

# An association of growth performance between nursery and finishing phases

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Swine veterinarians and producers frequently use production data to compare growth performance among groups and farms within production phases of nursery and finishing. Commercial producers frequently ask whether growth performance during the nursery phase is predictive of growth performance during the finishing phase. The objective of this study was to perform a retrospective analysis of the relationship between nursery and finishing performance.

## Materials and methods

Data used in this study were recorded in a computer program (Microsoft Excel®) designed for all producers who were part of the Pipestone System™ in southwestern Minnesota. All pigs were of similar genetic background and fed to similar nutritional specifications. To be included in the study, group ID and group size had to match between the nursery to finishing phases. Of the 183 nursery and 202 finishing records we initially examined, 105 groups met these criteria.

Data for the following variables were compared:

- number and weight of pigs at move in and move out,
- days on feed,
- feed delivered,
- average daily feed intake (ADFI),
- feed:gain ratio (F:G),
- average daily gain (ADG), and
- mortality.

Average daily gain, F:G, and mortality were then calculated for individual groups in nursery and finishing phases independently. One group with F:G smaller than 1.0 in nursery was omitted from the statistical analysis. Group size in the 104 groups ranged from 457–1269, with a mean size of 851 pigs.

The combined (nursery and finishing) phase ADG and F:G were calculated based on ADG and F:G in nursery and finishing by adjusting the periods of time in nursery and finishing phases. The equations were:

$$ADG_C = (ADG_N \times Day_N + ADG_F \times Day_F) \div (Day_N + Day_F)$$

and

$$F:G_C = (F:G_N \times Day_N + F:G_F \times Day_F) \div (Day_N + Day_F)$$

Where:

- Day is number of days pigs stay in either nursery or finishing,
- C represents combined phase,
- N represents nursery phase, and
- F represents finishing phase.

The combined phase mortality was calculated by the formula:

$$(\text{pig deaths in nursery} + \text{pig deaths in finishing}) \div \text{pigs moved in nursery.}$$

Linear (Pearson's) correlation was conducted to compare ADG, F:G, and mortality among nursery and finishing.

## Results

The mean values and performance parameters are shown in Tables 1–2. There was no linear relationship between ADG in the nursery and in finishing. The correlation

coefficient between the two-phase ADG was 0.061 ( $P > .5$ ). Feed:gain was negatively correlated between the nursery and finishing phases ( $r = -.223$ ) ( $P < .03$ ) (Figure 1). Mortality was not significantly correlated between nursery and finishing ( $r = 0.081$ ,  $P > .4$ ).

## Discussion

We were surprised by the lack of a linear relationship between nursery and finishing performance for daily gain, feed efficiency, and mortality. The results of our study suggest that growth performance in the nursery is not predictive of growth performance in finishing and that finishing performance is independent of nursery performance.

This observation is consistent with a study that demonstrated that pig birthweight is a good indicator of growth rate during the early stages of postnatal growth, but is not necessarily a good determinant of growth performance to slaughter weight,<sup>1</sup> suggesting a possible change in growth rate between young and finishing pigs. In another study of segregated early weaning (SEW),<sup>2</sup> pigs in SEW production systems grew faster than pigs in conventional systems during the nursery period. The superior growth of SEW pigs during the nursery phase was not observed during finishing period.

We do not know why there was no linear correlation in mortality between nursery and finishing phases. It is possible that environmental conditions differed between nursery and finishing barns, effecting mortality; our study design did not allow us to evaluate this possibility.

The analytical unit in this study was the group rather than individual pigs. Although pig-days in our statistical models were adjusted to account for pig mortality in the nursery and finishing phases, our study design did not allow us to determine exact weight gain and feed consumption values for pigs that died.

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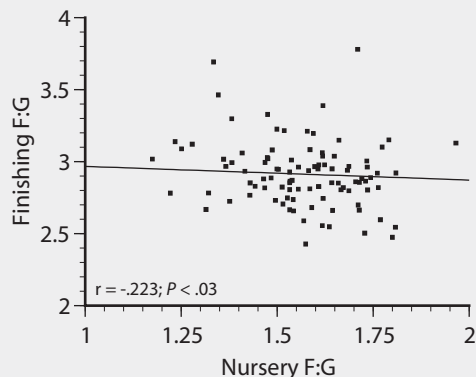
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**Table 1:** Mean weight and feed efficiency data for nursery and finishing phases ( $\pm$ SD)

	Mean move-in weight	Mean market weight	Mean days on feed
Nursery	4.4 kg $\pm$ 0.4 kg (9.8 lb)	(not applicable)	52.9 $\pm$ 3.5
Finishing	25.1 kg $\pm$ 2.8 kg (55.2 lb)	111.4 kg $\pm$ 4.5 kg (245.3 lb)	111.0 $\pm$ 8.4

**Table 2:** Mean performance parameters

	Average daily gain, kg						Feed:gain ratio						Mortality					
	Average		Top 20%		Bottom 20%		Average		Top 20%		Bottom 20%		Average		Top 20%		Bottom 20%	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Nursery	0.39	0.04	0.44	0.02	0.34	0.02	1.57	0.16	1.33	0.10	1.78	0.06	2.02%	1.40	0.75%	0.24	4.17%	1.58
Finishing	0.77	0.06	0.83	0.03	0.68	0.04	2.90	0.26	2.56	0.19	3.24	0.20	2.48%	1.10	1.23%	0.28	4.13%	1.01
Combined phase	0.64	0.04	0.69	0.02	0.59	0.03	2.47	0.18	2.24	0.11	2.71	0.16	4.44%	1.81	2.51%	0.36	7.29%	1.58

**Figure 1:** Comparison of nursery F:G and finishing F:G

The line in the scatter plot depicts a linear trend line of F:G between the phase of nursery and finishing.

Under commercial conditions, feed waste is calculated into the feed:gain value.

### Implications

- Growth performance in the finishing phase is independent from nursery performance.
- Good performance in nursery is not predictive of good performance in finishing.

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