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QUALITY VALUATION OF EGYPTIAN COTTON VARIETIES

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Abstract

The present study was conducted to develop credible approaches to determine the quality of Egyptian cotton varieties by virtue of criteria incorporating combinations of the fundamental fiber quality characteristics of strength, length and intrinsic fineness . Fiber quality index (FQI) and staple ratio (SR) were used, in this connection, as tools for ranking Egyptian cotton varieties included within either the extra-long staple (ELS) category or the long staple (LS) category . Further, FQI and SR were utilized to predict yarn strength which is a major quality consideration . The material used in this study comprised the extra-long staple (ELS) varieties Giza 45, Giza 70, Giza 76, Giza 77, Giza 87, and Giza 88, besides the long staple (LS) varieties Giza 80, Giza 83, Giza 85, Giza 86 and Giza 89 . The study covered the 3 successive seasons of 1996, 1997 and 1998.

The findings of this study clarified that the extra-long staple (ELS) varieties have markedly much higher values of either FQI or SR than the long staple (LS) varieties due to the fact that the ELS cottons have inherently longer, stronger and finer fibers than those of the LS types. Nevertheless, within each fiber length category, significant differences in either FQI or SR were detected. Further both FQI and SR were found to have significantly positive relation to yarn strength indicating that the cottons of higher values of FQI and SR would produce yarns of higher strength . However, regression equations were established to predict yarn strength in conformity with FQI and SR values.

Ranking of Egyptian cotton varieties by virtue of FQI and SR values indicated that, as concerns the extra-long staple category (ELS), Giza 87 variety ranked first where it significantly excelled the other varieties of that category, and it was followed in a descending order by Giza 45, Giza 88, Giza 76, Giza 70, and Giza 77. However, difference in quality between Giza 88 and Giza 76 was insignificant and the same pattern was true as for the quality difference between Giza 70 and Giza 77 varieties. As regards the long staple category (LS), Giza 86 variety proved to have the best quality,followed in a descending order by Giza 89, Giza 85 and Giza 83 . Those last 3 varieties did not differ significantly as concerns their quality criteria of FQI and SR. On the other hand, Giza 80 variety which ranked last in the long staple category, was found to have obviously inferior quality relative to the other varieties comprised under that category.

INTRODUCTION

Quality which denotes the spinning value of cotton, is largely determined by fiber physical properties particularly length strength and fineness . These fiber quality characteristics are predominately varietal and thus they are genetically controlled . However the exposure of cotton plants to the environmental conditions would cause variant fiber quality characteristics; yet this variation in fiber quality would be within the limits set by hereditary factors . Nevertheless, it is well recognized that cottons having the longest strongest and finest fibers such as the Egyptian extra-long staple varieties the American - Egyptian Pima cottons and the Sea Island type are highly appreciated by spinners since they are functionally capable of producing high quality yarns and fabrics.

Yarn strength is a major quality consideration since cotton fibers are usually and mostly spun to attain maximum yarn strength . However Lord (1961) pointed out that a strong long and fine cotton gave a stronger yarn in coarse counts than a weaker, shorter and coarser cotton . In finer spinning, this difference persisted and widened as the count increased . Ethridge *et al* (1982) used multiple regression techniques to select the best functional expression for the impacts of fiber properties, measured on the High Volume Instrument, on the strength of open-end spun yarns . They found that while most of the significant fiber properties were approximately linear in their impact on yarn strength, micronaire reading exhibited an impact that departed drastically from linearity. Further the results indicated that when yarn strength was the only quality consideration in the spinning operation low micronaire cottons appeared to be a better raw material than high micronaire cottons. Noteworthy also was the lack of any impact by fiber length on the strength of open-end spun yarns . Kamal *et al* 1987) working with the Egyptian cotton found that fiber tenacity appeared to have the most influence of any fiber property, on yarn strength.

