

# Tick-Borne Encephalitis in Sheep, Romania

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Little is known about the occurrence of tick-borne encephalitis in Romania. Sheep are an infection source for humans and are useful sentinels for risk analysis. We demonstrate high antibody prevalence (15.02%) among sheep used as sentinels for this disease in 80% of the tested localities in 5 counties of northwestern Romania.

**T**ick-borne encephalitis (TBE) virus (family *Flaviviridae*, genus *Flavivirus*), is a zoonotic pathogen that causes severe neurologic disease in humans. In Europe, most cases of TBE are reported in Scandinavia and in countries in Central and Eastern Europe countries, but little is known about the current TBE epidemiologic situation in Romania.

The main tick vector for TBE virus, *Ixodes ricinus*, prefers leaf litter and the lower vegetation layers of temperate deciduous and mixed forests. In areas with high rainfall, *I. ricinus* ticks also occur in high densities in coniferous forests and in open areas such as grasslands (1). *I. ricinus* ticks are widely distributed in Romania (2) and are the most common ticks found on a variety of vertebrate hosts, including humans (3,4).

Large domestic animals such as goats, sheep, and cattle are potential hosts for *I. ricinus* ticks. These animals may also develop an antibody response after infection with TBE virus without showing clinical signs and thus are a source of TBE virus among humans who consume nonpasteurized milk and milk products, which makes them valuable sentinels for the identification of TBE risk areas (5).

Romania has the third largest sheep flock in the European Union (EU), after Great Britain and Spain, totaling ~9.5 million sheep, which accounts for 11% of the total EU flock. Most of the animals are used for milk and meat production. The purpose of this study was to determine the current TBE virus infection status in northwestern Romania by using sheep as sentinels for TBE virus circulation.

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DOI: <https://doi.org/10.3201/eid2312.170166>

## The Study

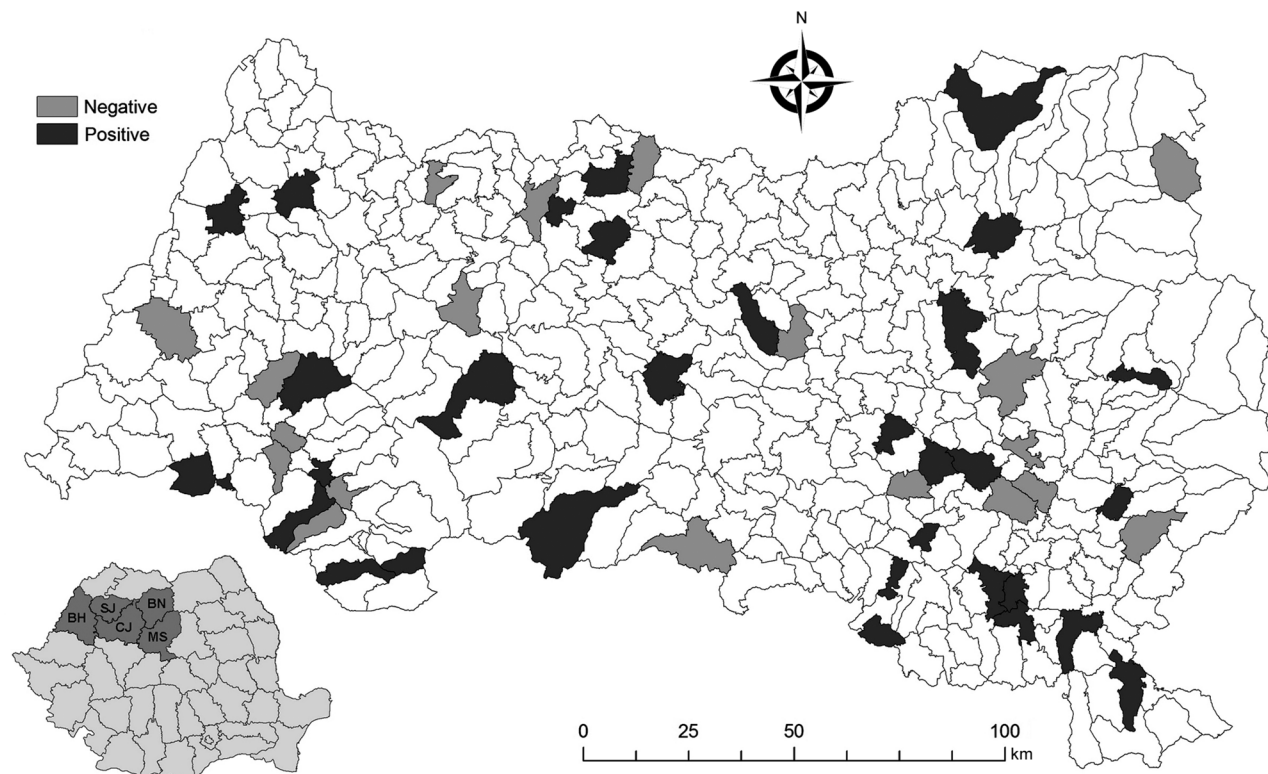
In September 2016, we randomly selected 519 serum aliquots from adult sheep from samples previously collected (July–August 2016) by the National Program for Surveillance, Prevention, Control and Eradication of Animal Diseases in 5 counties in northwestern Romania (Figure). The counties, number of samples, and number of sampling sites were Bihor, 119 samples, 12 locations; Bistrița-Năsăud, 100 samples, 10 locations; Cluj, 100 samples, 7 locations; Mureș, 100 samples, 11 locations; and Sălaj, 100 samples, 10 locations). We froze the aliquots at  $-20^{\circ}\text{C}$  before processing. We used the IMMUNOZYM FSME (TBE) IgG All-Species kit (Progen GmbH, Heidelberg, Germany) ELISA to detect TBE virus antibodies. We retested samples exhibiting  $\geq 25$  Vienna units/mL by using virus neutralization test (VNT) as described previously (6).

We tested samples from 168 (32.37%) sheep with borderline or positive results from ELISA by using VNT, and this method identified 78 (15.02%) animals as positive for antibodies specifically neutralizing TBE virus (online Technical Appendix Table, <http://wwwnc.cdc.gov/EID/article/23/12/17-0166-Techapp1.pdf>). Positive results were distributed among the counties we investigated: the highest seroprevalence was identified in sheep in Bihor County (27.73%) and the lowest seroprevalence in Mureș County (2%) (Table; Figure). We found positive sheep samples in 40 (80%) of 50 examined locations.

## Conclusions

TBE has been reported previously in Romania, but few studies confirmed the presence of the virus (7–10). However, in the past 3 decades, except for a few occasional records (11) and small-scale serologic surveys during clinical outbreaks, there have been large knowledge gaps in the studies on TBE in Romania, and the prevalence and distribution remain fairly unknown. We used sheep as sentinels for TBE virus distribution in northwestern Romania and identified the virus by VNT in 15.02% of sheep in 40 of 50 examined localities in 5 counties.

