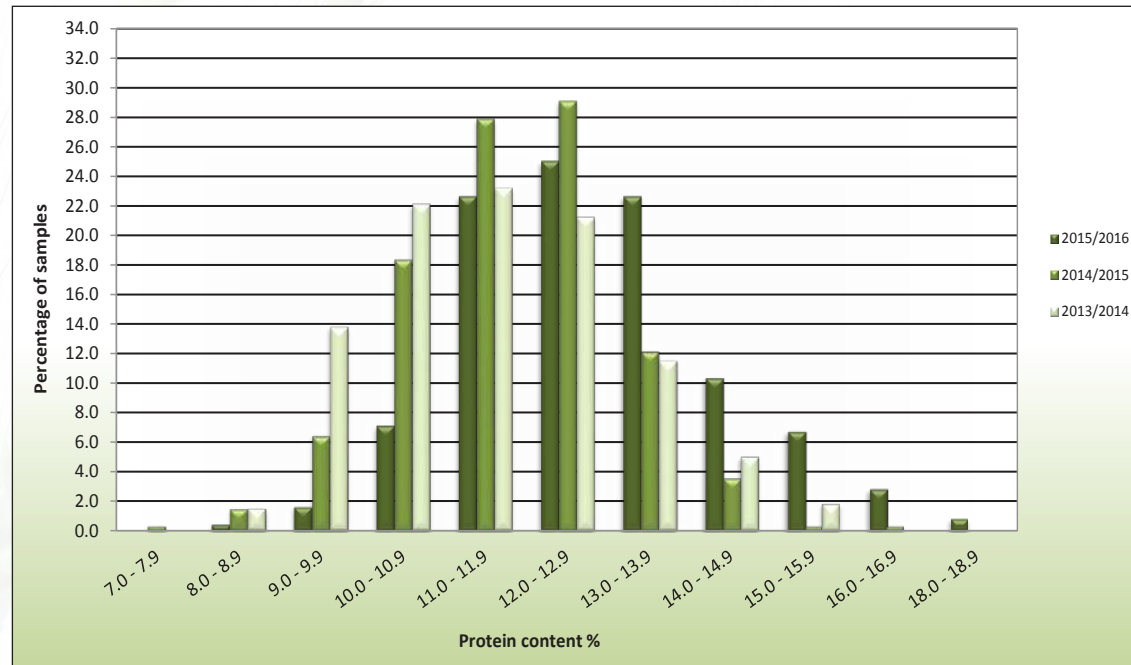


Crop quality of the 2015/2016 season

All national, seasonal and regional averages provided in this report are weighted averages.

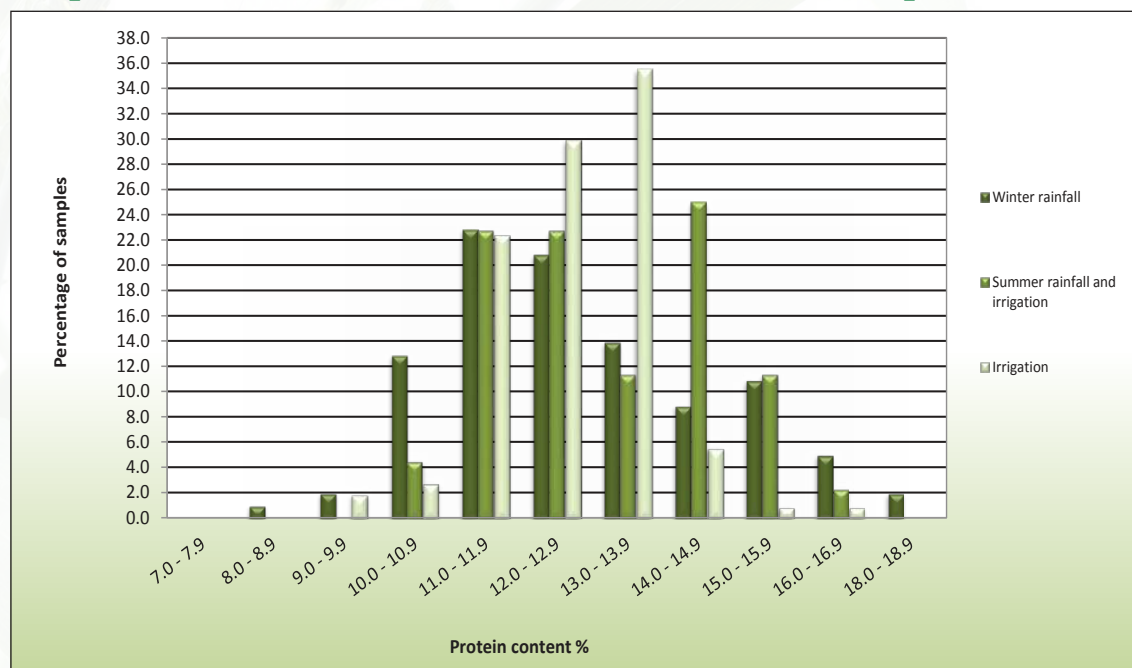
The national whole wheat protein average of 12.8% is the highest since the 2004/2005 season and can be attributed to the drought conditions experienced this season. Protein content is generally a function of the environment (soil and climatic conditions) where the wheat was grown as well as fertilizer treatment. The percentage of samples having protein contents exceeding 13.0%, increased significantly from 16.4% and 18.3% in the previous two seasons respectively, to 43.2% this season.

