The Selection Objectives for Pekin Ducks: A Complex Balance to Achieve

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Genetic selection programs for Pekin ducks pursue objectives comparable to those of broiler chickens, with notable improvements in performance over the years. On average, weight gains reach nearly 100 grams per year, while feed conversion ratios decrease by 0.02 points per year, and breast meat yields increase by about 0.25 points annually. However, this selection for increased productivity at ever earlier ages, similar to what has been observed with broiler chickens, leads to significant consequences.



Collateral effects on meat quality and animal well-being

Despite the advances, this ongoing quest for improvement can impact several aspects, such as meat quality (texture and organoleptic properties), animal well-being, and behaviour. In particular, farmers report an increase in atypical or problematic behaviours, such as heightened aggression (pecking episodes), animals circling, or ducks becoming either immobile or hyperactive.

Leg problems are also a major concern. These issues are often attributed to excessive weight gain observed in recent years, with more pronounced consequences in male lines, which are heavier than female lines. Some ducks adopt inappropriate gaits, even leading to overturning. Once on their backs, these animals are often condemned, despite the farmers' efforts to get them back on their feet. Moreover, recent studies have shown a link between intensive farming conditions and significant behavioural alterations. High-density rearing conditions or diets too concentrated in energy can exacerbate these undesirable behaviours.

The future of selection: between opportunities and challenges

The adoption of advanced methods, such as genomic selection, allows for further optimisation of Pekin duck performance gains but may worsen existing problems. It thus becomes crucial to find a balanced "optimum" between performance and animal well-being, which remains complex in an increasingly competitive context.

Additionally, diversifying selection objectives could include additional criteria, such as the animals' robustness in the face of environmental conditions or their resistance to common diseases in duck farms. These criteria could help improve both productivity and the sustainability of production systems.

Possible solutions

To mitigate these mobility issues, several approaches are under investigation. Some methods, such as manual scoring of leg and gait conditions, are not only ineffective but also extremely costly in terms of labour and

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time. This is why high-throughput phenotyping technologies are being developed to collect data massively on each subject, while being adaptable to other selection traits. Among these innovations, Grimaud Frères is at the forefront of this technological evolution. The company has chosen to use sensors equipped with modular biosensors, offering promising perspectives.

These devices allow for the measurement of various parameters, such as the distance running by each subject, time spent moving versus resting, social interactions, and the degree of exploration within the rearing building. Other indicators, such as the number of standing/lying positions, sudden changes in trajectory, or wing movements, are also recorded.

The Impact of new technologies

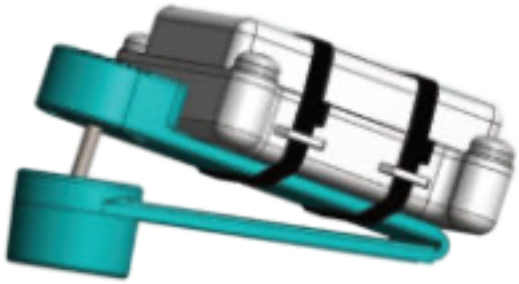
The miniaturisation of sensors and the reduction in their costs now make their use accessible on a large scale. Combined with embedded Machine Learning methods, these sensors enable quick identification of typical phenotypic profiles. This includes sought-after traits, such as good mobility, or traits to avoid, such as aggression or antisocial behaviours.

At the same time, integrating these technologies into connected farm management systems could provide real-time data to farmers. This would allow for quick decision-making to adjust farming conditions, thus limiting the risks related to problematic behaviours or health issues.

Genetic selection for Pekin ducks, although effective, must take into account ethical concerns and animal well-being issues. The new technologies, developed and perfected by Grimaud Frères, offer innovative solutions to balance productivity with respect for animals.

However, implementing these technologies on a large scale remains a major challenge. The future of the industry lies in a harmonious balance between performance, technological innovation, and the sustainability of farming practices. ■

Example of a tag equipped with several biosensors, attached to the wing of Pekin ducks, allowing the real-time transmission of a large amount of information about each individual, including behavioural and physiological data.



Example of the movements and accelerations recorded daily in a subject over a 24-hour period.

