Public health and pork and pork products: the perspective of producers in the United States of America

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Summary
In recent years, food safety issues have received increased attention from industry groups and governmental agencies in the United States of America (USA) and throughout the world. Consumer assurance of the safety of pork is vital if the demand for pork produced in the USA is to continue. The industry is facilitating co-operative efforts throughout the pork production chain to address food safety. These efforts include residue prevention, pre-harvest control of potential pathogens, the implementation of hazard analysis and critical control point systems throughout the chain and education of food-service workers and consumers.

Keywords

Introduction
In recent years, the attention of industry groups and governmental agencies in the United States of America (USA) and throughout the world has become more focused on food safety issues. For many years, pork producers have recognised the importance of delivering a product in which both domestic and international consumers can be confident. Consumer assurance of the safety of pork is vital to ensure continued demand for pork produced in the USA. Food safety is a continuum and therefore, effective attention to food safety issues requires partnership between all participants in the food chain. After a brief description of hazard analysis and critical control point (HACCP) principles as a foundation for food safety efforts, this paper describes the efforts of pork producers in the USA to facilitate cooperative efforts to address food safety from the farm to the consumer.

Hazard analysis and critical control point systems and the food industry
The food industry and governmental agencies have recognised that the application of HACCP principles is the most effective way to continue to enhance the safety of meat products. The HACCP principles provide an effective and rational means for assuring food safety. The use of this system enables food establishments to evaluate the types of hazards which could affect products, institute controls to keep these hazards from occurring or significantly minimise occurrence, monitor the performance of those controls and maintain records of this monitoring. The implementation of the HACCP system is based on seven principles, as follows:

a) conduct a hazard analysis
b) identify the critical control points (CCPs) in the process
c) establish critical limits for preventive measures associated with each identified CCP
d) establish CCP monitoring requirements and procedures whereby the results of monitoring are used to adjust the process and maintain control
e) establish corrective actions to be taken when monitoring indicates that there is a deviation from an established critical limit
f) establish effective record-keeping procedures which document the HACCP system
g) establish procedures which verify that the HACCP system is working correctly.
Many sectors of the food industry have based food safety systems on HACCP principles voluntarily. In July 1996, the Food Safety and Inspection Service (FSIS) issued a Final Rule on 'pathogen reduction: hazard analysis and critical control point systems', which provides improvements to the current meat and poultry inspection system and specifically mandated HACCPs for meat and poultry plants (2). The Rule includes the following requirements:

- each establishment develop and implement written sanitation standard operating procedures (SOPs) as a foundation for HACCP
- slaughter establishments perform regular microbial testing for general Escherichia coli to verify the adequacy of internal processing controls for the prevention and removal of faecal contamination and associated bacteria
- pathogen reduction performance standards for Salmonella based on national baseline data be established; slaughter establishments and establishments which produce ground meat products must meet these standards
- all meat and poultry establishments develop and implement HACCP systems.

The HACCP regulations and related provisions must be implemented in larger meat and poultry plants (500 or more employees) by 26 January 1998, in smaller establishments (between 10 and 500 employees) by 25 January 1999, and in very small establishments (fewer than 10 employees or annual sales of less than US$2.5 million) by 25 January 2000.

The sanitation SOP regulations and E. coli process control testing regulations came into effect on 27 January 1997. Salmonella pathogen reduction performance standards will be effective simultaneously with the implementation of HACCP systems.

The new rules apply to over 6,200 slaughter and processing plants which operate under federal inspection. Equivalent requirements will apply to State-inspected meat and poultry plants and to foreign plants which export to the USA.

Producer roles in food safety

Pork quality assuranceSM Program

The National Pork Producers Council (NPPC) has strongly supported the implementation of HACCP in any food safety programme. The pork industry recently reaffirmed this commitment at the 1997 annual meeting with a resolution stating that NPPC support a food safety system throughout the pork chain based on HACCP principles, and NPPC shall encourage all producers to show their support for the industry's ongoing efforts in food safety and market development activities by completing Level III of the pork quality assuranceSM (PQA) Program (3).

The most significant way in which pork producers in the USA address food safety responsibilities at present is through the PQA Program. Pork producers developed and implemented this voluntary education programme in 1989, to prevent antimicrobial residues and enhance herd health practices. Drug residue prevention is clearly a producer responsibility: residues cannot be 'fixed' by someone else in the chain.

The PQA Program is based on HACCP principles and comprises three levels, as follows: PQA Level I outlines an on-farm avoidance programme to producers; PQA Level II is a self-directed review of the PQA Level I material; PQA Level III is the highest level of the PQA Program, and can only be completed after discussions by the producer with a third party verifier. Approved verifiers are veterinarians, agricultural education instructors and United States Department of Agriculture Extension personnel. At the 1997 World Pork Expo, the NPPC released a new version of the PQA Program which includes all three levels in one booklet (4). This revision more clearly emphasises the responsibilities of producers with regard to antimicrobial residue avoidance, and is designed to blend with the HACCP plans in operation at meat packing plants.

