

## Relative Significance of Wheat flour quality factors determining gluten strength

**Aastha Dewan**

*Research Scholar, GJUS&T, Haryana*

*B S Khatkar, Professor, GJUS&T, Haryana (Hisar) India*

### Abstract

Wheat is widely used in processing of wheat based products. Suitability of a wheat variety for particular end products primarily depends on the composition of its gluten proteins. Efforts were made to investigate the relative significance of wheat flour quality factors influencing the gluten strength. Twelve wheat varieties were assessed for hardness index, physicochemical, gluten quality and rheological parameters. Grain hardness index ranged from 72.53 to 94.80, whereas protein content and SDS sedimentation volume varied from 7.92 to 13.22% and 30 to 67ml, respectively. Wet and dry gluten quantity ranged from 17.95 to 28.91% and 5.96 to 11.30%, respectively. Gluten index (99.14) was recorded the highest for the variety HPBW01, whereas it (58.66) was observed the lowest for the variety HI1500. R/E ratio of glens of different varieties varied from 0.75 to 4.22. SDS sedimentation volume values of flour samples were positively associated with protein concentration ( $r^2= 0.525$ ) and R/E ratio ( $r^2= 0.709$ ). Gluten index was found to have positive correlation with R/E ( $r^2= 0.502$ ), indicating their significance to gluten strength. Dough development time was highly correlated with energy at peak with  $r^2= 0.975$  at the 0.01 level. Linear regression equation showed reliability of gluten strength on the protein content, glutenin content and dough development time. Principal component analysis showed the higher loading factor for SDS sedimentation volume (0.803), glutenin (0.926), dry gluten (0.673), resistance/extension ratio (0.660), dough development time (0.725) and energy at peak (0.789) explaining their maximum contribution in determining gluten strength. The results suggest that R/E ratio, SDS volume, protein content, gluten index, dough development time can be used as promising parameters to predict the strength of wheat gluten.

### Biography:

Aastha Dewan is pursuing PhD in Food technology exploring the molecular role of wheat proteins. She has completed her Master of Technology in Food Technology in 2016. Her major project involved the development of Gluten-free Pasta by optimizing the dairy and non-dairy ingredients (Dewan et al., 2017) and carried out fuzzy analysis on the developed gluten free pasta (Meena et al., 2019). Her passion to reconnoitre the underutilized fruit (*Ziziphus mauritiana*) made her to process the fruit into variety of fruit based products in her Bachelor of technology (food technology). She is a life time member of Association of Food Scientist and Technologist of India (AFSTI). She has one year industrial experience as Quality Control Executive in Spice Industry and more than 2 years teaching experience in the University. She has mentored 2 master's student and taught food science courses like beverage technology, food analysis and preservation.



### Speaker Publications:

1. Dangi, P., & Khatkar, B. S. (2017). Effect of Gluten in Addition on Dough Mixing Characteristics of Wheat Varieties. *Int J Innov Res Sci Eng Technol*, 6, 13444-13447.
2. Dhaka, V., & Khatkar, B. S. (2013). Mixolab thermomechanical characteristics of dough and bread making quality of Indian wheat varieties. *Quality Assurance and Safety of Crops & Foods*, 5(4), 311-323.
3. Trad, H., Ayed, S., Rhazi, L., Slim, A., da Silva, J. A. T., Hellal, R., ... & Amara, H. S. (2014). Comparative quality analysis of gluten strength and the relationship with high molecular weight glutenin subunits of 6 Tunisian durum wheat genotypes. *Food Science and Biotechnology*, 23(5), 1363-1370.
4. Khatkar, B. S. (2006). Effects of high Mr glutenin subunits on dynamic rheological properties and bread making qualities of wheat gluten. *Journal of Food Science and Technology-Mysore*, 43(4), 382-387.
5. Edwards, N. M., Gianibelli, M. C., McCaig, T. N., Clarke, J. M., Ames, N. P., Larroque, O. R., & Dexter, J. E. (2007). Relationships between dough strength, polymeric protein quantity and composition for diverse durum wheat genotypes. *Journal of Cereal Science*, 45(2), 140-149.

### A Webinar on Nutrition & Dietetics

August 24, 2020.

### Abstract Citation:

Aastha Dewan, Relative Significance of Wheat flour quality factors determining gluten strength; *Food Security and Food Chemistry* 2020; August 24, 2020.

