

Cereal Watch



Update 2 • October 2016

CerealWatch Update

Summary

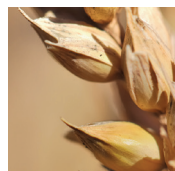
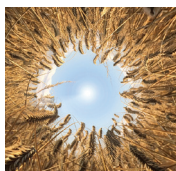
- CerealWatch provides an overview of the nutritional quality of new crop cereals. By the end of September, Trouw Nutrition GB had analysed 355 samples of barley and wheat.
- Wheat to date has a similar bushel weight and protein 2016 vs 2015, but lower starch and energy. For poultry using average poultry AME, this year's wheat will add around £1.00 per tonne to formulation costs.
- Barley to date has a lower bushel weight but higher starch, protein and energy vs 2015. The effect is a 25p/t swing in formulation cost in poultry feed.
- There are regional differences in cereal qualities so it is important to analyse the full nutrient content of incoming crops to optimise formulation and performance.

Wheat

- Protein is similar for 2015 wheat to 2016 new crop. This trend is also reflected by amino acid values.
- Energy values are lower than 2015 reflecting the continuing decrease in enzymatic starch.
- The average 2016 wheat will increase the formulation cost of a broiler feed by around £1.00 per tonne, related to the lower energy content.

	Wheat 2015 Harvest Average				Wheat 2016 New Crop August & September			
	Average	Max	Min	Std. Dev	Average	Max	Min	Std. Dev.
Bushel Weight kg/hl	77.29	86.80	62.60	3.30	77.11	90.40	62.30	2.99
Enzymatic Starch (%)	57.76	62.96	47.29	2.36	55.83	60.75	48.18	2.31
Crude Protein (%)	10.23	14.31	7.57	1.03	10.30	14.02	7.92	1.06
Methionine (%)	0.15	0.21	0.12	0.02	0.16	0.21	0.12	0.02
Lysine (%)	0.28	0.38	0.23	0.03	0.30	0.40	0.23	0.03
Tryptophan (%)	0.14	0.17	0.12	0.01	0.14	0.17	0.12	0.01
Broiler AMEn MJ/kg	11.65	12.44	10.01	0.35	11.46	12.20	10.37	0.33
Poultry AMEn MJ/kg	12.59	13.41	11.30	0.28	12.44	12.97	11.61	0.24
Pig NE MJ/kg	9.84	10.56	8.89	0.22	9.75	10.19	9.17	0.18
Ruminant ME MJ/kg	11.81	12.77	10.75	0.25	11.74	12.26	11.16	0.19

Fig. 1: A table showing differences between the 2015 new crop wheat, and 2016 new crop (August and September).



The regional split in wheat quality in 2016 crop is given below:

	Midlands	North	Scotland	South East	South West	Wales and West Midlands	Std. Dev.
Bushel Weight kg/hl	76.91	77.01	78.65	77.01	78.26	76.25	0.68
Enzymatic Starch (%)	55.66	55.61	59.21	56.15	55.53	56.36	1.41
Crude Protein (%)	10.43	9.87	9.30	10.25	10.76	9.68	0.51
Methionine (%)	0.16	0.15	0.14	0.16	0.16	0.14	0.01
Lysine (%)	0.30	0.29	0.27	0.30	0.31	0.27	0.02
Tryptophan (%)	0.14	0.14	0.13	0.14	0.15	0.13	0.01
Poultry AMEn MJ/kg	12.43	12.39	12.74	12.51	12.43	12.44	0.13
Broiler AMEn MJ/kg	11.45	11.40	11.83	11.53	11.43	11.47	0.16
Pig NE MJ/kg	9.74	9.73	9.95	9.81	9.76	9.74	0.09
Ruminant ME MJ/kg	11.76	11.68	11.85	11.81	11.74	11.66	0.07

Fig. 2: A table showing the regional average key nutrient values in the 2016 new crop wheat (August and September).

Regional Variation:

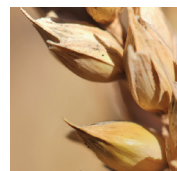
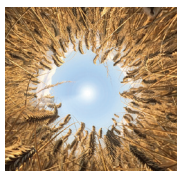
- Regional variation is apparent with Scotland currently having the highest energy and starch content but lowest protein.
- The lowest overall wheat quality is seen in the north of England.

Barley

- Whilst bushel weight is on average lower than 2015, protein, starch and energy content are all higher.
- The 2016 new crop barley could give a saving of approximately 25p per tonne in formulations compared to 2015. (Calculated using current RM costs and dependent on raw material availability and nutrient density of diet formulation).

