Optimization of Russian bread making test by instrumental determination of hydration level

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INTRODUCTION

Dough hydration level is a key point of bread making process. Dough behavior, and consequently bread quality, will change as the dough will be over or under-hydrated. Most of bread making test done around the world to evaluate flour properties are run in adapting hydration level in order to reach a constant dough consistency. This adaptation is done sensorially by the baker. The objective of this study, based on GOST 27669-88 Russian standard, is to evaluate the possibility to improve bread making test performances and objectivity by determining instrumentally the hydration level.

MATERIAL AND METHOD

48 flours samples, covering a large range of values (Figures 1a, 1b, 1c), are simultaneously tested with the exact GOST 27669-88 Russian bread making standard and with an adapted procedure. With the standard procedure, initial hydration level is determined according to flour moisture content, then sensorially adjusted by the baker during the kneading phase. With the adapted procedure, hydration level corresponds to the hydration to reach 1,55 Nm maximum torque on the Mixolab (Chopin+ protocol). For each sample, and each bread making procedure (GOST or Mixolab), 3 main parameters are determined: the volume (in ml/100g), the bread grain (in %) and the organoleptic score (in points).

RESULTS

The Mixolab procedure allows to improve produced bread quality for 80% of flour samples. Average increase is equal to 13 ml/100g (+30%) for the volume, 1,2% (+ 1,5%) for bread grain and 2 points (+ 2,2%) for organoleptic score. This increase is especially visible for samples with low quality performances (Figures 2a, 2b, 2c).

CONCLUSION

Determining hydration level with the Mixolab brings better performances and objectivity to the bread making tests.

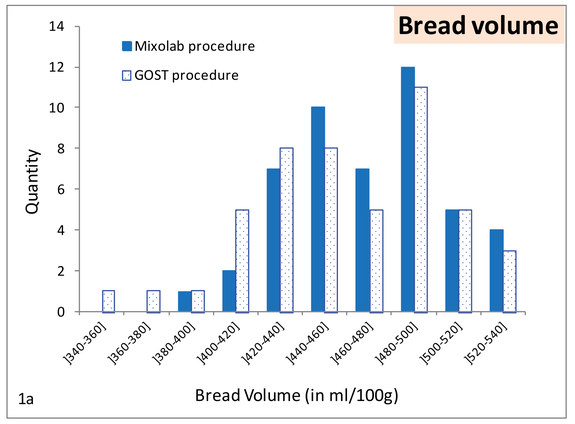

Figure 1a : Samples repartition (for GOST and Mixolab procedure)

