

RABIES CONTROL IN CENTRAL EUROPE - RESULTS AFTER MORE THAN 10 YEARS OF ORAL IMMUNIZATION OF FOXES

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La rage est une zoonose majeure. Le renard roux (Vulpes vulpes) est le réservoir et le vecteur en Europe. Les premiers essais de lutte (tir, empoisonnement, gazage, déterrage) n'ont pas donné de bons résultats. Les nombres de renards et de cas de rage ont encore augmenté. Après que des chercheurs américains aient pu vacciner per os des renards, les premiers essais terrain ont commencé en Suisse (1978) et en Allemagne (1983), avec des vaccins à virus vivants modifiés. En 1996, dix sept pays vaccinaient les renards. Depuis 1990, l'incidence de la rage dans ces pays a considérablement diminué, mais de façon homogène. De petites résurgences de cas apparaissent à la suite de non vaccination locale, de manque de moyens, de retour par proximité ou par foyers résiduels. En Allemagne, les nouvelles mesures comprennent l'extension des zones vaccinées, l'intensification des vaccinations transfrontalières, l'augmentation de la densité d'appâts au km², l'évaluation de nouvelles stratégies, une vigilance accrue, pas d'arrêt avant trois campagnes complètes. La coopération internationale doit être augmentée en matière de rage, recherche et contrôle.

Rabies is one of the most dangerous zoonosis with an inevitably lethal outcome of the disease. In 1993, a total of 31,223 human rabies cases were reported by the WHO. However, the real number of deaths per year is estimated to be between 35,000 and 50,000 world wide (Meslin, 1997).

Because of its high susceptibility to the rabies virus, the red fox (*Vulpes vulpes*) became the main reservoir and also the main vector for the transmission of the disease to other animals (Figure 1).

In the past, attempts had been made to control fox rabies at its roots by reducing the reservoir population based on different methods (e.g. shooting, poisoning, gassing, trapping). However, these conventional methods were not very successful in decreasing the fox density below the epidemic threshold. Nevertheless, the fox population and the number of rabies cases as well increased more and more (Figure 2).

After American researchers were able to immunize red foxes by the oral route, the first field trials were started in Switzerland (1978) and Germany (1983) with baits containing modified live virus vaccines. Because of its striking success, oral vaccination of foxes (OVF) became the new strategy of rabies control in Europe. In the following years vaccination areas were enlarged more and more and in 1996 seventeen countries were involved in vaccination campaigns.

Since 1990, there has been a very impressive decrease of the rabies incidence in central Europe (Table I). Nevertheless, this decrease is not continuously in temporal and spatial dimension. Short increases of the rabies incidence in different countries are caused by a lack of vaccination campaigns, shortage of financial support, reinfection from neighbouring areas or by spreading of the disease from residual foci.

The conclusions of these investigations are the following:

1. There are remarkable differences in vaccination strategies between the federal states.
2. There was a lack of accompanying measures (hunting, diagnosis, distribution of baits).
3. The decrease of rabies incidence and new ecological conditions resulted in a dramatical increase of the fox population.

In Germany, the efficacy of different OVF-strategies was evaluated using long term studies and epidemiological analysis (Figure 3).

Based on the results of these studies new administrative regulations were established in Germany:

1. Extension of vaccination areas,
2. Intensification of cross-border activities,
3. Increase in bait density per sqkm,
4. Evaluation of alternative vaccination strategies,
5. Intensification of rabies surveillance and follow-up investigations,
6. At the earliest stop of vaccination campaigns 3 years after the last reported case in area.

After the introduction of these recommendations in Germany (1994) the rabies incidence decreased from 1,378 rabies cases in 1994 to 152 in 1996, which equals a reduction of 89 % until 97 % in some federal states. In view of rabies eradication international co-operation in rabies control and research has to be intensified.

