

# Participatory risk assessment for food safety in informal markets

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## Abstract

The OIE Terrestrial Animal Code emphasizes risk analysis for promoting and maintaining food safety. In South Africa, approximately 45% of livestock is marketed through informal channels. The cross-over segment between the informal and formal marketing chain and the food safety risk of informally marketed meat is unknown, although traceability has been highlighted as a concern during EU inspections. It is known that zoonoses like cysticercosis, brucellosis, tuberculosis, campylobacteriosis, salmonellosis, leptospirosis, Rift Valley Fever, toxoplasmosis and anthrax can be transmitted through handling or slaughtering livestock or consuming meat. To make sure that food safety is prioritized in informal markets, risk analysis, including HACCP, is essential. According to the FAO, building a meat hygiene program under a competent authority needs three “building blocks”: good hygienic practices, HACCP and risk assessment. In countries with large informal sectors it is often difficult to implement these procedures; participatory approaches are a promising methodology for obtaining data from, and engaging with, the informal sector. A detailed flow diagram for the informal meat chain in Southern Africa could be built using a participatory approach to risk assessment. Using the data obtained from this approach it would be possible to put prerequisites in place, define critical control points and ultimately, manage the risks through risk communication to targeted low-income communities and subsistence farmers. This would also enhance export capacity in the region.

## Introduction

Only about 15% of South Africa can be considered arable and suitable for agriculture and 45% of the livestock kept in this small portion is owned by emerging or subsistence farmers. South Africa produces about 85% of its own meat requirements and the rest is imported from various countries (Cirkel, 2008; DLA, 2008). There is thus an opportunity for the small-scale and informal livestock farmer to enter the formal market with a possibility of creating sustainable livelihoods, but to do so they must meet food safety and quality standards (Mokoene, 2007). These standards are increasingly risk-based: both the World Organisation for Animal Health (OIE) and the World Health Organisation (WHO) emphasize risk analysis for promoting and maintaining food safety and emphasise the “farm to fork” approach for food supply chains and monitoring systems. In South Africa there are both formal and informal supply chains

Livestock identification and traceability systems are a priority of the OIE, as most outbreaks of zoonotic foodborne diseases can be traced back to primary production. Cysticercosis, brucellosis, tuberculosis, campylobacteriosis, salmonellosis, leptospirosis, Rift Valley Fever, toxoplasmosis and anthrax as well as other diseases can be transmitted through handling or slaughtering livestock or consuming meat (OIE, 2007; WHO, 2008). Veterinary Services, in close collaboration with other role-players like human and environmental health professionals, analysts, epidemiologists, food producers, processors and traders, need to put remedial measures in place to decrease risks to consumers (Buncic, 2006; OIE, 2007, McKenzie & Hathaway, 2006). Criteria are in place for good hygiene practice in the abattoir (Skaarup, 1985; CAC, 2005). In addition, guidelines on hazardous levels of contaminants in food of animal origin remedies are published internationally by the Codex Alimentarius Commission (CAC, 2005).

Veterinarians have been identified by the OIE as important role-players in food-safety and the role of the veterinarian includes training and advice on preventing food safety hazards in primary production (Benet and Bellemain, 2005; Benet *et al.*, 2006, McKenzie & Hathaway, 2006). To make sure that food safety is prioritized in informal markets, risk analysis, including HACCP (Hazard Analysis and Critical Control Points) is essential. Although these guidelines are implemented in formal livestock production systems by the formal sector in member countries, methods to implement or ensure food safety in informal markets remain problematical.

## Methodology

We carried out literature review, key participant interviews and preliminary situational analysis to identify current practices, role-players and relevant legislation for food safety in informal markets in Africa, using South Africa, which has both a formal and informal livestock sector, as a model. Participatory risk assessment enabled a situational analysis of the food production chain (value chain) in informal marketing

systems, as well as identification and characterisation hazards within these value chains. The regulatory framework identified will be investigated further and important public and private sector concerns ranked.

