



ASPECTS REGARDING THE EVOLUTION OF ENZOOTIC BOVINE LEUKOSIS IN ALBA COUNTY

BĂLGRĂDEAN, F.¹, NICHITA I.¹, GROS, R.V.¹, MOZA A.C.¹, TÎRZIU A.², MOȚ D.¹, HOTEA I.¹, BUCUR I.M.¹, TÎRZIU E.¹

¹Banat's University of Life Sciences "King Michael I of Romania" from Timisoara, Faculty of Veterinary Medicine, 300645, Calea Aradului No. 119, Timisoara, Romania

²"Victor Babeș" University of Medicine and Pharmacy, Ophthalmology Department, 300041, Piața Eftimie Murgu 2, Timisoara, Romania

E-mail: valentingros@usvt.ro

Abstract: The purpose of this study was to monitor the evolution of enzootic bovine leukosis, over a period of five years (2019-2023), in the localities within Alba County. Samples from 211.029 cattle were examined in the virology department of DSVSA Alba, by means of two serological tests: agar gel immunodiffusion test (AGID) and ELISA, applied in the diagnosis of enzootic bovine leukosis in Alba County. All the samples were examined by the immunoenzymatic test and confirmation of the diagnosis, for positive samples at ELISA, was done by AGID test. For each test, the number and proportion of positive and negative results per calendar year was determined. We note that the ELISA test allowed the detection of a larger number of animals with enzootic bovine leukosis compared to the AGID test, taken as a reference.

• Introduction

Enzootic bovine leukosis (EBL) is an infectious disease caused by the enzootic bovine leukosis virus, (Retroviridae family, Orthoretrovirinae subfamily, Deltaretrovirus genus), which naturally affects cattle and buffaloes. Most of the infections are subclinical, but a significant proportion (30%) of cattle over three years of age show persistent lymphocytosis, and a smaller number develop lymphosarcoma in various internal organs.

The enzootic bovine leukosis eradication program, by slaughtering infected animals, is in full swing, especially in the European Union states.

The purpose of the present study was to evaluate the evolution, spread, incidence and prevalence of EBL in the existing cattle herds in a county in central Romania, in order to establish the effectiveness of the methods to combat the disease.

• Material and method

The data required for the study were taken from the DSVSA Alba archive, from which the situation of EBL animals was extracted, for a five years period (between 2019 and 2023).

A database was created from DSVSA archive, the processed information came from 85 cattle holdings: private farms, authorized person holdings (APH) and private households (PH), with one or more animals (Table 1).

No.	Year	Animal provenance			Total cattle
		Non-professional holdings (PH)	APH type units	Farms	
1	2019	19.898	11.887	8.515	40.300
2	2020	20.372	12.280	8.671	41.323
3	2021	18.312	12.984	9.325	40.621
4	2022	18.143	13.221	10.082	41.446
5	2023	22.858	15.590	8.891	47.339
TOTAL		99.583	65.962	45.484	211.029

A total of 211,029 animals were tested, as follows: 40,300 samples were taken during 2019, 41,323 samples during 2020, 40,621 samples during 2021, 41,466 samples during 2022, respectively 47,339 samples during 2023 (Table 1).

For the detection of serum antibodies against the Enzootic Bovine Leukosis (EBL) virus, the indirect variant of ELISA immune-enzymatic test was used, and to confirm the diagnosis, positive samples in the immune-enzymatic test were retested by the agar gel Immunodiffusion (AGID) test. To interpret the results, the Office Excel program was used, with Add-ons for statistics.

• Results and discussions

Analyzing the results regarding the evolution of enzootic bovine leukosis, in a county in the center of Romania, over a period of five years, different aspects were found regarding the incidence of the disease in the period 2019-2023.

Comparatively analyzing the results regarding the incidence of enzootic bovine leukosis, in animals within Alba County, over a period of five years, we find significant differences from one year to another, and from one age to another (Table 7 and Chart 1).

Thus, the most cases, confirmed by agar gel immune-diffusion test, were registered in 2021, 11 cases, respectively 2023, when seven cases were diagnosed. In 2022, although 16 samples were positive through the immune-enzymatic test, upon reconfirmation, following the application of the immunodiffusion test, all samples were negative.

Similar results were also recorded in the samples from 2019, when out of the 27 positive samples by ELISA, only one case was confirmed by agar gel immunodiffusion test.

No.	Year	Examined samples (no.)	Positive cases ELISA		Confirmed cases AGID	
			No	%	No	%
1	2019	40.300	27	0,06	1	-
2	2020	41.323	5	0,01	3	0,01
3	2021	40.621	22	0,05	11	0,03
4	2022	41.466	16	0,04	0	-
5	2023	47.339	36	0,08	7	0,01
TOTAL		211.049	105	0,05	22	0,01



Chart 1 - The 2019 - 2023 EBL incidence in Alba County

Although the enzootic bovine leukosis eradication program, by slaughtering infected animals and compensating animal owners, in Romania, is in full swing, the number of positive cases is constantly increasing. We note, however, that the situation we found is not unique, the disease being present all over the world, with a different prevalence from one country to another.

Recent research in most countries, especially outside Europe, has reported continuous increases in the prevalence of BLV in both beef and dairy cattle.

As a result of this increasing prevalence, many countries have implemented BLV control programs, which include tight trade restrictions to protect their herds.

• Conclusions

- The enzootic bovine leukosis evolution dynamics in farm-type holdings, household holdings and authorized person holdings, within Alba County, had an upward trend until 2021, then the number of positive samples dropped to zero, in 2022, being followed by a slight increase in 2023, which can be attributed to the effectiveness of the disease eradication program.
- Regarding the type of holdings positive for EBL in the evaluated period, the largest positive cases were found in farm-type holdings and household holdings, the results being negative in the case of authorized person householdings.
- The total number of sick animals since the beginning of the monitoring period (2019 - 2023) reached the maximum value in 2021, respectively 11 positive cattle, confirmed, and 2023, when seven positive cases were confirmed.
- Remediation measures by extraction were applied in proportion to 100% in the case of all cattle with confirmed EBL.