South Australian meat hygiene has improved!

NOVEMBER 2002

The Status of Meat Hygiene in South Australia

Government of South Australia

PRIMARY INDUSTRIES AND RESOURCES SA

Primary Industries & Resources SA commissioned an independent review to assess and validate the outcomes and effectiveness of South Australia's Meat Hygiene Program. The following is a summary of the independent review completed in June 2002 by Dr John Sumner.*

Executive Summary

The study has shown that South Australia's meat hygiene and food safety standards have improved since PIRSA's Meat Hygiene Program was implemented in 1994.
The report's findings include:

- The hygienic quality of beef and sheep carcases are equal or superior to national and international benchmarks
- Cooked and cured smallgoods are of high hygienic quality
- A radical improvement in the manufacture of fermented meats
- Significant improvements in temperature control of meat and meat products
- More than 600 businesses have implemented food safety based QA programs.

SUMMARY OF FINDINGS

- Significant improvements in the hygienic status of South Australian meat.
- Food safety hazards have been mitigated by improved standards.
- Around 5300 audits of premises & 1500 audits of transport vehicles took place between 1995-2002.
- Industry complied with national standards in 99% of instances in 2001-02.
- Radical improvements in the manufacture of fermented meats.
- Microbial count on sheep meat significantly better in comparison with a recent USA survey.
- Beef & sheep carcases equal or superior to national & international benchmarks.
- Significant improvement in temperature control of meat
- High conformance with national standards for transporting meat.
- Cooked & cured products are of high hygienic quality.

Background

Over the past decade, the hygiene status of meat has gained worldwide interest. In January, 1995 an outbreak occurred in South Australia when children contracted E. coli 0111 from Mettwurst. More than 20 children were hospitalised, and one died.

Just prior to the January 1995 incident the SA Government introduced regulatory change incorporating the Meat Hygiene Program. The aim of the Program is to ensure the safety and wholesomeness of meat throughout the processing chain, enabling a high degree of confidence in the product for market accessibility and consumers.

Primary Industries and Resources SA (PIRSA) manages the Program by applying a co-regulatory model and by working closely with the lead food safety agency, the Department of Human Services (DHS).

Now, almost a decade after the regulatory changes began, the critical question is: how have changes to regulation of meat hygiene contributed towards market access and protection, and have they reduced the burden of disease in South Australia from consumption of meat and meat products?

Put another way, if we make macro-change to hygiene regulations and impose cost burdens to specific sectors along the agri-meat-food-retail-service-home continuum, can we measure, with any confidence, the effect of those changes and impositions?

PIRSA let a consultancy in January 2002 to determine the effectiveness of the Program. The findings of the consultancy are presented in this summary.

How can we measure the status of meat hygiene in SA?

The status of meat hygiene can be assessed by considering objective measures of South Australia's co-regulatory regime:

- ❑ To process meat for wholesale distribution/sale requires accreditation with the Meat Hygiene Unit (MHU). Conditions of accreditation mandate compliance with national standards and participation in a rigorous contract audit regime.
- ❑ Industry has invested heavily in improved construction and processing standards.
- ❑ PIRSA assists in information transfer through consultancies and training.
- ❑ Outcomes of all of these activities can be assessed in qualitative and quantitative terms.
- ❑ The review findings presented in the report are all based on objective measures for which scientific data could be found:
- ❑ Hygienic status of red meat production in SA
- ❑ Control of product temperatures during transport
- ❑ Hygiene status of smallgoods produced in SA
- ❑ Conformance with microbiological standards for fermented meats
- ❑ Compliance with standards.

* Dr John Sumner is a Consultant to the World Health Organisation (WHO), a Member of the international task force on Microbiological Sampling of Meat (2000), a Member of the Food & Agriculture Organisation (of WHO) expert panel on risk assessment (2000-2001), a Consultant to United Nations FAO (Rome 2000), Technical Coordinator of Meat & Livestock Australia's Food Safety Program for the Meat Industry (1996-2002), and has had extensive consultative work with peak Australian food industry bodies.

Since 1995 around 5,300 contracted 3rd party audits were undertaken at premises and 1,500 on vehicles.

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Lead indicators – measures of behavioural change

Audit intensity in SA meat industry

Qualified auditors as agents of the South Australian government have been used since 1995. Food Quality Systems and Food Safety Auditing Services currently provide this service.

Since 1995 around 5,300 contracted 3rd party audits were undertaken at premises and 1,500 on vehicles.

The Meat Hygiene Unit undertakes its own audits and inspections to assess the rigor of the audit process, to manage specific hygiene problems and to oversee the process of continuous improvement.

