EXTERNAL REFERENCES

ID SCREEN® SCHMALLENBERG VIRUS COMPETITION MULTISPECIES

Last update: October 2025

Publications / References:

PERFORMANCE EVALUATION

1)Wernike K. *et al.* (2019). **International proficiency trial demonstrates reliable Schmallenberg virus infection diagnosis in endemic and non-affected countries**. PLoS ONE 14 (6): e0219054.	• Laboratory proficiency trial: 10 serum samples from **sheep and cattle** (6 seropositive, 4 seronegative) were provided, and 4 commercial ELISA were tested: the ID Screen® Schmallenberg virus Competition Multispecies (tested in 28 laboratories); the ID Screen® Schmallenberg virus Indirect Multispecies, the IDEXX Schmallenberg Ab, and the SANOVIR SDV-Ab. • *Results*: using the ID Screen® Schmallenberg virus Competition Multispecies, all the tested samples were found with the expected status in all 28 laboratories.	Comparison with competitors

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2)Pejaković S. *et al.* (2018). **Test selection for antibody detection according to the seroprevalence level of Schmallenberg virus in sheep**. PLoS ONE 13(4): e0196532.	• performance evaluation of three SBV antibody detection assays: the ID Screen® Schmallenberg virus Competition multispecies (SBVC), IDEXX Schmallenberg virus Antibody, and SNT using control **sheep samples** with known status as controls (45 true negative and 45 true positive sera) and samples from previously field-infected animals (sheep samples from two different epidemiological contexts, n=127). • *Results*: ○ SNT: ▪ sensitivity : 100% ▪ specificity : 100% ○ to avoid biased estimation of the sensitivity and specificity, the results were evaluated under two scenarios : ▪ first scenario, where all suspect/doubtful results were included in negative results: - IDEXX kit: sensitivity 78% and specificity 98% - SBVC: sensitivity 96% and specificity 100% ▪ second scenario, where all suspect/doubtful reads were included in positive results: - IDEXX kit correctly diagnosed 93% of positive reference animals and yielded three false positives among the negative controls with sensitivity and specificity of 93% with an agreement with SNT of 0.86 - **SBVC recognized true positive and true negative samples with specificity and sensitivity of 100%, and a perfect diagnostic performance and perfect agreement with SNT** - ○ performance of three assays tested in field contexts: **overall observation showed that SBVC test is more sensitive than IDEXX kit, with results closer to the SNT.** ***In programs for monitoring freedom of disease in sheep population, the IDEXX kit was not able to recognise SBV infection, leaving only SNT and SBVC adapted to provide results.* (sic)**	Comparison with other tests	Correlation with other techniques			

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3)Schulz C. *et al*. (2015). **Schmallenberg virus infection in South American camelids: Field and experimental investigations**. Veterinary Microbiology 180 (2015) 171–179.	• -Investigation of the prevalence and course of SBV-infection in **SAC (South American Camelids)** : a field study (n=502) and an animal trial with three llamas and three alpacas were conducted. -SBV-specific antibodies were analysed in field study sera with seroneutralization test (SNT), the ID Screen® Schmallenberg Virus Indirect Multispecies (IDvet iELISA), or the ID Screen® Schmallenberg virus Competition Multispecies (SBVC); samples were considered SBV-seropositive when at least one serological test result was positive. -Serum samples of SAC experimentally infected with SBV were comparatively analysed with a neutralisation test and three commercially available ELISAs: IDvet iELISA, SBVC, and the ruminant-specific IDEXX Schmallenberg Ab Test (IDEXX iELISA). • *Results*: ○ 62.35% of field samples were found seropositive. ○ in experimentally infected SAC: seroconversion was detected at 9–21 dpi and at 7–40 dpi as measured by SNT and SBVC, respectively. The correlation between neutralising antibody titers and antibody levels obtained by SBVC was fair to good. -both IDvet ELISAs yielded similar results. -IDEXX ELISA showed doubtful results before and after SBV-infection for one llama and did not detect SBV antibodies in the alpaca seropositive by neutralisation. **The ID SCREEN® SCHMALLENBERG virus Competition Multispecies shows better performance than Idexx iELISA on experimentally infected SAC.**	Comparison with other tests	Correlation with other techniques	Epidemiological study	Experimental study	Particular species

