



## Livestock Management, Identification and Traceability System

*By Johan Cloete, Rachelle Cloete and Pauline Gitonga\**

### Background

Livestock trade significantly contributes to food security and economic empowerment of Arid and Semi-Arid (ASAL) Counties of Kenya. However, the ASAL counties face a constant challenge of livestock rustling and low management capacity to control zoonotic and Trans-boundary Animal Diseases (TADs) this has led to frequent loss of human lives during raids and imposition of quarantine and trade bans of livestock products. The IGAD Region Livestock Identification and Traceability System (LITS)<sup>1</sup> framework was validated in a workshop held in May 2016. Individual IGAD member countries to which Kenya is a member, have been tasked with the responsibility of identifying a LITS system that has two basic technical requirements; 1. Animal identification system such as a numbered ISO<sup>a</sup> certified ear tag and 2. Animal movement monitoring database system that is able to identify and track individual or groups of animals along the value chain from the livestock keeper to their final destination. This article will highlight the functionality of an innovative LITS system known as GMP Basic™.

### WHAT IS GMP BASIC™

GMP Basic™ is a patented livestock management, identification and traceability software solution developed in South Africa. The acronym GMP refers to **Good Management Protocols**. The GMP computer based platform was designed to primarily meet the commercial oriented livestock keeper's needs. The computer based platform acts as data repository that is able to centrally capture, store and disseminate securely to different users real time information on the location and type of livestock products a livestock keeper has at any given time this is beneficial to traders and abattoirs. In addition, the platform allows integration with other actors in the value chain such as public and private veterinary officials and laboratories hence one can carry out TADs surveillance as well as monitor and track control efforts. GMP Basic™ has two main components;

---

<sup>a</sup> International Organization for Standardization (ISO)

1. **The hardware component** which is an International Committee for Animal Recording (ICAR) certified and visual ear tag system. The ear tags are uniquely numbered, non-reusable and tamper proof. The tag numbers are issued from a central database so there is no duplication. The tag can be verified online by keying in the visual unique number or scanning the 2D bar code embedded feature (Figure 1). The ear tag number is linked to livestock keeper's details such as name and geographical location as well as individual or batch animal production, health and production information. The database is then able to track and monitor production management processes and is able to send a day to day management reminder of scheduled activities. GMP Basic™ also has other hardware identification inputs such as Radio-frequency identification (RFID) ear tags, subcutaneous implantable microchips and rumen boluses.



Figure 1: GMP Basic™ unique ear tag number and 2D- bar code system that can be used to verify tags.

2. **The software component** is a computer based database repository platform that is versatile and allows online and offline data entry. The database is securely managed and allows different levels of access to the different actors in the livestock value chain while ensuring that the OIE<sup>b</sup> guidelines for confidentiality and prompt reporting of livestock diseases as well as transparency on the levels of sanitary standards in place are recorded (Figure 2). GMP Basic™ software is also able to accommodate other traditional livestock identification systems such as ear notching, tattoos or clan brand marks.