According to the latest technical report by the European Centre for Disease Control and Prevention (12), during 2008–2010, only 14 cases of TBE were reported among humans in Romania. All 14 cases originated in 5 counties in northwestern Romania; incidence was low ( $<0.5/100,000$  inhabitants) in Bihor, Bistrița-Năsăud, Cluj, and Mureș and moderate ( $0.5\text{--}4.0/100,000$  inhabitants) in Sălaj. In a recent survey done by collecting *I. ricinus* ticks from vegetation, livestock, and reptiles in central



**Figure.** Locations in northwestern Romania where sheep were positive for tick-borne encephalitis virus–specific antibodies, determined by using virus neutralization test (6). BH, Bihor; BN, Bistrița-Năsăud; CJ, Cluj; MS, Mureș; SJ, Sălaj.

and southeastern Romania, the prevalence of the TBE virus estimated by using molecular methods was <1% (13). Coipan et al. evaluated the seropositivity for TBE in 51 patients who had neurologic signs and were admitted to a hospital in Sibiu County, Romania; specific TBE antibodies were found in samples from 38 (75%) patients (14). An outbreak of rural TBE was reported in the central Romania region of Transylvania, related to consumption of infected goat milk; specific serology in 41.5% of the patients was positive for TBE virus (15). Similar seroprevalence studies in other outbreaks found lower seropositivity values (5.8%–11.6%) in human patients (15); the same study randomly evaluated 1,669 human serum samples from Transylvania and reported a 0.5% seroprevalence for TBE. Taken together, these results suggest that clinical

cases of TBE in Romania are largely underreported, and many case-patients are misdiagnosed.

Our study confirms that TBE virus is endemic in northwestern Romania and should be considered a public health risk in this country. Considering the number of sheep and their almost ubiquitous presence in this country, their sentinel role in countrywide mapping of the TBE distribution should be evaluated.

This study was partially supported by the Czech Science Foundation (project No. 16-20054S) and by project LO1218 with financial support from the Ministry of Education, Youth and Sports of the Czech Republic under the NPU I program. J.S. was supported by project QJ1510104 of the Ministry of Agriculture of the Czech Republic. The work has been done under the frame of COST Action TD1303 “EurNegVec.”

**Table.** Seroprevalence of tick-borne encephalitis in sheep, northwestern Romania\*

County	No. samples	No. locations	ELISA-positive samples,		VNT-positive samples,	
			%†		%	No. VNT-positive locations
Bihor	119	12	29.41		27.73	11
Bistrița-Năsăud	100	10	18.00		12.00	5
Cluj	100	7	67.00		11.00	5
Mureș	100	11	16.00		2.00	2
Sălaj	100	10	32.00		20.00	9
Total	519	50	32.37		15.2	32

\*Testing locations were within communes subdivision of counties in Romania.

†Includes all positive and suggestive samples with antibody titer  $\geq 25$  Vienna units/mL.

Dr. Salat is a research scientist at the Veterinary Research Institute, Brno, Czech Republic. His research interests include tick-borne encephalitis and other zoonotic viral diseases.

## References

1. Gray JS, Kahl O, Robertson JN, Daniel M, Estrada-Peña A, Gettinby G, et al. Lyme borreliosis habitat assessment. *Zentralbl Bakteriol.* 1998;287:211–28. [http://dx.doi.org/10.1016/S0934-8840\(98\)80123-0](http://dx.doi.org/10.1016/S0934-8840(98)80123-0)
2. Mihalca AD, Gherman CM, Magdaş C, Dumitrache MO, Györke A, Sándor AD, et al. *Ixodes ricinus* is the dominant questing tick in forest habitats in Romania: the results from a countrywide dragging campaign. *Exp Appl Acarol.* 2012;58:175–82. <http://dx.doi.org/10.1007/s10493-012-9568-3>
3. Mihalca AD, Dumitrache MO, Magdaş C, Gherman CM, Domşa C, Mircean V, et al. Synopsis of the hard ticks (*Acari: Ixodidae*) of Romania with update on host associations and geographical distribution. *Exp Appl Acarol.* 2012;58:183–206. <http://dx.doi.org/10.1007/s10493-012-9566-5>
4. Briciu VT, Titilincu A, Țăulescu DF, Cârștina D, Lefkaditis M, Mihalca AD. First survey on hard ticks (*Ixodidae*) collected from humans in Romania: possible risks for tick-borne diseases. *Exp Appl Acarol.* 2011;54:199–204. <http://dx.doi.org/10.1007/s10493-010-9418-0>
5. Klaus C, Beer M, Saier R, Schau U, Moog U, Hoffmann B, et al. Goats and sheep as sentinels for tick-borne encephalitis (TBE) virus—epidemiological studies in areas endemic and non-endemic for TBE virus in Germany. *Ticks Tick Borne Dis.* 2012;3:27–37. <http://dx.doi.org/10.1016/j.ttbdis.2011.09.011>
6. Širmarová J, Tichá L, Golovchenko M, Salát J, Grubhoffer L, Rudenko N, et al. Seroprevalence of *Borrelia burgdorferi* sensu lato and tick-borne encephalitis virus in zoo animal species in the Czech Republic. *Ticks Tick Borne Dis.* 2014;5:523–7. <http://dx.doi.org/10.1016/j.ttbdis.2014.03.008>
7. Drăgănescu N. Study of some current viral encephalitides in the Socialist Republic of Rumania [in Rumanian]. *Stud Cercet Inframicrobiol.* 1968;19:297–312.
8. Drăgănescu N, Gîrjabu E, Iftimovici R, Totescu E, Iacobescu V, Tudor G, et al. Investigations on the presence of antibodies to alphaviruses, flaviviruses, Bunyavirus and Kemerovo virus in humans and some domestic animals. *Virologie.* 1978;29:107–11.
9. Drăgănescu N. Study of arboviruses in Romania (1958–1978). Results obtained in the “Stefan S. Nicolau” Institute of Virology. *Virologie.* 1979;30:283–93.
10. Ardeleanu D, Ardeleanu A, Albeanu M, Pricunda G, Drăgănescu N. Some epidemiological aspects of infections caused by tick-borne encephalitis virus in the region of Gorj [in Romanian]. *Stud Cercet Inframicrobiol.* 1968;19:87–90.
11. Petrescu A, Copelovici Y, Drăgănescu N, Birnaure F, Gîrjabu E, Mihail A, et al. The evidence of circulation of some viruses in a great town of Romania during the first half of 1992. *Rev Roum Virol.* 1993;44:243–51.
12. European Centre for Disease Prevention and Control. Epidemiological situation of tick-borne encephalitis in the European Union and European Free Trade Association countries. Stockholm: The Centre; 2012 [cited 2017 Aug 31]. <https://ecdc.europa.eu/en/publications-data/epidemiological-situation-tick-borne-encephalitis-european-union-and-european>
13. Vladimirescu A, Dumitrescu G, Ionescu L, Neculescu M, Moraru V, Popescu D, et al. Real-Time PCR studies regarding the *Borrelia burgdorferi*, *Francisella tularensis*, tick borne encephalitis virus (TBEv) and Crimean Congo hemorrhagic fever virus (CCHFv) occurrence in the Romanian ticks. *Int J Infect Dis.* 2016;45S:193–4. <http://dx.doi.org/10.1016/j.ijid.2016.02.448>
14. Coipan EC, Alexse A, Vladimirescu AF, Nicolescu G. Seropositivity among human subjects for both TBEV and *Borrelia burgdorferi* s.l. during a TBE outbreak in Sibiu County, Romania. *Int J Infect Dis.* 2008;12(S1):e334. <http://dx.doi.org/10.1016/j.ijid.2008.05.892>
15. Molnár GB, Persecă T, Feder A, Păcuraru D, Marialaki E, Cojan A. Epidemiological assessment of morbidity and natural foci of TBE-CEE virus infection in Transylvania [in Romanian]. *Rev Med Chir Soc Med Nat Iasi.* 2008;112:471–7.

