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Background

External and internal biosecurity becomes more and more important as farm size gets bigger, production evolves and transport of animals increases. One important aspect of external biosecurity is rodent control.

We surveyed the rodent control measures on Finnish swine and beef cattle farms, and explore the efficacy of control measures by trapping the rodents on each farm participating.

Material and methods

Cattle (n=18) and swine (n=20) farms from Southern and Western Finland were interviewed using structured questionnaire. Rodents were trapped using approximately one hundred instantly killing traps for two consecutive nights, on fall 2017 and fall 2018. The traps were checked and emptied after each night.

Linear regression model was built for exploring the effect of various rodent control measures. Catches of both years were added up and used as an outcome.

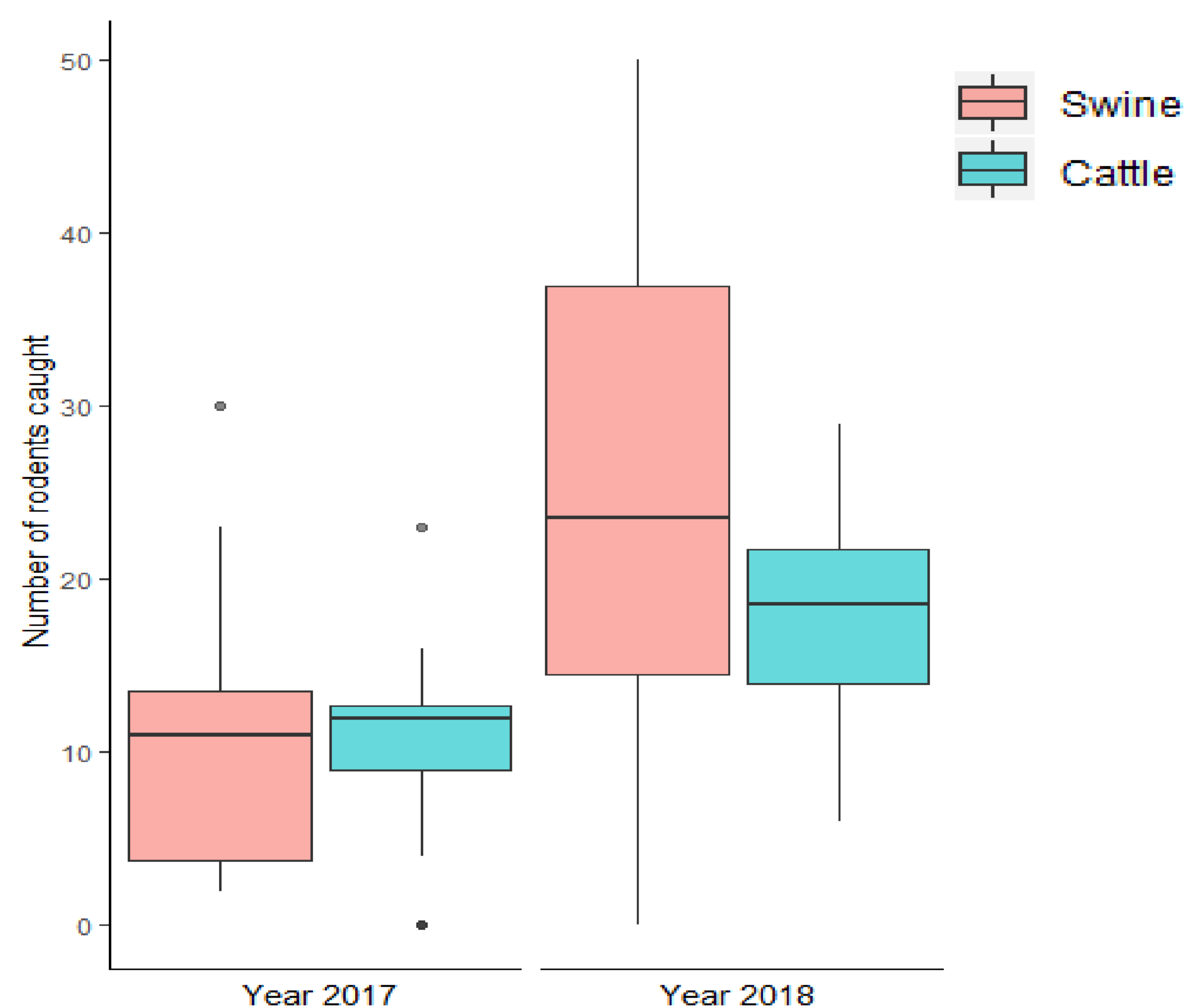


Figure 1. Rodent catches on years 2017 and 2018 on Finnish cattle and swine farms differ.

Conclusions

- Number of rodent catches varied between the farms and between the years.
- On a rodent peak year (2018) swine farms had more rodent catches than cattle farms.
- Having farm yard premises with no asphalt or gravel were associated with having more rodent catches

Table 1. Rodent control measures associated with rodent catches

	Coefficient	95% Conf. level	P value
Cattle farm	-16.5	-33.1; 0.15	0.052
Number of animals, <i>scaled</i>	-0.000026	-0.0042; 0.0042	0.99
Having cart ways only on the yard	20.2	5.2; 35.2	0.01
Number of cats on the farm	-3.4	-6.9; 0.05	0.053
Preventing rodent access to animal premises	-12.3	-25.7; 1.0	0.069
Observations of rodents by farmer during summer	-0.55	-1.2; 0.11	0.099
Asphalt on farm yard	7.9	-6.9; 22.7	0.285
Education level of the farmer*			
0	Ref.		
1	-3.6	-26.5; 19.3	0.749
2	-6.7	-29.7; 16.4	0.558
3	10.9	-19.6; 41.5	0.469
4	-7.2	-33.0; 18.5	0.569