---

<sup>b</sup> OIE- World Organisation for Animal Health

# GMPBasic™ Software Architecture

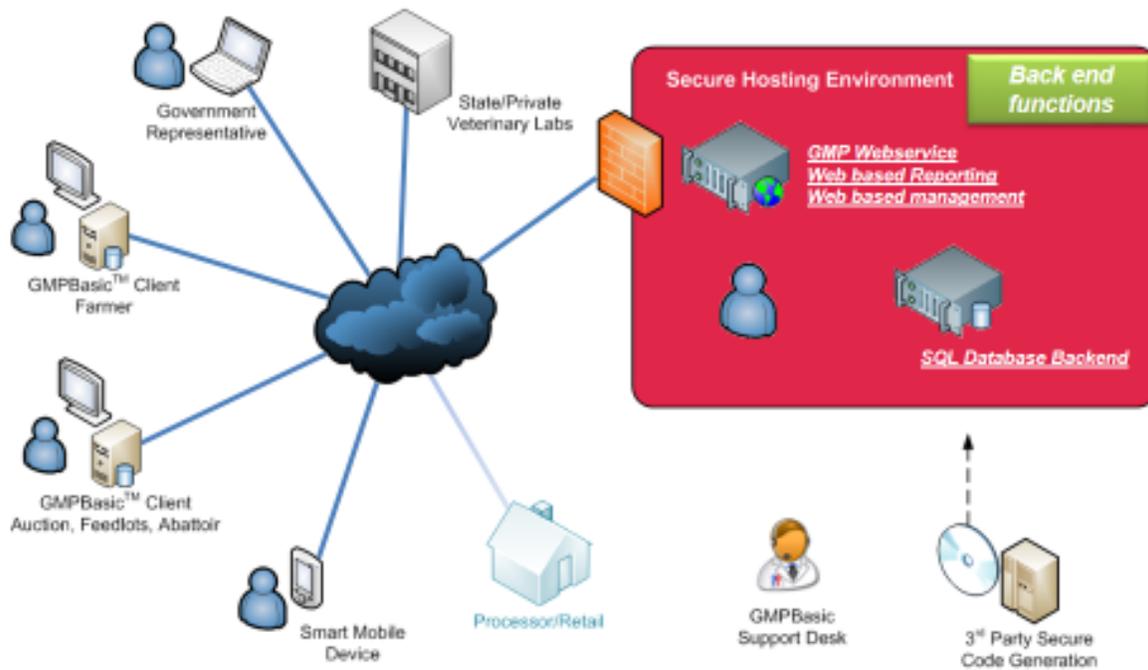


Figure 2: The diverse and flexible functionality of GMP Basic™ Software platform

## GMP BASIC™ BENEFITS

GMP Basic™ has been in use for the past eleven (11) years in South Africa and it offers different users in the livestock value chain a multitude of benefits as outlined below. The computer based software system allows the livestock keeper to uniquely identify their animals using a non-reusable, single issue and uniquely numbered ear tags. The system has a notification system whereby animals that have lost tags are displayed as they will have event information gaps. If properly applied, the rate of ear tags loss in livestock reared under extensive production systems is estimated to be less than 1 percent (%). The color of the tag is generally yellow to increase visibility of the ear tag unique number. However, management can also use varied coloured ear tags on the other ear so as to visually assist in identification of animals in different age groups, this ear tag colour can then be recorded as part of the livestock identification information stored in the GMP Basic™ platform.

GMP Basic™ has allowed livestock keepers keep updated production, treatment and other routine husbandry information such as vaccination, anthelmintic or tick control procedures. This has significantly reduced the manual recording of herd management activities. With regard to sustainable production, the system allows livestock keepers to know how many animals are in the herd and relate this to grazing pressure. The livestock keeper can then know when to move herds or vary the stocking rate so as to ensure there is no overgrazing and destruction of natural pastures. Animals that are removed from the herd due to death or off-take sales results in an automatic adjustment in the livestock keeper's records as well as in the central database. In addition, GMP Basic™ allows all offspring's destined for the meat market to be linked to a dams (mother) records and once ready for market the offspring's can be dispatched as a batch using the dams number as a tracking reference.

#### *Zoonotic and TADs surveillance and Control*

With regard to zoonotic and TADs surveillance and control, GMP Basic™ is able to capture and store disease incidence, treatment and laboratory findings information that can either be recorded by livestock keeper or recorded by the attending veterinarian or laboratory as they can have restricted access to the GMP Basic™ central database (Figure 2 and 3). Furthermore, GMP Basic™ will allow IGAD member countries to improve their TADs surveillance and monitor control activities thus aiding them to be on track in meeting their global mandate to progressively control and eradicate important TADs such as Foot and Mouth Diseases (FMD) and *Peste des petits ruminants* (PPR) as well as keep the momentum for surveillance of zoonotic infections such as Brucellosis and avian influenza. GMP system also allows for GPS<sup>c</sup> co-ordinates of livestock keeper and animals to be recorded, this can then be integrated into GIS<sup>d</sup> to allow for epidemiological investigations.

---

<sup>c</sup> Global Positioning System (GPS)

<sup>d</sup> Geographic Information System (GIS)

