

## **Risk factors for the different causes of piglet neonatal mortality in French farms**

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**Introduction:** Neonatal mortality is one of the main issues of concern for the pig industry worldwide, resulting in decreased sow performance and significant economic loss. Although the issue of neonatal mortality has been explored previously, the variability in methodology makes it difficult to reach general conclusions. The relative proportions of each cause of death need to be identified. In this study we used a necropsy-based classification of the different causes of piglet mortality. We identified piglet mortality patterns and determined different farm profiles. Finally, we assessed the impact of different risk factors on specific causes of piglet mortality, in order to illustrate the absence of homogeneity in the issue of neonatal mortality.

**Materials and Methods:** A database of dead piglets, originating from 146 French pig farms between 2004 and 2014, was classified into 16 different categories of death according to an established protocol. The analysis was conducted first at farm level, to assess the correlations between the different causes of piglet mortality. A principal component analysis and a hierarchical clustering were used to identify neonatal mortality patterns. Subsequently, the analysis was conducted at piglet level on 7761 piglets. Risk factors were identified for the 6 main causes of piglet mortality and for all the other causes, grouped under the label “other causes”.

**Results:** Six main causes of mortality represented 84.5% of all the neonatal deaths. The percentage of deaths due to starvation and crushing were the only causes correlated with more than one cause of piglet death ( $R > 0.30$ ,  $p < 0.05$ ). Three patterns of neonatal mortality were identified, suggesting the existence of 3 recognizable farm profiles. Deaths during farrowing were significantly fewer during the night than during the day. The reverse was the case for deaths due to starvation, which were significantly lower during the day. A seasonal effect was suggested for the non-viable and the mummified piglets. The number of deaths per litter was significantly lower for these two causes. For the six main causes of neonatal mortality, the piglets which died from a specific cause tended to have more littermates which died from the same mortality cause. Parity, litter size and year also had significant effects on certain causes of death, such as crushing or the “other causes”.

**Conclusion:** Different patterns of neonatal mortality exist in French farms and relate to different risk factors. Further risk factors need to be identified in order to determine the optimal interventions (e.g. genetic vs management) for each farm profile.

This work was conducted under the EU-funded PROHEALTH project.