Validation of saliva sampling techniques in swine in order to assess stress responses

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Salivary cortisol (a stress hormone) is an outcome measure that can be used along with health, behaviour, and productivity as an indication of what pigs are experiencing when exposed to various production methods. Saliva sampling has the potential to be a relatively non-invasive method of determining cortisol concentration, where pigs chew on cotton attached to a rod to collect the sample. However, techniques have not yet been validated or standardized for use in grower-finisher pigs. The purpose of this study was to determine the effect that different sampling regimens have on salivary cortisol concentration. The first regimen involved sampling individually housed pigs as many times as possible over 30 min. The second regimen involved sampling individually housed pigs every 30 min for three hours. The third regimen involved sampling pigs housed in groups of five. During group sampling, only one focal pig was sampled every 30 min for three hours. The other pigs were all sampled at the beginning and either at 30, 60, 120, 150 or 180 min (interval-sampled). Sampling difficulty was also recorded. For the pigs that were sampled intensively for 30 min, sampling difficulty did not have an effect on cortisol concentration ($P>0.05$). However, cortisol concentration increased over time ($P<0.05$). This could indicate that this sampling method is stressful for pigs. For individually housed pigs that were sampled every 30 min, cortisol concentration increased when sampling was difficult ($P<0.05$). However, over time, cortisol concentration decreased ($P<0.05$). This could indicate that the sampling method was not stressful for the pigs. For group-housed pigs, cortisol concentration also increased when sampling was difficult ($P<0.05$), but did not change over time. The cortisol concentration did not differ between the focal and interval-sampled pigs in the group setting.

Implications: Group/Interval sampling appears to be the least stressful regimen for collecting saliva samples. With this knowledge, there will be increased confidence that salivary cortisol concentrations indicate a stress response to the situation being tested (for example, the effect of crowding) and not a response to the sampling procedure.