Effect of phytase-xylanase supplementation on nitrogen balance in growing-finishing pigs fed wheat-based diets

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Dietary protein reduction reduces environmental impact of pig production without impairing pig performance. Phytase reduces phosphorus excretion and xylanase improves carbohydrate digestion. There is little information on the metabolic consequences of feeding reduced protein diets with phytase and xylanase, alone or in combination. It was hypothesized phytase and/or xylanase inclusion in pig diets would improve protein and carbohydrate utilization.

72 gilts (58 ± 6 kg, initial BW) were fed *ad libitum* six diets*:* high protein and phosphorus control (C), a low protein diet with added L-lysine HCl, L-threonine (LP+), low protein with no added phosphorus (LP-), and LP- diets with added phytase (P), xylanase (X) or phytase plus xylanase (PX); based on wheat, wheat middlings and soybean meal (for C only), in a randomised complete design. The diets were isoenergetic, containing 19% (C) 16% (LP+) and 16% (LP-, P, PX and X) crude protein. Data were analyzed by Proc Mixed of SAS. Average daily gain, daily feed intake, gain to feed were not affected by dietary treatments.

Parameter	Diets						SE	*P*
	C	LP+	LP-	P	PX	X		
N intake, g/d	71.2	59.0	57.7	58.1	58.3	56.4	1.6	0.0006
Fecal N, g/d	5.72	4.00	4.40	4.05	3.99	3.63	0.3	0.003
Urine N, g/d	44.0	30.8	29.6	30.0	31.0	30.3	1.4	<.0001
Retained N, g/d	21.5	24.2	23.7	24.0	23.3	22.4	1.6	0.827
Retained, %	30.2	41.0	41.1	41.3	40.0	39.7	0.8	0.001

Implications: Feeding reduced protein diets supplemented with synthetic amino acids and phytase-xylanase to finisher pigs will maintain performance. This will reduce nitrogen excretion and thus environmental impact of the pork industry. (Supported by Danisco Animal Nutrition, Alberta Pork, Degussa AG)