

Effect of dietary crude protein and metabolizable energy on growth performance and backfat thickness of Lanyu miniature pigs during cool and hot seasons ⁽¹⁾

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Abstract

Experiments were conducted to determine the dietary crude protein (CP) and metabolizable energy (ME) levels for growing Lanyu miniature pigs from 7 to 17 weeks of age. Experimental arrangement was $2 \times 2 \times 2$ factorial design with 2 levels of crude protein (13% and 16%), 2 levels of ME (2,800 kcal/kg and 3,100 kcal/kg) and 2 seasons (hot and cool season). Average feed intake, body weight gain, feed conversion ratio, backfat thickness and blood constituents of pigs were used as criteria for the establishment of optimal dietary CP and ME of Lanyu miniature pig. Results showed that Lanyu miniature pigs provided the diet with CP 16% have higher ($P < 0.05$) average feed intake and average daily gain during 7 - 17 wks. There was no significant difference on feed conversion ratio among all experimental groups. Pigs fed with ME 3,100 kcal/kg regardless of CP in the diet had higher ($P < 0.05$) increment of backfat thickness during 7 - 12 wks and 7 - 17 wks of age. For the season effect, higher feed intake and average daily gain were obtained when pigs were reared during the cool season (November-April) compared to the hot season (May-October). There were no season effect on feed conversion ratio and increment of backfat thickness. In conclusion, Lanyu miniature pigs fed the diet with CP 16% and ME 2,800 kcal/kg had higher feed intake and average daily gain.

Key words: Lanyu miniature pigs, Crude protein, Metabolizable energy, Growth performance, Backfat thickness.

Introduction

Laboratory animals play a crucial role in biomedical research and biotechnology development. The application of high-quality laboratory animals for research will increase the accuracy and reliability of experimental results. The quality of laboratory animals can be affected by feeding and management, breeding program, specific nutrition and pathogenic monitoring. Lanyu miniature pigs were introduced from Lanyu Islet to Taitung Animal Propagation Station (TAPS) on 1980 (Lee *et al.*, 1994). Currently, Lanyu miniature pigs have been used for biomedical research since then. Nevertheless, no specific recommendation for nutrient requirements for Lanyu miniature pigs are available so far. Lee *et al.* (2003) showed that no significance difference on growth, feed conversion ratio and carcass characteristics of 30 - 50 kg body weight (BW) Lanyu miniature pigs when daily provided 1 kg diet with CP 17.5% and DE 3,500 kcal/kg and allowed to approach pasture compared with pigs fed feed *ad libitum*. Then, calculating the minimal maintenance CP and DE requirement for Lanyu miniature pigs per day were respectively 94.7 g and 1,499 kcal. Backfat thickness of Lanyu miniature pigs (2.7 cm) was higher than that of LYD hybrid pigs (2.15 cm) at 50 kg of body weight. Laboratory pigs for medical research are required to have minimum fat deposition in order to facilitate the surgical procedure. The purpose of this study was to evaluate the effect

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