RABIES BULLETIN EUROPE - VOL. 13/No 2/1989

C O N T E N T S

The **RABIES BULLETIN EUROPE** is compiled and edited by the

WHO Collaborating Centre for Rabies Surveillance and Research

Dr. L.G. SCHNEIDER, Chief
Dr. W.W. MÜLLER, Ass.Chief
K.-P. HOHNSBEEN, Statistician

at the
Federal Research Centre for Virus Diseases of Animals

D 7400 TUEBINGEN, Postfach 1149
Federal Republic of Germany

TEL.: (0)7071-603 332, TELETEX: 707131=BFAVTue, TELEX: 17707131
NEW: T e l e f a x (0) 7071 - 603 201

The **BULLETIN** is sponsored by the **WORLD HEALTH ORGANIZATION** in Geneva, and the **INTERNATIONAL OFFICE OF EPIZOOTICS** in Paris.

The financial support of the WHO Centre by the **BUNDESMINISTERIUM FÜR JUGEND, FAMILIE UND GESUNDHEIT**, Bonn-Bad Godesberg, is gratefully acknowledged.

1. INTRODUCTION

This BULLETIN describes the reported rabies cases in Europe for the second quarter 1989. The situation in general appears under 2., and in individual countries under 2.1 to 2.27. Figures for the European part of the Union of the Soviet Socialist Republics are reported for the first quarter 1989 but not for the second quarter 1989.

In the miscellaneous section under 3.1 a report is given on Finland referring to the rabies outbreak last year and its control by oral vaccination of wildlife. 3.2 gives WHO Recommendations on rabies vaccines for oral use, prepared during a WHO Consultation in Geneva, 1-2 March 1989. Figures on Human Rabies Prophylaxis, as experienced in France is described under 3.3. A note under 3.4 refers to support by the European Community for the oral vaccination of wildlife against rabies.

The rabies case data are tabulated for the second quarter 1989 under 4.

The last section lists the official contributors to the BULLETIN.

The geographical distribution of cases in Europe of the second quarter 1989 is shown on maps of Europe and Turkey in the Annex.

2. RABIES IN EUROPE, 2ND QUARTER 1989

During the second quarter 1989, 4154 rabies cases were reported in Europe. These were 3469 in wild animals (83.5%) and 685 in domestic animals (16.5%). Of the cases in wild animals 3110 were foxes (74.9% of total), 83 badgers, 28 raccoon dogs, 1 wolf, 111 stone martens, 10 pine martens, 10 polecats, 1 raccoon, 94 roe deer, 1 red deer, 1 fallow deer, 4 wild boars, 1 squirrel, 1 black rat, and 13 insectivorous bats. Of the 685 domestic animals 198 were dogs (89 dogs = 45% of all dogs in Europe were reported from Turkey, a country with dog-mediated rabies), 198 cats, 123 cattle, 137 sheep, 6 goats, 19 horses, 3 donkeys, 1 other domesticated carnivore. These data are summarized in Tables 1 and 3.

Table 2 summarizes the quarters 1 and 2 1989 in Europe, except for the second quarter 1989 of the Union of the Soviet Socialist Republics.

In comparison with the second quarter 1988 (2969 cases) Europe experienced an increase by 40%. This includes most countries except for Austria, Finland and Hungary as countries with wildlife rabies, the Netherlands as a country with only bat rabies and Turkey with urban rabies.

Rabies-free countries in Europe participating in the surveillance were: Bulgaria, Iceland, Ireland, the mainland of Norway, Portugal, Sweden and the United Kingdom of Britain and Northern Ireland. There were no cases reported from Finland, Greece and Svalbard (Norway), but their last indigenously acquired case was recorded less than two years ago.

Bat rabies cases were reported from Denmark (1), the Federal Republic of Germany (4), the Netherlands (7) and Spain (1).

One human case was subsequently reported for the first quarter 1989 by the Union of the Soviet Socialist Republics.

Individual country reports follow:

2.1 Rabies in Austria (AUT)

by H. Schnabl

During the second quarter 1989, 391 rabies cases in animals were registered. Compared to the first quarter 1989 (594 animals) this amounts to a reduction of 34.2%. Of 381 rabid wild animals (97.4% of total) were 316 foxes (80.8%) 28 badgers (7.2%), 23 stone martens (5.9%), 1 polecat and 13 roe deer (3.3%). Of 10 rabid domestic animals (2.6% of total) were 8 cats, 1 bovine and 1 sheep.

The distribution of rabies cases by Bundesländer (federal provinces) and Bezirke (districts) was as follows:

Burgenland: 16 cases (4% of total); Bezirke-Eisenstadt/Umg., Güssing, Jemersdorf, Mattersburg, Oberpullendorf.

Kärnten: 62 cases (16%); Bezirke-Feldkirchen, Klagenfurt/Land, St.Veit/Glan, Spittal/Drau, Völkermarkt, Villach/Land, Wolfsberg.

Niederösterreich: 61 cases (16%); Bezirke-Gmünd, Krems/Donau, Melk, Neunkirchen, Wiener Neustadt, Zwettl.

Oberösterreich: 61 cases (16%); Bezirke-Freistadt, Gmunden, Kirchdorf/Krems, Perg, Vöcklabruck.

Salzburg: 1 case; Bezirk Tamsweg.

Steiermark: 190 cases (49%); Bezirke-Graz/Stadt, Bruck/Mur, Deutschlandsberg, Fürstenfeld, Hartberg, Judenburg, Leibniz, Leoben, Liezen, Mürzzuschlag, Murau, Weiz.

Free of rabies were the Bundesländer Wien, Vorarlberg and Tirol.

2.2 Rabies in Belgium (BEL)

by J. Tambeur

154 rabies cases were confirmed in 105 localities of the provinces Hainant, Liege, Luxembourg and Namur during the second quarter 1989. Of these were 43 cases in domestic animals (3 dogs, 6 cats, 22 cattle, 3 horses and 9 small ruminants) and 111 cases in wild animals (104 foxes, 3 badgers, 3 other mustelids and 1 deer).

There was a decrease of cases by 37% compared to the first quarter 1989, but an increase of 133% compared to the second quarter 1988.

An oral vaccination of foxes could not be organized during the spring, it will be organized in September 1989 in the total area of Belgium infected by rabies.

2.3 Bulgaria (BUL)

The country remained rabies-free.

2.4 Rabies in Czechoslovakia (CZE)

by M. Olach and J. Neumann

During the second quarter of 1989, 470 rabies cases were diagnosed in the territory of Czechoslovakia (CSR 423 and SSR 47). There were 444 cases in free living animals (94.5%) and 26 in domestic animals (5.5%).

Compared to the 1st quarter of 1989 there was a decrease by 98 cases, i.e. 17.3.%. In comparison with the second quarter of 1988 (344 cases), there were 121 cases more in 1989 (an increase of 34.7%). The mostly affected wild animal animal was the fox (424 cases) followed by the marten (17), the badger (2) and roe deer (one case). Of the domestic animals there were 18 cases in cats, 5 in dogs, 2 in sheep and 1 in a goat.

After a long period rabies reappeared in the district of Karviná (last focus registered in 1976). The regions with the highest number of cases were West Bohemia (140), followed by the region of North Bohemia (66), Central Bohemia (56) and North Moravia (54). Of the districts, the most affected ones were Karlovy Vary (42) followed by Chomutov (24), Tachov (20), Louny and Blansko (19).

At present rabies is registered on the territory of Czechoslovakia in 425 communities of 82 districts (CSR - 381 communities of 62 districts and in SSR - 44 communities of 20 districts).

There was no case of rabies reported in man.

2.5 Rabies in Germany, Democratic Republic (DDR)

During the second quarter 1989, 659 rabies cases were diagnosed in animals in the Democratic Republic of Germany, 282 cases less than during the previous quarter and 277 more than during the same period last year. Of the 659 cases 446 (67.7% of total) were in foxes, 11 in badgers, 26 in stone martens, 2 in raccoon dogs, 1 in a raccoon, 19 in roe deer, 1 in a fallow deer, and 2 in wild boars. There were 151 cases in domestic animals (34 dogs, 74 cats, 15 cattle, 27 sheep and 1 goat).

Of the 15 Bezirke (departments) of the country, the four with the highest incidence were Dresden (97 cases), Halle (87), Potsdam (74) and Cottbus (66). All others had less than 47 cases.

2.6 Rabies in Denmark (DEN)

by E. Stougaard

During the second quarter 1989, only one case of bat rabies was reported in Denmark.

The country remained rabies-free in terrestrial animals.

2.7 Rabies in Germany, Federal Republic (DEU)

A total of 676 rabies cases were reported during the second quarter 1989, 392 cases less than during the previous quarter and 238 more compared to the second quarter 1988. Of the total 608 cases were in wild animals (520

foxes, 15 badgers, 28 other mustelids, 40 roe deer, 4 bats, 1 squirrel), 68 cases were in domestic animals (7 dogs, 15 cats, 13 cattle, 28 small ruminants, 3 horses, 2 donkeys).

In the state (Bundesland) of Schleswig-Holstein 3 bat rabies cases were diagnosed and one in the state of Niedersachsen.

A mysterious case of rabies in a squirrel (characterized with monoclonal antibodies by the WHO Reference Centre for Rabies Surveillance and Research, Tübingen, and identified belonging into the serotype 1 group) occurred in Berlin. There was no case of rabies in the area in other animals reported for several years.

Newly infected with terrestrial animals was the state of Schleswig-Holstein close to the border with the German Democratic Republic, after having been rabies-free in these type of animals for approx. 4 years.

The state of Hessen was again the state with the highest incidence of infection. 57% of cases of the grand total (386 out of 676) were accounted for in Hessen.

Oral vaccination of foxes against rabies during spring was practiced in all federal states except for the city states Hamburg and Bremen.

On 31.08./01.09.1989 the 6th Round Table Meeting on Oral Vaccination of Wildlife against Rabies took place in Kassel, an annual conference discussing the experience of the field trial in the different Bundesländer (federal states).

