



A low-density sheep genotype panel for SMARTER sheep breeds

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The cost of genotyping is often prohibitive to large-scale genotyping. The cost per genotype is a function of the purchase order size; hence, requesting a large order of panels could reduce the cost per genotype. The objective was to develop a low-density genotype panel for sheep that would be as informative as possible to a range of different breeds and populations represented in SMARTER.

The density of the genotype platforms developed was 384, 1,000, 2,000, 3,000, 6,000, 9,000 and 12,000 DNA markers. To develop this, a summary file of the frequency of each variant per DNA marker was available for five meat sheep breeds from Ireland (i.e., Belclare, Charollais, Suffolk, Texel and Vendéen), two meat sheep breeds from the UK (i.e., Scottish Blackface and Texel), and five French dairy sheep breeds (i.e., Basco-Béarnaise, Black-faced Manech, Corse, Lacaune, and Red-faced Manech).

A total of 38,883 DNA markers were common to all sheep populations. Each low-density genotype panel was generated separately with the genome firstly being divided into N blocks of equal size where N was the number of markers to be selected for the panel being developed.

The most informative variant per block was selected. Using the 1,000-marker panel as an example, all selected variants were informative in all populations. For the 12,000-marker panel, a total of 527 were not informative in at least 1 breed. The selected DNA markers are now publicly available.



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