative mortalities between the time of loading of birds and the end of loading of containers than those that have occurred up to the time of arrival at the slaughterhouse, aspect that we also noticed. Other researchers, suggest that to maintain the welfare of birds during transportation attention should be directed towards increasing air temperature control and ventilation in vehicles during loading and transportation [2].

The average number of injured broiler chicks in our transports was 23,6 chicks (Figure 1) with an incidence between 0.178% - 0.565%, due to

improper methods of catching and handling chicks, swinging them up to the drawers of the containers, thus increasing their stress level. The catchers used in all the monitored transports practiced inappropriate methods, due to their lack of training.

These values were also due to defects in the containers that allowed birds to get trapped in the spaces, injuring wings and feet. Defective drawers or containers can have a negative impact on broiler chick welfare. The common defects that occurred were mechanical and consisted of drawers with broken walls through which chickens trapped and fractured their legs and wings, resulting in pain, suffering or even death and economic loss.

Manual catching, some studies show, resulted in leg (0.20%) and wing (7.7%) bruising, while the use of mechanical catching decreased the percentage of birds with wing bruising to 4.2% [5]. Some researchers claim that mechanical systems for restraining birds can reduce leg injuries compared to manually restraining and transporting them to transport containers [7].

Another situation identified in our study was the difference in welfare value, depending on the departure time of the transport (Table 3).

Table 3. Boarding hours and numbers of injured and dead broiler chicks at destination

Truck	Departure time	Injured chickens	Dead chickens
transport 1	04:03	11	5
transport 2	04:20	9	3
transport 3	06:46	20	21
transport 4	05:58	9	5
transport 5	06:01	20	11
transport 6	04:45	14	7
transport 7	06:34	19	7
transport 8	05:17	21	8
transport 9	06:18	16	6
transport 10	03:57	28	13

The results showed that the mortality and injury rate of the birds during the boardings in the morning (6:01 – 6:46 a.m.), was higher than in the other hours of the night. Most likely, these values were due to the hasty handling of the birds by the catchers and thermal stress experienced by the first birds loaded into the vehicle.

The errors in our study that led to the depreciation of broiler chicken's welfare consisted of traumatizing handling of the birds in the catching procedure, mechanical defects of the drawers/containers that unnecessarily injured the broilers, and overcrowding in some transports that led to the onset of heat stress.

Other results showed that the incidence of broiler mortality in journeys of less than two hours was lower than in journeys of more than ten hours transport distances [1]. In addition to mortality and injury losses, another consequence of improper transportation may also be the rejection of large numbers of carcasses from recovery, leading to a decrease in economic efficiency.

Conclusions

In our study, the operations planned and carried out for the short-term transport should have been better carried out regarding the catching of the birds by training the keepers, especially for the morning transports and providing intact containers/cages for the birds.

Mortality of broilers was present in all monitored transport, and this was due to improper catching and handling of the birds and/ or to heat stress in time the birds were waiting for the vehicle to depart. The high incidence of injuries was mainly caused by mechanical failures in the containers and improper methods of catching birds.

The welfare of broilers during the short-term transport from the farm to the slaughterhouse can be affected by risk factors that can be identified by evaluating the incidence of mortality at the destination (DoA) and their injuries.

Careful control of these factors can increase the welfare of broilers during short-term transport.

References

1. Yılmaz Aral, Mehmet Saltuk Arıkan, Ahmet Cumhuri, Çağla Kaya, Seyit Can Güloğlu, Engin Sakarya, (2014). Economic losses due to live weight shrinkage and mortality during the broiler transport. Ankara Üniversitesi Veteriner Fakültesi Dergisi, 60 (3):205-210.

2. Cockram M.S., Dulal K.J., (2018). Injury and mortality in broilers during handling and transport to slaughter. *Canadian Journal of Animal Science* 98: 416–432,
3. Dadgar, S., Lee, E.S., Leer, T.L.V., Burlingette, N., Classen, H.L., Crowe, T.G., and Shand, P.J. (2010). Effect of microclimate temperature during transportation of broiler chickens on quality of the pectoralis major muscle. *Poult. Sci.* 89: 1033–1041.
4. Dadgar, S., Lee, E.S., Leer, T.L.V., Crowe, T.G., Classen, H.L., and Shand, P.J. (2011). Effect of acute cold exposure, age, sex, and lairage on broiler breast meat quality. *Poult. Sci.* 90: 444–457.
5. Delezic, E., Lips, D., Lips, R., Decuyper, E., (2006). Is the mechanisation of catching broilers a welfare improvement? *Animal Welfare*, 15: 141–147.
6. Knezacek T.D., Olkowski A.A., Kettlewell P.J., Mitchell M.A., Classen H.L., (2010), Temperature gradients in trailers and changes in broiler rectal and core body temperature during winter transportation in Saskatchewan. *Canadian Journal of Animal Science*, 90, pp. 321-330.
7. Knierim Ute, Gocke A., (2003). Effect of Catching Broilers by Hand or Machine on Rates of Injuries and Dead-On-Arrivals. *Animal Welfare* 12(1):63-73
8. Mitchell M.A. and Kettlewell P.J. (1993). Catching and transport of broiler chickens. *Proceedings of the Fourth European Symposium on Poultry Welfare*, pp 219-229, Universities Federation for Animal Welfare.
9. Mitchell, M.A., Kettlewell, P.J. (1998). Physiological stress and welfare of broiler chickens in transit: solutions not problems! *Poultry science* 77 (12)1803-1814.
10. Mitchell M.A., Kettlewell P.J., (2009). Welfare of poultry during transport – a review. *Poultry Welfare Symposium Cervia, Italy*.
11. Elena MITRĂNESCU, Maria-Evelina GRĂDINARU, L. TUDOR, (2021). Assessment of the welfare of broiler chickens during transport and slaughtering in a Prahova County unit. *Revista Română de Medicină Veterinară*, 31, 4: 93-96.
12. Nicol, C.J., Scott, G.B. (1990). Pre-slaughter handling and transport of broiler chickens. *Applied Animal Behaviour. Science.* 28: 57-73.
13. Saraiva Sónia, Alexandra Esteves, Irene Oliveira, Malcolm Mitchell, George Stilwell, (2020). Impact of pre-slaughter factors on welfare of broilers. *Veterinary and Animal Science*, Volume 10, 100146.
14. Schwartzkopf-Genswein K.S., Faucitano L., Dadgar S., Shand P., González L.A., Crowe T.G., (2012). Road transport of cattle, swine and poultry in North America and its impact on animal welfare, carcass and meat quality: A review *Meat Science*, 92, pp. 227-243.
15. Vieira F.M.C, Silva I.J.O, Barbosa Filho J.A.D., Vieira A.M.C., Broom D.M., (2011). Preslaughter mortality of broilers in relation to lairage and season in a subtropical climate. *Poultry Science*, 90 pp. 2127-2133.
16. Vecerek V., Grbalova S., Voslarova E., Janackova B., Malena M., (2006). Effects of travel distance and the season of the year on death rates of broilers transported to poultry processing plants. *Poultry Science*, 85, pp. 1881-1884.
17. Vecerek V., Voslarova E., Conte F., Vecerkova L., Bedanova I., (2016). Negative trends in transport-related mortality rates in broiler chickens. *Asian Australasian Journal of Animal Sciences*, 29, pp. 1796-1804.
18. Warriss P.D., Pagazaurtundua A., Brown S.N., (2005). Relationship between maximum daily temperature and mortality of broiler chickens during transport and lairage. *British Poultry Science*, 46, 647–651.

19. Whiting T.L., Drain M.E., Rasali D.P., (2007). Warm weather transport of broiler chickens in Manitoba. II. Truck management factors associated with death loss in transit to slaughter Canadian Veterinary Journal, 48, pp. 148-154
20. Council Regulation (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations. Official Journal of the European Union, L3, pp. 1–44.
21. Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production. Official Journal of the European Union, L182, pp. 19–28.
22. Food and Agriculture Organization of the United Nations FAOSTAT Database (2020) Rome, Italy <http://www.fao.org/faostat/>
23. The Welfare of animals during transport - Opinion of the Scientific Panel on Animal Health and Welfare on a request from the Commission (Question n° EFSA-Q-2003-094) EFSA J, 44 (2004), pp. 1-36, <http://www.efsa.eu.int/>

AVIAN EIMERIOSIS AND ITS EFFECT ON THE PRODUCTIVE PERFORMANCE OF BROILERS

Alina BARAC, Daniel CUCĂ

Faculty of Veterinary Medicine, Spiru Haret University,
Blvd. Basarabia 256, Bucharest
email: alinabaracbarac@gmail.com

Abstract

The study followed the evolution of production parameters in 2 flocks of broilers in which avian coccidiosis evolved: a flock of ROSS 308 broilers and a flock of COBB 500 broilers.

Comparative observations were made on 2 broiler flocks one flock populated with the ROSS 308 hybrid, (L1) consisting of 23,000 chickens and the flock (L2) consisting of 23,200 COBB 500 chickens in which digestive disorders were observed throughout the production cycle. The following were monitored: evolution of body weight, average daily gain, mortality percentage, specific consumption and incidence of pathognomonic lesions. The L1 batch showed: body weight was 600 g lower, mortality rate 10.3%, average daily gain 66.1 g and an increased incidence of haemorrhagic typhlitis. Batch 2 showed much better productive performance values and a lower incidence of anatomopathological changes characteristic of eimeriosis.

These results can be explained by the fact that the commercial hybrid ROSS 308. is more susceptible to Eimeria protozoa infestation than the hybrid COBB 500.

Keywords: *avian eimeriosis, production parameters, body weight, mortality percentage, average daily gain, specific consumption, haemorrhagic typhlitis.*

Introduction

Avian coccidiosis, an intestinal disease caused by protozoan parasites of the genus *Eimeria*, occurs worldwide. It is considered to be one of the most economically important diseases of domestic poultry [1].

