Threonine Requirement of the High-Producing Lactating Sow

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The Message

Threonine is often the second limiting amino acid in most practical swine diets. Therefore, the threonine requirement of the high producing sow in lactation was determined in this study.

To minimize sow body tissue breakdown, the threonine requirement was found to be 37.3, 40.0 and 38.9 g total threonine/d (28.7, 30.8 and 30.0 g digestible threonine/d) for parity 1, 2 and 3+ sows, respectively.

To maximize litter growth, the threonine requirement was found to be 36.6, 39.2 and 38.2 g total threonine/d (28.2, 30.2 and 29.5 g digestible threonine/d) for parity 1, 2 and 3+ sows, respectively.

Introduction

Reproductive performance continues to increase within the pork industry. Logically, amino acid requirements need to be re-defined for sows with larger litters in lactation. Threonine is often the second limiting amino acid in most practical swine diets; however, limited research has been done on the threonine requirement of the sow in lactation.

Objectives

The objective of this study was to determine the threonine requirement of the high-producing sow in lactation.

Material and Methods

Lactation diets were formulated to contain .80 or 1.06% total lysine with threonine set at 37.5% of lysine and added at increments of .05% to maximum total threonine levels of .65 and .70% for the .80 and 1.06% lysine diets, respectively.

Sow BW gain exceeded expectation, averaging 6.9, 7.4 and 7.2 kg/d for parity 1, 2 and 3+ sows, respectively. Sows gained an average of 4.8 kg in lactation and body weight gain was maximized at .54% total threonine (quadratic; P < .05).

Plasma urea nitrogen levels were minimized at .54% total threonine (quadratic; P < .05). Average piglet weight at weaning (5.6, 6.2 and 5.8 kg for parity 1, 2 and 3+, respectively) and litter weight gain (2.49, 2.53 and 2.44 kg/d for parity 1, 2 and 3+, respectively) were maximized at .53% total threonine. The subsequent total piglets born (mean = 12.3) and the subsequent born alive (mean = 11.3) were not affected by threonine treatment (P > .10).

Results

To minimize sow body tissue breakdown, the threonine requirement was found to be 37.3, 40.0 and 38.9 g total threonine/d (28.7, 30.8 and 30.0 g digestible threonine/d) for parity 1, 2 and 3+ sows, respectively.

To maximize litter growth, the threonine requirement was found to be 36.6, 39.2 and 38.2 g total threonine/d (28.2, 30.2 and 29.5 g digestible threonine/d) for parity 1, 2 and 3+ sows, respectively.

The maintenance requirement for threonine in the sow is 41 mg total threonine/kg BW-0.75. The threonine requirement for litter growth is 14.3 g total threonine/kg litter growth. Using these requirements for maintenance and litter growth, pork producers can calculate the threonine requirement of lactating sows on their farms.

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