2.8 Rabies in Finland (FIN)

by S. Reinius

No case of rabies was diagnosed during the second quarter 1989 in Finland.

During the above mentioned period, laboratory examinations were carried out on the brains of 245 animals, and all the results were negative. These animals were: 67 raccoon dogs, 43 foxes, 27 badgers, 9 foxes bred in fox farms, 1 lynx, 1 pine marten, 1 polecat, 1 large weasel, 5 other wild carnivores, 3 squirrels, 6 hares, 1 hedgehog, 1 mole, 2 muskrats, 2 bats, 45 cats, 20 dogs, 7 cattle, 1 sheep, 2 rabbits.

(see as well the article on oral rabies vaccination in wildlife in this issue under 3.1).

2.9 Rabies in France (FRA)

by M. Aubert

940 rabies cases were registered during the second quarter 1989, 312 less than during the previous quarter. 764 were noted in the fox (81% of total), 32 in other wild animals and 144 in domestic animals (16 dogs, 24 cats, 30 cattle, 64 small ruminants and 10 horses).

The départements (departments) registering the greatest number of cases during this quarter were: Nièvre (109 cases), Doubs (87 cases), Jura (86 cases) and Meuse (85 cases).

2.10 Rabies in Greece (GRE)

by A. Saravanos

During the second quarter 1989, no case of rabies was reported in Greece.

2.11 Rabies in Hungary (HUN)

by L. Koltai

During the second quarter 1989, 138 rabies cases were diagnosed, 12.1% less than during the same period in 1988 (157 cases). The distribution of animal species was as noted prevously. Komitate (provinces) with the greatest density of cases were again in the west of the country: Somogy (18 cases), Zala (16), Fejer (13).

Previously planned oral vaccination of foxes against rabies had to be given up again for financial reasons.

2.12 Iceland (ICE)

The country remained rabies-free.

2.13 Ireland (IRE)

The country remained rabies-free.

2.14 Rabies in Italy (ITA)

by S. Prosperi

During the second quarter 1989, 9 cases of rabies have been diagnosed 7 in foxes and 2 in badgers. Seven cases occurred in the province of Trieste and 2 in the province of Gorizia. During this quarter the spread of rabies decreased. Only one municipality, in the province of Gorizia, was affected for the first time.

During the months of April and May the oral vaccination of foxes was performed as described in Rabies Bulletin Europe 1/89. At present an active surveillance is carried out in the area of vaccination, firstly, to discover any rabies cases and secondly, to examine foxes to check on the effectiveness of the oral vaccination.

2.15 Rabies in Luxembourg (LUX)

by F. Kons

Presently a deterioration of the rabies situation was noticed in the north and the centre of the Grand Duchy of Luxembourg. During the second quarter 1989, 8 cases of rabies (7 in foxes, one in a bovine) were registered.

The Veterinary Department intends to combat the disease with further oral vaccination campaigns of foxes against rabies, either partial or the total area of the country, in autumn 1989. The organisation of such vaccination campaigns is already under way.

Samples investigated during the quarter but with negati8ve results were: 9 foxes, 2 martens, 2 roe deer and 1 muskrat.

2.16 Rabies in the Netherlands (NET)

by J.H.M. Nieuwenhuijs

During the second quarter of this year, 78 bats were investigated, 7 of them were found positive. One bat sent in was not suitable for investigation. The total number of investigated animals was 512, most of these animals were red foxes (116 adults and 307 young).

The number of young red foxes will yet increase, because 39 of them, sent in during this quarter, are still under investigation. The results of those tests will be presented later.

As a result of the tests on young red foxes and the publication of investigation results in a late stage, the number of investigated animals in the first quarter has increased from 99 to 157.

2.17 Rabies in Norway (NOR)

by H.O. Bach-Gansmo

No case of rabies has been reported in Svalbard during the second quarter 1989.

The mainland remained rabies-free.

2.18 Rabies in Poland (POL)

A total of 293 cases of rabies was reported in Poland during the first quarter 1989, 164 cases less than in the previous quarter and 62 more than during the second quarter 1988.

237 cases were registered in wild animals (80.9% of total) - 179 foxes, 26 raccoon dogs, 1 badger, 6 pine martens, 5 polecats, 16 roe deer, 1 red deer, 2 wild boars, 1 black rat; and 56 domestic animals - 23 dogs, 23 cats, 8 cattle, 1 sheep, 1 other domesticated carnivore.

The distribution of rabies cases in the infected provinces (voivodeships) resembled the one in the previous quarter: there was a concentration of cases in the western half of the country.

2.19 Portugal (POR)

The country remained rabies-free.

2.20 Rabies in Romania (ROM)

Only 5 cases of rabies were reported in Romania during the second quarter 1989: 4 sheep and 1 fox. All cases occurred in one province, Satu-Mare, located in the north-west of the country.

2.21 Rabies in Spain (SPA)

by J.L. de Felipe Gardón

During the second quarter 1989, the mainland and islands of Spain remained rabies free in terrestrial animals.

There was no case of rabies in the Spanish Territory in North Africa (Ceuta and Melilla).

One bat rabies case was diagnosed in the province of Huelva, Autonomous Region Andalusia, during a bat surveillance programme.

The bat, an Eptesicus serotinus was captured on 7.6.1989. Because of its strange behaviour it was isolated and observed. As it died a few days later, the bat was submitted to the laboratory in Malaga for diagnosis.

No person was bitten by this animal.

2.22 Rabies in the European part of the Union of Soviet Socialist Republics (SSR)

by G.F. Koromyslov and B.L. Cherkasskiy

First quarter 1989

Figures are presented on the first quarter 1989. They are summarized in a table on page 32.

2.23 Sweden (SWE)

The country remained rabies-free.

2.24 Rabies in Switzerland (SWI)

by A.I. Wandeler

During the second quarter of 1989, the Swiss Rabies Diagnostic Center received 416 animals for examination. 8 (1.9%) of these were positive for rabies compared to 13 (2.2% of 603) in the previous quarter and 11 (2.9% of 374) in the first quarter of 1988. All 8 cases were observed in foxes. Five bats examined with immunofluorescence and i.c.-inoculation into suckling mice revealed no rabies virus.

Two rabid foxes originated in the lower Rhone Valley of canton Valais, all others from the Jura mountains in northwestern Switzerland.

Fox immunisation campaigns were conducted in spring 1989 along the Swiss-French border in the Jura mountains and in the lower canton Valais.

No bite exposures of humans to proven rabid animals were recorded in the second quarter of 1989. The number of people treated for non-bite exposures is not recorded.

2.25 Rabies in Turkey (TUR)

During the second quarter 1989, 118 rabies cases were reported from Turkey. There were 117 cases in domestic animals (89 dogs, 7 cats, 15 cattle, 3 horses, 1 sheep, 1 goat, 1 donkey) and only 1 in a wild animal, a wolf. There has been a decrease by 44 cases compared to the previous quarter and a decrease by 102 cases compared to the second quarter 1988.

Out of 67 provinces 29 were reported infected. Four had more than 9 rabies cases (Istanbul-17, Izmir-12, Ordu and Samsun 10 each), all other provinces registered less than 9. Many of the provinces of the centre of the country had no cases reported.

2.26 United Kingdom (UNK)

by M.J. Marriott

The country remained rabies-free.

Surveillance 1st and 2nd Quarter 1989

During the first and second quarter 1989, there were 9 incidents outside quarantine, involving 3 dogs, 3 cats (2 cats = 1 incident), 3 foxes and 1 goat. Laboratory examination was carried out on 9 occasions. One case was excluded after 4 days observation in isolation premises, and over a week since the symptoms were first observed. During the above mentioned period, laboratory examinations were carried out on the brains of 63 animals which had died in authorised quarantine premises, and all the results were negative.

From January to June 1989, 56 bats were examined for rabies and found negative. Of these, 3 could not be tested because of decomposition.

There were no cases of human rabies in the United Kingdom during the period.

2.27 Rabies in Yugoslavia (YUG)

276 cases of rabies in animals were reported in Yugoslavia during the second quarter 1989. Of these were 258 (93.5% of total) in wild animals (246 foxes, 10 badgers, 2 stone martens) and 18 in domestic animals (8 dogs, 9 cats, 1 bovine). Compared to the second quarter 1988, rabies cases increased by 69.

There was a concentration of cases in Slovenia (175 cases = 63.4% of total). Croatia reported 81 cases, Bosnia and Hercegovina 7, Wojwodina 10 and Serbia 3. Two cases in Serbia occurred near the border of Bulgaria, one dog in the community of Bor and one fox in the community of Zajecar.

3. MISCELLANEOUS

3.1 A Field Trial on Oral Immunization of Raccoon Dogs and Foxes against Rabies in Finland 1988-1989

by B. Westerling*

After detection of sylvatic rabies in the province of Kymi in April 1988 (Finland had been rabies free for 29 years) it was decided by the Veterinary and Game Management authorities, that a field trial on oral immunization of raccoon dogs and foxes would be executed with Tübingen baits according to the Bavarian model of bait distribution. Planning of the trial was done in cooperation with and guidance from the WHO Centre for Rabies Surveillance and Research, Tübingen, FRG.

Within a couple of months epidemiological surveys indicated a presence of a sylvatic rabies focus west to the Kymi river and with the raccoon dog as its primary vector and victim. The infection was presumed to have been brought in during the preceding winter by wolves from the USSR. By the end of July the infected area was estimated to some 500 km^2, but a gradual spread of the disease southward along the river and towards north-east through August and September brought the estimate to about 1200 km^2, including parts of 3 provinces.

In July 1988, a field test regarding the palatability of the Tübingen baits to Finnish racoon dogs and foxes was conducted by Prof.L.G. Schneider, with excellent results.

During the summer an organization for bait distribution was planned by the Province Game Management Officers (GMO) in each of the three provinces concerned, recruiting leaders from the local Game Management Associations (GMA), which handle and coordinate game management and the hunting matters of local hunting clubs on a municipal level.

