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1 **Clarification related to the commentary titled “The inappropriate use of formulae and references and the possible**
2 **domino effect of spurious results” written by Gautam et al. 2019**

3

4 Dear Editor,

5 Dr. Gautam *et al.* (2019) presented a strong critic *related to* the inappropriate use of formulae and references in
6 scientific papers and the possible effect of spurious results. The authors cited as example our work published in 2017
7 in a different scientific journal entitled “Optisample™: Open web-based application to optimize sampling strategies
8 for active surveillance activities at the herd level illustrated using Porcine Respiratory Reproductive Syndrome
9 (PRRS)” (Alba *et al.* 2017). However, in their commentary, Dr. Gautam *et al.* did not consider the context of freedom
10 of infection for PRRSV where this research was applied or its specific aim. Moreover, they did not demonstrate the
11 specific effect of the use of these formulae on this study.

12 In our work we used the formulae in a context of freedom of infection at farm level for PRRSV, in which the design
13 prevalence to demonstrate freedom of infection within a swine herd is lower than 5 % or 10%. We compared the
14 values of the outcomes of Optisample in 18 plausible scenarios using the function “sep.hypergeo” (Cannon87
15 approximation according to Gautam *et al.*) and the function “sep.hp” (hypergeometric function). Both algorithms
16 produced equivalent outcomes without any significant difference and in all the cases we got the same conclusion in
17 relation to the best strategy of sampling in these scenarios to demonstrate freedom of PRRSV infection (see
18 comparison in Table-ANNEX).

19

20 Table-ANNEX: Comparison between outputs of OPTISAMPLE using the function “sep.hypergeo” (1) and
 21 “sep.hp” (2)

INPUTS									
Notation	Herd A			Herd B			Herd C		
<i>N</i>	3000			3000			3000		
<i>hd</i>	Date 5 years ago			Current date (0 months)			Date 2 months ago		
<i>cd</i>	Current date			Current date			Current date		
<i>n_{ou}</i>	0			Unknown (n.d.)			1		
<i>p_p</i>	Unif (147, 231)			Unif (147, 231)			Unif (147, 231)		
	min: 147, max: 231			min: 147, max: 231			min: 147, max: 231		
<i>f_{ou}</i>	min: 5, max: 6			min 2, max: 3			min:3, max:4		
<i>ICC_{bt}</i>	Unif (.5, .7)			Unif (.5, .7)			Unif (.5, .7)		
<i>f_t</i>	monthly			monthly			monthly		
<i>P *</i>	.05			.05			.05		
<i>se_{test}</i>	Pert(.97, .98, .99)			Pert(.97, .98, .99)			Pert(.97, .98, .99)		
<i>Price_{test}</i>	5			5			10		
SAMPLING									
<i>Scheme</i>	I	II	IIIa	I	II	IIIb	I	II	IIIc
<i>Total_{nt}</i>	360	600	300	360	600	500	360	600	475
1. OUTPUTS using the function “sep.hypergeo” based on Canon1987 aproximation									
<i>AUC_S</i>	.96-.97-.98	.98-.99-.99	.91-.93-.95	.85-.89-.94	.95-.97-.98	.92-.96-.97	.78-.82-.84	.92-.93-.94	.93-.95-.96
<i>AUC_D</i>	.76-.78-.8	.92-.93-.93	.61-.63-.66	.59-.68-.74	.87-.9-.92	.77-.83-.86	.52-.58-.61	.85-.86-.87	.76-.79-.81
2. OUTPUTS using the function “sep.hp” based on hypergeometric distribution									
<i>AUC_S</i>	.96-.97-.98	.99-.99-.99	.91-.94-.96	.86-.91-.95	.96-.98-.98	.93-.97-.98	.82-.85-.87	.94-.95-.95	.94-.95-.97
<i>AUC_D</i>	.76-.78-.8	.92-.93-.94	.62-.64-.66	.62-.7-.75	.88-.91-.92	.79-.84-.87	.59-.62-.66	.86-.88-.89	.77-.8-.83
<i>Cost_{test}</i>	1800	3000	1500	1800	3000	2500	3600	6000	5750

22 The outcomes demonstrated that our study (Alba et al., 2017) was not an adequate example to evidence the
 23 inappropriate use of formulae such as Cannon87 approximation vs. hypergeometric function and the effect of
 24 spurious results. To assess the probability of freedom, it is essential to consider the context that determines the
 25 prevalence of design and other parameters, which were not taken into account by Gautam et al. 2019.
 26 We believe that the commentary of Gautam et al. 2019 can be misleading for those readers who have not read the
 27 original papers. In order to clarify the context, we added a comment in PlosOne.

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