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# Tick-Borne Encephalitis in Sheep, Romania

## Technical Appendix

**Technical Appendix Table.** Results from the seroprevalence study of tick-borne encephalitis in sheep in northwestern Romania.

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
1	Bihor	BH	Marghita	Marghita	24.27	–	NA	NA
2	Bihor	BH	Marghita	Marghita	22.11	–	NA	NA
3	Bihor	BH	Marghita	Marghita	20.22	–	NA	NA
4	Bihor	BH	Marghita	Marghita	21.03	–	NA	NA
5	Bihor	BH	Marghita	Marghita	28.86	+	40	+
6	Bihor	BH	Marghita	Marghita	20.22	–	NA	NA
7	Bihor	BH	Marghita	Marghita	23.73	–	NA	NA
8	Bihor	BH	Marghita	Marghita	22.38	–	NA	NA
9	Bihor	BH	Marghita	Marghita	29.41	+	20	+
10	Bihor	BH	Marghita	Marghita	22.11	–	NA	NA
11	Bihor	BH	Diosig	Diosig	31.03	+	40	+
12	Bihor	BH	Diosig	Diosig	25.62	+	20	+
13	Bihor	BH	Diosig	Diosig	19.41	–	NA	NA
14	Bihor	BH	Diosig	Diosig	19.41	–	NA	NA
15	Bihor	BH	Diosig	Diosig	22.92	–	NA	NA
16	Bihor	BH	Diosig	Diosig	25.08	+	80	+
17	Bihor	BH	Diosig	Diosig	24.00	–	NA	NA
18	Bihor	BH	Diosig	Diosig	23.46	–	NA	NA
19	Bihor	BH	Diosig	Diosig	28.05	+	20	+
20	Bihor	BH	Diosig	Diosig	16.16	–	NA	NA
21	Bihor	BH	Salonta	Salonta	14.54	–	NA	NA
22	Bihor	BH	Salonta	Salonta	15.62	–	NA	NA
23	Bihor	BH	Salonta	Salonta	14.54	–	NA	NA
24	Bihor	BH	Salonta	Salonta	14.81	–	NA	NA
25	Bihor	BH	Salonta	Salonta	18.05	–	NA	NA
26	Bihor	BH	Salonta	Salonta	16.97	–	NA	NA
27	Bihor	BH	Salonta	Salonta	18.05	–	NA	NA
28	Bihor	BH	Salonta	Salonta	17.51	–	NA	NA
29	Bihor	BH	Salonta	Salonta	23.19	–	NA	NA
30	Bihor	BH	Salonta	Salonta	15.62	–	NA	NA
31	Bihor	BH	Nojorid	Nojorid	18.86	–	NA	NA
32	Bihor	BH	Nojorid	Nojorid	26.97	+	20	+
33	Bihor	BH	Nojorid	Nojorid	25.62	+	40	+
34	Bihor	BH	Nojorid	Nojorid	20.49	–	NA	NA
35	Bihor	BH	Nojorid	Nojorid	26.43	+	40	+
36	Bihor	BH	Nojorid	Nojorid	39.41	+	20	+
37	Bihor	BH	Nojorid	Nojorid	33.46	+	80	+
38	Bihor	BH	Nojorid	Nojorid	17.51	–	NA	NA
39	Bihor	BH	Nojorid	Nojorid	24.54	–	NA	NA
40	Bihor	BH	Nojorid	Nojorid	20.22	–	NA	NA
41	Bihor	BH	Lugasu de Jos	Lugasu de Jos	19.41	–	NA	NA
42	Bihor	BH	Lugasu de Jos	Lugasu de Jos	26.97	+	80	+
43	Bihor	BH	Lugasu de Jos	Lugasu de Jos	17.24	–	NA	NA
44	Bihor	BH	Lugasu de Jos	Lugasu de Jos	16.43	–	NA	NA
45	Bihor	BH	Lugasu de Jos	Lugasu de Jos	16.97	–	NA	NA
46	Bihor	BH	Lugasu de Jos	Lugasu de Jos	16.43	–	NA	NA
47	Bihor	BH	Lugasu de Jos	Lugasu de Jos	18.59	–	NA	NA
48	Bihor	BH	Lugasu de Jos	Lugasu de Jos	38.05	+	20	+
49	Bihor	BH	Lugasu de Jos	Lugasu de Jos	21.57	–	NA	NA
50	Bihor	BH	Lugasu de Jos	Lugasu de Jos	16.43	–	NA	NA