Leaders of the GMAs and hunting clubs were given lectures on distribution planning and bait handling, after which the area of each GMA was divided, into terrain lots of appr. 13.5 km^2 on maps 1:50000, each representing the distribution area of 200 baits = the responsibility area of one patrol of hunters. Through the GMA each hunting club ordered the required numbers of 1:20000 topographic maps from the Vet.Dept. In all, more than 600 maps were delivered. On the 1:20000 maps each patrol made its distribution plan using the knowledge of its members as to game behavior, terrain, and its accessibility by car or in some areas by boat. For the total distribution area of 2400 km^2 153 patrols of hunters were needed, four of which distributed 60 baits on 4 km^2 each, to study the bait uptake in different habitats.

By mid-September 36 000 Tübingen baits had been transported frozen (-27°C) by lorry from the FRG and stored at the National Veterinary institute (NVI) at -22°C.

---

* Veterinary Department, Ministry of Agriculture and Forestry, Helsinki

The day before delivery the baits were moved into double plastic bags, 10x20 baits in each, and 10 disposable rubber gloves and a plastic covered instruction sheet was placed between the two bags. On the evening of the 23.9.1988 representatives of all the hunter patrols received one bag each at four different delivery sites. On Saturday the 24.9.1988, some 800 volunteer hunters distributed the baits, all mostly within 4-5 hours. The hunters were not remunerated, but each hunting club received FIM 50/km² covered, including areas not open for hunting.

The vaccine dose used was $5x10^7 TCID_{50}$/ml SAD B19.

A week later a rabid raccoon dog was recovered only 7 km from the North-Eastern border of the vaccination area. 4500 more baits were flown in and distributed by air over an area of 225 km². Soon afterwards rabies was detected outside the vaccination area, south-east of the Kymi river. Winter and frost approaching no further measures could be taken.

Through the winter, target animals were collected from the vaccination area and its surroundings. They were tested for rabies by immuno-fluorescence, for seroconversion by the RFFIT, and their jaw bones for tetracycline using a Leitz Dialux 22 microscope equipped with an 1-Lamba PLEOMOPAK epi-illuminator and filterblock D recommended for tetracycline detection.

The incidence of wildlife rabies from April 1988 - July 1989 is shown in Table (49 raccoon dogs, 12 foxes and 2 badgers comprising the 63 positive animals).

By the end of April, 126 raccoon dogs and 56 foxes from the vaccination area had been tested for seroconversion. 84% of the raccoon dogs and 64% of the foxes proved seropositive. It was interesting to note that raccoon dogs had a better seroconversion rate and generally developed higher titres.

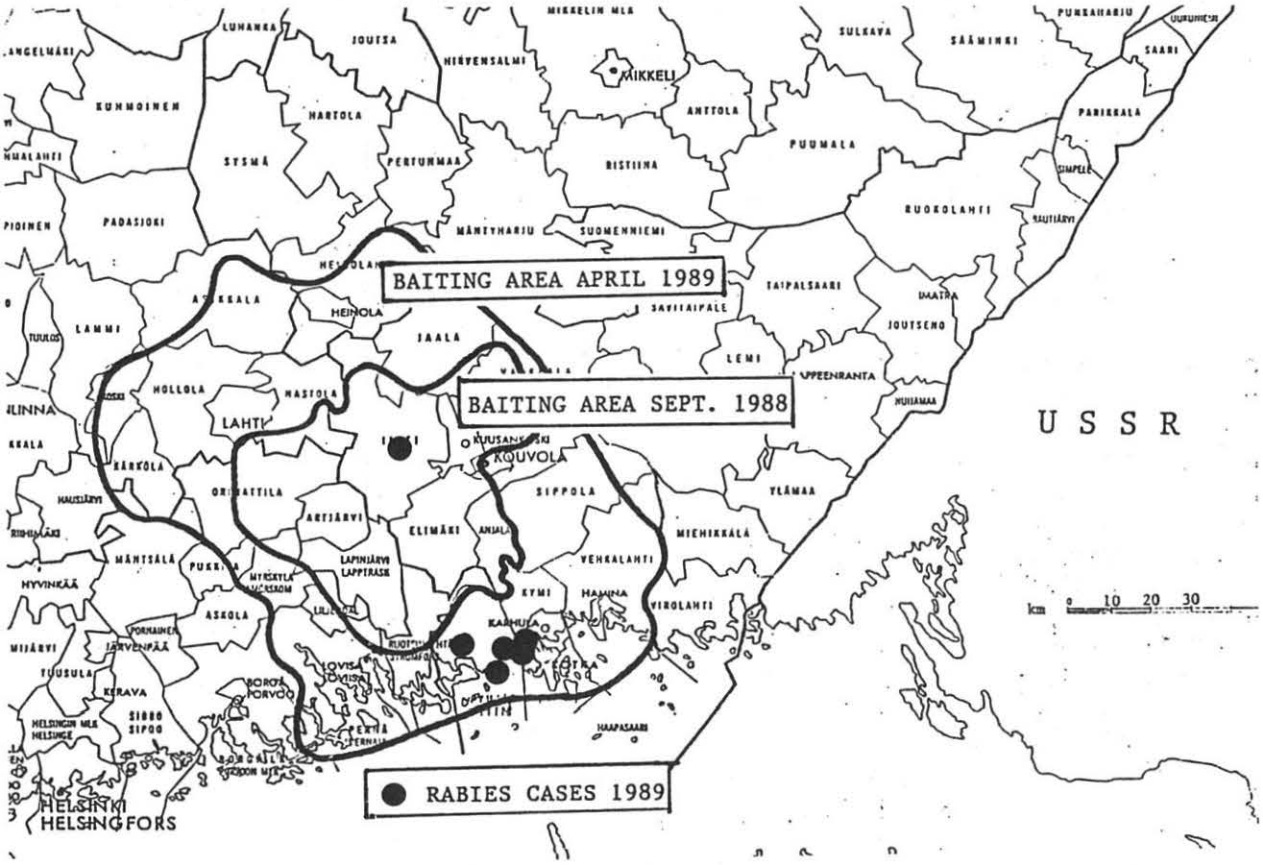
Of 156 raccoon dogs and 67 foxes from the same area tested for tetracycline 91% of the foxes, but only 75% of the raccoon dogs proved positive, a discrepancy lacking explanation for the time being.

Several seropositive raccoon dogs were obtained far outside the vaccination area, indicating considerable migration both before and after winter hibernation. Because of this observation and the fact that lakes and rivers froze early, a considerable enlargement of the field trial area for the spring campaign was found appropriate.

For the new areas the same routine as to planning and training of the hunters which had been practised in 1988 were applied. In late April some 3000 hunters distributed 109 500 baits over an area of approx. 7 500 km² the day after representatives of 551 hunter patrols had received their share of baits at 11 delivery sites. 9 600 baits were spread by air over an area of 520 km².

The spring campaign took place before raccoon dogs and foxes had given birth, which means, that the young for the moment are serving as an indicator for the presence of rabies in the campaign area.

On the map the September 1988 and April 1989 baiting areas and the sites of rabies cases recorded in 1989 are shown. The last case from the original area came to the NVI on the January 2, 1989 and the last one so far from the "outside" area on the February 15, 1989 (see Table).



Preliminary conclusions

The Tübingen bait and the Bavarian model of distribution provide effective means of controlling sylvatic rabies in a boreal biotope, where the raccoon dog is the primary target species. As to timing strategies on baiting campaigns versus population dynamics in climatic zones with short summers further studies are required.

Table:
Incidence of wildlife rabies in Finland

	Number of animals tested	Cases of rabies recorded: Baiting area	Outside baiting area
1988 April	16	5	
May	15	6	
June	11	6	
July	9	2	
August	34	7	
September	46	12	
October	70	11	1
November	69	4	1
December	45	1	1
1989 January	49	1	4
February	35		1
March	67		
April	41		
May	19		
June	11		
July	14		
	561	55	8

3.2 WHO Recommendations on Oral Rabies Vaccines

As mentioned in BULLETIN 4/89, WHO Recommendations on Requirements and Criteria for Field Trials on Oral Rabies Vaccination of Dogs and Wild Carnivores were prepared at a WHO Consultation in Geneva on 1-2 March, 1989. The WHO Report (WHO/Rab.Res./89.32), recently published, distinguishes the recommendations on 'Project Planning and Organisation', 'Vaccines', 'Bait Configuration and Application' and 'Research'. The 'Recommendations for Vaccines' are here once more repeated for reasons of importance.

3.2.1 Introduction

Two types of oral rabies vaccines have been used in experimental and field studies, namely modified live vaccines and recombinant vaccines. Extensive field experience has been acquired with the use of modified live vaccines in European foxes.

Oral vaccination is now contemplated for other species such as dogs, skunks, raccoons, mongooses, jackals, raccoon dogs, and other wild carnivores. A variety of rabies vaccines, both attenuated and recombinant, are being developed for use in these species. Safety considerations for non-target species and humans are basic to the field use of these vaccines.

Those recombinant vaccines for which innocuity in the intended species is established (as by genetic modification) may be considered of reduced virulence in other species. This in no way implies that further studies in other species should be curtailed. In addition, special studies (in the case of recombinant vaccines) are indicated in species which are known to be particularly susceptible or sensitive to the parent carrier virus.

Carefully planned field trials should be strongly encouraged only when the efficacy and safety of newly developed vaccines have been tested in the laboratory.

3.2.2 **Modified live vaccines (MLV)**

3.2.2.1 Efficacy and safety of orally administered MLV

Many MLV have been used in attempts to immunize foxes orally. They include two which are not effective at high concentrations of virus, namely CVS and HEP Flury. The one strain which has consistently been shown to be an effective oral immunogen for foxes is the SAD strain or its derivatives. The first field trial with SAD was carried out in Switzerland, beginning in 1978, and its use (in chicken head baits) has since then resulted in the virtual elimination of rabies from that country. In Switzerland, continual surveillance detected three animal cases of vaccine-induced rabies (one cat, one stone marten and one baby fox). No other vaccine deaths were noted in over 900 rabid animals examined. So far, approximately 1 000 000 baits have been distributed in this country.