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EPIDEMIOLOGICAL STUDIES

CATTLE

4)Djellata N.*et al.* (2025). **Investigating serological evidence of Schmallenberg virus in cattle in eastern Algeria**. Veterinary Research Forum (Vol. 16, No. 3, p. 129).	• sera from 300 dairy cows from 75 dairy farms were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence was ○ at the animal-level: 38.33% ○ at herd-level: 41.33%.					
5)Rasekh, M. *et al.* (2022). **First detection of Schmallenberg virus antibody in cattle population of eastern Iran**. Veterinary Research Forum (Vol. 13, No. 3, p. 443).	• sera from 273 cattle were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence was 12.45%.					
6)Agerholm J.S. *et al.* (2022). **Occurrence of malformed calves in April–May 2021 indicates an unnoticed 2020 emergence of Schmallenberg virus in Denmark**. Transboundary and Emerging Diseases, 69(5), 3128-3132.	• pleural effusion fluids from 7 malformed calves and serum samples from the dams were analyzed using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: 5 pleural effusion fluids and all dams were positive.			**Clinical cases**		
7)Molini U. *et al.* (2018). **Antibodies against Schmallenberg virus detected in cattle in the Otjozondjupa region, Namibia**. Journal of the South African Veterinary Association 89(0), a1666.	• blood samples collected from 9 cows that delivered stillborn and malformed calves were tested using the ID Screen® Schmallenberg virus Competition Multispecies. (SBVC) and SNT. • *Results*: all the samples were tested positive using SBVC, and 6/9 animals were tested positive with SNT.	**Correlation with other techniques**				
8)Wernike K. *et al.* (2018). **Development of within-herd immunity and long-term persistence of antibodies against Schmallenberg virus in naturally infected cattle**. BMC veterinary research, 14(1), 368.8.	• 23 naturally infected cattle were annually sampled for 6 years (2011-2017) and tested using ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: 17 of the 23 animals tested positive at the first sampling in 2011; 14 of them remained seropositive until 2017, while 3 animals became seronegative.					

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9)Jawor P. *et al.* (2017). **Infection exposure, detection and causes of death in perinatal mortalities in Polish dairy herds**. Theriogenology, 103, 130-136.	• Longitudinal study carried out on 121 cases of perinatal mortality in calves (PM) and 21 control calves; serum samples were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: ○ none of the control calves were seropositive ○ 4.1% of stillborn calves were seropositive.			**Clinical cases**		
10)Collins A.B. *et al.* (2017). **Schmallenberg virus: predicting within-herd seroprevalence using bulk-tank milk antibody titres and exploring individual animal antibody titres using empirical distribution functions (EDF)**. Preventive Veterinary Medicine, 143, 68-78.	• 24 Bulk Tank Milk (BTM) samples were tested using the ID Screen® Schmallenberg virus Milk Indirect and 4019 individual blood samples collected from lactating cows contributing to the BTM were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: ○ at animal level, seroprevalence was 83.3% ○ 22 herds were BTM-ELISA-positive (within-herd seroprevalence 30.6–100%) ○ 2 herds were BTM-ELISA-negative (within-herd seroprevalence 10.7 and 16.2%) indicating BTM-ELISA-negative herds can have seropositive animals. ***This study demonstrated highly and significant correlations between herd-level seroprevalence of SBV infection and bulk-tank milk ELISA results and that bulk-tank milk antibody titers are highly predictive of within-herd seroprevalence*. (sic)**		**Correlation with milk matrix**			
11)Collins A.B. *et al.* (2017). **Significant re-emergence and recirculation of Schmallenberg virus in previously exposed dairy herds in Ireland in 2016**. Transboundary and Emerging Diseases, 64(5), 1359-1363.	• 366 blood samples were collected in 25 study herds (15 samples per herd) before vector season and tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: ○ 256 animals tested seropositive ○ apparent prevalence: 69.9% ○ true prevalence (when correcting imperfect test characteristics): 77.7%**.**					

