



REPORT

FOR STAIKI FARM

01.12.2019 — 31.12.2019

Summary

Number of tags on cows:	as of 01.12.2019	291
	as of 01.01.2020	292
Number of inseminations:	following heat alerts	143
	without heat alerts	7
Number of heat alerts received		159
Inseminations following heat alerts to heat alerts received, %		89,9
Inseminations without heat alerts to all inseminations, %		4,7
Average time from heat alert to insemination, <i>h</i>		4,1 ±6,7

Notes

1. *Inseminations following heat alerts to all heat alerts, %* is the ratio of inseminations following heat alerts to all heat alerts received. Low (<80%) value of this ratio may indicate that either many true heats are plain ignored by the staff, or many cows cannot be bred because of their low weight or health issues, or activity threshold is too low so it should be increased in the app to get rid of false heat alerts.
2. *Inseminations without heat alerts to all inseminations, %* is the ratio of inseminations done despite cows' sub-threshold activity, following staff observations or hormone synchronization protocols, to all inseminations. High (>10%) value of this ratio may indicate either many cows bred inappropriately by the staff, or too high activity threshold which should be decreased in Ovi-bovi app by the user for better sensitivity, or extensive use of hormone sync protocols.
3. *Average time from heat alert to insemination* should be 6 to 12 hrs after the onset of heat as a first proxy to optimal insemination timing, with deviation of under ±12 hrs. Greater than ±12 hours deviation calls for revision of inseminator's schedule.

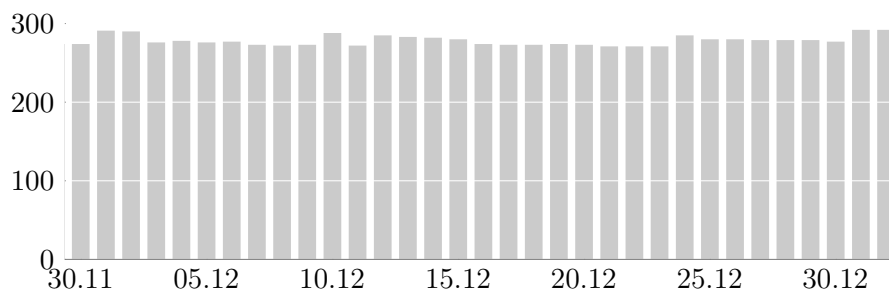


Figure 1. Number of tags on cows, daily, worn for at least 24 hrs (tag self-calibration time) prior to date shown.

