Comparison of yarn breaking strength in spinning processes based on fisher and student's criteria

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Abstract: In this scientific article, research was conducted on the comparison of yarn breaking strength based on the Fisher and Student's criteria, and the results are presented in the figures.

Keywords: spinning process, cotton fiber, fisher criteria, student criteria, yarn

After studying the physical and mechanical properties of yarns obtained from various mixtures, the breaking strength of the yarns was compared based on the Fisher and Student criteria using the obtained test results.

We compare the obtained test results according to the Fisher and Student criteria.

According to Student's t-test, the average value of these yarns is considered the same.

The physical and mechanical properties of yarns obtained from various mixtures were compared based on the Fisher and Student criteria (Table 1).

Table 1

Comparative indicators of physical and mechanical properties of yarns obtained from various mixtures according to criteria

No.	Mixture composition	According to Fisher's criterion		According to Student's criterion	
		breaking strength	relative breaking strength	breaking strength	relative breaking strength
1.	4-I-30%, 5-I-70% mixture	8.3	1.0	17.6	3.98
2.	4-II-60%, 5-I-40% mixture	3.0	3.165	13.2	0.35
3.	4-I-60%, 4-II-40% mixture	24.8	2.5	39.6	1.34

Based on the results of theoretical analysis, histograms showing changes in the quality indicators of yarns obtained from various mixtures according to the criteria are presented in Figures 1 and 2.

The analysis of test results comparison using Fisher and Student criteria reveals that for yarns obtained from 4-I-30%, 5-I-70% mixture and 4-II-60%, 5-I-40% mixture, there was a sharp difference in both Fisher and Student criteria regarding breaking strength. For relative breaking strength, the Fisher criterion was the same, while the Student criterion showed a sharp difference. For yarns from 4-I-30%, 5-I-70% mixture and 4-I-60%, 4-II-40% mixture, the Fisher criterion was the same, but the Student criterion showed a sharp difference in breaking strength. For relative

breaking strength, the Fisher criterion showed a sharp difference, while the Student criterion, conversely, did not. For yarns from 4-II-60%, 5-I-40% mixture and 4-I-60%, 4-II-40% mixture, both Fisher and Student criteria showed sharp differences in breaking strength, while for relative breaking strength, both criteria were considered the same.

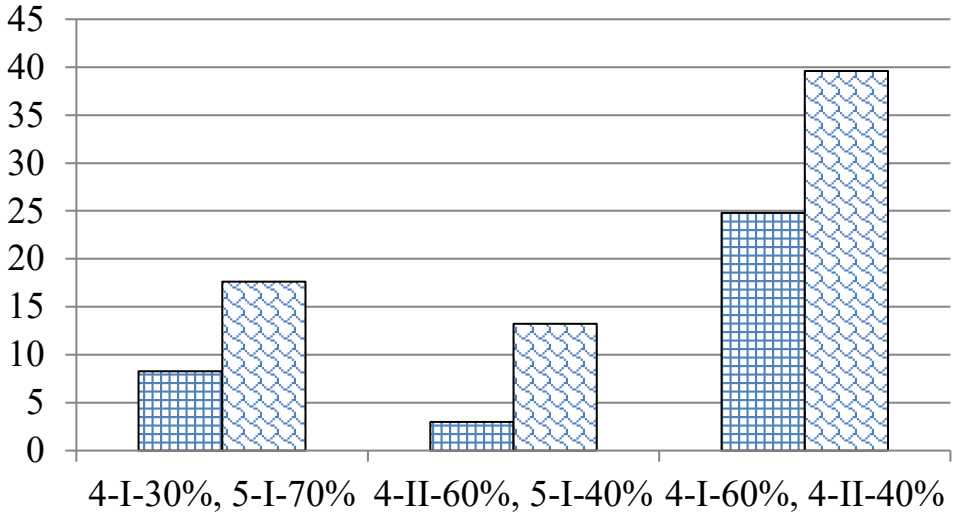

Figure 1. Changes in breaking strength of yarns obtained from various mixtures according to criteria.
- according to Fisher's criterion;
- according to Student's criterion.

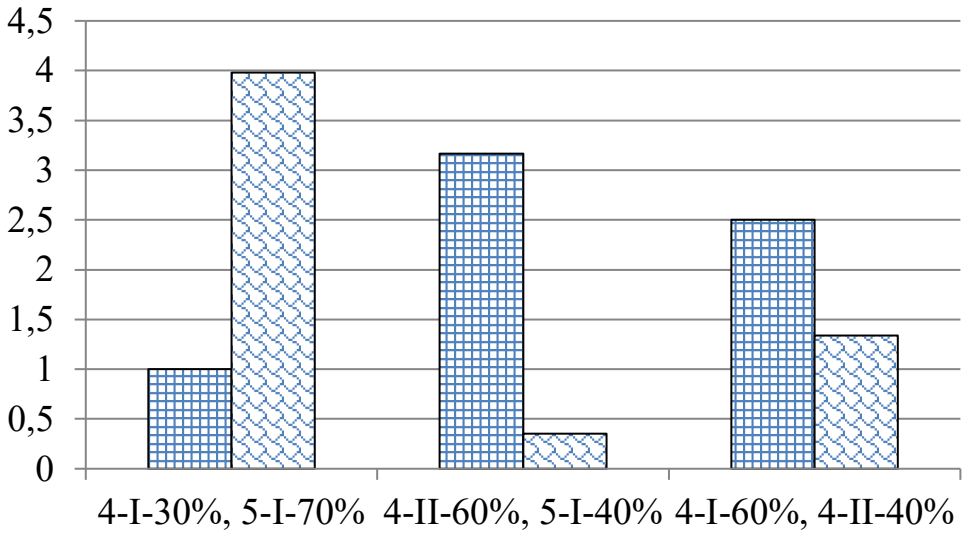

Figure 2. Changes in relative breaking strength of yarns obtained from various mixtures according to criteria.
- according to Fisher's criterion;
- according to Student's criterion.

In conclusion, the comparative analysis of yarns obtained from different mixtures using Fisher and Student criteria revealed sharp differences in their dispersion and average values.

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