

# Stimulating Exploratory Behaviour in Piglets: Effects on Pre-weaning Creep Consumption

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## SUMMARY

This study investigated whether feed consumption before and after weaning can be increased through stimulating exploratory behaviour in piglets, and whether this is best achieved through provision of enrichment (E), or through presentation of creep feed in a large tray feeder (TF) so as to facilitate synchronized feeding among littermates.

Enrichment consisted of cotton ropes hung in the farrowing pen. Piglets provided with E were observed to contact the enrichment on average 11 times per day. Feeder type, but not E, resulted in a greater frequency of piglet visits to the feeder on day 12 with more piglets the TF. On day 26 there was a tendency for a greater frequency of visits to the TF. Litters supplied with a TF also had a greater daily creep disappearance with no effect of E. However, litters provided with the Standard Feeder (SF) had a greater piglet birth to wean average daily gain. Provision of a larger feeder that encourages social feeding, appears to have a greater influence on attracting piglets to creep feed. The increased creep disappearance and more frequent feeder visits in the TF treatment indicate that this treatment may be effective at improving feed consumption and reduce weaning stress.

## INTRODUCTION

Piglet weaning is a stressful experience in standard commercial practice, as shown by high levels of aggression, weight loss and increased salivary cortisol concentrations. Inadequate food intake in the first two days after weaning, in combination with the stress of weaning, has been shown to decrease piglet performance, resulting in increased disease susceptibility and mortality through changes in metabolic and immune. Promoting feed intake in piglets before weaning by provision of creep feed familiarizes the animals with solid food, and has been shown to increase feed intake and improve growth rate in the critical two days post-weaning. Pre-weaning creep feed consumption by piglets has also been shown to correlate with increased weight gain in the week prior to weaning in addition

to improving post-weaning performance. However, the overall consumption of creep by a litter can be low, and varies greatly among littermates (Sulabo et. al., 2010). Considering this, the provision of creep is not generating the desired effect for producers, resulting in higher production costs without significant benefits.

It is of interest to identify convenient, effective and economical ways to increase the quantity and consistency of creep feed consumption by piglets within litters. Previous research has determined that the amount of creep consumed by piglets can be increased through provision of a specially designed feeder that encourages exploratory interaction around the feeder. It is known that piglets born outdoors are quick to consume starter feed and are often ingesting soil and plant material before weaning while exploring their environment. However, piglets born into indoor farrowing pens do not have the same opportunity for exploration in standard practice. This study builds upon current knowledge to investigate the effect of increasing the exploratory behaviour of piglets through provision of environmental enrichment in the farrowing pen and nursery. If simple enrichment can increase creep feed consumption in piglets this could transfer to piglets consuming starter feed earlier and having less of a growth check in the immediate post-weaning period.

## Specific objectives of this project were to determine:

- 1) If providing enrichment, and/or a large shallow tray feeder in the farrowing crate results in increased exploration of creep feeders or increased creep feed consumption by the piglets, and any improvements in pre-weaning growth rate.
- 2) If the provision of enrichment in the nursery and having a larger tray feeder in the farrowing room results in increased consumption or any improvements in piglet growth during the first 2 weeks in nursery.

## MATERIAL AND METHODS

Piglets from 28 litters with 11 to 14 piglets/litter were assigned to one of four treatments, (n=7 litters/treatment):

T1: Creep provided in a standard feeder (SF, see Figure 1);

T2: Creep provided in SF, with cotton rope as pen enrichment (SFE);

T3: Creep provided in a large tray feeder (9" x 13") (TF);

T4: Creep provided in TF with E provided (TFE, see Figure 2).

Creep feed was offered to all litters from 10 days after birth until weaning at 28 days. Strips of cotton rope were attached in two locations in the farrowing crate (anterior and posterior) for the E treatment, from 5 days after birth until weaning. Piglets were weighed on days 0 (birth), 3, 7, 10, 17, the day of weaning (day 26), day 35, and 42 in the nursery. Creep consumption was calculated weekly by total weight per litter. Behaviour was recorded on four litters per treatment for 8 hours (8am to 4pm), on days 12, 19, and

**Table 1.** Average total frequency of visits made to the creep over 8 hours (8am – 4pm) when presented in a Standard Feeder (SF) or Tray feeder (TF).

