

褐色萊鴨高飼效品系之選育及未來展望

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為增加農民經營效益，畜產試驗所宜蘭分所藉選拔殘差飼料採食量建立褐色萊鴨高飼效品系，截至第六代，褐色萊鴨高飼效品系之 34~37 週齡採食量、殘差飼料採食量、飼料換蛋率及蛋產量之遺傳率分別為 0.33、0.12、0.13 及 0.32；殘差飼料採食量與採食量之遺傳相關為 0.59，顯示殘差飼料採食量之選拔確實可降低飼料採食量。而從第六代性能資料來看，試驗期平均每日採食量則少了 13 g，以飼養 3 萬隻的蛋鴨場來說，每日將可省下 5,000 元之飼料支出。此褐色萊鴨高飼效品系將可作為高飼效純系育種、與民間褐色萊鴨雜交生產商用蛋鴨之種原及高飼效之鴨蛋供應品系進行推廣。另一方面，為加速殘差飼料採食量之選拔效率，本團隊自褐色萊鴨高飼效品系及對照品系分別挑選 10 隻個體，進行全基因組重定序。再針對高飼效品系特有 SNP 應用混合雜合度分析，篩選可能與殘差飼料採食量性狀相關的區域，並對這些 SNP 所在基因進行初步註解，發現許多基因可能與生長、繁殖性能及代謝調控有關，後續將進一步進行客製化晶片分析，期達到運用基因組選種提升選拔效率之目標。

關鍵語：褐色萊鴨高飼效品系、鴨、飼料殘差採食量、全基因組重定序、單核苷酸多態性

The Selection and the Perspective of Better Feed Efficiency Brown Tsaiya

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In order to increase farmers' benefit, Ilan Branch, Livestock Research Institute has developed a duck line of Better Feed Efficiency Brown Tsaiya by selecting on residual feed consumption (RFC). Until G6, the heritability of feed consumption (FC) at 34~37 wks of age, RFC, feed efficiency and egg mass were 0.33, 0.12, 0.13 and 0.32, respectively. And the genetic correlation between RFC and FC was 0.59. The results showed that the selection on RFC does improve FC. In G6, daily average feed consumption of the RFC selected line was 13 g less than the control line, it said that a farmer raising 30,000 layers will save NTD 5,000 on feed in each day. The Better Feed Efficiency Brown Tsaiya would be promoted as pure line for breeding, hybridization with industrial Brown Tsaiya for producing commercial layers, as also, as a better feed efficiency layers for egg production. On the other hand, 10 individuals of each RFC selected and control lines were selected and their DNA were pooled for library construction and whole genome re-sequencing. The pooled heterozygosity (Hp) across the genome was also been identified, only SNPs in the regions with potentially related to RFC-selected were screened and the genes containing these SNPs were surveyed preliminarily in the mean time. And we found several genes located in the above regions may be related with RFC traits because of the association with growth, reproductive performance and metabolic regulation, or located in calcium metabolism or energy utilization pathway. In the future, the SNPs will be applied for customized SNP chip and genotyping in RFC selected and control lines for further investigation, and it's hoped to reach the goal of improving the selection efficiency.

Key Words: Better Feed Efficiency Brown Tsaiya, Duck, Residual feed consumption, Whole-genome resequencing, Single nucleotide polymorphism