

# Quality Management, Auditing and Certification Impacts on Product Quality, On-farm Food Safety and Animal Well Being

Thomas G. Blaha, DVM, Ph.D.

School of Veterinary Medicine of Hannover, Field Station of Epidemiology

Buescheler Str. 9, D-49456 Bakum, Germany,

Phone: (+49) (0) 4446 95 99 110, Fax: (+49) (0) 4446 95 99 112,

E-mail: thomas.blaha@tiho-bakum.de

## Introduction

The liberalization of the global trade with food, and the fact that the consumers in the industrialized countries are more and more demanding food to be not only economical, but also healthy, tasty, and safe, while at the same time respecting animal welfare and the environment, are the two major determinants of rather drastic changes occurring in agriculture throughout the world. The current quantity-oriented food production (agricultural bulk-commodity supply of agricultural raw products into the food production chain) that guarantees the nutrient supply for a nation is changing into an international quality-oriented food system (vertical supply chains for the production of identity preserved food). The main driver of this development is without doubt the never-ending chain of food safety break-downs: *Salmonella* Enteritidis in eggs, BSE in the UK, *E. coli* O157:H7, the emergence of *Salmonella* Typhimurium DT104, the dioxin scandal in Belgium, and the BSE-scares in several continental European countries, especially in Germany. These events led to an increasing demand for transparency, traceability, and quality management (including internal audits and certification) in the entire food production chain, including the agricultural primary production.

The major tools for adopting standardized production procedures at farm level that address food safety, high quality, animal well being and environmental stewardship is the implementation of on-farm measures based on the principles of the HACCP concept (Hazard Analysis Critical Control Points) and of quality management and certification programs such as ISO 9000:2000, of which the concept of pre-harvest food safety is a core element.

## Pre-harvest food safety

The majority of today's food safety concerns have their origin in the production stages prior to slaughter and processing, the so-called "pre-harvest" stages, i.e. mainly the agricultural primary production. Examples for pre-harvest food safety issues, which stem from non-defined and non-standardized agricultural production procedures, are: latent infections such as *E. coli* O157:H7 in cattle, *Salmonella* in pigs, poultry and cattle, feed contamination with dioxin or TSE prions. Furthermore, the use of antimicrobials in food

animals is an emerging concern, which additionally draws the attention of the public to the production practices in livestock production.

All this means that there is an urgent need to develop pre-harvest food safety procedures that are to be added to the existing harvest and post-harvest food safety and food hygiene measures. In the context of these considerations, pre-harvest food safety can be defined as:

Pre-harvest food safety is the complex of measures that needs to be taken at farm level (farm supply and on-farm procedures) that aim at preventing and/or minimizing the amount of food-borne health risks to humans carried into the food chain via animals and animal products.

In the case of slaughter pigs, these “pre-harvest risks” are such as chemical residues, resistant bacteria or bacterial genes, zoonotic *Salmonella* spp., *Trichinella spiralis*, *Toxoplasma gondii*, *Campylobacter coli* and *Yersinia enterocolitica*.

## Pre-harvest food safety as integral part of quality assurance systems for food animal production

The need to improve the production standards of food animal production as a response to the consumers’ and the society’s expectations has been realized and addressed for at least 10 years in most countries with a developed pork production, especially in countries that export pork (Denmark, The Netherlands, Belgium, the USA and Canada). These countries have, in slightly different ways, developed standards for swine production that are driven by the producer associations (the Canadian Pork Quality Assurance System, and the PQA System of the U.S. National Pork Producer Council), or by industry associations (the Quality Assurance System of the UK Meat and Livestock Council, and the Dutch Produktschap voor Vee and Vlees with its renowned IKB-program = Integrale Ketten Beheersing), or with laws or ordinances issued by governments that set the basic standards as in the European Union with the “Zoonosis Directive”, or in Germany with the “Schweinehaltungshygiene-Verordnung”.

There is no doubt that these systems have had a positive impact on the overall knowledge of producers about good management practices at the farm level, and they have contributed to e.g. the steady decrease of drug residues in meat e.g. in the USA. However, these systems are still mainly bulk-commodity systems, since they address just the commodity in question such as pork, beef, milk or eggs rather than specific types of these food commodities with clear declarations of their specifics. The reason for this is that most of these systems are built on general standards, are “only” educational, are not regularly audited, and are not enforceable on every farm. Thus, they did not prevent the accelerating diminishing of the consumers’ trust in food. Even if 99% of all farms supplying a type of food comply with such GMP-like general standards, 1% and even less non-compliance results in further distrust in the current bulk-commodity setting.

## A pilot project for implementing quality management systems in pork production

Taking the current changes in agriculture and the food system into account has led to the establishment of a so-called new type cooperative called “Minnesota Certified Pork” (MNCEP). This cooperative is founded on the principles of implementing and certifying market-driven high quality and food safety standards on member farms to supply certain market segments with differentiable defined pork products. The cooperative is open to any progressive pork producer that is willing to comply with the MNCEP standards. MNCEP has, with the support of faculty members, staff and students of the University of Minnesota, developed its **MNCEP Quality Handbook**. It describes the **Standard Operating Procedures (SOP’s)** for the daily activities in the following areas: **Best Production Procedures** (animal care, breeding, farrowing, feeding, sanitation etc., etc.), **Food Safety** (prudent use of antimicrobials, residue avoidance, on-farm salmonella reduction, trichina- and toxoplasma-free production procedures, and needle avoidance measures), **Environmental Stewardship and Community Relations** (MPCA permit, Manure management plan, manure storage management, and odor reduction), **Animal Well Being** (facilities and animal environment, animal husbandry and care, handling, mixing, moving and transporting animals). The Quality Handbook also describes what and how to record the activities (**Logbooks**) that have an impact on the compliance with the MNCEP quality standards.