It is of particular concern to mention that each fiber property does not affect yarn strength individually, but rather by acting in combinations with other fiber properties with which it is correlated . This conception is based on the fact that cotton fiber properties are physically interrelated . In this connection Lord (1961) referred to that among the various world cottons it has been found that long staple cottons are usually of smaller perimeter i.e. they tend to be intrinsically finer with a low value of standard

fiber weight per centimeter (Hs). He added that long cottons tend also to be strong and the tendency for fiber strength to increase with fiber length among the various cottons is similar in nature to the fineness-length relationship, where there are some divergences in each relationship. However, it is rather interesting to note that Lord (1961) proposed to use the quantity S 1/8.L/Hs, which increases with increasing fiber strength (higher S 1/8), length (higher L) and intrinsic fineness (lower Hs), to be plotted against yarn strength values expressed as count-strength product. Nevertheless, it is worthy to mention that the standard fiber weight per centimeter (Hs) which refers to intrinsic fineness is defined as the average fiber weight per centimeter that the cotton would have had if the growth conditions had been such that the fiber maturity coincided with the standard level of unity for the maturity ratio and the perimeter remained unaltered (Lord, 1961). Accordingly, variations in standard fiber weight per centimeter are independent of maturity and reflect corresponding variations in average perimeter and the standard fiber weight per centimeter may thus be regarded as a measure of intrinsic fiber fineness. It is of further interest to mention that Foster et al (1983) used the term " Fiber Quality Index " (FQI) to refer to the previously mentioned relationship of S 1/8.L/Hs which was proposed by Lord (1961). However, Foster *et al* (1983) utilized the fiber quality index (FQI) for rating and ranking 23 varieties of cotton, in order of reducing desirability, as an attempt to describe the overall performance potential of cottons.

As regards the Egyptian cotton, Abo-Sehly *et al* (1968) used different combinations of cotton fiber properties to be correlated with yarn strength . They concluded that those different combinations of fiber properties were found to be reliable in predicting yarn strength of Egyptian cotton. They added that the use of micronaire reading instead of hair weight would be more convenient since hair weight measurement is an arduous and time-consuming process. Also Mohamed and Hegab (1981) pointed out that leanness ratio or staple ratio (2.5 % span length/ micronaire reading) was found to be higher in the extra-long staple variety Giza 70 than in the shorter staple types, Giza 69 and Giza 72. Moreover, within a variety, leanness ratio was inversely related to lint grade where it tended to increase with lowering of the grade . Kamal *et al* (1991), utilized the values of fiber quality index (FQI) which incorporates the 3 major cotton fiber properties of strength (S 1/8), length (L) and intrinsic fineness (Hs) as a single cri-

terion for rating and ranking of the commercial Egyptian cotton varieties . They reported that with respect to the extra-long staple varieties, Giza 76 variety proved to be the best in 2 of the 3 seasons of study, while Giza 45 variety deteriorated in ranking from first in 1987 season to second in 1988 and to fourth i.e. last in 1989 season. Regarding the long staple varieties, Giza 69, Giza 75 and Giza 81 varieties were found to have almost comparable values of fiber quality index which distinctly excelled the corresponding values of either Giza 80 variety or Dendera variety.

MATERIALS AND METHODS

The data of this study were taken from the " Spinning Test Reports On The Egyptian Cotton", which are annually issued by the Cotton Research Institute, Agricultural Research Center, Giza, Egypt . The study covered the 3 successive seasons of 1996, 1997 and 1998 . The quality characteristics considered in the study were fiber strength at 1/8" gauge length (T1), fiber 2.5% span length, hair weight (HW), maturity percentage (M%) and skein strength of 60's count carded yarn (lea product). Further, maturity ratio (MR) was calculated using the following equation proposed by Lord (1961):

$$\text{Maturity ratio (MR)} = 1.762 - \sqrt{2.439 - 2.123 \text{ Maturity percentage (M\%)}}$$

Also, standard fiber weight per centimeter or standard fineness (Hs) was calculated by dividing hair weight per centimeter (HW)/ maturity ratio(MR).

