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Analysis of Technological of Cocoons Foreign and Local Collections

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Abstract: This article presents the technological parameters of domestic and foreign silk dry breed cocoons, Line 51 and Chinese breed cocoons yield, average cocoon shell thickness, cocoon shell deformation, cocoon yield, total length of cocoon thread.

Keywords: cocoon, silk, breed, silkiness, shell thickness, amount of raw silk output, length of cocoon thread.

Enter. High-quality raw silk and high-quality cocoons are required in the production of silk products. The cocoon quality parameters are influenced by the mulberry silkworm breed and hybrid, mulberry leaf composition, methods of feeding the silkworm, agrotechnics of silkworm feeding, the shape of the cocoon, the time of cocoon picking, cocoon transportation processes, cocoon deactivation, drying, milking, preparation for cocooning and cocooning processes. [1-4].

In our republic, worm seeds are brought from abroad, and cocoons are grown in local conditions. In particular, scientific research is being carried out by the scientists of the Silk Research Institute to create types of mulberry silk kurti suitable for local conditions, technological and quality indicators that can compete with breeds and hybrids imported from abroad.

Genetic-breeding scientists: Sh.R.Umarov, B.U.Nasirillaev, U.T.Daniyarov and others conducted research in the direction of creating high-tech breeds, systems, obtaining combinations of industrial hybrids from the most suitable breeds with their participation [5-6]. The main goal of the sericulture research institute and genetic selection scientists is to create breeds and hybrids that can compete with foreign hybrids. Experiments were conducted in order to research the technological indicators of domestic and foreign silkworm cocoons.

Analysis of the obtained results. In the first season of spring silkworm rearing, the local breed Line 51 and the Chinese breed were reared under local conditions. Mulberry silkworms were fed industrially using natural bunches during the cocooning period following the agrotechnical rules for feeding mulberry silkworms. The obtained living cocoons were killed by hot air, and the cocoons were dried in the shade to a moisture content of 10% according to the specified standard.

The shape and size of the cocoons depend on the breed and sex of the silkworm, the agrotechnics of silkworm feeding and the conditions during the cocoon wrapping period, the shape and size of the cocoons.

If the shape and size of the cocoons are the same, it allows to obtain high-quality raw silk, if they have a different shape, it complicates the technological processes, leads to an increase in the unevenness of the cocoon thread, and has a negative effect on the production of high-quality raw silk.

The size and shape of the resulting cocoons were determined (Table 1).

Table- 1. Geometric indicators of cocoons

Mulberry silkworm breed	Cocoon length, *mm*, *D*	Diameter of cocoon parts, *mm*			$d_{average}$	Cocoon calbr.	Thinning coefficient. C_i	The coefficient of buoyancy. C_b	Cocoon shape
		d_{head}	d_{bottom}	d_{waist}					
China	31	16,6	17,9	18,3	17,25	medium	1,6	0,92	thin waist
Line 51	34	18,5	19,2	19,8	18,85	big	1,4	0,96	thin waist

As can be seen from the results, the indicators of Chinese and Line-51 breed cocoons are thin-waisted cocoons, and we can see that the cocoons obtained from Line-51 breed are large caliber, and the coefficient of belchan is 0.96 and the coefficient of thinning is 1.4. If thin cocoons are processed correctly and technological regimes are set correctly during spinning, there are almost no interruptions in raw silk, which is the basis for the production of high-quality raw silk.

The hardness of the cocoon shell is one of the important indicators, it is considered an important factor in the establishment of technological regimes in the process of quality storage, transportation, preparation of cocoons for spinning, and the thickness of the shell affects silkiness. Based on this, the thickness and hardness of the cocoon shell was studied for the selected breeds.

When measuring the thickness of the cocoon shell, samples were taken from 5 places of the cocoon shell and measured using a TR25-100 thickness gauge with an accuracy of 0.1 mm. The deformation of the cocoon shell was measured using a VK brand apparatus. In this case, the Indicator index, mm n_1=n with an accuracy of 0.01, and the amount of Deformation, D=n_1.4.55, with an accuracy of mm, and the results are presented below (table 2).