### **The compliance with these quality and safety standards is achieved by:**

- 1) Once a month: internal audits of every single MNCEP farm that help the MNCEP members to implement the SOP’s outlined in the MNCEP Quality Handbook and that produce records on the basis of audit checklists to prove the compliance with the SOP’s. In case of non-compliance, they help the MNCEP members to implement the necessary corrective measures, and record the resulting compliance during a follow-up visit;
- 2) Once a year a third-party certification of the compliance of the entire cooperative with the rules of the MNCEP Quality Handbook by the State of Minnesota (Department of Agriculture, Board of Animal Health), using the state seal with the addition “Minnesota Certified” (MinnCERT).

The internal audits and the third-party certification by the State of Minnesota follow the concept of ISO9000:2000.

The majority of the described SOP’s are **recommendations** that help standardize the production processes on MNCEP farms and improve the overall efficiency on the farms that follow the Quality Handbook. However, those SOP’s that are necessary to meet defined demands of a targeted market segment are **requirements** that are subject of the internal audits and the third-party certification. The 8 defined market demands that were selected for the initial phase of implementing the MNCEP standards on the first MNCEP member farms are:

- 1) compliance with high-standard animal well being rules,

- 2) no sub-therapeutic use of antimicrobials,
- 3) *Salmonella* monitoring and risk reduction
- 4) *Trichinella*-free production procedures,
- 5) *Toxoplasma*-free production procedures,
- 6) needle-avoidance measures
- 7) no use of rendered animal by-products, and
- 8) “Minnesota grown” (= born and raised in Minnesota)

From June 2000 to January 2001, 5 Minnesota pork producers (3000 sows altogether, sow herds ranging from 100 to 2000 sows) implemented those SOP's that are necessary to guarantee the production criteria listed above that

On January 29, 2001 were granted the “MinnCERT certificate” signed by the Minnesota Commissioner of Agriculture, certifying the compliance with the “requirement SOP's”, based on the records of four audits per farm, on a letter of guarantee from the producers, on the results of two *Salmonella* ELISA-test checks per herd, and on one day-long on-farm inspection by the Minnesota Board of Animal Health.

The partners of MNCEP are Swift & Co., SuperValu and three grocery chains in the Twin Cities. MNCEP is a “pull-through” approach, which means that new producers are only recruited as the market grows.

However, maintaining and further developing the partnerships, and most of all, the market relationship with the end user is a permanent challenge.

## Lessons learned from MNCEP

As said in the beginning, there is a growing demand for implementing quality assurance procedures in the primary production of food, AND for proving compliance with the claims by some means of certification all over the world. In Germany for instance, due to the panic-like reaction of the German consumers and politicians to the first domestic BSE cases in November 2000, the food animal sector is currently facing quite drastic changes: In the months and years to come, food animal producers have to implement self-control measures that prove the compliance with the mandatory standards and that will be used for neutral controls conducted by private, but accredited certification bodies. The government will later on just “control the control”. Therefore, Germany has right now a huge need for advice and consultation on how to achieve a standard of the production procedures (food safety, animal well being and environmental stewardship), which is potentially certifiable and, thus, re-establishing the lost consumers' trust in the production of food from animal origin. Of course, it is not necessary to develop the principles for excellence in production and food safety again and again for countries or production chains that try to implement on-farm quality assurance and food safety (only the implementation needs adaptation to the specific conditions). However, it is helpful to know the lessons learned from pilot projects. Those lessons learned from MNCEP are:

1. It is possible to implement any quality production procedure on swine farms for either meeting mandatory standards and/or for achieving market leadership by meeting or exceeding market expectations.

2. This is, however, only possible with **written documents** (a Quality Handbook that spells out WHAT IS TO BE DONE) that is binding for any producer that joins the group, and with **written records** (daily notes of WHAT HAS BEEN DONE).
3. Any implementation of standards that exceed mandatory levels, need an incentive from the market (the anticipated increase of the farm's efficiency through the quality management system is mostly not a strong incentive, since in the beginning producers have often higher costs).
4. Therefore, any attempt to implement high-quality procedures to attract the market needs to be strictly a "pull-through" approach.
5. Building partnerships between the sectors that form the vertical supply chain needs time and constant work.
6. If possible, capital should be available for not only covering the initial costs, but also to be able to invest in e.g. a manager, an auditor and advertisement and point-of-sale materials.
7. The approach, the results and the benefits for the consumer must be much more actively communicated to the public and the consuming community than within the pork producing community!

In summary: there is a growing demand for implementing and certifying quality management systems in the primary production of food. The principles of what needs to be done are known – the implementation of the principles cannot be copied, but any production system must find its own way how to comply with the claims, and how to prove the compliance with the claims to customers and consumers.