In the Federal Republic of Germany, a SAD derivative called SAD B19 was developed by selection in cloned BHK cells. The vaccine is an effective immunogen in foxes at the $1x10^6$ $TCID_{50}$/ml level, and its use (in Tübingen fox baits since 1985) has resulted in a 60% reduction of fox rabies in that country. No case of vaccine-induced rabies has been found in approximately 10 000 rabid animals examined, after the placement of over 8 000 000 baits in nine European countries. A laboratory experiment on raccoon dogs has shown 100% seroconversion and protection after oral application of 10^8 $TCID_{50}$/ml of SAD B19 vaccine in fox baits. After field vaccinations with a dose of $5x10^7$ $TCID_{50}$/ml, 80% of 80 raccoon dogs showed seroconversion. In limited experiments this vaccine also effectively immunized 75% of raccoons at $10^{8.8}$ $TCID_{50}$/ml, and gave approximately 50% protection at $10^{7.5}$ $TCID_{50}$/ml. The raccoons did not develop antibodies and were not protected after oral administration of the ERA strain.

Only limited studies have been carried out on the efficacy of SAD and SAD derivatives in dogs. ERA (BHK) has only limited efficacy when administered orally to young adult dogs at a level of 10^8 $MICLD_{50}$/ml (approximately 30%); in contrast, SAD B19 has been administered orally to 40 dogs in the Tübingen laboratory (with Tübingen baits) and found to be effective at doses of $10^{7.5}$ $TCID_{50}$/ml. All dogs developed serum neutralizing antibodies (range at levels of 2-20 I.U./ml). One puppy (4-5 weeks old) inadvertantly took the bait and was immunized - no disease developed.

3.2.2.2 Safety requirements of modified live vaccines

The candidate vaccine strain should be characterized according to classical procedures.

A. Innocuity testing

Dogs

(a) The vaccine chosen should not produce any disease in 10 young dogs (3-6 months old) when administered orally at a 10-fold concentration of the quantity recommended for field use.

(b) To trace the possible excretion of vaccine virus in saliva of orally vaccinated dogs, 10 dogs administered 10 times the field concentration of vaccine should be swabbed daily for three days and no virus should be present after three days. Any virus recovered should be characterized by monoclonal antibodies.

(c) To test for possible latency, 10 dogs given 10 times the field concentration orally should be sacrificed and brain and salivary gland examined at 6 months. Any vaccine strain leading to latency should be rejected.

Other target species

Analogous procedures for other target species should be applied as described under the section on dogs, above.

Non-target species

(a) Wild rodents. Where feasible, at least 10, and if possible, 50 of each of the most common local rodent species should be administered 0.05 ml of the recommended field dose of vaccine by two routes: oral and intramuscular. No more than 10% of the animals so vaccinated should develop sickness or death attributable to vaccine (in Europe the rodents tested have included Rattus and Apodemus).

(b) Wild or domestic animals (other than rodents). Five of the most relevant local wild or domestic animals that may take baits should be administered the field concentration of vaccine orally in the volume indicated in Table 1. (For example, in Europe, the common species are wild boars, stone martens, badgers and cats.) No animal given that dose should show signs of vaccine rabies.

Table:
Volume of Vaccine/Animal

Weight	Volume
< 500 g	0.05 ml
500 g - 1 kg	0.10 ml
1 - 4 kg	1.00 ml
4 - 20 kg	2.00 ml
> 20 kg	5.00 ml

Any results obtained by the production laboratory or a WHO Collaborating Centre on Rabies (regarding oral vaccination of dogs or other wild carnivores) should always be corroborated by another WHO Collaborating Centre on Rabies.

B. Risk assessment

(a) Humans

An intense surveillance system should be established to detect any possible human exposure to vaccine. Humans accidentally in contact with the vaccine (by mouth, nose, eye or wound) should receive rabies postexposure prophylaxis. Similarly, persons working with the vaccine and at risk of exposure to it should receive pre-exposure immunization.

(b) Domestic or wild animals

Any rabies virus isolated from animals in vaccination areas should be examined by monoclonal antibodies to ensure that no vaccine-induced rabies has occurred.

3.2.3 Recombinant live virus vaccines (RLV)

3.2.3.1 Innocuity testing

This section deals with the intrinsic safety aspects, i.e. the innocuity of a RLV preparation for the vaccinee. A first evaluation of residual virulence of the candidate strain should be performed by standard laboratory methods, e.g. oral and parenteral inoculation of laboratory animals. Subsequently, oral vaccination of the target species should be performed (e.g. fox, raccoon, dog). The same general guidelines should be followed as have been indicated for Modified Live Vaccines (section 3.2.2.2). Appropriate laboratory tests (e.g. pock markers, epitopes recognizable by monoclonal antibodies, genetic probes) can be useful for periodic monitoring of virulence, once its genetic basis has been defined.

Innocuity can be expected from vaccine strains where either genomic deletions or insertional mutagenesis has led to the inactivation of virulence-relevant gene(s). It has been shown, for instance, that inactivation of the thymidine kinase gene leads to vaccinia virus mutants of reduced virulence; the same approach should be followed for other candidate vector viruses.

3.2.3.2 Risk assessment of non-target species

Here, other safety aspects are considered, i.e. the innocuity of a vaccine for non-target species and for man. Where possible, the transmission of vaccine virus to humans should be tested.

Real and hypothetical risks must be differentiated. The real risk for non-target species can be definitely established by innocuity testing of non-target species in the laboratory. Aspects of pathogenicity of the candidate vaccine strain can and should be studied in appropriate laboratory animals, the non-target species, the most relevant wild vertebrates and in man, if possible. Thus the course of infection by the RLV must be known, such as its spread from the site of entry, excretion, transmission, contagiousness, and virus persistence. Where approved human vaccines against the carrier virus exist, their use should be considered for those persons involved in vaccine production or distribution.

In the case of vaccinia vectored rabies glycoprotein vaccine (as now developed) where the rabies glycoprotein gene is inserted at the thymidine kinase position in the vaccinia DNA, this vaccine may be considered non-infectious for rabies, and pre-exposure or postexposure rabies vaccination is not recommend for persons exposed to this vaccine. Rabies risks from other recombinant vaccines must be evaluated on an individual basis as such vaccines are developed.

A hypothetical risk is the recombination of the RLV vaccine viral genome with that of another virus, with the resulting recombinant possessing higher virulence and greater epidemiological potential. The realization of this hazard has not been borne out for poxviruses either in the laboratory or in nature. Nevertheless, the possibility of other RLV's to recombine, to cause persistent infecitons, or to become oncogenic should be kept in mind and investigated. This applies especially to other potential vector viruses whose DNA replication is in the nucleus.

3.2.3.3 General considerations on risk

In summary, a safe vaccine virus candidate should:

(a) not acquire virulence during replication in the vaccinee;

(b) not be oncogenic in the vaccinee;

(c) be apathogenic for non-target species (including humans) and not cause persistent infections;

(d) not recombine with viruses occurring in nature to result in viable progeny;

(e) demonstrate that its possible excretion has not been shown to be hazardous;

(f) bear at least one genetic marker for identification (for instance, the B-galactosidase gene).

3.3 Human Rabies Prophylaxis

(Figures on human rabies prophylaxis are not always easily available. France has published in Bulletin épidémiologique hebdomadaire No. 26/1988 a report by the Direction générale de la Santé covering the years 1983 to 1987).

FRANCE. - In 1987, 14654 persons presented at one of the 64 anti-rabies centres or posts for bites, scratches or contacts with animals with suspected rabies. Anti-rabies treatment was initiated in about half (7890) of these cases.

Persons consulting

The distribution by sex (40% females, 60% males) and by age of those who reported to anti-rabies centres remained the same as in previous years. In most cases (98%), the place of contamination was France.

Domestic animals were the major source of incidents giving rise to consultation (90%), whereas the majority of animals identified by laboratory tests as rabid were wild animals. There appeared to be no seasonal fluctuation in the number of persons reporting, other than a slight increase during the summer months.

Treatment

The percentage of suspected cases for whom anti-rabies treatment was initiated in France was the same as in previous years (see Table). In nearly half of these cases (45%), treatment was initiated following contact with stray animals which were not found.

Table:
Human rabies: distribution of persons consulting or treated in France from 1983 to 1987

	1983	1984	1985	1986	1987*
Persons consulting	6 133	15 179	15 369	15 104	14 356
Persons treated	2 784	7 702	7 905	7 840	7 651
Percentage	45.4	50.7	51.4	51.9	53.3

* = Data incomplete

Most persons contaminated outside the country were given anti-rabies treatment. Regardless of the type of vaccine utilized when treatment was initiated abroad, treatment was continued with cell-culture vaccines.

Reporting time

Fifty-six per cent of cases reported and received anti-rabies treatment within 48 hours of suspected contamination; 29% within between 48 hours and 10 days, and 15% after 10 days.

Vaccines and sera used

The preparations used were mainly cell culture vaccines (human diploid cells or bovine embryo kidney cells). They were used without associated serotherapy in the majority of cases. When serotherapy is given, specific gammaglobulins of human origin are almost always used. Contrary to the recommendations of the WHO Expert Committee and in spite of the cost of gammaglobulins, a substantial number of people received serotherapy only (with no associated vaccine) in cases of suspected contamination by known animals placed under surveillance. **Gammaglobulins should only be used in cases of serious contamination and always in association with a vaccine.** Twenty per cent of the treatments initated were interrupted when the animal was traced and confirmed to be negative clinically or by laboratory tests. More than 6% of persons treated did not complete their treatment.

Reactions

Cell culture vaccines are very well tolerated, as evidenced by the fact that no reactions were reported in 96.7% of cases. In 2.6% of cases, patients complained of local reactions, pain, or redness at the point of injection. A general reaction of fever, malaise and fatigue was reported in less than 1% of cases.

Comments

No imported cases of human rabies were reported in 1987, the last being a patient who died in Toulon in 1982. No case of human rabies following contamination in the territory of France was diagnosed in 1987.