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12)Collins A.B. *et al.* (2016). **Post-epidemic Schmallenberg virus circulation: parallel bovine serological and Culicoides virological surveillance studies in Ireland**. Veterinary Research 12:234.	• whole-herd SBV serosurveillance was conducted in 26 herds before (during spring) and following the 2014 vector-season (during winter), and following the 2015 vector-season (during winter). During spring 2014, 5531 blood samples were collected from 4070 cows and 1461 heifers. During winter 2014, 2483 blood samples were collected from 1550 youngstock (8–10 months old) and a subsample (n = 933; 288 cows, 645 heifers) of the seronegative animals identified in the spring. Youngstock were resampled in winter 2015. All the serum samples were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: - in spring 2014: ○ animal-level seroprevalence was 62.5 % (cows = 84.7 %; heifers = 0.6 %). ○ within-herd seroprevalence ranged widely from 8.5 %–84.1 % in the 26 herds - in winter 2014: ○ 22 animals (0.9 %; 10 cows, 5 heifers,7 youngstock) originating in 17 herds tested seropositive. - in winter 2015: ○ all youngstock, including the 7 animals found seropositive during winter 2014, tested seronegative, suggesting their initial positive result was due to persistence of maternal antibodies	
13)Wernike K. *et al*. (2014). **Dynamics of Schmallenberg virus infection within a cattle herd in Germany, 2011**. Epidemiol. Infect. 142, 1501–1504.	• blood samples were taken from 58 dairy cows at several time points between May 2011 and January 2012. All samples were analyzed by the ID Screen® Schmallenberg virus Competition Multispecies. Moreover, samples were tested by RT-PCR. • *Results*: -until the end of September, every tested sample was negative suggesting the absence of an infection before autumn 2011. -end of September/beginning of October, SBV genome was detected in blood samples of some animals -starting in the end of September, the first cows seroconverted and the within-herd prevalence reached 100% within 1 month.	**Correlation with other techniques**

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SMALL RUMINANTS

14)Kiene F. *et al.* (2024). **Exposure of small ruminants to the Schmallenberg arbovirus in Germany from 2017 to 2018–animal-specific and flock-management-related risk factors**. Preventive veterinary medicine, 230, 106274.	• sera from 2759 sheep and 446 goats were tested using the ID SCREEN® SCHMALLENBERG virus Competition Multispecies.
	• *Results*: seroprevalence was
	  ○ in sheep: 60%
	  ○ in goats: 40.4%.

15)Veljović L. *et al*. (2023). **Seroprevalence of Schmallenberg virus in sheep in Belgrade epizootic area**. Acta Veterinaria, 73(4), 502-510.	• A total of 600 sheep sera from a serum bank, 100 serum samples from each year,.were tested using the ID Screen® Schmallenberg virus Competition Multispecies, • *Results*: average annual seroprevalence of 24.5% in the six years.
16)Larska M. *et al.* (2023). **Occurrence of emerging ruminant viruses in goats in Poland**. Polish Journal of Veterinary Sciences, 26(1), 137-142.	• sera from 365 goats were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence was 12.6%.
17)Al-Barwary L.T.O. (2018). **Serological Study For Detection Of New Emerging Ectoparasites Borne Disease (Schmallenberge Viruse) In Duhok Province – Iraq.** Assiut Vet. Med. J. Vol. 64 No. 159, 39-42.	• 192 sheep sera were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence 16.4%.
18)Sohier C. *et al*. (2017). **Unchanged Schmallenberg virus seroprevalence in the Belgian sheep population after the vector season of 2014 and 2015 despite evidence of virus circulation**. Research in Veterinary Science, 114, 177-180.	• a cross-sectional seroprevalence study in sheep was performed to determine the seroprevalence against SBV after the vector season of 2015. Sera of 409 sheep coming from 70 farms were collected between October 2015 and April 2016 and tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: overall seroprevalence after vector season was 26%.

