Past and future of emerging small ruminant diseases

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In 1919, the founding year of GD Animal Health, and the decades that followed, no special attention was paid to diseases of small ruminants, although tuberculosis, brucellosis and foot-and-mouth disease frequently ravaged dairy cattle farms where often also small ruminants were kept.
In the fifties of the last century, liver fluke infections repeatedly resulted in such a high mortality rate in sheep that coordinated action was undertaken to reduce infection pressure. From 1955 onwards, GD started efforts to get rid of *Galba truncatula*, the intermediate host of *Fasciola hepatica*, by spraying chemicals on the habitat of the snail, and by lowering the water level in the field. Coordinated yearly treatments of cattle were additional ways of reducing infection pressure. Massive mortality in the province of Friesland in 1969 with more than ten thousand sheep dying as a consequence of liver fluke infection, resulted in setting up the Liver Fluke Forecasting Committee, and this also formed the starting point of coordinated small ruminant health care.
With the launch of the maedi visna and caprine arthritis encephalitis (CAE) accreditation program in 1982 and 1987, respectively, a serious attempt was made to combat the economically most important endemic diseases of small ruminants.
Between 1982 and 1984, caseous lymphadenitis (CL) was imported for the first time with dairy goats from France. In February 2017, history repeated itself with the importation of Lacaunes with CL from France.
The theoretical possibility that bovine spongiform encephalopathy (BSE) could have been transmitted to sheep through sheep eating contaminated feed before the feed ban of July 1988 on inclusion of ruminant derived meat and bone meal in concentrates, and the fact that BSE and scrapie could not easily be distinguished from each other resulted in a breeding program for scrapie resistance in 1998 which turned out to be very successful in the long term.
A serious outbreak of foot-and-mouth disease in 2001, the first outbreak of bluetongue in 2006, the largest recorded outbreak of Q fever in humans related to *Coxiella burnetii* shedding dairy goats from 2005 to 2009, and schmallenberg virus related severe malformations in ruminants from the autumn of 2011 onwards, are examples of emerging and challenging diseases affecting small ruminants. Such severe outbreaks not only affect livestock farmers but also cause social unrest among the general public, certainly as long as zoonotic transmission has not been excluded.

Since May 2018, several cases of ovine enzootic nasal adenocarcinoma (OENA), PCR positive for ovine enzootic nasal tumor virus 1 (ENTV-1), have been confirmed in a flock of Drenthe heath sheep and Kempens heath sheep that had imported breeding rams in 2015. Because this was the first time that OENA has been confirmed in the Netherlands, GD has advised to cull the flock as has been very successfully done in 1978 after the import of jaagsiekte or ovine pulmonary adenocarcinoma, caused by jaagsiekte sheep retrovirus.
It is uncertain if diseases like sheep and goat pox, peste des petits ruminants, Rift Valley fever, louping-ill and other tick-borne encephalitides can be kept outside the country. It will also always remain uncertain whether or not diseases we still do not know yet will emerge.
But it is certain that many things will change. Global warming resulting in climate change, and antimicrobial and anthelmintic resistance will affect the thinking and actions of future generations that also have a different view on the way farm animals are kept. The founding of GD Animal Health, a century ago, focussed on combatting zoonoses like tuberculosis and brucellosis. This one health idea will also be a determining factor in the future decades of small ruminant health management.