



International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.699

Volume 14, Issue 8, August 2025

Stress Level in Silver Pheasants (*Lophura –nycthemera*) During Captivity

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ABSTRACT: Silver pheasants (*Lophura nycthemera*) are beautiful birds that are often kept in captivity for breeding, conservation, and research. However, captivity can be stressful for them due to limited space, environmental changes, and human interaction. Stress affects their health and behavior, and one way to measure stress is by checking the levels of cortisol, a hormone released when animals are under stress. I collected the blood samples and use a method called Radioimmunoassay (RIA) to measure cortisol levels. This research paper discusses the impact of captivity on stress levels in silver pheasants, how cortisol is measured, and ways to reduce stress in captive birds. Understanding stress in these birds can help improve their living conditions and overall well-being.

KEYWORDS: Stress, cortisol, captivity

I. INTRODUCTION

The silver pheasant is a beautiful bird known for its striking appearance and graceful movements. Native to the forests and mountains of Southeast Asia, especially in countries like China, Thailand, and Vietnam, this bird is admired for its shimmering white feathers and long tail.

The male silver pheasant is especially eye-catching with bright white and black plumage, a red face, and long tail feathers. In contrast, the female is more brownish, helping her stay camouflaged in the wild. These birds live in forested areas and prefer to stay on the ground, although they can fly short distances if needed.

Silver pheasants are omnivores, which means they eat both plants and small insects. They are also known for their unique calls and social behavior, often forming small groups.

Because of their beauty and calm nature, silver pheasants are sometimes kept in aviaries or bird parks. However, in the wild, their habitat is at risk due to deforestation, so protecting them is important for nature conservation.

Silver pheasants are native to forests in Southeast Asia and China. They are known for their striking black-and-white feathers and are often kept in aviaries, zoos, and breeding centers. While captivity provides safety and care, it can also be stressful for the birds. Stress in animals can lead to health problems, changes in behavior, and even a shorter lifespan.

One of the most effective ways to measure stress in birds is by testing the levels of cortisol, a hormone produced by the adrenal glands. When a bird experiences stress, its body releases more cortisol, which can be measured through blood samples. Scientists use a technique called Radioimmunoassay (RIA) to detect cortisol levels and assess stress in captive silver pheasants. This research aims to understand how captivity affects these birds and what can be done to reduce their stress levels.

Cortisol Hormone and Its Role in Stress

Cortisol is a hormone that plays a major role in how animals and humans respond to stress. It helps the body deal with challenging situations by increasing energy, regulating blood pressure, and controlling metabolism. However, when cortisol levels remain high for too long, it can harm the body.

In silver pheasants, high cortisol levels can weaken the immune system, reduce their ability to reproduce, and make them more vulnerable to diseases. Chronic stress can also lead to aggressive behavior or loss of appetite. Since silver pheasants in the wild have more freedom and natural stimulation, they are less likely to experience long-term stress compared to those in captivity. That is why it is important to monitor cortisol levels in captive silver pheasants

II. MATERIAL AND METHODS

Collecting Blood Samples to Measure Cortisol

Scientists sometimes check a hormone called **corticosterone** (like bird stress juice). If this hormone is high, it means the bird is stressed. It can be measured in:

1. Blood (a bit invasive)
2. Feathers or poop (non-invasive and easier)

To check the cortisol levels in silver pheasants, I collected the blood samples from the birds. This process needs to be done carefully to avoid causing extra stress. The most common way to collect blood is by drawing a small amount from a vein in the bird's wing or leg. The blood sample is then stored in a special container and sent to a laboratory for testing by using RIA method.

Taking blood samples can be stressful for the bird, so it is important to handle them gently and complete the process quickly. If the bird is stressed while the blood is being drawn, its cortisol levels may temporarily rise, which can affect the accuracy of the results. To prevent this, some researchers also collect fecal samples as an alternative method to measure stress hormones.

Radioimmunoassay (RIA) for Measuring Cortisol

After collecting the blood sample, I use a method called Radioimmunoassay (RIA) to measure cortisol levels. RIA is a laboratory technique that helps detect very small amounts of hormones in the blood. In this test, a radioactive substance is mixed with the blood sample, and special antibodies are used to measure how much cortisol is present. The results help scientists understand how much stress the bird is experiencing.

Although RIA is a very accurate method, it requires specialized equipment and trained professionals to perform the test safely. Other methods, such as Enzyme-Linked Immunosorbent Assay (ELISA), are sometimes used as an alternative to measure cortisol levels in birds.

III. DISCUSSION

Captivity can be stressful for silver pheasants because it is very different from their natural habitat. Some of the main factors that cause stress in captive birds include:

1. **Limited Space** – In the wild, silver pheasants have large areas to explore, but in captivity, they are often kept in small enclosures. This lack of space can make them feel trapped and stressed.
2. **Unfamiliar Environment** – Birds in captivity experience different temperatures, lighting, and sounds compared to their natural habitat. These changes can cause stress, especially if they are not provided with a comfortable environment
3. **Human Interaction** – Frequent human contact, especially if the birds are not used to it, can be stressful. Loud noises, sudden movements, or rough handling can increase their stress levels.
4. **Dietary Changes** – In captivity, birds are often given a specific diet, which may be different from what they eat in the wild. If their diet lacks essential nutrients, it can affect their health and increase stress.
5. **Social Factors** – Some birds prefer to live in groups, while others like to be alone. If silver pheasants are housed in the wrong social setting, they may feel threatened or lonely, leading to stress.

