Understanding the Silkworm Life Cycle: A Guide for Home Rearing

Raising silkworms at home is a rewarding experience that connects you to one of humanity's oldest industries. Whether you are a hobbyist, a teacher looking for a classroom project, or someone interested in small-scale sericulture, the key to success lies in understanding the silkworm life cycle. The entire process, from egg to adult moth, takes roughly six to eight weeks, and each stage demands specific care. The silkworm life cycle is a complete metamorphosis, meaning the insect passes through four distinct phases: egg, larva (caterpillar), pupa (inside a cocoon), and adult moth. Getting the conditions right at each step is what separates a healthy colony from a failed one.

The domesticated silkworm, *Bombyx mori, no longer exists in the wild. It has been bred for thousands of years for its silk production, and it relies entirely on humans for its survival. This makes silkworm breeding a responsibility as much as a hobby. The moths cannot fly, and the larvae are helpless without a steady supply of fresh mulberry leaves. Knowing what to expect at each phase will help you plan your feeding schedule, manage space, and avoid common problems like disease or poor hatching.*

Starting with Silkworm Eggs

Everything begins with silkworm eggs. These are tiny, pinhead-sized spheres that start out a pale yellow and darken to a slate grey or black if they are fertile. The color change is a reliable indicator of viability. If you buy eggs from a supplier, they are often in a state of diapause, a kind of suspended animation. To break this dormancy, you need to simulate spring. Store the eggs in a refrigerator at around 2 to 8 degrees Celsius for several weeks, then bring them out into warmth. The eggs will hatch about 10 to 14 days after being placed in an incubator or a warm room at 24 to 28 degrees Celsius. Humidity is also critical at this stage. Aim for 70 to 80 percent relative humidity. Too dry, and the eggs will desiccate; too humid, and they can mold. A simple spray bottle used daily on the container's sides usually works, but avoid wetting the eggs directly.



The Larval Stage: Hungry Caterpillars

When the eggs hatch, out come tiny black caterpillars no bigger than a millimeter. They are often called ants or first instar larvae. This is the larval stage, and it is the most labor-intensive part of silkworm care. For the next four to five weeks, these caterpillars will eat almost constantly. Their only food is fresh mulberry leaves. They will not eat anything else, so you must have a reliable supply. If you do not have a mulberry tree nearby, you can buy leaves online, but this gets expensive. Many home raisers freeze leaves for short-term storage, though fresh is always best. The larvae grow rapidly. They molt four times, shedding their skin to accommodate their expanding bodies. Each molt marks a new instar. By the fifth instar, the caterpillars are fat, creamy white, and about 7 to 8 centimeters long. They eat ferociously, and you will hear a soft munching sound if you listen closely. This is also the stage where silkworm feeding must be consistent. They need fresh leaves two to three times a day. Old, wilted leaves can cause digestive issues, and overcrowding leads to stress and disease. Silkworm temperature should stay between 24 and 27 degrees Celsius. If it drops too low, growth slows; if it gets too hot, the caterpillars may stop eating. Silkworm humidity around 60 to 70 percent keeps them from drying out during molting.

Common Challenges in the Larval Stage

Silkworm diseases are most common during this stage. The worst is a viral infection called grasserie, which turns the larvae into a liquid mess. It spreads quickly in dirty conditions. Good silkworm care means cleaning the rearing tray every day. Remove droppings and old leaf stems. Also, avoid handling the caterpillars directly; use a soft brush or a leaf to move them. Another issue is the larvae wandering off, especially when they are ready to spin. They look for a corner or a piece of cardboard. If they escape, they can dry out and die. Silkworm growth can stall if the leaves are too old or if the caterpillars are overcrowded. A good rule of thumb is to give each mature larva at least twice its body length in space.

Spinning the Cocoon and the Pupa Stage

After about four to five weeks, the caterpillars stop eating. They become restless, raising their heads and searching for a place to spin. This is the sign that the larval stage is ending. You need to provide them with a structure, like a cardboard egg carton or a bundle of twigs. Each caterpillar will find a spot and begin to secrete a single continuous strand of silk from its spinneret. The silk comes out as a liquid that hardens on contact with air. Over two to three days, the caterpillar builds a dense, oval-shaped cocoon around itself. Inside the cocoon, the caterpillar molts one last time into a pupa. The pupa is a brown, mummy-like form that does not move. This is the chrysalis phase. It is a period of profound transformation. The insect's body breaks down into a kind of cellular soup and reorganizes into the adult moth. This process takes about two to three weeks, depending on temperature. This is also the stage where sericulture traditionally intervenes. Commercial silk producers boil the cocoons with the pupa inside to kill it and then unwind the silk filament. If you want to raise moths for breeding, you let the cocoons develop naturally.



The Adult Moth Emerges

When the metamorphosis is complete, the adult moth pushes its way out of the cocoon. It secretes a fluid that softens the silk, creating an opening. The moth that emerges is not like a butterfly. It cannot fly. Its wings are small and crumpled. The adult moth's only purpose is to mate and lay eggs. It does not eat. Its mouthparts are reduced, and its digestive system is gone. Within hours of emerging, the males and females find each other. They mate for several hours. After mating, the female begins laying silkworm eggs. She can lay hundreds of them over a day or two, carefully placing them in clusters. She then dies within a week. The male may mate again before dying. The eggs will be dormant until the next warm season, or you can refrigerate them to simulate winter. The cycle is complete.

Planning for the Next Generation

If you want to continue silkworm breeding, you need to manage the new eggs carefully. Only keep eggs from healthy, well-fed parents. If you see any signs of disease in the adult moths, discard those eggs. Also, decide how many you want to raise. A single female can lay 300 to 500 eggs, which can quickly become overwhelming. Silkworm farming at home is sustainable if you control the population. You can give away eggs to other hobbyists or freeze excess eggs to stop them from hatching. Understanding the silkworm life cycle helps you plan your stock. If you stagger the hatching by refrigerating different batches, you can have caterpillars at different stages, spreading out the work and the supply of mulberry leaves.



Wrapping Up Practical Points

People often ask about the best time of year to start. Spring and early summer are natural, because mulberry trees produce fresh leaves. But you can raise silkworms year-round if you have a mulberry tree that keeps its leaves or if you buy dried leaf powder (though fresh is far better). The silkworm life cycle is predictable, which makes it manageable. The key variables are temperature, humidity, and food quality. If you keep those in check, the rest follows naturally. Silkworm development will proceed on its own schedule, and you will have a front-row seat to one of nature's most remarkable transformations. The entire process, from the first tiny caterpillar to the moth laying eggs, is a lesson in patience and biology. It is also a direct link to the ancient art of silk making, a craft that has connected cultures for millennia. Whether you raise them for silk, for education, or simply for the joy of it, the experience is deeply satisfying. Just remember: fresh leaves, clean trays, and consistent warmth. Those three things will carry you through every stage of the silkworm life cycle.