Eimer's discovery: German parasitologist Otto Eimer is credited with the initial discovery and characterization of *Eimeria* parasites. In 1870, Eimer described the life cycle of *Eimeria stiedae*, a species that infects rabbits and causes hepatic coccidiosis. His work laid the foundations for understanding coccidiosis and for the study of *Eimeria* parasites.

Subsequent research by other scientists in the early 20th century extended the knowledge of coccidiosis to different animal species, including poultry. Researchers identified additional species of *Eimeria* parasites and studied their biology, epidemiology and impact on host health and production.

Infected chickens often experience delayed growth and reduced weight gain compared to healthy birds. This can lead to longer production cycles

and increased feed costs per unit of meat produced. In severe cases, some birds fail to reach market weight, leading to reduced profitability for poultry producers.

Coccidiosis causes significant economic losses in the poultry industry due to several factors: reduced growth rates, poor feed conversion efficiency, increased mortality, high treatment and prevention costs, emergence of opportunistic infections.

Overall, the economic impact of coccidiosis in the poultry industry underlines the importance of effective disease management and prevention strategies to minimise losses and ensure the sustainability of poultry production operations. By implementing proactive coccidiosis control measures, poultry producers can reduce economic risks and maintain the profitability of their operations.

There are seven valid species of chicken coccidia, *E. acervulina*, *E. brunetti*, *E. maxima*, *E. mitis*, *E. necatrix*, *E. praecox*, and *E. tenella* [5], each species developing in a particular location within the chick digestive tract. It is common to find at least six species (e.g., *E. acervulina*, *E. maxima*, *E. tenella*, *E. brunetti*, *E. mitis*, and *E. praecox*) in litter samples from a single flock during its first 6 weeks [6].

The life cycle of eimeria in birds was first described by Fathman in 1910, and in 1929 Tyzzer described the endogenous and exogenous developmental stages and phases schizogonic, gametogonic and sporogonic phases.

Parasites of the genus *Eimeria* reproduce by the coccidial cycle schizogonic, gametogonic and sporogonic phases.

This process is aided by trypsin, bile, and CO₂. The released sporozoites penetrate the villous epithelial cells. Sporozoites of some species (*E. brunetti* and *E. praecox*) develop within cells at the site of penetration. Sporozoites of other species (*E. acervulina*, *E. maxima*, *E. necatrix*, and *E. tenella*) are transported to other sites, for example the crypt epithelium, where they undergo development [1].

This pathway may be widespread within *Eimeria* spp. [3]. Newly characterized enzymes in *E. tenella* and *E. maxima* have been reported also, as well as a list of enzyme activities previously reported in avian *Eimeria* [4].

The evolution and dynamics of parasitosis vary with the system of rearing hens, compliance or non-compliance with technology, presence of other diseases, intervention of stressors, etc. in chick eimeriosis, which can evolve clinically or subclinically, with manifestations ranging from mildly decreased appetite, reduced average daily gain, weight loss, diarrhoea (which may be haemorrhagic), dehydration and death.

These signs are non-pathognomonic and appear after four or five days post infestation. The most severe manifestations are seen in birds between three and twelve weeks of age of life.

In terms of the location of the aetiological agents, acimeriosis can be caecal, caused by *E. tenella* and intestinal caused by the other six species currently considered valid.

Diagnosis of chick eimeriosis is based on the corroboration of survey data epidemiological, clinical manifestations with morpho-pathological lesions and laboratory examinations complementary laboratory tests.

The epidemiological investigation considers information on: age of the chickens, the rearing system, hygiene conditions, anticoccidials used, the evolutionary nature of the Disease.

Coccidiosis is recognized as the parasitic disease that has the greatest economic impact on poultry production. The annual worldwide cost is estimated at about \$800 million (107), and that for the American broiler industry about \$450 million. These estimates include the costs of prophylactic in-feed medication for broilers and broiler-breeders, alternative treatments (e.g., with amprolium) if the medications fail, and losses due to mortality, morbidity, and poor feed conversions of birds that survive outbreaks [2].

Material and method

The biological material that was used in the research of this study was the commercial hybrid ROSS 308 and COBB 500.

Both ROSS 308 and COBB 500 hybrids belong to the category of broiler chicks for meat production, specialized in breast (400g at 42 days) and breast meat (420-440 g both at 42 days) production, with a very high productive potential, achieving an average weight of 2.6-2.7 kg at 6 weeks of age (40-42 days) under normal technological conditions, with an average daily gain of 65 g, a specific consumption of 1.55 kg combined feed/kg gain and a stocking rate of 97%.

Two flocks of birds were tested: 23000 birds flock L 1 and 23200 birds flock L 2.

The studies focused on 4 productive parameters, both in group 1 and group 2: weekly body weight, average daily gain, specific consumption, mortality percentage

Weekly body weight was determined individually by weighing a sample of at least 300 heads.

Final specific consumption was determined by relating the total amount of feed consumed to the total gain achieved at the end of the period.

Average daily gain was determined by the difference between the final and initial weights, based on the number of days of growth.

Mortality was determined daily on the batch sheet, where the data obtained were recorded, and the final mortality was obtained by summing the weekly mortality.

Results and discussion

From the analysis of the data presented in Table 1 the body weight was better in group 2 compared to group 1 (Tabel 1).

In week 1, 2 and 3 the weights did not show significant variations, the weights in general were similar

In week 4 Lot L1 had a weight 130 g less than Lot L2. In week 5 the differences increased to 190 g in Lot 1 compared to Lot 2.

At the end of the production cycle the differences were 600 g between the 2 batc. In terms of mortality percentage, the analysis of the data presented in Table 2 shows that group 1 had a higher mortality percentage than group 2 (Tabel 2).

Tabel 1

Body weight comparison

Nr. Crt.	Specify	Lot				T
		Lot 1		Lot 2		
		\bar{X}	S \bar{x}	\bar{X}	S \bar{x}	
1.	Week 1	195.08	1.60	198.50	1.64	4.8388
2.	Week 2	508.20	2.80	510.30	1.86	5.4322
3.	Week 3	1000.30	2.40	1015.00	1.41	5.8985
4.	Week 4	1480.50	2.61	1610.90	2.90	7.8819
5.	Week 5	2050.10	3.22	2240.90	1.10	6.1149
6.	Week 6	2180.20	5.33	2780.10	3.37	7.0239

At the end of week 6 batch 1 had a mortality rate of 10.38% and batch 7.01 had a mortality rate of 3.37%.

The average daily gain over the same period showed a similar evolution to body weight. The gain showed a constant increase in the two groups, with a higher increase in weeks 1, 2 and 3, after which in week 6 it recorded a low level (18.5 g) in the case of group 1, while in group 2 a gain of 77.02 g was observed in week 6 (Tabel 3).

Table 2

Mortality percentage comparison

Nr. Crt.	Specify	Lot				T
		Lot 1		Lot 2		
		\bar{X}	S \bar{x}	\bar{X}	S \bar{x}	
1.	Week 1	0.950	0.09	0.643	0.05	1.012008
2.	Week 2	0.437	0.01	0.541	0.01	2.65145 *
3.	Week 3	0.629	0.01	0.525	0.01	3.60432 *
4.	Week 4	3,621	0.01	1.528	0.01	3.25751 *
5.	Week 5	2.091	0.06	2.444	0.04	4.5565 **
6.	Week 6	2.666	0.01	1.331	0.03	1.55083
7	Total	10,388	0.01	7.012	0.02	2.9600

Table 3

Average daily gain per week comparison

Nr. Crt.	Specify	Lot				Lot
		Lot 1		Lot 2		
		g	S \bar{x}	\bar{X}	g	
1.	Week 1	21.50	2.56	22,07	1.85	3.55215 *
2.	Week 2	44,73	4.97	44,54	2.32	7.93313***
3.	Week 3	70,3	4.48	72,10	2.88	4.23084**
4.	Week 4	68,6	4.31	85.05	2.63	1.701604
5.	Week 5	81,30	4.75	90	9.81	1.281893
6.	Week 6	18.5	6.48	77.02	8.41	0.126768

As regards to the specific medium consumption, it was higher in batch 1 consisting of chickens belonging to hybrid ROSS 308 (1.71 kg feed per kg GV) than in batch 2 consisting of broilers COBB 500 (1.61 kg)

Table 4

Specific medium consumption comparison

Nr. Crt.	Specify	Lot				Lot
		Lot 1		Lot 2		
		kg	S \bar{x}	\bar{X}	g	
1.	Specific consumption 1-42 days	1.71	1.56	1.61	1.85	3.55215 *

Conclusions

1. The COBB 500 broiler flocks had a higher body weight at slaughter 2780.10 g (pen 2) than those from pen 1 which had a body weight of 2180.20 g at 42 days of age.

2. Broilers from pen 2 had an average daily gain from 0 to 42 days of age of 66.10 g and those from pen 1 had an average daily gain of 51.9 g.

3. Mortality is lower in flock 2 (3.37%) due to a more severe evolution of coccidiosis compared to flock L1 where it is 10.38% worse.

4. Feed consumption is higher in pen 1 (1710 g) compared to pen 2 where it was 1610 g.

5. The incidence and frequency of haemorrhagic typhlitis lesions was very high in the flock of birds belonging to the ROSS 308 hybrid and lower in the COBB 500 breed.

Acknowledgement

This study is part of an undergraduate research carried out in the Faculty of Veterinary Medicine, Spiru Haret University, 2024.

