

Tamper-proof sample collection & the chain of custody



B. Mc Inerney, A. Pacquit, K. McDonnell, F. Butler and S. Ward*
University College Dublin, Biosystems Engineering, Earlsfort Terrace, Dublin 2, Ireland
The AvianBioTrack Project:
Enhanced traceability in the poultry meat chain using biometrics and e-tracking technology



INTRODUCTION

A key link in the farm-to-fork chain, where potential product contamination can occur, is the feed input to the system. The consumer demands that auditable controls are in place to test and monitor of the quality of the feedstuffs fed to animals entering the food chain (Cummins *et al.*, 2002). Poultry feeds are sourced on the national and world markets, and it is not always possible to have an inspector present (from the local regulatory authority), especially in 3rd country situations, to oversee the sampling and the subsequent chain of custody to the laboratory. It is essential that feed samples are taken even if regulators cannot provide round the clock supervision. In that respect there is no effective traceable system currently in place for feeds. A statistically robust and tamper-proof sampling system, that guaranties the integrity of the sample chain of custody, has recently been developed at the University College Dublin (Ireland). In compliance with legislation and best practice, the proposed system provides verifiable product samples for subsequent laboratory analyses. It is envisaged that the device will enable certifiable feed samples to be tracked and traced, through associated bar-codes / RFID tags, from the sample point to the laboratory, thus truly achieving complete Food Chain Traceability from feed input to consumer.

Tamper-proof sample

MATERIALS AND METHODS

The device will be tested during field trials with partners in the poultry industry. A statistical model of the sampling procedures (batch volume, size of particle, flow rate) required to ensure the quality of feed will be developed for the poultry industry.

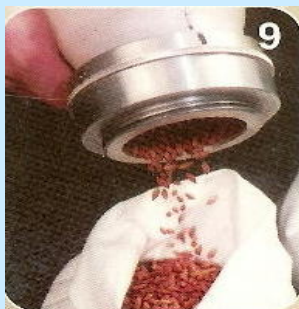


Fig. 1. Sample removal from tamper proof device

The tamper proof feature will be challenged through a number of scenarios and various environments to ensure its reliability and detect the occurrence of tampering or foul play during and post sampling.

The feasibility of implementation of a verifiable tamper-proof system for poultry feed sampling will be assessed in the current industry settings.

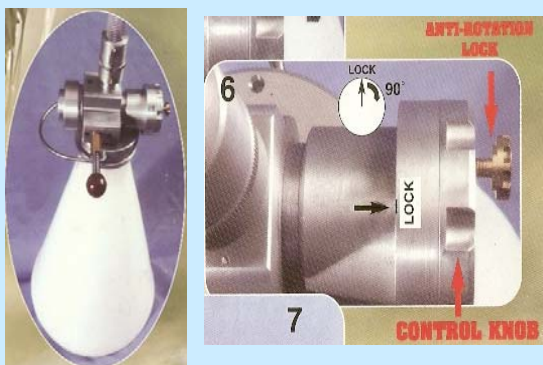


Fig. 2. Sampler and tamper proof feature

Traceability & chain of custody

MATERIALS AND METHODS

A barcode/RFID tag will be incorporated into the tamper proof sampler to store critical data such as sampling ID, company ID and location as well as feed history. The designated official, upon collection of the sample, will ensure its integrity by scanning the barcode/RFID tag and decide to accept or reject the sample. This tag can subsequently be read at any point between sampling and laboratory analysis, thus guaranteeing a secure chain of custody.



Fig. 3. A typical RFID tag

This critical data will be stored in a secure database accessible to authorised parties only. It is hoped that in the event of future feed related public health issues, this system will provide rapid access to critical data.



Fig. 4. A barcode/RFID seal tag can store critical data

REFERENCES

Cummins, E., Grace, P., Fry, J., McDonnell, K. and S. Ward (2002) BSE: Risk, uncertainty and policy change. Risk: Health, Safety & Environment 13(1&2): 95-113