Comparison of 4 Spring Triticale Cultivars and Low-Protein Wheat on Growth Performance and Nutrient Digestibility in Weaned Pigs

Ruwani Seneviratne[1,3], Ruurd Zijlstra[3], and Eduardo Beltranena*[1,3]

Alberta Agriculture and Rural Development, Edmonton, Alberta[1], University of Alberta, Edmonton, Alberta[3]

*e-mail: eduardo.beltranena@gov.ab.ca · tel: 780.427.4567 · fax: 780.427.1057

BACKGROUND

Feed grain competitiveness is of paramount importance to the sustainability of the pork industry in Western Canada. Triticale is a hybrid grain developed by crossing wheat and rye. Triticale grain cultivars yield 5-20% more grain than wheat cultivars. Thus, there is the potential of producing more pork per planted area of triticale compared to wheat. Bunker and Tyndal are new spring triticale cultivars developed by the Field Crop Development Centre (Lacombe, Alberta). There is no information on feeding Tyndal or Bunker triticale cultivars to pigs.

OBJECTIVE

The objective of this study was to compare growth performance and apparent total tract digestibility (ATTD) of nutrient of weaned pigs fed different spring triticale cultivars among themselves and to low protein Canadian Prairie Spring (CPS) red wheat 5700 (control).

APPROACH

This experiment was conducted in three nursery rooms at Swine Research Technology Centre. Each room housed 80 pigs in 20 pens, 2 barrows and 2 gilts per pen for 5 weeks. Pigs started on test one week after weaning at 20 days of age (6.3±0.94 kg).

TEST DIETS

Table 1. Ingredient composition of control and test diets

Ingredient, %	CPS Wheat 5700	Triticale			
		Alta	Bunker	Pronghorn	Tyndal
CPS Wheat 5700	62.6	-	-	-	-
Alta triticale		62.6	-	-	-
Bunker triticale		-	62.6	-	-
Pronghorn triticale		-	-	62.6	-
Tyndal triticale		-	-	-	62.6
Soybean meal	15.0	15.0	15.0	15.0	15.0
Lactose	5.0	5.0	5.0	5.0	5.0
Herring fish meal	5.0	5.0	5.0	5.0	5.0
Canola oil	5.0	5.0	5.0	5.0	5.0
Soy protein concentrate	2.5	2.5	2.5	2.5	2.5
Limestone	1.0	1.0	1.0	1.0	1.0
Mono/dical phosphate	0.8	0.8	0.8	0.8	0.8
Marker	0.8	0.8	0.8	0.8	0.8
Salt	0.5	0.5	0.5	0.5	0.5
Vitamin premix	0.5	0.5	0.5	0.5	0.5
Mineral premix	0.5	0.5	0.5	0.5	0.5
L-lysine HCl	0.35	0.35	0.35	0.35	0.35
L-threonine	0.25	0.25	0.25	0.25	0.25
DL-methionine	0.15	0.15	0.15	0.15	0.15
L-tryptophan	0.04	0.04	0.04	0.04	0.04
Choline chloride 60%	0.03	0.03	0.03	0.03	0.03

Pigs were weighed at the initiation of feeding the experimental diets (d 0) and on d 7, 14, 21, and 28. Pen feed disappearance was recorded weekly. Collected data were used to calculate pen average daily weight gain (ADG), average daily feed intake (ADFI), and feed efficiency expressed as ADG/ADFI (G:F).

Freshly voided faeces were collected by grab sampling from each pen from 0800 to 1600 h on d 15 and 16. Faeces were pooled by pen, frozen at -20°C and subsequently freeze dried. Ground samples of diets, ingredients and lyophilized faeces were analysed for nutrient composition.

RESULTS

BODY WEIGHTS

Weekly body weights of pigs fed Alta, Bunker and Pronghorn triticale diets were not different from pigs fed the control CPS wheat diet. Pigs fed Tyndal triticale were lighter than controls fed CPS wheat at d 21 and d 28.

