Animal Feed Science and Technology 191 (2014) 91–97

Contents lists available at ScienceDirect

Animal Feed Science and Technology

journal homepage: www.elsevier.com/locate/anifeedsci

Exploratory behaviour and performance of piglets fed novel flavoured creep in two housing systems

O.O. Adeleye[a,b,*], J.H. Guy[a], S.A. Edwards[a]

[a] School of Agriculture, Food and Rural Development, Newcastle University, Newcastle upon Tyne NE1 7RU, UK
[b] Department of Animal Production and Health, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria

ARTICLE INFO

Article history:
Received 19 January 2013
Received in revised form 1 February 2014
Accepted 3 February 2014

Keywords:
Creep feeding
Exploratory behaviour
Flavour diversity
Piglet performance

ABSTRACT

Creep feeding can improve growth and performance of piglets before and after weaning, especially if sow milk supply is reduced for any reason, but intake by suckling piglets is often low. It was hypothesised that the sequential presentation of different flavoured creeps each day would stimulate exploratory behaviour and improves feed intake and weight gain during lactation, with subsequent post-weaning benefits. This study aimed at investigating the effect of increasing creep flavour diversity in two lactation housing systems. Thirty-six sows (Large White × Landrace) were used in a 2 × 2 factorial design; sows were randomly allocated to either a farrowing crate or a loose farrowing PigSAFE pen at five days before farrowing, while the litters were further allocated to either a standard or diverse flavour creep feeding regime on day 10 of lactation. Housing system had no main or interactive effect on the feed intake and weight gain of piglets in the lactation and post-weaning periods. Feeding 5 different flavoured creeps (Toffee, Apricot, Butterscotch, Apple and Red fruit) in a daily sequential order increased the hourly frequency of visits to the creep feeder on day 18 of life ($P = 0.004$), and increased the piglets' feed intake over days 15–22 of lactation ($P = 0.01$), and day 22 to weaning at 28d ($P = 0.03$). When controlling for day of presentation, butterscotch flavoured creep promoted a higher intake than red fruit creep ($P = 0.004$), with other flavours intermediate. The prior experience of flavour diversity significantly increased weight gain in the first 2 weeks after weaning on a standardised feeding regime for both treatments ($P = 0.03$). Results suggest that dietary novelty may be a method to stimulate early exploratory behaviour, feed intake and performance.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

Creep feeding can benefit the growth and performance of piglets before and after weaning, especially if sow milk supply is reduced for any reason (Lawlor et al., 2002; Wattanakul et al., 2005). However, creep feed intakes have been reported to be very low during lactation (Kuller et al., 2010) and ways of stimulating the exploratory behaviour and acceptance of creep feeds by piglets during lactation would be beneficial. One approach to achieve this might be by presenting the feed in a more variable form, using novelty to encourage exploration. Studies on rats offered novel feeds have shown that rats ate more when fed different flavoured feeds in a concurrent pattern (Shafat et al., 2009; Myers et al., 2005; Treit et al., 1983). In sheep

* Corresponding author: Adeleye O.O, Department of Animal Production and Health, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria. Tel.: +234 8132146857.
E-mail address: gbengamcf@yahoo.co.uk (O.O. Adeleye).

http://dx.doi.org/10.1016/j.anifeedsci.2014.02.001
0377-8401/© 2014 Elsevier B.V. All rights reserved.

studies, it was also observed that making feed novel to growing lambs by varying the colour, texture and/or the flavour in a concomitant design was effective in increasing intake (Villalba et al., 2012; Treit et al., 1983).

To enhance weight gain in rats, cafeteria feeding was introduced to stimulate feed intake (Shafat et al., 2009). This system of feeding allows animals to have access to several food items of varied composition, appearance and texture and has led to increase in feed intake and significantly heavier rats at weaning (Rothwell and Stock, 1982). An alternative approach, which might be expected to give greater stimulation of exploratory behaviour because of daily novelty, is the repeated variation in the nature of the available feed on a daily basis.

It has been reported that piglets reared in more extensive lactation environments have higher weaning weights and reduced post weaning growth check because of better feed intake (O'Connell et al., 2005). The extent to which this reflects better milk production by less confined sows or enhanced pre-weaning development of exploratory and ingestive behaviour by the piglets in a more complex environment has received little study. Therefore, the aim of this study was to investigate the effect of increasing creep feed variety by use of different sequential flavours on intake, growth and health of piglets (pre and post weaning) in two housing systems with different degrees of complexity and freedom for the sow.