* 0 = Basic education, 1 = Vocational upper secondary qualification in agriculture, 2 = Higher vocational level or University of applied sciences education, 3 = Academic degree in agriculture, 4 = Other

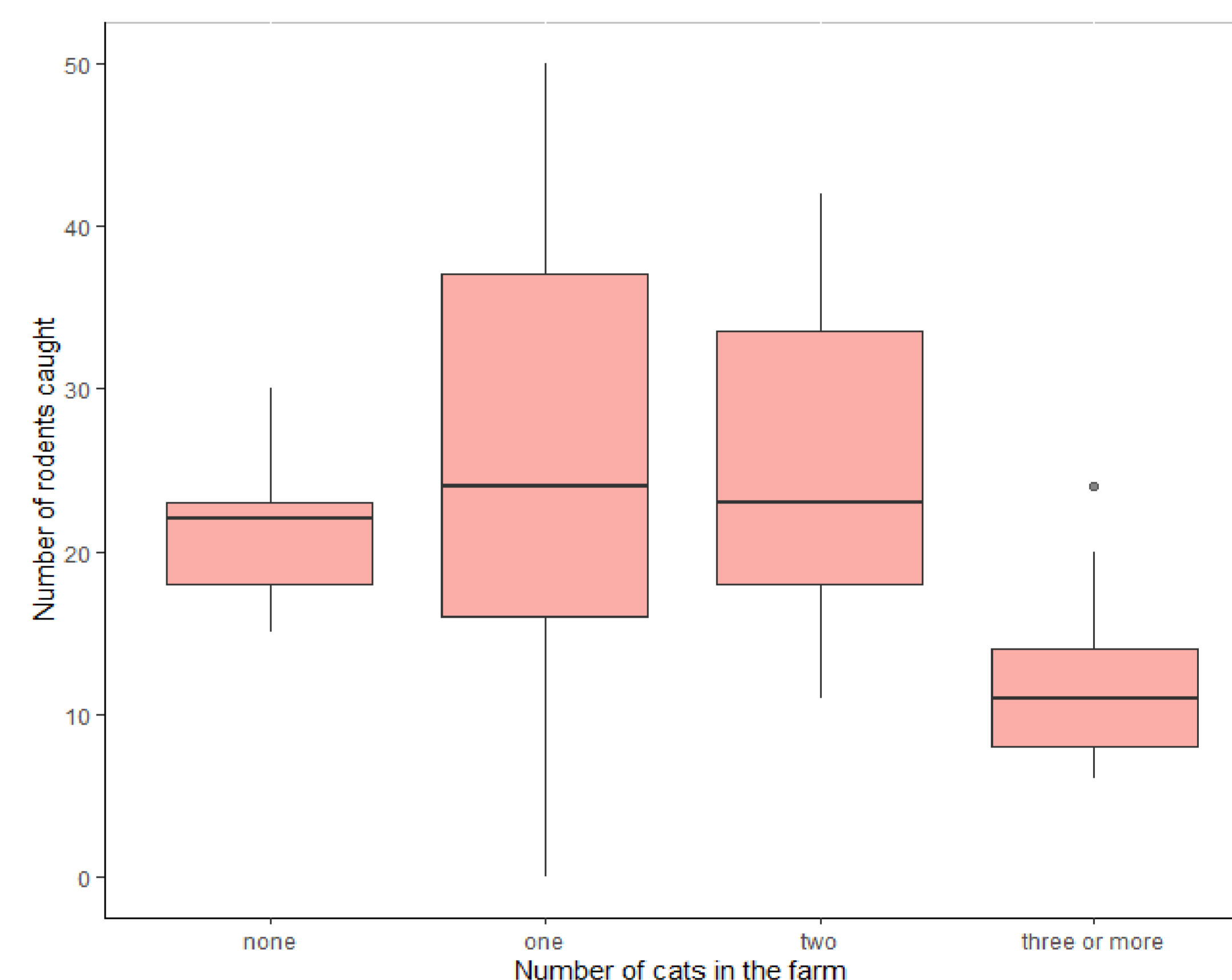


Figure 2. Number of cats tends to associate with rodent catches

Results

Swine farms were bigger than cattle farms, with a median animal number of 950 pigs (mean 1630, SD 1710) and 205 head of cattle (mean 271, SD 184) per farm.

Most of the caught rodents and small mammals were mice (yellow-necked mouse, house mouse, harvest mouse; 65.2%) and voles (bank vole, southern vole, field vole; 23.2%). Only 4.0% of the yield were rats (brown rat) and 7.5% were shrews (common shrew, taiga shrew, pygmy shrew, Eurasian water shrew).

In 2018 mean catches of rodents were higher than in 2017, and also higher on swine farms (mean 24.9, SD 13.2) than on cattle farms (mean 17.6, SD 6.6) (**Figure 1**). The number of rodent catches on each year on farms did not correlate ($p = 0.36$).

The regression model (**Table 1**) showed that farms with farm yard consisting of only cart ways, no gravel or asphalt had higher rodent catches ($p = 0.010$). Cattle farms had a tendency for lower catches ($p = 0.052$) and number of cats on farm tended to be negatively associated with number of rodents caught on farm ($p = 0.053$, **Figure 2**). Also, trying to prevent rodent access to animal premises tended to yield lower catches ($p = 0.069$).

Education level, having (or not having) asphalt on farm yard and observation of rodents by farmer confounded with some other variables, and were thus included in the model. Number of animals was also forced into the model.

For accounting the clearly different sizes of swine and cattle farms, farms were *scaled* so that large swine farms and large cattle farms were comparable, and smaller swine farms and smaller cattle farms similarly.