

Assessing straw bedding intake in sows and growing pigs



Harper Adams University College Project Report



SUMMARY

- Straw has been used historically as a bedding material for pigs. However, pigs can be inclined to play with and eat straw. This could cause problems such as a reduced diet digestibility for the pig, as well as a requirement for more cereal-based feed.
- This UK study investigated the quantity of wheat straw bedding which sows and growers ate, when it was renewed daily or weekly. Investigations into the diet digestibility were also undertaken.
- The implications were that a substantial quantity of straw can be eaten by sows, housed indoors in the summer, on a restricted diet. On average, 224 g/kg of straw were eaten per kg of the total feed consumed. This needs to be considered when rations are formulated. In this study the growing pigs ate negligible quantities of straw bedding. Further work is on-going to examine the effects of straw on diet digestibility.

STRAW BEDDING CONSUMPTION PROBLEMS

Different cereal straws have been used historically as appropriate bedding materials for pigs which are reared indoors in the UK. However, pigs of different ages are inclined to eat the straw. This can cause a variety of problems.

- Because it is such a fibrous material this can create too rapid a flow of the food through the intestines. This means that the nutrients in the diet of the pigs are not properly absorbed in the intestines thus the digestibility of the diet is reduced.
- Since most of the diet of the pig is based on cereals (such as wheat) more of this is needed to maintain pig growth performance. As well as being uneconomical to feed extra cereal, there are implications of wastefulness because the cereal or arable land could have been used for the human population.
- Additionally, straw carries a possible risk of mycotoxicosis. This is a disease which can arise if particular moulds grow on the cereal crop, producing toxins. These toxins, known as mycotoxins, can cause problems with fertility in the herd.

OTHER STUDIES

Some studies have estimated the amount of straw eaten by different ages of pigs under different management conditions. Variable intake predictions have been made which may depend on housing, feeding method and interval and bedding renewal rate. If the bedding is renewed daily, the pigs may play with it more and eat more because it is novel and fresh, compared to weekly renewal. There is a lack of research on the effect of straw on the overall diet digestibility, and the effect of frequency of bedding-up on straw intake of sows and finishing pigs.

AIM OF THIS STUDY

The aim of this study was to investigate the quantity of wheat straw bedding being eaten by commercial sows and growers when it was replenished either weekly or daily. Additionally, an investigation was conducted into the effects of straw consumption on diet digestibility for sows and growers.

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Nutritional Value of Straw

Straw consists mainly of **lignin**, **cellulose** and **hemi-cellulose**, and other non-structural carbohydrates, with very small quantities of protein, fat, and minerals. Wheat straw is particularly poorly digested because it has a very high lignin content (contributing to high fibre).

Transfer of Nutrients

Some studies have shown that consumption of straw by pigs, causes more nutrients to be transferred from the small intestine to the large intestine where digestion is less efficient.

Acknowledgement

The funding for this project from the Biotechnology and Biological Sciences Research Council (BBSRC) is gratefully acknowledged.

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TREATMENTS AND MEASUREMENTS

Studies on both sows and growers were undertaken over three weeks during summer months. Forty five commercial sows were penned in groups of six to eight and were fed a restricted diet (once a day feeding). The three treatments for sows were as follows:

- no straw (concrete floor);
- wheat straw added daily (approximately 15 kg per pen);
- wheat straw added weekly (approximately 100 kg per pen).

Ninety six commercial growers were penned in even-sized and mixed sex groups of eight. The treatments were similar to those of the sows but only half the amount of straw was used for daily and weekly treatments.

Various measurements were taken. These included straw intake (see box) and diet digestibility.

FINDINGS

The findings on straw intake were as follows.

- Sows ate 179 to 274 g straw bedding per kg of feed eaten. This was a substantial and significant quantity.
- It appeared that the sows ate more if the straw bedding was added daily rather than weekly, although this difference was not significant. (See the chart below.)
- Although measuring the straw intakes of growing pigs presented some difficulties, calculated values suggested that they did not eat any measurable quantity of straw bedding.

Ambient temperatures averaged 22°C.

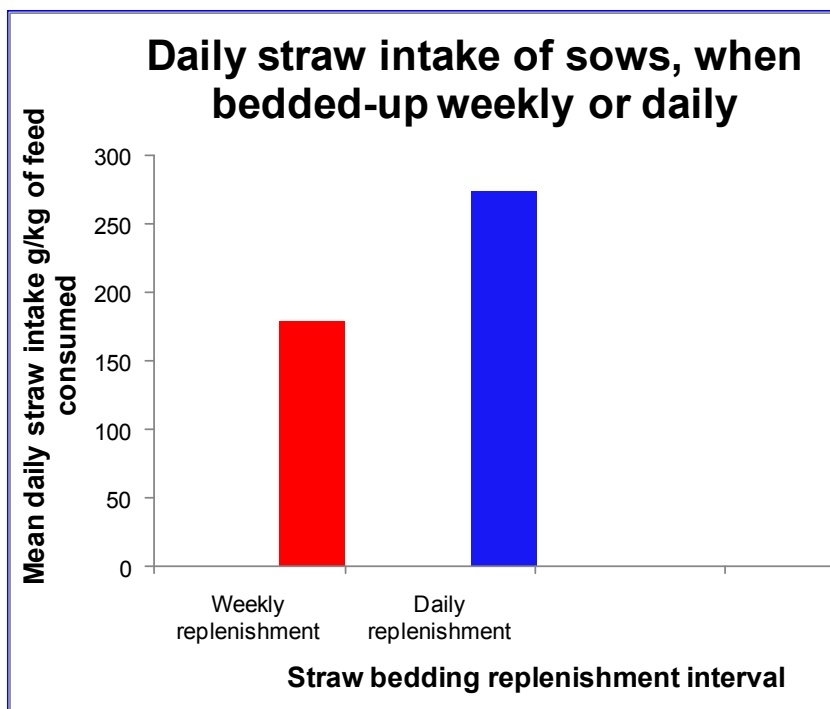


Estimating Straw Intake

A harmless feed marker, titanium dioxide, and naturally-occurring lignin, were used to estimate the intake of straw.

Prior Experience of Straw

The growing pigs in this study had no previous experience of straw. It is not known whether or not this contributed to the small amount of straw which was eaten by them.



IMPLICATIONS

Housed sows which are fed a restricted diet, in summer months, eat a substantial amount of straw bedding whether it is provided weekly or daily. In this study sows ate approximately 224 g straw per kg of feed consumed. This needs to be considered when rations are formulated. In this case growing pigs which were fed ad-lib did not eat any significant amount of straw bedding.

Further Information

Mansbridge, S.C., and Stewart, A.H. 2012. An assessment of straw intake by acid insoluble markers in commercial pigs housed in straw based systems. *Advances in Animal Biosciences: Proceedings of the British Society of Animal Science annual conference, Nottingham 24-25 April 2012.*

HAUC Project Report 091

Series Editors:

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