	Barley 2015 Harvest Average				Barley 2016 New Crop – August & September			
	Average	Max	Min	Std. Dev.	Average	Max	Min	Std. Dev.
Bushel Weight kg/hl	66.26	75.40	55.30	4.17	65.03	73.60	52.20	3.74
Enzymatic Starch (%)	51.57	58.41	37.90	3.53	53.24	60.32	42.20	3.25
Crude Protein (%)	9.23	13.2	7.41	0.89	9.79	11.67	7.48	0.97
Methionine (%)	0.15	0.18	0.12	0.01	0.16	0.19	0.13	0.01
Lysine (%)	0.33	0.39	0.28	0.02	0.35	0.41	0.29	0.02
Tryptophan (%)	0.12	0.14	0.10	0.01	0.13	0.15	0.10	0.01
Broiler AMEn MJ/kg	10.44	11.46	8.41	0.51	10.71	11.75	8.85	0.50
Poultry AMEn MJ/kg	11.57	12.33	9.80	0.42	11.79	12.65	10.14	0.41
Pig NE MJ/kg	9.14	9.72	7.72	0.33	9.22	9.88	7.95	0.31
Ruminant ME MJ/kg	10.97	11.51	9.91	0.31	11.03	11.65	9.95	0.33

Fig. 3: A table showing differences between the 2015 new crop barley and 2016 new crop (August and September).



The regional split in barley quality in 2016 crop is given below:

	Midlands	North	Scotland	South East	South West	Wales and West Midlands	Std. Dev.
Bushel Weight kg/hl	62.53	65.64	64.31	64.59	65.07	65.72	1.18
Enzymatic Starch (%)	51.95	52.65	50.89	54.33	52.92	54.01	1.28
Crude Protein (%)	10.00	9.69	9.21	9.97	9.88	9.59	0.30
Lysine (%)	0.36	0.35	0.33	0.36	0.35	0.35	0.01
Methionine (%)	0.16	0.16	0.14	0.16	0.16	0.16	0.01
Tryptophan (%)	0.13	0.13	0.12	0.13	0.13	0.13	0.01
Adult Barley AMEn MJ/kg	11.65	11.72	11.39	11.97	11.73	11.86	0.20
Broiler Barley AMEn MJ/kg	10.56	10.60	10.25	10.91	10.66	10.80	0.23
Pig NE MJ/kg	9.10	9.18	8.94	9.35	9.17	9.28	0.14
Ruminant ME MJ/kg	11.02	11.03	10.69	11.15	10.98	11.06	0.16

Fig. 4: A table showing the regional average key nutrient values in the 2016 new crop barley (August and September).

- In contrast to wheat, Scotland has the lowest quality of barley, although this is not reflected in the bushel weight.
- The highest quality barley is seen in the south east.

Nutrient trends

- There is little correlation between crude protein and enzymatic starch.
- Enzymatic starch, poultry energy and protein show a very minimal correlation with bushel weight.
- Bushel weight cannot be used as an accurate prediction of protein, or enzymatic starch or poultry AMEn energy values. This should be kept in mind when deciding how to assess the quality of new crop cereals.

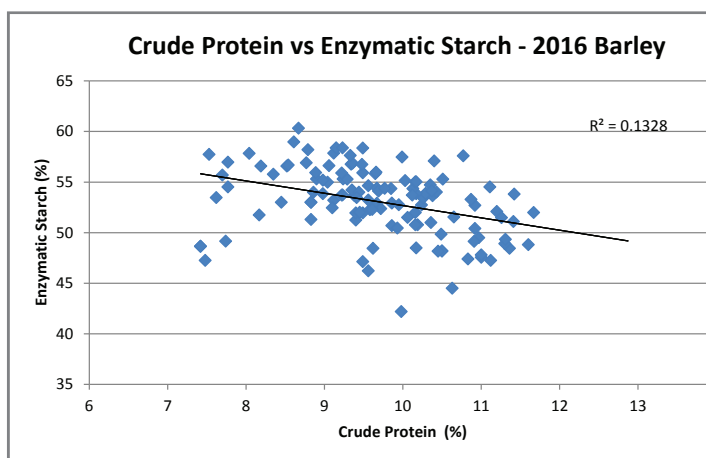


Fig. 5: A graph showing the relationship between enzymatic starch and crude protein in the 2016 new crop barley.

