



CerealWatch Summary Report

The 2017 harvest is complete, and all NIR and Mycotoxin analysis completed. Both winter and summer wheat and barley crop harvest progress were ahead of 2016 early in the season in July and August, however rains at the beginning of September slowed harvest progress significantly, meaning that the 2017 cereal harvest finished later than 2016 (AHDB, 2017). Compared to 2016, 2017 new crop wheat and barley proteins have increased, barley by 0.62% and wheat 0.72%. Wheat starch has increased by 1.22% and barley starch has decreased by 5.3%.

Summary Tables

Wheat	2016 - New Crop Wheat				2017 - New Crop Wheat			
	Average	Max	Min	Std. Dev.	Average	Max	Min	Std. Dev.
Bushel Weight kg/hl	76.53	90.40	56.90	3.15	75.40	84.90	64.40	2.92
Enzymatic Starch (%)	55.65	60.75	41.78	2.49	56.87	60.31	42.62	1.44
Crude Protein (%)	10.34	14.02	7.92	0.99	11.06	15.92	8.82	1.03
Broiler AMEn MJ/kg	11.45	12.20	9.94	0.34	11.65	12.17	9.46	0.21
Poultry AMEn MJ/kg	12.43	12.97	11.13	0.26	12.49	13.01	10.96	0.20
Pig NE MJ/kg	9.75	10.19	8.74	0.19	9.78	10.17	9.03	0.16
Ruminant ME MJ/kg	11.72	12.26	10.67	0.68	11.73	12.28	10.31	0.23

Fig. 1 Table showing national average nutrient values for the 2016 and 2017 new crop wheat.

Barley	2016 - New Crop Barley				2017 - New Crop Barley			
	Average	Max	Min	Std. Dev.	Average	Max	Min	Std. Dev.
Bushel Weight kg/hl	64.57	73.60	51.50	3.37	64.07	72.00	49.10	3.72
Enzymatic Starch (%)	52.96	60.32	32.52	4.90	47.66	53.48	43.06	1.98
Crude Protein (%)	9.69	12.87	7.41	0.93	10.31	13.59	8.06	0.94
Broiler AMEn MJ/kg	10.68	11.75	8.85	0.53	9.92	10.63	9.05	0.30
Poultry AMEn MJ/kg	11.75	12.65	10.14	0.45	11.30	11.91	10.12	0.26
Pig NE MJ/kg	9.19	9.88	7.95	0.34	8.97	9.49	7.91	0.23
Ruminant ME MJ/kg	11.01	11.65	9.95	0.35	11.05	11.78	9.42	0.32

Fig. 2 Table showing national average nutrient values for the 2016 and 2017 new crop barley.

Enzymatic starch has been analysed instead of Polarimetric, and may be 3% lower for wheat, and 1.3% lower for Barley (CVB, 2007) - be sure to take this in to account if amending matrix values.

Crude protein and total amino acids were independently measured by NIR, it has been observed that the correlation between total amino acids and crude protein can vary depending on cereal type, and amino acid being measured. It has been found that total lysine in barley shows the highest correlation with crude protein, with an R squared value of 0.77, compared to total methionine at 0.68. Wheat crude protein correlation with total methionine is consistent with that seen in barley (R2=0.782), however total lysine has very low correlation with crude protein values (R2=0.382).

Trend Graphs - Crude Protein and Total Amino Acids

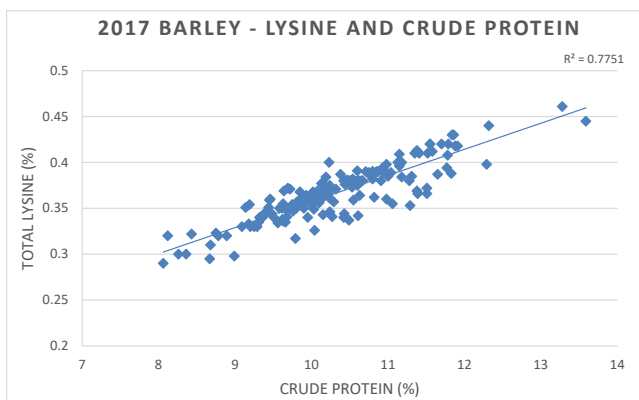


Fig. 3 A comparison between the 2017 new crop wheat crude protein and total lysine.

