Investigating chicken immune responses with PACE genotyping for improved animal health and sustainability.

Innate and acquired immune responses are increasingly under scrutiny due to declining availability of antibiotics for animal production systems. A greater understanding of how variability within immune response genes impacts survival is important to livestock health and sustainability.

A recent study from Hy-line International in collaboration with scientists from the USA and Poland has identified the gene responsible for the D blood system antigen in chickens, CD99. There are 13 blood systems known in the chicken; apart from B, A and E blood group systems, little is known about the candidate genes or genomic locations of any of the other chicken blood systems.

DNA pools from a variety of chicken lines were initially analysed by GWAS to narrow down the target genomic region, at which point sequence information and candidate gene SNP panels provided additional precision to validate the candidate gene CD99.

A PACE SNP panel of 7 SNPs and one Indel was developed for CD99. This was used to screen a selection of chicken lines. A total of 11 unique CD99 haplotypes were found. This rapid SNP-based test can now be used to identify variants within CD99, allowing the impact on traits to be studied further.

Reference:

Fulton, Janet E., et al. "CD99 and the Chicken Alloantigen D Blood System." Genes 14.2 (2023): 402.