One case of human encephalitis in which rabies was thought to be etiologically implicated was initially diagnosed as a probable case of rabies on the basis of **in vivo** laboratory tests, but subsequently definitively discounted following the negative results obtained from the post mortem samples.

(Source: **Weekly Epidemiological Record, 1984, 64, 97-98, WHO Geneva).**

3.4 European Community (EC) supports oral vaccination

In connection with a report on the rabies situation in the Member States of the EC, a Council Regulation has been passed in Brussels instituting a certificate for dogs and cats on visits of less than one year and to setting up a pilot project for the control and eradication of rabies.

For the pilot project, a financial support of 9.3 Million ECU over a period of 3 years is granted to support present field trials on oral vaccination of wildlife against rabies.

Member countries submit their eradication programmes and receive an application up to 50% support for the vaccine baits and cost of distribution.

TABLE 1

EUR EUROPE **2/89** RABIES CASES 1. 4.89 - 30. 6.89

LOCATION CODE NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
	DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
AUT AUSTRIA	-	8	1	-	1	-	10	316	28	24	13	-	381		391
BEL BELGIUM	3	6	22	3	9	-	43	104	3	3	1	-	111		154
BUL BULGARIA *							0						0		0
CZE CZECHOSLOVAKIA	5	18	-	-	3	-	26	424	2	17	1	-	444		470
DDR GERMAN DEM. REPUBLIC	34	74	15	-	28	-	151	446	11	26	20	5	508		659
DEN DENMARK							0	-	-	-	-	1	1		1
DEU FED.REP. OF GERMANY	7	15	13	3	28	2	68	520	15	28	40	5	608		676
FIN FINLAND *							0						0		0
FRA FRANCE	16	24	30	10	64	-	144	764	11	18	3	-	796		940
GRE GREECE *							0						0		0
HUN HUNGARY	13	14	17	-	3	-	47	88	-	2	1	-	91		138
ICE ICELAND *							0						0		0
IRE IRELAND *							0						0		0
ITA ITALY							0	7	2	-	-	-	9		9
LUX LUXEMBOURG	-	-	1	-	-	-	1	7	-	-	-	-	7		8
NET NETHERLANDS							0	-	-	-	-	7	7		7
NOR NORWAY *							0						0		0
POL POLAND	23	23	8	-	1	1	56	179	1	11	17	29	237		293
POR PORTUGAL *							0						0		0
ROM ROMANIA	-	-	-	-	4	-	4	1	-	-	-	-	1		5
SPA SPAIN							0	-	-	-	-	1	1		1
SSR SOVIET SOCIAL.REP.**							-						-		-
SWE SWEDEN *							0						0		0
SWI SWITZERLAND + LIECHT							0	8	-	-	-	-	8		8
TUR TURKEY	89	7	15	3	2	1	117	-	-	-	-	1	1		118
UNK UNITED KINGDOM *							0						0		0
YUG YUGOSLAVIA	8	9	1	-	-	-	18	246	10	2	-	-	258		276
TOTAL	198	198	123	19	143	4	685	3110	83	131	96	49	3469	0	4154
PER CENT	4.8	4.8	3.0	0.5	3.4	0.1	16.5	74.9	2.0	3.2	2.3	1.2	83.5	0.0	100.0

* NO CASES, ** NO DATA.

TABLE 2

EUR EUROPE **1-2/89** RABIES CASES 1. 1.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
AUT	AUSTRIA	2	18	6	-	1	-	27	852	47	34	25	-	958		985
BEL	BELGIUM	10	16	41	4	28	-	99	285	6	5	3	-	299		398
BUL	BULGARIA *							0						0		0
CZE	CZECHOSLOVAKIA 1)	14	35	-	-	4	2	55	949	4	20	8	2	983	1	1039
DDR	GERMAN DEM. REPUBLIC	85	123	17	2	43	1	271	1185	20	62	56	6	1329		1600
DEN	DENMARK							0	-	-	-	-	1	1		1
DEU	FED.REP. OF GERMANY	20	35	34	3	53	2	147	1394	42	55	99	7	1597		1744
FIN	FINLAND							0	2	-	-	-	4	6		6
FRA	FRANCE	33	47	68	23	141	1	313	1814	19	35	8	3	1879		2192
GRE	GREECE *							0						0		0
HUN	HUNGARY	36	41	25	-	7	2	111	369	-	2	5	1	377		488
ICE	ICELAND *							0						0		0
IRE	IRELAND *							0						0		0
ITA	ITALY							0	45	2	-	-	-	47		47
LUX	LUXEMBOURG	-	-	1	-	-	-	1	12	-	-	-	-	12		13
NET	NETHERLANDS							0	-	-	-	-	8	8		8
NOR	NORWAY *							0						0		0
POL	POLAND	51	47	10	1	2	2	113	493	8	22	40	74	637		750
POR	PORTUGAL *							0						0		0
ROM	ROMANIA	1	1	2	-	5	-	9	2	-	-	-	3	5		14
SPA	SPAIN							0	-	-	-	-	1	1		1
SSR	SOVIET SOCIAL.REP.**	136	82	367	22	191	23	821	319	-	3	1	40	363	1	1185
SWE	SWEDEN *							0						0		0
SWI	SWITZERLAND + LIECHT							0	19	2	-	-	-	21		21
TUR	TURKEY	223	14	25	7	7	2	278	-	-	-	-	2	2		280
UNK	UNITED KINGDOM *							0						0		0
YUG	YUGOSLAVIA	13	24	6	3	1	-	47	752	22	7	7	1	789		836
TOTAL		624	483	602	65	483	35	2292	8492	172	245	252	153	9314	2	11608
PER CENT		5.4	4.2	5.2	0.6	4.2	0.3	19.7	73.2	1.5	2.1	2.2	1.3	80.2	0.0	100.0

* NO CASES. ** NO DATA FOR 2ND QUARTER. 1) HUMAN CASE ACQUIRED IN VIETNAM.

TABLE 3

EUR EUROPE 2/89	RABIES CASES 'OTHER ANIMAL SPECIES'									1. 4.89 - 30. 6.89
LOCATION	OTHER DOMEST. ANIMALS		OTHER WILD ANIMALS							TOTAL
CODE NAME	OTH.DOM. CARNIVO.	DONKEY	WOLF	RACOON DOG	RACOON	WILD BOAR	INSECTIV. BAT	SQUIRREL	BLACK RAT	
DDR GERMAN DEM. REPUBLIC	-	-	-	2	1	2	-	-	-	5
DEN DENMARK	-	-	-	-	-	-	1	-	-	1
DEU FED.REP. OF GERMANY	-	2	-	-	-	-	4	1	-	7
NET NETHERLANDS	-	-	-	-	-	-	7	-	-	7
POL POLAND	1	-	-	26	-	2	-	-	1	30
SPA SPAIN	-	-	-	-	-	-	1	-	-	1
TUR TURKEY	-	1	1	-	-	-	-	-	-	2
TOTAL	1	3	1	28	1	4	13	1	1	53
PER CENT	1.9	5.7	1.9	52.8	1.9	7.5	24.5	1.9	1.9	100.0

AUT AUSTRIA — RABIES CASES — 1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
103	EISENSTADT - LAND							0	1	-	-	-	-	1		1
104	GUESSING							0	2	-	-	-	-	2		2
105	JENNERSDORF							0	1	-	-	-	-	1		1
106	MATTERSBURG							0	11	-	-	-	-	11		11
108	OBERPULLENDORF							0	1	-	-	-	-	1		1
204	KLAGENFURT-LAND							0	2	-	-	-	-	2		2
205	SANKT VEIT AN DER GL							0	19	-	-	1	-	20		20
206	SPITTAL AN DER DRAU							0	2	1	-	-	-	3		3
207	VILLACH-LAND							0	1	-	1	-	-	2		2
208	VOELKERMARKT							0	23	2	-	-	-	25		25
209	WOLFSBERG							0	7	1	-	1	-	9		9
210	FELDKIRCHEN	-	1	-	-	-	-	1						0		1
309	GMUEND							0	1	1	1	-	-	3		3
313	KREMS AN DER DONAU-L	-	2	-	-	-	-	2	9	-	2	-	-	11		13
315	MELK	-	1	-	-	-	-	1	4	-	1	-	-	5		6
318	NEUNKIRCHEN							0	2	-	-	-	-	2		2
323	WIENER NEUSTADT-LAND							0	16	-	-	-	-	16		16
325	ZWETTL	-	1	-	-	-	-	1	13	2	5	-	-	20		21
406	FREISTADT							0	4	-	-	-	-	4		4
407	GMUNDEN							0	3	-	-	-	-	3		3
409	KIRCHDORF AN DER KRE							0	2	-	-	-	-	2		2
411	PERG							0	11	1	1	-	-	13		13
417	VOECKLABRUCK	-	1	-	-	-	-	1	36	1	-	1	-	38		39
505	TAMSWEG							0	1	-	-	-	-	1		1
601	GRAZ-STADT							0	-	1	-	-	-	1		1
602	BRUCK AN DER MUR							0	2	-	-	-	-	2		2
603	DEUTSCHLANDSBERG							0	1	-	-	-	-	1		1
605	FUERSTENFELD							0	1	-	-	-	-	1		1
607	HARTBERG	-	-	-	-	1	-	1	44	4	6	2	-	56		57
608	JUDENBURG							0	1	-	-	-	-	1		1
610	LEIBNITZ							0	9	-	-	-	-	9		9
611	LEOBEN	-	1	-	-	-	-	1						0		1
612	LIEZEN	-	1	-	-	-	-	1	23	2	2	3	-	30		31
613	MUERZZUSCHLAG							0	8	1	-	1	-	10		10
614	MURAU							0	3	-	-	-	-	3		3
617	WEIZ	-	-	1	-	-	-	1	52	11	5	4	-	72		73
TOTAL		0	8	1	0	1	0	10	316	28	24	13	0	381	0	391
PER CENT		0.0	2.0	0.3	0.0	0.3	0.0	2.6	80.8	7.2	6.1	3.3	0.0	97.4	0.0	100.0

