

Considerations when estimating number and age structure of gilt pool for a *Mycoplasma hyopneumoniae* eradication program

Contributors (listed in alphabetical order): Eduardo Fano, Jer Geiger, Sam Holst, Emily, McDowell, Maria Pieters, Amanda Sponheim

- Breeding herd size
- Length of closure
 - It is common to target 9 or 10 months
- Replacement rate
 - For example, if estimating a 270-day closure, $270 \text{ days} / 365 \text{ days} = 74\%$ of a year. Assuming a 50% annual replacement rate, $74\% \text{ of a year} \times 50\% \text{ annual replacement rate} = 37\%$ of total sow population = number of gilts needed to maintain 50% replacement rate during a 270-day herd closure.
 - Note: Some gilts may already exist in the pipeline for the farm (ie: isolation, gilt development unit (GDU), or a portion of the resident breeding herd population)
 - Consider limiting sow herd culling during closure where able to help maintain breed targets
 - It is important to consider the duration of closure may extend beyond 240 days, and a contingency plan should be agreed upon prior to securing gilts
 - An off-site breeding project is a commonly used contingency plan in the event the herd closure extends beyond 240 days
 - Breeding should be timed so that the first group of *M. hyopneumoniae* naïve gilts are due to farrow shortly after the herd closure period is completed. This allows for production targets to be maintained as consistently as possible after the elimination project is completed.
 - The youngest gilts have not yet been born at Day 0 that would be needed to fill that gap in the last month(s) of herd closure
- Available housing
 - Consider increased space requirements for gilts vs. market pigs:
 - Nursery phase (wean – 70 days of age): $\geq 3.5 \text{ ft}^2/\text{gilt}$
 - Grower phase (70 days of age – boar exposure): $\geq 7.5 \text{ ft}^2/\text{gilt}$
 - GDU (boar exposure – breeding): $\geq 12 \text{ ft}^2/\text{gilt}$
 - The GDU site ideally would be equipped to run medications through the water after Day 0 is confirmed
 - Also consider feed management when housing different ages of gilts together that require different formulations
- Gilt age distribution to allow for replacements throughout the herd closure
 - An example age distribution may be: one lot at three weeks of age, one lot at eight weeks of age, one lot at 13 weeks of age, one lot at 18 weeks of age, and one lot at 23 weeks of age
- Minimum desired age at *M. hyopneumoniae* exposure
 - Consider exposure influence on mortality and morbidity
 - Consider exposing gilts $\geq 5\text{-}6$ weeks of age to minimize disease impact

- Morbidity, mortality, and selection rates
 - Under normal non-closure circumstances, selection rates for gilts 220-250 pounds might be 70-80%
 - Morbidity/mortality may be higher in the younger groups of gilts
 - For example, some request 2x the normal order for the group to be exposed at six weeks of age, 1.5x order for the 11 week of age group, and normal selection expectations for the remaining older lots of gilts
 - Need may also increase if exposing to more than one pathogen
 - For example, higher mortality levels in the youngest lot of gilts exposed to *M. hyopneumoniae* and PRRSv (some estimate $\geq 30\%$) may be anticipated versus exposure to *M. hyopneumoniae* alone
 - May be influenced by the length of time between *M. hyopneumoniae* exposure and Day 0 confirmation
 - When using aerosol exposure, may plan to test for Day 0 confirmation as early as 14 days post-exposure (vs. 30)
 - Once Day 0 is confirmed, medications are often administered in the youngest two groups of gilts
- Provide at least 3 weeks post-exposure before breeding
- Boar exposure typically begins between 24 and 26 weeks of age
 - Generally, provide 1 adult boar per 100 gilts
 - Make sure teaser boars available that are over 12 months of age with high libido
- Gilts are typically eligible for breeding at:
 - Minimum of 300 pounds (up to 350 pounds at first service) with one heat no service (HNS) recorded, 29 - 32 weeks of age, if meet weight and HNS
 - Target 90% of gilts in this range
- Summary:
 - Place as many gilts as the GDU facilities will accommodate with adequate space for each age group
 - If possible, secure additional short-term GDU space to ensure an adequate supply to the end of the closure
 - Understand herd closure may need to extend beyond 240 days

Resource:

PIC Gilt and Sow Management Manual. Aug. 23, 2022. Accessible at: <https://www.pic.com/resources/gilt-sow-management-guidelines-english/>