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
51	Bihor	BH	Rosiori	Rosiori	22.65	-	NA	NA
52	Bihor	BH	Rosiori	Rosiori	24.00	-	NA	NA
53	Bihor	BH	Rosiori	Rosiori	16.43	-	NA	NA
54	Bihor	BH	Rosiori	Rosiori	21.03	-	NA	NA
55	Bihor	BH	Rosiori	Rosiori	15.35	-	NA	NA
56	Bihor	BH	Rosiori	Rosiori	28.32	+	80	+
57	Bihor	BH	Rosiori	Rosiori	17.78	-	NA	NA
58	Bihor	BH	Rosiori	Rosiori	25.89	+	40	+
59	Bihor	BH	Rosiori	Rosiori	19.14	-	NA	NA
60	Bihor	BH	Rosiori	Rosiori	19.95	-	NA	NA
61	Bihor	BH	Sanmartin	Sanmartin	14.27	-	NA	NA
62	Bihor	BH	Sanmartin	Sanmartin	15.62	-	NA	NA
63	Bihor	BH	Sanmartin	Sanmartin	13.46	-	NA	NA
64	Bihor	BH	Sanmartin	Sanmartin	35.89	+	20	+
65	Bihor	BH	Sanmartin	Sanmartin	17.24	-	NA	NA
66	Bihor	BH	Sanmartin	Sanmartin	14.00	-	NA	NA
67	Bihor	BH	Sanmartin	Sanmartin	18.05	-	NA	NA
68	Bihor	BH	Sanmartin	Sanmartin	18.32	-	NA	NA
69	Bihor	BH	Sanmartin	Sanmartin	17.78	-	NA	NA
70	Bihor	BH	Sanmartin	Sanmartin	14.54	-	NA	NA
71	Bihor	BH	Vascau	Vascau	28.59	+	40	+
72	Bihor	BH	Vascau	Vascau	27.78	+	20	+
73	Bihor	BH	Vascau	Vascau	26.16	+	40	+
74	Bihor	BH	Vascau	Vascau	24.81	-	NA	NA
75	Bihor	BH	Vascau	Vascau	18.05	-	NA	NA
76	Bihor	BH	Vascau	Vascau	26.16	+	10	-
77	Bihor	BH	Vascau	Vascau	19.68	-	NA	NA
78	Bihor	BH	Vascau	Vascau	58.32	+	80	+
79	Bihor	BH	Vascau	Vascau	84.81	+	AF	-
80	Bihor	BH	Vascau	Vascau	27.51	+	40	+
81	Bihor	BH	Simian	Simian	25.89	+	80	+
82	Bihor	BH	Simian	Simian	16.43	-	NA	NA
83	Bihor	BH	Simian	Simian	24.54	-	NA	NA
84	Bihor	BH	Simian	Simian	27.78	+	40	+
85	Bihor	BH	Simian	Simian	17.51	-	NA	NA
86	Bihor	BH	Simian	Simian	14.27	-	NA	NA
87	Bihor	BH	Simian	Simian	17.51	-	NA	NA
88	Bihor	BH	Simian	Simian	23.46	-	NA	NA
89	Bihor	BH	Simian	Simian	23.00	-	NA	NA
90	Bihor	BH	Simian	Simian	16.94	-	NA	NA
91	Bihor	BH	Cefa	Cefa	31.22	+	40	+
92	Bihor	BH	Cefa	Cefa	25.10	+	20	+
93	Bihor	BH	Cefa	Cefa	21.28	-	NA	NA
94	Bihor	BH	Cefa	Cefa	22.16	-	NA	NA
95	Bihor	BH	Cefa	Cefa	21.11	-	NA	NA
96	Bihor	BH	Cefa	Cefa	27.60	+	20	+
97	Bihor	BH	Cefa	Cefa	25.14	+	20	+
98	Bihor	BH	Cefa	Cefa	23.21	-	NA	NA
99	Bihor	BH	Cefa	Cefa	26.37	+	20	+
100	Bihor	BH	Cefa	Cefa	24.26	-	NA	NA
101	Bihor	BH	Tulca	Tulca	17.95	-	NA	NA
102	Bihor	BH	Tulca	Tulca	17.07	-	NA	NA
103	Bihor	BH	Tulca	Tulca	16.72	-	NA	NA
104	Bihor	BH	Tulca	Tulca	16.72	-	NA	NA
105	Bihor	BH	Tulca	Tulca	25.49	+	40	+
106	Bihor	BH	Tulca	Tulca	26.89	+	20	+
107	Bihor	BH	Tulca	Tulca	19.35	-	NA	NA
108	Bihor	BH	Tulca	Tulca	17.60	-	NA	NA
109	Bihor	BH	Tulca	Tulca	19.88	-	NA	NA
110	Bihor	BH	Tulca	Tulca	21.98	-	NA	NA
111	Bihor	BH	Tauteu	Tauteu	14.61	-	NA	NA
112	Bihor	BH	Tauteu	Tauteu	16.72	-	NA	NA
113	Bihor	BH	Tauteu	Tauteu	17.77	-	NA	NA
114	Bihor	BH	Tauteu	Tauteu	28.82	+	20	+
115	Bihor	BH	Tauteu	Tauteu	23.74	-	NA	NA
116	Bihor	BH	Tauteu	Tauteu	22.33	-	NA	NA
117	Bihor	BH	Tauteu	Tauteu	18.30	-	NA	NA

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
118	Bihor	BH	Tauteu	Tauteu	26.54	+	40	+
119	Bihor	BH	Tauteu	Tauteu	32.51	+	40	+
120	Bistrita Nasaud	BN	Zagra	Zagra	13.61	-	NA	NA
121	Bistrita Nasaud	BN	Zagra	Zagra	13.61	-	NA	NA
122	Bistrita Nasaud	BN	Zagra	Zagra	17.24	-	NA	NA
123	Bistrita Nasaud	BN	Zagra	Zagra	15.73	-	NA	NA
124	Bistrita Nasaud	BN	Zagra	Zagra	15.42	-	NA	NA
125	Bistrita Nasaud	BN	Zagra	Zagra	13.91	-	NA	NA
126	Bistrita Nasaud	BN	Zagra	Zagra	16.94	-	NA	NA
127	Bistrita Nasaud	BN	Zagra	Zagra	14.82	-	NA	NA
128	Bistrita Nasaud	BN	Zagra	Zagra	17.55	-	NA	NA
129	Bistrita Nasaud	BN	Zagra	Zagra	15.73	-	NA	NA
130	Bistrita Nasaud	BN	Uriu	Cristestii Ciceului	5.12	-	NA	NA
131	Bistrita Nasaud	BN	Uriu	Cristestii Ciceului	14.82	-	NA	NA
132	Bistrita Nasaud	BN	Uriu	Cristestii Ciceului	17.85	-	NA	NA
133	Bistrita Nasaud	BN	Uriu	Cristestii Ciceului	15.12	-	NA	NA
134	Bistrita Nasaud	BN	Uriu	Uriu	20.88	-	NA	NA
135	Bistrita Nasaud	BN	Uriu	Uriu	25.12	+	80	+
136	Bistrita Nasaud	BN	Uriu	Hasmasu Ciceului	36.33	+	40	+
137	Bistrita Nasaud	BN	Uriu	Hasmasu Ciceului	23.30	-	NA	NA
138	Bistrita Nasaud	BN	Uriu	Hasmasu Ciceului	20.27	-	NA	NA
139	Bistrita Nasaud	BN	Uriu	Ilisua	26.33	+	40	+
140	Bistrita Nasaud	BN	Chiuza	Sasarm	14.82	-	NA	NA
141	Bistrita Nasaud	BN	Chiuza	Sasarm	56.33	+	20	+
142	Bistrita Nasaud	BN	Chiuza	Sasarm	12.09	-	NA	NA
143	Bistrita Nasaud	BN	Chiuza	Sasarm	11.79	-	NA	NA
144	Bistrita Nasaud	BN	Chiuza	Sasarm	15.42	-	NA	NA
145	Bistrita Nasaud	BN	Chiuza	Sasarm	14.82	-	NA	NA
146	Bistrita Nasaud	BN	Chiuza	Sasarm	14.82	-	NA	NA
147	Bistrita Nasaud	BN	Chiuza	Sasarm	21.18	-	NA	NA
148	Bistrita Nasaud	BN	Chiuza	Sasarm	35.73	+	20	+
149	Bistrita Nasaud	BN	Chiuza	Sasarm	37.24	+	80	+
150	Bistrita Nasaud	BN	Salva	Salva	15.73	-	NA	NA
151	Bistrita Nasaud	BN	Salva	Salva	23.30	-	NA	NA
152	Bistrita Nasaud	BN	Salva	Salva	13.91	-	NA	NA
153	Bistrita Nasaud	BN	Salva	Salva	12.09	-	NA	NA
154	Bistrita Nasaud	BN	Salva	Salva	23.00	-	NA	NA
155	Bistrita Nasaud	BN	Salva	Salva	27.24	+	20	+
156	Bistrita Nasaud	BN	Salva	Salva	34.82	+	40	+
157	Bistrita Nasaud	BN	Salva	Salva	33.30	+	20	+
158	Bistrita Nasaud	BN	Salva	Salva	18.15	-	NA	NA
159	Bistrita Nasaud	BN	Salva	Salva	323.91	+	40	+
160	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	15.12	-	NA	NA
161	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	6.94	-	NA	NA
162	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	16.64	-	NA	NA
163	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	20.58	-	NA	NA
164	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	14.52	-	NA	NA
165	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	15.73	-	NA	NA
166	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	17.85	-	NA	NA
167	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	39.06	+	20	+
168	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	48.15	+	10	-
169	Bistrita Nasaud	BN	Sieu-Odorhei	Sirioara	12.70	-	NA	NA
170	Bistrita Nasaud	BN	Chiochis	Strugureni	15.12	-	NA	NA
171	Bistrita Nasaud	BN	Chiochis	Strugureni	12.70	-	NA	NA
172	Bistrita Nasaud	BN	Chiochis	Chiochis	26.03	+	AF	-
173	Bistrita Nasaud	BN	Chiochis	Strugureni	16.33	-	NA	NA
174	Bistrita Nasaud	BN	Chiochis	Bozies	15.42	-	NA	NA
175	Bistrita Nasaud	BN	Chiochis	Chiochis	13.91	-	NA	NA
176	Bistrita Nasaud	BN	Chiochis	Bozies	37.85	+	AF	-
177	Bistrita Nasaud	BN	Chiochis	Chiochis	11.18	-	NA	NA
178	Bistrita Nasaud	BN	Chiochis	Apatiu	24.82	-	NA	NA
179	Bistrita Nasaud	BN	Chiochis	Apatiu	27.55	+	AF	-
180	Bistrita Nasaud	BN	Urmenis	Sopteriu	28.45	+	10	-
181	Bistrita Nasaud	BN	Urmenis	Sopteriu	22.70	-	NA	NA