References

1. Trout, J. M., and H. S. Lillehoj. 1995. Eimeria acervulina infection: evidence for the involvement of CD8+ T lymphocytes in sporozoite transport and host protection. *Poult. Sci.*74:1117–1125
2. Williams, R. B. 1998. Epidemiological aspects of the use of live anticoccidial vaccines for chickens. *Int. J. Parasitol.*28:1089–1098
3. Alocco, J. J., H. Profous-Juchelka, R. W. Myers, B. Nare, and D. M. Schmatz. 1999. Biosynthesis and catabolism of mannitol is developmentally regulated in the protozoan parasite Eimeria tenella. *J. Parasitol.*85:167–173
4. Williams, R. B. 1999. Three enzymes newly identified from the genus Eimeria and two more newly identified from E. maxima, leading to the discovery of some

- aliphatic acids with activity against coccidia of the domestic fowl. *Vet. Res. Commun.*23:151–163.
5. Shirley, M. W. 1986. New methods for the identification of species and strains of *Eimeria*, p.13–35. In L. R. McDougald, P. L. Long, and L. P. Joyner (ed.), *Research in avian coccidiosis*. University of Georgia, Athens.
 6. Williams, R. B. 1995. Epidemiological studies of coccidiosis in the domestic fowl (*Gallus gallus*). II. Physical condition and survival of *Eimeria acervulina* oocysts in poultry house litter. *Appl. Parasitol.*36:90–96.

THE PREVALENCE OF HEPATO-BILIARY NEOPLASMA IN DOGS

Veronica- Mădălina GERU, Marian SOARE

Faculty of Veterinary Medicine, University Spiru Haret (România)
Bulevardul Basarabiei 256, Bucuresti, Romania
Email: geruveronica@yahoo.com

Abstract

Morphological and functional changes in the examined animal were highlighted to establish the clinical and imaging profile for confirming the suspected diagnosis considering these categories of neoplasms with hepatic localization. Thirty cases were presented in which liver formations were identified using ultrasound examination, out of which 13 cases had samples taken for histopathological examination. In dogs, the highest percentage level of neoplasms was identified during the study, with hepatocellular carcinoma having 38.46%. Due to the liver's regenerative function, many dogs remain asymptomatic until the tumor reaches a size large enough to cause dysfunctions, making it a disease that is difficult to prevent or treat early.

Keywords: *neoplasm, canine hepatocellular carcinoma, liver biopsy, histopathological characterization*

Introduction

Hepatic neoplasms are characterized by abnormal tissue proliferation of genetically modified tissues. The growth of abnormal cells exceeds in size and speed all processes occurring in cases of inflammation, regeneration, and repair (1).

Cells originating from the primary tumor can be transported through lymphatic or blood vessels to other organs, where they become secondary tumors.

Morphopathologically, a neoplasm can be defined as a process of progressive multiplication of cellular elements, resulting in a new tissue with particular characteristics (2).

Benign tumors have a slow progressive growth, sometimes interrupted by partial stagnation, do not cause distant seeding, do not recur postoperatively, and do not lead to the animal's death (e.g., hepatocellular adenoma, nodular hyperplasia, lipomas, hemangioma) (3). Benign tumors can grow due to hemorrhages, degeneration, infections, and infarction.

Malignant tumors have a rapid cell growth, invade neighboring structures, and can metastasize. The tumor induces the host to supply blood vessels, and as vascularization increases, the tumor invades and destroys

neighboring tissues (e.g., hepatocellular carcinoma, cholangiocarcinoma, fibrolamellar hepatocarcinoma) (4).

Hepatocellular carcinomas are malignant neoplasms of hepatocytes. They can appear as large solitary structures resembling normal liver tissue but can also be found throughout the liver. Histologically, the tumor forms trabecular structures of hepatocytes with cellular pleomorphism and moderate to pronounced nuclear atypia, including large atypical, multinucleated hepatocytes (5).

Objective

The purpose of this study was to highlight the ability of neoplasms to metastasize due to the liver's vascularization and anatomical position.

Material and Methods

The study was conducted on 30 patients, who underwent biochemistry and hematology analyses, ultrasound examination, and histopathological examination in 13 of them. Anamnesis was obtained from animal owners or the individuals accompanying the patients to the clinic. From the anamnesis, we gathered information about the patient's medical history, when the animal's health condition changed, breed, age, sex, hormonal status, whether there is anorexia, how long vomiting has been occurring and its nature, the characteristics of the feces, and if the animal has lost weight recently.

The clinical examination was performed by inspecting the animal from a distance and up close, assessing whether the animal experiences pain while moving, if the animal's face appears sad or lively, if there is hepatomegaly, observing the hair density, checking for dermatological or endocrine diseases, and examining the oral, vaginal, and anal areas.

Palpation was conducted to determine if there is pain in the right hypochondrium or abdominal area, to assess the degree of dehydration, palpate the superficial lymph nodes, and perform bimanual palpation to identify if hepatomegaly is present. Percussion was performed to observe if the liver's dull sound extended over an enlarged projection and if the animal had ascites. Temperature was measured rectally or with a digital thermometer from the ear.

Histopathological examination is an essential tool in medicine and biology, providing critical information for diagnosing and treating diseases. It is crucial for this process to be performed by trained and experienced professionals to ensure the accuracy and reliability of the results. It is important in diagnosing diseases and conditions, including cancer,

infections, and inflammatory diseases. It helps in treatment planning and monitoring disease progress and is important in scientific research and the development of new treatments and therapies (2).

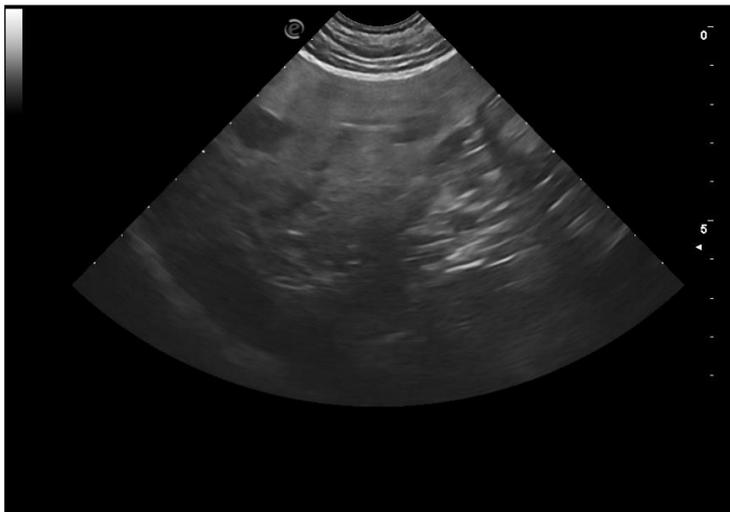
Most hepato-biliary neoplasms are detected late, when the tumor has already invaded the tissue and exhibits a destructive nature.

Results and Discussion

Case 1

The first case was represented by Alba, a 9-year-old spayed female mixed breed, presented to the clinic with apathy, vomiting, and weight loss over the past month. She is dewormed internally and externally. The biochemistry analyses showed an increase in ALT, T-Pro, and GPT.

Fig. 1.



Ultrasound examination. Enlarged liver with hypoechoic nodular lesions.

Ultrasound examination revealed moderate hepatomegaly with numerous hypoechoic nodular lesions scattered throughout the hepatic parenchyma. (Fig.1.) Increased parenchymal echogenicity was observed, with no evident vascular distensions.

Histopathological description: The hepatic structure consists of numerous blood cells, active macrophages with hemosiderin and hematoidin phagocytosis, fibroblasts, and degenerated pigment. An areolar structure is observed, composed of spaces occupied by malignant cells (marked anisokaryosis, anarchic arrangement, prominent nucleoli, atypical mitoses 7/field at 40x magnification).

The diagnosis for this case was hemangiosarcoma.

Case 2

The second case was represented by Nou, a 6-year-old intact male Shih Tzu, stayed with relatives for a week. After returning home, he was observed to be apathetic, a condition persisting for 3 days, with a lack of appetite for food and water. Clinical signs included pale mucous membranes, abdominal pain, and progressive weight loss. Hematological examination showed an increase in HGB, and biochemistry analysis revealed elevated levels of BUN, ALP, T-Pro, and GPT.

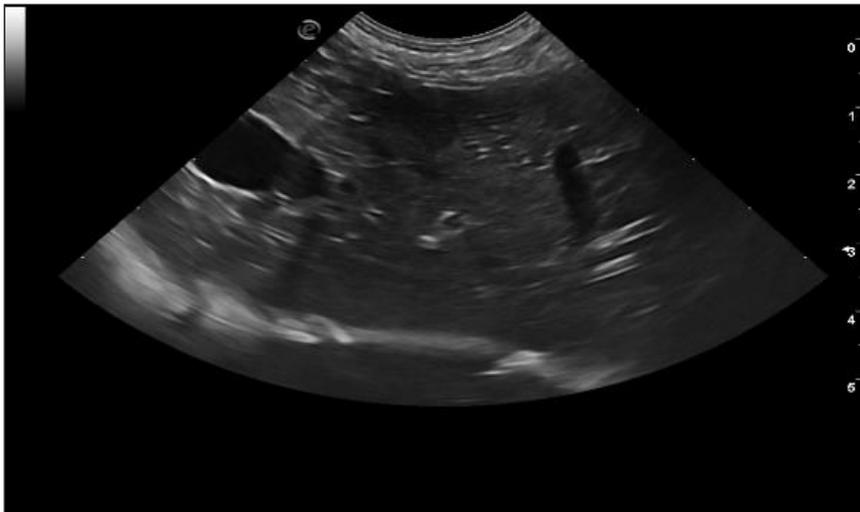


Fig. 2. Ultrasound examination showing increased liver echogenicity.

The ultrasound revealed normal dimensions, generally homogeneous echostructure, regular margins, portal vasculature within normal limits, and hepatic lymph nodes with no ultrasound alterations. The calcified tissue shows a coarse echostructure and increased echogenicity compared to the liver's echogenicity (Fig. 2.).

