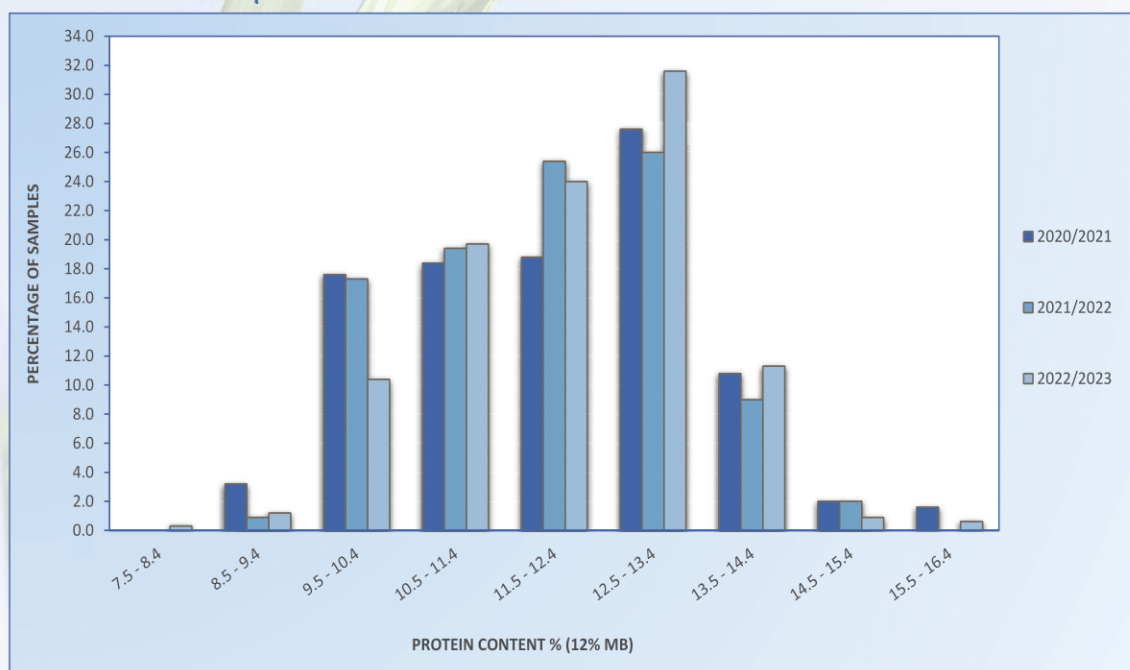


Crop quality of the 2022/23 season

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

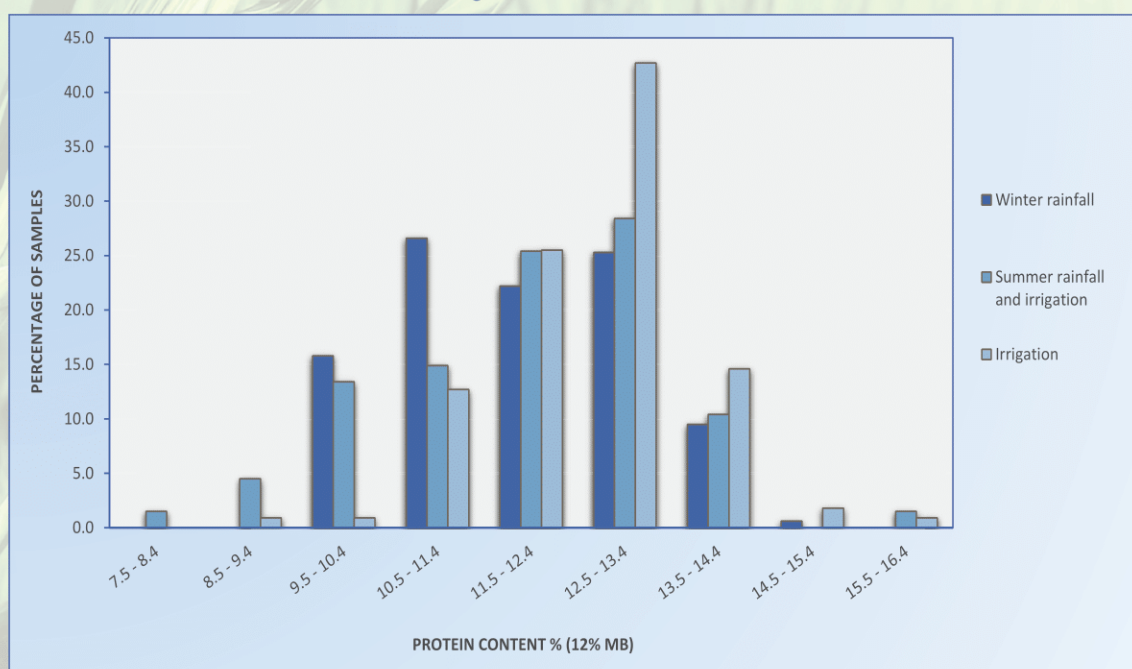
The national whole wheat protein average increased slightly from 11.9% in the previous season to 12.1%. The ten-year national average is 12.2%. Protein content is generally a function of the growing environment (soil and climatic conditions) as well as fertiliser application. Please see Graphs 21 and 22 for the protein content distribution over the last three seasons and between the three major production areas during 2022/23.

