

For information

LegCo Panel on Security

**Feasibility of Applying
Radio Frequency Identification (RFID) Technology
to Enhance Poultry Traceability**

Purpose

At the last Security Panel meeting, Members requested that the Administration consider the use of modern technology to enhance poultry traceability. This paper briefs Members on the feasibility of using Radio Frequency Identification (RFID) technology for this purpose.

The RFID Technology and its Application on Live Food Animals

2. A RFID system consists of a tag (transponder) and a reader (interrogator). It involves the collection of information stored on a tag/reader combination using radio frequency communications. Information stored can range from an identification number to a dynamic long history of an individual object. It is either presented to a hand-held device with an alpha-numeric display or a computer which automatically manages and manipulates the input data.

3. Although RFID technique can be applied to assist in the identification and traceability of the live food animals, the efficiency is limited by several factors. The radio frequency used has to be kept in the low frequency range to minimize possible health hazard to the animals. This means that the RFID tag must be large enough to provide sufficient surface area for the reader to interrogate. Alternatively, if the tag is small, the distance between the tag and the reader must be as short as possible (not more than a few centimeters) to yield an accurate reading. Besides, the cost of the tags and manpower involved in tagging the animals mean that it is only cost effective for larger and more expensive food animals, for which concise histories of farm management and health condition are required for import and export trading purposes.

4. RFID technology has been used extensively in cattle industry in countries such as Australia, Canada, New Zealand and Japan. Usually, the tags are attached firmly onto the ear of the cattle. When the cattle walk through a passageway reader, stored information will be transmitted and recorded in a computer system. Using a hand-held reader requires more time and manpower, and it is often risky for the operator to come close to the cattle to read the tag. The information usually include a unique identification number and data on the farm of origin to facilitate tracing. The movement and farm management histories throughout the life of the cattle can also be stored and obtained for study using this system.

5. Application of RFID technology in live pigs is not common overseas but is being explored by the Guangdong Entry-Exit Inspection and Quarantine Bureau (GDCIQ) in collaboration with the Food and Health Bureau and the Food and Environmental Hygiene Department. Current problems encountered include the loss of tags during transportation and slaughtering/dressing processes, and lack of an efficient passageway reader for the busy and crowded environment inside the slaughterhouse. Trials and modifications are being carried out to solve these problems.

Feasibility of Using RFID Technology in Poultry Traceability

6. There is little overseas experience to draw from published literature on the use of RFID technology in live poultry. However, difficulties listed below can be anticipated :

- (a) Poultry are highly mobile animals and reared in flocks of large number. Tagging is a labour intensive process which is not welcomed by farmers.
- (b) The small body size of poultry renders the attachment of the RFID tag very difficult – choosing the anatomical position of attachment and size of the tag are main problems.
- (c) The pecking behaviour in poultry may increase the chance of damage or loss of tags.
- (d) Poultry are unlikely to walk through the passageway reader(s) one after another, and some of them may even jump or fly over the reader.

- (e) It is almost impossible for any kind of reader to read the individual information correctly from their tags if they are kept inside a cage.
- (f) It is also time consuming and labour intensive to use hand-held readers to read the information of each individual bird considering their continuous movement within cages and large number in a consignment at both Man Kam To Livestock Inspection Station and upon arrival at the Cheung Sha Wan Temporary Poultry Wholesale Market.
- (g) As there is limited research on the use of RFID in poultry traceability, there is no data on detection failure rate, tag missing rate, failure of readers and the optimal distance between tag and reader. Without these important data, the practicality of using RFID to enhance poultry traceability can hardly be determined.

Way Forward

7. Due to limited research and foreseeable operational difficulties in using RFID to enhance poultry traceability, the concept will need to be further explored. There is also a need to consider its feasibility in both local and Mainland farms, and at control points.

Centre for Food Safety
Food and Environmental Hygiene Department
15 July 2008