Review of SHMP Charts - Chart 3 - PRRS cumulative incidence by sow herd status at time of infection.

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Key Points:

- Chart 3 represents the proportion of herds for each PRRS status that become infected during the year.
- Status 2 herds appear to have high incidence. Make sure your status 2 herds (no ongoing immunization) are appropriately chosen.
- The increase in incidence in status 1 herds during the 2014/2015 may reflect a regional epidemic of 1-7-4 over powering herd immunity.

Chart 3 shows incidence risk by sow herd status at the time of the break. In order words, it represents the proportion of herds being in each of the different statuses (1, 2fvi, 2vx, 2, 3 and 4) when new infection occurred. This proportion of farms is calculated by dividing the number of new breaks in each status by the farms that were in that status the previous week. This percentage is accumulated during the year.

The denominator of this proportion is a dynamic number as new farms are entering and leaving each category every week. For example, farms are becoming infected each week and entering the status 1 category but also some farms are leaving this category because they are moving to status 2fvi, 2vx and 2. There is a substantial range in the number of farms that are in any of the PRRS status categories over time (table 1). As commented in previous science pages, notice the decrease in number of herds using field virus as a gilt/sow immunization program and corresponding increase in the use of vaccine for the same purpose. As commented in the chart 2 explanation, the current number of herds sharing PRRS status is 446 herds of the total 766 SHMP herds.

Table 1. Average number of herds (and range) that were in each status during the weeks of 4 years of monitoring.

	2012/2013	2013/2014	2014/2015	2015/2016
1	84 (111-55)	61 (92-34)	92 (110-74)	119 (149-80)
2fvi	60 (79-45)	42 (61-27)	21 (28-16)	26 (38-15)
2vx	24 (58-10)	83 (102-60)	101 (111-91)	96 (117-79)
2	25 (30-19)	15 (28-8)	15 (18-11)	13 (22-7)
3	22 (27-15)	32 (37-24)	25 (31-22)	23 (27-20)
4	146 (163-118)	167 (171-163)	176 (183-171)	169 (183-150)
Total	361 (394-326)	400 (424-393)	430 (441-425)	446 (454-452)

If we look at the same chart in the last four years (Figure 1) it can be seen that farms being positive stable (2fvi, 2vx or 2) are at higher risk of breaking. It is likely that veterinarians are using vaccination (2vx) or field virus inoculation (2fvi) in the gilts to stimulate immunity and decrease the clinical loss because they recognize that these herds are at greater risk of being infected. The relatively high incidence in the status 2 herds is disconcerting. These herds do not have any ongoing immunization program and yet, our data suggests are at high risk of infection. They represent only 3% of our herds (13/446), but owners of these 13 herds will likely suffer increased economic loss due to the lack of immunization. The same can be said for farms that are in status 3 from 2012 - 2015. As would be expected, herds that achieve status 4 have consistent low incidence.

Notice the relatively low incidence in the infected sow herds (status 1). As a whole, these herds are probably at the highest risk and yet have the lowest incidence. This probably reflects the protective effect of herd immunity. As immunity wanes, the herd likely becomes more susceptible. This is not evident in this chart but could be explored in analysis of incidence over time within status 1 herds. Somewhat related to this rationale is the increase of breaks in status 1 farms during the period 2014 - 2015. Many of these became infected with 1-7-4 which may have been able to overpower the existing herd immunity.

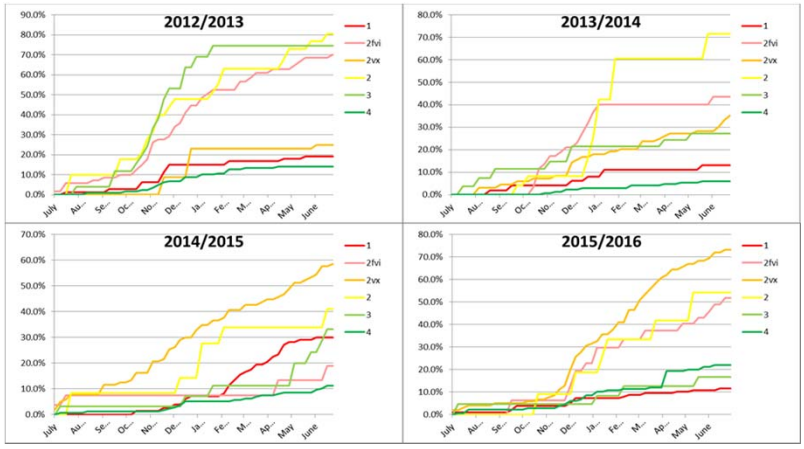

Figure 1. Incidence by break herd status at the time of the break in the last 4 seasons.

Dr. Carles Vilalta is a DVM, PhD from Spain who started as a post-doctoral researcher with our SHMP project in April. Carles has been reviewing our calculations and charting process for our SHMP data and this poses a great opportunity to summarize them again for you. Bob Morrison (BobM@UMN.Edu)