

India ranks second in the world silk production. However, in the changing global scenario, there is a dire need to produce gradable silk. To achieve this, apart from pre-cocoon factors, post-cocoon aspects also need to be focused.

Quality of raw silk

Productivity and quality of raw silk are mainly influenced by five major factors i.e. quality of cocoons, process parameters, quality of water, reeling contrivances and human skill,

Quality of cocoons

Cocoon quality mainly depends on silkworm breed/hybrid, rearing technology and environmental conditions. They play a decisive role on the raw silk quality, productivity and cost of production as well.

The main quality parameters of cocoon are: uniformity in shape & size, grains, compactness, shell percentage, filament length, reelability, non-broken filament length, single cocoon filament denier, raw silk percentage and defective cocoon percent.

Shape & size

Generally, oval shaped cocoons have even shell thickness and the peanut shaped uneven shell thickness. The non-uniformity in cocoons leads to uneven cooking which affects reeling performance and quality of raw silk.

Compactness

The compact, uniform and dense formation of cocoon layer helps achieve uniform cooking resulting in better raw silk recovery and quality raw silk

Shell percentage

The wt. of cocoon shell has an impact on raw silk yield. More the shell percentage, better would be the yield and quality of raw silk. This has an impact on reeling cost also.

Filament length

Filament length determines rate of production. Naturally, the reelers prefer cocoons with a longer filament length. This influences evenness of silk yarn.

Reelability

Reelability is mainly influenced by racial character and environment. It depends on no. of droppings and casting. This influences the raw silk yield, productivity and quality.

Non - broken filament length

It depends on reelability and determines the no. of casting. Higher NBFL gives better productivity and quality

Defective cocoons

Defective cocoons reduce the raw silk yield. They produce low quality raw silk and increase cost of production. Filament denier is mainly influenced by racial character and spinning condition.

Filament denier

This is influenced by racial character and spinning condition. Normally, the size of the filament is coarser in the outer layer and finer towards the inner layer. The extent of this variation is 25% to 40%. This influences the size deviation and the evenness variation.

Raw silk percentage

It is the amount of raw silk recovered from cocoons. It depends on race, conditions of rearing and mounting, cocoon drying, storage, cooking and reeling conditions.

Appropriate reeling process

Mechanical properties of raw silk are influenced by the process parameters of reeling adopted. This would lead to desired quality of raw silk.

Cocoon stifling

This process kills the pupae, removes the moisture content and enhances quality during reeling.

It is achieved by maintaining temperature, duration, cocoon layer thickness and degree of drying.



Cocoon storage

It is done to condition the dried cocoons and reach equilibrium state between moisture level inside the cocoons and outside atmosphere. It is achieved by providing proper ventilation;



Storing the cocoon in a thin layer facilitates aeration and avoids fungus attack. It also protects from beetles, ants and rats.

Cocoon sorting

It is done to take out the defective cocoons which affect the reeling performance and quality of the silk significantly.



It can be achieved by removing double, soiled and unshaped cocoons. It is done by farmers. The remaining defective cocoons are removed on cocoon sorting table by the reeler.

Cocoon mixing

Mixing of smaller lots to make a bigger one is done in order to produce quality raw silk with higher productivity.

It is achieved by grouping the cocoons in accordance with the quality and by testing them for filament denier, NBFL, reelability by single cocoon reeling.

IMPACT OF COCOONS AND REELING PARAMETRES ON QUALITY OF RAW SILK



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Cocoon cooking

It is done to get better productivity by ensuring good reelability of the cocoons ; to reduce thread troubles during reeling ; to ensure better raw silk recovery by reducing waste generation.



It is achieved by maintaining proper temperature, duration of treatment, water quality and heat transmission medium.

Brushing

It is done to pick the correct end from cooked cocoons during reeling. It is important to reduce waste generation.



It is done by manually brushing using bamboo stick/coconut twigs; Brushing should be balanced to avoid silk waste and poor raw silk recovery.

Reeling

It is done to combine number of ends of the cocoon filament to form a single thread of desired denier. Good reeling is achieved by skill, machinery and management.

It is achieved by maintaining optimum level of reeling speed, basin temp. and croissure length.

Small reel permeation

It is done to wet the raw silk on small reels before re-reeling; It softens the gum spots to facilitate smooth unwinding and enhances the re-reeling performance.

This helps in retaining the luster besides improving the handle of silk. It is achieved by soaking or vacuum permeation.

Re-reeling

This is done to transfer the raw silk reeled on small reel to a larger one. It eliminates gum spots in the reeled silk. In this process , the loose ends are tied up and thin ends eliminated to ensure smooth winding



It is achieved by maintaining proper speed of machine, tension, humidity and temperature. Finally, the lacing is done to avoid entanglement.

Raw silk testing and classification

It is done as per the recommended method of testing and classification adopted by the International silk Association. It is done to know the quality of silk and determine its grade. It helps in the fair transaction of raw silk.

Quality tests for raw silk

The tests for raw silk quality are visual inspection and mechanical tests viz winding; size; evenness variation; cleanness; neatness, tenacity, elongation and cohesion. It is important that reeling should ensure: production of target quality of raw silk with better raw silk yield, productivity and quality .

Factors affecting profit margin

Cost of cocoons for reeling one kg. of raw silk depends on yield and unit cost of raw material which is influenced by shell (%)



Production cost of reeling per kg raw silk depends on productivity and wages which are influenced by filament length and NBFL. Ultimately, the selling price of silk is influenced by its quality

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