

Simplifying Genetic Testing from Porcine Hair and Blood Samples

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A variety of methods were tested to find the most non-evasive repeatable technique for genotyping swine. Currently, most livestock genotyping requires blood sampling, typically from restrained animals. This causes considerable stress to the animal and is labour intensive.

Blood samples collected in vacuum tubes usually yields 30 to 50 ug of DNA per mL of whole blood, enough for hundreds of PCR tests. However, genotyping for defined genetic markers requires only nanogram amounts of DNA for PCR analysis. Based on this criteria, we tested a variety of techniques to find the most non-invasive, reproducible, labor saving method that would allow accurate reproducible DNA genetic testing.

The methods tested were 1. collection of ~ 50 uL blood from a ear vein prick on chemically treated blotting paper known as FTA cards. 2. Collection of epithelial cells from inside the cheek of animals using cotton swabs also known as buchal cells swabbing 3. Collection of hair follicles from the neck followed by DNA purification using either a chelex/ proteinase K clean-up procedure or extraction with guanidium thiocyanate and phenol chloroform. The easiest, most reliable method was DNA isolated from pulled hair follicles cleaned with guanidium thiocynate and phenol chloroform. Ten hair follicles was sufficient for 10-15 PCR tests sufficient to determine paternity or 10 separate genotypic tests.

Implications:

The development of these new DNA sampling techniques will allow researchers and producers to genetically test their animals much more cheaply and easily and with less stress.