Changing environmental conditions in certain wildlife populations in Germany and their possible effects on the epidemiology and control of FMD

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Introduction

Foot-and-mouth disease (FMD) outbreaks in wildlife species used to be relatively rare events during the time as FMD was endemic in Germany. Only a few reports are available about FMD virus infections among ruminant and other cloven-hoofed wildlife species even during high-epidemic phases with sometimes more than 16,000 affected farms in the sixties of the last century. Therefore, limited attention was paid concerning a stronger involvement of wildlife species into the FMD control concepts in case of the incursion of the virus in earlier times. The aim of this study is to demonstrate the need of an increased FMD awareness in certain wildlife populations in case of FMD outbreaks.

Materials & Methods

Statistical data on hunting bags are used in general as indirect indicators to estimate wildlife populations. The following graphs (Fig.1-Fig.4) show the development of hunting bags of FMD susceptible game species in Germany during the preceding 70 years. In comparison, the increase of areas under cultivation of some energy plants and oil seeds based on official statistical data (Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten) is demonstrated (Fig. 5 and Fig.6).

Results & Discussion

The populations of some FMD susceptible game species increased remarkably during the last decades in Germany (Fig. 1 - 4). Higher feed availability, partly better environmental conditions for wildlife of cover, at least during the vegetation periods are some of the factors for an increase of population densities of these wildlife species.

Especially, the growth of the wild boar population (Fig. 4) may influence the FMD control policy in case of FMD outbreaks. As an additional wild boar promoting factor, the enlargement of renewable energies may also contribute to a further increase of the wild boar population by providing even more feed. A significant proportion of energy plants consists of maize, which is used for biogas production (Fig. 5). Oil seed production has been also remarkably increased in Germany during the last decades (Fig. 6). Thus, the area under cultivation for rapeseed increased by factor 6 between 1997 and 2007. Maize and rapeseed fields are attractive habitats and feed sources for many wildlife species and serve wildlife as a perfect cover.

Urbanisation in many regions reduced the natural distances between wildlife, especially game species and human beings or domestic animals, respectively. Some of FMD susceptible wildlife species, e.g. wild boar and roe deer, enlarged their habitats into the urban areas even of big cities (Fig. 7). Thus, the probability of direct or indirect contacts between humans and domestic animals and wildlife increased. In case of an incursion of FMD virus in urban areas, susceptible wildlife may be exposed by contacts to contaminated garbage, animal products or kitchen waste. Wild boar is capable of playing an important role in the epidemiology of FMD, if an index case by garbage consumption occurs and may act as an epidemiological link to other susceptible wildlife and domestic species for a certain period of time. The comparable high amount of FMD virus excretion by aerosols increases the importance of pig species additionally.

Conclusions

- Population densities of FMD susceptible wildlife species will probably further increase in countries like Germany due to partly improving environmental conditions for some game species, like feed availability.
- Disease awareness campaigns concerning FMD should considerate susceptible wildlife species in highly densely populated livestock areas and in urban areas.
- Once FMD virus entered susceptible game species populations, control and eradication may be prolonged and complicated. Therefore, in case of FMD outbreaks, the actual epidemiological situation in wildlife species should be always taken carefully into consideration in designing restriction zones and planning control measures.