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19)Sohier C. *et al.* (2017). **Evidence of extensive renewed Schmallenberg virus circulation in Belgium during summer of 2016–increase in arthrogryposis-hydranencephaly cases expected**. Transboundary and emerging diseases, 64(4), 1015-1019.	• seroprevalence study carried out between June and September 2016 on 501 sheep from 81 farms; sera were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: - June 2016: ○ overall seroprevalence was 25% ○ between-herd seroprevalence was 60% -September 2016: ○ overall seroprevalence was 62% ○ between-herd seroprevalence was 96%.
20)Valas S. *et al*. (2015). **Serosurvey of Schmallenberg Virus Infection in the Highest Goat-Specialized Region of France**. Transboundary and Emerging Diseases, 62(5), e85-e88.	• 1490 goat sera from 50 herds were analyzed using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence was ○ at herd-level: 62% ○ within-herd: 13.1%

CATTLE AND SMALL RUMINANTS

21)Foxi C. *et al.* (2025). **Assessing Schmallenberg Virus Disease in Sardinia (Italy) After the First Epidemic Episode in 2012**. Pathogens, 14(4), 349.	• serum samples collected between 2013 and 2023 from sheep (n = 421), cattle (n = 174), and goat (n = 65) farms, in which early embryonic death, abortion, and malformed newborns were reported and serum samples randomly collected from sheep in 2022 (n = 311 animals) and 2024 (n = 339 animals) were analyzed using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: ○ testing 2013-2023:.seropositivity varied within species and years (overall prevalence: 0-90.37%) ○ sheep testing 2022: seroprevalence was 16.4% ○ sheep testing 2024: seroprevalence was 21.53%.

22)Rexhepi A. *et al.* (2021). **First evidence of Schmallenberg virus infection in domestic ruminants in Kosovo and Albania**. Veterinaria Italiana, 57(1), 13-17.	• 364 bovine, ovine, and caprine sera were collected in Kosovo and Albania and analyzed using the ID Screen® Schmallenberg virus Competition Multispecies. 48 positive simples were subsequently analyzed by serum neutralization test (SNT). • *Results*: ○ overall percentage of ELISA positive results: 17.9%; ○ prevalence in Kosovo: 23.1% (cattle 45.5%, sheep 19.2% and goat 6.8%) ○ prevalence in Albania: 8.9% (cattle 11.1%, sheep 0% and goat 20.0%) ○ SNT confirmed the presence of neutralizing antibodies against SBV in all samples tested.	Correlation with other techniques
23)Kęsik-Maliszewska J. *et al.* (2021). **Schmallenberg virus in Poland endemic or re-emerging? A six-year serosurvey**. Transboundary and Emerging Diseases, 68(4), 2188-2198.	• sera from 21,833 ruminants (13,646 from cattle, 7,285 from sheep, and 590 from goats; a species record was missing for 312 samples but assumed to be either bovine, ovine, or caprine) were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: ○ overall seroprevalence was 37.5% ○ cattle seroprevalence was: 47% ○ sheep seroprevalence was: 22.4% ○ goat seroprevalence was: 19.7%.	
24)Zhai S.L. *et al.* (2017). **Preliminary serological evidence for Schmallenberg virus infection in China**. Trop Anim Health Prod DOI 10.1007/s11250-017-1433-2.	• serum samples from242 dairy cattle, 41 goats, 13 yellow cattle, and 21 buffalo were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: overall seroprevalence was ○ in dairy cattle: 57.4% ○ in yellow cattle: 15.3% ○ in goats: 9.7% ○ in buffalo: 19%.	

