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C-reactive protein quantification in porcine saliva: A minimally invasive test for pig health monitoring.

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C-reactive protein (CRP) is an acute phase serum protein widely used as a measure of inflammation, both in humans and in animals. It is also known to be present in saliva, although usually at levels that are too low to be measured by most commercial enzyme-linked immunoassay kits. A previous study has used a highly sensitive time-resolved immunofluorometry assay (TR-IFMA) to measure CRP in dog saliva. This study investigates the suitability of this assay for use with pig saliva, and whether the assay can distinguish between healthy and diseased animals under experimental and field conditions.

Inflammation was experimentally induced in two pigs by giving injections of turpentine oil, and CRP concentrations were measured in saliva and serum samples collected at 0, 24, 48, and 72 hours after injection. Salivary CRP levels related to naturally occurring inflammation were also compared in two groups of commercially reared pigs (average age 190 days), one a healthy control group, and a second group that exhibited a number of disease conditions. All CRP determinations were carried out with the TR-IFMA assay.

The results showed that the pigs with experimentally induced inflammation had significantly increased serum and salivary CRP levels. Naturally occurring inflammation also produced significantly higher salivary CRP levels, based on the comparison of the healthy and diseased groups of commercially reared animals. Mean intra- and inter-assay coefficients of variation (5.75% and 9.73%, respectively) were calculated from two pooled saliva samples, one from the control group of healthy pigs, and the other from the diseased group. The assay also showed acceptable linearity of dilution (correlation coefficients of 0.991 and 0.990 for the two pooled samples). The lower limit of detection was very low, making possible the measurement of the very low levels of CRP found in the pig saliva. Significantly, a positive correlation ($r=0.726$, $P<.001$) was found between CRP levels in the serum and saliva of the healthy and diseased pigs. This suggests that salivary CRP may be an acceptable alternative to the measurement of CRP in serum for the assessment of health of pigs.

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