

Study of the Mortality Rate in Pre-fattening Pigs

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ABSTRACT— *The focus of this experimental work was the long-term analysis of the mortality of pigs in the pre-fattening category, as well as the determination of the most important etiological and predisposing factors of death. We carried out this research on farm in the east of Slovakia, in the Spiš region, over a period of three years. Based on our 36-month monitoring of pig mortality, we found that pre-fattening mortality was on a downward trend with mortality rates of 2.79%, 2.72% and 2.71% in consecutive years. There is also a certain seasonal impact on mortality in pre-fattening, because we found a higher incidence of deaths especially in the cold spring, autumn and winter months. Diseases such as respiratory and diarrheal diseases were among the most important etiological and predisposing factors of mortality in the observed farm.*

Keywords— Pigs, Pre-fattening, Mortality

1. INTRODUCTION

The etiology of post-weaning mortality in pigs can be generalized to non-infectious and infectious factors and causes. Non-infectious factors include anatomical, morphological or functional abnormalities and disorders such as gastric ulcers, acute abdominal events, hernias, rectal prolapses and injuries [1; 2; 3; 4; 5; 6]. Factors related to the animal itself are also important, such as gender, genetics, birth weight, maternal parity [7; 8; 9; 10; 11], factors associated with housing, equipment of pens and size of housing areas [12; 13], nutritional deficiencies, influence of season [14; 15; 16], management factors such as pre-weaning management, age and weight at weaning, pig origin, litter size, transport, hygiene [17; 18; 19] and poisons such as mycotoxins, salt, etc. [20; 21]. Detection of the exact cause of mortality is often extremely difficult and time-consuming, because multiple factors are usually involved and it is quite difficult to distinguish and determine their relative contribution [22].

2. MATERIALS AND METHODS

2.1 Pig mortality analysis

Mortality monitoring took place during a period of 36 months from 2018 to 2020. It was based on regular farm visits, farmer information – cases histories, necropsies of dead animals and farm computer data.

2.2 Characteristics of the farm

The monitored pig farm was located in eastern Slovakia, in the district of Spišská Nová Ves. All categories of pigs were bred there. The category of breeding animals produced piglets intended for fattening. The mother breed was Large White. The Landras breed was used as the paternal breed, and in the C line, also Yorkshire, Pietrain and their crossbreeds. The average number of sows in 2018 was 197.3, in 2019 it was 198.8 and in 2020 it was an average of 191.7. The number of litters in 2018 was 413, in 2019 the number of litters was 369 and in 2020 the number of litters was 373. The average length of pregnancy of sows in 2018 was 114.9 days, in 2019 it was 115.0 days and in 2020 it was 115.0 days. The average number of litters per sow and year was – 2.4 in 2018; in 2019 – 2.3 and in 2020 – 2.20.

Piglets were weaned on average 33 days after birth. Weanlings had an average weight of 6.5 kg at weaning. After weaning, pre-fattening was carried out up to a live weight of 40 kg. Just this category was the subject of our research.

2.3 Statistical processing of results

The significance (P) of differences in the means of corresponding variables were evaluated by One-way analysis of variance and by Tukey's Multiple Comparison Test. We used GraphPad Prism 9 for the statistical processing.