This revision is based on the Food and Drug Administration (FDA) Compliance Policy Guide (CPG) (1). Considerable discussion has taken place with the FSIS, the FDA and packers, to ensure that this revision meets both packer and government expectations of producer responsibilities. Briefly, the programme consists of ten 'good production practices': the first six relate to antimicrobial residue avoidance (food safety); the last four address management to help minimise the use of animal health products (efficient, quality production).

These good production practices (GPPs) are as follows:

**Food safety**

- GPP 1: identify and track all treated animals
- GPP 2: maintain medication and treatment records
- GPP 3: properly store, label and account for all drugs and medicated feeds
- GPP 4: obtain and use veterinary prescription drugs only within the context of a valid veterinarian/client/patient relationship
- GPP 5: educate all employees and family members on proper administration techniques and withdrawal times
- GPP 6: use drug residue tests when appropriate.
Efficient, quality production

- GPP 7: establish an efficient and effective herd health management plan
- GPP 8: provide proper swine care
- GPP 9: follow appropriate on-farm processing and commercial feed processor procedures
- GPP 10: complete quality assurance checklist annually, and re-certify every two years.

Currently, about 75% of pork produced in the USA is obtained from establishments which have completed the PQA Program. It is anticipated that packers which apply the HACCP system will show increased interest in on-farm production residue avoidance practices. Packers may require producers to complete the PQA Program, provide letters of guarantee, provide or make available treatment records for shipped swine, sign marketing agreements specifying the conditions under which animals are raised, or a combination of these practices.

At the July 1997 meeting of the NPPC Packer Processor Industry Council (which represents the majority of pork packers in the USA), the following statement was approved:

'Pork producer participation in the PQA Program is critical to ensure continued and expanded access to domestic and international markets. The PQA Program will position the industry to take full advantage of these opportunities, helping to make pork the meat of choice. Involvement by all pork producers by directly participating in the program and spreading the message of its importance to the domestic and international markets is needed.

The Packer Processor Industry Council strongly endorses the PQA Program and urges all producers to demonstrate their commitment to producing a safe, quality pork product by completing the PQA Program' (5).

Antimicrobial usage

There has been increased interest in the potential for antimicrobial usage in animals to result in the transfer of resistance to humans. Pork producers in the USA have been very supportive of the implementation of the current national antimicrobial susceptibility monitoring programme for animals and humans. The data gained from these studies will provide information on the more judicious use of antimicrobials in human and animal therapies. The PQA Program, which includes a review of antimicrobial usage at the farm level, will be revised to contain additional educational information, as necessary, to ensure prudent usage of these products.

In addition, the industry is rapidly adopting production practices, such as all-in, all-out production and age segregated rearing, which result in improved animal health. This enables producers to reduce significantly the use of antimicrobials.

Pathogens

A newer challenge for animal agriculture has been to address the presence of potential human pathogens at the farm level. The NPPC established a Pork Safety Task Force in 1994. The mission of the Task Force is to ensure the safety of pork in the USA by means of co-ordinated, science-based efforts throughout the pork production chain. The long-term goals of this Task Force are to decrease the potential for foodborne illness from pork products and to improve product image with regard to safety among consumers worldwide. One of the main objectives of the Task Force has been to identify gaps in knowledge and invest industry funds in appropriate research to address this lack of knowledge.

After a review of current scientific data, the Pork Safety Task Force has identified key areas for food safety research in both the pre-harvest (on-farm) and post-harvest stages of the food chain. The NPPC funded nine research projects in 1994, six projects in 1995, and ten projects in 1996. In 1997, seven projects have been selected to date with additional projects in the planning stages. The pre-harvest projects have focused on the feasibility of developing HACCP-like systems at the farm level to ensure the control of potential human pathogens.

While mandatory HACCP systems for meat and poultry establishments are appropriate at present, additional research is needed on the ecology and epidemiology of micro-organisms of public health significance before the most appropriate stage for intervention in the food chain can be determined. The presence of a potential pathogen in an animal on a farm does not necessarily mean the most effective control point is on the farm. Several questions need to be answered, including the feasibility and cost of making measurable progress on-farm, and the potential for this improvement to be translated into enhanced food safety throughout the food chain. Many potential foodborne agents produce little or no disease in livestock. Strategies to minimise animal disease and production losses may have a limited impact on some foodborne agents. However, producers may be able to implement practices which reduce the number and types of potential human pathogens present in animals. Pilot demonstration projects will be needed to determine the effectiveness of on-farm food safety programmes. The industry strongly supports this type of research.

The NPPC, in co-operation with government agencies, researchers and allied industries, sponsored an international symposium in March 1996 on Salmonella in pork production. Key researcher workers provided project updates and future research needs were outlined. The second international symposium on this topic was held in August 1997 in Denmark. In June 1997, the NPPC met with the American Association of Swine Practitioners (AASP) Pork Safety...
Committee to discuss GPPs for food safety, including pathogens. The NPPC, together with the AASP, organised a meeting of key Salmonella researchers to discuss current progress on research projects, future research needs and information available to start developing GPPs for Salmonella.