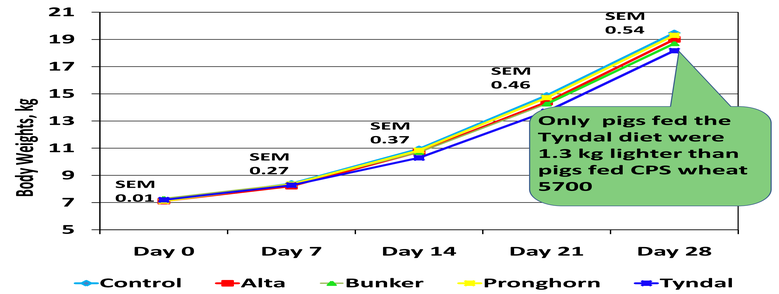

Figure 2. Comparison of feeding four triticale varieties on body weights of weaned pigs on trial weigh days

GROWTH PERFORMANCE

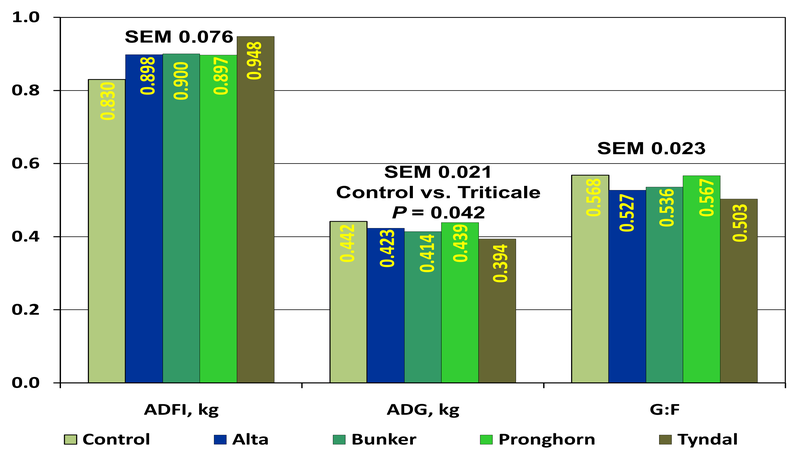

Figure 3. Growth performance of weaned pigs fed four Triticale cultivars or low protein CPS wheat 5700 (0 to 28 days)

- For the entire study (d0 to 28), pigs fed Pronghorn triticale grew 45 g faster than pigs fed Tyndal triticale. Pigs fed the control CPS wheat grew 25g faster than pigs fed the four triticale cultivars.
- For the entire study (d 0 to 28) and for each weekly period the feed intake of pigs fed triticale diets did not differ from pigs fed the control CPS wheat diet (ADFI, Figure 3).
- For the entire study (d 0 to 28), the feed conversion of pigs fed triticale diets did not differ from pigs fed the control CPS wheat diet (F:G, Figure 3).
- Only for the d 15 to 21 period, feed conversion of pigs fed the triticale diets was 0.1 lower than the controls fed CPS wheat 5700.

NUTRIENT DIGESTIBILITY

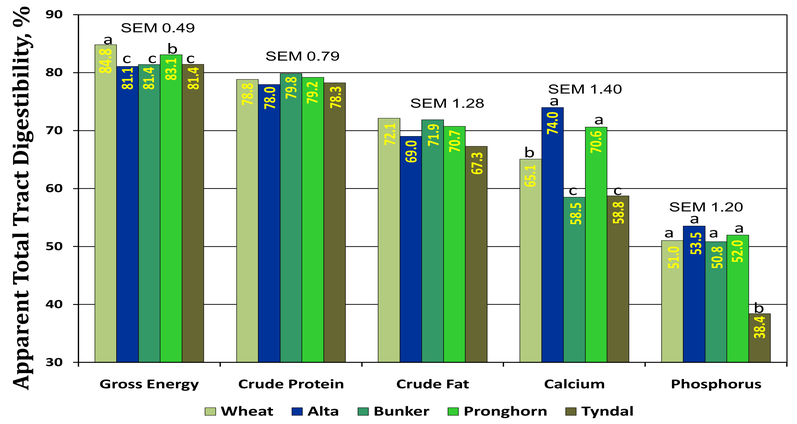

Figure 4. Apparent total tract digestibility (ATTD) of nutrients of triticale and CPS wheat 5700 diets fed to weaned pigs

The ATTD of gross energy of triticale diets was 3% lower than that of the control CPS wheat diet. The ATTD of gross energy of the Pronghorn diet was higher than that of the other triticale cultivar diets. The ATTD of crude protein and crude fat was not different among test diets. The ATTD of calcium and phosphorous was different among triticale diets and from the control CPS wheat diet.

TAKE HOME MESSAGE

The results of the present study indicate that up to 63% triticale grain can be included in weaned pig diets in full substitution for low-protein CPS wheat 5700. Diets formulated with triticale cultivars, except Tyndal, resulted in similar growth performance to feeding control CPS wheat 5700. Bunker, Pronghorn, and Alta spring triticale cultivars can thus be fed as replacements for wheat in weaned pig diets.

ACKNOWLEDGEMENTS

AARI Alberta Agricultural Research Institute · Canadian Triticale Biorefinery Initiative · Government of Alberta · University of Alberta · Swine Research & Technology Centre