Chronic wasting disease risk assessment in Portugal - setting up a project

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Background information

The recent identification of Chronic Wasting Disease (CWD) in Norway points to the hypothesis that cervids population in Europe could be at risk for Transmissible Spongiform Encephalopathies (TSEs) and a potential prion reservoir, as it occurs in other diseases, threatening the livestock and public health.

In these species, the susceptibility / resistance to prion diseases are also influenced by the polymorphisms in the *prnp* gene, so the characterization of the *prnp* genotypic profile in cervids, as well as the PrP^{res} survey and the georeferencing of TSE affected farms will contribute to delineate if there is a risk of dissemination of CWD in Portugal.

❑ Portuguese Cervid Population

In Portugal, there are three cervid species: red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*) and fallow deer (*Dama dama*). The first two are native species and live in the wild (Figure 1). The number of cervids in Portugal is increasing due to habitat changes, such as rural desertification and the extension in wooded and bushes areas. Moreover, some species, especially red deer, has been re-introduced for hunting purposes.

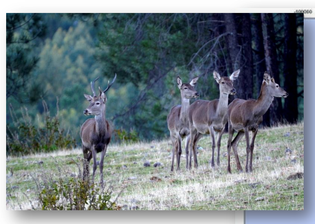
❑ Previous TSE testing in cervids

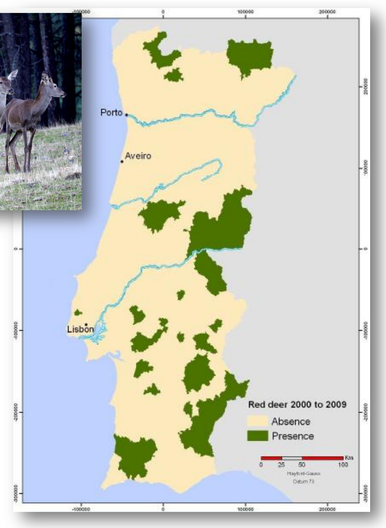
Within the framework of EU survey for CWD in cervids during 2007-2009, Portugal tested only 161 farmed and 14 wild animals in a 3-year surveillance system and no cases of CWD or other TSE were reported. Its drawbacks were: (a) limited testing performed in cervid species potentially susceptible to CWD; (b) lack of representativeness of samples according to the size and distribution of the cervids population; (c) the sensitivity of TSE testing carried out in obex samples and (d) the lack of data on the *prnp* gene polymorphisms frequency and diversity in the EU cervids population and in the tested animals (EFSA, 2010).

❑ TSEs in Portugal

The probability of cervid species in Portugal being exposed to a TSE prion is non-negligible as Portugal had a high BSE prevalence (Orge *et al.,* 2015) and an emergence of classical scrapie was also reported in a background of atypical scrapie consistently detected every year in sheep and goats (Orge *et al.*, 2010). Due to the extensive grazing areas shared by the population of wild ruminants and sheep and goat flocks, real contact with scrapie prions is likely to occur.

(a)





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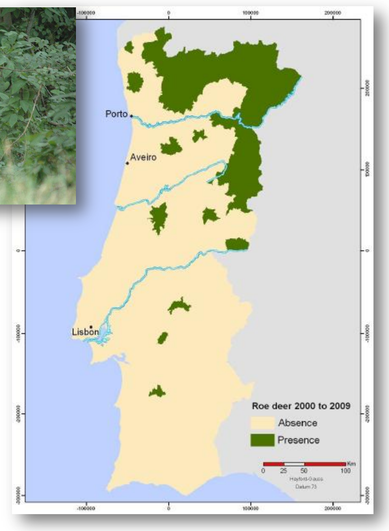