Description: The examined hepatic parenchyma is replaced by a poorly demarcated, non-encapsulated, infiltrative neoplastic formation, extending multifocally into the histological margins. The tumor is highly cellular, composed of epithelial cells arranged in tubular structures and nests, occasionally forming solid structures, bordered by a moderate connective stroma (desmoplasia). The neoplastic cells are cuboidal, polygonal, and/or slightly prismatic, with indistinct margins, acidophilic cytoplasm, and a moderate N/C ratio. The nuclei are round, oval, basal with finely granular

chromatin and 1-3 prominent nucleoli. There is marked anisocytosis and anisokaryosis with karyomegaly. The number of mitotic figures ranges from 1-3 per HPF. Necrotic foci associated with hemorrhage and mixed inflammation (neutrophilic, macrophagic, and lymphocytic) are observed. The diagnosis for this case was cholangiocarcinoma.

The research was conducted on 30 dogs, with the largest percentage being 18 females (60%) and 12 males (40%), belonging to different breeds and age groups. The diagnosed hepato-biliary neoplasms were hepatocellular carcinoma (38.46%), nodular hyperplasia (7.69%), hemangiosarcoma (15.38%), cholangiocarcinoma (30.76%), and hepatocellular adenoma (7.69%) (Fig.3.).

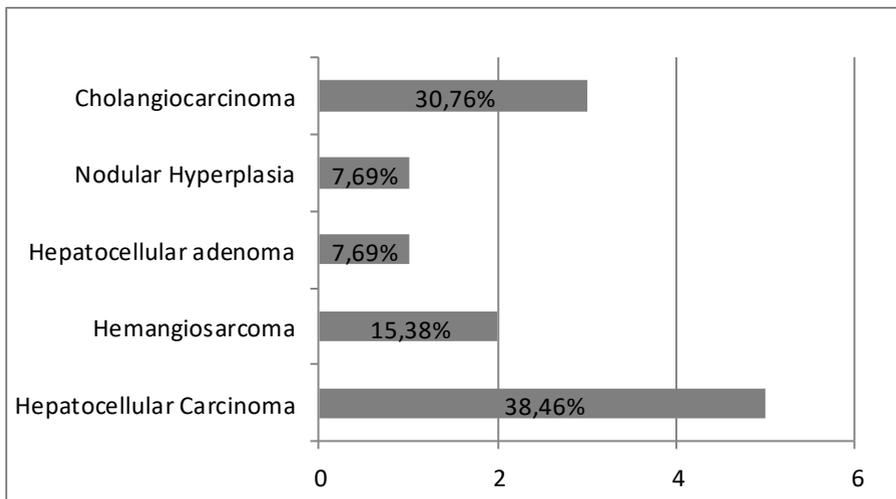


Fig. 3. Graphical representation of hepatic neoplasms

Conclusions

Among the dog breeds studied, the highest percentage of hepatic neoplasms was found in the French Bulldog breed at 22.33%. The clinical examination revealed generally common symptoms with the following values: 38.46% jaundice/subicterus (5 cases), 53.84% apathy (7 cases), 61.84% anorexia (8 cases), 55.84% abdominal pain (7 cases), 61.53% vomiting (8 cases), 69.23% progressive weight loss (9 cases).

The blood biochemistry examination showed an increase in ALP (76.92%) and ALT (46.15%), and total protein (T-pro) (38.46%).

The clinical examination revealed generally common symptoms with the following values: 38.46% jaundice/subicterus (5 cases), 53.84% apathy (7 cases), 61.84% anorexia (8 cases), 55.84% abdominal pain (7 cases), 61.53% vomiting (8 cases), 69.23% progressive weight loss (9 cases).

Acknowledgements

This study is part of a bachelor's thesis focused on the identification and diagnosis of hepato-biliary neoplasms, as encountered in medical practice and specialized literature up to the present.

References

1. Baba, Oncologie comparată, București: EDITURA ACADEMIEI ROMÂNE, 2002.
2. S. B. Manolescu Nicolae, Oncologie Veterinară, București: Ceres, 1991.
3. N. Manolescu, Oncologie Comparată, București: Ceres, 1991.
4. D. Crînganu, Oncologie generală, București: PRINTECH, 2009.
5. D.H.T.J.M.Vail, Small animal Clinical Oncology, London, Neu York, Oxford, Philadelphia.: ELSEVIER, 2020.
6. N. Manolescu, introducerea în oncologie comparată, București: Universitară Carol Davila, 2003.
7. A. I. Baba, Oncologie comparată, București: EDITURA ACADEMIEI ROMÂNE, 2002.

DYNAMICS OF THE IMMUNE RESPONSE AGAINST NEWCASTLE DISEASE IN BROILER FLOCKS WITH REOVIRAL INFECTIONS

Mădălina MIHALACHE, Daniel CUCA

Faculty of Veterinary Medicine, Spiru Haret University, Blvd. Basarabia 256, Bucharest
email: medelina_@yahoo.comm

Abstract

The study followed the dynamics of post-vaccination antibodies against avian pseudorabies in a flock of broilers with diagnosed cases of avian Reoviroosis compared to a clinically healthy control flock.

Comparative observations were made on two batches of ROSS 308 broiler chickens, of which the batch (L1) consisting of 23 100 healthy 40-day-old chickens and the batch [(L2) consisting of 23 120 40-day-old chickens in which locomotor disorders were observed and serologically specific antibodies were detected. The following were followed: evolution, percentage of mortality, level of post-vaccination pseudorabies antibody titers and incidence of locomotor disorders. In this flock the mortality percentage was 8% and the percentage of samples with protective titer against avian pseudorabies was 60%.

These results are due to the fact that in birds with reoviral infections the dynamics of immune and production parameters are deficient due to locomotor disorders and the impossibility to move to the feed lines.

Keywords: *avian reovirosis, locomotor disease antibodies, mortality rate.*

Introduction

Reoviroasis in birds is more common in chickens and turkeys, but cases have also been reported in ducks, geese, pigeons, partridges and some parrot species. It usually develops systemically, sometimes inapparently, sometimes with well-expressed clinical signs (locomotor disorders, digestive disorders, failure to achieve average daily gain).

Of the diseases caused by orthoreoviruses in birds, the best known, anatomically speaking, is viral arthritis (avian tenosynovitis) and malabsorption syndrome in birds.

The aim of the work was to demonstrate the involvement of reoviral infections in the dynamics of the immune response in the production of antibodies against the pseudo avian influenza in the most numerous zootechnical category of poultry raised in Romania - broilers.

Avian reoviruses have also been associated with other disease conditions in chickens where the role of the virus is less clear and indeed sometimes tenuous.

These include enteric problems such as cloacal pasting and mortality [1], ulcerative enteritis [3], enteric disease [2], respiratory disease [3, 4], inclusion body hepatitis [5], increased mortality and heart lesions in young broilers [6], sudden deaths in young broilers associated with lesions in the heart, kidney and liver [6] and the variously named runting/malabsorption/brittle bone disease in young broilers.

Material and method

The biological material under investigation is the tetralinear hybrid ROSS 308, bred in the investigated farm.

Two batches were tested consisting of:

- 23100 birds tested positive for avian Reoviroosis (House 28) 23120 birds clinically and serologically healthy for Reoviral infection (House 33).
- Anti-reoviral and anti-ND antibodies were analysed on blood samples collected from the farm.
- Blood samples were collected from the axillary vein in syringes without anticoagulant. After collection, samples were identified and transported to the laboratory in isothermal boxes where they were immediately processed according to methods for the determination of serum antibodies to antiretroviral (ELISA test) and anti-mouse antibodies (haemagglutination inhibition reaction).
- A total of 200 blood samples were collected from the chickens, 100 samples each at 35 and 42 days per litter for antibodies against avian viral arthritis and avian pseudorabies.
- The own studies and research were carried out in a privately owned establishment specialising in broiler rearing:
- The commercial company is a company specialized in poultry meat production with its head office in the town of Potcoava, OLT county.
- The own studies and researches necessary for the elaboration of the work were carried out in the period December 2023 - April 2024.
- Serological and histopathological examinations were carried out in the central laboratory in Bucharest. - The clinical and pathological examinations were carried out at the farm in Potcoava, Olt County

Results and discussions

From the analysis of the data presented in Table 1, it can be seen that broilers from pen 28 show antibodies against viral infectious arthritis starting at the age of 35 days with a peak level around the age of 42 days (Table 1).

In the case of flock 33 there are no antibodies against avian reovirus in serological testing (Table 2).

Table 2 *Serum antibodies values against avian reovirus*

Nr crt	Age of broilers in the 28 houses	Nr. sample	Serum antibody titer values				
			0	1	2	3	4
1	35 days	100	0	20	30	50	0
2	42 days	100	0	10	30	40	20

Table 1 *Serum antibodies values against viral infectious arthritis*

Nr crt	Age of broilers in the 33 houses	Nr. sample	Serum antibody titer values				
			0	1	2	3	4
1	35 days	100	100	0	0	0	0
2	42 days	100	100	0	0	0	0

The analysis of graph 1 of the weekly mortality dynamics of hybrid Ross 308 shows that in during the period analysed, there is an increase in mortality in weeks 5 and 6 in the group with evolving viral infectious arthritis (houses 28), while in the healthy group there is a low mortality (houses 33).

Table 3 *Evolution of mortality percentage*

Nr. Crt.	Specify	Lot			
		Houses 28		Houses 33	
		\bar{X}	S \bar{x}	\bar{X}	S \bar{x}
1.	Week 1	0.550	0.09	0.503	0.05
2.	Week 2	0.537	0.01	0.562	0.01
3.	Week 3	1,60	0.01	0.525	0.01
4.	Week 4	1,421	0.01	0.528	0.01
5.	Week 5	2.091	0.06	0.454	0.04
6.	Week 6	1.540	0.01	0.531	0.03
7	Total	7,739	0.01	3.103	0.02

At the age of 35 days in the batch of hale 28, 30% i.e. 15 samples showed high level of postvaccine antibodies 1/16, 1/32, 70%, 35 samples had low values. At slaughter age 42 days 30 samples were negative and 20 positive (Table 3).