RABIES CASES 1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
BEL	BELGIUM															
HH	HAINHAUT							0	1	-	-	-	-	1		1
LG	LIEGE	1	-	4	1	-	-	6	32	1	-	1	-	34		40
LX	LUXEMBOURG	1	5	13	-	6	-	25	59	2	2	-	-	63		88
NA	NAMUR	1	1	5	2	3	-	12	12	-	1	-	-	13		25
TOTAL		3	6	22	3	9	0	43	104	3	3	1	0	111	0	154
PER CENT		1.9	3.9	14.3	1.9	5.8	0.0	27.9	67.5	1.9	1.9	0.6	0.0	72.1	0.0	100.0
DEN	DENMARK															
060	VEJLE							0	-	-	-	-	1	1		1
LUX	LUXEMBOURG															
06	CLERVAUX							0	5	-	-	-	-	5		5
08	REDANGE							0	2	-	-	-	-	2		2
09	WILTZ	-	-	1	-	-	-	1						0		1
TOTAL		0	0	1	0	0	0	1	7	0	0	0	0	7	0	8
PER CENT		0.0	0.0	12.5	0.0	0.0	0.0	12.5	87.5	0.0	0.0	0.0	0.0	87.5	0.0	100.0
NET	NETHERLANDS															
01	DRENTHE							0	-	-	-	-	2	2		2
04	GRONINGEN							0	-	-	-	-	3	3		3
07	NOORD-HOLLAND							0	-	-	-	-	1	1		1
10	ZUID-HOLLAND							0	-	-	-	-	1	1		1
TOTAL		0	0	0	0	0	0	0	0	0	0	0	7	7	0	7

CZE CZECHOSLOVAKIA RABIES CASES 1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
00	DISTRICT OF PRAGUE							0						0		0
01	CENTRAL BOHEMIA	-	2	-	-	-	-	2	52	-	2	-	-	54		56
02	SOUTH BOHEMIA	-	1	-	-	1	-	2	23	-	3	-	-	26		28
03	WEST BOHEMIA	-	4	-	-	1	-	5	130	-	5	-	-	135		140
04	NORTH BOHEMIA	-	2	-	-	1	-	3	60	-	3	-	-	63		66
05	EAST BOHEMIA	-	1	-	-	-	-	1	28	-	1	-	-	29		30
06	SOUTH MORAVIA	1	1	-	-	-	-	2	47	-	-	-	-	47		49
07	NORTH MORAVIA	-	2	-	-	-	-	2	48	2	2	-	-	52		54
0	CZECH SOCIALIST REPUBL	1	13	-	-	3	-	17	388	2	16	-	-	406		423
10	DISTRICT OF BRATISLAV							0						0		0
11	WEST SLOVAKIA	3	-	-	-	-	-	3	6	-	-	-	-	6		9
12	CENTRAL SLOVAKIA	-	2	-	-	-	-	2	10	-	1	1	-	12		14
13	EAST SLOVAKIA	1	3	-	-	-	-	4	20	-	-	-	-	20		24
1	SLOVAC SOCIALIST REPUB	4	5	-	-	-	-	9	36	-	1	1	-	38		47
TOTAL		5	18	0	0	3	0	26	424	2	17	1	0	444	0	470
PER CENT		1.1	3.8	0.0	0.0	0.6	0.0	5.5	90.2	0.4	3.6	0.2	0.0	94.5	0.0	100.0

DDR GERMAN DEMOCRATIC REPUBLIC — R A B I E S C A S E S — 1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	HAUPTSTADT BERLIN							0	-	-	-	-	1	1		1
02	COTTBUS	3	6	3	-	-	-	12	49	1	3	1	-	54		66
03	DRESDEN	3	4	-	-	11	-	18	66	3	4	4	2	79		97
04	ERFURT	2	5	-	-	2	-	9	34	-	1	2	-	37		46
05	FRANKFURT/ODER	3	1	-	-	-	-	4	37	-	1	1	1	40		44
06	GERA	-	3	-	-	3	-	6	7	-	-	-	-	7		13
07	HALLE	4	27	1	-	4	-	36	44	-	3	4	-	51		87
08	KARL-MARX-STADT	-	7	-	-	4	-	11	23	1	2	3	-	29		40
09	LEIPZIG	1	2	-	-	2	-	5	18	1	2	1	-	22		27
10	MAGDEBURG	2	2	1	-	-	-	5	27	-	2	-	-	29		34
11	NEUBRANDENBURG	3	-	2	-	-	-	5	25	1	2	1	-	29		34
12	POTSDAM	3	5	3	-	-	-	11	57	2	1	2	1	63		74
13	ROSTOCK	5	3	1	-	1	-	10	19	-	-	-	-	19		29
14	SCHWERIN	3	5	3	-	-	-	11	23	-	5	-	-	28		39
15	SUHL	2	4	1	-	1	-	8	17	2	-	1	-	20		28
TOTAL		34	74	15	0	28	0	151	446	11	26	20	5	508	0	659
PER CENT		5.2	11.2	2.3	0.0	4.2	0.0	22.9	67.7	1.7	3.9	3.0	0.8	77.1	0.0	100.0

DEU FEDERAL REPUBLIC OF GERMANY — RABIES CASES — 1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
010	SCHLESWIG-HOLSTEIN							0	4	-	-	-	3	7		7
020	HAMBURG							0						0		0
031	BRAUNSCHWEIG	-	-	2	-	3	-	5	13	-	-	1	-	14		19
032	HANNOVER	-	1	-	-	1	-	2	8	-	-	-	-	8		10
033	LUENEBURG							0						0		0
034	WESER-EMS							0	-	-	-	-	1	1		1
040	BREMEN							0						0		0
051	DUESSELDORF							0						0		0
053	KOELN							0						0		0
055	MUENSTER							0						0		0
057	DETMOLD	-	1	1	-	1	-	3	6	-	-	1	-	7		10
059	ARNSBERG	-	-	-	1	2	-	3	15	-	1	-	-	16		19
061	DARMSTADT	4	3	3	-	6	-	16	221	8	10	19	-	258		274
062	KASSEL	1	6	6	-	7	-	20	79	2	4	7	-	92		112
071	KOBLENZ	-	-	-	2	1	1	4	1	1	1	-	-	3		7
072	TRIER							0	10	-	-	-	-	10		10
073	RHEINHESSEN-PFALZ	-	1	-	-	1	-	2	19	-	1	2	-	22		24
081	STUTTGART	-	1	-	-	2	-	3	51	1	3	1	-	56		59
082	KARLSRUHE							0	2	-	1	-	-	3		3
083	FREIBURG	1	-	-	-	-	-	1	10	1	-	-	-	11		12
084	TUEBINGEN							0	7	-	-	2	-	9		9
091	OBERBAYERN							0	1	-	-	-	-	1		1
092	NIEDERBAYERN							0						0		0
093	OBERPFALZ							0	6	-	-	-	-	6		6
094	OBERFRANKEN	-	2	-	-	-	-	2	7	-	1	-	-	8		10
095	MITTELFRANKEN							0	9	-	-	1	-	10		10
096	UNTERFRANKEN	1	-	-	-	2	-	3	17	1	3	1	-	22		25
097	SCHWABEN	-	-	-	-	1	-	1	16	-	-	1	-	17		18
100	SAARLAND	-	-	1	-	1	1	3	18	1	3	4	-	26		29
110	BERLIN (WEST)							0	-	-	-	-	1	1		1
TOTAL		7	15	13	3	28	2	68	520	15	28	40	5	608	0	676
PER CENT		1.0	2.2	1.9	0.4	4.1	0.3	10.1	76.9	2.2	4.1	5.9	0.7	89.9	0.0	100.0

FRA F R A N C E — R A B I E S C A S E S — 1. 4.89 – 30. 6.89

LOCATION		D O M E S T I C A N I M A L S							W I L D A N I M A L S						HUMAN CASES	TOTAL
CODE	NAME	DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	AIN							0	1	2	–	–	–	3		3
02	AISNE							0	9	–	–	–	–	9		9
08	ARDENNES	–	1	–	–	4	–	5	15	–	2	1	–	18		23
10	AUBE	–	–	–	1	–	–	1	23	–	–	–	–	23		24
21	COTE D'OR	2	1	3	1	11	–	18	58	–	1	–	–	59		77
25	DOUBS	1	5	–	–	2	–	8	74	4	1	–	–	79		87
39	JURA	–	–	1	–	–	–	1	85	–	–	–	–	85		86
51	MARNE	1	–	–	–	1	–	2	8	–	–	1	–	9		11
52	MARNE (HAUTE)	1	–	2	3	7	–	13	18	1	–	–	–	19		32
54	MEURTHE ET MOSELLE	3	2	11	–	5	–	21	48	–	1	–	–	49		70
55	MEUSE	1	3	4	2	2	–	12	70	–	2	1	–	73		85
57	MOSELLE	1	–	2	–	–	–	3	13	–	–	–	–	13		16
58	NIEVRE	–	1	–	–	11	–	12	91	2	4	–	–	97		109
60	OISE	2	1	1	1	2	–	7	39	–	1	–	–	40		47
67	RHIN (BAS)	1	1	–	–	–	–	2	9	–	–	–	–	9		11
68	RHIN (HAUT)	–	–	1	–	–	–	1	9	1	2	–	–	12		13
70	SAONE (HAUTE)	–	1	1	2	–	–	4	19	–	1	–	–	20		24
71	SAONE ET LOIRE	–	1	1	–	3	–	5	31	–	–	–	–	31		36
77	SEINE ET MARNE	–	1	1	–	1	–	3	17	1	–	–	–	18		21
78	YVELINES							0	19	–	–	–	–	19		19
80	SOMME	1	–	–	–	–	–	1	9	–	–	–	–	9		10
88	VOSGES	2	4	1	–	12	–	19	42	–	3	–	–	45		64
89	YONNE	–	2	–	–	3	–	5	47	–	–	–	–	47		52
90	TERR.DE BELFORT							0	3	–	–	–	–	3		3
95	VAL D'OISE	–	–	1	–	–	–	1	7	–	–	–	–	7		8
TOTAL		16	24	30	10	64	0	144	764	11	18	3	0	796	0	940
PER CENT		1.7	2.6	3.2	1.1	6.8	0.0	15.3	81.3	1.2	1.9	0.3	0.0	84.7	0.0	100.0