Heats and inseminations by days

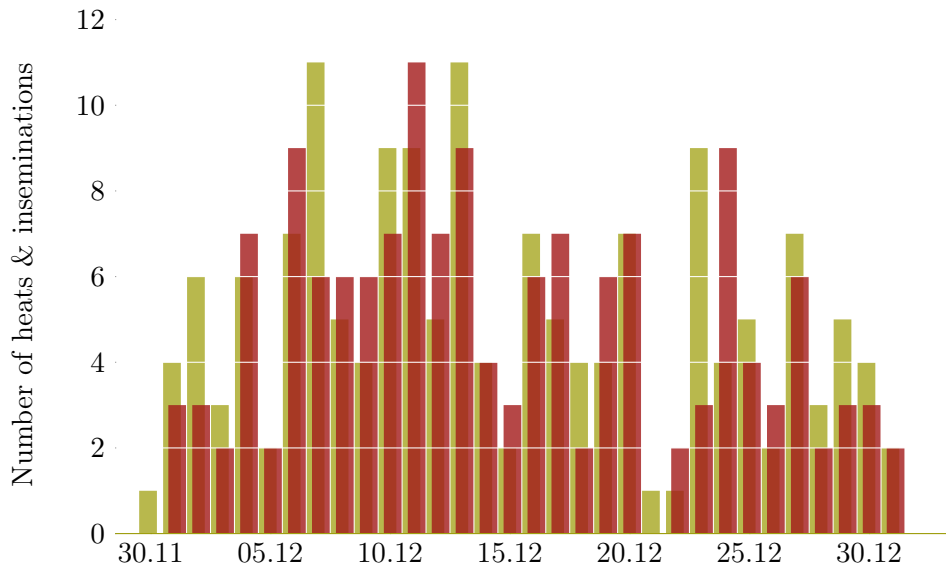


Figure 2. Number of heats detected by the system (■) and inseminations done (■), daily, for cows wearing Ovi-bovi tags for at least 24 hrs (tag self-calibration time) prior to date shown.

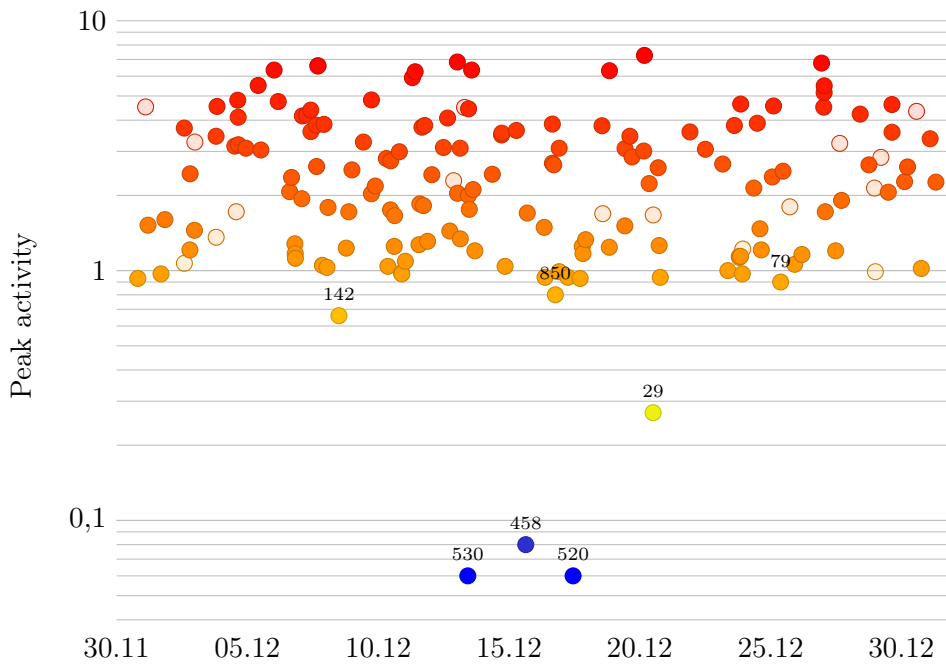


Figure 3. Peak activity of cows in heat. Filled circles designate inseminations; cow IDs show cows (if any) bred despite their sub-threshold activity.

