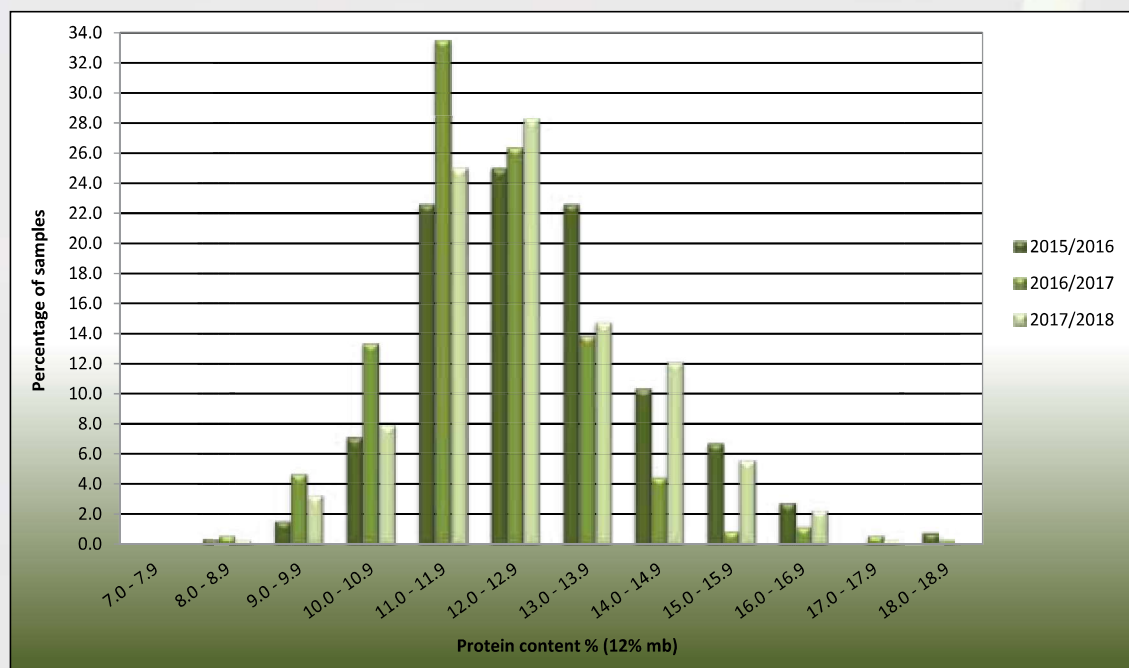


Crop quality of the 2017/2018 season

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

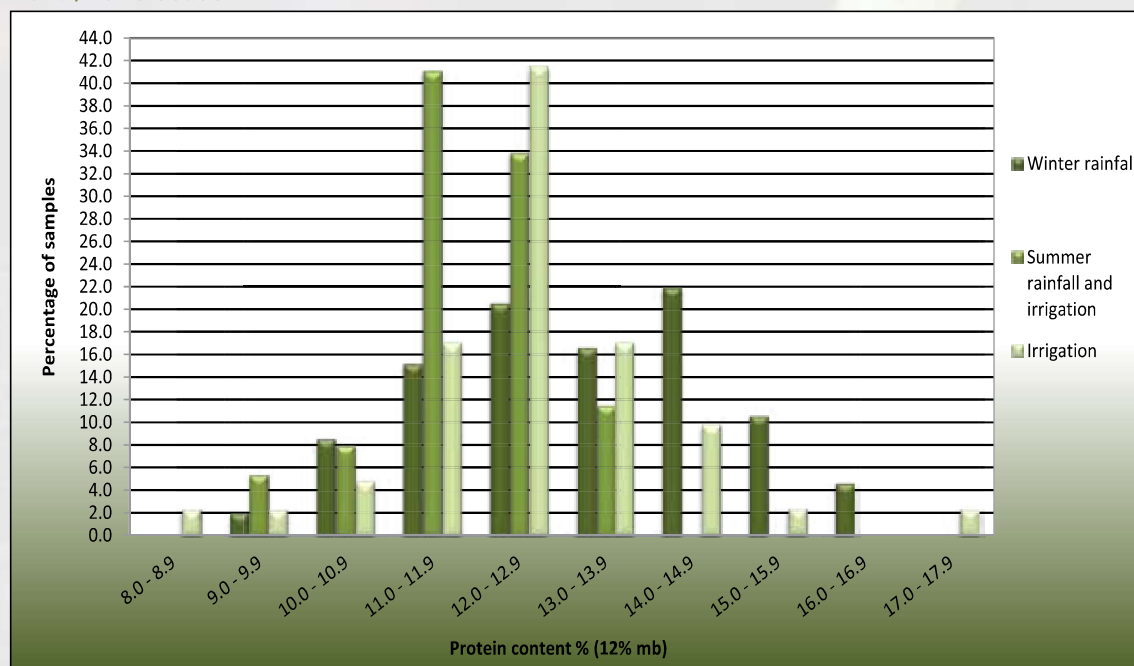
The national whole wheat protein average increased from 12.0% in the previous season to 12.6%. This is the second highest average since the 2004/2005 season and can be attributed to the above average protein values observed in the Western Cape where severe drought conditions were experienced. Please see Graphs 19 and 20 for the protein content distribution over the last three seasons and between the three major production areas.

Graph 19: Protein content distribution over the last three seasons



The Winter rainfall areas reported the highest whole wheat protein average, namely 13.2% since the start of this annual survey twenty years ago. The Irrigation areas averaged 11.9% and the production regions in the Free State province 12.6%.