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
182	Bistrita Nasaud	BN	Urmenis	Sopteriu	11.79	-	NA	NA
183	Bistrita Nasaud	BN	Urmenis	Sopteriu	20.58	-	NA	NA
184	Bistrita Nasaud	BN	Urmenis	Sopteriu	25.12	+	10	-
185	Bistrita Nasaud	BN	Urmenis	Sopteriu	8.45	-	NA	NA
186	Bistrita Nasaud	BN	Urmenis	Sopteriu	17.55	-	NA	NA
187	Bistrita Nasaud	BN	Urmenis	Sopteriu	18.15	-	NA	NA
188	Bistrita Nasaud	BN	Urmenis	Sopteriu	19.06	-	NA	NA
189	Bistrita Nasaud	BN	Urmenis	Sopteriu	14.52	-	NA	NA
190	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	18.76	-	NA	NA
191	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	12.70	-	NA	NA
192	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	20.27	-	NA	NA
193	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	13.00	-	NA	NA
194	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	13.00	-	NA	NA
195	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	13.00	-	NA	NA
196	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	13.00	-	NA	NA
197	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	13.30	-	NA	NA
198	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	11.48	-	NA	NA
199	Bistrita Nasaud	BN	Josenii Bargaului	Josenii Bargaului	12.09	-	NA	NA
200	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	13.91	-	NA	NA
201	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	22.70	-	NA	NA
202	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	20.27	-	NA	NA
203	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	42.09	+	40	+
204	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	22.39	-	NA	NA
205	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	14.21	-	NA	NA
206	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	13.61	-	NA	NA
207	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	13.91	-	NA	NA
208	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	23.00	-	NA	NA
209	Bistrita Nasaud	BN	Silivasu de Campie	Silivasu de Campie	16.94	-	NA	NA
210	Bistrita Nasaud	BN	Dumbrava	Dumbrava	18.95	-	NA	NA
211	Bistrita Nasaud	BN	Dumbrava	Dumbrava	18.25	-	NA	NA
212	Bistrita Nasaud	BN	Dumbrava	Dumbrava	17.89	-	NA	NA
213	Bistrita Nasaud	BN	Dumbrava	Dumbrava	17.37	-	NA	NA
214	Bistrita Nasaud	BN	Dumbrava	Dumbrava	18.60	-	NA	NA
215	Bistrita Nasaud	BN	Dumbrava	Dumbrava	18.95	-	NA	NA
216	Bistrita Nasaud	BN	Dumbrava	Dumbrava	12.98	-	NA	NA
217	Bistrita Nasaud	BN	Dumbrava	Dumbrava	15.44	-	NA	NA
218	Bistrita Nasaud	BN	Dumbrava	Dumbrava	16.32	-	NA	NA
219	Bistrita Nasaud	BN	Dumbrava	Dumbrava	17.02	-	NA	NA
220	Cluj	CJ	Vad	Vad	71.43	+	0	-
221	Cluj	CJ	Vad	Vad	60.71	+	0	-
222	Cluj	CJ	Vad	Vad	21.43	-	NA	NA
223	Cluj	CJ	Vad	Vad	30.00	+	40	+
224	Cluj	CJ	Vad	Vad	47.14	+	40	+
225	Cluj	CJ	Vad	Calna	49.29	+	10	-
226	Cluj	CJ	Vad	Calna	101.43	+	0	-
227	Cluj	CJ	Vad	Calna	40.00	+	0	-
228	Cluj	CJ	Vad	Calna	55.00	+	0	-