Graph 14: Protein content distribution over the last three seasons



Contrary to normal expectations, the Winter rainfall areas (12.8 %) did not have the lowest whole wheat protein average this season. This position was taken by the Irrigation areas, with an average of 12.6%. The production regions in the Free State province, as in previous seasons reported the highest average protein content of 13.2%.

Graph 15: Protein content distribution between the three production areas



Flour protein content is on average 0.5 to 1.2% lower than that of whole wheat and averaged 11.8% this season. The protein loss can be attributed to the removal of the bran and aleuron layer as well as the germ during milling. The protein content is reported on a 12% moisture basis.

The average hectoliter mass increased by 0.9 kg/hl to 81.1 kg/hl compared to the previous season and was also higher than the six year weighted average of 80.5 kg/hl for determinations done by means of the Kern 222 instrument. Of the 21 samples that reported values below the 77 kg/hl minimum level for grade B1 wheat, 12 originated in the Western Cape (Winter rainfall area), 5 in the North West, 3 in the Free State and one in Limpopo. The regional averages ranged from 79.7 kg/hl in the Winter rainfall areas to 82.6 in the Irrigation areas.

The thousand kernel mass, reported on a 13% moisture basis decreased further, from 39.3 g in the 2013/2014 season to 38.8 g last season to 36.8 g this season. Averages over production areas varied from 34.8 g in the Free State to 37.9 g in the Irrigation areas. The weighted average percentage screenings (1.8 mm sieve) of 1.71% was higher than the 1.55% and 1.58% of the previous two seasons. The Winter rainfall areas reported the highest average percentage, namely 1.86% and the Irrigation areas the lowest of 1.43%.

The weighted average falling number was 393 seconds, the highest average value of the past eighteen seasons. As a result, none of the samples analysed for this survey reported falling number values below 250 seconds. The highest average falling number value of 405 seconds, was reported for the Irrigation areas. All falling number values reported are corrected for the altitude at which the test is performed. During the previous two seasons four and 29 samples respectively reported falling numbers below 250 seconds.

The weighted mixogram peak time on flour milled on the Quadromat Junior mill averaged 2.7 minutes, shorter than the 3.0 minutes of the previous two seasons as well as the ten year average (2.9 minutes). The weighted mixogram peak time of the flour from the Bühler mill was 2.6 minutes, comparing well with the 2.7 minutes last season. Mixing time, in general, decreases as protein content increases to about 12.0%, thereafter remaining approximately constant with flour protein increases.

Extraction rate is an indication of the flour yield that can be obtained from a given amount of wheat. The extraction rate achievable on industrial scale mills is a number of percentage points higher than on laboratory scale mills due to an increase in roller surface area. Industrial type mills are also set to obtain optimum extraction rates within certain quality parameters, whereas the laboratory scale mill at SAGL is set to indicate differences in milling quality. Composite samples per class and grade per production region are cleaned, tempered/conditioned and then milled to facilitate flour and dough quality assessment. The weighted average Bühler MLU 202 laboratory mill extraction for the 70 composite samples was 73.4%, equal to the previous season.

