

Nucleotide deficiencies in starter diets for weanling pigs

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ABSTRACT: The objective of the current work was to investigate if traditional starter diets fed to weanling pigs are adequate or deficient in nucleotides. The nucleotide concentrations in sow's milk were measured at d 3, 7, 14, 21, and 28 of lactation. The results of this experiment showed that the concentration of nucleotides in sow's milk is relatively constant from d 14 to d 28 of lactation. The concentration of 5'AMP, 5'CMP, 5'GMP, 5'IMP, and 5'UMP is approximately 117.5, 56.0, 185.5, 23.5, and 2,334.5 ppm, respectively (DM basis) during this period. Because there are no established requirements of nucleotides for weanling pigs, it was assumed that these values also represent the requirements for nucleotides for pigs during the post-weaning period. Ten feed ingredients (i.e., barley, casein, corn, fish meal, naked oats, spray dried protein plasma, spray dried red blood cells, soybean meal, soy protein concentrate, and dried whey) that are often included in starter diets for pigs were then analyzed for their concentrations of nucleotides. Using the data for the nucleotide concentration in the feed ingredients, a starter diet was formulated using corn (49.32%), dried whey powder (20%), soybean meal (8%), fish meal (8%), spray dried protein plasma (7.5%), and vitamins, minerals, oil, and crystalline AA (7.18%). The concentration of nucleotides in this diet was calculated to be 6.46, 58.99, 2.03, 4.33, and 1.00 ppm of 5'AMP, 5'CMP, 5'GMP, 5'IMP, and 5'UMP, respectively. By subtracting the values calculated for the diet from the values found in the milk, it was found that the diet is adequate in 5'CMP, but severely deficient in all of the other four 5'nucleotides. The deficiency was calculated to be

111.04, 183.47, 19.17, and 2,333.5 ppm for 5'AMP, 5'GMP, 5'IMP, and 5'UMP, respectively. It is concluded that typical starter diets fed to weanling pigs are deficient in nucleotides. Because the need for nucleotides is increased during periods of stress the deficiency of nucleotides may compromise pig performance during the immediate post-weaning period.

Key Words: Nucleotides, Pigs, Starter diets, Weaning