



The Effect of Ergot on the Performance of Weanling Pigs

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Summary

Ergot contains numerous poisonous substances (alkaloids), which upon ingestion by animals may lead to poor growth rate, decreased feed consumption and poor feed efficiency. The effect will depend on the age or physiological stage of the animal, and the amount consumed. Results obtained in this study indicate that the consumption of diets containing more than 0.10% high alkaloid ergot by weanling pigs severely reduces growth rate, and feed consumption and efficiency.

Introduction

Ergot infection in cereal grains, especially wheat, is of great economic importance. An ergot infection may not result in reduced grain yield but will reduce quality due to the replacement of grain kernels with a number of poisonous alkaloid-containing ergot sclerotia. These grains may end up as feedstuff in swine diets. Ergot ingestion may impair growth and development. Also, the plasma concentration of certain hormones, especially prolactin, may be reduced. Information is lacking on the safe inclusion level of ergot in the diet of the weanling pig. This experiment was conducted to investigate the impact on performance of including ergot-contaminated wheat in the diet of weaned pigs and determine the level that can safely be included in the diet.

Experimental Procedures

Ground ergot sclerotia were added to diets at 0% (control), 0.05%, 0.10%, 0.25%, 0.50%, and 1.00% (weight basis). Ground wheat ergot sclerotia contained 1880 mg alkaloid/kg with ergocristine, ergotamine, ergosine, ergocryptine and ergocornine constituting 40, 36, 11, 7, and 6%,

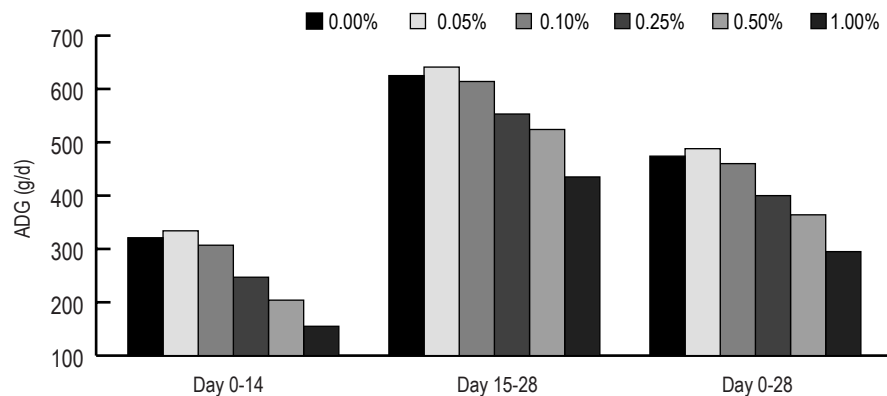


Figure 1 The effect of level of dietary ergot on ADG of piglets ($P < 0.001$, all periods).

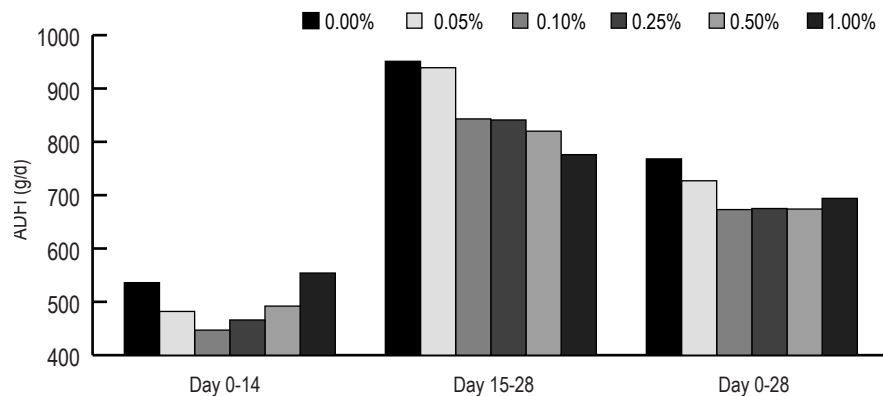


Figure 2 The effect of level of dietary ergot on ADFI of piglets ($P > 0.05$, d 0-14; $P < 0.05$, d 15-28 and d 0-28).