At the age of 35 days the results of the titer values in hall 33 were better compared to the titer values in hall 28 i.e. 90%, 45 samples showed high level of postvaccinal antibodies 1/16, 1/32, 1/64 and 10% negative had low values of 1/8. At slaughter of the whole batch the percentage of positive samples was 100% (1/16,1/32,1/128,1/256) (Table 4).

Table 3 *Serum antibody titers values Hall 28*

Nr crt	Age of birds	Nr sample	Serum antibody titers values Hall 28								
			0	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512
1	35 days	50	10	10	15	15	-	-	-	-	-
2	42 days	50	0	10	20	10	10	-	-	-	-

Table 4 *Serum antibody titers values Hall 33*

Nr crt	Age of birds	Nr sample	Serum antibody titers values Hall 33								
			0	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512
1	35 days	50	0	0	5	30	10	5	-	-	-
2	42 days	50	0	0	5	10	15	10	5	5	-

Analysing the presence of locomotor symptoms, it can be observed that in the first week of life locomotor symptoms are present in the chickens in Brooder 28 and absent in those in Brooder 33.

From the second week onwards, the symptoms remain unchanged in favour of the flock of house 33, which is maintained throughout the period analysed.

In the flock of barn 28 the locomotor symptoms were maintained from 14 days until 42 days of age when the flock was slaughtered.

Conclusions

- Mortality percentage is lower in flock 1 (3.1%) due to absence of reoviral infection compared to flock with 7,73% Avian Infectious Arthritis.
- The level of post-vaccination anti-pseudopest antibodies was higher in samples from flock 33 (100% at 42 days of age) in which no reoviral arthritis evolves.
- In samples collected from hall 28 the percentage of positive samples was low 40% and the percentage of negative samples was high 60% at the age of 42 days.
- The incidence and frequency of locomotor symptoms was very high in the batch of birds from house 28.
- In flocks of house 33 no specific symptoms of avian infectious arthritis were observed.
- The low level of anti-pseudopestosis antibodies in flock 28 is due to the presence of reoviral infection which prevents normal dynamics of anti-pseudopestosis antibodies.

References

1. Dutta S.K. & Pomeroy B.S. (1969). - Isolation and characterisation of an enterovirus from baby chicks having an enteric infection. II. Physical and chemical characterisation and ultrastructure. *Avian Dis.*, 11, 9-15. (1)
2. Krauss H. & Ueberschar S. (1966). - Zur Structur eines neuen Geflügel-Orphanvirus. *Zentralbl. Veterinärmed.*, 13, 239-249 (2)
3. Fahey J.E. & Crawley J.F. (1954). - Studies on chronic respiratory diseases of chickens. II: Isolation of a vims. *Can. J. comp. Med.*, 18, 13-21. (3)
4. Petek M., Feiluga B., Borghi G. & Baroni A. (1967). - The crawley agent: an avian reovirus. *Arch. ges. Virusforsch.*, 2 1 , 413-424 (4)
5. McFerran J.B., McCracken R.M., Connor T.J. & Evans R.T. 1976). - Isolation of viruses from clinical outbreaks of inclusion body hepatitis. *Avian Pathol*, 5, (5)
6. Bains B.S., Mackenzie M. & Spradbrow P.B. (1974). - Reoviruses associated with mortality in broiler chickens. *Avian Dis.*, 18,472-476. (6)

CLINICAL AND RADIOLOGICAL ASPECTS IN MUSCULOSKELETAL DISORDERS IN DOGS

Maria MOCANU, Soare MARIAN

Spiru Haret University, Faculty of Veterinary Medicine,
Basarabia Boulevard, 356, Bucharest, Romania
Email: mocanumaria186@gmail.com

Abstract

This study investigates the clinical and radiological aspects of locomotor disorders in dogs, including issues like degenerative joint diseases, dysplasia, fractures, dislocations, and spinal disorders, aiming to ensure precise diagnosis and management for optimal health and quality of life. The research, conducted from 2021 to 2024, examined 60 dogs from various breeds, utilizing radiographs performed, and clinical examinations, incorporating inspection, palpation, percussion, and owner-provided anamnesis to diagnose locomotor disorders. The study found that the most common locomotor disorders were fractures (47%) and metabolic conditions (27%), predominantly affecting the hind limbs (64%), with a higher incidence in senior dogs and a noticeable increase in neoplastic conditions with age. The findings underscore the importance of a multidisciplinary approach involving veterinarians, radiologists, and rehabilitation specialists in the diagnosis and treatment of locomotor disorders.

Keywords: locomotor disorders, radiology, lameness

Introduction

Locomotor disorders in dogs are a significant concern in veterinary medicine due to their impact on the animals' health and quality of life. These disorders encompass a wide range of problems, including degenerative joint diseases, hip and elbow dysplasia, fractures, luxations, and spinal conditions. Accurate diagnosis and effective management are crucial for maintaining mobility and comfort in affected dogs.

Clinical and radiological assessments play a vital role in diagnosing and evaluating the severity of these conditions. Clinical examinations can reveal symptoms such as pain, lameness, stiffness, and muscle atrophy, which are critical indicators of locomotor issues. Locomotor disorders were most often manifested as limping. Depending on the intensity, limping could be classified into three grades: slight discomfort while walking, obvious limping, and lack of support on a limb. Inspection also assessed the timing of the limp, with cold limping being evident at the beginning of movement and warm limping appearing after a period of activity (4). Complementary radiological imaging, particularly X-rays, provides detailed views of bone

and joint structures, allowing for precise identification of abnormalities and assessment of the extent of damage.

This study aimed to explore the clinical and radiological aspects of locomotor disorders in dogs, analyzing the correlations between observed clinical symptoms and radiological changes. The research seeks to offer a comprehensive perspective on diagnostic methods and the clinical implications of these disorders. Additionally, the study highlights the importance of a multidisciplinary approach in diagnosing and treating locomotor disorders, emphasizing the essential collaboration between veterinarians, radiologists, and rehabilitation specialists.

Materials and Methods

The study was conducted between 2021 and 2024, examining a total of 60 animals aged between 6 months and 14 years. Among them, 33 were females and 27 were males from the following breeds: Bichon (10 cases), Yorkshire Terrier (9 cases), Mixed breed (16 cases), Golden Retriever (4 cases), Rottweiler (2 cases), French Bulldog (6 cases), Cane Corso (4 cases), Shih-tzu (3 cases), Pomeranian (2 cases), Bull Terrier (2 cases), and Poodle (2 cases).

The examination methods used included the clinical examination of the patient within the veterinary clinic, followed by radiological examination of patients, when necessary, with referrals to a laboratory.

The clinical examination of the locomotor system was conducted both functionally, by assessing the animal's position in motion and at rest (the position of the limb relative to the ground, lack of support on the ground), and physically, by examining the components of the locomotor system (3).

For the radiological examination of the locomotor apparatus in the presented cases, standard radiography was used, employing various incidences depending on the affected area and the condition. The radiographic image is formed based on the properties of X-rays, which penetrate an anatomical area composed of tissues with different compositions, densities, and thicknesses. As a result, the absorption of radiation will be unequal, resulting in a radiographic image composed of lighter and darker areas (2).

Orthopedic problems were often specific to certain breeds or age groups. In some cases, conditions that affected young dogs became less prevalent once the patient reached skeletal maturity, and this information was useful when deciding on the treatment protocol (1).

Results and discussion

Out of the 60 cases examined with locomotor disorders, we found 11 breeds among the dogs examined, the most common being: Mixed breed (16.27%), Bichon (12.20%), and Yorkshire Terrier (9.15%). Following clinical and imaging examinations, we diagnosed the following types of conditions: traumatic - fractures (47%), tumoral processes (suspected based on radiological examination) (15%), metabolic (suspected based on radiological examination) (10%), and other - elbow/hip luxation (28%).

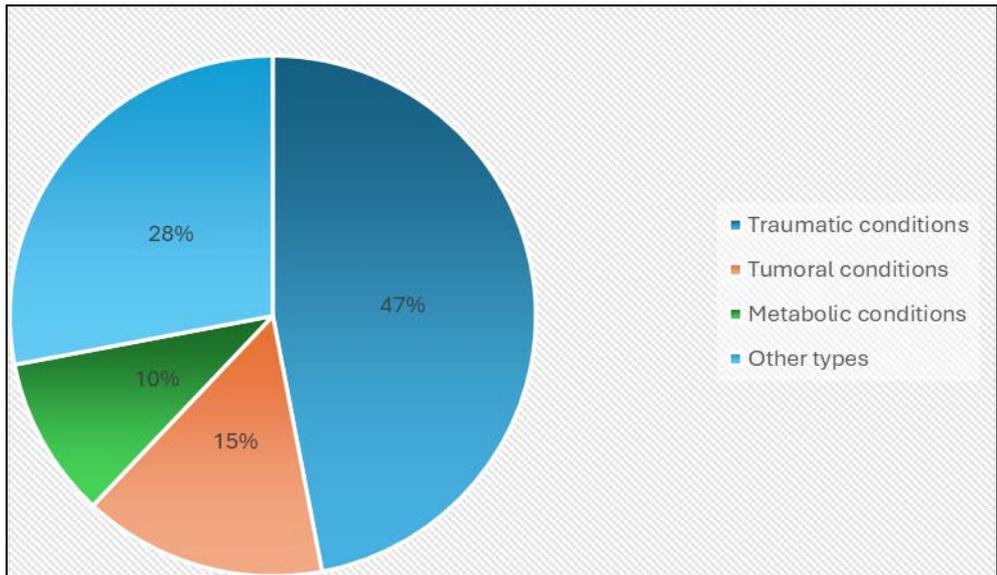


Fig. 1 Graphical representation - types of conditions

Traumatic injuries, predominantly fractures, were the most prevalent at 47%. Suspected tumors accounted for 15% of cases, while metabolic conditions such as rickets or osteomyelitis were identified in 10% of cases. Luxations of the elbow and hip joints constituted 28% of diagnoses, highlighting the diverse range of orthopedic challenges encountered.