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25)Blomström A.L. *et al.* (2014). **Serological Screening Suggests Presence of Schmallenberg Virus in Cattle, Sheep and Goat in the Zambezia Province, Mozambique**. Transboundary and Emerging Diseases Published by Blackwell Verlag GmbH. 61 (2014) 289–292.	• serological screening for SBV antibodies in cattle (n=79), sheep (n=145) and goat (n=141) using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: ○ all farms tested had seropositive animals ○ cattle displayed the highest prevalence with 100% positive animals. ○ sheep and goat also displayed a high number of positive animals with a 43–97% and 72–100% within-herd seroprevalence, respectively.					
26)Chaintoutis S.C. *et al.* (2013). **Evidence of Schmallenberg virus circulation in ruminants in Greece**.Trop Anim Health Prod DOI 10.1007/s11250-013-0449-5.	• Serology study on three dairy cow herds and three sheep flocks. Milk samples were screened using the ID Screen® Schmallenberg virus Milk Indirect. 147 sera were tested for the presence of antibodies against SBV using the ID Screen® Schmallenberg virus Indirect Multispecies and the ID Screen® Schmallenberg virus Competition Multispecies (SBVC). 22 ELISA-positive sera from cows were tested by serum neutralization test (SNT) for Schmallenberg virus, Akabane virus (AKAV), and Shamonda virus (SHAV). • *Results*: antibodies against SBV were present in the milk samples from the three cow herds and 2 sheep flocks. When the sera from these herds were tested by the ID Screen® Schmallenberg virus indirect multispecies, antibodies were detected in 58 out of 90 cows. Retesting of the samples using SBVC gave the same results. SNT confirmed SBV-specific antibody responses. No neutralizing antibodies against AKAV or SHAV were found. **High correlation between the ID SCREEN® Schmallenberg virus Milk Indirect ELISA, the ID Screen® Schmallenberg virus Indirect Multispecies, the ID Screen® Schmallenberg virus Competition Multispecies and SNT. No cross reaction with AKAV and SHAV.**		**Correlation with other techniques**			**EXclusivity data**

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SWINE

27)Ferrara G. *et al*. (2024). **Pigs in southern Italy are exposed to three ruminant pathogens: an analysis of seroprevalence and risk factors analysis study**. BMC veterinary research, 20(1), 183.	• 414 pig sera were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence was 5.3%.	

DOGS

28)Wensman J.J. *et al*. (2013). **Presence of Antibodies to Schmallenberg Virus in a Dog in Sweden**. Journal of Clinical Microbiology. Vol. 51, N°8, p. 2802-2803.	• 100 dog sera were tested twice using the ID Screen® Schmallenberg virus Competition Multispecies. To confirm the presence of SBV-specific antibodies in the ELISA-positive samples, a serum neutralization test (SNT) was performed.
	• *Results*:
	  ○ first test: 2 samples found positive (23 and 20% competition)
	  ○ second test: same samples tested positive (26 and 24% competition)
	  ○ neutralizing antibodies were found in the 2 samples .
		Correlation with other techniques

CAMELIDS

29)Stanitznig A. *et al.* (2016). **Prevalence of important viral infections in new world camelids in Austria**. Wiener Tierärztliche Monatsschrift - Veterinary Medicine Austria 103.	• serum samples from 186 llamas and 261 alpacas were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: overall seroprevalence was 67.7%.	

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WILDLIFE

30)Wernike K. *et al.* (2024). **Extensive Schmallenberg virus circulation in Germany, 2023**. Veterinary Research, 55(1), 134.	• wild ruminant blood samples collected during the 2022 (61 animals: 35 **red deer** and 26 **roe deer**) and 2023 (137 animals: 92 red deer, 35 roe deer, 7 mouflon, 3 species unknown) hunting seasons were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: overall seroprevalence was o in 2022: 4.95% o in 2023: 40.15%.					
31)Bayrou C. *et al.* (2022). **Schmallenberg virus, cyclical reemergence in the core region: a seroepidemiologic study in wild cervids, Belgium, 2012–2017**. Transboundary and Emerging Diseases, 69(3), 1625-1633.	• seroprevalence was followed for 6 years in wild deer populations using the ID Screen® Schmallenberg virus Competition Multispecies (2258 sera were analysed: 1140 from roedeer and 1118 from red deer). To assess the relative sensitivity and specificity of the commercial ELISA used in this study, 622 sera were randomly drawn from the 2012, 2013, and 2014 cohorts for simultaneous testing by seroneutralization (SN), being taken as the gold standard. • *Results*: 2 years of intense circulation were revealed, 2012 and 2016, characterized by a peak seroprevalence in the two studied populations. o -relative sensitivity/SN: 71% o -relative specificity/SN: 93%.	Correlation with other techniques				
32)Kesik-Maliszewska J. *et al.* (2018). **Epidemiology of Schmallenberg virus in european bison (*Bison bonasus*) in Poland**. Journal of Wildlife Diseases, 54(2), pp. 272–282.	• 347 **bison** sera and sera collected from three species of cervids (73 **red deer**, 6 **roe deer**, and 6 **moose**) were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: seroprevalence was o in bisons: 73.2% o in red deer: 33% o in roe deer: 17% o in moose: 67%.					