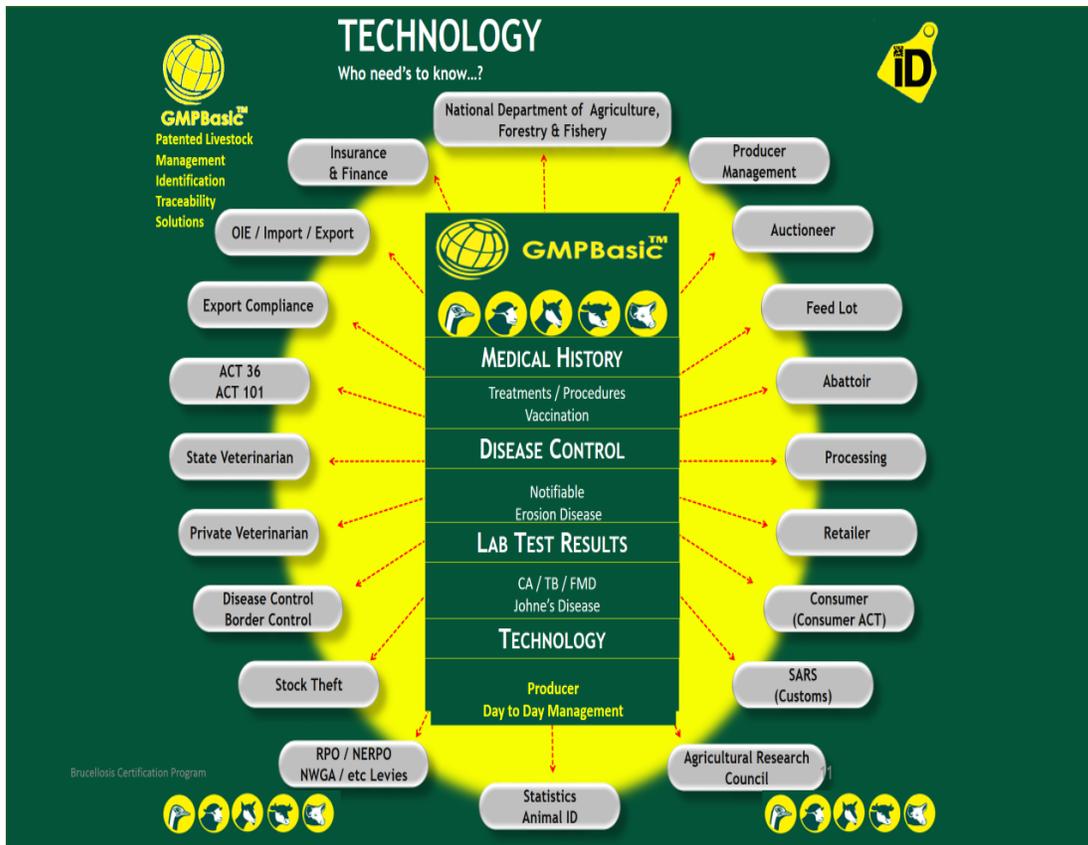


Figure 3: GMP Basic™ software platform is able to capture, store and disseminate livestock production, health and management information to different actors in the livestock value chain

## EVIDENCE: GMP BASIC™ WORKS

### **Beef ranch case study**

In 2013, GMP Basic™ was tasked with introducing a livestock identification, traceability and surveillance system in Rust de Winter livestock farms. These farms are located on the border of Mpumalanga, Limpopo and Gauteng provinces and are on leased government land. The baseline census determined that there were 65 farmers with 5361 cattle, 2641 goats and 154 sheep. GMP Basic™ partnered with Gauteng state veterinary officials, University of Pretoria- 5th year veterinary students and lecturers and veterinary drug pharmaceuticals companies.

In one day the GMP team and partners were able to;

1. Tag 5361 cattle and tag numbers electronically linked to livestock owner name, farm location and individual animal's bio data (age, sex and breed). This information was imported into each owner's GMP Basic™ profile

2. Administer preventive animal health procedures (anthelmintic and Vaccination) that were also recorded manually during ear tagging and were later uploaded into the farmers GMP Basic profile and synchronized into the GMP Basic central database. A total of 3753 cattle were vaccinated against *Bacillus anthracis*, *Clostridium botulinum* types C1+2 and type D and *Clostridium chauvoei*.

The day was hailed as successful by all stakeholders as veterinary extension services were rendered, veterinary students got invaluable practical experience, pharmaceutical companies used the opportunity to extend their marketing reach and the animal identification, recording and traceability solution was demonstrated and adopted by the livestock keepers. The net result of this exercise culminated in South Africa winning the OIE World Veterinary Day Award of 2013.

### ***Ostrich export case study***

South Africa (SA) is the world leader in ostrich production with a 75% of global market share<sup>2</sup>. In 2012, the SA ostrich industry which is a multibillion rand industry experienced its worst avian influenza scare. The GMP Basic™ traceability solution was selected from various service providers and was contracted to provide an individual bird tagging and traceability solution. This requirement included providing each individual bird a unique identification number, New Castle Disease (NCD) vaccination record, avian influenza testing and movement permit management. These requirements were necessary so as to comply with European Union (EU) and OIE requirements for export based avian products. The SA ostrich industry also had to implement on farm veterinary procedural notifications (VPN) and bio-security modules (BSM) protocols to prevent the entry of avian influenza infections. All these requirement were recorded and made available through the GMP Basic central database platform. The notable success is that together with GMP Basic the SA Ostrich export industry is now stable and is able to track approximately a hundred thousand new ostriches annually.

## CONCLUSION

The GMP Basic™ is an innovative livestock management, Identification and traceability solution that can be used by ASAL Counties to grow and integrate their livestock animal resource. The publication has demonstrated GMP Basic™ versatility that will allow each ASAL county the opportunity to customize it so as to meet their unique livestock production and disease control and surveillance needs. GMP Basic™ is cost effective especially when rolled out as a large scale LITS system. Though not done in South Africa, GMP Basic™ has the potential to play a role in reducing stock theft as it has an in-depth recording capability that can integrate with other traceability inputs like traditional brand marks, RFID rumen boluses, microchips and DNA sampling. Adoption of GMP Basic™ will allow ASAL counties to integrate their livestock disease and production information thus giving them more leverage when implementing disease control measures and when negotiating trade deals with local, regional and international markets.

## AUTHORS INFORMATION

\*GMP Basic™ Kenyan Representative – Dr. Pauline Gitonga email [paula.n.gitonga@gmail.com](mailto:paula.n.gitonga@gmail.com)

### References

---

<sup>1</sup> Regional Guidelines on Livestock Identification and Traceability System (LITS) in the IGAD Region is a legal framework that was validated in a workshop held between 2<sup>nd</sup> and 3<sup>rd</sup> May 2016 in Fairway Hotel, Kampala, Uganda.

<sup>2</sup> A profile of the South African ostrich market value chain (2012). A report by the Republic South African, Department of Agriculture, Forestry and Fisheries.