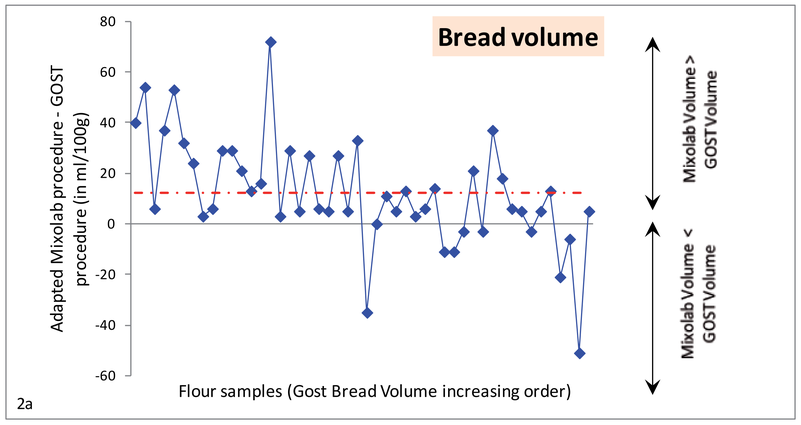

Figure 2a : Bread quality – Comparison between GOST and Mixolab procedure

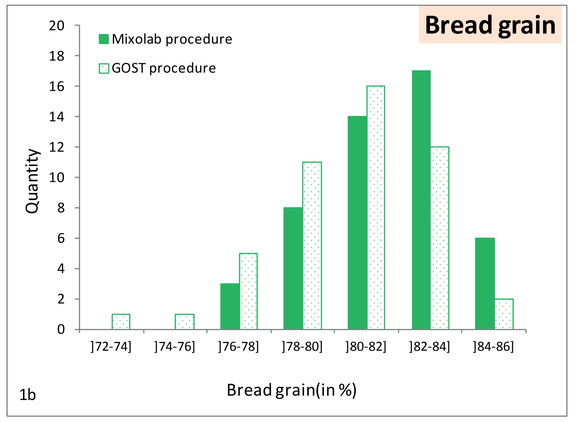

Figure 1b : Samples repartition (for GOST and Mixolab procedure)

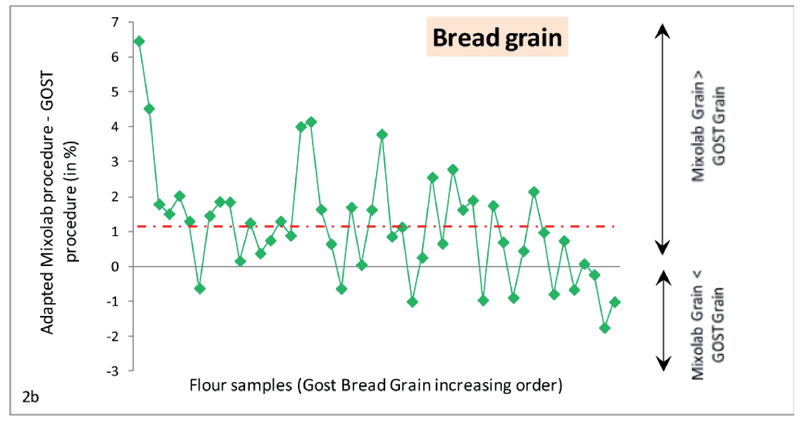

Figure 2b : Bread quality – Comparison between GOST and Mixolab procedure

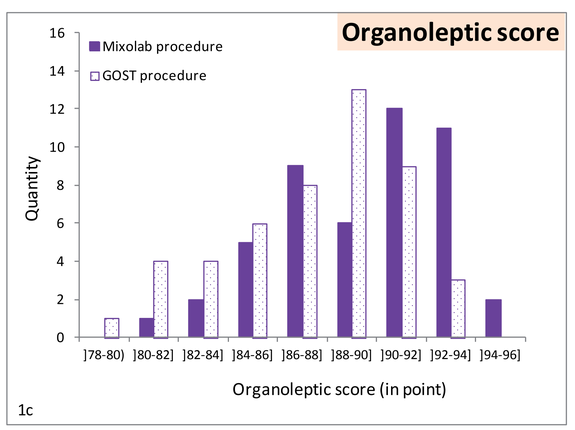

Figure 1c : Samples repartition (for GOST and Mixolab procedure)

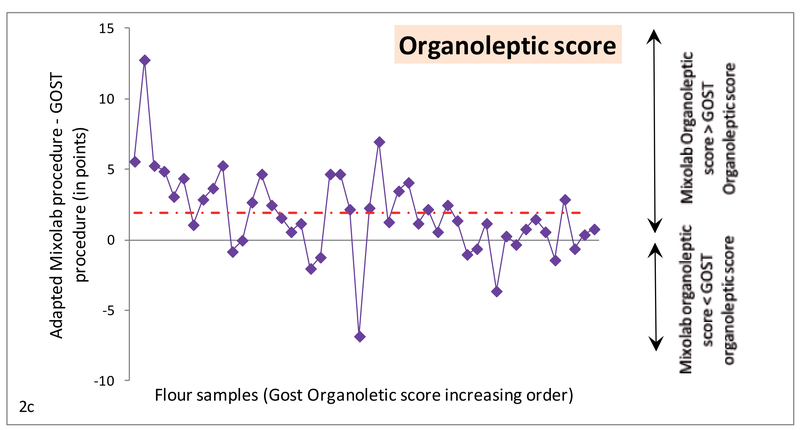

Figure 2c : Bread quality – Comparison between GOST and Mixolab procedure