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Physicochemical, rheological and nutritional properties of Nigerian and selected foreign wheat (*Triticum aestivum* L.) varieties

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Statement of the Problem: Wheat importation has huge expenditure of foreign exchange of developing countries including Nigeria; however, almost 10-million-tonne rise has revealed that Nigeria has the capacity to be self-sufficient in wheat production. This study was conducted to assess the physicochemical, rheological and nutritional properties of two varieties of wheat grown in Nigeria (Reyna 28 and Pastor) and selected imported wheat varieties from Argentina (Seavenus), Lithuania (Sirina), Estonia (Helsinki Eagle) and Canada (Carne).

Methodology: The wheat grains were evaluated for physicochemical properties. The wheat varieties were milled to produce flour and physicochemical, rheological as well as chemical compositions were studied to establish suitability for pan bread using standard methods. The statistical analysis were done using SPSS 16.0 (at $p=0.05$).

Findings: The hectolitre weight for screened and unscreened wheat ranged from 75.72-82.43 kg/hl and 72.98-81.90kg/hl, respectively. A thousand kernel weight of different wheat varieties ranged from 26.17-35.30g. The wet and dry gluten contents ranged from 24.90-33.47% and 8.37-11.10%, respectively. The results for physicochemical characteristics showed that wet and dry gluten content of the flour samples ranged from 26.20-40.03% and 8.77-12.93%, respectively. Gluten index ranged from 57.33-94.67% while the falling number ranged from 150.67-362.33secs. The starch damage ranged from 10.05-12.10% with Canadian variety having the least value. Dough development time (DDT) ranged from 2.27

to 7.23min while the stability time ranged from 2.17-18.63 min. Degree of weakening ranged from 24.67 to 77.67 FU with highest value recorded in Lithuanian variety and least in Canadian variety. Similarly, the moisture, crude protein, crude fat, ash, crude fibre and carbohydrate contents varied from 11.83-13.30%, 10.4-14.9%, 3.5-4.6%, 0.57-0.87%, 4.43-8.53% and 58.6-68.4%, respectively. There exists variation in the baking quality (loaf weight, loaf volume and specific volume) of the pan breads. Bread samples made from different wheat flour were acceptable to the consumer sensory panel.

Conclusion and Significance: The study revealed that the significant differences in the properties of wheat varieties from the different countries imply that the flours have potential for a wide end use in food applications.

Biography

Makinde Folasade Maria has her expertise in the utilization of lesser known crops which could serve as staple foods in Nigeria. These native crops have received little research attention. Among them are numerous fruits of Nigerian trees, grains, vegetables and oilseeds that grow wild in the rain forest and the woodland savannah zones or are cultivated on small, compound farms. Lack of knowledge of the nutritional qualities of lesser known crops grown in developing countries like Nigeria is responsible for the poor utilization of these crops in different food formulations. A different approach is developed to offer rural and poor urban populace the opportunity to utilize these crops through appropriate household or village technology. Thus, the research centres not just on developing and disseminating the evidence, but also on building knowledge of the ways in which innovations can be embedded into on-going practice.

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