

Comparison of Grower Herd Performance before and after a Partial Depopulation.

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Abstract

Partial depopulation ('Swiss method') is accepted as an effective way to eradicate *Mycoplasma hyopneumoniae* from pig herds. This case study compares grower herd productivity before and after a partial depopulation, conducted on a commercial New Zealand pig herd in December 2003. Grower herd data were collected prospectively for batches weaned between April and July 2003 and 2004. A two-sample t-test was used to compare differences in parameters before and after the depopulation. Results showed that after depopulation, carcass weight average daily gain increased by 53 g/d and age at market declined by 13 days. In the period after the depopulation, the pre-weaning growth rate increased by 24 g/d. There was no significant difference in the growth rates from birth to 56 or 78 days of age. The increase in overall growth rate is most likely associated with the improvement in health status that occurred as a result of the depopulation.

Introduction

Mycoplasma hyopneumoniae is the primary agent of enzootic pneumonia, which causes considerable economic losses in affected swine herds (Christensen, Sørensen et al. 1999). The greatest losses occur due to reduced growth rate and feed efficiency especially in late finishing pigs. Partial depopulation ("Swiss method") targets the eradication of enzootic pneumonia and other pathogens by medicating the sow herd and depopulating the growing herd (Zimmermann, Odermatt et al. 1989; Baekbo 1999).

A New Zealand pig farm conducted a partial depopulation in December 2003 to eradicate *Mycoplasma hyopneumoniae*. Enzootic pneumonia was endemic on this farm and had been controlled by vaccination (RespiSure®, by Pfizer). Eradication of enzootic pneumonia was considered a feasible option to improve farm productivity for two reasons. Firstly, neighbouring pig farms were located further than 10 km away from this farm, so that the risk of re-infection was low considering that biosecurity measures were followed. Secondly, the opportunity cost of suboptimal growth rates was regarded high using benchmarks from high health herds. This descriptive case study presents changes in grower herd parameters before and after the partial depopulation.

Materials and Methods

The 400-sow farrow-to-finish farm was located in the North Island of New Zealand. Both, before and after the depopulation, pigs were typically weaned at 30 days of age and entered separate rooms in the weaner shed. Subsequently, pigs were transferred to the grower and finisher shed at 56 and 78 days post-weaning, respectively. During these latter two production phases, pigs were housed in pens. The nutrition did not change considerably in the period before and after depopulation with pigs primarily being feed bread by-products with dietary supplements.

During the partial depopulation in December 2003, all pigs under 10 months of age were removed from the farm and a three-week farrowing stop was implemented to avoid re-infection of the breeding herd. All facilities were thoroughly cleaned and disinfected. During this time the feed for the breeding herd was heavily medicated for 8 weeks with Lincospectin™, Pulmotil™ and Dynamutilin™.

Grower herd records were managed using the software package PigWIN. Grower herd data were collected prospectively in the periods between April and July in 2003 and 2004. Data included carcass weights, back fat measurements, age at slaughter and sample weights at weaning, at transfer to the grower shed and at transfer to the finisher shed. The entire batch was weighed at weaning, and 15% of the pens were weighed at transfer to the grower and finisher shed. All weight measurements were divided by the respective age of the pigs to assess average daily gain. Feed data were not collected. Continuous data were displayed as means and 95% confidence interval. The significance of differences was assessed using a two-sample t-test.

Results

After the depopulation, carcass average daily gain increased by 53 g/d (Table 1). This was accompanied by a reduction in age at market by 13 days, whilst changes in carcass weight were non-significant. Back fat depths of carcasses increased by 1 mm after the depopulation. Average daily gain up to weaning increased by 24 g/d after the depopulation, whereas average daily gain up to 56 and 78 days of age did not reveal a significant difference between observation periods. Number of piglets weaned decreased from 153.6 before the depopulation to 127.9 after the depopulation.

Table 1. Grower herd performance before (12 batches weaned from 3 April to 26 June 2003) and after (14 batches weaned from 22 April to 22 July 2004) a partial depopulation conducted on a New Zealand pig farm in December 2003.

Variable	Before depopulation		After depopulation		P-value
	Mean	95% CI ^a	Mean	95% CI ^a	
Number of piglets weaned	153.6	143.2 - 164.0	127.9	114.9 - 140.8	0.003
Live weight ADG from birth to weaning (g/d) ^b	272	264 - 280	296	286 - 307	<0.001
Live weight ADG from birth to 56 days of age (g/d) ^b	342	298 - 387	339	319 - 359	0.85
Live weight ADG from birth to 78 days of age (g/d) ^b	467	422 - 511	437	403 - 470	0.26
Age at market (d)	153.9	151.3 - 156.5	141.4	139.0 - 143.8	<0.001
Carcass backfat (mm)	8.8	8.5 - 9.1	9.8	9.5 - 10.2	<0.001
Carcass weight ADG from birth to market (g/d) ^b	416	407 - 425	469	459 - 479	<0.001

^a The 95% confidence interval of the mean.

^b ADG: Average daily gain.

Discussion

The data in the analysis were chosen to cover the same periods of the year to minimize the confounding effect of season. However, our findings should not be interpreted as causality but associations as data were routinely collected on-farm without controlling the environment and secondly multivariate techniques were not applied.

The main aim of the depopulation was to improve grower herd performance via the eradication of *Mycoplasma hyopneumoniae*. Although freedom of disease was not confirmed, slaughter surveillance by the supervising veterinarian indicated that disease eradication was successful (data not presented). Our results showed a substantial improvement in carcass average daily gain by 53 g/d, which converts to approximately 70 g/d live weight average daily gain. This increase compares favourable to 45 g/d (Frey, Stevenson et al. 1998) and 70 g/d (Lawton 2000) increase in live weight average daily gain observed on other New Zealand farms after partial depopulation. The current data could not explain the reduction in weaning numbers by 26 piglets per week. The increase in back fat indicates a decline in carcass quality, which has also been reported by Frey & Stevenson (1998). Therefore, these results support the recommendations of Frey & Stevenson (1998) that after improving the health status of a herd it is necessary to make dietary adjustments in order to optimize nutrient utilization after improving the health status of a herd.

Conclusion

The results of this study indicate that partial depopulation was effective in enhancing average daily gain and thus reducing days to market.

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