Table 2. The thickness and hardness of the cocoon shell

№	Breed name	The average thickness of the cocoon shell, *mm*	Deformation of the cocoon, *mm*
1	China	0,69	0,58
2	Line 51	0,76	0,52

As can be seen from the results, the average thickness of the cocoon shell in Line 51 cocoons was 0.76 mm, and 0.69 mm in Chinese cocoons. The amount of cocoon shell deformation was found to be 0.52 mm in Line 51 and 0.58 mm in Chinese cocoons, and we can see that Line 51 cocoon shell thickness and hardness are good based on the obtained results.

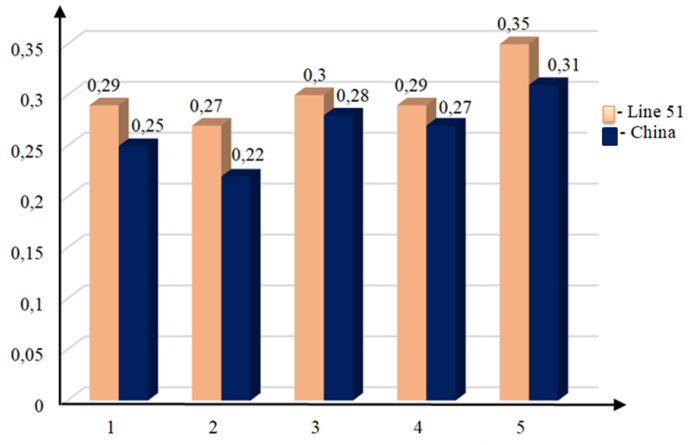


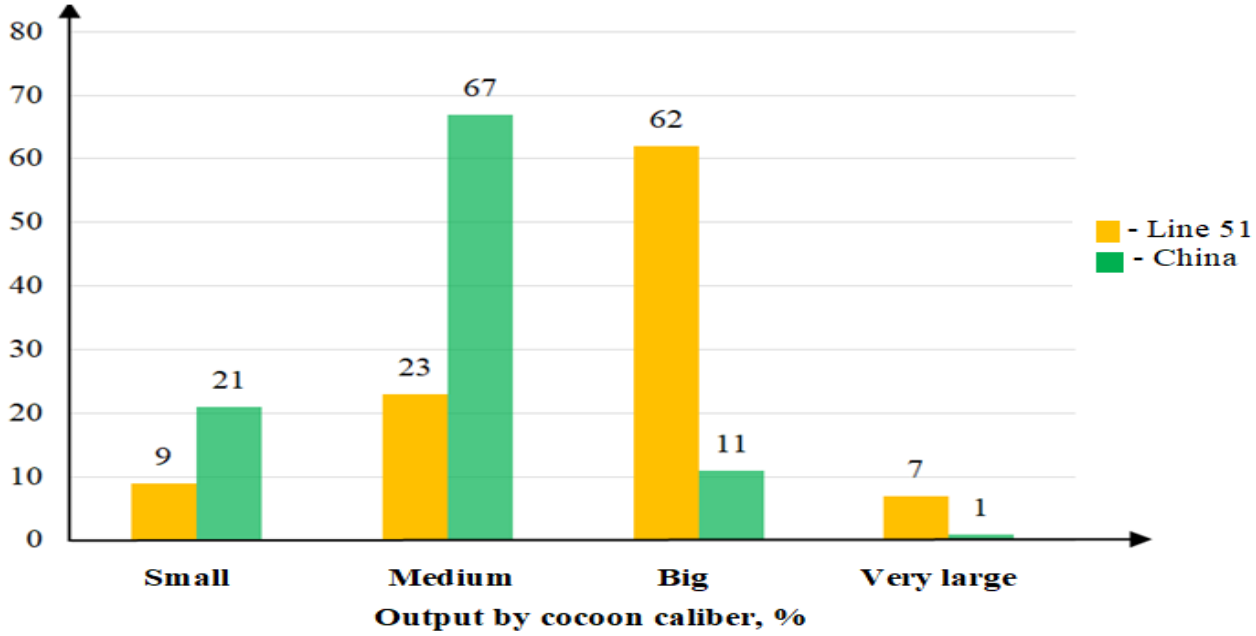
Fig 1. The average strength of the cocoon, *mg/mm²*

1.Pole part of the head hemisphere, 2. Side wall of the head hemisphere, 3. The lower part of the hemisphere is the pole, 4. Bottom hemispherical side wall, 5. Waist.

