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Poultry Extension Collaborative newsletter

A collaboration between Purdue University, University of Arkansas, University of Georgia, and Virginia Tech

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The welfare of broiler chickens part 1: impact of growth rate

Extension collaborative for the poultry industry

- Definitions
- Growth rate & health
- Growth rate & behavior

American and European companies are pledging to move to include slow-growing broiler chickens for production, which means they will use broiler chickens with less efficient growth rates in their production systems. Slow-growing strains show improved welfare outcomes compared to conventional ones.

This newsletter describes some characteristics of fast- and slow-growing broilers, along with the impacts that the differing growth rates can have on the birds' health and behavior.

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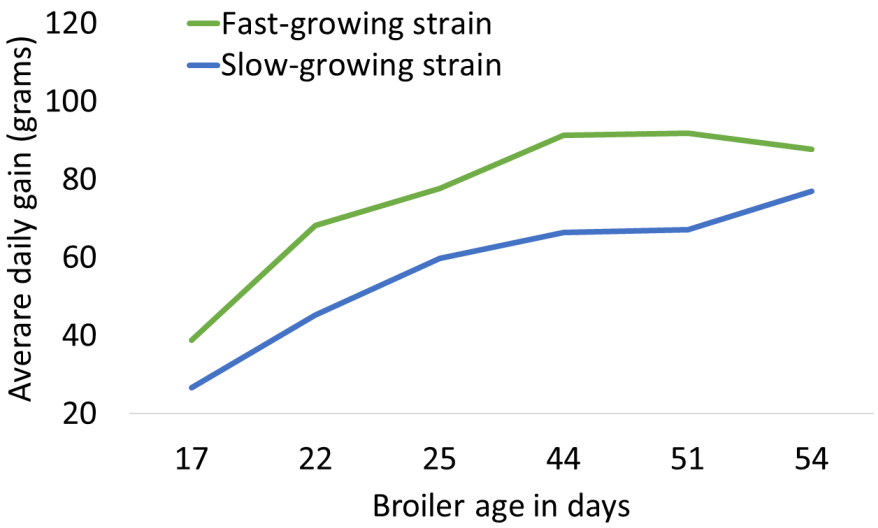
What are fast- and slow-growing chickens?

A fast-growing broiler chicken is a type of chicken that gains weight rapidly and is typically used in commercial broiler chicken farms.

Fast-growing broilers can reach a growth rate of up to 3.5 oz (100 g) per day.

“Slow-growing” broilers have been defined as birds that require an increased number of days to grow to the same size and weight compared to conventional fast-growing strains (NCC, 2016).



Average daily growth rates in grams of a fast-growing broiler chicken and slow-growing broiler chicken strain from 17 days of age. Figure credit: Alexandra Ulans, Virginia Tech

The threshold for average growth per day for strains to be considered slow-growing differs among stakeholders but a commonly mentioned threshold for average daily gain is <50 g/day over their life span (G.A.P., 2016; Rayner et al., 2020).

Why is growth rate important?

Having a fast growth rate can cause a variety of health concerns for chickens, resulting in discomfort, pain, or even death.

These health concerns tend to mainly impact the cardiovascular and musculoskeletal systems (heart, muscles and bones) of the birds.

In addition, the rapid weight gain can change their behaviors as movement becomes more strenuous when birds gain weight (Bokkers, 2004).

A fast- (left) and slow-growing (right) broiler side-by-side comparison. Both birds are 36 days old. Photo credit: Alexandra Ulans, Virginia Tech

Did you know?

Fast-growing broiler chickens reach their target processing weight at 6-7 weeks of age (depending on the target weight)

Fast-growing broilers are the most common type of broiler used today, because they are cost-efficient in producing meat. However, consumer concern for animal welfare continues to grow, resulting in an increased use of slower growing breeds (Alonso et al., 2020).

Growth rate impacts health

Fast-growing broilers can be prone to a range of diseases that are associated with their growth rate and/or body weight. Here are some examples.

Sudden death syndrome
Can impact 0.5-4% of birds (Crespo and Shivaprasad, 2013)

As fast-growing broilers rapidly gain weight, their hearts can struggle to circulate blood to all the newly formed tissue. Seemingly healthy birds will suddenly collapse and die.

Ascites
Can impact 10% of birds (Closter et al., 2012)

A common cardiovascular disease that occurs due to stress on the heart and changes in the liver. This results in accumulation of fluid in the body cavity and causes difficulty breathing which slowly gets worse (Bessei, 2006).

Femoral head necrosis
Can impact 14% of birds (Wilson et al., 2020)

Tissue death of cartilage, the most common cause of lameness (Bradshaw et al., 2002). This disease is caused by a bacterial infection that typically results in leg fractures, resulting in birds experiencing pain and lameness (Wijesurendra et al. 2017).

Kinky back
Can impact 8-30% of birds (Makrai et al., 2011)

A deformation of the vertebrae causing compression of the spinal cord, making walking difficult (Kelly, 1971). A similar condition in human has been shown to cause pain (Kalichman et al., 2009).

Contact dermatitis
Can impact 22% of birds (Dinev et al., 2019)

Necrosis (tissue death) of the skin that comes in prolonged contact with poor-quality litter. It can cause pain and lead to secondary infections (Berg, 1998).

By reducing the speed at which broilers grow, the incidences of these health issues decrease significantly (Wideman et al., 2013; Alves et al., 2016; Hartcher and Lum, 2020; Weimer et al., 2020).

Growth rate impacts behavior

Since fast-growing broilers gain weight quickly, their behavioral repertoire changes in comparison to other chicken strains and to when they are younger.

These broilers will spend more time sitting, feeding, and drinking rather than performing behaviors like walking, foraging (searching food), preening (plumage maintenance), dust bathing, perching, and playing (Dixon, 2020; Rayner et al., 2020).

Due to a variety of factors, fast-growing broilers' legs tend to become weaker. In turn, long durations of resting on poor-quality litter can result in skin lesions (Hartcher and Lum, 2020).

Slow-growing broilers show more high-energy behaviors, including standing, walking, foraging, and comfort behaviors compared to fast-growing broilers, which suggests improved health and ability to perform normal behavior (Abeyesinghe et al., 2021; Dixon, 2020; Rayner et al., 2020).

Photo credit: Alexandra Ulans, Virginia Tech

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Summary: fast- vs slow-growing broilers

Fast-growing broilers have been genetically selected for very efficient growth and muscle development, but are prone to issues with their health and behavior. One way to address these is to use slower-growing strains for meat production instead. This way, chickens are able to adapt to the weight they gain, resulting in less disease and more active birds. However, these birds are less efficient and production will be more costly.

Sources and additional resources

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