Heats and inseminations by hours of the day

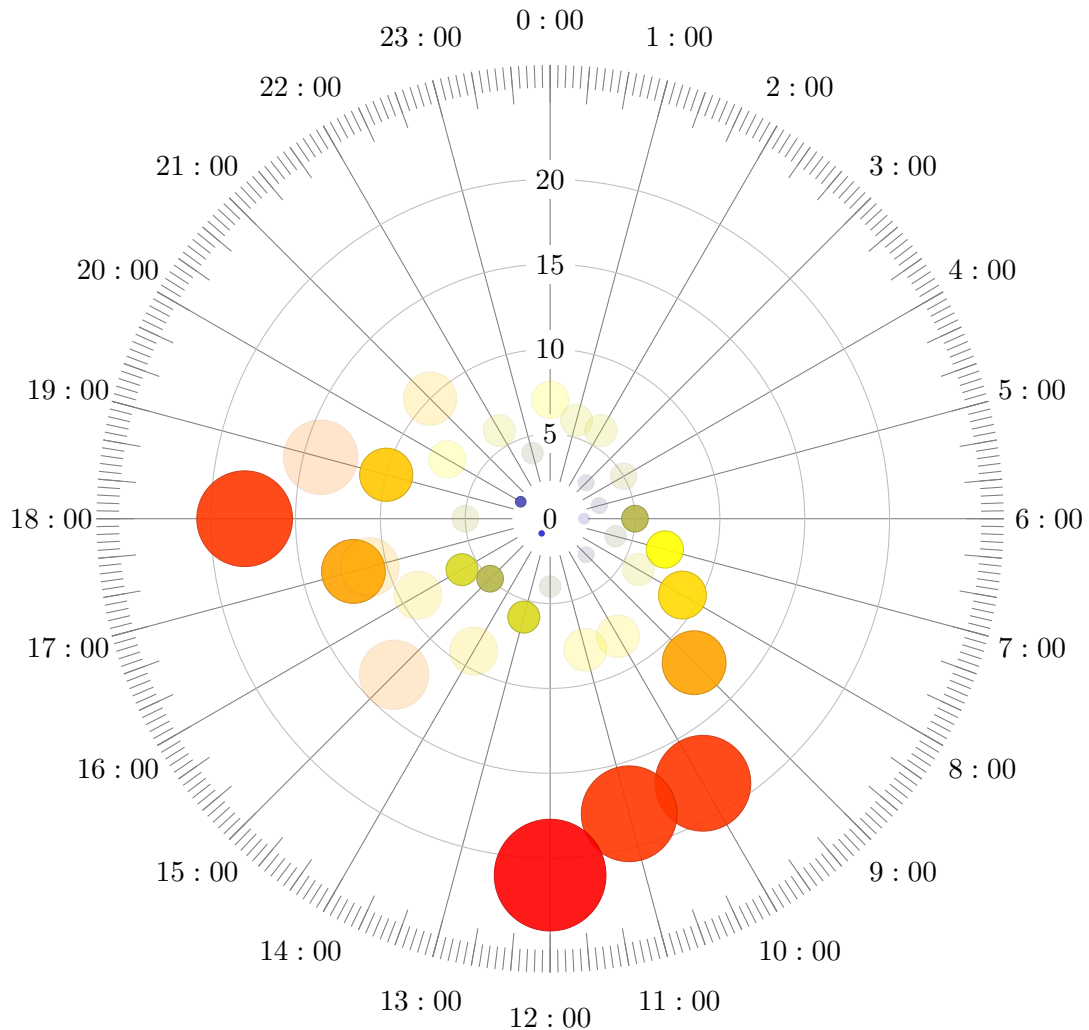


Figure 4. Distribution of heats detected by the system (transparent circles) and inseminations done (filled circles) by hours of the day, averaged.

Correct insemination timing can create a significant improvement in pregnancy rate on the farm. Optimal time from the onset of heat to insemination depends on many factors (breed and age of a cow, semen preparation etc.) and should preferably be calculated based on statistical analysis of insemination success records for the given farm. This can be done after several months of proper usage of Ovi-bovi system, with insemination data carefully filled in by the staff for each cow.

As a first proxy, we recommend to **inseminate cow within 8 to 12 hours after heat alert is received.**