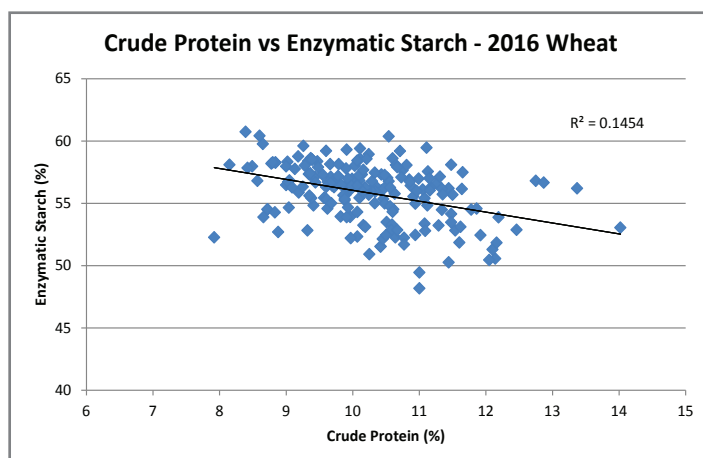


Fig. 6: A graph showing the relationship between enzymatic starch and crude protein in the 2016 new crop wheat.

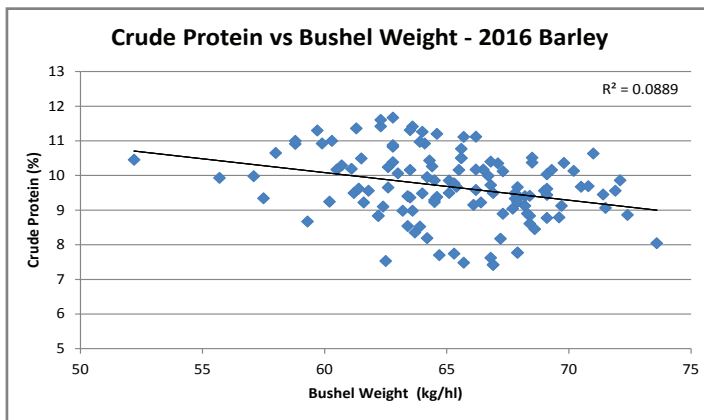


Fig. 7: A graph showing the relationship between crude protein and bushel weight, in the 2016 new crop barley.

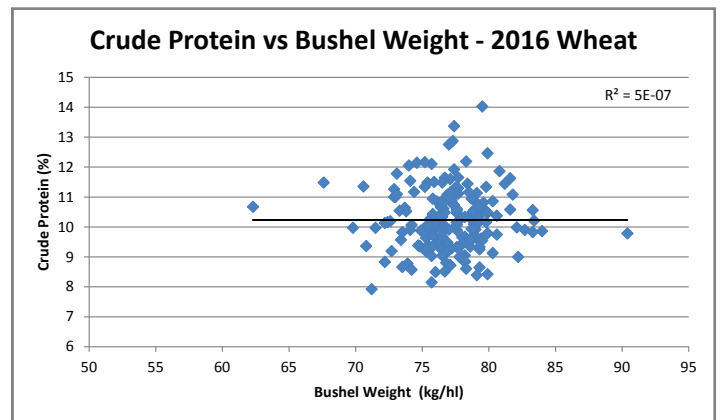


Fig. 8: A graph showing the relationship between crude protein and bushel weight, in the 2016 new crop wheat.

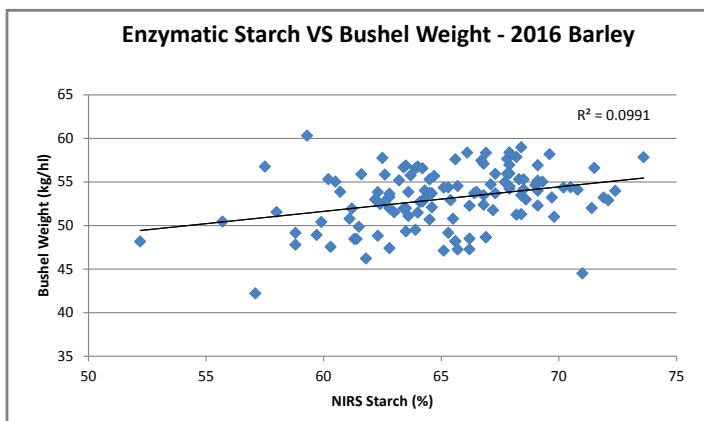


Fig. 9: A graph showing the relationship between enzymatic starch and bushel weight, in the 2016 new crop barley.

