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The use of flavours in feed improves performance of piglets weaned at 21 days of age

D. Torrallardona*, Ll. Llauradó*, J. Matas**, F. Fort** and E. Roura**

*IRTA, Centre de Mas Bové, Apartat 415, 43280 Reus, Spain

**Lucta S.A., Apartat 1112, 08080 Barcelona, Spain

SUMMARY – A trial was conducted with 120 21d-old piglets to study the effect of the addition of flavours on their weaning diet. The animals were distributed in 30 pens of four animals, and five experimental diets were tested: T-1 (control diet without added flavour) and T-2, T-3, T-4 and T-5 (control diet + 4 different presentations of flavour; Luctarom[®], Lucta S.A., Spain). Body weight and food intake were measured at 21 and 35 days of trial. No differences were observed between the four diets containing flavour; therefore only the contrasts between the control diet and the other four diets together are reported. Using flavour increased weight gain (+11 g/d; P = 0.06) and feed intake (+11 g/d; P = 0.11) between 0 and 21 days. Between 21 and 35 d of experiment, the use of flavour also improved weight gain (+37 g/d; P = 0.02), feed intake (+30 g/d; P = 0.14) and feed:gain ratio (-0.1; P = 0.02). Over the whole experimental period (0-35 d) flavour improved weight gain (+23 g/d; P = 0.01), feed intake (+18 g/d; P = 0.11) and feed:gain ratio (-0.05; P = 0.12). It is concluded that the supplementation with flavour of piglet diets significantly improved the performance after weaning.

Key words: Weaning, piglets, flavours, feed intake.

RESUME – "L'utilisation d'arômes dans l'aliment améliore les performances de porcelets sevrés à 21 jours d'âge". Un essai a été réalisé avec 120 porcelets âgés de 21 jours, afin d'étudier les effets de l'inclusion d'arômes à leur alimentation de sevrage. Les animaux ont été répartis par groupes de quatre dans 30 unités expérimentales, et 5 aliments ont été testés : T-1 (aliment témoin sans arôme) et T-2, T-3, T-4 et T-5 (aliment témoin + 4 profils différents d'arômes ; Luctarom[®], Lucta, S.A., Espagne). Le poids et la consommation d'aliment ont été enregistrés au 21ème et 35ème jours de l'essai. Aucune différence n'a été observée entre les quatre alimentations contenant les arômes ; c'est pour cette raison que seul le contraste entre l'aliment témoin et les quatre autres alimentations est présenté. L'utilisation d'arômes entre le 1er et le 21ème jour augmente la prise de poids (+ 11g/j ; P = 0,06) et la consommation d'aliment (+ 11g/j ; P = 0,11). Entre le 21ème et le 35ème jour de l'essai, l'utilisation d'arômes améliore également la prise de poids (+37 g/j ; P = 0.02) ; la consommation d'aliment (+30 g/d ; P = 0.14) ainsi que la conversion (-0.1 ; P = 0.02). Sur le total de la période expérimentale, (0-35 j), l'arôme a amélioré le gain de poids (+ 23 g/j ; P = 0,01), la consommation d'aliment (+ 18g/j ; P = 0,11) et la conversion (-0,05 ; P = 0,12). Nous pouvons en conclure que l'inclusion d'arômes dans l'alimentation des porcelets améliore significativement les performances après le sevrage.

Mots-clés : Sevrage, porcelets, arômes, consommation d'aliment.

Introduction

Early weaned piglets are sensitive to gastrointestinal disorders partially due to a reduced feed intake causing atrophy of the villi (Pluske *et al.*, 1996). Such a reduced feed intake is due to an adaptation period from the sow's milk to dry feed. Further reductions in feed intake may occur when switching feeds from a higher to lower profiles in digestibility and palatability as piglets mature. Nutritional means to overcome these problems are found in stimulating nutrient intake through palatability enhancers.

Feed flavours are additives developed to improve, correct or enhance the natural taste and smell of feeds. Flavours have been used in piglet feeding since the 1960's to facilitate an early start in the consumption of feed. They act as both: (i) palatability enhancers, thus, improving the taste and smell of feeds and reducing aversion to new diets; and (ii) feed attractants thus changing the feeding behaviour of piglets.