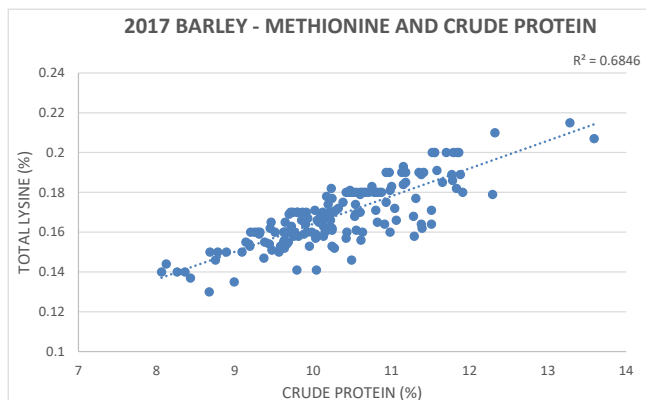


Fig. 4 A comparison between the 2017 new crop barley crude protein and total methionine.

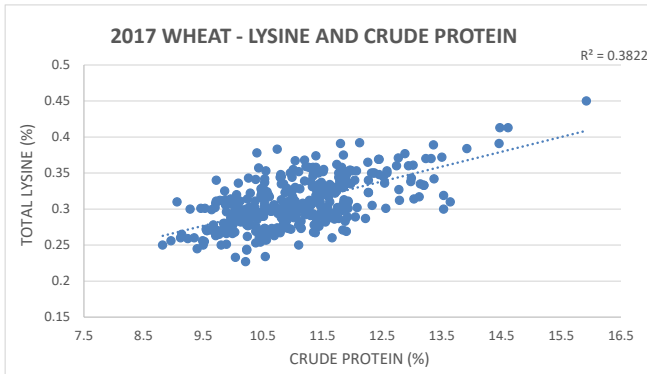


Fig. 5 A comparison between the 2017 new crop wheat crude protein and total methionine.

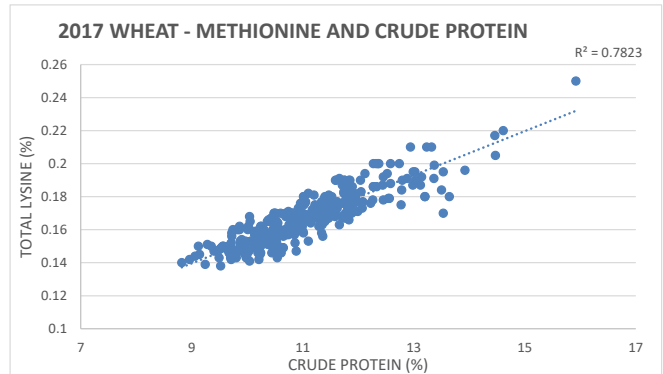


Fig. 5 A comparison between the 2017 new crop wheat crude protein and total methionine.

Regional Tables

Scotland remains to have the lowest wheat crude protein value and the highest enzymatic starch value, whereas Wales and West have the highest enzymatic starch value, South West wheat has the highest crude protein values. Similarly, Scottish barley also has the highest enzymatic starch, and lowest crude protein values. Conversely, the Wales and West region has the highest crude protein and lowest enzymatic starch value.

