

Mating of Göttingen Minipigs at Scantox for use in embryofoetal development studies

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Introduction

For embryofoetal development studies, synchronization and mating take place at Scantox all weekdays including weekends. The overall study period can therefore be shortened considerably, allowing for the entire study to be performed simultaneously, thus allowing for an earlier reporting deadline to the benefit of the client.

Biology of the minipig^(A)

- Sexual maturity of females at 9-11 kg (4-5 months of age)
- The first estrous cycles are not used for mating in reproductive toxicology studies
- Length of estrous cycle: 21-22 days
- Length of estrous: 3 days
- Average litter size: 5-6 piglets

Estrous synchronization

To shorten the study period, all female animals are synchronised upon arrival in a staggered approach in groups of 5-6 animals per day. This number of animals per day facilitates the mating procedure and also at the very end of the study, the termination procedures.

To synchronise the estrous cycle, the minipigs are treated with Altrenogest (progesteron) daily in the diet for 18 days. After this, signs of estrous will appear after approximately a week and mating can begin.

Mating

- Includes normally gilts of 7-8 month of age and boars of proven fertility
- Mating is performed twice daily over a period of 1-3 days for each female (or until the female shows no signs of heat)
- A maximum of three successful matings are allowed per female
- The male animal will visit the female, not the other way around, to allow for familiar surroundings for the female during mating
- Each female will be mated with one specific male for all matings, if at all possible.
- The first successful mating determines the GDO (Gestational Day 0)

Prior to mating, a check of brother/sister relationships will be performed to prevent mating between siblings from taking place. After end of mating, females will be distributed into study groups, based on:

- An equal distribution of siblings
- Females mated on the same day
- Females mated with the same male.

Results

- Pregnancy rate at Scantox is above 95%
- Number of live fetuses per litter: 2-8 fetuses (n = 5.3, SD = 1.7)
- Dead fetuses per litter: 1.2%
- Rate of early and late resorptions: ~ 0.4 resorptions / litter

Conclusion

The mating procedure used at Scantox ensures a high pregnancy rate of above 95%, with an average litter size of 5.3 and a low percentage of dead fetuses together with low rates of resorptions. This allows for fewer animals to be included in the study to fulfil the guideline requirement of 16 pregnant animals per dose group (B).

Mating at Scantox will result in attractive timelines for performing embryofoetal development studies, as mating can be performed on all days of the week and the high capacity for minipigs at the Scantox facilities allows for the entire study to be performed at the same time, decreasing biases.

Besides optimized mating procedures, Scantox offers a highly qualified, agile and lean data collection, evaluation and reporting team, and can therefore provide a 100% QC'ed first draft report less than 40 weeks from arrival of animals on site, having the 21 weeks of in vivo work for a full-term (GD110 termination) study, and the extensive and time-consuming procedures of staining and examination of skeletons and heads in mind.

References

(A) Peter B et al, Sexual maturation in the female Göttingen minipig. Toxicologic Pathology Vol 44(3) 482-485, 2016 and Jorgensen KD, Minipig in reproduction toxicology. Scand J Lab Anim Sci 25: 63-75, 1998 (B) S5 (R3 guideline)



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