Bread Wheat Quality: Rheological Characteristics of Some Local and Imported Bread Wheat Samples of Turkey
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Rheological characteristics of dough that is obtained from bread wheat flour affects the quality of the product crucially. The rheological parameters such as stability, water absorption, extensibility and the resistance against to extension are generally used in order to determine the differences in flour quality and decide on the suitable raw material. It was aimed to reveal the rheological characteristics of flour types that are obtained through local (Cumhuriyet75, Tosunbey, İzmir85, Panda, Bezostaja, Esperya, Negev, Adana99, Flamura, Toros) and imported (Kazakstani and Russian) wheat samples so as to produce wheat flour for bread by flour factories in Lakes Region (Isparta, Burdur and Afyonkarahisar provinces of Turkey). For this purpose various flour types were applied to test with SMS/Kieffer gluten and dough extensibility rig and The Dobraszczyk-Roberts (D/R) dough inflation system by a Stable Micro Systems TA.XTPlus Texture Analyzer and farinograph. According to farinograph results for water absorption values of flours varied between %64.50 (Bezostaja) and %53.70 (Cumhuriyet75). The highest stability were found to be in Adana99, Toros and Esperya in 18.70, 18.30 and 18.10 mins., and the lowest stability were in types of Cumhuriyet75, Rus and İzmir85 in 7.10, 6.10 and 4.70 mins. Degree of softening (after 12 min) varied between (Toros and Negev) with 0.00 B.U. and (İzmir85) with 72.00 B.U.

When SMS/Kieffer gluten and dough extension test results are taken into consideration, maximum resistance against to extension was displayed by Russian with 31.23 g and Kazakstani with 29.41 g, and the lowest ones were Esperya with 14.86 and Bezostaja with 11.85 g. Regarding extensibility, as Bezostaja displays the highest with 61.76 mm, it was respectively followed by Tosunbey with 42.21 mm and Negev with 40.57. The lowest extensibility were identified respectively in Cumhuriyet75 with 17.62, İzmir with 20.13 mm, Russian with 20.30 mm. The samples that have the highest area values were Kazakstani with 1141.82 g.mm, Russian with 978.27 and the lowest ones were Cumhuriyet75 with 566.91 g.mm and İzmir85 with 650.50 g.mm. According to results of D/R test for dough inflation in texture analysis device, wheat flour’s pressure values against extension changed between (P) 54.64 mm (Bezostaja) and 195.29 mm (Cumhuriyet75). When extensibility were taken into consideration, as Bezostaja (45.30) had the highest extension capability, Russian had the lowest (14.79 mm). The types that have the highest bread energy were respectively Kazakstani with (184.31 J*10000), Tosunbey with (165.72 J*10000) and Flamura with (163.97 J*10000), and the lowest ones were Panda with (93.06 J*10000) and Bezostaja with (96.54 J*10000). As a result, as imported wheat products have higher resistance values
against to extension, they had lower extensibility. Starting from
the view that there should be a specific ratio between resistance against to extension
and extensibility in good bread wheat flour, it was concluded that Bezostoja type was
found to have high rheological quality in comparison to others.

As seen in the results, rheological quality of flour varies to a large extent according to
wheat type. Therefore, in order to produce bread wheat flour that is in standard quality,
one needs to pay attention to the correct selection of raw material, and when
necessary the use of local types should be increased through blending.

Keywords: Bread Wheat, Dough, Rheology, Extensibility, Dough Inflation