Fiber quality index (FQI), was determined from the following equation proposed by Lord (1961) and later used by Foster et al (1983):

$$\text{FQI} = \frac{\text{Stelometer strength (T1) x 2.5\% span length}}{\text{Standard fineness (Hs)}}$$

Staple ratio (SR) value was calculated as follows:

$$\text{SR} = \frac{\text{2.5\% span length}}{\text{Standard fineness(Hs)}}$$

It is worthwhile to mention that the Egyptian cotton varieties considered in this study were the 6 extra-long staple (ELS) varieties Giza 45, Giza 70, Giza 76, Giza 77, Giza 87 and Giza 88 besides the 5 long staple (LS) varieties Giza 80, Giza 83, Giza 85, Giza 86, and Giza 89. Noteworthy also is that the data of fiber quality characteristics

and yarn strength of the cotton varieties involved in this study were those of the nominal grade " Good ". However, the data of grade Good were not available for some varieties and in such a case, the data of the nominal grade Good / Fully Good were used instead of the Good grade.

Analysis of variance was conducted and correlation and regression coefficients were computed according to the procedures outlined by Little and Hills (1978).

RESULTS AND DISCUSSION

1. Fiber quality index (FQI) and staple ratio (SR) of Egyptian cotton varieties :

The data recorded in table 1 demonstrate the average values (average of the 3 seasons 1996, 1997 and 1998) of fiber strength at 1/8 " gauge length (T1), fiber 2.5% span length (2.5% SL), hair weight (HW), maturity percent (M%), maturity ratio (MR), standard hair weight (Hs) and skein strength of 60,s count carded yarn (Lea product), of the Egyptian cotton varieties. As it has been previously mentioned, fiber quality index (FQI) was calculated using the formula proposed by Lord (1961) and Foster et al (1983), i.e. FQI = T1x2.5% SL / Hs. Also, staple ratio (SR) was calculated as follows: SR = 2.5% SL / Hs.

It is of particular concern to note that; in the previous studies, all researchers used the values of hair weight (HW) to calculate the values of staple ratio (SR). However, in the present study we truly believe that the use of the standard hair weight (Hs) instead of the hair weight (HW) to produce the staple ratio (SR) values deems to be more rational and more appropriate. This conception is ascribed in fact to that the standard hair weight (Hs) is regarded as a reliable indication of the fiber intrinsic fineness since fiber maturity in such a case will be held at the constant level of unity . As such, the highest value of staple ratio would be attained from the longest and the intrinsically finest fibers having the lowest value of standard hair weight (Hs) . In contrast, the lowest staple ratio value would be produced from the shortest and the intrinsically coarsest fibers having the highest Hs value. Nevertheless, in the present study, it is worth-mentioning that when calculating the values of staple ratio (SR), the decimal point has been ignored.

From the data of table 2, it is quite obvious that , the extra-long staple cotton varieties have markedly much higher values of either fiber quality index (FQI) or staple ratio (SR) than the long staple varieties.These findings are fully expected since the fibers of the extra-long staple varieties are inherently longer, stronger and intrinsically finer than the fibers of the long staple types.

As for the extra-long staple cotton varieties, values of fiber quality index (FQI) ranged from 7.15 for Giza 77 variety to 9.93 for Giza 87. With regard to the long staple varieties, FQI values varied from 4.26 for Giza 80 to 6.34 for Giza 86. On the other hand, staple ratio (SR) values of the extra-long staple varieties ranged from 211 for both Giza 70 and Giza 77 varieties to 284 for Giza 87, while the corresponding values of the long staple varieties varied from 150 for Giza 80 variety to 196 for Giza 86. However, it is worthy to mention that the analysis of variance indicated statistically significant differences among various Egyptian cotton varieties regarding values of fiber quality index and staple ratio, even within the same staple length category, i.e. either within the extra-long staple category or within the long staple category.