The aim of the present trial was to study the effect of four different flavours profiles on the performance of 21 day-old weanling pigs.

Material and methods

Animals

One hundred and twenty 21-day-old piglets (*Landrace*) weighing an average of 5.1 kg were used. They were housed in three rooms of the weaning unit of IRTA's Department of Animal Nutrition. The animals were distributed by initial body weight into 30 pens of four animals each.

Diets

A pre-starter diet was offered to the piglets during the first three weeks of trial. Between weeks 3 to 5 a starter diet was used. There were five experimental treatments with T-1 (control diet with no flavour added), and T-2, T-3, T-4 and T-5 (control diet + one of 4 different flavours). The flavours used were four different profiles of Luctarom® (Lucta S.A., Spain). Within each treatment, the same level of flavour intensity was used in the pre-starter and the starter diets.

Measurements

Feed and piglets were weighed at the start, at day 21 post-weaning, and at the end of the experiment (35 days post-weaning). Average daily gain, average feed intake and feed to gain ratio were measured for each treatment and compared statistically. For the statistical analysis, the effect of the room block was considered, and initial body weight was used as co-variable. No differences were observed between the four diets containing flavour, therefore only the contrasts between the control diet and the other four diets together are reported.

Results and discussion

The results of the trial are presented in Table 1. Piglets fed with the flavoured diets showed improved performances as compared to control animals.

Table 1. Weight gain, feed intake and feed:gain ratio of 21 d-old weaning pigs fed on diets with flavours

	Control	Flavour	Statistical significance	Improvement (%)
Pre-starter phase (0-21 d)				
Body weight day 0 (kg)	5.1	5.1	–	–
ADG (g/d)	256	267	P = 0.06	4.3
ADFI (g/d)	385	396	P = 0.11	2.9
Feed:Gain	1.51	1.49	P = 0.54	1.3
Starter phase (21-35 d)				
Body weight day 21 (kg)	10.5	10.7	P = 0.06	2.1
ADG (g/d)	385	422	P = 0.02	9.2
ADFI (g/d)	697	727	P = 0.14	4.3
Feed:Gain	1.81	1.71	P = 0.02	5.5
Whole trial				
Body weight day 35 (kg)	15.9	16.6	P = 0.01	4.8
ADG (g/d)	307	330	P = 0.01	7.0
ADFI (g/d)	508	526	P = 0.11	3.5
Feed:Gain	1.65	1.60	P = 0.12	3.0

During phase 1 (0-21 days), flavours showed a tendency to increase feed intake (P = 0.11) and weight gain (P = 0.06), whereas feed to gain ratio appeared to remain unchanged. It seems

that the improvement in weight gain might be due to the improvement of palatability of diets by the flavours.

During starter (21-35 days) and overall phases (0 to 35 days post-weaning), flavours increased not only feed intake ($P = 0.14$ and $P = 0.11$, respectively) and weight gain ($P = 0.02$ and $P = 0.01$, respectively) of the piglet but also feed to gain ratio ($P = 0.02$ and $P = 0.12$, respectively). Flavours showed to be highly efficacious in preventing a drop in feed intake due to switching from a pre-starter diet, with higher digestibility and palatability profile, to a starter diet. On the other hand improvement in feed utilization may indicate a better development of the gastrointestinal mucosa. This is consistent with findings from previous authors (Pluske *et al.*, 1996).

Conclusions

The use of feed flavours (Luctarom[®]) improved weight gain and apparently feed intake in the first three weeks of transition from lactation to dry feed. When pre-starter diet was switched to a starter diet (21 days post-weaning), inclusion of flavours resulted in apparent increase in feed intake together with significantly improved weight gain and feed to gain ratio. It is concluded that flavours in piglets improve transition from milk to dry feed and from pre-starter to starter diets. It is hypothesised that improvement in weight gain and feed to gain ratio are due to the increase in feed intake which in turn would trigger better gastrointestinal development.

Reference

Pluske, J.R., Williams, I.H. and Aherne, F.X. (1996). Maintenance of villous height and crypt depth in piglets by providing continuous nutrition after weaning. *J. Anim. Sci.*, 62: 131-144.