A COMPARISON STUDY OF DNA COLLECTED USING REFERENCE COLLECTION DEVICES FOR IMPROVED LABEFFICIENCY

Justina A. Nichols, BS; Megan M. Foley, M.S.F.S
The Center for Forensic Science Research and Education

DNA has been established as the gold standard in the field of forensic biology for over a decade. Due to this, collecting and preserving DNA is crucial to the success of forensic testing as a complete profile is necessary for generating accurate statistics. Maintaining a simple, yet effective procedure is not only beneficial to the sample donor, but also the analyst processing samples in the lab. Gentueri® Inc. is a DNA preservation company with the goal of developing devices that are not only user friendly, but also convenient in design and storage. The Gentueri® products being tested in this study are the GenSwab™ generation one and two DNA collection devices. The GenSwab™ device is an oral collection tool including a foam pad that is rubbed on the inside of the donor's cheeks and then folded, allowing for the foam pad to rest on the sample transfer area of the FTA card.

In this study, the Gentueri® products have been evaluated and compared to another reference collection device, EasiCollect™. For the comparison, buccal samples were collected from volunteers using the products, and extracted using the PrepFiler™/AutoMate Express™ or EZ1™ system. The extracted samples were then quantified using Quantifiler™ Trio on the 7500 rtPCR system. The amount of DNA recovered using each device was determined and compared between the brands. A random selection of the samples will continue on in analysis using capillary electrophoresis to confirm that all devices can produce a DNA profile.

When examining data produced by the extraction of 20 original GenSwabs™ and 20 generation two GenSwabs™ on the AutoMate Express™, the average DNA collected from a 1.5 mm punch was roughly 8 ng for the original GenSwab™ and 11 ng for second generation GenSwab™. When comparing the Gentueri® devices with the EasiCollect™, the average DNA collection amount was 15 ng. Due to the large variation in the results, the EasiCollect™ performance, though seemingly better than the second generation GenSwab™, was not statistically significant.

Further testing was done using the EZ1™ extraction system with five of each device. The results from the test indicated that the average DNA generated from a 1.5 mm punch of original GenSwab™ was 3 ng, 9 ng for second generation GenSwab™, and 5 ng for the EasiCollect™.

Unfortunately, due to the small sample size and wide range of results, there was a high variation. To remedy this, further testing should be done to determine the optimal method anddevice for buccal DNA collection.