Wheat	Midlands	North	Scotland	South East	South West	Wales and West
Bushel Weight kg/hl	74.99	75.44	77.85	75.63	76.45	76.80
Enzymatic Starch (%)	56.87	57.26	58.47	57.00	56.84	56.76
Crude Protein (%)	11.12	10.56	9.42	11.11	11.49	11.14
Methionine (%)	0.17	0.16	0.15	0.17	0.17	0.17
Lysine (%)	0.31	0.30	0.28	0.31	0.32	0.31
Tryptophan (%)	0.15	0.14	0.13	0.15	0.15	0.16
Poultry AMEn MJ/kg	12.51	12.49	12.71	12.50	12.52	12.49
Broiler AMEn MJ/kg	11.66	11.67	11.79	11.67	11.66	11.63
Pig NE MJ/kg	9.80	9.77	9.94	9.78	9.79	9.78
Ruminant ME MJ/kg	11.76	11.66	11.83	11.74	11.74	11.73

Fig. 7 A comparison of regional average key nutrient values in the 2017 new crop wheat .

Barley	Midlands	North	Scotland	South East	South West	Wales and West
Bushel Weight kg/hl	63.75	62.64	62.50	66.10	63.29	64.64
Enzymatic Starch (%)	46.71	47.79	48.77	47.89	48.32	46.92
Crude Protein (%)	10.60	10.28	9.17	10.45	10.33	10.81
Methionine (%)	0.17	0.17	0.14	0.17	0.17	0.18
Lysine (%)	0.37	0.37	0.33	0.37	0.37	0.38
Tryptophan (%)	0.13	0.13	0.12	0.13	0.13	0.17
Poultry AMEn MJ/kg	11.16	11.28	11.40	11.37	11.39	11.27
Broiler AMEn MJ/kg	9.77	9.93	10.04	9.98	10.04	9.85
Pig NE MJ/kg	8.85	8.95	9.10	9.03	9.04	8.95
Ruminant ME MJ/kg	10.89	10.98	11.13	11.14	11.12	11.05

Fig. 8 A comparison of regional average key nutrient values in the 2017 new crop barley.

All averages are cumulative starting from 1st of July 2017 for the South, 10th July for Wales and Midlands, 17th July for the North, and 24th of July for Scotland.



Pig Report

The difference in nutritional quality of 2016 and 2017 new crop can have a financial impact on formulations. For example, in a pig finisher diet 2017 average wheat analysis could save approximately £4.00 / tonne, whereas Barley analysis will cost approximately £3.00 per tonne in formulations versus 2016. Not accounting for variation in the nutritional value of cereals when least cost formulating can have a negative impact on both pig performance and feed costs.

Summary Tables

Wheat	2016 - New Crop Wheat				2017 - New Crop Wheat			
	Average	Max	Min	Std Dev.	Average	Max	Min	Std Dev.
Bushel Weight kg/hl	76.53	90.40	56.90	3.15	75.40	84.90	64.40	2.92
Enzymatic Starch (%)	55.65	60.75	41.78	2.49	56.87	60.31	42.62	1.44
Crude Protein (%)	10.34	14.02	7.92	0.99	11.06	15.92	8.82	1.03
Digestible Lysine (%)	0.25	0.32	0.20	0.02	0.26	0.37	0.19	0.03
Pig NE MJ/kg	9.75	10.19	8.74	0.19	9.78	10.17	9.03	0.16

Fig. 1 Table showing national average nutrient values for the 2016 and 2017 new crop wheat.

Barley	2016 - New Crop Barley				2017 - New Crop Barley			
	Average	Max	Min	Std Dev.	Average	Max	Min	Std Dev.
Bushel Weight kg/hl	64.57	73.60	51.50	3.37	64.07	72.00	49.10	3.72
Enzymatic Starch (%)	52.96	60.32	32.52	4.90	47.66	53.48	43.06	1.98
Crude Protein (%)	9.69	12.87	7.41	0.93	10.31	13.59	8.06	0.94
Digestible Lysine (%)	0.27	0.31	0.22	0.02	0.28	0.35	0.22	0.02
Pig NE MJ/kg	9.19	9.88	7.95	0.34	8.97	9.49	7.91	0.23

Fig. 2 Table showing national average nutrient values for the 2016 and 2017 new crop barley.