2. Relation of fiber quality index (FQI) and staple ratio (SR) to yarn strength:

The relationship between each of fiber quality index (FQI) and staple ratio (SR) with yarn strength are graphically illustrated in figures 1 and 2 respectively . These graphs however, clarify that both fiber quality index and staple ratio have highly significant positive relations with yarn strength expressed as lea product. Thus, these findings connote that the cotton varieties having higher values of either FQI or SR would produce yarns of higher strength . As it was previously stated, higher FQI values will result from cottons having stronger, longer and intrinsically finer fibers. Likewise, higher SR values are produced from longer and intrinsically finer cotton fibers . However in this respect Lord (1961) supported this statement where he reported that a strong, long and fine cotton gave a stronger yarn in coarse counts than a weaker, shorter and coarser cotton. In finer spinning, this difference persisted and widened as the count increased .

However, the data displayed in figure 1 indicate that the simple correlation coefficient (r) between fiber quality index (FQI) and yarn strength equals 0.9447, the de-

Table 1. Average values of fiber strength at 1/8" gauge length (T1), fiber length (2.5% SL), hair weight (HW), maturity percent (M%), maturity ratio (MR), standard hair weight (HS) and skein strength of 60's count carded yarn (lea product) of Egyptian cotton varieties (Average of the 3 seasons 96, 97 and 1998).

Cotton varieties	T_1(g/tex)	2.5% S.L. (mm.)	H.W. (millitex)	M%	M.R.	H.S. (millitex)	Yarn skein strength (Lea product)
Giza 45	33.5	34.5	110	74	0.83	132	2883
Giza 70	34.2	34.6	139	76	0.85	164	2878
Giza 76	34.6	34.9	130	78	0.88	149	2893
Giza 77	33.9	34.4	138	76	0.85	163	2882
Giza 87	34.9	35.0	110	79	0.89	123	3068
Giza 88	34.6	34.9	136	83	0.94	146	2895
Giza 80	28.4	30.6	169	74	0.83	204	2067
Giza 83	27.6	30.3	151	77	0.86	174	2033
Giza 85	29.6	29.8	139	76	0.85	165	2307
Giza 86	32.4	23.5	146	78	0.88	166	2537
Giza 89	29.5	31.3	154	80	0.90	169	2272

Table 2. Average values of fiber quality index (FQI) and staple ratio (SR) of the Egyptian extra-long staple (ELS) and long staple (LS) cotton varieties.

Varieties	Fiber Quality Index (FQI)	Staple Ratio (SR)
Extra-Long Staple (ELS)		
1- Giza 45	8.76	261
2- Giza 70	7.22	211
3- Giza 76	8.10	234
4- Giza 77	7.15	211
5- Giza 87	9.93	284
6- Giza 88	8.27	239
Mean of ELS varieties	8.24	240.0
Long Staple (LS)		
7- Giza 80	4.26	150
8- Giza 83	4.81	174
9- Giza 85	5.34	181
10- Giza 86	6.34	196
11- Giza 89	5.46	185
Mean of LS varieties	5.24	177.2
Grand Mean	6.88	211.4
New L.S.D. 0.05	0.67	20.8
New L.S.D. 0.01	0.89	27.6

