Strongylidoses studies on equines are a topical issue worldwide, due to serious repercussions caused by both severe symptomatology and diminished general health state of animals.

Identification of strongyl species from Romanian horses, obtained by fecal cultures coming from 1,992 equines (26 horse populations from 13 counties) revealed dominance of *Cyatostomum* genus (82.10-93.03%) followed by *Strongylus vulgaris* (4.17-10.10%).

*In vivo* analysis by Fecal Eggs Count Reduction Test (FECRT) of resistance to Benzimidazole, conducted between 2003-2008, on 992 horses belonging to 22 populations, revealed installation of resistance phenomenon in 66.66% of cases.

*In vitro* strongyl resistance to anthelmintic drugs was detected by use of Egg Hatch Assay (EHA) and Larval Development Assay (LDA). Strongyl resistance to Benzimidazoles was detected in 77.28% of the populations taken in to study. In 22.72% of the studied horse population, the strongyls did not present adaptive phenomena to any of the tested Benzimidazoles.

The Anthelmintic Resistance Program (ARP), created and used for the first time in Romania, allowed numerical, biostatistical and graphic analysis of data obtained at *in vitro* tests, making possible the risk assessment for the exposed animal or equine population with regard to the possibility of occurrence of resistant strongyl species. Our analyses established that the correlation between FECRT and *in vitro* tests was 86.25%, quantified through the use of a biomathematical model. EHA and LDA tests data interpretation needed identification of equine populations that were never provided anthelmintic treatment, especially BZ treatment. Moreover, even if the equines were not treated, they must not have been exposed to contamination risk with possible resistant strongyls from other treated equines. Such an equine population has been identified in the Danube Delta Natural Reserve, in Romania. Faecal samples have been collected from 67 wild horses living in the Danube Delta. The faecal samples have been processed and analyzed by McMaster and Stoll methods (on coprocultures), the lethal concentration 50 (LC$_{50}$) and the minimal inhibitory concentration (MIC) for ABZ, FBZ and MBZ being subsequently quantified through applying a biomathematical model.

Due to the fact that these equine populations did not receive anthelmintic treatments, MIC and LC$_{50}$ obtained for the three tested substances are considered referential and will subsequently be used for the determination of the RF within equine populations that will be eventually taken into study. We stress the fact that monthly collection of biological samples in The Danube Delta and calculation of MIC and LC$_{50}$ will offer the possibility of obtaining accurate reference values that may be eventually used in studies worldwide.