Graph 20: Protein content distribution between the three production areas during the 2017/2018 season



Flour protein content is on average 0.5 to 1.2% lower than that of whole wheat and averaged 11.3% 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 decreased by 0.8 kg/hl to 80.7 kg/hl compared to the previous season and compares very well with the eight-year weighted average of 80.6 kg/hl for determinations done by means of the Kern 222 instrument. Of the 31 samples that reported values below the 77 kg/hl minimum level for grade B1 wheat, 26 originated in the Western Cape (Winter rainfall area) as can be expected due to the drought, the remaining five samples originated from the Free State production regions. The regional averages ranged from 79.1 kg/hl in the Western Cape to 83.2 kg/hl in the Irrigation areas.

The 1000 kernel mass, reported on a 13% moisture basis, decreased from 38.6 g last season to 37.7 g this season. The 2015/2016 season's average was 36.8 g. Averages over production areas varied from 36.2 g in the Western Cape to 39.6 g in the Irrigation areas. The weighted average percentage screenings obtained with a 1.8 mm slotted sieve was 1.51%, 0.35% lower than the previous season and also the lowest value of the past five seasons. The Winter rainfall areas reported the highest average percentage, namely 1.79% and the Irrigation areas the lowest of 1.05%. 28 of the 304 samples exceeded the 3% maximum permissible screenings level for grade B3 and of these 11 exceeded the 4% maximum permissible level for grade B4. Most of these samples originated in the Western Cape.

The national weighted average falling number value was 371 seconds, higher than last season's 356 seconds and equal to the ten-year weighted average value of 369 seconds. Five of the samples analysed for this survey reported falling number values below 250 seconds and of these four were below 220 seconds. All but one of these samples originated in the Free State area, the other sample in the Western Cape. The highest average falling number value of 385 seconds, was reported for the Irrigation areas. All falling number values reported, are corrected for the altitude at which the test is performed. The results of this, as well as previous surveys, provide evidence that low falling number values are not a significant problem in South Africa.

The weighted mixogram peak time on flour milled on the Quadromat Junior mill averaged 2.7 minutes, equal to the previous two seasons and slightly shorter than the ten-year average of 2.9 minutes. The weighted mixogram peak time of the flour from the Bühler mill was 2.6 minutes, also equal to the previous two seasons. 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 milling procedure and laboratory scale mill at SAGL is not set to optimize extraction but rather 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 73.1%, higher than the 72.5% of the previous season.

The average Kent Jones colour this season was -4.1 KJ units, lower than the -3.8 KJ units of 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:

2017/2018 season: L* 93.78 (93.44 – 94.24), a* 0.43 (0.30 – 0.57) and b* 9.84 (8.36 – 11.24)

2016/2017 season: L* 93.71 (92.17 – 94.30), a* 0.46 (0.34 – 0.63) and b* 10.12 (9.03 – 11.65)

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.

The average ash content was calculated to be 0.60 % 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. 405 of 5 May 2017), cake flour's ash content should not exceed 0.65%, white bread flour's ash content should be between 0.60 to 1.00% and that of all-purpose wheat flour between 0.55 and 0.75%.

The Rapid Visco Analyser (RVA) average peak viscosity of the samples analysed was 2269 cP (centipoise), the minimum viscosity 1715 cP and the final viscosity 2548 cP. Last season the values were 2257 cP, 1742 cP and 2570 cP respectively. The analysis conditions were kept constant during all of the analyses. Results are reported on a 14% moisture basis.

The wet gluten (14% mb) averaged 30.7% and the dry gluten, also on a 14% moisture basis, 10.4%. These values are equal to the previous season. The average gluten index value was 93 (94 last season), ranging between 75 and 100. 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 farinograph analysis resulted in an average water absorption of 60.3% (60.1% the previous season) and an average development time of 5.5 minutes (5.2 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 40 BU and 37 BU respectively.

The average alveogram strength was 39.2 cm² and the average P/L value 0.81 (37.0 cm² and 0.57 the previous season). The distensibility of the dough as determined by the Alveograph decreased compared to the previous season, indicating a more elastic dough.

The average extensogram strength was 106 cm² (99 cm² previous season). The maximum height in Brabender Units were higher than last season (382 BU in 2017/2018 and 364 BU in 2016/2017), but still compared well. The extensibility values were similar, 198 mm now and 193 mm previously.

When viewing the comparisons between seasons (Table 4 and Graph 22 on pages 20 to 22), it is interesting to notice that the average values of the 2017/2018 and 2015/2016 seasons' farinograph, alveograph and extensograph results are almost identical, while the 2016/2017 and 2014/2015 results are very similar.

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.

This is the second season, that amino acid profiles of local wheat were determined as part of this survey. Total Amino acid analyses that included 18 amino acids namely Aspartic acid, Glutamic acid, Serine, Glycine, Histidine, Arginine, Threonine, Alanine, Proline, Tyrosine, Valine, Isoleucine, Leucine, Phenylalanine, Lysine, Tryptophan, Cystine and Methionine were performed on forty samples, randomly selected to represent different regions as well as grades. Please see Table 7 on pages 68 and 69 for the results and page 77 for information on the methods followed.

Mycotoxin analyses were performed on forty wheat samples, randomly selected to represent different regions as well as grades. The samples 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 B₁; B₂; G₁; G₂, Fumonisin B₁; B₂; B₃, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A is possible in one run.

Seven samples tested positive for deoxynivalenol (DON) residues. The average value of the seven positive results was 202 µg/kg (ppb) and the highest value obtained 570 µg/kg, which is still well below national and international maximum residue levels. Please see the mycotoxin results on pages 64 and 65. Last season, four samples tested positive for DON residues with an average value of 289 µg/kg (ppb), the highest value obtained was 501 µg/kg.