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
229	Cluj	CJ	Vad	Calna	137.14	+	10	-
230	Cluj	CJ	Floresti	Floresti	10.71	-	NA	NA
231	Cluj	CJ	Floresti	Floresti	12.86	-	NA	NA
232	Cluj	CJ	Floresti	Floresti	52.14	+	0	-
233	Cluj	CJ	Floresti	Floresti	25.00	+	0	-
234	Cluj	CJ	Floresti	Floresti	32.14	+	0	-
235	Cluj	CJ	Floresti	Luna de Sus	49.29	+	10	-
236	Cluj	CJ	Floresti	Luna de Sus	46.43	+	0	-
237	Cluj	CJ	Floresti	Luna de Sus	34.29	+	0	-
238	Cluj	CJ	Floresti	Luna de Sus	33.57	+	80	+
239	Cluj	CJ	Floresti	Luna de Sus	25.71	+	0	-
240	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	118.57	+	20	+
241	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	187.86	+	20	+
242	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	81.43	+	0	-
243	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	37.86	+	10	-
244	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	30.71	+	10	-
245	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	77.14	+	0	-
246	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	66.43	+	0	-
247	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	66.43	+	10	-
248	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	34.29	+	0	-
249	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	110.71	+	10	-
250	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	139.29	+	10	-
251	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	14.29	-	NA	NA
252	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	90.00	+	10	-
253	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	26.43	+	10	-
254	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	25.71	+	20	+
255	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	16.43	-	NA	NA
256	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	40.71	+	10	-
257	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	22.14	-	NA	NA
258	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	14.29	-	NA	NA
259	Cluj	CJ	Cluj-Napoca	Cluj-Napoca	52.14	+	20	+
260	Cluj	CJ	Floresti	Tauti	38.57	+	0	-
261	Cluj	CJ	Floresti	Tauti	22.86	-	NA	NA
262	Cluj	CJ	Floresti	Tauti	57.86	+	0	-
263	Cluj	CJ	Floresti	Tauti	27.14	+	0	-
264	Cluj	CJ	Ciucea	Ciucea	16.43	-	NA	NA
265	Cluj	CJ	Ciucea	Ciucea	85.71	+	10	-
266	Cluj	CJ	Ciucea	Vanatori	117.14	+	10	-
267	Cluj	CJ	Ciucea	Vanatori	26.43	+	10	-
268	Cluj	CJ	Negreni	Negreni	32.86	+	10	-
269	Cluj	CJ	Negreni	Bucea	26.43	+	20	+
270	Cluj	CJ	Ciucea	Ciucea	27.14	+	0	-
271	Cluj	CJ	Ciucea	Ciucea	27.14	+	10	-
272	Cluj	CJ	Ciucea	Ciucea	38.57	+	0	-
273	Cluj	CJ	Ciucea	Ciucea	40.00	+	10	-
274	Cluj	CJ	Ciucea	Ciucea	24.29	-	NA	NA
275	Cluj	CJ	Ciucea	Ciucea	23.57	-	NA	NA
276	Cluj	CJ	Negreni	Negreni	65.00	+	40	+
277	Cluj	CJ	Negreni	Negreni	41.43	+	10	-
278	Cluj	CJ	Ciucea	Ciucea	95.71	+	10	-
279	Cluj	CJ	Ciucea	Ciucea	113.57	+	0	-
280	Cluj	CJ	Gilau	Gilau	34.29	+	10	-
281	Cluj	CJ	Gilau	Gilau	42.86	+	20	+
282	Cluj	CJ	Gilau	Gilau	28.57	+	0	-
283	Cluj	CJ	Gilau	Gilau	22.86	-	NA	NA
284	Cluj	CJ	Gilau	Gilau	50.00	+	10	-
285	Cluj	CJ	Gilau	Gilau	49.29	+	10	-
286	Cluj	CJ	Gilau	Gilau	12.86	-	NA	NA
287	Cluj	CJ	Gilau	Gilau	35.00	+	20	+
288	Cluj	CJ	Gilau	Gilau	32.86	+	10	-
289	Cluj	CJ	Gilau	Gilau	30.71	+	10	-
290	Cluj	CJ	Gilau	Gilau	15.00	-	NA	NA
291	Cluj	CJ	Gilau	Gilau	36.43	+	0	-
292	Cluj	CJ	Gilau	Gilau	25.00	-	NA	NA
293	Cluj	CJ	Gilau	Gilau	22.14	-	NA	NA
294	Cluj	CJ	Gilau	Gilau	15.71	-	NA	NA
295	Cluj	CJ	Gilau	Gilau	11.43	-	NA	NA



Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
296	Cluj	CJ	Gilau	Gilau	30.00	+	0	-
297	Cluj	CJ	Gilau	Gilau	31.43	+	10	-
298	Cluj	CJ	Gilau	Gilau	18.57	-	NA	NA
299	Cluj	CJ	Gilau	Gilau	23.57	-	NA	NA
300	Cluj	CJ	Dabaca	Dabaca	52.14	+	0	-
301	Cluj	CJ	Dabaca	Dabaca	47.14	+	0	-
302	Cluj	CJ	Dabaca	Dabaca	20.00	-	NA	NA
303	Cluj	CJ	Dabaca	Dabaca	27.86	+	0	-
304	Cluj	CJ	Dabaca	Dabaca	20.00	-	NA	NA
305	Cluj	CJ	Dabaca	Dabaca	23.57	-	NA	NA
306	Cluj	CJ	Dabaca	Luna de Jos	43.57	+	0	-
307	Cluj	CJ	Dabaca	Luna de Jos	37.86	+	0	-
308	Cluj	CJ	Dabaca	Luna de Jos	32.14	+	0	-
309	Cluj	CJ	Dabaca	Luna de Jos	14.26	-	NA	NA
310	Cluj	CJ	Dabaca	Luna de Jos	13.91	-	NA	NA
311	Cluj	CJ	Dabaca	Luna de Jos	27.95	+	10	-
312	Cluj	CJ	Dabaca	Paglisa	21.11	-	NA	NA
313	Cluj	CJ	Dabaca	Luna de Jos	18.12	-	NA	NA
314	Cluj	CJ	Dabaca	Paglisa	19.00	-	NA	NA
315	Cluj	CJ	Dabaca	Paglisa	12.86	-	NA	NA
316	Cluj	CJ	Dabaca	Dabaca	14.61	-	NA	NA
317	Cluj	CJ	Dabaca	Dabaca	15.67	-	NA	NA
318	Cluj	CJ	Dabaca	Dabaca	19.00	-	NA	NA
319	Cluj	CJ	Dabaca	Dabaca	14.44	-	NA	NA
320	Mures	MS	Panet	Berghia	12.98	-	NA	NA
321	Mures	MS	Panet	Berghia	12.75	-	NA	NA
322	Mures	MS	Panet	Berghia	37.75	+	20	+
323	Mures	MS	Panet	Berghia	12.30	-	NA	NA
324	Mures	MS	Panet	Berghia	8.43	-	NA	NA
325	Mures	MS	Panet	Berghia	10.93	-	NA	NA
326	Mures	MS	Panet	Berghia	11.39	-	NA	NA
327	Mures	MS	Panet	Hartau	15.48	-	NA	NA
328	Mures	MS	Lunca	Logig	19.57	-	NA	NA
329	Mures	MS	Lunca	Logig	21.61	-	NA	NA
330	Mures	MS	Lunca	Logig	36.84	+	0	-
331	Mures	MS	Lunca	Logig	13.89	-	NA	NA
332	Mures	MS	Lunca	Logig	11.61	-	NA	NA
333	Mures	MS	Galesti	Troita	21.61	-	NA	NA
334	Mures	MS	Galesti	Troita	20.02	-	NA	NA
335	Mures	MS	Galesti	Troita	19.57	-	NA	NA
336	Mures	MS	Galesti	Troita	30.93	+	10	-
337	Mures	MS	Galesti	Troita	25.48	+	10	-
338	Mures	MS	Galesti	Troita	10.93	-	NA	NA
339	Mures	MS	Galesti	Troita	9.11	-	NA	NA
340	Mures	MS	Sanpaul	Sanmarghita	17.07	-	NA	NA
341	Mures	MS	Sanpaul	Sanmarghita	14.57	-	NA	NA
342	Mures	MS	Sanpaul	Sanmarghita	14.11	-	NA	NA
343	Mures	MS	Sanpaul	Sanmarghita	17.98	-	NA	NA
344	Mures	MS	Sanpaul	Valea Izvoarelor	18.20	-	NA	NA
345	Mures	MS	Sanpaul	Valea Izvoarelor	33.66	+	10	-
346	Mures	MS	Sanpaul	Valea Izvoarelor	38.89	+	10	-
347	Mures	MS	Sanpaul	Valea Izvoarelor	19.34	-	NA	NA
348	Mures	MS	Sanpaul	Valea Izvoarelor	14.80	-	NA	NA
349	Mures	MS	Sanpaul	Chirileu	19.57	-	NA	NA
350	Mures	MS	Deda	Bistra Muresului	11.39	-	NA	NA
351	Mures	MS	Deda	Bistra Muresului	20.25	-	NA	NA
352	Mures	MS	Deda	Bistra Muresului	11.39	-	NA	NA
353	Mures	MS	Deda	Bistra Muresului	22.52	-	NA	NA
354	Mures	MS	Deda	Bistra Muresului	11.16	-	NA	NA
355	Mures	MS	Deda	Bistra Muresului	15.93	-	NA	NA
356	Mures	MS	Deda	Bistra Muresului	38.43	+	0	-
357	Mures	MS	Deda	Bistra Muresului	13.89	-	NA	NA
358	Mures	MS	Deda	Bistra Muresului	14.80	-	NA	NA
359	Mures	MS	Deda	Bistra Muresului	16.16	-	NA	NA
360	Mures	MS	Bala	Ercea	28.20	+	0	-
361	Mures	MS	Bala	Ercea	11.16	-	NA	NA
362	Mures	MS	Bala	Ercea	25.93	+	0	-

