PRRS RFLP 1-7-4: Time to Stability and Associated Risk Factors

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Key Points:

- A lower proportion of sow herds achieved stability than in the study performed by Linhares et al 2014. However, of those that did achieve stability, TTS was similar to that reported by Linhares et al.
- Herds with natural ongoing 1-7-4 exposure to gilts in the GDU reached stability earlier than other exposure methods.
- Few herds performed "true" herd closures. 95% of herds that achieved stability opened their herds early, with no correlation between TTS and weeks from 1-7-4 detection to gilt introduction.

Introduction

In a study of 61 sow herds infected with PRRSv, Linhares et al. (2014) reported that 76% reached stability and had a median TTS of 38.6 weeks when assessed at the 4th consecutive negative test. Herds infected with any PRRS virus RFLP were included in this study. PRRSv RFLP 1-7-4 first emerged in the United States in 2014. In addition to reports of severe clinical signs in breeding sites, there was speculation that time to stability (TTS) was significantly longer than past virulent strains. Therefore, the objective of this study was to determine if TTS was longer in herds infected with RFLP 1-7-4.

Methods

In March of 2015, SHMP participants were invited to participate in a study to determine time to stability and associated risk factors in sow herds infected with PRRSv 1-7-4. A total of 8 participants, accounting for 149 sow herds, agreed to participate. Stability was defined as having reached 4 consecutive negative monthly tests of due-to-wean pigs. The herd inclusion criteria were as follows: farrow-to-wean herd enrolled in SHMP, diagnostic confirmation of PRRSv 1-7-4 infection with no evidence of another isolate post detection, testing pigs by PRRSv-rtPCR began no later than 12 weeks post detection with monthly sampling of at least 30 pigs (6 x 5 pools), and complete a breeding survey to capture herd level information. Diagnostic submissions for all herds ended 52 weeks post detection or 3/31/2016 if not already stable.

Risk factors included herd and gilt developing unit (GDU) intervention at PRRSv detection, ongoing intervention thereafter, prior PRRSv exposure, herd size, GDU location, percentage of sows housed individually in gestation, weaning frequency, farrowing house flow, and differences among systems.

Results

Of the original 149 sow herds, 107 fulfilled the inclusion criteria and of these 107, 61 (57%) reached stability with a median TTS of 37.0 weeks (mean 36.6; SD: 7.5). Regarding herd closure, 58 of the 61 herds were not closed to gilt entries until stability was achieved. And time from 1-7-4 detection to gilt introduction was not correlated with TTS (r=+0.18; p=0.17).

Of the risk factors assessed, both system and ongoing gilt exposure post detection were significant ($p<0.05$). Overall, herds in system D reached stability sooner than all other systems with herds in system A not achieving stability in the observational period (<53 wks) (Figure 1). Exposure methods in the GDU included live virus inoculation in conjunction with modified live vaccine (LVI+MLV), only MLV, and natural exposure to 1-7-4 virus prior to entry into the GDU. Herds with natural exposure reached stability sooner than other exposure methods with a median TTS of 37.5 weeks, in comparison to 47.0 and 46.0 for treatment groups LVI+MLV and MLV, respectively.

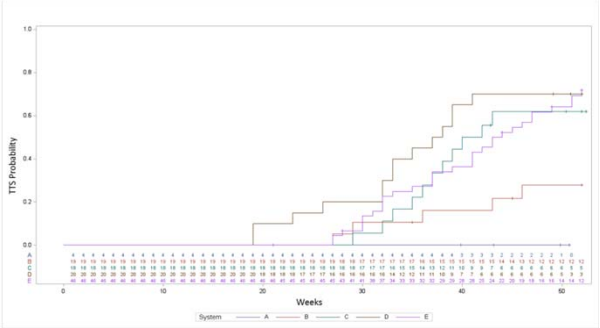

Figure 1. Kaplan Meier survival curves for probability of TTS for herds within each system at any point in time during the study. Each step in a curve signifies at least one herd reaching stability at a given point in time.

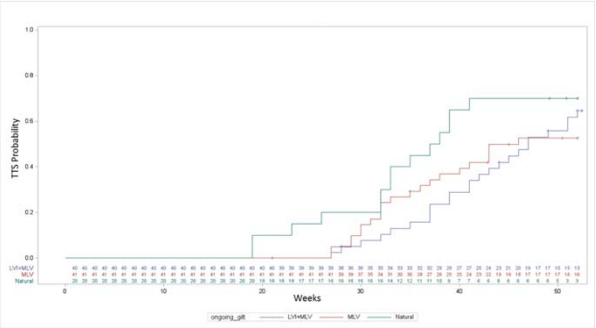

Figure 2. Probability of TTS for herds based on the ongoing exposure method used in the GDU.

Discussion

Although a slightly lower proportion of 1-7-4 herds reached stability than reported by Linhares et al (2014), the median TTS for those that did was very similar to the previous study with a difference of 1.6 weeks. One possibility which could explain this was that veterinarians in the previous study had the stated intent to eliminate PRRSv from their herds. This could equate to a higher level of internal biosecurity in those herds. Also, all herds in Linhares' cohort performed "true" whole herd closure until stability was achieved. These results suggest that "true" herd closure may not be necessary for herds to achieve stability.

Conclusions

Of the 1-7-4 herds evaluated in the study, fewer herds achieved stability than in an earlier study, but those that did had very similar TTS with a difference of 1.6 weeks. The lower proportion of 1-7-4 herds achieving stability may be associated with biosecurity practices that were not detected in the risk factor survey. The high proportion of herds that achieved stability without performing herd closure indicates that although closure may be an affective practice upon detecting PRRS in a sow herd, it is not necessary for certain herds to achieve stability.