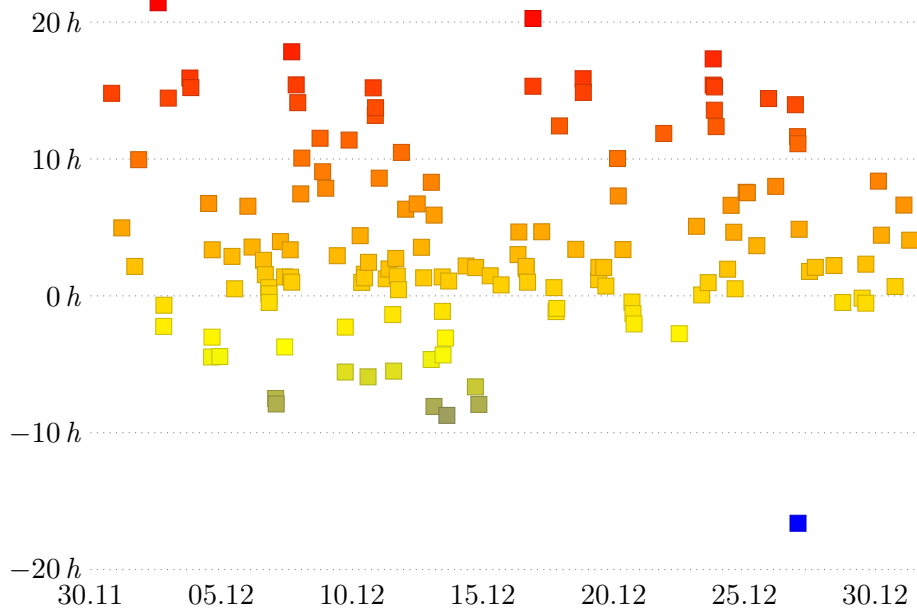


Figure 5. Time from heat detected by the system to insemination done. Negative values (if any) mean insemination done prior to heat alert received.

Discrepancy analysis

Two kinds of discrepancies between Ovi-bovi data and actual inseminations are possible: cow *not* bred despite her *high* activity (i.e., heat detected by the system and heat alert received by the staff); cow *bred* despite her *low* activity (i.e., heat not detected by the system and heat alert not received by the staff).

Discrepancies of the first kind (see Table 1) can occur when (1.1) *insemination is considered not feasible* because of young age or low weight, or endometritis, or other health issues; (1.2) *insemination is missed* by inseminator who e.g. failed to arrive in time; (1.3) *heat was considered false* in the course of cow inspection by inseminator or veterinarian.

Discrepancies of the second kind (see Table 2) can occur because of inadequately high sensitivity threshold set in Ovi-bovi app, or app usage errors such as: tag number registered in the app does not correspond to the cow actually wearing that tag; cow is linked to the wrong group in the app; groups are too small (under 15 animals) or too heterogeneous (made up of cows of different breeds, ages and/or stages of their reproductive cycle).

Each case from Tables 1 & 2 can be inspected and appropriate actions performed to improve farm's KPI in the forthcoming months.

Table 1. Cows *not* bred despite their *high* activity.

Cow ID	Heat onset time	Activity	
		individual	group-adjusted
369	2019-12-01 02:35	1,83	4,52
60/69283.1	2019-12-02 14:10	0,83	1,07
263	2019-12-02 23:48	1,26	3,27
571	2019-12-03 19:19	0,98	1,36
182	2019-12-04 13:44	1,17	1,72
608	2019-12-12 21:11	1,29	2,29
785	2019-12-13 07:10	1,46	4,50
559	2019-12-18 13:58	0,93	1,69
655	2019-12-20 12:15	0,92	1,67
761	2019-12-23 22:26	0,91	1,22
680	2019-12-25 17:36	1,10	1,80
891	2019-12-27 15:22	1,37	3,23
182	2019-12-28 23:14	1,11	2,14
878	2019-12-29 00:04	0,80	0,99
253	2019-12-29 05:09	1,18	2,84
381	2019-12-30 13:51	1,64	4,34

Table 2. Cows *bred* despite their *sub-threshold* activity.

Cow ID	Insemination time	Activity	
		individual	group-adjusted
142	2019-12-08 11:55	0,69	0,66
530	2019-12-13 10:10	0,21	0,06
458	2019-12-15 15:20	0,29	0,08
850	2019-12-16 18:30	0,83	0,80
520	2019-12-17 10:45	0,16	0,06
29	2019-12-20 12:10	0,44	0,27
79	2019-12-25 09:10	0,67	0,90