

## A method for determining the amino acid and glucose requirements of new lines of pig

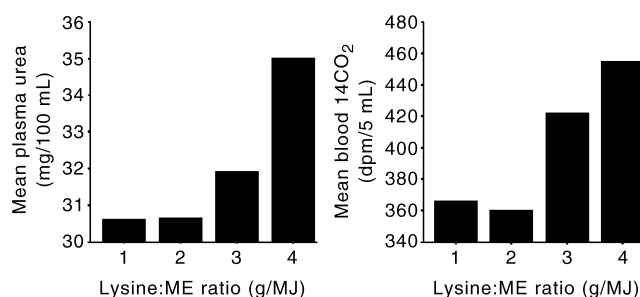
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Consumer market demand for lean meat continues to encourage research and development of lines of pig that produce lean mass quickly and efficiently. With genetic changes would come changes in the amounts, and ratios, of absorbed amino acids and glucose that would be required by these pigs to meet their potential for lean mass growth. This study was undertaken to examine the feasibility of using plasma concentration of urea as a basis of a quicker method for determining the amino acid and glucose requirements of new lines of pigs.

Eight Large White weaner pigs (19–20 kg) were used to examine the changes in plasma concentrations of urea and  $^{14}\text{CO}_2$  when  $[1-^{14}\text{C}]$ Leucine (Leu) and different levels of amino acids and glucose were infused intravenously. Each pig was installed with chronic indwelling catheters in the left and right jugular veins and confined in individual cages, in a metabolism room maintained at an ambient temperature of 24°C, relative humidity of approximately 60% and a 12 h/12 h light/dark lighting regime. The animals were examined in two groups of four in a 4 (days)  $\times$  4 (rates of infusion) Latin Square design. On each of the four days each animal received for 6 h an intravenous infusion of a solution of glucose + amino acids that supplied metabolisable energy (ME) at a rate of 0.75 MJ/h but a Lysine (Lys) to ME ratio (g/MJ) of either 0.7, 0.8, 0.9, or 1.0. The composition of amino acids in the infusates, except for Lys, which was varied, was similar to that in pig muscle.  $[1-^{14}\text{C}]$ Leu was infused simultaneously, but for 4 h only.



It is clear from the data presented in the figures that significant changes ( $P < 0.05$ ) in the concentration of plasma urea would reflect changes in the rate of oxidation of dietary amino acids as these would be determined by the ratios of amino acid to amino acid and amino acids to glucose. Both the changes in concentration of plasma urea and of blood  $^{14}\text{CO}_2$  were similar in pattern and indicate that a ratio of true digestible Lys to ME of 0.8 or between 0.8 and 0.9 would be optimal for protein synthesis and deposition in these pigs. It is concluded that concentration of urea in plasma could be used as a basis of a quicker and reliable method for determining the amino acid and glucose requirements of new lines of pig.

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