As new research information becomes available concerning the potential of effective on-farm practices to enhance product safety, the PQA Program will be the delivery system for these animal production food safety recommendations.

Trichinella

Although the prevalence of trichinella in swine in the USA is extremely low and the number of human cases of this disease is small, trichinella remains a consumer concern. Control methods used to date in the USA have been the provision of proper cooking instructions to consumers and the food services as well as the implementation of regulations for processed pork. Since 1995, the NPPC, the Agricultural Research Service, the Animal and Plant Health Inspection Service and the FSIS have co-operated to develop the tools which will allow the industry to address the hazard of trichinella. The 1995-1996 National Trichinae Research Project in New England, New Jersey and Ohio verified the on-farm risk factors for trichinella (wildlife and rodent exposure) and validated an enzyme-linked immunosorbent assay (ELISA) serological test.

The next step, which commenced in April 1997, is a Trichinae Pilot Herd Certification Project in north-west Iowa. The purpose of the project is to compare the ELISA test with pooled digestion results and to develop an on-farm audit process for risk factors for trichinella. Over 200 farms will receive on-farm audits to evaluate the presence or absence of safe production practices in regard to trichinella. Future steps will be to continue the validation of the on-farm audit form in other regions and to explore mechanisms for an on-farm certification programme.

Co-ordination throughout the pork production chain

While further research is required at the farm level, the NPPC has worked with all the other participants in the production chain to ensure that up-to-date food production safety information is available at every level. Producers are investing significant sums of money in food safety research and education throughout the pork chain. The NPPC has a staff food microbiologist who works with a Post-Harvest Food Safety Technical Advisory Group composed of microbiologists from the packing industry and Government and university researchers to identify research needs and to provide the latest information to the food industry. Current post-harvest research is focused on the impact of the microbial status of incoming animals on contamination rates of pork products, microbiological sampling of carcasses, microbiological profiling of carcasses during processing and intervention strategies to control contamination during processing. The NPPC provides a quarterly publication, Tech Talk, for the scientific community and abattoir quality assurance personnel, which contains the most recent research results. In addition, research reports from producer-funded research are posted on the NPPC web site (http://www.nppc.org) as these are received.

Proper food handling is critical to food safety. The NPPC is a member of the Industry Council on Food Safety which provides food safety training to food service managers. Consumer education is another important component in addressing food safety. The NPPC is working with others in industry and government to ensure that consumers obtain the necessary food safety information. Food safety information is included in recipes and other material provided to consumers, and is also available on the web site.

Conclusion

Effective action on food safety issues requires the co-ordination of efforts throughout the food chain. Comprehensive food safety education and research 'from the farm to the table' is needed. Pork producers in the USA are committed to addressing industry responsibilities by providing a safe and wholesome product to consumers.
La santé publique et la viande de porc ou les produits de charcuterie : l’approche des producteurs aux États-Unis d’Amérique

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Résumé
Ces dernières années, les questions liées à l’hygiène alimentaire ont fait l’objet d’une attention accrue de la part des groupements de producteurs et des organismes publics aux États-Unis d’Amérique, ainsi que dans le reste du monde. Les consommateurs doivent être assurés de l’innocuité de la viande de porc et de la charcuterie produites aux États-Unis d’Amérique, garantie nécessaire au maintien de la demande sur ces produits. En vue de répondre aux exigences de l’hygiène alimentaire, les producteurs de viande de porc instaurent une chaîne de coopération d’un bout à l’autre de la filière porcine. Entre autres efforts tendant à cet objectif, il convient de noter le contrôle des résidus, les contrôles des agents pathogènes avant l’abattage, l’application de l’analyse des risques, points critiques pour leur maîtrise d’un bout à l’autre de la chaîne, la formation du personnel dans le secteur de l’alimentation et l’information des consommateurs.

Mots-clés

Salud pública, carne de cerdo y embutidos: el punto de vista de los productores estadounidenses

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Resumen
En los últimos años, los grupos de productores y los organismos públicos de Estados Unidos de América y del resto del mundo vienen prestando una atención creciente a los temas relativos a la protección alimentaria. Para que se mantenga la demanda de carne de cerdo y embutidos producidos en Estados Unidos, es fundamental garantizar al consumidor la inocuidad de dichos productos. A tal efecto, los productores realizan esfuerzos coordinados a lo largo de toda la cadena productiva. En este marco se inscriben la prevención de la presencia de residuos, el control previo al sacrificio de la presencia de posibles patógenos, la aplicación de sistemas de análisis de riesgos y control de puntos críticos en toda la cadena, la capacitación de los manipuladores de alimentos y la información dirigida a los consumidores.

Palabras clave
References