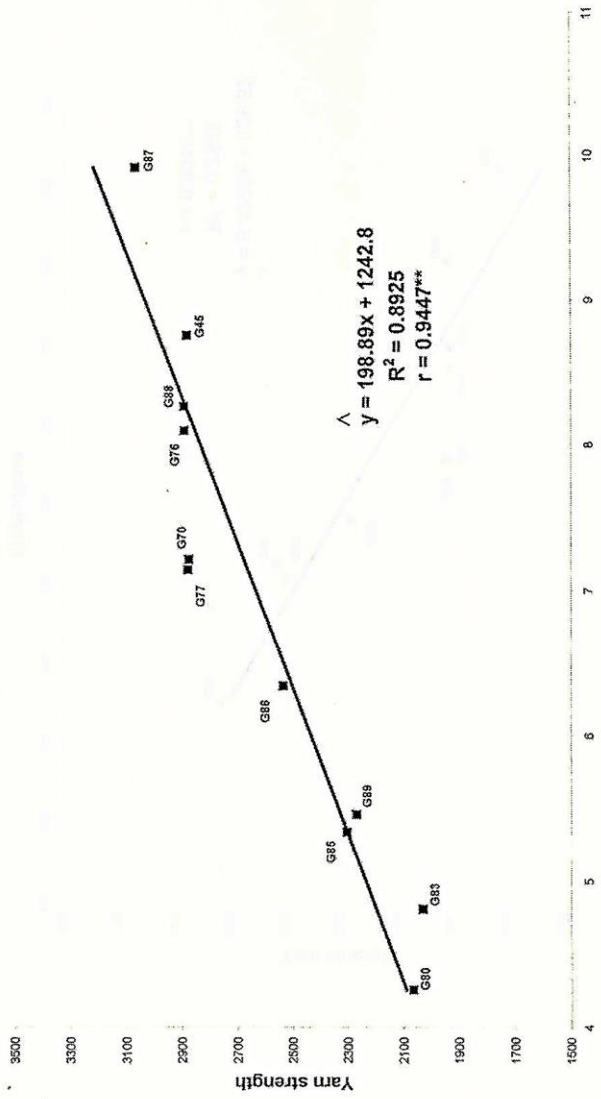

Fig. 1. Relationship between fiber quality index (FQI) and yarn strength (Lea product) in Egyptian cotton.

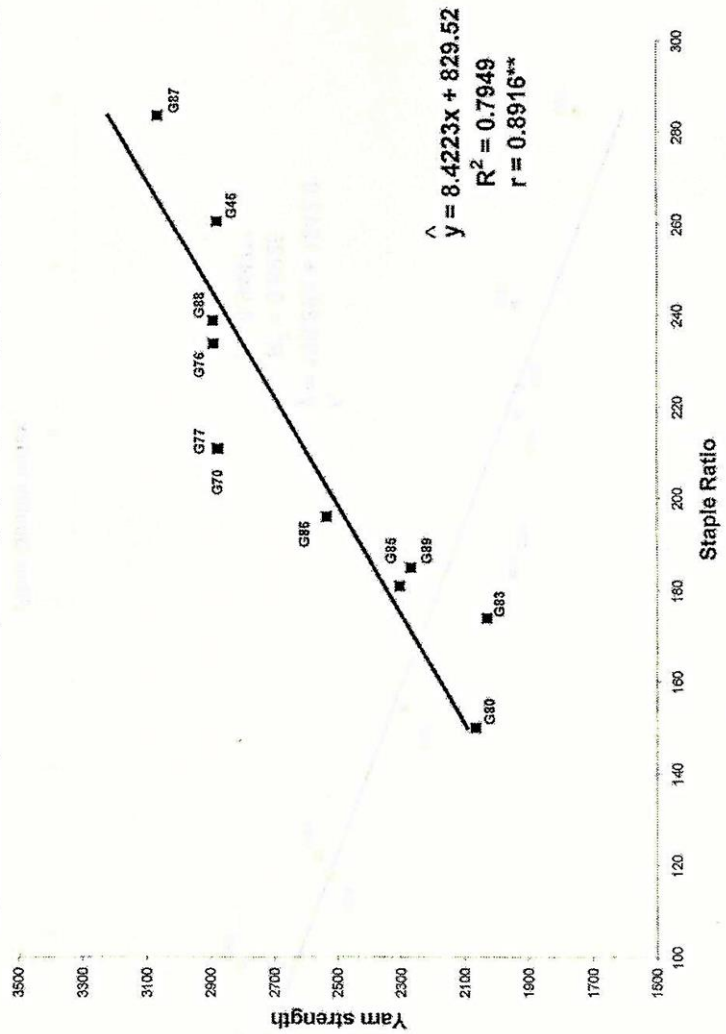

Fig. 2. Relationship between staple ratio (SR) and yarn strength (Lea product) in Egyptian cotton.