## Results

Preliminary results indicate that meat production practices in South Africa can be divided roughly 50/50 between the formal market and the informal market. Livestock in the formal production chain comes mainly from intensive farming systems through feedlotting in the case of beef and mutton, or highly intensive rearing systems in the case of poultry and swine (Olivier, 2004). In the formal market, record is kept of each animal from birth until it reaches the abattoir. All slaughter livestock are branded for identification purposes and receive vaccines against common problem diseases as set out in the Animal Health Act of 2000 (DOA, 2008). Formal food chain actors include primary producers, processors, wholesalers and retailers. Monitoring and quality control of livestock production and animal health rests with mainly the veterinary profession, while food quality control at the level of processing, wholesaling, distribution and retailing is the responsibility of the National Department of Health. Import and export quality control of animal products (not only livestock but also aquatic animals and bees) are chiefly the responsibility of the Veterinary Services (DOA, 2008; DOH, 2008; OIE, 2007)

We found that legislation to govern food hygiene in South Africa is fragmented and divided between the Department of Health and the Department of Agriculture (DOA, 2008; DOH, 2008). Legal requirements are in place to monitor the quality and safety of meat and meat products in South Africa, including HACCP. These requirements are listed and described in the Meat Safety Act, Act 40 of 2000 (2000). The Act describes in detail both primary and secondary meat inspection procedures to allow for quality control at the abattoirs. It does not contain any guidelines for those meats that form part of the informal market other than that the animals must be slaughtered at a registered rural abattoir and the procedures for meat inspection are assumed to be the same as for the more "formal" abattoirs. Traditional or home slaughter of livestock is allowed, providing it is for own consumption and not for sale.

Within abattoirs, animals are handled humanely as specified in the Meat Hygiene Act and OIE guidelines to ensure a safe, sound and wholesome product (DOA, 2000). Primary and secondary meat inspection and grading of the carcass ensure that quality of the product is met. The whole formal meat supply chain is controlled in line with the guidelines of the Terrestrial Animal Code as South Africa is a member of the OIE (OIE, 2007). State veterinary services also conduct surveillance and monitoring, food safety in abattoirs and control the import of safe food of animal origin.

Prerequisites that enhance food safety in both the formal and the informal markets include registration of pesticides and stock remedies according to the Farm Feeds, Fertilizers and Stock Remedies Act (DOA, 2008). In addition the state subsidises testing for bovine tuberculosis and brucellosis as well as vaccination against anthrax and rabies in informal, low-income and communal farming systems, although these are paid for by commercial farmers (Cirkel, 2008).

In the informal sector, animals are usually kept to supply the farmer and his/her family with milk and meat, to slaughter during a ceremony, to pay a dowry (lobola) or keep as a form of savings or "bank" (animals are sold when money is needed urgently). Animals may be sold at an auction, to a speculator, from where they could go to an auction or a registered abattoir, or sold to someone else in the community who wants to slaughter it for own use. When the animal is slaughtered informally, quality control lies directly with the owner or the person slaughtering. Although all livestock has to conform to the regulations on animal identification, this is not always adhered to in the informal sector (Van de Moosdijk & Schiferli, 2002).

The cross-over segment between the informal and formal marketing chain and the food safety risk of informally marketed meat has not been described, although traceability has been highlighted as a concern during European Union (EU) inspections (Cirkel, 2008). Although there is sufficient legislation in place to conform to the OIE standards, certain areas remain of concern to the EU and imports (with the exception of ostrich meat) from South Africa were suspended in 2008. One possible cross-over or conversion from the informal market to the formal market is livestock sold at auctions or abattoirs by speculators or stock thieves. Anecdotal evidence suggests that although movement permits are mandated in terms of the Animal Health Act (2000) this may not be a sufficient deterrent or control mechanism.

## Conclusions

The participatory approach to risk assessment we used, based partly on methods used in participatory epidemiology (Thrusfield, 2005), and linked to risk management and communication strategies, will support increasing livestock production by improving the management of safety of livestock food products, thus maximizing market access for the poor dependent on livestock while minimizing the food borne disease

burden for poor consumers. It could do this by adapting the HACCP methods successfully used for food safety in developed countries and international trade to domestic informal markets where livestock products are sold. This will require innovating and testing tools and approaches through training and practical application. This participatory approach will provide appropriate mechanisms for better food safety management in informal markets. Key role-players in the Agricultural and Health Sector will have to be trained in participatory approaches to risk assessment. Not only would this improve food safety and improve the health of small-scale farmers, but could also enhance export capacity and thus enhance job creation and small-scale entrepreneurs and provide sustainable livelihoods in the informal agricultural sector.

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