The study's clinical examinations revealed a higher incidence of hind limb issues (64%) compared to forelimb issues (36%), indicating a predominant prevalence of lower limb orthopedic conditions. Demographically, the study included 33 female and 27 male dogs, with puppies (42%), adults (58%), and seniors (17%) represented across different age groups.

One of the representative cases is Zack, a senior Yorkshire Terrier, as we can highlight the importance of a comprehensive clinical examination complemented by radiological evaluation to obtain an accurate diagnosis.

Zack's symptoms began following a playful leap from a bed to chase after a ball. Subsequently, she exhibited pronounced limping and displayed sensitivity upon palpation of her left hind limb. Notably, Zack avoided placing weight on the affected leg, particularly on hard surfaces. A pivotal aspect of the clinical examination was the positive result of the Drawer Test, a maneuver indicating instability within the knee joint, strongly suggesting a ligamentous injury.



Fig. 2 - Consultation for Zack - Palpation of the left hind limb knee

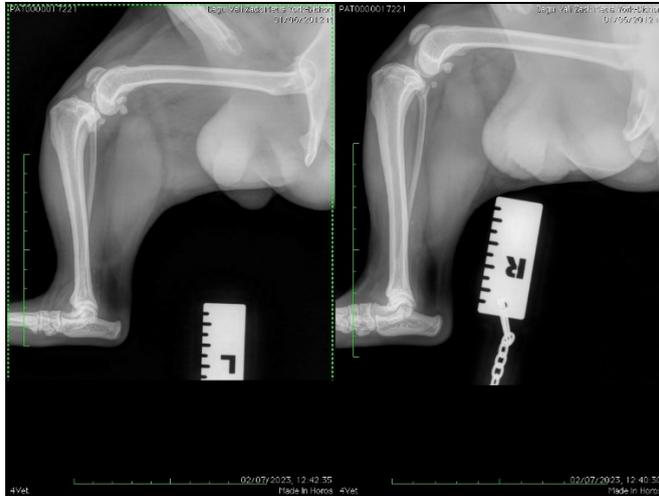
Upon further clinical examination, Zack demonstrated clear asymmetry in weight-bearing, favoring the right hind limb. Tenderness and discomfort were observed upon palpation of the left stifle joint (knee). He showed reluctance to place the left hind limb on the ground, especially on firm surfaces. A positive drawer test indicated joint instability, specifically suggesting possible ligament damage.

Radiological diagnosis was performed using X-ray imaging, Zack was positioned to obtain clear lateral and ventrodorsal views of the hip joint.

Luxation patellae (bilateral) was confirmed through clinical examination and lateral-lateral radiographs. A partial or total rupture of the left hind limb

cruciate ligament was suspected based on clinical signs and radiographic findings. Joint effusion, indicated by the presence of fluid in the knee joint, suggested a possible ligament injury. Bilateral tibial angular deformity was identified, indicating alignment issues in the tibial bones. Additionally, a possible femoral neck fracture on the left side was suspected and required further evaluation.

Treatment was surgical intervention to reposition the patella anatomically, also post-operative physical rest for complete recovery.



***Fig. 2 - Lateral X-ray of the left hind limb, latero-lateral incidence;
Bilateral patellar luxation***

This approach addresses Zack's bilateral patellar luxation and potentially associated ligament injury, aiming for effective restoration of joint function and stability.

Conclusions

Based on the findings from the examination of 60 cases with locomotor disorders, several conclusions can be drawn: we found an equal distribution between male and female dogs, with mixed-breeds, Bichons, and Yorkshire Terriers most affected. Traumatic injuries, mainly fractures, were prevalent due to household and road accidents causing polytrauma. Dysplastic conditions and metabolic disorders were also significant.

The study identified a variety of musculoskeletal conditions, with traumatic injuries, particularly fractures, being the most prevalent. Incidence

of locomotor disorders rises sharply with age, affecting mobility and daily activities. Traumatic injuries often worsen pre-existing joint degeneration.

Our findings are consistent with studies from the Royal Veterinary College, indicating higher prevalence among senior dogs and an increased incidence of neoplastic conditions, similar to human medicine trends.

Integrating clinical expertise with advanced diagnostics is crucial for tailored treatment plans, enhancing canine well-being and longevity. Understanding these disorders through thorough studies improves veterinary care and outcomes for canine patients.

References

1. Boyd S, 2014, Orthopaedic Examination of the Canine Patient, World Small Animal Veterinary Association World Congress Proceedings.
2. Vlăgioiu T, 2015, Radiologie veterinară aparatul locomotor, Editura Ars Docendi,
3. Vlăgioiu C. și Tudor N., 2012, Semiologie veterinară și tehnici de examinare, Editura Sitech, Craiova
4. Vulpe V. 2016, Semiologie specială veterinară, Editura Pim, Iași.

TRANSPORTATION OF PETS WITHIN THE EUROPEAN UNION

Alina Mariana MURGU, Luiza BĂDIC

Faculty of Veterinary Medicine, Spiru Haret University,
Blvd. Basarabia 256, Bucharest
email: murgu.alina_m@yahoo.com

Abstract

The transport of pets is an important and continuously developing branch, which must be carried out following certain European standards, both to ensure the well-being of the transported animal, and to ensure traceability from the point of departure to the point of its arrival, being essential to ensure the prevention of the spread of infectious-contagious diseases, both for other animals and for humans.

There is a substantial trade in dogs and cats, through breeding facilities and the sale of puppies and cats, such as kennels and felis, through pet stores that sell dogs and cats of all ages, but also through animal shelters that provide, also dogs and cats, either by selling them or by adopting rescued, stray or unwanted dogs and cats.

Taking into account the upward trend in the last decades of helping abandoned animals from Romania coming from Western European countries, it is possible to explain the increased number of international adoptions in recent years and the need for the existence of international commercial transport of live animals that ensures the transport of pets in safety, fast and at a low cost.

Keywords: *international transport, pets, animal welfare*

Introduction

Commercial activities involving cats and dogs are growing and contributing significantly to the European economy. One of the most important activities is their translocation for commercial purposes. Scientific studies on the effects of transport on the welfare of dogs and cats are rare, so most available information is based on recommendations or practical experience rather than scientifically based research. According to a Eurobarometer conducted in 2023, 44% of the citizens of the Union own pets and 74% of them believe that the welfare of pets should be better protected than they are now [3]. 6 out of 10 European citizens' initiatives that have been successful so far relate to animal welfare reflecting on the importance citizens give on better protecting animals in general.

In 2021, it was estimated that EU citizens owned 72.7 million dogs and 83.6 million cats [6]. There is a substantial trade in dogs and cats, through breeding facilities and the sale of puppies and cats, such as kennels and felis, through pet stores that sell dogs and cats of all ages, but also through

animal shelters that provide, also dogs and cats, by giving in adoption rescued stray or unwanted dogs and cats.

The transport of pets is an important and continuously developing branch, which must be carried out following certain European standards, both to ensure the well-being and health of the transported animal, as well as to ensure traceability from the point of departure to the point of arrival of the of it, being essential to ensure the prevention of the spread of infectious-contagious diseases, both for other animals and for humans. Animal welfare during transport in the EU is regulated by Council Regulation (EC) no. 1/2005 dictating the requirements that must be met during the commercial transport of all animals. However, the legislation has very few references to dogs and cats.

Evidence of a significant volume of document forgeries, misleading information and indications of commercial movement of dogs disguised as non-commercial movements to take advantage of less stringent control rules was collected by the EU Coordinated Action on the Illegal Trade in Cats and dogs performed in 2022 and 2023 [2]. In 2020, the European Parliament adopted a resolution on the illegal trade in EU pets calling for an EU-wide harmonized system of mandatory identification and registration of cats and dogs to combat the illegal trade [5].

For the purpose of international transport by road with an authorized commercial vehicle, animals are subject to a series of conditions that must be met in order to travel to another EU country, such as: mandatory identification with a microchip and its registration in the national database Registry of Dogs with Owners (RECS), mandatory anti-rabies vaccination at least 21 days before transport and at most 1 year before it (exception from the 21 days for vaccinations that have continuity and are made during the validity period of the previous vaccine), carrying out a clinical examination at the veterinarian and treatment against *E. Multilocularis* maximum 48 hours before the transport, accompanying the animal by an internationally recognized passport in which the previously mentioned information is recorded (Figure 1) [7].

A TRACES certificate ensures that it is possible to trace all parties involved in the movement and sale or placement of animals and establishes a harmonized system addressed in all Member States [4]. According to the sanitary-veterinary rules, dogs and cats must come from facilities registered by the competent national authority, such as dog/cat/ferret collection centers or sanitary-veterinary authorized facility that are also registered in the TRACES NT system. Also, the destination point must be a registered unit. These establishments must not be subject to any ban on animal health grounds, must examine the animals regularly, inform the authorities of a

possible disease and comply with the provisions ensuring the welfare of the animals kept and their identification and traceability [1].



Fig. 1. Summary of the basic legislation

(Source: “Guidelines on commercial movement of cats and dogs by land”, 2020)

Taking into account the sharp increase in past recent years of international adoptions, but also of the sale of animals by breeders or the translocation of owners to Western European countries, the need for the existence of authorized transports of pets has become indispensable for their travel to these countries in conditions of safety, but also through the lower costs they entail.