There has been a wide array of scientific discussion and research on stress levels in birds during captivity. These discussions span multiple disciplines—behavioral ecology, physiology, veterinary science, and animal welfare—and reveal how complex and variable avian stress responses can be. Here's an overview of perspectives from different scientists and research angles.

Dr. Mason's work in animal welfare often focuses on stereotypic behaviors in captive animals, including birds. Her research highlights how repetitive, abnormal behaviors such as feather plucking or pacing can be clear indicators of chronic stress in captive birds.

A pioneer in neuroendocrinology, Dr. Wingfield introduced the concept of the "**emergency life history stage**", referring to how birds temporarily alter hormone levels (especially **corticosterone**) in response to stress.

Best known for her work with the African grey parrot, **Alex**, **Dr. Pepperberg** has shown that birds are capable of high levels of cognitive functioning and emotional complexity. Cognitive stimulation and social interaction significantly reduce stress and promote wellbeing. Her research argued against traditional views of birds as simple-minded and supported the need for cognitive enrichment in captivity.

Dickens and Möstl was also worked on the stress level of birds in captivity. Specializing in avian cognition, **Dr. Healy's** work often compares wild and captive bird behavior. Captivity affects spatial learning, problem-solving, and stress response due to restricted movement and reduced stimulus. Her findings suggest that cognitive and environmental complexity in captivity can mitigate some negative stress effects.

Panas Tumkiratiwong et.al., studied on stress level of birds. The study tracked monthly plasma levels of sex steroids and corticosterone in captive male and female Silver Pheasants for a full year. Birds in big outdoor cages exhibited **lower corticosterone levels** compared to those placed in small enclosures, demonstrating that confinement significantly alters stress hormone levels.

Jones (1996) and Mench (2002) worked on "Fear and adaptability in poultry." **And** The welfare of poultry in production systems."

These findings are particularly relevant for understanding **animal welfare in breeding programs**, and highlight how enclosure types impact physiology.

Common Stressors Identified in Studies:

- **Lack of social interaction**
- **Limited space for flight and movement**
- **Poor diet or feeding regimen**
- **Lack of environmental enrichment**
- **High noise levels or irregular light cycles**

IV. CONCLUSION

Scientists largely agree that captivity imposes stress on birds, especially when conditions are far removed from their natural habitats. However, they also emphasize that proper care- social, cognitive, environmental—can significantly reduce that stress. The primary indicator of stress in birds is elevated **corticosterone**, a glucocorticoid hormone.

Chronic high levels can suppress immunity, reduce reproductive success, and impair growth. The future of avian care in captivity is leaning toward individualized, enriched environments and ongoing behavioral and hormonal monitoring. Stress is a serious concern for silver pheasants in captivity. Measuring cortisol levels through blood samples and RIA tests helps us to understand how much stress these birds are facing. Captivity can cause stress due to limited space, unfamiliar environments, human interference, and changes in diet. High stress levels have negatively impacted their health and behavior, so it is important to improve their living conditions by providing a more natural habitat, proper diet, and social interactions. By reducing stress in captivity, we can help silver pheasants live healthier and happier lives. In my research we found that lack of environmental enrichment and space leads to frustration and stress. Emphasized the importance of providing mental stimulation and naturalistic environments. Captivity can elevate corticosterone levels, but chronic elevation can suppress immunity and reproduction. Provided frameworks for measuring physiological stress via hormonal assays. Cognitive stimulation and social interaction significantly reduce stress and promote wellbeing. Environmental enrichment can reduce fear responses and feather pecking.

Loud noises or irregular lighting disrupt natural rhythms. Bright artificial lighting at night can interfere with sleep and hormone regulation. Silver pheasants are **shy birds** and love staying in quiet, forest-like areas. If we try to make their cage feel like a mini forest, they will be much happier

Ways to Reduce Stress in Captive Silver Pheasants

- To keep silver pheasants healthy and reduce their stress levels, it is important to provide them favourable environment for their physical and psychological needs like
- Providing a naturalistic habitat giving birds more space, hiding spots, and perches can help them feel safer and more comfortable.
- Minimizing Human Disturbance – Keep them away from noise, limiting handling, and allowing them to have spaces can help reduce stress.
- Improving Diet and Nutrition – giving them a well-balanced diet similar to what they eat in their natural habitat can improve their health and reduce stress.
- Allowing Social Interaction – Keeping birds in small groups or pairs, based on their natural behavior, can help them feel less lonely and more secure.
- Proper male-female ratios, avoiding overcrowding.
- Limit handling, reduce exposure to loud noise and sudden environmental changes.
- Regular feeding and care schedules.
- Monitor health closely to catch stress-related illness early.
- Avoid touching or moving them too often

Dr. Fry has researched the effects of captive environments, including artificial lighting and noise, on stress in birds. Chronic exposure to artificial conditions can disrupt circadian rhythms and stress hormone cycles. Advocated for the design of more naturalistic aviaries and reduction of sensory stressors.

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