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The influence of sample size on fitting the true flock prevalence in animal welfare assessment – impressively presented

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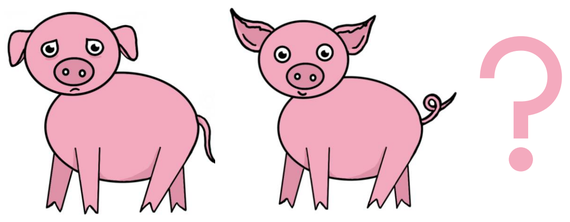
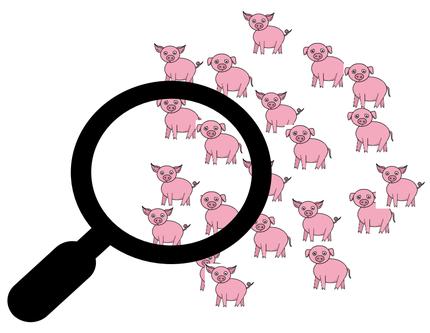
1. Introduction



How is the flock health?



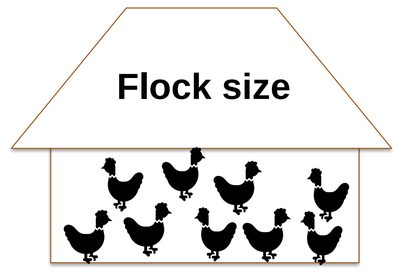
Animal welfare assessment protocols
Score 0 = intact, score 1 = damaged
Recommended sample size (N) = 50-150

?

a) Flock size: 400, true prevalence 30%, N= 50, error margin= ?
b) Flock size: 400, expected prevalence: 1%, accepted error margin= +-1%, calculated N= 16, observed prevalence 10%, CI= ?

2. Materials and Methods

Analyses of



200
250
300
350
.
.
.
10,000

flock sizes between 200 to 10,000 animals

a) True prevalence
b) Expected prevalence

2%
6%
15%
30%
60%
75%

for every simulated flock size

a) Simulated N
b) Calculated N

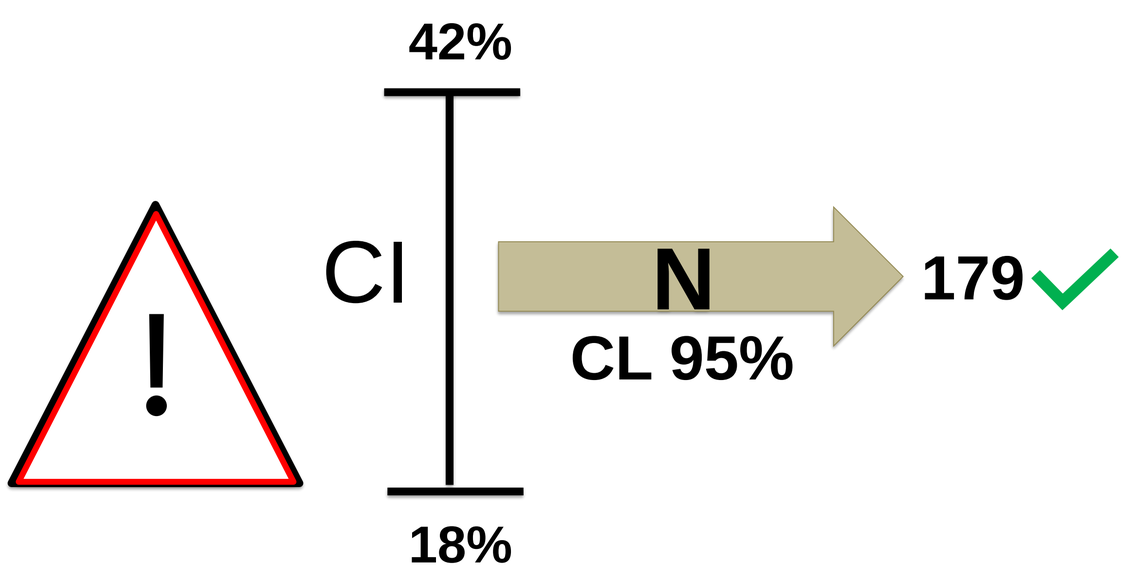
50
100
150
200
.
.
.
500

for every simulated flock size and a) true or b) expected prevalence

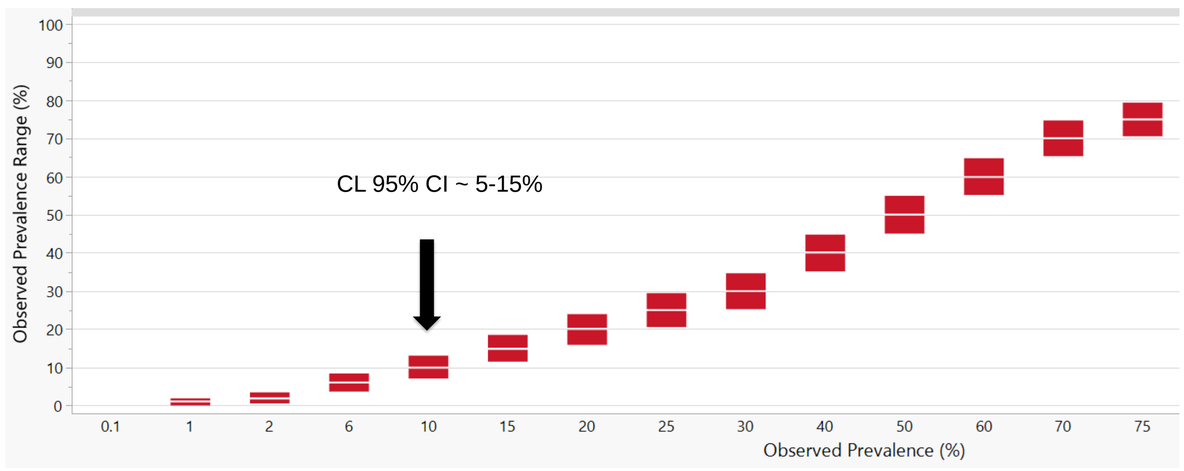
10,000 iterations for every possible combination

3. Results

a) Flock size: 400, true prevalence: 30%, N= 50



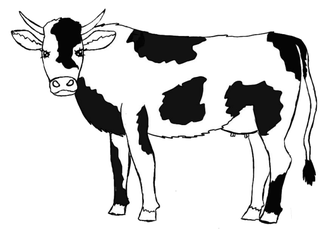
b) Flock size: 400, expected prevalence: 1%, accepted error margin= +- 1%, calculated N= 16, observed prevalence: 10%



4. Discussion and Conclusion

We need to be aware

- even in small flocks N has sometimes to be higher than recommended in several assessment protocols
- about existing margins of error when the observed prevalence differs from the expected one
- a prevalence threshold that is not exceeded ≠ true prevalence.
- observer bias or method errors ⟶ higher margin of error



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