Effect of a precision feeding strategy applied to groups of pigs in a commercial setting

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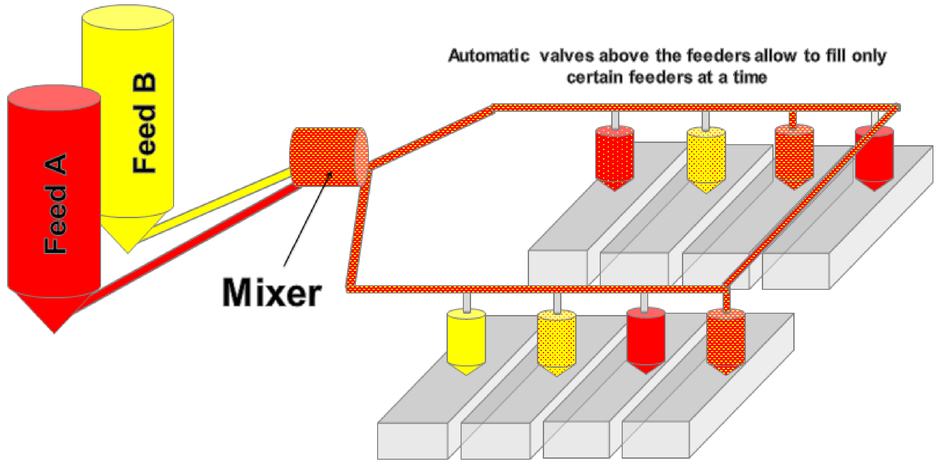
Introduction

In commercial facilities pigs are fed in large groups. Using a unique feed for a large group of pigs implies that:

some pigs are underfed = ⇩ growth performance
some pigs are overfed = ⇧ nutrient wastage

Precision feeding in groups, also known as daily multiphase feeding, is a feeding technique that provides, mostly on a daily basis and to a smaller group of pigs (pen), a feed tailored to the requirements of this smaller group.



Controlled by a computerized feeding system, different mixes of feed can be sent to the different pens in the farm.

How it works? With only 2 feeds, a high and a low nutrient concentration feed, lots of different levels of nutrients can be given to pigs by mixing those 2 feeds.

Why "in groups"? To reduce excess of nutrients given to pigs, one strategy is to put together pigs having the same nutrient requirements like pigs of the same sex and/or the same weight.

Objective

Validate the effect of a precision feeding strategy applied to groups of pigs segregated by sex and by weight in a commercial setting.

Material and methods

Animals

1 008 pigs divided in 24 groups of 42 pigs / Initial live weight (LW) = 24.2 ± 2.9 kg

Experimental treatments

Factorial design

2 x 2

2 sexes: Barrows (B) & Gilts (G)

2 feeding treatments: Four-phase feeding (4P)
Multiphase feeding per group (MPG)

Pigs were initially divided by weight group (small, medium small, medium large and large pigs).

Feeds

For each group of pigs given the MPG treatment (i.e. combination of weight group and sex), the desired lysine (Lys) concentration was obtained by blending the A and B feeds in different proportions. Two feeding programs were used, one per sex, and determination of lysine requirement was based on the factorial method described by Hauschild and al (2012).

Table 1 SID Lysine concentration of feed used in this experiment

		4P treatment				MPG treatment	
		1	2	3	4	A	B
SID Lys	%	1.02	0.91	0.78	0.69	1.09	0.49

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Table 2 Growth performances and carcass characteristics of pigs

	Feeding treatment		Sex		Treatment * Sex				SEM	P value		
					4P		MPG					
	4P	MPG	F	B	F	B	F	B		Treat.	sex	Treat.* Sex
Initial BW (kg)	24.3	24.2	24.0	24.5	24.0	24.5	23.9	24.4	1.3	0.568	0.003	0.965
ADFI (kg/d)	2.59	2.65	2.49	2.75	2.47	2.72	2.52	2.78	0.07	0.290	< 0.001	0.914
ADG (g/d)	934	949	903	980	899	968	907	991	20	0.097	< 0.001	0.363
Feed conversion	2.78	2.79	2.76	2.80	2.74	2.81	2.78	2.80	0.05	0.784	0.445	0.699
SID Lys intake (g/d)	20.5	16.7	17.7	19.4	19.4	21.5	16.1	17.3	0.5	< 0.001	< 0.001	0.186
Dietary SID lysine (g/kg)	7.89	6.32	7.13	7.07	7.87	7.91	6.40	6.23	0.04	< 0.001	0.125	0.011
Carcass weight (kg)	106.4	106.5	105.8	107.1	105.8	107.0	105.8	107.2	0.5	0.878	0.012	0.865
Fat depth (mm)	22.8	22.2	21.5	23.5	21.8	23.8	21.1	23.2	0.5	0.085	< 0.001	0.947
Muscle depth (mm)	65.1	64.8	66.5	63.4	66.6	63.6	66.4	63.2	0.7	0.646	< 0.001	0.914

Effect of feeding treatments

The MPG treatment when compared to the 4P treatment…

… ⇩ **Lys intake by 18%** ($P < 0.001$)

… had no impact on ADFI and feed conversion

… **tended to have a higher ADG** ($P = 0.097$)

⇨ Similar results on ADG had been observed in a previous study (Pomar and al, 2014)

Effect of sex

When compared to barrows, gilts had:

⇩ ADFI

⇩ ADG

⇩ Fat depth

One **interaction** (treat. * sex) was observed regarding **Lys concentration**:

MPG gilts > MPG barrows whereas 4P gilts = 4P barrows

⇨ This result shows that **MPG** can **take into account feed intake difference between sexes** by giving higher levels of Lys to gilts considering their lower feed intake.

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Table 3 Variation of the feed cost savings of the MPG for the years 2011, 2012 and 2013

Year	Feed cost savings per pig			Price difference
	Average	Maximum	Minimum	Soymeal - corn
2011	$2.0	$2.4	$1.4	$125
2012	$3.3	$4.9	$1.4	$225
2013	$3.8	$4.7	$3.1	$316

Economic results

Since no significant effects on ADG and ADFI were observed, impact on production cost can be calculated with reference only to feed costs.
When calculated with **Quebec's 2013 feed prices**, the MPG strategy reduced feed costs by **$3.80/pig**.

However, it is important to know that this economy varies between years and even during a specific year, with the fluctuations of ingredient prices (Table 3). The higher the price difference between soymeal and corn, the higher the savings.

Conclusion

The results of this study show that the multiphase feeding strategy in groups (MPG) had:

No effect on growth performances
⇩ Lys intake
⇩ feed costs

As some companies are already offering equipment to implement such a strategy, this feeding strategy can be applied now.

References

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