The article study carried out was based on the interdependence of the pet transport company Murgu Alina Mariana PFA and the shelter of the Suflete Dragi Association (ASD) and was based on data analysed over a period of 3 years, respectively October 2020 – October 2023, starting with the foundation of the transport company and made on a sample of 1439 animals transported during this time period.

From the total of 1439 animals transported, 420 of them came from outside the Dear Souls Association, representing a total of 29%, and the remaining 71% being represented by animals adopted from the ASD shelter (Figure 2). During the 3 years analyzed, it was found that most animals were adopted in France, with 776 animals adopted from ASD and 412 animals from other associations or individuals, followed by Belgium, with 238 animals from within the ASD and 8 animals from other associations or individuals (Figure 3).

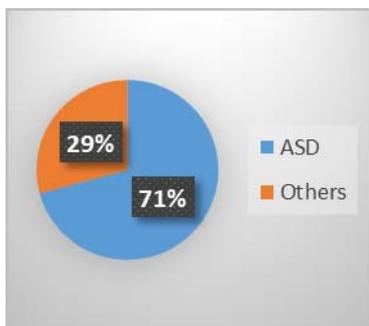


Fig. 2. Animals transported within Oct. 2020 – Oct. 2023

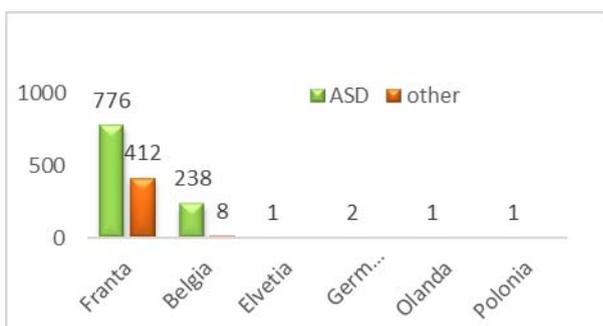


Fig. 3. Animals adopted by country within Oct. 2020 – Oct. 2023

Testing animals before transport provides with relevant epizootological information regarding the incidence of *Dirofilariasis* on animals in the ASD shelter. Although not all animals in the shelter are tested, these results provide relevant insight into the frequency of SNAP 4DX tested diseases in canids from the ASD shelter. Thus, from the collected information, it follows that out of 621 tested animals, 73 of them have positive results for *Dirofilaria*, representing 12% of the total of tested dogs, 13 came out positive for *Anaplasma*, representing 2% of the total, and 6 animals were positive in *Ehrlichia*, accumulating 1% of the total. 519 of the tested dogs had negative results, representing 85% (Tabel 1).

Tabel 1

Incidence of diseases tested with SNAP 4DX in dogs traveling from ASD

An	2020		2021		2022		2023		Grand Total
	Canide	Felide	Canide	Felide	Canide	Felide	Canide	Felide	
Anaplasma	1		1		5		6		13
Anaplasma, Ehrlichia							1		1
<i>Dirofilaria</i>	19		23		18		13		73
<i>Dirofilaria</i> , <i>Anaplasma</i>			1						1
<i>Dirofilaria</i> , <i>Anaplasma</i> , <i>Borrelia</i>			1						1
<i>Dirofilaria</i> , <i>Borrelia</i>					1				1
<i>Ehrlichia</i>			2		1		3		6
Negative	55	6	236	18	108	16	120	25	590
Total	75	6	264	18	133	16	143	25	686
No	1		124	17	147	19	115	10	434
No need	28		62	5	100	11	112	7	325
	104	6	450	40	380	46	370	42	1439

Conclusions

From the perspective of public health concerns, this article wants to come as a support in combating the illegal transport of animals that can allow the

interspecies transmission of various diseases, causing zoonotic outbreaks. In this sense, obtaining and making correct and complete documents for both the carrier and the animal, are essential and regulated by normatives and laws, providing safety, transparency and traceability of the transport and the transported animals.

In the activity of transporting pets, welfare conditions must be respected, although Romanian legislation is not yet perfectly aligned with EU requirements in this field. Also, the regulation of the transport of companion animals needs to be differentiated and detailed, compared to the transport of farm animals, on which the emphasis is placed in the legislation of international long-term transports.

Following the results obtained from the 1439 animals transported in the first 3 years of activity of the analyzed company, we can conclude that the real need for international adoptions for animals in Romania, but also the desire of non-governmental organizations and Western European individuals to help in this regard, explains the existence of international transport of pets. The prevalence of *Dirofilariasis* detected in animals transported from the shelter raises an alarm signal about the spread of this disease in Romania and should lead veterinarians to take a stand regarding the promotion of standard prophylactic methods, both among owners and shelters, to protect the pets they own.

References

1. ANSVSA, “NORMĂ SANITARĂ VETERINARĂ din 18 ianuarie 2024, privind procedura de înregistrare/autorizare sanitar-veterinară a unităților, centrelor de colectare, transportatorilor și mijloacelor de transport rutier din domeniul sănătății și protecției animalelor”, 2024, <https://legislatie.just.ro/Public/DetaliiDocumentAfis/279034>
2. European Commission, Directorate-General for Health and Food Safety, “Illegal trade of cats & dogs, EU enforcement action”, 2023, doi:10.2875/236344.
3. European Commission, Special Eurobarometer 533 “Attitudes of Europeans towards Animal Welfare”, Fieldwork: March 2023
4. European Commission, “TRACES at a glance”, https://food.ec.europa.eu/horizontal-topics/traces_en
5. European Parliament resolution of 12 February 2020 on protecting the EU’s internal market and consumer rights against the negative implications of the illegal trade in companion animals (2019/2814(RSP)), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020IP0035>
6. FEDIAF annual report 2023, <https://europeanpetfood.org/about/annual-report/>
7. Welfare in Pet Trade, “Guidelines on commercial movement of cats and dogs by land”, 2020, https://food.ec.europa.eu/system/files/2020-11/aw_platform_plat-conc_guide_dog-cat_transport-land.pdf

ASPECTS REGARDING EMBRYO TRANSFER IN HORSES

Ştefan MOŞESCU, Mihai DANES

Spiru Haret University, Faculty of Veterinary Medicine, 256 Basarabia Avenue.,
30352 Bucharest, Romania
e-mail: mosescustefan85@yahoo.com

Abstract

Embryo transfer is a technique that helps multiply valuable genes, facilitates the rapid and efficient growth of a valuable population. Moreover, this procedure is used for the conservation of endangered species and last but not least is a method of reproduction with a significant economic impact favorable to farm management.

Keywords: *mare, embryo transfer, embryos, donor, recipients, stallion, semen*

Introduction

Embryo transfer in horses is a technique used in assisted animal reproduction, involving the transfer of fertilized embryos from a donor animal to a recipient animal to support a pregnancy. This technique is commonly used in farm animal breeding, species conservation efforts, and biological research. The process of embryo transfer in animals involves several steps. Firstly, ultrasound is used to monitor the ovarian follicles of the donor mares and determine the optimal timing for breeding or artificial insemination. Ultrasound also helps in detecting and monitoring gestation in the recipient mare after embryo transfer. Donor mares are given luteinizing hormone (LH) (1) to stimulate ovulation and prepare them for artificial insemination. Following ovulation, artificial insemination is carried out using sperm from a stallion. The fertilized embryo develops in the uterus of the donor mares, and after about 7-8 days post-ovulation, the embryo is collected from the uterus through flushing with a sterile solution. The embryo is then evaluated under a microscope to assess its development and quality, with poor-quality embryos typically being discarded. The transfer of embryos to the recipient mare is usually performed using a non-surgical technique, involving the insertion of a catheter through the vagina and cervix into the uterus of the recipient mare. After transfer, a pregnancy test is conducted to confirm the success of the transfer and the pregnancy of the recipient mare. If pregnancy is confirmed, the mare is cared for like any other pregnant mare, with regular monitoring of the pregnancy progress. Cryopreservation (2) of embryos is a modern technique used for long-term

storage and transport of embryos. This process involves vitrification of the embryos, a rapid freezing technique that prevents the formation of ice crystals that could damage the embryo. Embryo transfer in horses has multiple applications, contributing to the conservation and improvement of genetic lines, enhancing the reproductive output of farm animals, and supporting the reproduction of wild animals. This technique has a significant impact on animal husbandry and species conservation, aiding in the enhancement of genetic quality and productivity of animals.

Materials and methods

The embryo transfer process in mares is similar to that of other farm animal species, with some particularities due to the specific physiology of mares. A distinctive feature of this species is the low number of 1-2 ova produced per estrous cycle in mares. This requires careful preparation of the animals involved stallions as donors of seminal material used for artificial insemination of donor mares; donor mares suitable for reproduction from the Arabian Thoroughbred breed; receptive surrogate mare recipients from the Haflinger breed.

Donor stallions are purebred animals classified based on the value of their offspring acquired from breeders worldwide, with names like ElJahez, Gazuan, Dominic. Seminal material is collected on the farm in individual collections and stored in 0.5ml plastic straws.

Each collection yields 15-20 ml of seminal material, viability and counting tests reveal 125,000,000 spermatozoa/ml, 1.2×10^8 to the power of 7; freezing is done in liquid N₂ at -196 degrees Celsius at a concentration of $8-9 \times 10^6$ to the power of 6 spermatozoa/ml.

Each collection is checked and microscopically assessed (fig.1) : sperm density, viability, motility, integrity.

