

5A-105: Extent and time of early embryo loss and effects of nutrition on embryo quality

Embryo survival at day 9, 21 and 35 of pregnancy in intact and unilaterally oviduct ligated multiparous sows

Project Leader - Pieter Langendijk (SARDI Livestock)

Background

Embryo mortality in pigs ranges from 10 to 50%, and losses are high predominantly in multiparous sows. Because embryo losses are related to the available uterine space, it is often assumed that embryo survival at the end of the embryonic phase (d35-40 of gestation) is limited by uterine capacity. Most studies, however, have assessed the extent of embryo mortality at this stage and hence it is not clear at what time during early gestation the losses actually occur and to what extent the losses at various stages of the embryonic phase are space related. This study was undertaken to assess when embryo mortality occurs and how available uterine space affects it.

Methodology

Multiparous sows were mated and sacrificed at day 9, day 21, or day 35 of gestation to measure the number of ovulations, embryo survival, and a number of placental and uterine characteristics. In a subsample of sows one oviduct was ligated to reduce the number of embryos entering the uterus by 50% on average, and hence double the available space for the embryos. These sows were sacrificed at day 21 or day 35.

Key Findings/Conclusions

In conclusion, in multiparous sows about 40% of embryos are lost during the first month of gestation. Two thirds of this loss is between day 9 and day 21, so before and around implantation of the embryos. Embryo loss during this critical stage was not due to crowding and is likely to be due to intrinsic embryo quality, interaction between embryos and/or the uterine environment, or a combination of these factors. There was less loss of embryos between day 21 and 35 where uterine space appears to become limiting.

Ovulation rate still limits embryo survival in multiparous sows and efforts should be continued to increase ovulation rate in sows, particularly through management of younger sows and improving genetic efforts in this area.

Ways to increase ovulation rate through management:

- Replacement gilts should be mated at second or third heat.
- Flush feed breeding gilts (2.5 kg per day or more) prior to mating. To be effective flush feeding should start at least two weeks before expected mating.
- In first litter sows, body weight loss during lactation needs to be minimised by:
 1. Maximise feed intake during lactation, which requires a good climate control in the farrowing shed, and avoid over-conditioned gilts during late gestation (don't feed more than 2.5 kg/day)
 2. Limit suckling litter size to 10-11 piglets.
- In first litter sows, first post weaning mating can be delayed by one week of Regumate treatment. Preferably use a double dose (2*20 mg per day) or twice single dose; or alternatively skip-a-heat. Both strategies allow metabolic recovery of the sows and potentially increase ovulation rate and embryo survival.

Potential Users of Information

The findings of this study are not immediately applicable at a commercial level, but provide strong direction for further research that aims to increase litter size. These indications can be used in future tenders for APL and Pork CRC.