Graph 21: Protein content distribution over the last three seasons



The Irrigation areas reported the highest whole wheat protein average, namely 12.6%. The production regions in the Winter rainfall area of the Western Cape averaged 11.8% and the Summer rainfall and irrigation areas of the Free State 11.9%.

Graph 22: Protein content distribution between the three production areas during the 2022/23 season



Flour protein content is on average 0.5 to 1.2% lower than that of whole wheat and averaged 11.0% this season, slightly (0.1)% percent higher than the previous season. The difference in the protein content between the whole wheat and flour protein, 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 of 79.8 kg/hl is 0.1 kg/hl lower than the previous season and 0.4 kg/hl lower than the ten-year national average of 80.2 kg/hl. Twelve samples (4%) reported values below the 76 kg/hl minimum level for Super grade, Grade 1 and Grade 2 wheat. Seven of these samples originated in the Free State, three in Limpopo and one each in the Western Cape and Northern Cape. Regional averages ranged from 79.0 kg/hl in the Free State, 79.8 kg/hl in the Western Cape and 80.3 kg/hl in the Irrigation areas.

The average 1000 kernel mass, reported on a 13% moisture basis, decreased from 40.3 g last season to 37.0 g this season. The 2020/21 season's average was 38.2 g. Averages over production areas varied from 35.9 g in the Summer rainfall and irrigation areas of the Free State to 37.2 g in the Irrigation areas and 37.3 g in the Winter rainfall areas. The weighted average percentage screenings obtained with a 1.8 mm slotted sieve was 1.69%, compared to the 1.20% and 1.63% of the previous two seasons respectively. The Summer rainfall and irrigation areas reported the highest average percentage, namely 2.38% and the Irrigation areas the lowest of 1.15%. 31 (9%) of the 335 samples exceeded the 3% maximum permissible screenings level for Super grade to Grade 3. More than half of these samples (52%) originated in the Winter Rainfall areas and 29% in the Summer rainfall and irrigation areas of the Free State.

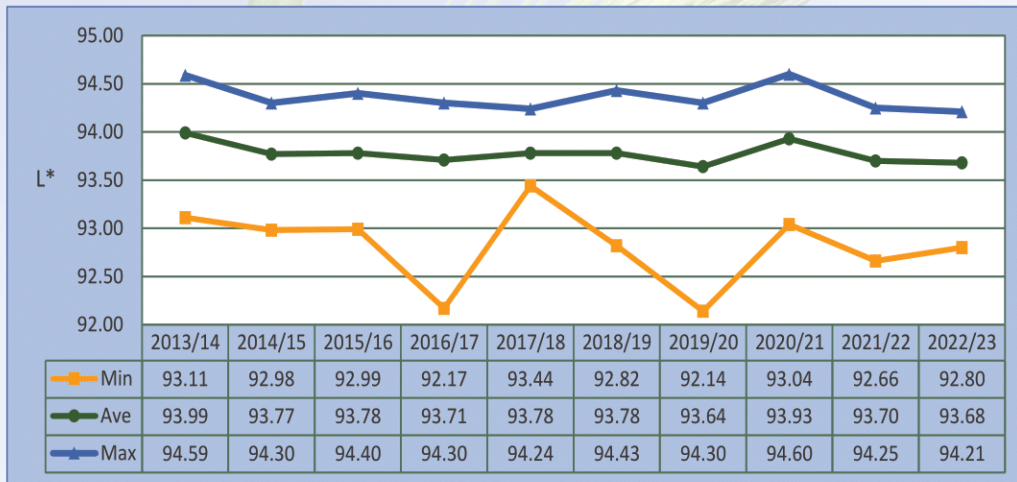
The national weighted average falling number value was 361 seconds, higher than the 341 seconds of last season's average. The ten-year weighted average value is 364 seconds. 21 (6%) of the samples analysed for this survey reported falling number values below 250 seconds, 16 (5%) of these were below 220 seconds and were downgraded to COW as a result. These samples originated from KwaZulu-Natal (N=10), the Free State (N=5) and North West (N=1). Last season 9% of the samples analysed as part of the survey, was downgraded to COW due to a low falling number. Falling number values this season ranged between 116 and 858 seconds. All falling number values reported, are corrected for the altitude at which the test is performed.