For each artificial insemination, 1,000,000,000 spermatozoa are used, which is 1×10^9 to the power of 8. Between 4-8 straws, or between 2-4 ml of frozen seminal material, are used. A dose contains 4 straws. For insemination with fresh material, one dose containing 30 ml of seminal material is used. Materials Used: 1. Synchronization Equipment: Prostaglandins and other hormones for estrous cycle control and syringes and needles for medication administration. 2. Equipment for Embryo Collection (fig.2), Uterine catheters for flushing the donor mare's uterus (fig.3), Specialized collection solution (Dulbecco's Phosphate-Buffered Saline – DPBS or EquiFlush with BSA or PVA), Filters for separating embryos from the wash solution. 3) Microscope and Slides for Evaluation, Microscope for assessing embryo viability. (fig.4), Glass slides for

examination. 4)Transport Media: Sterile containers for transport., Special transport medium (e.g., Holding Media or EquiHold) for maintaining embryo viability during transport. 5)Transfer Equipment: Sterile catheters for embryo implantation. (fig.5), Speculum and equipment for manipulating the recipient mare's uterus. 6) Monitoring Instruments: Ultrasound machine for monitoring the estrous cycle and embryo positioning.

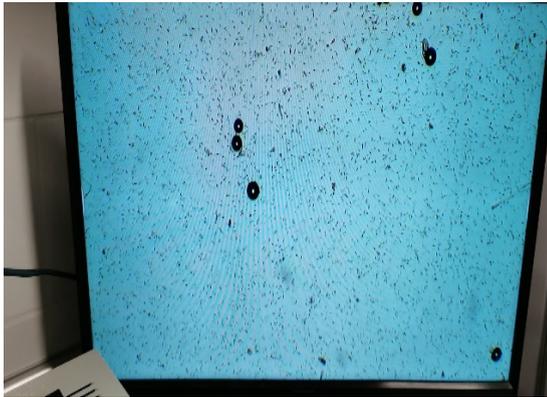


Fig.1-Sperm checked



Fig.2- Embryo collection filter



Fig.3- Uterine catheter for flushing

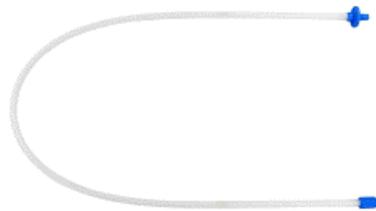


Fig.5- Catheter for embryo implantation



Fig.4- Microscope

Results and discussion

Out of 20 donor mares, we managed to collect 6 embryos, while it was not possible for the remaining 14 mares due to various issues. Some problems were attributed to infertility or unsuccessful insemination, others to hormonal issues, and some to reproductive system lesions. This embryo transfer procedure requires great precis

ion and is influenced by numerous factors that doctors, despite their effort, technique, and knowledge, cannot control 100%.

A remarkable case is that of the donor mare, representing a complex situation regarding embryo transfer in horses. Facing multiple issues that could hinder the success of embryo transfer, this mare required a specialized and careful approach to overcome these obstacles. The massive 8.39 cm hemorrhagic cyst (fig.6) poses a major problem as its size can affect the normal functioning of the uterus and interfere with embryo implantation and development. This type of cyst may be associated with hormonal imbalances or other reproductive disorders affecting the mare's fertility. Treatment and management of this cyst were top priorities to ensure an optimal uterine environment for embryo transfer. Treatment with prostaglandin F2 alpha is often used to induce luteolysis and regulate the reproductive cycle of animals. In the case of the donor mare, the administration of prostaglandin F2 alpha was used to help reduce the size of the hemorrhagic cyst and restore an optimal uterine environment for embryo transfer.



Fig.6- Hemorrhagic cyst

The developed uterine cyst (fig.8) and highly vascularized corpus luteum are two other aspects that can influence the success of embryo transfer. The presence of a uterine cyst can affect the normal structure and functioning of the uterus, while a highly vascularized corpus luteum (fig.7) may indicate excessive hormonal activity or other imbalances that could affect the mare's reproductive cycle.



Fig.7-Corpus luteum



Fig.8-Uterine cyst

These hormones play a crucial role in regulating the reproductive cycle, stimulating ovulation, and maintaining normal corpus luteum function. The

use of these hormones in the donor mare was beneficial to correct hormonal imbalances and improve the function of the reproductive system.

Conclusions and recommendations

In conclusion, with the help of embryo transfer, we have numerous advantages:

1)Rapid multiplication of individuals: Through embryo transfer, a single genetically valuable animal can produce multiple offspring in a shorter time compared to natural reproduction. This is essential in the conservation of horse species at risk, where the number of individuals is low.

2)Avoiding inbreeding: In the case of horse species with small populations, there is a risk of inbreeding and loss of genetic diversity. Embryo transfer can help avoid this phenomenon by introducing new and diverse genes within the population.

Acknowledgements

This study is part of an undergraduate research carried out in the Faculty of Veterinary Medicine, Spiru Haret University, 2023.

References

1. <https://www.ontario.ca/page/anatomy-physiology-and-reproduction-mare>
2. Astrastoae V, Ungureanu M-C, Stoice O, 2003, Ethical and legal problems of the new reproductive technologies, Revista Romana de Bioetica, vol.1 (2).

Din ANALELE UNIVERSITĂȚII SPIRU HARET au mai apărut:

• **Seria Sociologie-Psihologie**

nr. 1, 2000; nr. 2, 2007; nr. 3, 2008; nr. 4, 2009;
nr. 5, 2010; nr. 6, vol. 1-2, 2011;
nr. 7, vol. 1-2, 2012; nr. 8, vol. 1-2, 2013; nr. 9, vol. 1, 2014

• **Seria Matematică-Informatică**

nr. 1, 2005; nr. 2, 2006; nr. 3, 2007; nr. 4, 2008; nr. 5, 2009;
nr. 6, 2010; nr. 7, 2011; nr. 8(1), 2012; nr. 8(2), 2012;
nr. 9(1), 2013; nr. 9(2), 2013;
vol. 10, nr. 1, 2014; vol. 10, nr. 2, 2014; vol. 11, nr. 1, 2015

• **Seria Jurnalism**

nr. 1, 2000; nr. 2, 2001; nr. 3, 2002; nr. 4, 2003;
nr. 5, 2004; nr. 6, 2005; nr. 7, 2006;
nr. 8, 2007; nr. 9, 2008; nr. 10, 2009; nr. 11, 2010;
vol. 12(1), 2011, vol. 12(2), 2011;
vol. 13(1), 2012; vol. 13(2), 2012; vol. 14(1), 2013; vol. 14(2), 2013;
vol. 15(1), 2014; vol. 15(2), 2014; vol. 16(1), 2015; vol. 16(2), 2015;
vol. 17(1), 2016, vol. 17(2), 2016; vol. 18(1), 2017

• **Seria Filologie, Limbi și Literaturi Străine**

nr. 1, 1999; nr. 2, 2000; nr. 3, 2001; nr. 4, 2002; nr. 5, 2003;
nr. 6-7, 2004-2005; nr. 8-9, 2006-2007;
nr. 10, 2008; nr. 11, 2009; nr. 12, vol. 1-2, 2009;
nr. 13, vol. 1-2, 2010; nr. 16, 2011;
nr. 17, 2012; nr. 18, 2013; nr. 19, 2014

• **Seria Geografie**

nr. 1, 1998; nr.2, 1999; nr. 3, 2000; nr. 4, 2001;
nr. 5, 2002; nr. 6, 2003; nr. 7, 2004; nr. 8, 2005; nr. 9, 2006;
nr. 10, 2007; nr. 11, 2008; nr. 12, 2009; nr. 13, 2010; nr. 14, 2011; nr. 15, 2012

• **Seria Medicină Veterinară**

nr.1, 2000; nr. 2, 2001; nr. 3, 2002; nr. 4-5, 2003-2004;
nr. 6-7, 2005-2006; nr. 8, 2007; nr. 9, 2008; nr. 10, 2009; nr. 11, 2010
nr. 12, 2011; nr. 13, 2012; nr. 14, 2013; nr. 15, 2014; nr. 16, 2015; nr. 17, issue 1-2, 2016;
nr. 18, issue 1, 2017; nr. 18, issue 2, 2018; nr. 19, issue 1, 2018, nr. 19, issue 2, 2018,
nr. 20, issue 1, 2019; nr. 20, issue 2, 2019; nr. 21, issue 1, 2020; nr. 21, issue 2, 2020;
nr. 22, issue 1, 2021; nr. 22, issue 2, 2021; nr. 23, issue 1, 2022; nr. 23, issue 2, 2022;
nr. 24, issue 1, 2023; nr. 24, issue 2, 2023, nr. 25, issue 1

• **Seria Economie**

nr. 1, 2001; nr. 2, 2002; nr. 3, 2003; nr. 4, 2004;
nr. 5, 2005; nr. 6, 2006; nr. 7, 2007;
nr. 8, 2008 (vol. I - IV); nr. 9, 2009; vol.1(10), issue 1-4, 2010;
vol. 2(11), issue 1-4, 2011; vol. 3(12), issues 1-2, 2012; vol. 4(13), issue 1-3, 2013;
vol. 5(14), issue 1-4, 2014; vol. 6(15), issues 1-3, 2015;
vol. 7(16), issue 1-4, 2016; vol. 8(17), issue 1-4, 2017

• **Seria Științe Juridice**

nr. 1, 2001; nr. 2, 2002; nr. 3, 2005; nr. 4, 2006;
nr. 5, 2007; nr. 6, 2008; nr. 7, 2009; nr. 8, vol. 1, 2, 2010;
nr. 9, 2011; nr. 10, 2012, nr. 9, 2011, nr. 10, 2012

• **Seria Educație Fizică, Sport și Kinetoterapie**

nr. 1, 2001; nr. 2, 2002; nr. 3, 2006; nr. 4, 2007; nr. 5, 2008; nr. 6, 2009

• **Seria Arhitectură**

nr. 1, 2009; nr. 2, vol. I-II, 2010;
nr. 3, vol. I-II, 2010; nr. 4, vol. I-II, 2012

• **Seria Arte (Muzică, Teatru)**

nr. 1, 2008; nr. 2, 2009; nr. 3, 2010
nr. 4, 2011; nr. 5, 2012; nr. 6, 2013; nr. 7, 2014