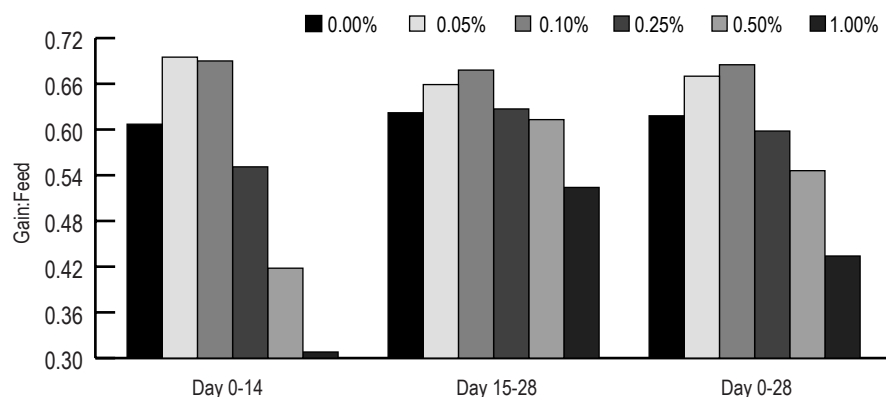


Figure 3 The effect of level of dietary ergot on feed efficiency of piglets ($P < 0.01$, all periods).

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respectively. Thus, diets contained 0.00, 1.04, 2.07, 5.21, 10.41, and 20.82 mg alkaloid/kg, respectively. Each diet was fed to 8 pens of four pigs (two barrows and two gilts) for four weeks. Average daily gain and feed efficiency were calculated from the

Diets containing up to 0.10% ergot can safely be fed to weanling pigs, provided these pigs are not destined for the breeding herd.

performance data. Prolactin analysis was conducted on serum samples collected from pigs on day 28. Regression analysis was used to determine the effect of ergot level on performance and serum prolactin concentration.

Results and Discussion

Nervous signs or cutaneous lesions associated with ergotoxicity were not observed. Average daily gain was similar for pigs that consumed diets up to 0.10% ergot, but was depressed at higher levels ($P < 0.001$) (Figure 1). The effects were most pronounced in weeks 1 and 2 with pigs fed the 1.00% ergot gaining 82 and 38% less than control (211 vs. 39 g/d, and 432 vs. 269 g/d, week 1 and 2, respectively) (Figure 1). Average daily feed intake was decreased over the entire period ($P < 0.05$) but was unaffected by ergot during weeks 1 and 2 ($P > 0.20$) (Figure 2). Feed efficiency (gain:feed ratio) was increased at low levels of ergot inclusion but was reduced with ergot levels above 0.10% (0.685 vs. 0.435, 0.10% vs. 1.00%). Serum prolactin concentration was reduced at all levels of ergot ($P < 0.0001$) (Figure 4). The maximum level of alkaloids that can be

included in weanling pig diets without adverse effects on ADG and feed efficiency was 2.31 mg alkaloid/kg. This is based on the alkaloid content and profile of ergot sclerotia used in this study and corresponds to 0.12 g ergot sclerotia per 100 g diet.

Implications

Feeding high levels of ergot alkaloid caused severe reductions in the growth performance of weanling pigs. Prolonged exposure depressed feed intake. Serum prolactin concentration was depressed which indicates that ergot may impair normal mammary gland development in gilts. When the level

of ergot in wheat is known, the level that can be used in weanling pig diet can be calculated. For example, wheat contaminated with 1.0% ergot, should not comprise more than 10% of the diet of weanling pigs.

Acknowledgements

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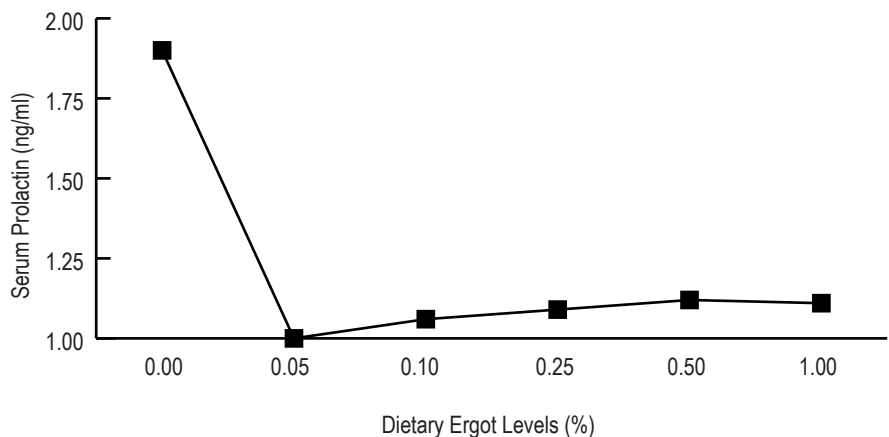


Figure 4 The effect of level of dietary ergot on serum prolactin concentration of piglets ($P < 0.0001$).