Phode: Flock Uniformity in Broiler Chickens – Consequences on Performance & Solutions

In poultry production, flock uniformity can be evaluated by two indicators: coefficient of variation (CV%) of live body weight (ratio of the standard deviation to the mean), and uniformity (percentage of individuals within ±10% of the mean).

Under standard conditions, a CV below 10–12% between day 14 and day 49 is considered acceptable. Intrinsic factors – genetics, initial hatch weight, sex – and extrinsic factors – stocking density, feed quality, heat stress, digestive infections – can reduce uniformity by 2.5 to 15 points. A heterogeneous flock is not merely one with variable average weight: it is a population whose individual nutritional requirements (energy, amino acids, etc.) are structurally divergent.

Despite the uniform genetics of all individuals in a flock, animal variability is part of the challenges.

A single diet distributed to a heterogeneous flock inevitably leads to underfeeding for lighter individuals and overfeeding for heavier ones. These gaps will only widen unless the entire flock is overfed with protein and amino acids, which would have significant health and economic consequences. Furthermore, this heterogeneity already has an intrinsic impact on economic performance.

Performance losses and economic costs on the horizon

These individual nutritional imbalances translate into measurable performance losses at the flock level. Increasing heterogeneity is significantly correlated with a deterioration in the feed conversion ratio (FCR) and a reduction in average daily gain (ADG), as well as increased mortality.

A 2% increase in CV leads to a +0.3-point increase in FCR.

The live weight dispersion resulting from nutritional imbalances has downstream consequences on slaughter operations. Since automated cutting lines are calibrated for a specific carcass size, a flock with a high CV generates a large volume of out-of-specification carcasses. This results in commercial downgrades, costly manual adjustments, and reduced cutting yields.

For a typical flock of 20,000 broilers slaughtered at 2.5 kg, a 2% increase in CV (i.e., +0.3 FCR points) represents a direct additional cost of $1,200 to $1,500 per flock in feed not converted into meat. On top of this, increased mortality, carcass downgrades, and slower slaughter line throughput must be factored in. The losses for the sector are considerable, and investing in various strategies to improve this criterion is fully justified.

Plant extracts have a role to play

Plant extracts have long been considered to yield inconsistent results. This is due to natural variations in the active compounds and the content of the active compounds for these products. Furthermore, they are used at very low inclusion rates (between 100 and 500 g/t), and delivering the correct dose at the scale of an individual chick raises genuine homogeneity-of-mixing challenges. Therefore, before claiming to improve flock uniformity, these barriers must first be addressed.

Three levels must be looked at:

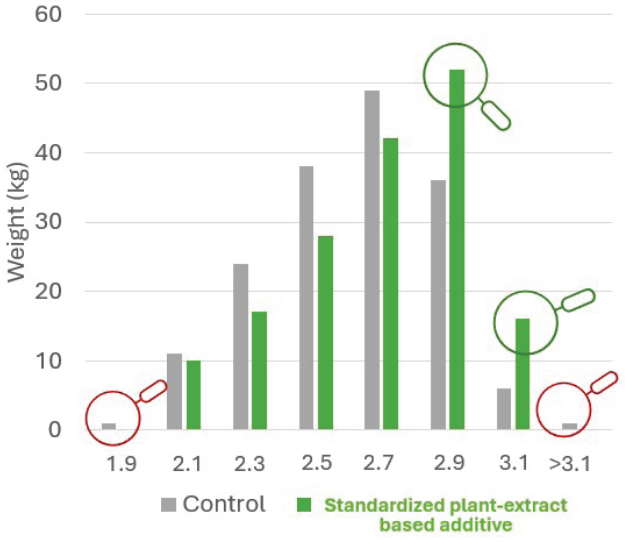
- Complex composition: Offering a complex blend of essential oils already provides animals with multiple active compounds and helps address the diverse situations they encounter in the field;
- Standardised composition: A complex composition alone is not sufficient. Indeed, active compounds in plant extracts vary according to the origin, the season, the weather, and the extraction method. Standardising the active compounds level remains necessary with such extracts;
- Specific galenic – All actives, at the right amount, to all animals: The galenic of the additive should enable good dispersion in the mixer, ensuring homogeneity and stability of the active compounds in the feed mixture. A chicken adapts its feed intake according to its physiological stage. It is essential to deliver the correct dose of active compounds to each animal, from chick to adult stages.

With all of this in place, promising results can be expected on overall performance – body weight gain, feed conversion ratio, mortality – as well as on uniformity being sought (higher income, easier planning for integrators).

In a trial conducted at the NKP experimental station (Thailand), the addition of a standardised plant-extract-based feed additive resulted in an increase in the animal's live body weight alongside an improved weight distribution (Figure 1). The animals were heavier, but with no outliers – no extremely small or large individuals. The curve nonetheless shows a strong tendency towards heavier animals. Ideal for both the processor and the farmer.

Plant extracts have a role to play in a performance improvement strategy that includes uniformity.

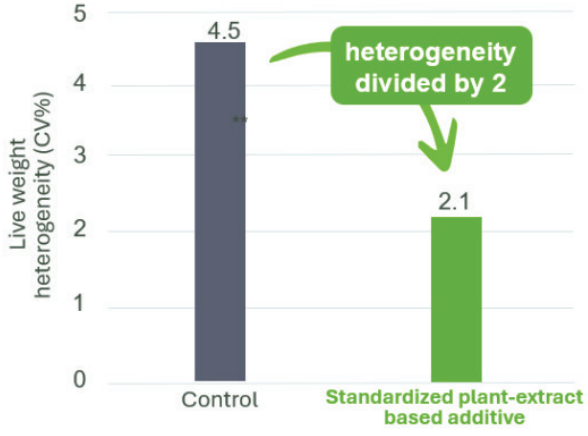
Figure 1: live weight repartition improvement du to a proprietary standardized plant-extract based additive



Thailand NKP experimental farm,
n=2*168 birds in 12 pens
Feed program according to Ross recommendations + Phytases Quantum Blue
Standardized plant-extract based additive 100 ppm day 1 to 35
p=0.002

A trial conducted at the Virginia Diversified Corp. experimental station (USA) confirmed the value of plant extracts for improving uniformity. In this trial, at 42 days of age, the mean body weight of control animals was 4.200 lb compared to 4.543 lb for animals supplemented with a standardised plant-extract-based additive. This increase in average body weight was achieved while simultaneously reducing the coefficient of variation of broiler body weight (Figure 2).

Figure 2: Live weight coefficient of variation



Experimental farm: Virginia diversified Corp. (USA)
1200 Ross 308 - 2 treatments (n=12 pens)
Feed program according to Ross recommendations'
Standardized plant-extract based additive 100 ppm
** p<0.01

Conclusion

Plant extracts have a role to play in a performance improvement strategy that includes uniformity. The key to success lies in the complexity of composition with standardised extracts, supported by an adapted galenic with good mixing capacity in the feed, covering the specificities from the earliest age to the adult stage.

Flock uniformity begins on day one, and it can be won or lost every single day.

- DR. JEAN-FRANÇOIS GABARROU, Scientific and technical director, Laboratoires Phodé (France)

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