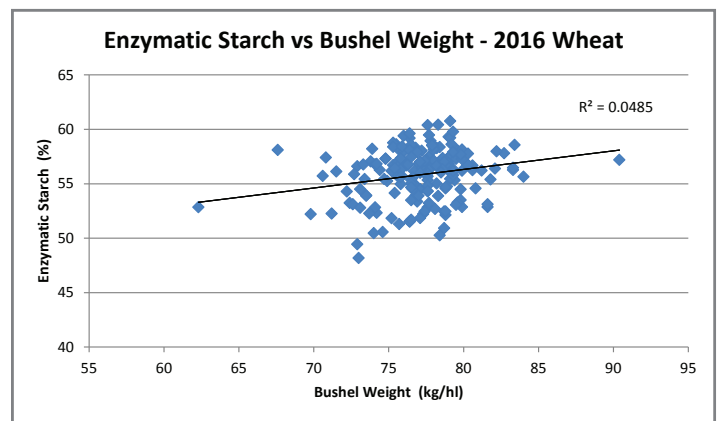


Fig. 10: A graph showing the relationship between enzymatic starch and bushel weight, in the 2016 new crop wheat.

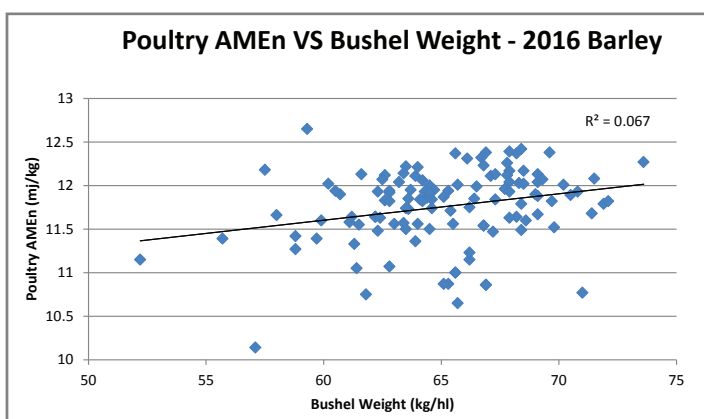


Fig. 11: A graph showing the relationship between poultry AMEn and bushel weight, in the 2016 new crop barley.

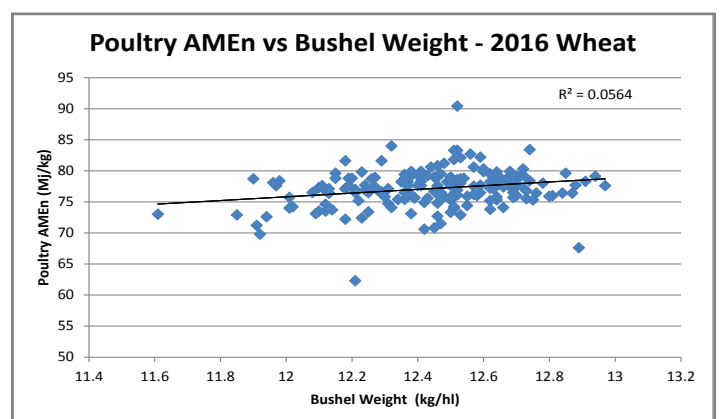
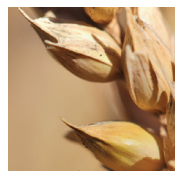
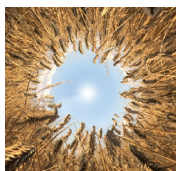


Fig. 12: A graph showing the relationship between poultry AMEn and bushel weight, in the 2016 new crop wheat.



Monogastric

The nutritional quality of cereals can have a large impact on monogastric diets, due to the high inclusions which are often used. Variation in nutritional quality should therefore be regularly monitored and acted upon when required to avoid any impact on economic and physical performance.

- There is little difference in protein and digestible amino acids between the 2015 harvest average, and 2016 new crop wheat. The impact on formulation will be minimal.
- The shift in both wheat and barley enzymatic starch seen in the 2016 new crop compared to 2015 should be taken into account, especially when considering estimated energy values (AMEn, ME).

