

Fibre to Fabric

The thin strands of thread or yarn used to make fabric are called as **Fibre**. The fibres may be natural or synthetic. The natural fibres can be obtained from plant sources like the cotton and the jute and also from animal sources like the wool and the silk.

Animal fibres – Wool and Silk

Wool

Wool is obtained from the fleece (hair) of sheep or yak. These hairs act as insulators of heat. They trap the heat and keep these animals warm.

The hairy skin of the sheep has two types of fibres that form its fleece:

- (i) The coarse beard hair, and
- (ii) The fine soft under-hair close to the skin.



Selective Breeding

It is the process of selecting parents for obtaining special characters in their offspring, such as soft under hair in sheep.

Animals that yield wool

Wool is obtained from a wide range of animals across the country. For example yak wool in Ladakh and angora wool in Jammu Kashmir. The table shows the variety of Indian sheep.

Breed	Quality of wool	Place of rearing
Lohi	Good quality wool	Rajasthan, Punjab
Marwari	Coarse wool	Gujarat
Patanwadi	For hosiery	Gujarat

Nali	Carpet Wool	Rajasthan, Haryana, Punjab
Bakharwal	For woollen shawls	Jammu and Kashmir
Rampur bushair	Brown fleece	Uttar Pradesh, Himachal Pradesh

From fibres to wool

To obtain wool from fibres the sheep needs to be reared. The hair of the sheep is removed and processed into wool. Some breeds of sheep have thick coat of hair on their body which yields good quality wool in large quantities. These sheep are selectively bred to get better quality of wool in the offspring.

Processing fibres into wool

The processing of the wool can be categorized into six steps:-

Shearing

The fleece of the sheep along with a thin layer of skin is removed from its body by machines. This process is called shearing. Woollen fibres are then processed to obtain woollen yarn. Shearing doesn't hurt a sheep. It's just like getting a haircut. The wool is removed by following an efficient set of movements.



Shearing

Scouring

After the wool is sorted, it must be washed thoroughly. Some of the foreign substances in the raw wool can be removed simply by washing in water but the grease requires soap. If too much lanolin is left in the wool it will repel the dye in places, resulting in a mottled effect. This process is called as scouring.



Scouring

Sorting

Now the hairy skin is sent to the factory to separate hairs of different textures. There are numerous kinds of wool. Every fleece comprises several kinds of wool. The wool is not uniform over the entire body of the sheep. Some parts are longer than the other, some parts are finer, some cleaner. The fleece must be divided into parts in order to get desired uniform wool.



Sorting

Separation of burrs

The small burrs or the fluffy fibres are picked out from the hair. They are scoured again and dried. This is the wool ready to be drawn into fibres.

Dyeing

The fibres can be dyed in various colours, as the natural fleece of sheep and goats is black, brown or white. Many subtle dye colors can be extracted from various plants for a natural dye process. On a large commercial scale the use of chemical dyes is more convenient and thus more common.



Dyeing

Carding and Combing

The fibres are combed and rolled into yarn. Carding is gently spreading washed and dried wool in preparation for further processing. Combing is done for straightening and stretching the fibers to obtain maximum spinning capacity. The longer fibres are made into wool for sweaters and the shorter fibres are spun and woven into woollen cloth.



Combing

Silk

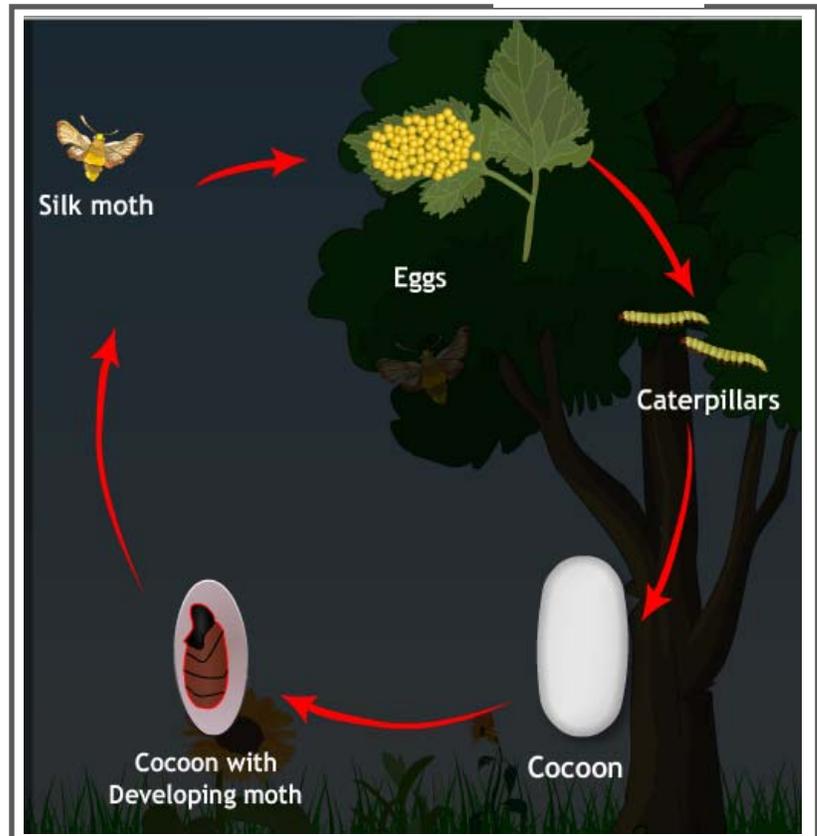
A silk fibre come from cocoons of the silk moth and therefore is an animal fibre. The rearing of silkworms for obtaining silk is called **sericulture**.



Silk fibre

Life history of silk moth

- The life of a silkworm starts when a female moth lays eggs on the mulberry leaves.
- After sometime, these eggs hatch into larvae or caterpillars.
- Slowly these caterpillars grow in size by feeding only on the leaves of mulberry trees.
- The next stage in the life cycle of a silk moth is a pupa, it starts weaving a net around itself so that it can easily hold net.
- It secretes a fibre made of protein, which solidifies and hardens when exposed to air for some time. This is the **silk fibre**.



Life cycle of Silk moth

- Caterpillars continue to spin silk fibre till they completely get covered by them.
- This silk covering in which a silk moth covers itself is known as a **cocoon**.
- Further development of the silk moth takes place inside the cocoon as it enters the pupa stage.
- After sometime, the pupa enters into the adult stage and emerges out of the cocoon as a moth.
- The whole process thus continues and is known as the life cycle of a silkworm.

From cocoon to silk

Rearing silkworms:

The female silk moth lays eggs on mulberry leaves, which are then transferred to a piece of paper or cloth.



Rearing silkworms



Silkworms in bamboo trays

The eggs are stored under hygienic conditions, in a specific temperature and pressure for the larvae to hatch.

When the larvae hatch, they are placed on clean bamboo trays and are fed on leaves of the mulberry tree.

Caterpillars eat a large amount of leaves and increase in size at a very rapid pace.

The caterpillars stop eating after 25-30 days and move to a chamber in the bamboo tray.



Silkworms on mulberry leaves



Cocoon with Silkworms

There, they spin a cocoon and get attached to the tray.

These cocoons are then collected by farmers and processed to form silk fibres.

Processing silk

Cocoons are collected and kept under the sun, or boiled, or exposed to steam. This helps in separating out the silk fibres. This process of separating silk fibres from the cocoon is called **reeling the silk**. This is followed by the spinning of silk fibres into threads.



Reeling the silk