HUN HUNGARY

RABIES CASES

1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	BUDAPEST	1	1	-	-	-	-	2						0		2
02	BARANYA	-	-	1	-	-	-	1	4	-	-	-	-	4		5
03	BACS-KISKUN	1	-	2	-	1	-	4	9	-	-	-	-	9		13
04	BEKES							0	1	-	-	-	-	1		1
05	BORSOD-ABAUJ-ZEMPLEN	1	2	-	-	-	-	3	3	-	-	-	-	3		6
06	CSONGRAD							0	2	-	-	-	-	2		2
07	FEJER	1	1	2	-	-	-	4	9	-	-	-	-	9		13
08	GYOER-SOPRON							0	2	-	-	-	-	2		2
09	HAJDU-BIHAR	-	1	-	-	-	-	1	3	-	-	-	-	3		4
10	HEVES							0	1	-	-	-	-	1		1
11	KOMAROM	-	-	1	-	-	-	1	2	-	-	-	-	2		3
12	NOGRAD	-	-	1	-	-	-	1	1	-	-	-	-	1		2
13	PEST	-	1	-	-	-	-	1	5	-	-	-	-	5		6
14	SOMOGY	1	2	4	-	1	-	8	9	-	-	1	-	10		18
15	SZABOLCS-SZATMAR	1	1	2	-	-	-	4	6	-	1	-	-	7		11
16	SZOLNOK	2	1	2	-	-	-	5	2	-	-	-	-	2		7
17	TOLNA	1	1	1	-	1	-	4	3	-	-	-	-	3		7
18	VAS	1	-	-	-	-	-	1	10	-	-	-	-	10		11
19	VESZPREM	1	1	-	-	-	-	2	6	-	-	-	-	6		8
20	ZALA	2	2	1	-	-	-	5	10	-	1	-	-	11		16
TOTAL		13	14	17	0	3	0	47	88	0	2	1	0	91	0	138
PER CENT		9.4	10.1	12.3	0.0	2.2	0.0	34.1	63.8	0.0	1.4	0.7	0.0	65.9	0.0	100.0

RABIES CASES 1. 4.89 - 30. 6.89

LOCATION CODE NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
	DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
ITA ITALY															
34 TRIESTE E GORIZIA							0	7	2	-	-	-	9		9
TOTAL	0	0	0	0	0	0	0	7	2	0	0	0	9	0	9
PER CENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.8	22.2	0.0	0.0	0.0	100.0	0.0	100.0
ROM ROMANIA															
31 SATU-MARE	-	-	-	-	4	-	4	1	-	-	-	-	1		5
TOTAL	0	0	0	0	4	0	4	1	0	0	0	0	1	0	5
PER CENT	0.0	0.0	0.0	0.0	80.0	0.0	80.0	20.0	0.0	0.0	0.0	0.0	20.0	0.0	100.0
SPA SPAIN															
21 HUELVA							0	-	-	-	-	1	1		1
SWI SWITZERLAND AND LIECHTENSTEIN															
05 BASEL-LAND							0	2	-	-	-	-	2		2
12 NEUCHATEL							0	1	-	-	-	-	1		1
23 VALAIS							0	2	-	-	-	-	2		2
26 JURA							0	3	-	-	-	-	3		3
TOTAL	0	0	0	0	0	0	0	8	0	0	0	0	8	0	8
YUG YUGOSLAVIA															
10 SR BOSNA I HERCEGOVIN							0	7	-	-	-	-	7		7
30 SR HRVATSKA	1	3	-	-	-	-	4	76	1	-	-	-	77		81
50 SR SLOVENIJA	4	3	1	-	-	-	8	156	9	2	-	-	167		175
60 SR SRBIJA	2	-	-	-	-	-	2	1	-	-	-	-	1		3
61 SAP VOJVODINA	1	3	-	-	-	-	4	6	-	-	-	-	6		10
TOTAL	8	9	1	0	0	0	18	246	10	2	0	0	258	0	276
PER CENT	2.9	3.3	0.4	0.0	0.0	0.0	6.5	89.1	3.6	0.7	0.0	0.0	93.5	0.0	100.0

POL POLAND

RABIES CASES

1. 4.89 – 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	WARSZAWA	2	–	–	–	–	–	2	6	–	1	–	–	7		9
03	BIALA PODLASKA	–	1	–	–	–	–	1	–	–	1	–	–	1		2
07	BIELSKO-BIALA							0	–	–	–	1	–	1		1
09	BYDGOSZCZ	2	4	–	–	–	–	6	14	1	2	–	2	19		25
11	CHELM	–	1	–	–	–	–	1	–	–	–	–	2	2		3
13	CIECHANOW	–	1	–	–	–	–	1	–	–	–	–	3	3		4
15	CZESTOCHOWA	–	1	–	–	–	–	1	5	–	–	2	–	7		8
19	GDANSK	–	–	–	–	–	1	1	14	–	2	–	1	17		18
21	GORZOW	–	1	–	–	–	–	1	21	–	–	–	1	22		23
23	JELENIA GORA	–	–	2	–	–	–	2	8	–	–	–	–	8		10
25	KALISZ	2	–	–	–	–	–	2	4	–	1	–	–	5		7
27	KATOWICE	–	2	–	–	–	–	2	10	–	–	3	1	14		16
29	KIELCE	1	1	–	–	–	–	2						0		2
31	KONIN	–	1	–	–	–	–	1	2	–	–	–	–	2		3
33	KOSZALIN	1	–	1	–	–	–	2	6	–	1	4	2	13		15
35	KRAKOW							0	–	–	–	1	–	1		1
37	KROSNO							0	1	–	–	–	–	1		1
39	LEGNICA							0	3	–	–	–	–	3		3
41	LESZNO	1	–	–	–	–	–	1	5	–	–	2	–	7		8
43	LUBLIN							0	2	–	–	–	–	2		2
47	LODZ	–	–	2	–	–	–	2	2	–	–	–	–	2		4
49	NOWY SACZ							0	5	–	–	–	1	6		6
51	OLSZTYN	–	3	1	–	–	–	4	–	–	–	–	10	10		14
53	OPOLE	–	1	–	–	–	–	1	10	–	–	–	–	10		11
55	OSTROLEKA							0	2	–	–	–	–	2		2
57	PILA	2	–	–	–	1	–	3	12	–	–	–	1	13		16
63	POZNAN	–	2	–	–	–	–	2	4	–	2	3	–	9		11
65	PRZEMYSL	–	1	1	–	–	–	2	3	–	–	–	–	3		5
67	RADOM							0	1	–	–	–	–	1		1
69	RZESZOW							0	1	–	–	–	–	1		1
71	SIEDLCE	1	–	–	–	–	–	1	1	–	–	–	–	1		2
73	SIERADZ							0	1	–	–	–	–	1		1
77	SLUPSK	3	–	–	–	–	–	3	5	–	–	–	–	5		8
79	SUWALKI	–	1	–	–	–	–	1	3	–	–	–	3	6		7
81	SZCZECIN	1	–	–	–	–	–	1	4	–	–	–	–	4		5
83	TARNOBRZEG	1	–	–	–	–	–	1	–	–	1	–	–	1		2
87	TORUN							0	3	–	–	–	1	4		4
89	WALBRZYCH	1	–	1	–	–	–	2	5	–	–	1	1	7		9
91	WLOCLAWEK	2	1	–	–	–	–	3						0		3
93	WROCLAW	1	–	–	–	–	–	1	4	–	–	–	–	4		5
95	ZAMOSC	–	1	–	–	–	–	1	4	–	–	–	–	4		5
97	ZIELONA GORA	2	–	–	–	–	–	2	8	–	–	–	–	8		10
TOTAL		23	23	8	0	1	1	56	179	1	11	17	29	237	0	293
PER CENT		7.8	7.8	2.7	0.0	0.3	0.3	19.1	61.1	0.3	3.8	5.8	9.9	80.9	0.0	100.0

TUR TURKEY

RABIES CASES

1. 4.89 - 30. 6.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
001	ADANA	2	-	1	-	-	-	3						0		3
006	ANKARA	1	-	-	-	-	-	1						0		1
007	ANTALYA	1	1	1	-	-	-	3						0		3
010	BALIKESIR	2	-	-	-	1	-	3						0		3
011	BILECIK	1	-	-	-	-	-	1						0		1
016	BURSA	7	1	-	-	-	-	8						0		8
021	DIYARBAKIR	2	1	2	-	-	1	6						0		6
022	EDIRNE	-	-	1	-	-	-	1						0		1
027	GAZIANTEP	3	-	-	-	-	-	3						0		3
034	ISTANBUL	13	2	-	1	-	-	16	-	-	-	-	1	1		17
035	IZMIR	9	1	1	-	1	-	12						0		12
036	KARS	1	-	-	-	-	-	1						0		1
037	KASTAMONU	1	-	-	-	-	-	1						0		1
038	KAYSERI	1	-	-	-	-	-	1						0		1
039	KIRKLARELI	5	-	-	-	-	-	5						0		5
041	KOCAELI	2	1	-	-	-	-	3						0		3
043	KUETAHYA	6	-	-	-	-	-	6						0		6
044	MALATYA	1	-	-	-	-	-	1						0		1
045	MANISA	1	-	-	1	-	-	2						0		2
051	NIGDE	1	-	-	-	-	-	1						0		1
052	ORDU	9	-	1	-	-	-	10						0		10
054	SAKARYA	4	-	2	-	-	-	6						0		6
055	SAMSUN	8	-	2	-	-	-	10						0		10
057	SINOP	2	-	1	-	-	-	3						0		3
059	TEKIRDAG	1	-	-	-	-	-	1						0		1
060	TOKAT	1	-	-	-	-	-	1						0		1
061	TRABZON	2	-	-	-	-	-	2						0		2
063	URFA	-	-	-	1	-	-	1						0		1
067	ZONGULDAK	2	-	3	-	-	-	5						0		5
TOTAL		89	7	15	3	2	1	117	0	0	0	0	1	1	0	118
PER CENT		75.4	5.9	12.7	2.5	1.7	0.8	99.2	0.0	0.0	0.0	0.0	0.8	0.8	0.0	100.0