termination coefficient (R^2) equals 0.8925 and the regression coefficient (b) equals 198.89.As regards the relation of staple ratio (SR) to yarn strength (fig.2) the simple correlation coefficient (r) equals 0.8916, the determination coefficient (R^2) equals 0.7949 and the regression coefficient (b) equals 8.4223. Accordingly, it could be stated that in conformity with the values of the determination coefficients (R^2) generally fiber quality index has evidently higher contribution to the variation in yarn strength (about 89.2%) than that of staple ratio (about 79.5 %). A possible explanation for this finding is that fiber strength at 1/8" gauge length (T1) was taken into consideration when determining fiber quality index while it was not taken into account in case of determining staple ratio. In this respect, Abo Sehly *et al* (1968) pointed out that when fiber strength at 1/8" gauge length (T1) was included in the values derived from the various combinations of fiber properties, the correlations between those values with yarn strength had obviously improved and the highest value of 0.99 was attained for the simple correlation between the quantity: $T1 \times \frac{\text{half fall}}{\text{Fineness by weight (HW)}}$ and yarn strength

The regression analysis of graphs 1 and 2 clarifies that most of the actual values of yarn strength of Egyptian cotton varieties were close to the regression lines indicating that the deviations of the actual values from the expected or the estimated values of yarn strength were mostly minimal. The only possible exceptions were Giza 83, Giza 45 and Giza 87 varieties which revealed actual values of yarn strength lower than would have been expected,while by contrast Giza 70 and Giza 77 varieties showed actual yarn strength values higher than expected . Generally, the data of table 3 indicate that, in accordance with the values of fiber quality index (FQI), Giza 77 variety was found to have the highest deviation between the actual and the estimated values of yarn strength (217.1 lea product units) while the reverse was true for Giza 85 variety which had the least deviation (2.1 lea product units). Likewise, in conformity with the values of staple ratio (SR), Giza 77 variety again showed the highest deviation in yarn strength values (275.4 lea product units), whereas Giza 80 variety attained the least deviation (-25.9 lea product units) . However, it could be reported that most of the deviations of the actual yarn strength values from the estimated values, existing on the regression line, are generally small or at least reasonable. Thereupon, it is concluded that most of the Egyptian cotton varieties do not reveal any conclusive evidence of either strength anomaly or weakness anomaly. Yet, as for Giza 83, Giza 45 and Giza 87

varieties, which gave yarn strength values lower than expected, it is concluded that these 3 varieties have the potentiality to produce yarns of higher strength than they actually gave . On the contrary, Giza 70 and Giza 77 varieties showed yarn strength higher than expected insinuating an evidence of strength anomaly.

The linear regression equation $\hat{Y} = bx + a$ has been used to predict yarn strength (lea product) of Egyptian cotton corresponding with given values of either fiber quality index (FQI) or staple ratio (SR). $\hat{Y}$ is the estimated value of Y; (b) is the regression coefficient and (a) is the intercept (constant term). However, he following regression equation was developed to predict yarn strength ($\hat{Y}$) in conformity with given values (x) of fiber quality index (FQI)

$$\hat{Y} = 198.89\ x + 1242.8 \text{ (Fig.1).}$$

Likewise, the following regression equation is used to predict yarn strength ($\hat{Y}$), in accordance with given values (x) of staple ratio (SR)

$$\hat{Y} = 8.4223\ x + 829.52 \text{ (Fig.2) .}$$

3. Ranking of Egyptian cotton varieties by virtue of fiber quality index (FQI) and staple ratio (SR):

The data recorded in table 4 demonstrate the ranking of Egyptian cotton varieties in accordance with the values of either fiber quality index (FQI) or staple ratio (SR). However since both fiber quality index and staple ratio are closely related to yarn strength (Figures 1 and 2), hence they can be satisfactorily utilized as credible criteria for rating and ranking of Egyptian cotton varieties. The ranking has been made in order of reducing quality and thus rank 1 represents the highest quality and the other ranks are progressively lower. Nevertheless, by reference to table 4, it is quite obvious that each cotton variety was found to have the same rank whether ranking was made by virtue of fiber quality index (FQI) or in virtue of staple ratio (SR), indicating complete coincidence between FQI and SR as criteria of cotton quality valuation.

