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Kinky Back (Spondylolisthesis) in Broiler Chickens: What We Can Do Today to Reduce the Problem

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Spondylolisthesis, often called "kinky back," is a deformity that affects broiler chickens' spines. The deformity occurs in the fifth and/or sixth vertebrae (T6) and leads to spinal cord compression, making it hard for birds to walk. In severe cases, it can cause paralysis. Chickens are lame and will sit with extended feet, show an imbalance, and fall on their sides when attempting to stand.

Walking ability, or gait, is related to this condition. Even when the deformation is subclinical, meaning not obviously detected, birds may have spinal compression and poor walking ability, suggesting they are in pain. This article describes some characteristics of this disorder and some preventive methods to reduce the prevalence of this condition in a broiler chicken flock.

Development and Prevalence of Subclinical and Clinical Spondylolisthesis

This condition can affect chickens between 3 and 6 weeks of age before it evolves into clinical, or observable, cases. When it's not obvious and does not show observable signs, it is called "subclinical" spondylolisthesis (fig. 1). Subclinical spondylolisthesis can affect 15%-60% of a flock. Clinical spondylolisthesis is a severe health and welfare concern and can affect 2% of a flock. When spondylolisthesis evolves into a clinical condition, the bird must be euthanized to end pain and distress.

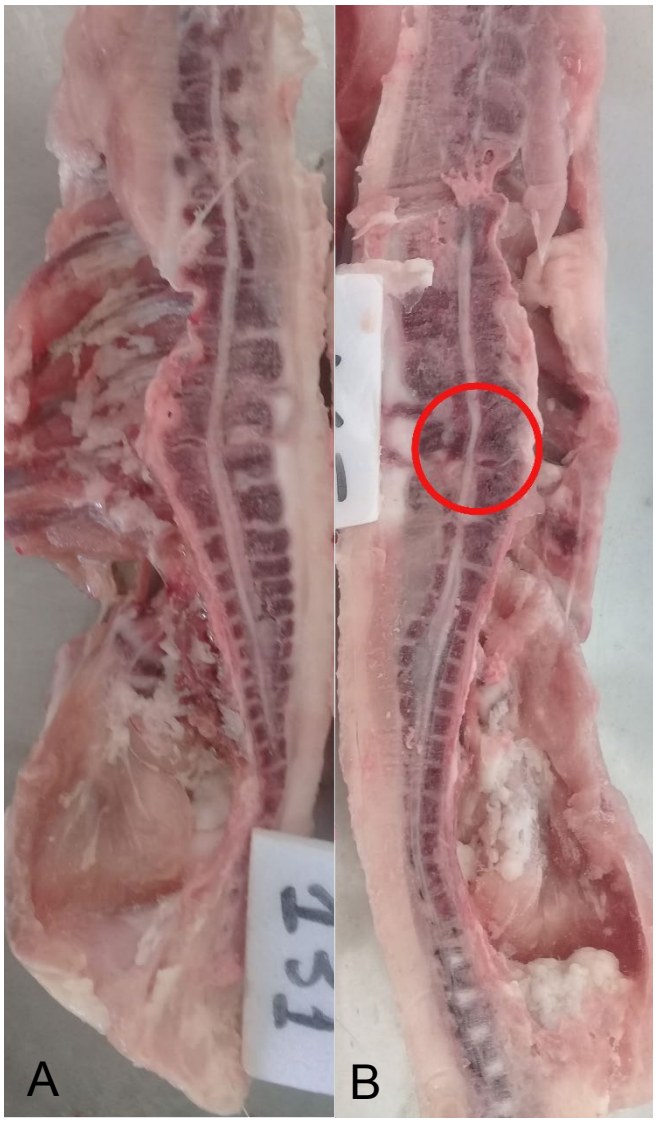

Figure 1. Dissected backs of broiler chickens at 43 days of age. (A) Healthy: vertebrae found on their normal axis without compressing the bone marrow, no spondylolisthesis. (B) Subclinical spondylolisthesis: vertebrae compressing the bone marrow. (Photo courtesy of Lourenco-Silva et al. 2023.)

Chickens with subclinical spondylolisthesis do not show symptoms, while broilers with clinical spondylolisthesis are unable to walk, will have an abnormal sitting posture, are unbalanced, and may fall over when attempting to stand.

What We Can Do to Limit the Issue

The prevalence of subclinical spondylolisthesis and the possible development to clinical cases can be reduced by providing environmental resources that increase complexity. Complexity refers to an enriched environment with numerous resources that address animal needs. For example, a perch for a chicken would be a resource that adds complexity to the environment, and addresses the bird's need to roost. These resources will stimulate birds' activity and thus provide opportunities for birds to exercise and walk more than they would without these items. Here are some suggested resources to promote exercise:

- Perching platforms with or without ramps, depending on height.
- Straw or hay bales.
- Laser light projections onto the floor (fig. 2).

Figure 2. Step platforms and laser lights can be resources to stimulate exercise and strengthen broilers' bones and muscles. (Photo courtesy of Lourenco-Silva et al. 2023.)

These resources increase exploratory behaviors, positive activity, and walking. This can strengthen the locomotor system, alleviate the pressure of the bird's body weight, and reduce the prevalence of subclinical spondylolisthesis.

Step platforms provide the means for exercise, such as walking up and down and jumping off the platforms. Hay bales and laser lights stimulate exploratory behavior, such as chasing and pecking. A 2023 study (https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0284087) found that these resources reduced prevalence of subclinical spondylolisthesis (Lourenço da Silva et al. 2023).

Researchers found that platform perches were most effective in reducing the prevalence of subclinical spondylolisthesis, with 21% of the flock impacted, compared to almost 60% of the flock in the control group, without added resources. Laser lights reduced the prevalence to 29%. Possibly, a combination of these resources, or more resources, may reduce the prevalence of subclinical spondylolisthesis even further.

"Kinky Back" Is a Multifactorial Problem

Providing resources to increase complexity (an enriched environment) does not prevent the issue completely, although it can reduce the prevalence significantly. Many factors contribute to the development of the disorder, including genetic predisposition, nutrition, age, stocking density, incubation conditions, and bedding materials.

Summary

- Kinky back can negatively affect fast-growing broilers even without obvious signs.
- Kinky back is a multifactorial disorder. There is no magical solution, as both genetic and environmental factors impact the prevalence.
- Environmental resources stimulate exploratory behaviors and exercise, strengthening the birds' musculoskeletal systems.
- Environmental complexity can reduce the prevalence of subclinical spondylolisthesis in broilers.

Additional Resources

Lourenço da Silva, M. I., I. C. L. Almeida Paz, A. S. Jacinto, M. A. Nascimento Filho, A. B. S. Oliveira, F. Mota, F. R. Caldara, and L. Jacobs. 2023. "Providing Environmental Enrichments Can Reduce Subclinical Spondylolisthesis Prevalence Without Affecting Performance in Broiler Chickens." PLOS ONE 18(4): e0284087. https://doi.org/10.1371/journal.pone.0284087.

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