3. RESULTS

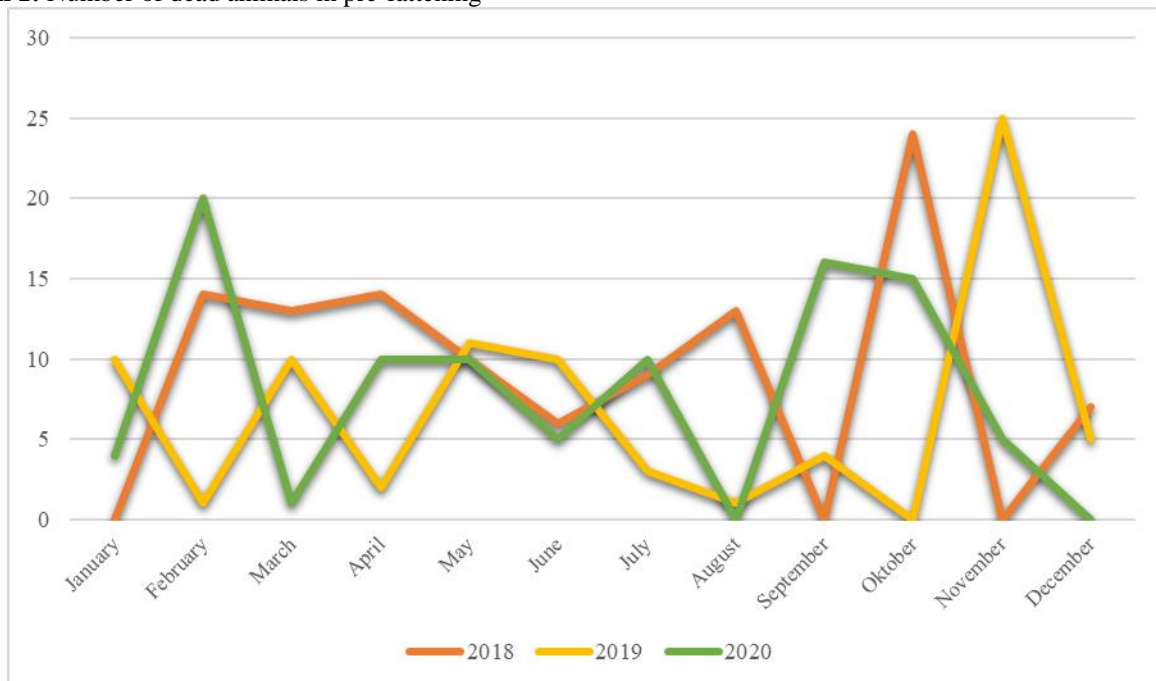
In first year of our study (2018), we recorded an increase of mortality from zero to 4.67% in pre-fattening, which represented the death of 14 pigs out of 300 pigs (see graph 1). Later, the mortality curve had an approximately constant tendency with minor fluctuations in pig mortality values. We reached the peak again with the onset of colder weather in October, when out of 319 pigs raised in that month, 24 pigs died in pre-fattening, which represented 7.52%. By the end of the year, the mortality curve fell to low numbers again. The average number of deaths for 2018 was 2.79 % (see graph 2), which meant the death of 110 pigs out of a total of 3941 kept in 2018.

The first half of 2019 had a fluctuating and alternating tendency, when we observed month after month the alternation of the mortality of 10 pigs per month with the mortality of 1 – 2 pigs per month, which represented a percentage range of 0.38 – 5.21% per population in a given month. Furthermore, we observed a decreasing mortality in breeding. With the onset of the winter months, the curve increased again rapidly, when in November the death of up to 25 pigs was observed out of the total number of 206 pigs reared in that month. For us it was 12.14%. At the end of the year, the curve dropped rapidly again to lower death numbers. The average death for 2019 was 2.72%, which meant the death of 82 pigs out of a total of 3013 for that year.