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33)Graham D.A. *et al*. (2017). **A survey of free-ranging deer in Ireland for serological evidence of exposure to bovine viral diarrhoea virus, bovine herpes virus-1, bluetongue virus and Schmallenberg virus**. Irish Veterinary Journal, 70(1), 13.	• 388 blood samples from free-ranging deer (54.8% **sika deer**, 35.3% **fallow deer**, 4.3% **red deer**, and 0.3% hybrid species) were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: overall seroprevalence was 9.7%.	
34)Kęsik-Maliszewska J. *et al.* (2017). **Were Polish wild boars exposed to Schmallenberg virus?** J Vet Res 61, 151-155.	• sera from 203 **wild boars** were tested using the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: only 2 samples tested positive (seroprevalence 0.99%).	
35)Malmsten A. *et al.* (2017). **Serological testing of Schmallenberg virus in Swedish wild cervids from 2012 to 2016**. BMC Veterinary Research 13:84.	• 92 wild cervids sera from **moose** (n = 22), **red deer** (n = 15), **fallow deer** (n = 44) and **roe deer** (n = 11) were tested using the ID Screen® Schmallenberg virus Competition Multispecies. Sampling occured during three time periods (period 1 before vector season during 2012, period 2 after the vector season during 2012 and period 3 after the vector season during 2015). In addition, sera from time period 2 were analyzed with SNT. • *Results*: all samples collected in period 1 and period 3 were negative, but 53% of animals from period 2 were seropositive (wild cervids being highly unlikely to be reservoirs of SBV); sera from period 2 showed a high correlation with SNT.	Correlation with other techniques

36)Krzysiak M.K. *et al.* (2016). **Serological study of exposure to selected arthropod-borne pathogens in European Bison (*Bison bonasus*) in Poland**. Transboundary and emerging diseases, 64(5), 1411-1423.	• sera from 251 **European bison** and 65 cervids (58 **red deer**, 4 **roe deer**, and **3** elk) were tested using the ID Screen® Schmallenberg virus Competition Multispecies.
	• *Results*: seroprevalence was
	  ○ in bisons: 76.1%
	  ○ in cervids: 35.4%.	

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37)Laloy E. *et al.* (2016). **Schmallenberg virus in zoo ruminants, France and the Netherlands**. Emerging Infectious Diseases, 22(12), 2201.	• sera from 54 **exotic and wild ruminants** from 2 zoological parks were tested using the ID Screen® Schmallenberg virus Competition Multispecies and virus neutralizing test (VNT). • *Results*: the 2 methods gave identical results except for 5 samples found negative by ELISA and positive by VNT; antibodies were found in 73.3% of animals from park 1 and 48.7% of animals from park 2.	Correlation with other techniques
38)Molenaar F.M. *et al.* (2015). **Exposure of Asian elephants and other exotic ungulates to Schmallenberg virus**. PLoS One, 10(8), e0135532.	• sera from **exotic artiodactyls and perissodactyls** (241 samples from 165 individuals of 48 different exotic ungulate species) were tested using the ID Screen® Schmallenberg virus Competition Multispecies; samples from 34 individuals of 20 different species were further verified using PRNT. • *Results*: There was complete concordance between the PRNT and the ID Screen® Schmallenberg virus Competition Multispecies results for deer (**hog deer**, **reindeer**), antelope (**greater kudu, blackbuck**), bovids (**yak, gaur**), **giraffes**, and **red river hogs**. There was also concordance between the positive and negative results of the ID Screen® Schmallenberg virus Competition Multispecies and PRNT for **Asian elephants**.	Correlation with other techniques
39)Mouchantat S. *et al.* (2015). **A broad-spectrum Screening of Schmallenberg virus antibodies in wildlife animals in Germany**. Veterinary Research, 46(1), 99.	• samples collected during 4 hunting seasons from 2077 wild boars, 44 mouflon, 1363 deer, 339 carnivores (red fox, marten, badger, raccoon dog, raccoon), and 195 small mammals (rodents, shrews) were tested using the ID Screen® Schmallenberg virus Competition Multispecies; doubtful and negative results were retested using a microneutralization assay. • *Results*: o no antibodies were found in carnivores and small mammals. o no antibodies were found in wild boars and deer in the first hunting season, but were found in the 3 following seasons. o antibodies were found in mouflon in the 4 seasons.	