SSR UNION OF SOVIET SOCIALIST REPUBLIC — RABIES CASES — 1. 1.89 – 31. 3.89

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	RSFSR	84	26	267	14	187	23	601	137	–	–	–	6	143	1	745
02	MOLDAVIAN SSR	25	37	85	1	–	–	148	91	–	3	–	2	96		244
03	UKRAINIAN SSR	14	2	8	7	–	–	31	32	–	–	–	6	38		69
04	BYELORUSSIAN SSR	3	1	1	–	2	–	7	10	–	–	–	6	16		23
05	LITHUANIAN SSR	5	2	1	–	–	–	8	32	–	–	–	15	47		55
06	LATVIAN SSR	4	14	5	–	–	–	23	15	–	–	1	5	21		44
07	ESTONIAN SSR	1	–	–	–	2	–	3	2	–	–	–	–	2		5
TOTAL		136	82	367	22	191	23	821	319	0	3	1	40	363	1	1185
PER CENT		11.5	6.9	31.0	1.9	16.1	1.9	69.3	26.9	0.0	0.3	0.1	3.4	30.6	0.1	100.0

LIST OF CONTRIBUTORS

AUT **AUSTRIA**
Dr. W. S c h u l l e r
Dr. H. S c h n a b l
Bundesanstalt für Tierseuchen-bekämpfung

BEL **BELGIUM**
Dr. J. T a m b e u r
Ministère de l'Agriculture

BUL **BULGARIA**
Dr. N. T. B e l e v
Ministère de l'Agriculture

CZE **CZECHOSLOVAKIA**
Dr. M. O l a c h
Dr. J. N e u m a n n
Federal Ministry of Agriculture and Food

DDR **GERMAN DEMOCRATIC REPUBLIC**
Dr. K.-H. L e b e n t r a u
Mininisterium für Gesundheitswesen

DEN **DENMARK**
Dr. E. S t o u g a a r d
Veterinaerdirektoratet

FIN **FINLAND**
Dr. R. B e r g e r
Dr. Saara R e i n i u s
Ministry of Agriculture and Forestry

FRA **FRANCE**
Dr. J. B l a n c o u
Centre d'Etudes sur la Rage de Nancy

GRE **GREECE**
Dr. E. T s a g l a s
Ministry of Agriculture

HUN **HUNGARY**
Dr. A. G l ó z i k

Dr. Laszlo K o l t a i
Ministry of Agriculture

ICL **ICELAND**
Dr. Páll A. P á l s s o n
Chief Veterinary Officer

IRE **IRELAND**
Dr. P. J. O'C o n n o r
Dr. J. M o y n a g h
Department of Agriculture

ITA **ITALY**
Dr. S. P r o s p e r i
Istituto di Malatti Infettive
Univ. degli Studi di Bologna

LUX **LUXEMBOURG**
Dr. F. K o n s
Ministère de l'Agriculture

NET **NETHERLANDS**
Dr. J.H.M. Nieuwenhuijs
Ministry of Welfare, Health and Cultural Affairs

Dr. J.A. S m a k
Veterinary Service
Min. of Agricult. and Fisheries

NOR **NORWAY**
Dr. Olav S a n d v i k

Dr. H.O. B a c h - G a n s m o
Det Kongelige Landbruksdepartm.

POL **POLAND**
Dr. Jan K o l a s z
Ministry of Agriculture

Dr. Danuta S e r o k o w a
National Institute of Hygiene

POR **PORTUGAL**
Dr. C.A.M. de Andrade Fontes
Direccao-Geral da Pecuaria

ROM **ROMANIA**
Dr. N. M o g o s
Ministère de l'Agriculture

SPA **SPAIN**
Dr. J.A. Garrido P é r e z
Ministerio de Sanidad y Consumo

Dr. C. Escribano M o r a
Ministerio de Agricultura,
Pesca y Alimentation

SSR **EUROPEAN PART OF THE UNION OF SOVIET SOCIALIST REPUBLICS**
Prof. G.F. K o r o m y s l o v
The Kovalenko All-Union
Institute of Experimental
Veterinary Medicine, Moscow

Prof. B.L. C h e r k a s s k i y
Central Research Institute of
Epidemiology, Ministry of Public
Health, Moscow

SWE **SWEDEN**
Dr. B. N o r d b l o m
National Board of Agriculture
Veterinary and Animal

SWI **SWITZERLAND**
Dr. A.I. W a n d e l e r
Vet. Bacteriological Institute
University of Berne

TUR **TURKEY**
Dr.E.I s t a n b u l l u o g l u
Ministry of Agriculture,
Forestry and Rural Affairs

UNK **UNITED KINGDOM**
Dr. K.C. M e l d r u m

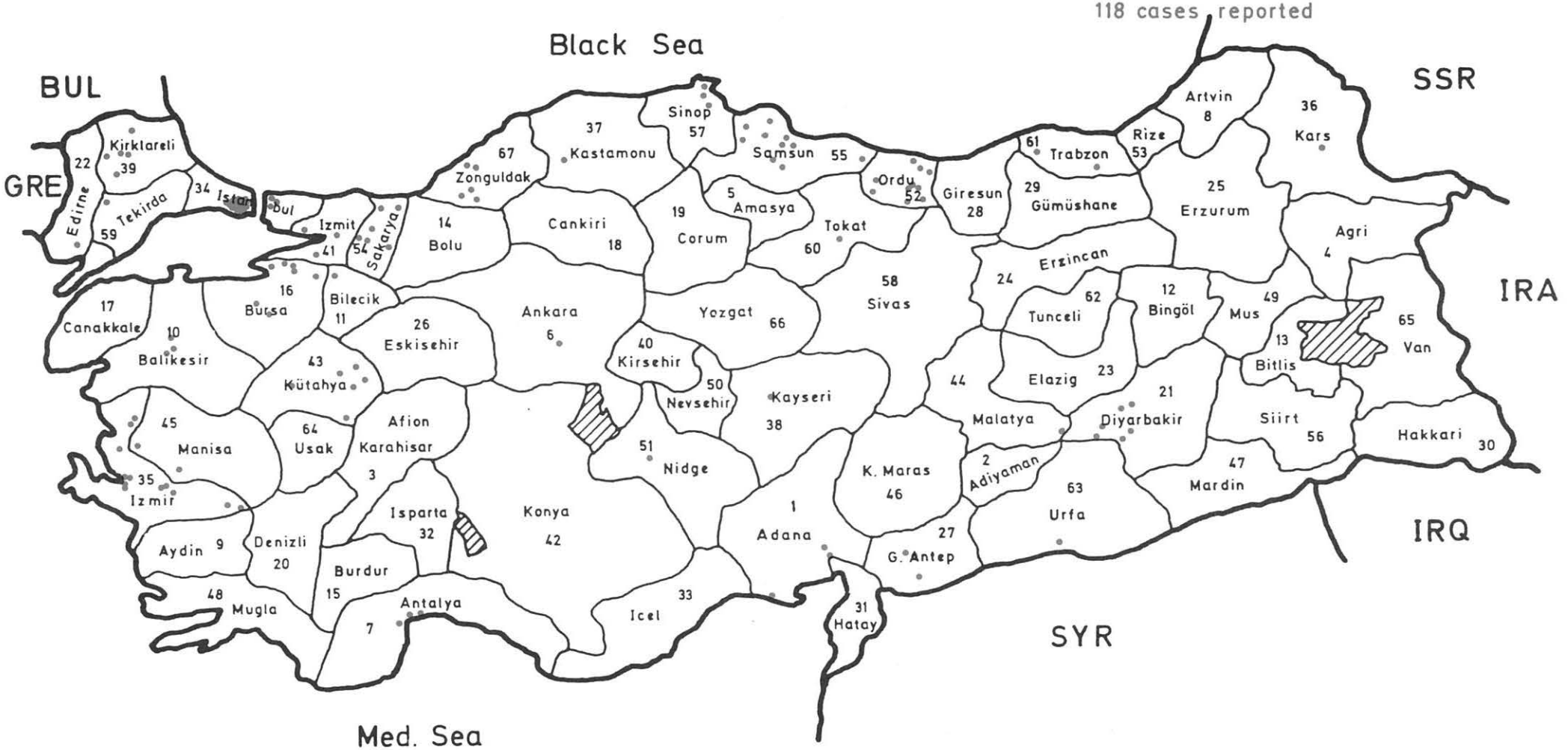
Dr. M.J. M a r r i o t t
Ministry of Agriculture,
Fisheries and Food

YUG **YUGOSLAVIA**
Dr. M. R a d o v a n o v i c
Federal Committee for Agricult.

Dr. Milos P e t r o v i c
Pasteur Institute, Novi Sad

WHO Coll. Centre
Tuebingen / DEU

Rabies Cases Turkey
2nd Quarter 1989
118 cases reported



WHO Coll. Centre
Tuebingen / DEU

Rabies Cases Europe
2nd Quarter 1989

4154 cases reported

13 bat rabies cases included

ICE
(rabies free)

NOR
(mainland
rabies free)

FIN
(0)

SWE
(rabies free)

DEN
(1)

IRE
(rabies free)

UNK
(rabies free)

NET
(7)

BEL
(154)
(8)

(672)
(4)
DEU

(659)
DDR

(293)
POL

SSR
(no data)

(470)
CZE

FRA
(940)

AUT (391)

(138)
HUN

(8)
SWI

ROM
(5)

ITA
(9)

YUG
(276)

BUL
(rabies free)

POR
(rabies free)

SPA
(1)

ALB
(no data)

TUR
(118)

GRE
(0)

0 50 100 km

(rabies free) = no indigenous case reported for at least two years