The effect of increasing dietary fibre and the provision of straw racks on the welfare of sows housed in small static groups

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Abstract

This study assessed the effects of increasing dietary fibre levels in concentrate rations and providing access to straw in racks on the welfare of pregnant sows housed in small static groups. In a 2 × 2 factorial design experiment, 128 Large White × Landrace pregnant sows were offered one of two diets: (i) High fibre diet with 9% crude fibre, or (ii) Control diet with 4.5% CF, and one of two levels of access to a foraging substrate: (i) access to straw in racks or (ii) no straw. The study was replicated eight times using group s of four sows, and treatment periods lasted four weeks. Sows were housed in pens with voluntary cubicles and a slatted exercise area and were offered a wet diet twice a day. Back-fat levels were measured before sows were mixed into groups at 28 days post partum, and four weeks later. Aggressive interactions were recorded on the day of mixing, and injury scores were recorded one week post mixing. Scan sampling was used to collect data on general activity, posture and location of the sows, and on sham-chewing and bar-biting behaviours across the treatment period. In addition, detailed focal observations were carried out on all sows across the treatment period. Straw usage was also recorded. There were no treatment effects on changes in back-fat levels over the treatment period. Treatments had no effect on post-mixing aggression or on injury scores. However, focal observations showed that sows with access to straw were involved in fewer bouts of head-thrusting over the treatment period. Control diet sows spent more time inactive than sows on the high fibre diet, however high fibre diet sows spent more time lying with eyes closed than sows on the control diet. Sows on the high fibre diet with access to straw showed less sham-chewing and bar-biting behaviour than sows in other treatments. These results show that although a diet containing 9% crude fibre promoted resting behaviour, it was necessary to combine it with access to straw to reduce stereotypic behaviour of sows in small static groups.

Keywords: animal welfare, behaviour, fibre, sows, static groups, straw rack

Introduction

European Union pig welfare legislation requires that pregnant sows be provided with bulky or high fibre diets (Council Directive 2001/88/EC). This legislation arose because these animals are often fed a restricted diet in order to optimise reproductive performance (Ramonet et al 2000a). However, this can leave the animals feeling hungry (Ramonet et al 2000b) and has been linked with increased levels of aggression (Jensen et al 2000), increased physical activity (De Leeuw et al 2005) and the development of stereotypies (Lawrence & Terlouw 1993).

This legislative requirement can be met by increasing the fibre content of the concentrate ration and/or through providing sows with access to a foraging substrate. However, the effectiveness of these regimes may differ depending on how they are implemented. For example, the significance of increasing dietary fibre levels differs depending on the fibre level used (Ramonet et al 1999; Bergeron et al 2000), the source of fibre (Matte et al 1994; Ramonet et al 2000a) and the method of feeding, ie wet or dry feeding (Bergeron et al 2002; Scott et al 2007) and once or twice a day feeding (Robert et al 2002). There has been a significant amount of research on the effect of increasing the fibre content of the concentrate ration using sugar beet pulp in ad libitum dry-feeding systems (Brouns et al 1995). In addition, wet feeding pigs is becoming increasingly popular due to the fact that it is a cost-effective method of feeding as it uses low dry matter products (Scott et al 2007). There are a number of health and welfare benefits believed to be associated with liquid feeding systems. For example, satiety levels in sows may be further improved by wet feeding which can result in improved gut fill (Bergeron et al 2002; Scott et al 2007). However, there is limited information available on the impact of wet feeding on pig health and welfare (Scott et al 2007).