Establishing cell-banks of Anatolian domestic breeds with visualization of cryostorage

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Introduction

The project "In vitro Conservation and Preliminary Molecular Identification of Some Turkish Domestic Animal Resources" aims to establish cryobanks containing biological materials like embryo, semen, somatic cell and DNA samples where in both Marmara Research Center, Genetic Engineering and Biotechnology Institute (MRC, GEBI), Kocaeli and Lalahan Livestock Central Research Institute (LLCRI), Ankara in conformity with Food and Agriculture Organization (FAO) declarations. The project TURKHAYGEN-I comprises 13 sheep, 6 cattle, 5 goat, Anatolian water buffalo and 5 horse breeds. The breeds in the project are native genetic resources in Anatolia. As in other countries, the breeding strategies are being conducted and highly productive animals are being imported to increase the productivity of local breeds of Turkey. Consequently, this brought about the decrease in biodiversity of far animal genetic resources and endangered their existence. The collection of each breed is planned to be 50 individuals (25 male, 25 female) to keep the genetic variation in the cryobank for the future recovery.

The records, analyses and the data codes stored in a server connected to web with public and restricted access. A fully functional and accessible cryo-cell-bank could only obtain the base material for cloning technologies.

Materials and Methods

According to wide usage of computer technologies and as a result of storing amounts of data, it is in need to use in both data storing and processing system like database technologies but a database should be easy to use by even computer novice users.

For this study, a commercial cryo-container system is fully visualized to access correctly to somatic cell vials. This visual database system is also connected to project’s whole database with all bioinformatics data including GPS records. The cell-bank part of the cryostorage is so important to rescue endangered Anatolian domestic animals in case of extinction. The project and its database interface claim to supply ordered information about animals and its cryopreserved materials. The industry standard web-based applications could help researchers to access right material independent from time. Visualization would be the main key to manage the database records for cryo-banks. The project’s database has different parts for both local and internet based usage. Some parts of the databank is based on table and grid type data of entrance and editing parts. On other hand, the physical cryo-storage system has a container structure based on racks, boxes and vials. Every single (lateral) line on the boxes has a bundle of vials for one unique animal, every box has 100 vials for ten different animals. The chart structure of the databank could be useful for normal management but it would not be enough for proper usage for the cryobank.

Inputs and Conclusion

When one of the breed in the cryobank must be recovered via SCNT, the visual usage and the information providing over the databank would be very easy to operate, because of the uniformity of both databank and cryocontainer. If in need to change the structure or the container, the visual structure could be easily swapped to satisfy for future researchers’ needs.

Input data has imported from Microsoft™ Excel® Datasheets manually then database application has built on Microsoft™ Access®, the web interface constructed with Adobe™ Dreamweaver® with help of ATAF™ and some other tools via JET™ engine. Graphical interface has gridded over Adobe™ Photoshop® then conclusion work of unifying the whole structure has made.

As a summary of this work, the results can be listed below:

• Basically designed and easily manageable visual interface
• Strong database application with web frontage
• A pioneer study for animal cryo-cellbanks in Turkey
• Future application can be converted or swapped, integration can be established, thanks to web database standarts.

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