**Validation of a mathematical model of the bovine estrous cycle for cows with different estrous cycle characteristics**

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**Supplementary** **Table S1**

The set of 15 differential equations1 of the mathematical model2.

|  |  |
| --- | --- |
| Eq. nr. | Equation |
| 1. |  |
| 1a. |  |
| 1b. |  |
| 2. |  |
| 3. |  |
| 3a. |  |
| 3b. |  |
| 4. |  |
| 5. |  |
| 5a. |  |
| 5b. |  |
| 6. |  |
| 7. |  |
| 8. |  |
| 9. |  |
| 10. |  |
| 11. |  |
| 12. |  |
| 13. |  |
| 14. |  |
| 15. |  |

1 Notation of Hill functions in the above equations is abbreviated as *H(substrate)*. For full description of the Hill equations see Table S2. E2 = estradiol, P4 = progesterone, GnRH = gonadotropin releasing hormone, Inh = inhibin, OT = oxytocin, OTR = oxytocin receptor, FSH = follicle stimulating hormone, LH = luteinizing hormone, IOF = intra-ovarian factors, CL = corpus luteum size. Foll = follicle size, Ovul Foll = ovulated follicle,  *Syn* = synthesis, *Rel* = release, *Pit* =pituitary, *Hypo* = hypothalamus, *c* = rate constant, *t* = time.

2 Reference: Boer HMT, Apri M, Molenaar J, Stötzel C, Veerkamp RF, and Woelders H 2012. *Candidate mechanisms underlying atypical progresterone profiles as deduced from parameter perturbations in a mathematical model of the bovine estrous cycle. Journal of Dairy Science 95, 3837-3851.*