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Identification of biological variables associated with robustness of piglets at weaning

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The robustness of a piglet at weaning can be seen as its ability to express optimal growth without any health problems and regardless of weaning conditions. The identification of the level of the robustness of piglets at weaning could allow implementing targeted cares and treatments. The aim of this study was to identify some biological markers measured around weaning that could be associated with the growth of the piglet after weaning. Blood variables (n=62) describing immunity, stress, oxidative status and metabolism were measured at 26 and 33 days of age on piglets (n=288) from 16 commercial farms selected with contrasting sanitary statuses (deteriorated: SS- or good: SS+). The sanitary status of the farm was significantly associated with 37 of 67 variables measured (P<0.05). Thus, piglets reared on SS- farms showed higher activation of the immune system, mobilization of body reserves and oxidative stress after weaning than SS+ piglets. In order to evaluate differences in robustness within farms, the relative ADG from 26 to 47 days of age was calculated (RADG = ADG from 26-47 days of age divided by live weight at 26 days), and piglets were then classified according to the median of their farm in classes of low or high RADG (RADG- or +). This classification was considered as a proxy of robustness. After weaning, RADG+ piglets showed greater immune activation (neutrophil count), lower mobilization of body reserves (non esterified fatty acids and creatinine) and a higher concentration in vitamin A, an antioxidant vitamin, compared to RADG- piglets.