Background and goal of study
Near-infrared spectroscopy (NIRS) is used to monitor regional tissue oxygenation (rSO$_2$) during general anaesthesia (1, 2). The measurement might have sources of error still insufficiently examined in the clinical setting.

The goal of this cross-over study was to investigate the effect of differently coloured coverings on rSO$_2$ in piglets.

Materials and methods
Twenty-five healthy piglets aged 4-6 weeks were anaesthetized, intubated, mechanically ventilated and fully monitored using spirometry, ecg, pulse oximetry, invasive blood pressure and rectal temperature. Neuro-monitoring comprised of oxygen partial pressure (PtO$_2$) measurement and laser doppler blood flow (CBF) in brain tissue. The rSO$_2$ was measured by placing NIRS sensors in the supra glabellar region.

In 12 animals sensors were covered with a uni-coloured pink (P) napkin and a turquoise (T) napkin in a random order (Setting A). In further 13 animals sensors were covered with blue-coloured surgical drape (SD) and a napkin with a reddish SantaClaus (SC) motive (Setting B). Uncovered (UC) baseline values were captured and measurements obtained for a period of three minutes. During measurements, the animals were kept in normoterm, normotensive, normoglycaemic and normoxic condition. Inspired oxygen fraction and ventilatory settings were kept constant. One-way ANOVA was used to compare the 3 coverage’s during each part of the study (p<0.05).

Results
Part 1: rSO$_2$-T differed significantly from rSO$_2$-UC and rSO$_2$-P (Mean ± SD rSO$_2$-UC: 49.7 ± 7.5; rSO$_2$-P: 49.8 ± 8.1; rSO$_2$-T: 45 ± 8.0 %) (p<0.05).
Part 2: rSO$_2$-SD differed significantly from rSO$_2$-UC and rSO$_2$-SC (rSO$_2$-UC: 57.4 ± 6.8; rSO$_2$-SC: 57.5 ± 6.4; rSO$_2$-SD: 52 ± 5.9 %) (p<0.05).

CBF and PtO$_2$ remained unchanged during measurements in part 1 and 2.

Conclusion
NIRS readings can be influenced by covering of the sensors. The colour of the cover seems to be of importance. This variability is likely to reflect a source of error rather than an actual change in rSO$_2$ and should be considered, when interpreting rSO$_2$ in a clinical setting. We suggest application of a black sensor cover to avoid the influence of light.

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