2. Materials and methods

2.1. Experimental design and animals

Thirty-six sows (Large White × Landrace) were used in an experiment, which had a 2 × 2 factorial design. Sows were allocated equally across 3 consecutive production batches, which farrowed at three-weekly intervals. At 5 days before farrowing, the sows were randomly allocated to one of two housing treatments: (a) Farrowing crate, or (b) PigSAFE loose farrowing pen. The PigSAFE (Piglet and Sow Alternative Farrowing Environment) system was designed as a higher welfare alternative for housing during farrowing and lactation, incorporating features to meet the biological needs of the animals and the practical needs of farm staff. It comprises a nest area with straw and piglet protection features including a heated creep, a separate slatted dunging area and lockable sow feeder. Both housing systems are described in detail in Cain et al. (2013). On day 10 of lactation, litters in each system were further divided into two groups based on litter size and mean piglet weight, and allocated to one of two creep feeding treatments:

i) Standard creep feeding: a commercial creep feed (Flat Deck 1, A-One Feeds, Thirsk) without additional flavouring, given throughout lactation.
ii) Novel creep feeding: this was the same base creep feed as (i) with addition of one of 5 different flavouring agents (Inroads International, Shropshire, United Kingdom), given sequentially on different days, as follows: Apricot flavour, Red fruit flavour, Toffee flavour, Apple flavour and Butterscotch flavour.

2.2. Feeding and litter management

The sows were fed two standard home-mixed feeds based on barley and soya bean meal; one from day 0 of gestation to transfer to farrowing accommodation, and another from this point throughout lactation. Both were home mixed meal diets based on barley and soyabean meal, with no added flavourings. After farrowing, litters were standardised to 10–12 piglets by cross-fostering, and all piglets received the same standard husbandry treatment in relation to teeth resection, tail docking and iron injection. Piglets were weighed before commencing creep feeding on day 10 of lactation. The flavours were added at the rate of 500 g/t, according to manufacturer's advice, by mixing the appropriate amount (0.5 g) to treat 1 kg of feed with 30 g of water and spraying this onto the creep feed, after which it was air dried before feeding. Control creep feed was sprayed with water alone to correct for any effects of wetting and drying.

For the first 5 days after creep feeding commenced (days 10–14), a small measured amount of creep (15 g, pre-weighed into labelled bags for each litter per day) was fed daily on the floor of the covered piglet nest area. During this period, refusals could not be determined because piglets were floor fed to stimulate investigation and ingestion of the feed. On day 15, creep feeders were introduced into the pens with the amount of daily creep fed doubled (30 g/litter). The creep troughs in the PigSAFE system were placed inside the piglet nest area, while the feeding troughs were placed just outside the nest in the farrowing crate system. This was because, whereas in the conventional system the sows were restricted in the crates, the sows in the loose pens could reach and eat the creep feed, or disturb feeding piglets, at all locations apart from the piglet nest area. Piglets were fed twice daily, in the morning (07:00) and afternoon (14:00–15:00). Additional feed was added for litters that consumed all the creep feed before noon. As lactation progressed, the amount of creep was increased daily, with small amounts (60 g, pre-weighed into labelled bags for each litter per day) added as it was cleared up (checked at least 3 times daily), and any residual removed and weighed at the start of the next day. Litters were fed to appetite in this way as their creep intake developed. Litters assigned to the flavour diversity treatment were fed a different flavour of creep every day in a sequential manner. The order in which different flavours were presented was varied between the three different farrowing batches to avoid the confounding of individual flavours with piglet age (Table 2).

Piglets were weaned in the fourth week (at 28 ± 0.04 days of age) and moved as litter groups to weaner accommodation with fully-slatted flooring in all-in all-out, controlled environment rooms. They were offered the standard commercial creep feeds (supplied by A-One Feeds, Thirsk, without further flavouring added on farm) *ad libitum* according to the normal farm

Download English Version:

https://daneshyari.com/en/article/2419606

Download Persian Version:

https://daneshyari.com/article/2419606

Daneshyari.com