Enzymatic starch has been analysed instead of Polarimetric, and may be 3% lower for wheat and 1.3% lower for Barley (CVB, 2007) - be sure to take this in to account if amending matrix values.



Mycotoxin Information

268 Mycotoxin tests have been carried out this harvest, 21 of which were positive. Barley was generally the least contaminated material with 4% of tests being positive, whereas wheat was the most contaminated, with 10%. Barley was most contaminated with T2/HT2, and wheat with DON. DON levels found in wheat could potentially be harmful for pig health where inclusion of wheat is high in finished feed, similarly levels of ZEA observed in barley could cause a risk, especially in piglet and gilt diets.

Mycotoxin Tables

2017 Wheat	Average of +ve (PPB)	Max	% Negative	No. Samples
DON	1270	2526	83	42
ZEA	51	118	81	42
T2/HT2	0	0	100	42

Fig. 3 Table showing mycotoxin levels in the 2017 new crop wheat.

2017 Barley	Average of +ve (PPB)	Max	% Negative	No. Samples
DON	0	0	100	46
ZEA	583	>1500	93	46
T2/HT2	70	105	93	46

Fig. 4 Table showing mycotoxin levels in the 2017 new crop barley.

To interpret the results in Figs. 3 and 4, guidance levels of DON and ZEA, and indicative levels of T2/HT2 listed below (Fig. 5). The 'Cereals - as sample' levels can be compared directly to analysed data, whereas the animal limit needs to be calculated by the cereal inclusion into finished feed in order to understand total intake of the Mycotoxin.

Mycotoxin (PPB)	Cereals - as sample	Pig - total feed	
DON	8000	900	
ZEA	2000	Piglet, gilt	100
		Sow and Fattening Pig	250
T2/HT2	500	250	

Fig. 5 Table showing total cereal and pig mycotoxin indicative and guidance levels.

Guidance values for DON (Deoxynivalenol) and ZEA (Zearalenone) and indicative level of combined T2 / HT2. These are toxic metabolites (Mycotoxins), that are produced by Fusarium fungi, which can grow during the crop cycle due to certain predisposing factors. If these levels or above are observed, further investigations should be carried out.

All averages are cumulative starting from 1st of July 2017 for the South, 10th July for Wales and Midlands, 17th July for the North, and 24th of July for Scotland.



Poultry Report

2017 average wheat analysis could save £3.60 per tonne in a laying hen formulation versus the 2016 analysis, whereas barley is not taken in formulations where wheat is also offered, mainly driven by the decrease in starch of 2017 Barley.

Summary Tables

Wheat	2016 - New Crop Wheat				2017 - New Crop Wheat			
	Average	Max	Min	Std Dev.	Average	Max	Min	Std Dev.
Crude Protein (%)	10.34	14.02	7.92	0.99	11.06	15.92	8.82	1.03
Enzymatic Starch (%)	55.65	60.75	41.78	2.49	56.87	60.31	42.62	1.44
Digestible Lysine (%)	0.26	0.33	0.2	0.03	0.26	0.38	0.20	0.03
Digestible Methionine (%)	0.14	0.19	0.11	0.01	0.15	0.25	0.13	0.02
Poultry AMEn MJ/kg	12.43	12.97	11.13	0.26	12.49	13.01	10.96	0.20
Broiler AMEn MJ/kg	11.45	12.2	9.94	0.34	11.65	12.17	9.46	0.21

Fig. 1 Table showing the differences between the 2016 and 2017 new crop wheat.