Through the thickness and strength of the cocoon, it will be possible to determine the density and porosity of the cocoon.

One of the main indicators in the production of high-quality raw silk is to obtain a product with the same linear density. The caliber of the cocoon is required to be the same in order to have less unevenness in the linear density of the raw silk. Therefore, the cocoons are calibrated and divided into small, medium, large, and very large calibers [6-7].

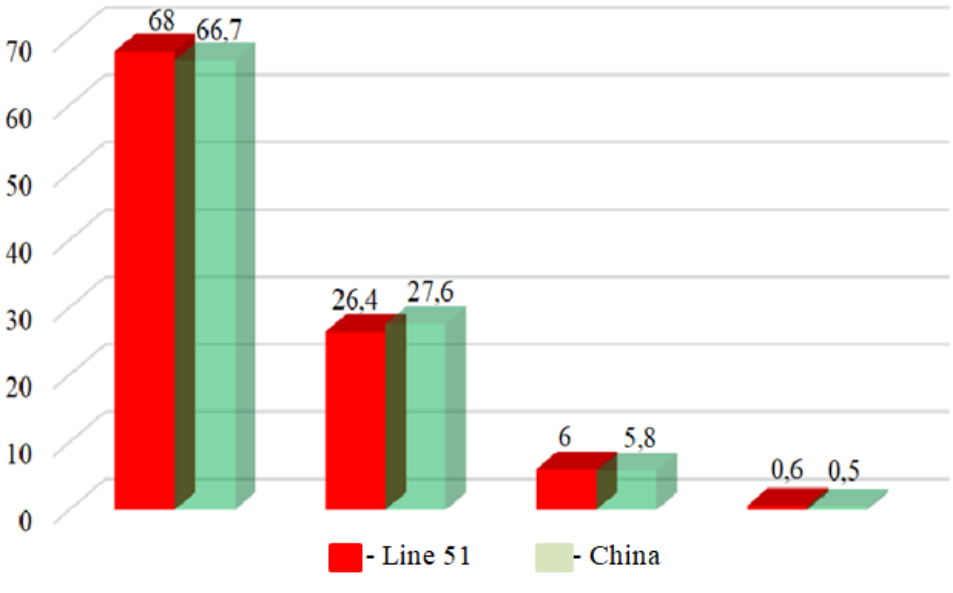
The caliber of cocoons by domestic and foreign breeds was determined and presented in the histogram below.



Output by cocoon caliber, %

From the results, we can see that small, medium caliber cocoons have 67% yield in Chinese breed. We can see that 62% of the cocoons of the local breed are mostly large-caliber cocoons. It is known from research that if the butterflies emerging from medium and large caliber cocoons are crossed, it will be possible to prepare hybrids for this medium caliber industry. To obtain high-quality raw silk, it is possible to obtain high-quality raw silk from cocoons with uniform linear density and medium caliber.

Industrially reared cocoons from Line 51 and China breeds were hand-sorted and the results of cocoons were determined and presented in the histogram below.



Cocoon output by variety, %

As can be seen from the results, we can see that 67% of small-caliber cocoons were hatched in the Chinese breed. We can see that 62% of the cocoons of the local breed were mainly large-caliber cocoons.

Industrially reared cocoons from Line 51 and Chinese breeds are sorted with the help of a lake, and the quality of cocoons is determined and presented in the histogram.