With respect to the extra-long staple (ELS) category, Giza 87 variety ranked first where it excelled significantly the other varieties included in this category. Giza 45 variety ranked second and followed in a descending order by Giza 88, Giza 76, Giza 70,

Table 3. Estimated and actual values of yarn strength (Lea product) of Egyptian cotton varieties and magnitudes of deviations between those values as related to fiber quality index (FQI) and staple ratio (SR).

varieties	FQI	Yarn strength			SR	Yarn strength		
		Estimated values	Actual values	Deviation Act. - Est.		Estimated values	Actual values	Deviation Act. - Est.
Giza 45	8.76	2985.0764	2883	-102.0764	261	3027.74	2883	-144.74
Giza 70	7.22	2678.7858	2878	199.2142	211	2606.63	2878	271.37
Giza 76	8.10	2853.809	2893	39.191	234	2800.34	2893	92.66
Giza 77	7.15	2664.8635	2882	217.1365	211	2606.63	2882	275.37
Giza 87	9.93	3217.7777	3068	-149.7777	284	3221.45	3068	-153.45
Giza 88	8.27	2887.6203	2895	7.3797	239	2842.45	2895	52.55
Giza 80	4.26	2090.0714	2067	-23.0714	150	2092.87	2067	-25.86
Giza 83	4.81	2199.4609	2033	-166.4609	174	2295.00	2033	-262.00
Giza 85	5.34	2304.8726	2307	2.1274	181	2353.96	2307	-46.96
Giza 86	6.34	2503.7626	2537	33.2374	196	2480.29	2537	56.71
Giza 89	5.46	2328.7394	2272	-56.7394	185	2387.65	2272	-115.65

Table 4. Ranking of Egyptian cotton varieties in conformity with the values of fiber quality index (FQI) and staple ratio (SR).

Cotton varieties	Fiber Quality Index (FQI)		Staple ratio (SR)	
	Value	Rank	Value	Rank
	Extra-long staple (ELS) varieties			
Giza 45	8.76	2	261	2
Giza 70	7.22	5	211	5
Giza 76	8.10	4	234	4
Giza 77	7.15	6	211	5
Giza 87	9.93	1	284	1
Giza 88	8.27	3	239	3
	Long staple (LS) varieties			
Giza 80	4.26	5	150	5
Giza 83	4.81	4	174	4
Giza 85	5.34	3	181	3
Giza 86	6.34	1	196	1
Giza 89	5.46	2	185	2
New L.S.D 0.05	0.67		20.8	
New L.S.D 0.01	0.89		27.6	

and finally Giza 77 . It is rather interesting to note that the differences in the values of FQI and SR of Giza 88 and Giza 76 varieties were generally small and statistically insignificant. The same pattern was true as for the differences between Giza 70 and Giza 77 varieties which showed almost comparable values of FQI and SR . Generally, it could be stated that Giza 87 variety undoubtedly represents the top quality among the extra-long staple (ELS) Egyptian cotton varieties , while by contrast, both Giza 70 and Giza 77 varieties have evidently the least quality within the extra-long staple category, regardless of the fact that their yarn strength values are higher than expected showing a sign of strength anomaly .

In regard to the long staple (LS) category, Giza 86 variety proved to have the best quality, followed in a descending order by Giza 89, Giza 85, Giza 83 and finally Giza 80 which ranked last in this category . It is of particular concern to note that the differences in quality criteria of FQI and SR of Giza 89, Giza 85 and Giza 83 varieties were generally small and insignificant from a statistical standpoint . Nevertheless, Giza 80 variety was found to have obviously inferior quality relative to the quality of the other varieties comprised under the long staple (LS) category .