Barley	2016 - New Crop Barley				2017 - New Crop Barley			
	Average	Max	Min	Std Dev.	Average	Max	Min	Std Dev.
Crude Protein (%)	9.69	12.87	7.41	0.93	10.31	13.59	8.06	0.94
Enzymatic Starch (%)	52.96	60.32	32.52	4.90	47.66	53.48	43.06	1.98
Digestible Lysine (%)	0.26	0.33	0.20	0.03	0.28	0.39	0.19	0.04
Digestible Methionine (%)	0.14	0.19	0.11	0.01	0.15	0.22	0.10	0.02
Poultry AMEn MJ/kg	11.75	12.65	10.14	0.45	11.30	11.91	10.12	0.26
Broiler AMEn MJ/kg	10.68	11.75	8.85	0.53	9.92	10.63	9.05	0.30

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268 Mycotoxin tests have been carried out this harvest, 21 of which were positive. Barley was generally the least contaminated material with 4% of tests being positive, whereas wheat was the most contaminated, with 10%. Barley was most contaminated with T2/HT2, and wheat with DON. The level of mycotoxin contamination observed does not pose a risk to poultry health.

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Mycotoxin (PPB)	Cereals - as sample	Poultry - total feed
DON	8000	5000
ZEA	2000	-
T2/HT2	500	250

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Ruminant Report

This year wheat is of better quality than last season with higher starch and crude protein on average. 2017 crop is of similar ME to last year but DyNE, the energy available to the cow for milk production, is higher. Fermentable carbohydrates, bypass starch and glucogenic energy are higher than last season, but acid load is also higher. This year's barley has lower starch, but higher crude protein than last season. ME is similar but DyNE is lower, suggesting that the energy is not as available to the cow for milk production. Both fermentable carbohydrates and bypass starch are lower.

Summary Tables

New Crop Wheat	2017			2016
	Min	Average	Max	Average
Crude Protein %	8.82	11.06	15.92	10.34
Enzymatic Starch %	42.62	56.87	60.31	55.65
ME MJ/kg DM	11.99	13.64	14.28	13.60
RFC g/kg	312.20	390.93	416.03	387.00
TFC g/kg	518.86	588.77	620.43	582.00
Acid Load	63.71	78.40	83.07	77.70
Bypass Starch g/kg	51.07	68.15	72.29	67.00
Glucogenic Energy g/kg	208.13	252.54	262.70	249.00
DyNE MJ/kg DM	7.88	9.11	9.57	8.83

Fig. 1 2017 average, min and max wheat analysis including NutriOpt Dairy values

New Crop Barley	2017			2016
	Min	Average	Max	Average
Crude Protein %	8.06	10.31	13.59	9.69
Enzymatic Starch %	43.06	47.66	53.48	52.96
ME MJ/kg DM	10.95	12.85	13.70	12.80
RFC g/kg	269.73	302.30	330.07	308.00
TFC g/kg	466.06	516.91	561.33	527.00
Acid Load	54.55	60.30	64.98	61.10
Bypass Starch g/kg	62.65	69.31	77.76	77.00
Glucogenic Energy g/kg	209.04	227.41	243.86	237.00
DyNE MJ/kg DM	7.45	8.22	8.73	9.03

Fig. 2 2017 average, min and max barley analysis including NutriOpt Dairy values



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Mycotoxin Tables

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In order to interpret the results in Figs. 3 and 4, guidance levels of DON and ZEA, and indicative levels of T2/HT2 listed below (Fig. 5). The 'Cereals - as sample' levels can be compared directly to analysed data, whereas the animal limit needs to be calculated by the cereal inclusion into finished feed in order to understand total intake of the Mycotoxin.

Mycotoxin (PPB)	Cereals - as sample	Ruminant - Total feed	
DON	8000	Calves	2000
ZEA	2000	Calves, Dairy cattle	500
T2/HT2	500		250

Fig. 5 Table showing total cereal and ruminant mycotoxin indicative and guidance levels.

Guidance values for DON (Deoxynivalenol) and ZEA (Zearalenone) and indicative level of combined T2 / HT2. These are toxic metabolites (Mycotoxins), that are produced by Fusarium fungi, which can grow during the crop cycle due to certain predisposing factors. If these levels or above are observed, further investigations should be carried out.

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