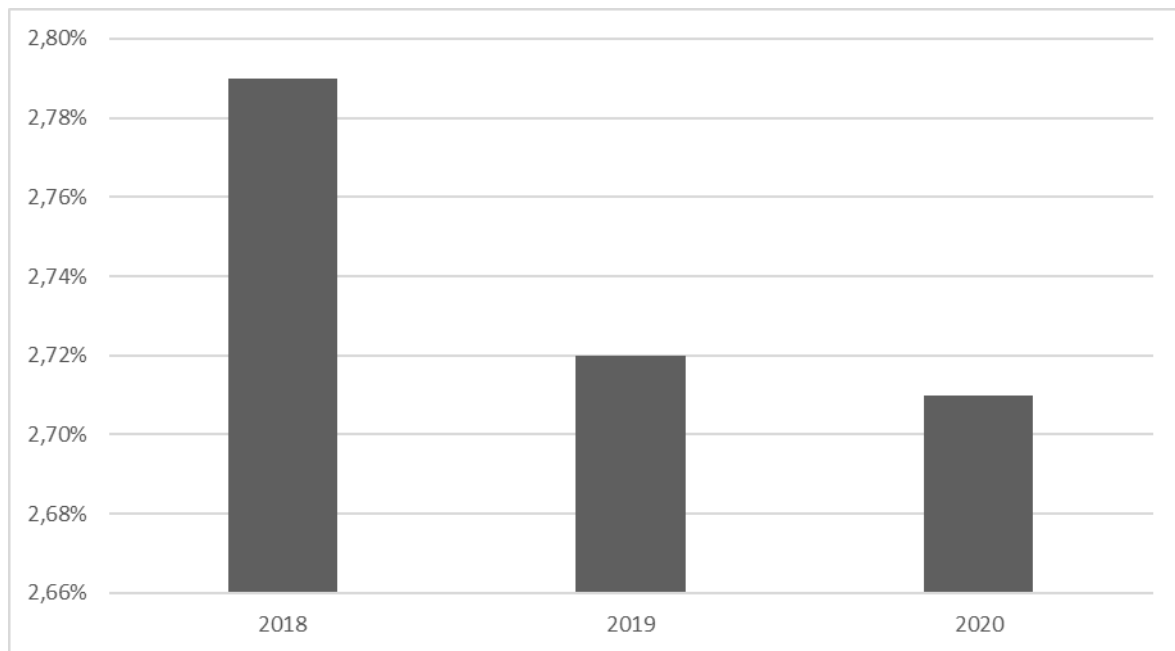
In the last year of monitoring (2020), we recorded a high increase in deaths at the early beginning of the year in February, namely 20 dead pigs and a percentage representation of 7.19%. Mortality began to decrease in the following summer months and had an alternating course. We observed a range of 0-10 deaths per month. The percentage of deaths ranged from 0 to 3.36%. The curve went up again to 7.39%, but at the end of the year the mortality rate improved again and we observed that only 1.89% of the pigs died in that month. The average mortality for the year 2020 was 2.71%, which meant the death of 96 pigs out of a total of 3548 pigs for that year.

Statistical processing showed insignificant differences between the observed mortality values during the analysed years of investigation.

Graph 1: Number of dead animals in pre-fattening



Graph 2: Average percentage mortality in pre-fattening



4. DISCUSSION

The mortality rate that is considered acceptable for growing pigs in commercial farms ranges from 2.5 to 3.3% [23]. In the United States of America, between 2005 and 2010, 3.6% mortality is reported in post-weaning nurseries (pigs from approx. 8 to approx. 30 kg). In the study by Knauer and Hostetler [24], a mortality rate of 7.6% was recorded, but between weaning and the end of fattening. A report from the National Swine Health Monitoring System [25] states that in 2012 died 3.6% of pigs in the grower category, 4.1% of pigs in the rearing/fattening category, and 5.6% of pigs in the weaning period – finished fattening category. The most common cause of death reported by breeders when evaluating all production categories from weaning was respiratory diseases [25]. In our experimental monitoring, viral and bacterial diseases of the digestive system leading to diarrhoea, dehydration and metabolic acidosis were most often involved in the death of piglets shortly after weaning. During the cold months, it was mainly respiratory diseases associated with pneumonia of various extent and type.

Diseases that occur more often in this phase of the pig's life are generally multifactorial, and the severity of their occurrence does not depend only on the virulence of the agents involved, but mainly on the risk factors present in the system [23]. However, there are few studies that generally assess the exact causes of pig mortality [26], as more emphasis is placed on evaluating epidemiological aspects [27; 28] and risk factors [29; 30].

In contrast with clinical, serological, pathological, or even some performance parameters, mortality can be recorded reliably by swine barn managers. Although mortality is often recorded on a weekly basis, the data are usually used to calculate only overall mortality. In addition, weekly mortality data can be linked with other health parameters (eg, coughing index) that are more difficult to measure under practical conditions [31].

5. CONCLUSION

By analysing the examinations, autopsies and obtained data, we can conclude that the percentage of deaths in the researched farm decreased year-on-year. In 2018, an average of 2.79% of pigs died, in 2019 the death curve dropped slightly, or reached the value of 2.72% and in 2020 the value of average deaths reached 2.71%. The most deaths in 2018 were recorded in the month of October, which was 7.52%, in 2019, the most pigs died in November, which represented 12.14%, and in 2020, in February, which was 7.19%. Therefore, we can observe the most deaths mainly in the early spring and autumn months, which may be related to the seasonality of deaths associated with colder weather.

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