THE NUTRITIVE VALUE OF HIGH-YIELDING TRITICALE VARIETIES AND THEIR POTENTIAL FOR INCLUSION IN POULTRY DIETS

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Triticale is a cereal grain that holds great promise as an alternative to wheat and other conventional grains used in poultry diets. Triticale generally has a higher yield than wheat and adapts to more difficult agronomic conditions than wheat (Korver *et al.,* 2004). A crop breeding group at the University of New England (UNE) has developed varieties that are even more high-yielding and more disease-resistant than the current commercial strains. These varieties will need further evaluation to establish their potential for animal, and particularly poultry feeding.

Eight varieties of triticale were obtained from the breeding group and subjected to detailed and proximate analysis, prior to feeding trials. Cultivar H116 contained more protein than the other cultivars (139 g/kg) while the lowest protein content was observed in cultivar H127 (Table 1). The cultivars were very similar in lysine content, containing between 4.3 g/kg in cultivar H127 and 4.9 g/kg in H249. Methionine content varied from 1.6 (cultivar H127) to 2.0 g/kg in cultivar H249. The gross energy content of the grains ranged from 18.2 (H127 and 128) to 18.5 MJ/kg (H55); the other five cultivars being iso-caloric at 18.4 MJ/kg. Crude fat was also highest (27.4 g/kg) in cultivar H55 and lowest in H128, and this may be the major cause of differences in energy values of between these two cultivars. Total starch varied from 578 g/kg in cultivar H157 to 657 g/kg in H249. Cultivar H55 was the highest in non-starch polysaccharides, 139 g/kg while H20 contained only 90 g/kg.

Calcium content varied from 0.3 to 0.5 g/kg, respectively in cultivars H426 and H55, while the phosphorus content was highest (4.4 g/kg) in cultivar H157 and lowest (3.5 g/kg) in H20. Phytate was quite high in all cultivars, generally close to half of the total P content. Cultivar H20 had the lowest level of phytate, 1.8 g/kg, while the highest amount, 2.2 g/kg, was found in H249.

Table 2 shows the digestibility of dry matter, starch and viscosity of samples during *in vitro* digestion. The *in vitro* method was adapted from Babynsky *et al* (1990), with slight modifications. The *in vitro* dry matter digestibility (IVDMD) varied between 71.1 % (H55) and 77.5 % (H128). Starch digestibility was between 19.5 % (H249) and 40.3 % (H157), and this low *in vitro* digestibility may be due to the high content of resistant starch. Cultivar H55 was the most viscous during digestion (1.2 cP) and this may be due to the high concentration of NSP in this cultivar.

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Tabel 1. Chemical composition (g/kg, dry matter) of the different varieties of triticale

Component	Variety							
	H116	H127	H128	H157	H20	H249	H426	H55
Dry matter	879	873	873	873	872	875	871	873
Ash	19.2	17.4	18.1	18.7	18.1	17.5	17.5	16.7
Crude protein	139	125	135	136	135	136	132	126
Gross Energy (MJ/kg)	18.4	18.2	18.2	18.4	18.4	18.4	18.4	18.5
Crude fat	18.5	15.9	13.9	14.6	16.3	17.5	19.1	27.4
Ca	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5
P	4.1	4.0	4.1	4.4	3.5	3.6	4.0	3.7
K	5.7	5.5	5.8	5.7	5.9	5.4	5.7	5.0
Mn (mg/kg)	45.7	59.6	44.1	59.7	53.5	49.4	45.9	47.3
Na (mg/kg)	26.5	16.6	33.1	35.0	17.7	38.8	13.8	30.1
Total Starch	612	654	639	578	612	657	626	592
Resistant starch	*442*	*478*	*484*	*463*	*455*	*509*	*453*	*453*
P-Phytate	2.0	2.1	2.1	2.2	1.8	2.2	2.0	1.9
Total NSP	102	104	100	119	90	96	100	139
Soluble NSP	*10*	*12*	*10*	*10*	*11*	*9*	*10*	*11*
Insoluble NSP	*92*	*91*	*89*	*110*	*79*	*87*	*90*	*128*
Free sugars	31	27	29	23	31	27	33	28
Amino Acids								
Arginine	7.5	6.6	7.6	7.4	7.3	7.9	7.6	7.4
Threonine	4.4	3.9	4.6	4.4	4.3	4.7	4.4	4.5
Alanine	5.9	5.1	5.7	5.5	5.8	6.0	5.6	5.4
Lysine	4.6	4.3	4.8	4.6	4.7	4.9	4.7	4.6
Methionine	1.9	1.6	1.8	1.9	1.9	2.0	2.0	1.8
Valine	6.5	5.5	6.5	6.4	6.4	6.8	6.4	6.1
Isoleucine	4.9	4.1	4.8	4.8	4.7	5.0	4.8	4.5
Leucine	9.1	8.0	9.3	9.2	8.9	9.5	9.0	8.8
Phenylalanine	6.2	5.6	6.6	6.4	6.0	6.5	6.4	6.1

Tabel 2. *In vitro* digestibility of samples

Component	Variety							
	H116	H127	H128	H157	H20	H249	H426	H55
Dry matter digestibility (%)	75.8	76.3	77.5	74.0	75.4	77.3	77.4	71.1
Starch digestibility (%)	22.0	24.4	25.8	40.3	20.9	19.5	39.4	30.2
Viscosity during digestion (cP)	1.0	1.1	1.0	1.0	1.0	1.1	1.0	1.2

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