Day	Feeder type		Pooled SEM	P
	SF	TF		
12	1.3	6.0	1.2	<0.06
19	3.8	15.0	3.6	0.052
26	5.3	16.4	4.1	0.086

26. Footage was scanned at five minute intervals to determine the number of piglets interacting with the feeders, and for E and TFE, the number of piglets interacting with E. The frequency and the average number of piglets observed at the feeder or E was calculated on each observation day. Average daily gain and creep consumption were calculated. Data were analyzed using PROC MIXED (SAS 9.2) to determine the individual and interactive effects of feeder type and provision of E on visits to the creep.

## RESULTS AND DISCUSSION

**Piglet behaviour:** Piglets interacted with E when provided, on average 11 visits per day in the farrowing crate. However, provision of a tray feeder, rather than enrichment resulted in a greater frequency of piglet visits to the creep (Table 1). This continued from day 12, with a tendency for a greater number of visits to the feeder on days 19 and 28 pre-weaning. There was a tendency for a greater number of piglets per visit at the tray feeder on day 12 pre-weaning, but no differences thereafter among the treatments.

**Creep intake and growth rate:** Rope enrichment had no effect on the creep disappearance or average daily gain in the pre-weaning period. Litters supplied with the TF had greater daily creep disappearance (In g/pig/day: SF: 5.4; TF: 13.2, SEM 1.33,  $P < 0.0005$ ), with no effect of E. No treatment differences in average daily gain values were observed between day 0 and 28, and day 28 to 42. Pre-weaning growth rate did not differ across treatments, however, piglets using a TF pre-weaning, showed no weight loss in the first days post weaning. On day 29 (day after weaning), T2 piglets had a significantly greater growth check within the first 24 hours of moving into the nursery, while the ADG of piglets in T1, T3 and T4 did not differ (Table 2).

The provision of enrichment in the farrowing pen elicited exploratory behaviour in the piglets, as demonstrated through rope interaction observations. However, provision of a larger feeder that could encourage social feeding and rooting appears to have a greater influence on attracting piglets to creep feed. This was demonstrated by the increased frequency of visits to the feeder when litters were provided with tray feeders. This feeder was a rectangular shape,

**Table 2.** Growth rate (ADG, kg) per piglet across treatments.

Treatment	Standard Feeder	Standard Enrichment	Tray Feeder	Tray Feeder + Enrichment	Pooled SEM	P
Birth to Wean (Day 0 to 28)	0.26	0.23	0.21	0.22	0.014	NS
Wean to day 42	0.22	0.16	0.24	0.25	0.03	NS
ADG day 1 nursery	-0.04 <sup>ac</sup>	-0.22 <sup>c</sup>	0.16 <sup>ab</sup>	0.18 <sup>ab</sup>	0.11	0.06
ADG day 35	0.22	0.23	0.16	0.16	0.02	NS
ADG day 42	0.35	0.34	0.34	0.38	0.02	NS



**Figure 1.** Standard feeder (T1 and T2) provided in farrowing crate.



**Figure 2.** Tray feeder (T3 and T4) and pen enrichment provided to piglets in the farrowing crate.

allowing more piglets to investigate the feeder simultaneously. Pigs are social feeders, and will synchronize feeding. The accessibility of the tray feeder may help facilitate this behaviour. The increased creep disappearance found in the tray feeder suggests piglets were interacting with the creep. However, birth to wean growth rates did not reflect any benefits of increased creep consumption suggesting that use of the tray feeder may have resulted in greater feed wastage.

In the period immediately following weaning, piglets using the tray feeder performed better, having no negative growth check, and maintained a positive average daily gain compared to piglets that had been given standard feeders. There was no effect of enrichment on the piglet performance post weaning. Piglets that received the standard feeder and rope enrichment had a significantly greater growth check at day 29 post-weaning than did piglets provided with the tray feeder, with or without enrichment.

## CONCLUSION

A large tray feeder that encourages social feeding and foraging is more effective at attracting piglets to creep than a standard feeder, or the provision of rope enrichment. Providing a tray feeder before weaning also had a positive effect on piglet growth immediately after weaning. Growth benefits may have arisen from piglets more readily taking to solid feed post weaning, having had increased exploration of solid feed pre-weaning. These results are favorable for producers as a reduced growth check post weaning could also mean that piglets are better prepared for immune challenges and other stressors associated with weaning.

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