Feeding wheat millrun to starter pigs

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Take Home Message

Wheat millrun could be a cost-effective feedstuff for sustainable pork production. The effects of substitution of soybean meal (SBM) and wheat with increasing inclusion of wheat millrun on diet nutrient digestibility and growth performance of young pigs were evaluated. In total, 160 weaned pigs were fed five pelleted wheat-based diets containing 0, 5, 10, 15 or 20 per cent wheat millrun in substitution for up to 15 % SBM and 5 per cent wheat for three weeks starting two weeks after weaning at 21 days of age (Initial BW = 9.8 kg). Diets were balanced for net energy (NE) using canola oil and for digestible amino acids using crystalline amino acids. Increasing dietary inclusion of wheat millrun did not affect average daily feed intake and average daily gain, and improved feed conversion (feed:gain). In conclusion, 20 per cent wheat millrun can replace 15 per cent SBM and 5 per cent wheat in diets formulated to equal dietary NE value and standardized ileal digestible lysine content and fed to nursery pigs starting two weeks after weaning without detrimental effects on growth performance.

Why wheat millrun?

Alternative ingredients such as wheat co-products from flour milling of wheat such as wheat millrun or wheat middlings are increasingly included in swine diets to reduce feed cost. Annually, 700,000 MT of milling co-products from processing 3.1 million MT of wheat in Canadian flour mills could be destined for animal feeding. Feeding alternative feedstuffs provides challenges to achieve predictable growth performance. Compared with wheat grain, wheat millrun contains more crude protein (CP), lipids and fibre, and consequently has a lower net energy (NE) value. As an omnivorous species, swine has the potential to convert high fibre diets into pork products. However, concerns about high inclusion of wheat millrun in swine diet exist because dietary fibre of wheat millrun is difficult to digest.

Wheat millrun may provide an economic advantage by replacing part of soybean meal (SBM) in swine diets, because it is much cheaper. However, wheat millrun contains much less CP than SBM. Thus, it is a challenge for weaned pigs to replace dietary SBM with wheat millrun. Previously, an upper dietary inclusion of 15% wheat millrun was suggested for finishing pigs. However, little information exists on

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the upper limit of dietary inclusion of wheat millrun in substitution for SBM and wheat for weaned pigs without affecting growth performance while reducing feed cost.

Nutrient profile of wheat millrun

The wheat millrun sample was sourced from Masterfeeds (Edmonton, AB, Canada). The sample contained 12.1 per cent ADF, 37.0 per cent NDF, 16.8 per cent CP, 15.2 per cent starch, 0.74 per cent lysine and 0.72 per cent available lysine, 0.23 per cent methionine, 0.52 per cent threonine, and one per cent phosphorus on as fed basis.

The weaned pig trial

The animal trial was conducted at the Swine Research and Technology Centre, University of Alberta (Edmonton, AB, Canada).

Experimental diets were formulated to contain 0, 5, 10, 15 or 20% wheat millrun in substitution of up to 15 per cent SBM and 5 per cent wheat grain. Diets were formulated to provide 2.41 Mcal NE/kg, 4.39 g standardized ileal digestible (SID) lysine/Mcal NE and other amino acids as ideal ratios to lysine. Diets were balanced for NE using canola oil and for digestible amino acids using crystalline amino acids. Diets contained 5 per cent canola protein concentrate and 5 per cent herring meal as specialty ingredients. Diets did not contain antimicrobials or growth promoters. Diets were steam pelleted at 70°C.

In total, 160 pigs (Duroc × Large White/Landrace F1; Hypor, Regina, SK, Canada) were weaned at 21 days of age (Initial BW = 9.8 kg) and housed in 40 pens with 4 pigs in each pen. After weaning, pigs were fed sequentially commercial phase one and phase two diets (Hi-Pro Feeds, Sherwood Park, AB, Canada) for two and 12 days, respectively. Pigs in each pen were then fed a randomly allocated one of the five test diets for three weeks. Pigs had free access to water and the assigned diets. Individual pig body weight and pen feed disappearance were measured weekly.

Trial results

For the entire 21-day trial, increasing dietary inclusion of wheat millrun from 0 to 20 per cent did not affect feed intake or growth, and improved feed conversion (feed:gain; Figure 1). Final BW was 20.5, 19.9, 20.4, 20.6 and 20.6 kg for pigs fed 0, 5, 10, 15 and 20% wheat millrun, respectively, and was not affected by wheat millrun inclusion.