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
363	Mures	MS	Bala	Ercea	8.20	-	NA	NA
364	Mures	MS	Bala	Ercea	17.98	-	NA	NA
365	Mures	MS	Bala	Ercea	14.34	-	NA	NA
366	Mures	MS	Bala	Ercea	26.39	+	0	-
367	Mures	MS	Bala	Ercea	15.02	-	NA	NA
368	Mures	MS	Bala	Ercea	10.02	-	NA	NA
369	Mures	MS	Bala	Ercea	16.39	-	NA	NA
370	Mures	MS	Cuci	Cuci	19.57	-	NA	NA
371	Mures	MS	Cuci	Cuci	34.11	+	0	-
372	Mures	MS	Cuci	Cuci	20.02	-	NA	NA
373	Mures	MS	Cuci	Cuci	11.61	-	NA	NA
374	Mures	MS	Cuci	Cuci	30.02	+	20	+
375	Mures	MS	Cuci	Cuci	17.30	-	NA	NA
376	Mures	MS	Cuci	Cuci	23.43	-	NA	NA
377	Mures	MS	Cuci	Cuci	35.70	+	0	-
378	Mures	MS	Cuci	Cuci	19.57	-	NA	NA
379	Mures	MS	Cuci	Cuci	25.70	+	0	-
380	Mures	MS	Iernut	Sfantu Gheorghe	10.70	-	NA	NA
381	Mures	MS	Iernut	Sfantu Gheorghe	23.66	-	NA	NA
382	Mures	MS	Iernut	Sfantu Gheorghe	15.48	-	NA	NA
383	Mures	MS	Iernut	Sfantu Gheorghe	21.16	-	NA	NA
384	Mures	MS	Iernut	Sfantu Gheorghe	15.93	-	NA	NA
385	Mures	MS	Iernut	Sfantu Gheorghe	28.20	+	0	-
386	Mures	MS	Iernut	Sfantu Gheorghe	43.20	+	0	-
387	Mures	MS	Iernut	Sfantu Gheorghe	17.98	-	NA	NA
388	Mures	MS	Solovastru	Solovastru	18.89	-	NA	NA
389	Mures	MS	Solovastru	Solovastru	21.61	-	NA	NA
390	Mures	MS	Solovastru	Solovastru	11.39	-	NA	NA
391	Mures	MS	Solovastru	Solovastru	15.25	-	NA	NA
392	Mures	MS	Solovastru	Solovastru	12.75	-	NA	NA
393	Mures	MS	Solovastru	Solovastru	16.16	-	NA	NA
394	Mures	MS	Solovastru	Solovastru	13.66	-	NA	NA
395	Mures	MS	Solovastru	Solovastru	13.20	-	NA	NA
396	Mures	MS	Solovastru	Jabenita	11.84	-	NA	NA
397	Mures	MS	Solovastru	Jabenita	19.57	-	NA	NA
398	Mures	MS	Solovastru	Jabenita	15.02	-	NA	NA
399	Mures	MS	Solovastru	Jabenita	30.25	-	NA	NA
400	Mures	MS	Rusii Munti	Maioresti	12.30	-	NA	NA
401	Mures	MS	Rusii Munti	Maioresti	8.43	-	NA	NA
402	Mures	MS	Rusii Munti	Maioresti	11.84	-	NA	NA
403	Mures	MS	Rusii Munti	Maioresti	17.30	-	NA	NA
404	Mures	MS	Rusii Munti	Maioresti	19.57	-	NA	NA
405	Mures	MS	Rusii Munti	Maioresti	23.43	-	NA	NA
406	Mures	MS	Rusii Munti	Maioresti	19.57	-	NA	NA
407	Mures	MS	Rusii Munti	Maioresti	14.34	-	NA	NA
408	Mures	MS	Rusii Munti	Maioresti	17.98	-	NA	NA
409	Mures	MS	Rusii Munti	Maioresti	12.07	-	NA	NA
410	Mures	MS	Batos	Uila	18.30	-	NA	NA
411	Mures	MS	Batos	Uila	15.14	-	NA	NA
412	Mures	MS	Batos	Uila	23.21	-	NA	NA
413	Mures	MS	Batos	Uila	15.14	-	NA	NA
414	Mures	MS	Batos	Uila	22.68	-	NA	NA
415	Mures	MS	Batos	Uila	13.56	-	NA	NA
416	Mures	MS	Batos	Uila	12.68	-	NA	NA
417	Mures	MS	Batos	Uila	13.56	-	NA	NA
418	Mures	MS	Batos	Uila	13.39	-	NA	NA
419	Mures	MS	Batos	Uila	17.42	-	NA	NA
420	Salaj	SJ	Garbou	Garbou	22.78	-	NA	NA
421	Salaj	SJ	Garbou	Garbou	25.08	+	10	-
422	Salaj	SJ	Garbou	Garbou	28.78	+	20	+
423	Salaj	SJ	Garbou	Garbou	21.08	-	NA	NA
424	Salaj	SJ	Garbou	Garbou	23.24	-	NA	NA
425	Salaj	SJ	Garbou	Garbou	26.78	+	20	+
426	Salaj	SJ	Garbou	Garbou	27.85	+	10	-
427	Salaj	SJ	Garbou	Garbou	19.39	-	NA	NA
428	Salaj	SJ	Garbou	Garbou	27.55	+	10	-
429	Salaj	SJ	Garbou	Garbou	24.01	-	NA	NA

