

Feed intake patterns and gut health in piglets shortly after weaning

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Background and objectives

During weaning, piglets are exposed to several stress factors that induce low feed intake, diarrhoea, and even mortality. During this acute phase, reduced enteral stimulation is known to affect gut mucosal integrity. After the acute phase piglets are hungry which might lead to too high feed or spiking feed intakes in the adaptive phase after weaning (Legendi, 1987). This may, in its turn lead to gut health problems. Highly palatable diets and/or limited feeder space allowance might promote the development of such problems. To test this hypothesis, we studied the effect of feed intake patterns on the markers of gut health in weaned piglets

Material and methods

Piglets (Hypor x Topigs Top Pi) were weaned at day 21±1 (body weight 8.2±0.5kg) and housed in individual cages (n=60). Littermates and genders (barrows and gilts) were equally assigned to one of the following treatments: Treatment A – ad libitum access to feed during the whole day; Treatment B- ad libitum access to feed only from 7:30 – 9:00 h; Treatment C – restricted feeding based on a calculated feed curve fed in 3 portions equally distributed over the day. A semi commercial palatable diet (174 g protein/kg; 2575 kcal NE/kg; 12.1 g AID Lys/kg) was used for all treatment groups. Five barrows and five gilts per treatment group were sacrificed four hours after the introduction of fresh feed in the morning of day 9. Digesta samples from stomach and the mid jejunum were collected for chemical analyses and conventional microbiology. Data were analysed using the PROC GLM procedure (SAS).

Results

Table 1 Mean growth and feed intake during the first week after weaning and E. coli and lactic acid bacteria counts in stomach and mid jejunum at day 8-9.

Treatments	Growth (g/day)	Feed intake (g/day)	Stomach		Mid jejunum	
			% Dry matter	pH	E. coli log CFU/g	Lactic acid bacteria log CFU/g
A (ad lib)	192 ^a	196 ^a	21.9 ^b	4.3 ^b	6.34	6.87 ^a
B (7:30-9:00)	73 ^b	67 ^c	31.2 ^a	4.9 ^a	5.65	6.48 ^{ab}
C (restricted)	100 ^b	105 ^b	18.3 ^b	3.6 ^c	5.05	5.72 ^b
SEM	11.4	8.1	1.8	0.2	0.5	0.3

Means within column with different superscripts differ significantly

Piglets on restricted feeding showed lower gastric dry matter and lower pH in the stomach. A high feed intake (treatment A) leads to higher counts of lactic bacteria in the mid jejunum, while piglets with a spiky feed intake pattern (treatment B) show intermediate counts. E. coli counts in mid jejunum were numerically higher than in the piglets on restricted feeding.

Conclusion and discussion

A too high feed intake or a too spiking feed intake pattern in the adaptive phase after weaning stimulates bacterial growth in the small intestine and in this way probably affects gut health. We speculate this is the result of an insufficient gastric digestion due to overload of the stomach.

References

LEGENDI V. (1987) Habilitationsschrift zur Erlangung an die Tierärztlichen Hochschule Hannover, 200 pp.