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Table I
Rabies cases in Central Europe 1990 - 1996

Country	Year						
	1990	1991	1992	1993	1994	1995	1996
Austria	2,514	2,460	1,117	675	254	95	14
Belgium	144	29	34	2	61	213	44
France	2,984	2,166	1,285	261	99	40	17
Germany	5,572	3,597	1,427	845	1,378	857	152
Luxembourg	64	16	2	1	1	15	17
Netherlands	22	12	8	10	1	4	5
Switzerland	25	105	127	175	225	23	6
Total	11,325	8,385	4,000	1,969	2,019	1,247	255

Figure 1
Rabies cases in Germany 1990-1996

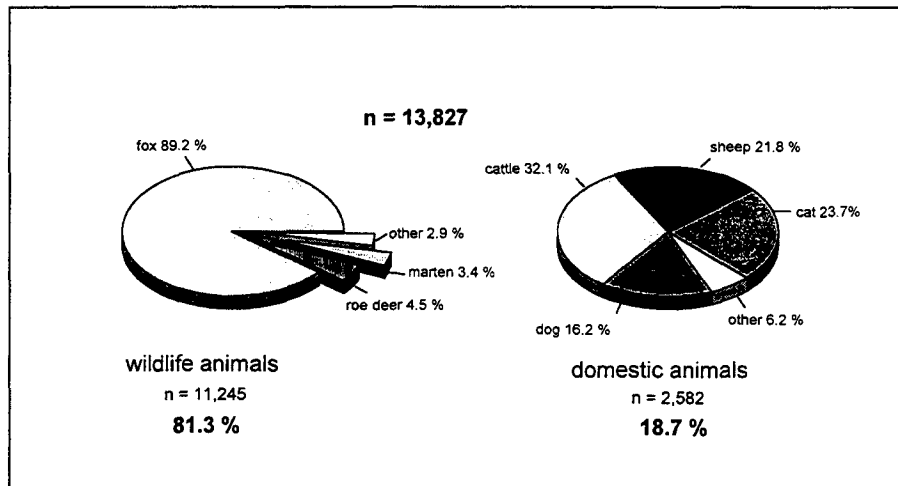


Figure 2
Hunting bag of foxes and rabies cases in Germany

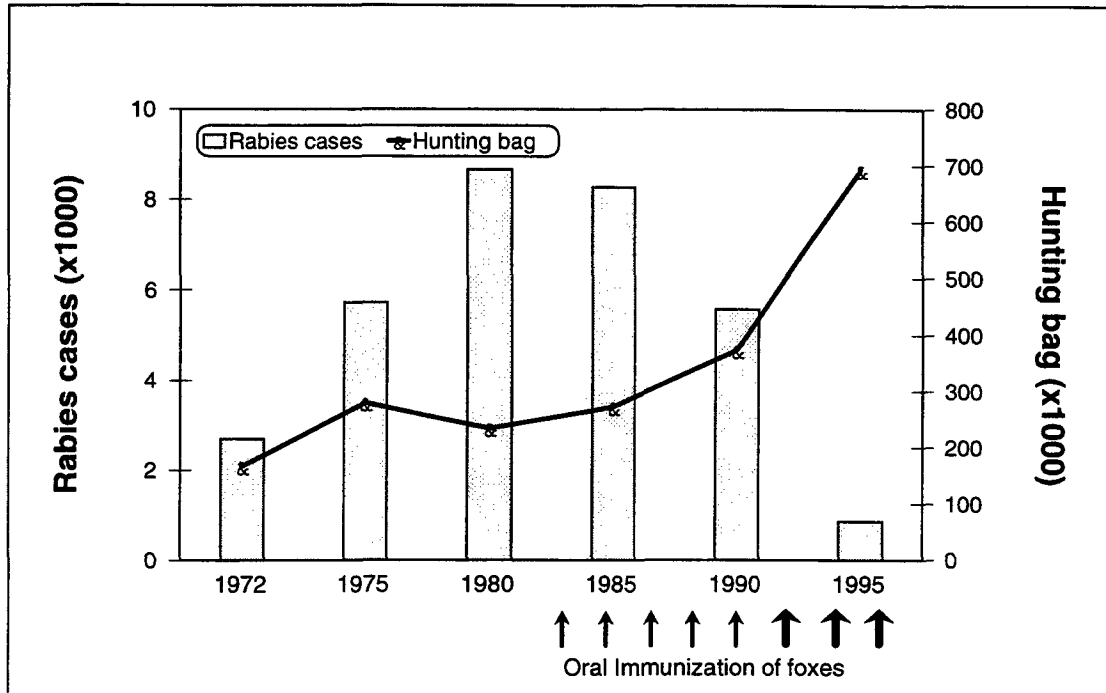


Figure 3
Comparison of different strategies of OVF in Germany

