Improved venous catheter sampling in LYD pigs

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Background:
In order to sample blood, LYD pigs are instrumented with permanent venous ear catheters. A catheter length of 42 cm has been used for years regardless of the size of the pig. In some types of studies, where rapid infusions have been performed in a parallel vein or where ultra-rapid insulins have been administered subcutaneous; there have been signs of cross talk. Autopsy has shown how the 42 cm catheter enters the Vena Cava and not is isolated in one Vena Jugularis.

Description of the initiative:
We tested shorter lengths of catheters spanning from 32 to 26 cm in length. One challenge is that as the catheters decrease in length the veins are sampling from a smaller vein which can make blood sampling difficult. On the other hand the catheter should be short enough to avoid blood from the opposite Vena Jugularis. 27 cm catheters are now used for sampling.

Results:
The shorter catheters have shown to remove cross talk from infusions where two opposite jugular catheters are used. In studies where subcutaneous administered ultra-rapid acting insulins are studied we see a decrease in variance for the most common primary endpoints. Depending on the type of study this has decreased the number of animals needed when conducting power calculations and we are likely to save around 20%-40% animals in some studies.

Conclusion:
We have shown how optimising the sampling procedure can obtain better data and thereby reduce the number of animals used.

Impact of the initiative:
This method has now become standard for all relevant LYD pig studies within our function of insulin pharmacology including approximately 300 animals per year. Potentially we expect this could reduce the number of animals used by 30-60.

Perspectives:
Other animal models could be reviewed regarding administration/sampling cross talk.