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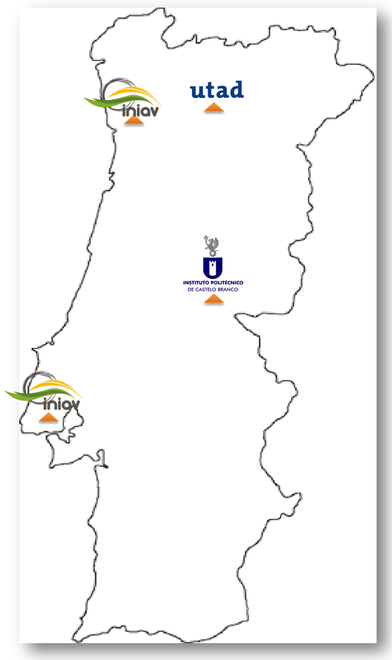

Figure 1. Distribution of cervids population in Portugal: (a) Red deer; (b) Roe deer; (c) Fallow deer (maps a,b -Salazar,2009; c-adapted from http://www.wilder.pt/seja-um-naturalista/como-encontrar-veados-gamos-e-corcos-em-portugal/). Photos taken by Ana Matos (a) and Gilberto Fernandes (b,c).

Figure 2. Project Partners

Objectives

i) To determine the *prnp* genetic variability in the cervids population;

ii) To define if there is genetic susceptibility / resistance to CWD;

iii) To evaluate the risk of exposure of the cervids population in Portugal to prions (BSE, Classical and atypical scrapie);

iv) To increase CWD awareness among stakeholders.

Tasks

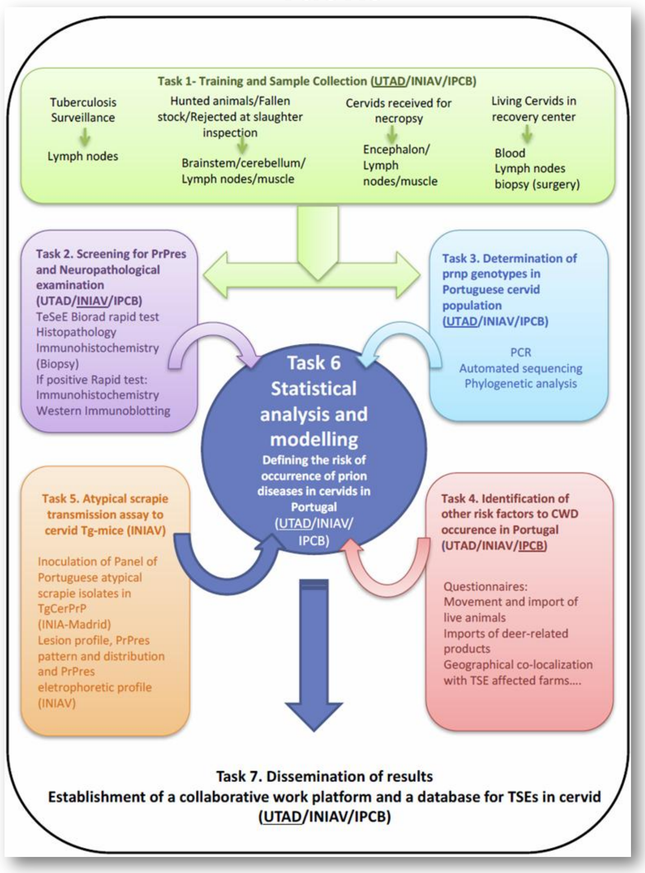

Figure 3. Diagram of the tasks

Work team

A 3 years- collaborative project **(Project nº 029947IC&T 02/SAICT/2017-SAICT)** was established by the University of Trás-os-Montes e Alto Douro (UTAD), the National Institute for Agricultural and Veterinary Research (INIAV) and the Polytechnic Institute of Castelo Branco (IPCB) to carry out a risk analysis for a potential occurrence of CWD in Portugal (Figure 2). This is a synergistic collaboration as both UTAD and IPCB are located in areas with a closer contact with the cervid population and INIAV is the national reference laboratory for animal TSEs. This project also involves the formal collaboration of the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA, Madrid) where Portuguese atypical scrapie transmission assays into cervid-Tg mice will be developed and supervised by the Senior Researcher Juan Maria Torres.

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