In conclusion, either fiber quality index (FQI) or staple ratio (SR) could be utilized as a credible criterion for valuating the quality of Egyptian cotton varieties and for predicting yarn strength of those varieties .

However, quality valuation clearly indicated that, as regards the extra-long staple varieties (ELS), Giza 87 variety appeared to be a reliable substitute for Giza 45 variety which has had a unique reputation in the world cotton market for quite a long time, on account of the extraordinary characteristics of its fibers and yarns . Thus, it seems rational to assume that Giza 87 variety would be capable of proving its worthiness as a top quality cotton variety in the next few years . On the other hand, the long staple Egyptian cotton variety Giza 86 is now known in the world cotton market as the "Egyptian Pima", due to its peculiar quality properties which obviously excel those of the other varieties in the long staple category particularly fiber strength and length which would provide this variety with promising potentiality to yield exceptionally high yarn strength.

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تقييم جودة أصناف القطن المصرى

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أجريت هذه الدراسة لتقييم جودة أصناف القطن المصرى استناداً إلى معايير تتمثل فى قيم رقمية محسوبة من قيم تواليف لصفات جودة تيلة القطن الأساسية وهى متانة التيلة وطول التيلة والنعومة الذاتية للتيلة وقد استخدم لهذا الغرض قيم معامل جودة التيلة FQI ونسبة التيلة SR لترتيب أصناف القطن المصرى حسب جودة تيلتها وأيضاً استخدمت قيم معامل جودة التيلة ونسبة التيلة للتنبؤ بمتانة الغزل لتلك الأصناف.

وقد استخدمت فى هذه الدراسة أصناف القطن المصرى الطويلة التيلة الممتازة أو فائقة طول التيلة ELS جيزة ٤٥، جيزة ٧٠، جيزة ٧٦، جيزة ٧٧، جيزة ٨٧، جيزة ٨٨ إضافة إلى أصناف القطن الطويلة التيلة LS جيزة ٨٠، جيزة ٨٣، جيزة ٨٥، جيزة ٨٦، جيزة ٨٩ . وقد شملت الدراسة ثلاثة مواسم هى ١٩٩٦، ١٩٩٧، ١٩٩٨ .

وقد أوضحت نتائج الدراسة أنه بصفة عامة كانت أصناف القطن الفائقة الطول تتفوق بوضوح على أصناف القطن الطويلة التيلة بالنسبة لقيم معامل جودة التيلة ونسبة التيلة وأيضاً فى داخل طبقة الأصناف الفائقة الطول فقد كانت هناك فروق معنوية بين هذه الأصناف فى قيم معامل جودة التيلة ونسبة التيلة ونفس هذا الأمر كان صحيحاً بالنسبة لطبقة الأقطان الطويلة التيلة. من ناحية أخرى فقد وجد أيضاً أن قيم معامل جودة التيلة ونسبة التيلة ترتبط ارتباطاً معنوياً موجباً مع متانة الغزل. وقد تم عمل معادلات للتنبؤ بمتانة الغزل من واقع قيم معامل جودة التيلة ونسبة التيلة باستخدام معامل الانحدار البسيط.

وقد أشارت نتائج الدراسة كذلك إلى أن صنف القطن جيزة ٨٧ هو أفضل أصناف طبقة الأقطان الفائقة الطول من ناحية الجودة حيث أحتل المركز الأول فى هذا الصدد وتلاه حسب الترتيب التنازلى جيزة ٤٥ ثم جيزة ٨٨ ثم جيزة ٧٦ ثم جيزة ٧٠ وأخيراً جيزة ٧٧ . وبالنسبة لطبقة الأقطان الطويلة التيلة فقد أثبت الصنف جيزة ٨٦ أنه يتربع على قمة هذه الطبقة من ناحية الجودة ويليه تنازلياً الأصناف جيزة ٨٩ ثم جيزة ٨٥ ثم جيزة ٨٣ وأخيراً جيزة ٨٠ الذى يمثل بلا شك أدنى جودة بين أصناف القطن المصرى.