The weighted mixogram peak time on flour milled on the Quadromat Junior mill averaged 3.3 minutes compared to the 3.2 minutes of the 2021/22 season. The ten-year average is 3.0 minutes. The weighted mixogram peak time of the flour from the Bühler mill was 3.1 minutes, slightly higher than the 2.9 minutes of the previous season. Mixing time is a measure of optimum dough development and thus also of protein quality.

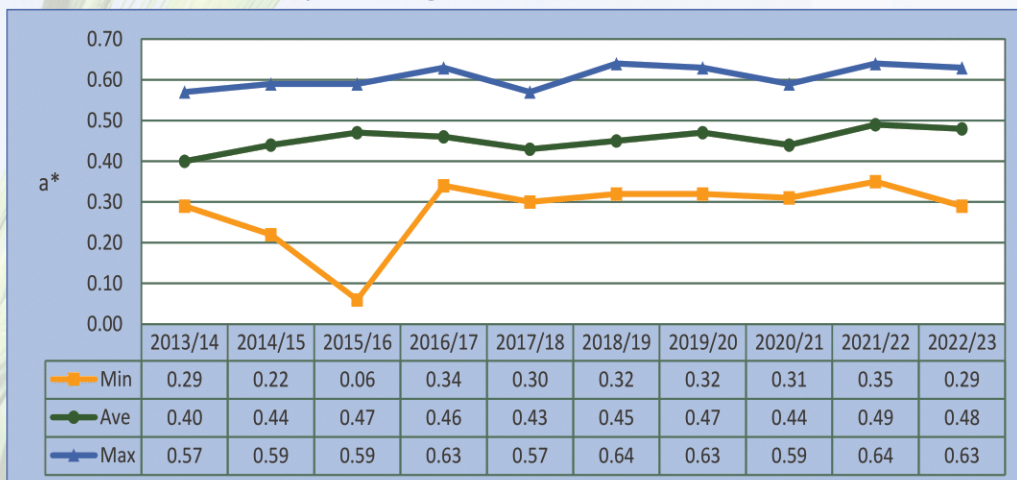
Extraction rate is an indication of the flour yield that can be obtained from a given amount of wheat. The extraction rate achievable on industrial scale mills is a number of percentage points higher than on laboratory scale mills due to an increase in roller surface area. Industrial type mills are also set to obtain optimum extraction rates within certain quality parameters, whereas the milling procedure and laboratory scale mill at SAGL is not set to optimise 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 composite samples was 73.8% compared to the 73.9% of the previous season.

Colour is an important parameter of milled wheat since the colour of wheat flour affects the colour of the finished product, like the crumb colour of a loaf of bread. In general, a bright white colour flour is more desirable for most products. The dry colour determination by means of a Konica Minolta CM-5 spectrophotometer has been implemented on the composite flour samples ten seasons ago (since 2013/14). The CIE L*a*b* (CIELAB) colour model uses lightness (L*) and two colour values (a* and b*), these colour coordinates define where a specific sample's colour lies in a Cartesian graph. L* represents lightness (100 being white and 0 being black), a* represents green to red variation and b* represents variation from blue to yellow. Please see Graphs 23 (L*), 24 (a*) and 25 (b*) for a comparison of the ranges in the CIE L*a*b* values obtained. The minimum and maximum values are based on a single composite sample's result in a specific season.