Pig

	Wheat				Wheat			
	2015 Avg	Max	Min	Std Dev.	2016 Avg.	Max	Min	Std Dev.
Crude Protein (%)	10.23	14.31	7.57	1.03	10.30	14.02	7.92	1.06
Digestible Lysine (%)	0.23	0.32	0.19	0.02	0.25	0.33	0.19	0.03
Pig NE MJ/kg	9.84	10.56	8.89	0.22	9.75	10.19	9.17	0.18

	Barley				Barley			
	2015 Avg	Max	Min	Std Dev.	2016 Avg.	Max	Min	Std Dev.
Crude Protein (%)	9.23	13.2	7.41	0.89	9.79	11.67	7.48	0.97
Digestible Lysine (%)	0.25	0.30	0.21	0.02	0.27	0.31	0.22	0.02
Pig NE MJ/kg	9.14	9.72	7.72	0.33	9.22	9.88	7.95	0.31

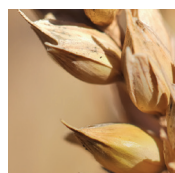
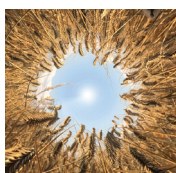
Fig. 13: A comparison between average nutrient values for the 2015 crop and 2016 new crop barley and wheat (August and September).

Poultry

	Wheat*				Wheat			
	2015 Avg	Max	Min	Std Dev.	2016 Avg	Max	Min	Std Dev.
Crude Protein (%)	10.23	14.31	7.57	1.03	10.30	14.02	7.92	1.06
Enzymatic Starch (%)	57.79	62.96	47.29	2.36	55.83	60.75	48.18	2.31
Digestible Lysine (%)	0.24	0.33	0.20	0.02	0.26	0.34	0.20	0.03
Digestible Methionine (%)	0.14	0.19	0.11	0.01	0.14	0.19	0.11	0.01
Adult AMEn MJ/kg	12.59	13.41	11.30	0.28	12.44	12.97	11.61	0.24
Broiler AMEn MJ/kg	11.65	12.44	10.01	0.35	11.46	12.20	10.37	0.33

Fig. 14: A comparison between average nutrient values for the 2015 crop and 2016 new crop barley and wheat (August and September).

*Amino Acids calculated on latest calibration data.



	Barley *				Barley			
	2015 Avg	Max	Min	Std Dev.	2016 Avg	Max	Min	Std Dev.
Crude Protein	9.23	13.2	7.41	0.89	9.79	11.67	7.48	0.97
Enzymatic Starch	51.57	58.41	37.90	3.53	53.24	60.32	42.20	3.25
Digestible Lysine (%)	0.28	0.35	0.25	0.02	0.30	0.34	0.25	0.02
Digestible Methionine (%)	0.14	0.16	0.11	0.01	0.14	0.17	0.12	0.01
Broiler AMEn Mj/kg	10.44	11.46	8.41	0.51	10.71	11.75	8.85	0.50
Poultry AMEn Mj/kg	11.57	12.33	9.80	0.42	11.79	12.65	10.14	0.41

Fig. 14: A comparison between average nutrient values for the 2015 crop and 2016 new crop barley and wheat (August and September).

Ruminant

- Barley and wheat have lower levels of fermentable carbohydrate, both rapid and total, which lowers acid loading but focus on ensuring an active rumen in the whole ration.
- Dynamic Energy suggests that overall energy available may be marginally less than the 2015 average due to reduced energy from rumen fermentation and a smaller increase in bypass starch levels than expected.
- Rationing to meet animal demand will be more expensive with this year's crop.

Barley	2015 Min	Average 2015	2015 Max	2016 Min	Average 2016	2016 Max
RFC (g/kg)	230	326	383	263	310	356
TFC (g/kg)	415	536	611	455	528	596
Acid Load	46.4	63.9	73.9	52.9	61.8	69.7
Bypass Starch (g/kg)	55	75	85	61	77	88
Glucogenic Energy (g/kg)	181	239	268	202	240	267
DyNE (MJ/kg)	5.66	7.29	8.07	6.22	7.18	7.91

Fig. 15: Comparison between 2015 and 2016 average, min and max barley NutriOpt values

Wheat	2015 Min	Average 2015	2015 Max	2016 Min	Average 2016	2016 Max
RFC (g/kg)	323	405	419	334	382	405
TFC (g/kg)	515	603	631	527	585	616
Acid Load	65.5	79.8	82.2	68.1	76.1	79.6
Bypass Starch (g/kg)	57	69	76	58	67	73
Glucogenic Energy (g/kg)	216	253	267	223	246	260
DyNE (MJ/kg)	6.88	7.84	8.11	7.08	7.65	7.93

Fig. 16: Comparison between 2015 and 2016 average, min and max wheat NutriOpt values