

Thesis Title The Evaluation of Protein in Weanling Pig Diets through Blood Urea Nitrogen in Spraque Dawley Rats

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Abstract

This study investigated a fast , efficient , and economical method for determining the nutritive value of proteins by making the equation from the correlation between BUN (Blood urea nitrogen) of weanling pigs and BUN of spraque dawley rats. The study was divided into 4 steps : the first step : to study on the difference of procedures to analyse BUN in order to select the best method to be used in the next step . The second step : to evaluate of protein in 5 diets of 30 day-old weanling pigs which had normal renal function by BUN analysis. The third step : to raise 1-2 , 2-3 , and >3 month-old rats which had normal function with the same diets for 7 , 10 , 15 , 20 , 25 and 30 days , and to analyse the BUN. The forth step : to study the correlation of BUN between weanling pigs and spraque dawley rats which received 5 diets for making index equations to predict the BUN weanling pigs from the BUN of rats.

The results demonstrated that the first step : the BUN from the automated procedure , diacetyl monoxime reaction procedure , and enzyme urease procedure was not significantly different ($P > 0.05$) . The BUN of the same diet in 30 day-old weanling pigs were 12.56 ± 3.2 , 12.80 ± 3.09 , and 12.75 ± 3.16 mg/dl , respectively . The second step : the evaluation of protein in 5 diets which were 16.71 , 20.43 , 21.83 , 19.64 and 18.29 percent of protein to treat 30 pigs per 1 diet for 3 weeks , it was found that in the first , second and third week the BUN of treatment 5 was

the least, 9.75 ± 13.90 mg/dl , which was significantly different ($P < 0.05$) from treatment 1 – 4 which tended to be the highest average daily gains (ADG) , 371.25 g/day , on the average of 3 weeks. When the impact of blood drawings to the ADG were observed , it was found that the pigs from which the blood sampling was taken had significant higher ADG than the other group from which no blood was taken for sampling ($P < 0.05$) , 324.3 ± 3 and ± 124 g/day , respectively .

The third step : the results of raising the rats with the same 5 diets demonstrated that there were no effects from 7 , 10 , 15 and 20 days of feeding to the BUN of all treatments ($P > 0.05$) . But the different age and diets affected them. The BUN of rats >3 months old of age was significantly different ($P < 0.05$) from 1-2 month old rats , but there was no difference between 1-2 and 2-3 month-old rats ($P > 0.05$) .

The forth step : the correlation of BUN between weanling pigs and rats which received the same 5 diets were analysed. This research indicated that after 1 , 2 and 3 weeks weanling pigs showed the most correlation with 1-2 , 2-3 and 1-2 month – old rats , respectively , after 7 days of feeding , $r = 0.704$, 0.745 and 0.810 , respectively. The equations were $Y = 7.61 + 0.33 X$, $Y = 3.67 + 0.55 X$, and $Y = 3.15 + 0.58 X$. In addition , when the means of BUN from 7 , 10 , 15 and 20 days of feeding were made, it was found that after 1 , 2 and 3 weeks weanling pigs showed the most correlation with 1-2 , >3 and 1-2 month – old rats , respectively , $r = 0.675$, 0.607 and 0.664 , respectively. The equations were $Y = 5.84 + 0.44 X$, $Y = 0.85 X - 2.85$ and $Y = 1.80 + 0.66 X$. When X were the BUN of rats , and Y were the BUN of weanling pigs .