

## البحث الأول

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### **An application of modern statistical approach to estimate a technological value of some egyptian cotton varieties**

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### **ABSTRACT**

This paper presents a statistical method used to determine the technological value or overall quality of Egyptian cotton fiber. The method has been proposed based on a multiple-criteria decision-making (MCDM) technique [multiplicative analytic hierarchy process (MI<sub>AHP</sub>)]. To know the degree of accuracy of the proposed method, Pearson and Spearman correlation coefficients were estimated between the technological values of cotton fibers that estimated by MI<sub>AHP</sub> and the measured carded ring skein strength under four counts (Ne) being 50, 40, 30 and 20. In addition, full model regression and stepwise multiple linear regressions were used to predict carded ring skein strength using most important cotton fiber properties.

Highly significant relation (P - value < 0.01) was observed with values more than 0.88 whether using Pearson or Spearman correlation coefficients indicated that the supposed technological values considered a good tool to express of the Egyptian cotton fibers quality and also reflect achievable level of carded ring skein strength. The results of multivariate analysis techniques (full model regression and stepwise multiple linear regression) indicated that fiber strength (FS) and short fiber content (SFC) were the most important contributing cotton fiber properties in carded ring skein strength ( $R^2 > 80\%$ ) under the four used counts (Ne). The current investigation was carried out using six Egyptian cotton varieties namely: Giza 88, Giza 70, Giza 92, Giza 86, Giza 80 and Giza 90. The previous varieties were tested for fiber and yarn measurements using samples taken from seasons 2008 and 2009.

#### **Keywords:**

**Analytic hierarchy process, cotton fiber properties, Technological value.**