From the results, it can be seen that the output of type 1 cocoons corresponds to local breed cocoons. We can see that the moisture content of non-type cocoons is 0.5% in local breed cocoons.

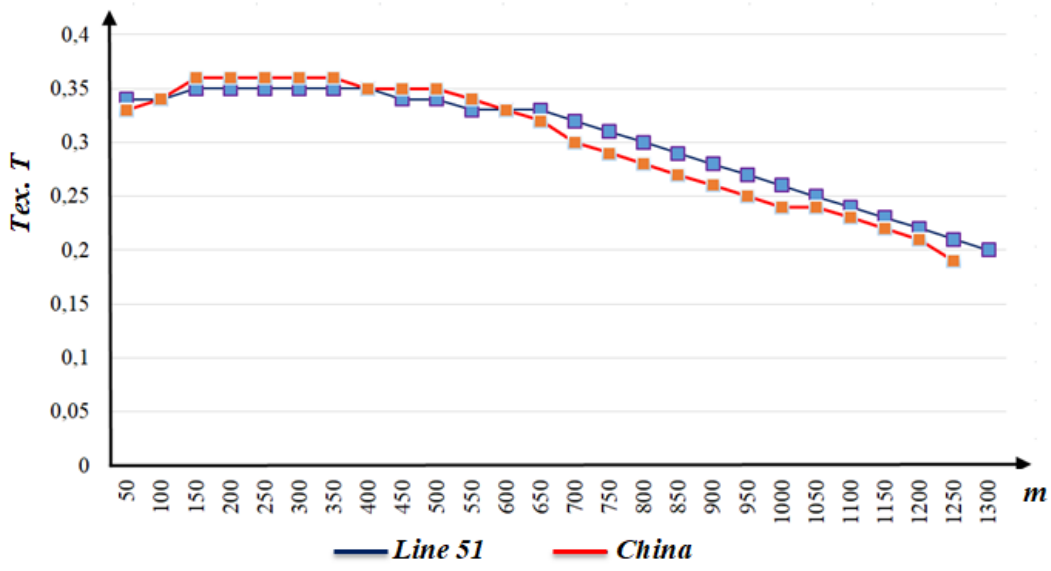
In order to determine the technological parameters of the sample cocoons, the technological parameters of the cocoons were determined by soaking the cocoons in a single spinning machine.

3 tables. Technological indicators on the results of individual cocoon washing

№	Technological indicators	The cocoon breed	
		China	Line 51
1	Average weight of dry cocoons, g	0,780	0,890
2	Product yield from the cocoon, %		
	Cocoon slime	0,60	0,58
	Cocoon thread	50,6	53,8
	Boiler, skin	4,5	4,8
	Sponge	32,0	34,0
	Worm skin	0,74	0,81
	Water soluble substances	2,62	2,51
3	Silkiness, %	62,3	64,1
4	The total length of the cocoon thread, *m*	1300	1420
5	Continuous length of cocoon thread, *m*	874	968
6	Wormability of the cocoon, *%*	92,6	94,8

From the results of individual cocooning, we can see that the parameters of the industrially reared Line 51 silkworm breed are much higher. We can see an average 10% improvement in cocoon weight and yield and cocoon shell worminess.

Based on the obtained results, the following graph was obtained for the total length of the cocoon thread.



The total length of the cocoon thread and the linear density of the cocoon thread were determined by spinning the cocoons individually. The linear density of raw silk obtained from local cocoons was 0.32 tex and the length of cocoons was 1300 meters. In foreign cocoons, we can see that the linear density of raw silk is 0.34 tex and the total length of the cocoon is 1250 meters.

Conclusion: To use domestic silkworm in industry, we must first get a good hybrid. For this purpose, it has been shown that it is possible to achieve economic efficiency by breeding elite breed cocoons and crossing genetically close breeds, using hybrid cocoons with uniform linear density, good worminess, and high raw silk yield in industry, and Line 51 and other breeds of silkworms. crossbreeding showed that it is possible to prepare high-quality cocoon raw materials for industry in the future.

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