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
430	Salaj	SJ	Hida	Hida	22.16	-	NA	NA
431	Salaj	SJ	Hida	Hida	23.55	-	NA	NA
432	Salaj	SJ	Hida	Hida	21.24	-	NA	NA
433	Salaj	SJ	Hida	Hida	24.93	-	NA	NA
434	Salaj	SJ	Hida	Hida	25.39	+	10	-
435	Salaj	SJ	Hida	Hida	21.55	-	NA	NA
436	Salaj	SJ	Hida	Hida	25.24	+	40	+
437	Salaj	SJ	Hida	Hida	20.78	-	NA	NA
438	Salaj	SJ	Hida	Hida	23.85	-	NA	NA
439	Salaj	SJ	Hida	Hida	23.39	-	NA	NA
440	Salaj	SJ	Balan	Balan	20.78	-	NA	NA
441	Salaj	SJ	Balan	Balan	21.70	-	NA	NA
442	Salaj	SJ	Balan	Balan	24.78	-	NA	NA
443	Salaj	SJ	Balan	Balan	23.70	-	NA	NA
444	Salaj	SJ	Balan	Balan	25.24	+	40	+
445	Salaj	SJ	Balan	Balan	18.62	-	NA	NA
446	Salaj	SJ	Balan	Balan	20.47	-	NA	NA
447	Salaj	SJ	Balan	Balan	21.70	-	NA	NA
448	Salaj	SJ	Balan	Balan	19.55	-	NA	NA
449	Salaj	SJ	Balan	Balan	22.62	-	NA	NA
450	Salaj	SJ	Dragu	Dragu	22.78	-	NA	NA
451	Salaj	SJ	Dragu	Dragu	19.55	-	NA	NA
452	Salaj	SJ	Dragu	Dragu	24.01	-	NA	NA
453	Salaj	SJ	Dragu	Dragu	31.85	+	10	-
454	Salaj	SJ	Dragu	Dragu	21.70	-	NA	NA
455	Salaj	SJ	Dragu	Dragu	19.85	-	NA	NA
456	Salaj	SJ	Dragu	Dragu	19.85	-	NA	NA
457	Salaj	SJ	Dragu	Dragu	20.93	-	NA	NA
458	Salaj	SJ	Dragu	Dragu	21.39	-	NA	NA
459	Salaj	SJ	Dragu	Dragu	26.32	+	40	+
460	Salaj	SJ	Letca	Letca	28.16	+	20	+
461	Salaj	SJ	Letca	Letca	21.55	-	NA	NA
462	Salaj	SJ	Letca	Letca	40.78	+	20	+
463	Salaj	SJ	Letca	Letca	18.47	-	NA	NA
464	Salaj	SJ	Letca	Letca	22.32	-	NA	NA
465	Salaj	SJ	Letca	Letca	19.39	-	NA	NA
466	Salaj	SJ	Letca	Letca	17.70	-	NA	NA
467	Salaj	SJ	Letca	Letca	18.47	-	NA	NA
468	Salaj	SJ	Letca	Letca	37.55	+	40	+
469	Salaj	SJ	Letca	Letca	31.08	+	20	+
470	Salaj	SJ	Dobrin	Dobrin	29.08	+	20	+
471	Salaj	SJ	Dobrin	Dobrin	24.16	-	NA	NA
472	Salaj	SJ	Dobrin	Dobrin	18.16	-	NA	NA
473	Salaj	SJ	Dobrin	Dobrin	18.62	-	NA	NA
474	Salaj	SJ	Dobrin	Dobrin	28.01	+	40	+
475	Salaj	SJ	Dobrin	Dobrin	24.93	-	NA	NA
476	Salaj	SJ	Dobrin	Dobrin	24.01	-	NA	NA
477	Salaj	SJ	Dobrin	Dobrin	26.93	+	40	+
478	Salaj	SJ	Dobrin	Dobrin	31.08	+	20	+
479	Salaj	SJ	Dobrin	Dobrin	32.47	+	10	-
480	Salaj	SJ	Cuzaplac	Cuzaplac	21.85	-	NA	NA
481	Salaj	SJ	Cuzaplac	Cuzaplac	20.01	-	NA	NA
482	Salaj	SJ	Cuzaplac	Cuzaplac	44.01	+	20	+
483	Salaj	SJ	Cuzaplac	Cuzaplac	29.55	+	20	+
484	Salaj	SJ	Cuzaplac	Cuzaplac	58.93	+	10	-
485	Salaj	SJ	Cuzaplac	Cuzaplac	26.01	+	80	+
486	Salaj	SJ	Cuzaplac	Cuzaplac	18.93	-	NA	NA
487	Salaj	SJ	Cuzaplac	Cuzaplac	21.08	-	NA	NA
488	Salaj	SJ	Cuzaplac	Cuzaplac	28.01	+	40	+
489	Salaj	SJ	Cuzaplac	Cuzaplac	21.39	-	NA	NA
490	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	23.55	-	NA	NA
491	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	21.24	-	NA	NA
492	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	19.39	-	NA	NA

Sample no.	County	County abbreviation	Commune	Locality	ELISA (VIEU/ml)	ELISA result	VNT titer	VNT result
493	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	25.55	+	0	-
494	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	21.08	-	NA	NA
495	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	23.70	-	NA	NA
496	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	22.78	-	NA	NA
497	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	25.24	+	80	+
498	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	24.16	-	NA	NA
499	Salaj	SJ	Mesesanii de Jos	Mesesanii de Jos	45.24	+	10	-
500	Salaj	SJ	Fildu de Jos	Fildu de Jos	21.24	-	NA	NA
501	Salaj	SJ	Fildu de Jos	Fildu de Jos	19.08	-	NA	NA
502	Salaj	SJ	Fildu de Jos	Fildu de Jos	23.70	-	NA	NA
503	Salaj	SJ	Fildu de Jos	Fildu de Jos	21.70	-	NA	NA
504	Salaj	SJ	Fildu de Jos	Fildu de Jos	21.24	-	NA	NA
505	Salaj	SJ	Fildu de Jos	Fildu de Jos	23.55	-	NA	NA
506	Salaj	SJ	Fildu de Jos	Fildu de Jos	21.39	-	NA	NA
507	Salaj	SJ	Fildu de Jos	Fildu de Jos	21.39	-	NA	NA
508	Salaj	SJ	Fildu de Jos	Fildu de Jos	20.62	-	NA	NA
509	Salaj	SJ	Fildu de Jos	Fildu de Jos	24.93	-	NA	NA
510	Salaj	SJ	Galgau	Galgau	32.00	+	0	-
511	Salaj	SJ	Galgau	Galgau	26.08	+	20	+
512	Salaj	SJ	Galgau	Galgau	21.80	-	NA	NA
513	Salaj	SJ	Galgau	Galgau	33.63	+	0	-
514	Salaj	SJ	Galgau	Galgau	22.61	-	NA	NA
515	Salaj	SJ	Galgau	Galgau	25.88	+	0	-
516	Salaj	SJ	Galgau	Galgau	18.94	-	NA	NA
517	Salaj	SJ	Galgau	Galgau	21.39	-	NA	NA
518	Salaj	SJ	Galgau	Galgau	34.24	+	20	+
519	Salaj	SJ	Galgau	Galgau	16.90	-	NA	NA

\*NA, not applicable; ELISA, enzyme-linked immunosorbent assay; VNT, virus neutralization test.