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40)Chiari M. *et al.* (2014). **Serosurvey for Schmallenberg virus in alpine wild ungulates**. Transboundary and Emerging Diseases, 61(1), 1-3.	• 375 serum samples collected during six consecutive hunting seasons (2007-2013) from free-living **red deer** (352) and **chamois** (23) were tested using the ID Screen® Schmallenberg virus Competition Multispecies; to confirm the positive ELISA samples, neutralizing SBV antibody titers were determined by the virus neutralization test (VNT). • *Results*: 21 red deer and a single chamois tested positive ; all the samples collected before the 2012–2013 hunting season were negative; the 52 red deer and six chamois, sampled during hunting season 2012–13), showed respectively a seroprevalence of 40.3% and 16.6%. All sera positive by ELISA were also positive by VNT.	Correlation with other techniques
41)Laloy E. *et al.* (2014). **Schmallenberg virus infection among red deer, France, 2010–2012**. Emerging Infectious Diseases, 20(1), 131.	• blood samples from 502 **red deer** were tested using the ID Screen® Schmallenberg virus Indirect Multispecies and the ID Screen® Schmallenberg virus Competition Multispecies (SBVC). A subset of samples was also tested by a seroneutralization test (SNT). • *Results*: the 2 ELISA methods exhibited a 92% match. A large part of the sera positive or doubtful by ELISA methods were also positive for SBV by SNT, suggesting a good specificity of both methods, though slightly better for the ID Screen® SCHMALLENBERG virus Competition Multispecies. ***We also pinpointed the relevance of new competition ELISA for improving SBV surveillance in wildlife species.* (sic)**	Correlation with other techniques

42)Larska M. *et al.* (2014). **Cross-sectional study of Schmallenberg virus seroprevalence in wild ruminants in Poland at the end of the vector season of 2013**. BMC Veterinary Research 10:967.	• 580 sera from wild ruminants, **red deer** (n = 176), **roe deer** (n = 66), **European bison** (n= 11), **fallow deer** (n = 256), and **mouflon** (n = 71) were tested using the ID Screen® Schmallenberg virus Competition Multispecies. Randomly selected samples giving negative (n = 20), positive (n = 50), and doubtful (n = 12) results were verified by VNT.
	• *Results*:
	  ○ overall seroprevalence was 25%
	  ○ positive (n = 50) and negative (n = 20) results were confirmed consistent by VNT, while 9 (75%) and 3 (25%) out of 12 SBVC doubtful sera were VNT positive and negative, respectively.
		Correlation with other techniques

EXPERIMENTAL STUDIES

43)Kraatz F. *et al*. (2015). **Deletion mutants of Schmallenberg virus are avirulent and protect from virus challenge**. Journal of Virology. 89 (3):1825-1837.	• the ID Screen® Schmallenberg virus Competition Multispecies (SBVC) and a neutralizing test were used to follow specific SBV antibody response of **mice** and **cattle** after inoculation with recombinant SBV mutants and infectious cattle serum.
	• *Results:*
	  ○ mice: antibodies were present in every surviving mouse on day 21 post-inoculation.
	  ○ cattle: first antibodies were detectable by SBVC 1 week after infection in one animal inoculated with infectious serum and 2 weeks after infection in all cattle injected with mutant strains. Neutralizing antibodies could be detected from 2 weeks after inoculation onwards in all animals inoculated with mutant strains or infectious serum à simplifier
	  ○ 3 weeks after the challenge infection, antibodies were detectable in samples from all cattle and the control mice by ELISA, and all but one cow had a positive result with the neutralization test.
		Correlation with other techniques