The average Kent Jones colour this season was -3.5 KJ units, slightly lower than the previous season. As from the 2012/2013 survey, a dry colour determination by means of a Konica Minolta CM-5 spectrophotometer is also included. Please see the comparison of the CIE L*a*b* values obtained below. The average and range (in brackets) are provided to assist with interpretation of these parameters:

2015/2016 season: L* 93.78 (92.99 – 94.40), a* 0.47 (0.06 – 0.59) and b* 9.75 (8.51 – 11.39)

2014/2015 season: L* 93.77 (92.98 – 94.30), a* 0.44 (0.22 – 0.59) and b* 9.72 (8.21 – 11.11)

2013/2014 season: L* 93.99 (93.11 – 94.59), a* 0.40 (0.29 – 0.57) and b* 9.50 (8.49 – 10.63)

2012/2013 season: L* 93.85 (93.14 – 94.39), a* 0.41 (0.26 – 0.54) and b* 9.92 (8.65 – 11.35).

L* represents lightness (100 being white and 0 being black), a* represents green to red variation and b* represents variation from blue to yellow.

This is the second survey that the ash content is determined on the composite samples. The average ash content was determined to be 0.65 % on a dry basis (moisture free basis), compared to the 0.59% of the previous season. According to the Wheat product regulations (Government Notice No. R. 186 of 22 February 2008), cake flour's ash content should not exceed 0.60% and white bread flour's should be between 0.60 to 1.00%.

This is the third survey that include Rapid Visco Analyser (RVA) analyses on the composite samples. The average peak viscosity of the samples analysed was 2318 cP (centipoise), the minimum viscosity 1709 cP and the final viscosity 2597 cP. Last season the values were 2246 cP, 1719 cP and 2550 cP respectively. The analysis conditions were kept constant during all of the analyses.

The wet gluten (14% mb) averaged 31.9% and the dry gluten also on a 14% moisture basis, 11.0%. These values are higher than the 28.9% and 9.8% respectively of the previous season. This observation is expected taking the higher protein contents into account. The average gluten index value was 95, ranging between 84 and 99. The gluten index provides an indication of the gluten strength (higher being better) and is not influenced by the protein content. A value between 70 and 100 is generally accepted as good quality for pan bread baking purposes. The average gluten index value last season was 88.

The farinograph analysis had an average water absorption of 60.8% (59.5% the previous season) and an average development time of 5.8 minutes (5.3 minutes the previous season). The stability value of 8.0 minutes compared well with the 8.3 minutes reported previously. There was also no significant difference between the mixing tolerance indexes of these two seasons, namely 38 BU and 35 BU respectively.

The average alveogram strength was 38.3 cm² and the average P/L value 0.75 (38.1 cm² and 0.59 the previous season). The distensibility of the dough reported on the Alveograph was shorter than during the 2014/2015 season. A combination of this and also a slightly higher stability value resulted in the observed increase in P/L value.

The average extensogram strength was 105 cm² (98 cm² previous season). The maximum height in Brabender Units did not increase significantly compared to the previous season (373 BU in 2014/2015 and 360 BU in 2014/2015). The extensibility values were similar, 198 mm now and 196 mm previously.

The 100 g loaves baked using the straight-dough optimized bread making method, received an evaluation rated as "Excellent". The basis for this evaluation refers to the relationship between the protein content and the bread volume.

Forty samples, randomly selected to represent different regions as well as classes and grades, were tested by means of a SANAS ISO/IEC 17025 accredited multi-mycotoxin screening method using UPLC-MS/MS. With this technique simultaneous quantification and confirmation of Aflatoxin G₁; B₁; G₂; B₂, Fumonisin B₁; B₂; B₃, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A are possible in one run.

Four samples tested positive for deoxynivalenol (DON) residues. The average value of the four positive results was 397 µg/kg (ppb) and the highest value obtained 593 µg/kg, which is still well below national and international maximum residue levels. Please see the mycotoxin results on pages 60 - 61. Last season, five samples tested positive for DON residues with an average value of 229 µg/kg (ppb), the highest value obtained was 361 µg/kg.