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Global Assessment Of Chicken Variation Using The 18K Chicken SNP Iselect Infinium Assay

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We genotyped 17,790 SNPs for over 40 different chicken populations, including broilers, layers, traditional breeds from Europe, Africa and Asia, and wild chicken, using DNA pooling. Genotyping was done using the 18K Chicken SNP iSelect Infinium assay, which samples SNPs evenly distributed throughout the chicken genome. This study allows us to address questions regarding patterns of variation between macro, micro, and sex chromosomes. We also aim to validate genotyping of pooled chicken DNA samples in the Infinium assay, as an alternative to individual genotyping. Virtual pools from individually typed DNA samples from selected populations are compared to allele frequencies derived from experimental pools of varying size. By rapid and cheaper screening many populations of chicken from very diverse origin adopting the pooled DNA technique, we can determine which SNPs are polymorphic within and across populations. This allows us to validate the chosen SNPs and to provide estimates of the minor allele frequencies of these SNPs. Furthermore, this allows investigation whether the pooled DNA strategy is an efficient method to study general patterns of diversity (e.g. heterozygosity, historical relationships) for large numbers of populations based on large-scale genotyping data. In addition, because *Gallus lafayettei* (individual and pooled) was included as an outgroup reference, the ancestral state of most SNPs can be determined.