44)Wernike K.*et al*. (2015). **Schmallenberg virus recurrence, Germany, 2014**. Emerging infectious diseases, 21(7), 1202.	• 5 **sheep** and 1 **calf** were subcutaneously inoculated with blood samples from 1 of the holdings, with new cases confirmed in 2014. Serum samples were taken at weekly intervals and tested in a microneutralization assay and the ID Screen® Schmallenberg virus Competition Multispecies. • *Results*: antibodies were detected on day 7 after infection (sheep 2, sheep 5) or day 14 after infection (calf, sheep 3, sheep 4) in both tests.	Correlation with other techniques
45)Hechinger S. *et al.* (2014). **Single immunization with an inactivated vaccine protects sheep from Schmallenberg virus infection**. Veterinary Research, 45:79.	• 5 vaccinated **sheep** and 5 control sheep were inoculated with a prototype inactivated vaccine. The serological status was monitored weekly by the ID Screen® Schmallenberg virus Competition Multispecies and a standard microneutralization test (SNT) • *Results*: antibodies were detected in controls on day 7 after inoculation by SNT and on day 8 after inoculation by the ID Screen® Schmallenberg virus Competition Multispecies.	Correlation with other techniques

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46)Schulz C. *et al.* (2014). **Infectious Schmallenberg Virus from Bovine Semen, Germany**. Emerging Infectious Diseases Vol. 20, No. 2.	• investigation of infectivity of SBV RNA–positive semen by experimental subcutaneous injection of cattle ; serum samples were tested by using the ID Screen® Schmallenberg virus Competition Multispecies; selected serum samples were also tested by neutralization test. • *Results*: for 5 out of 11 injected cattle, seroconversion occurred at 8 days post-infection (DPI) with the ID Screen® Schmallenberg virus Competition Multispecies and at 12 DPI by SNT.	Correlation with other techniques

DETECTION OF OTHER BUNYAVIRUSES

47)Sick F. *et al.* (2020). **Shuni virus-induced meningoencephalitis after experimental infection of cattle**. Transbound. Emergía faireDis.;00:1–10.	• 6 calves each were experimentally inoculated with two different **Shuni virus** strains (SHUV 2162/16 and SHUV 2504/3/14) ; sera collected were analyzed by SNT, IFA, and the ID Screen® Schmallenberg virus Competition Multispecies.
	• *Results*:
	  ○ all animals inoculated with SHUV strain2162/16 seroconverted: SNT as of day 7, immunofluorescence as of day 14, and the ID Screen® Schmallenberg virus Competition Multispecies scored positive at days 14 and/or 21.
	  ○ no antibodies were detected in cattle inoculated with SHUV strain 2504/3/14 or the control animals
		Correlation with other techniques

48)Coupeau D. *et al*. (2019). **Host-dependence of in vitro reassortment dynamics among the Sathuperi and Shamonda Simbuviruses**. Emerging Microbes & Infections, 8(1), 381-395.	• sera from 1525 animals of 6 species (4 ruminants: cattle, sheep, goat, camel, and 2 equids: horse and donkey) were tested using the ID Screen® Schmallenberg virus Competition Multispecies; to better determine the serological status of these animal, a set of 20 randomly selected samples was tested using a Virus Neutralisation Test (VNT) in each animal species against **Shamonda virus** (SHAV) and **Sathuperi virus** (SATV). • *Results*: ○ using the ID Screen® Schmallenberg virus Competition Multispecies: 18-59% of animals were seropositive	Correlation with other techniques

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	○ using the VNT on selected samples: 87% of sera contained neutralyzing antibodies against either SHAV or SATV.	
49)Oluwayelu D. *et al* (2018). **Neutralizing antibodies against Simbu serogroup viruses in cattle and sheep, Nigeria, 2012–2014.** BMC Veterinary Research (2018) 14:277.	• apparently healthy cattle (n = 490) and sheep (n= 165) were tested using the ID Screen® Schmallenberg virus Competition Multispecies (SBVC) as tool of detection of antibodies against various Simbu serogroup viruses; seroneutralization test (SNT) was applied on ELISA-positive samples to detect the presence of specific neutralizing antibodies against Schmallenberg virus (SBV), **Simbu virus** (SIMV) and **Shamonda virus** (SHAV). • *Results*: seropositivity rates for cattle and sheep were 91.2% and 65.4%, respectively; testing of 20 selected ELISA-positive sera by SNT showed that all were positive for one or more of SBV, SIMV and SHAV.	**Correlation with other techniques**

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