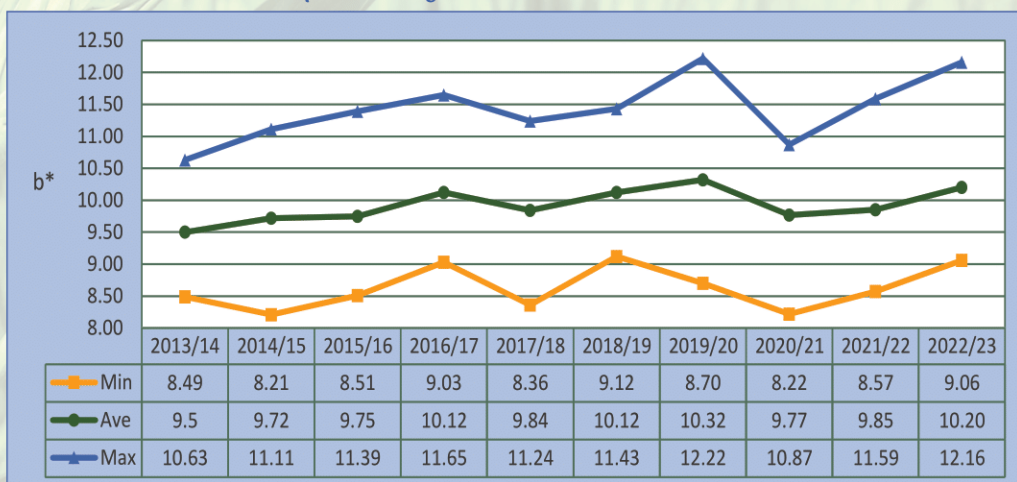
Graph 23: Range of L* values over ten seasons



Graph 24: Range of a* values over ten seasons



Graph 25: Range of b* values over ten seasons



The average ash content was 0.59 % on a dry basis (moisture free basis), on par with the previous season's average of 0.60%. 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 2297 cP (centipoise) (1179 – 2912 cP), the minimum viscosity 1799 cP (877 – 2218 cP) and the final viscosity 2593 cP (1294 – 3400 cP). The range of the values are provided in brackets. The previous season the average peak viscosity was 2081 cP (1213 - 2705 cP), the minimum viscosity 1619 cP (948 – 2007 cP) and the final viscosity 2326 cP (1339 – 3004 cP). The RVA test parameters were kept constant during all the analyses. Results are reported on a 14% moisture basis.

The wet gluten (14% mb) averaged 29.5% and the dry gluten, also on a 14% moisture basis, 9.8%. The previous season, these values averaged 28.9% and 9.6% respectively. The average gluten index value was 96 (equal to last season) and ranged between 87 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 farinograph analysis resulted in an average water absorption of 59.4% (60.0% the previous season) and an average development time of 5.4 minutes (5.7 minutes the previous season). The stability value of 12.6 minutes was almost three minutes longer than the previous average (9.7 minutes). The mixing tolerance index was 31, compared to the previous season's average of 42 BU.

The average alveogram strength was 41.4 cm² and the average P/L value 0.66 (42.5 cm² and 0.77 the previous season). The distensibility of the dough (130 mm) increased on average compared to the previous season (121 mm). The average stability value decreased from 86 mm to 80 mm this season.

The average extensogram strength increased from 103 cm² in the previous season to 109 cm². The maximum height in Brabender Units was also higher than last season, 411 BU in 2022/23 versus 393 BU in 2021/22. The average extensibility value this season (192 mm) was equal to the previous season's 191 mm.

The 100 g loaves baked using the straight-dough optimised 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.

Please see the results provided per individual production region on pages 35 to 56.

Mycotoxin analyses were performed on 40 wheat samples, randomly selected to represent different regions. The samples were tested by means of a SANAS ISO/IEC 17025 accredited multi-mycotoxin 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 are possible in one run.

17 samples (43%) tested positive for deoxynivalenol (DON) residues, four of these samples exceeded the national maximum allowable level of 2 000 µg/kg for cereal grain intended for further processing. The average value of the 17 positive results was 1 780 µg/kg (ppb) and the highest value measured 6 463 µg/kg. Last season, 14 samples (35%) tested positive for DON residues with an average value of 484 µg/kg (ppb), the highest value obtained was 1 085 µg/kg. 15-ADON residues were found on 12 of the samples (30%) with the average of the positive samples 154 µg/kg. In 2021/22 13% of the samples (5 samples) tested positive for 15-ADON residues. As in the previous season, a single sample also tested positive for Zearalenone residues. Please see the mycotoxin results in Table 6 on pages 58 and 59.