

# Humane and Efficient Non-Invasive Sample Collection from Cattle, Goats, Camels, Horses & Avian DNA testing

Prof. Raed M. Al-Atiyat<sup>1,2</sup> and Abdulaziz S. Algawaan<sup>1</sup>, Khalid Said<sup>3</sup>, Dr. Bassam El-Fahmawi<sup>4</sup>,

<sup>1</sup>Genetics and Biotechnology, Animal Sci. Dep., Agriculture Faculty, King Saud University, Kingdom of Saudi Arabia, <sup>2</sup>Animal Sci. Dep., Agriculture Faculty, Mutah University, Jordan,

<sup>3</sup>Medical Oasis, Est., Riyadh, Kingdom of Saudi Arabia, <sup>4</sup>Mawi DNA Technologies, Hayward, CA, USA

## SUMMARY

### Background

Obtaining a quality DNA sample from animals can be challenging due to the level of collector expertise, collection process, collection environment, sample transport and storage, and sample processing. Generally, there two approaches to collect a sample from animals; it is either invasive or non-invasive. Invasive sample collection (e.g. blood draw, ear bunch, blood spots) and non-invasive collection methods such as oral/nasal swabs and hair pulls are well established methods to obtain DNA from animals, but samples obtained with these procedures suffers from several issue that can affect the quality of the sample, which includes being tedious, might require specialized transportation, time consuming to process in the lab and mostly results in low quality DNA causing in re-sampling. The collection location and environment can lead high bacterial content which potentially can compromise the integrity of the sample, resulting in low sample output and suboptimal DNA quality for downstream applications, especially for complex applications such as next generation sequencing. The DNA quality is becoming essential as next generation sequencing costs are coming down making it more appealing to the animal genomics' research community.

The iSWAB-VET device is a non-invasive collection system that maintains the integrity of the DNA at the point of collection for samples collected in the field. Unlike existing swab-based methods, the swabs are discarded after collection and not sent back to the lab so processing time, effort, and cost is significantly reduced. Most importantly the iSWAB is designed to enable fast (<2 mins), safe and humane sample collection from animals

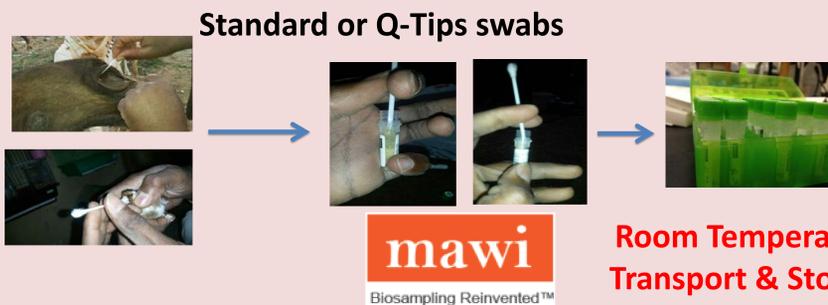
### Aim:

To evaluate the ease of collection, DNA yields and quality from animals' nasal or oral samples collected non-invasively with SWAB-Vet. The collected samples were transported and stored at room temperature as per manufacturer recommendations

### Conclusions

The iSWAB-VET samples were collected with ease with minimal stress to the animals as we as he collector. High DNA yields and quality was achieved sufficient to perform multiple PCR based assays as well as NGS and microarray based analysis

## 1. Sample Collection & Stabilization



## 2. DNA Extraction

Promega Wizard® Genomic DNA Purification Kit- Whole Blood Protocol

## 3. DNA Quantification and Quality Analysis



## DNA Yield And Quality