Increasing dietary inclusion of wheat millrun reduced the apparent total tract digestibility (ATTD) of gross energy of diets from 83.3 per cent to 79.3 per cent, but did not affect the ATTD of CP at about 80.3 per cent. Diet digestible

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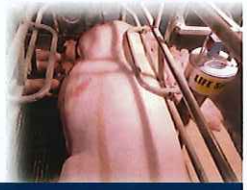

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energy values were maintained at about 3.35 Mcal/kg with increasing inclusion of wheat millrun and the predicted NE values of diets were increased from 2.36 to 2.38 Mcal/kg with increasing inclusion of canola oil.

Cost vs. benefit

Assuming prices per MT for wheat $240, wheat millrun $195, soybean meal $590, canola oil $1,165, L-lysine-HCl $2,020, L-threonine $4,600, and DL-methionine $8,000, increasing dietary inclusion of wheat millrun from 0 to 5, 10, 15 and 20%, reduced feed cost by $11.0, 20.0, 28.4 and 36.6 per MT, respectively; and reduced feed cost per unit of body weight gain by 3.3, 7.6, 10.3 and 11.6 cents/kg, respectively.

Recommendation

Wheat millrun is an alternative ingredient to be considered for weaned pigs. Once pigs are eating well at two weeks after weaning, up to 20 per cent wheat millrun can be included in diets for nursery pigs to replace up to 15 per cent SBM and five per cent wheat. Diets should be formulated based on NE and SID lysine content, so that growth performance of nursery pigs fed wheat millrun could be maintained.

Acknowledgements

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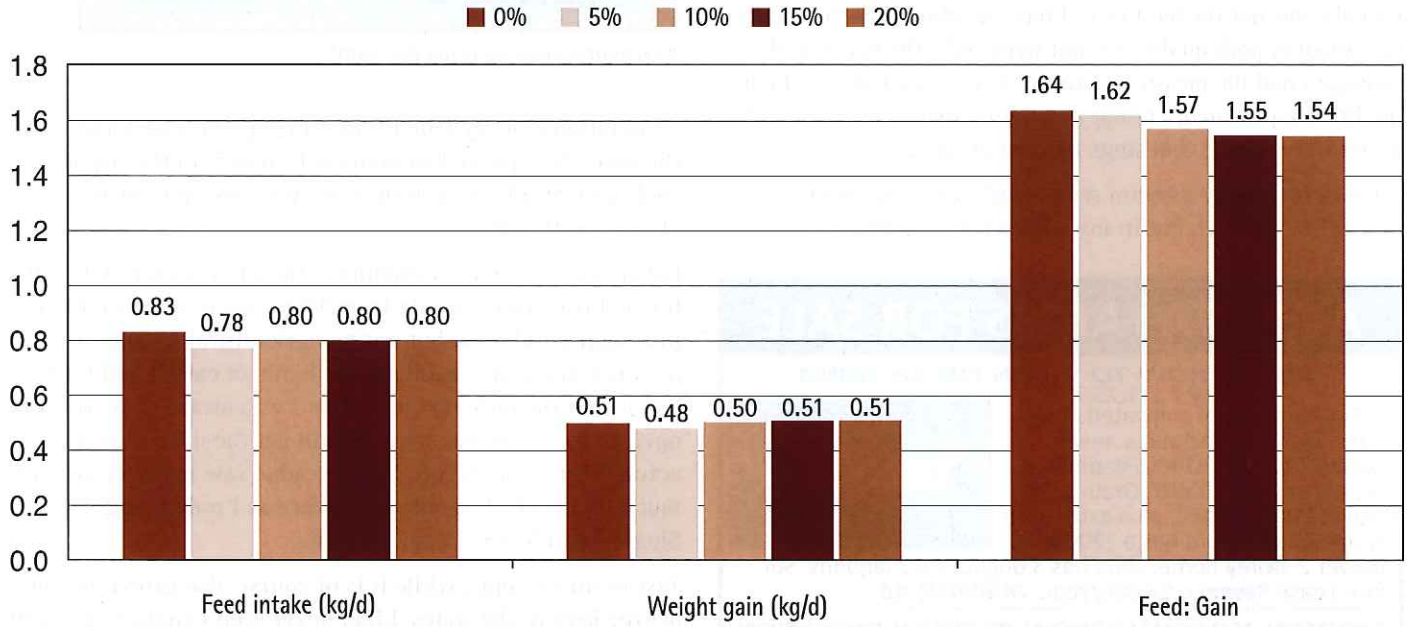
Figure 1. Growth performance of piglets fed increasing inclusion of wheat millrun in the diets



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