Over the period 1995-2002, food safety-based quality assurance programs of more than 600 operations have been approved.

Compliance with Australian Standards

During 2001-02 compliance ratings indicated that 87% and 70% of businesses substantially complied with hygienic production and construction criteria, respectively. Industry complied with national standards in 99% of instances in 2001-02.

Also during 2001-02 there were more than 3700 opportunities for improvement cited by the auditors, who issued minor (77), major (23) and critical (3) corrective action requests.

Industry Training

The uptake of systems has been assisted by training. There have been more than 14 separate training initiatives for industry since 1995, attended by more than 700 businesses.

Microbiological status of smallgoods – How does South Australia measure up?

South Australia's smallgoods industry manufactures a wide range of products, particularly fermented meats which, since 1995, are required to conform with three parameters:

- raw meat must have <100 generic E. coli/g
- The process must deliver at least a 3-log reduction in generic E. coli
- E. coli not detected in 0.1g of final product

E. coli in raw materials

In 1997-99, 4-12% of raw material was >100/g while in 2000 and 2001 no samples have been >100/g.

Fermented meats

In each of 1994-95 there were more than 70 isolations of Salmonella from over 600 samples submitted (ca 11%). In 1996-98 a total of 5 isolations were made from more than 1800 samples while in 1999-2001 there have been no isolations. These data are taken to indicate improved reduction of Gram-negative pathogens by fermented meat processing in SA.

E. coli in final product

During the past six years, manufacturers of fermented meats and the DHS have submitted samples to registered laboratories in order to assess the effectiveness of maturation temperature and time. Isolations over the period 1997-2001 vary according to the test method used by the laboratory but indicate a very low level of detection, invariably in samples submitted prior to release. For "E. coli not detected in 0.1g" all mettwurst (106 samples) and salami (35 samples) conformed.

Cooked and cured smallgoods from two plants were monitored by registered laboratories in Adelaide. Both plants were able to control re-contamination of final products with E. coli, and *TVCs were <log3/g (except for pastrami).

Summary

Data submitted to registered laboratories indicate significant improvement in the hygiene status of smallgoods. For fermented meat products in particular there have been improvements in raw meat quality and process control.

These significant improvements have been due to the cooperation by industry and the collaborative efforts of the DHS and PIRSA.

* TVC – Total viable count (all bacterial)

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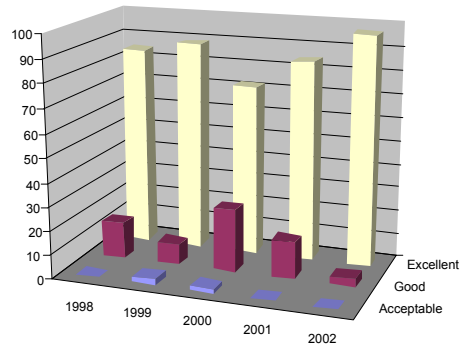
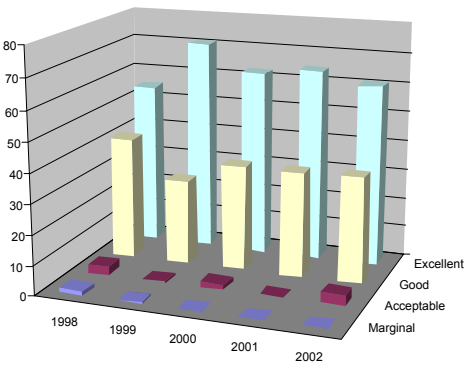
The operations of PIRSA's Meat Hygiene Unit have been underpinned by a quality management system certified to ISO9001:1994 and subsequently ISO9001:2000 since 1998.

Quality System
Quality Endorsed Company
ISO 9001
Lic. QEC12021
Standards Australia

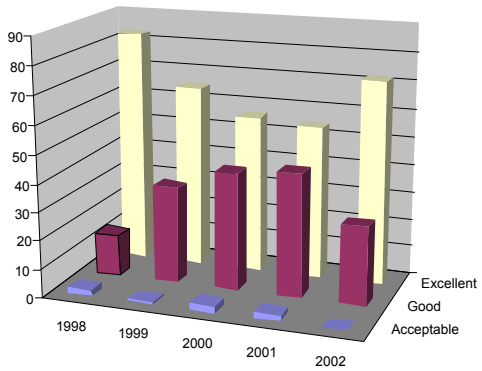
Carcase survey at Abattoirs – How does South Australia measure up?



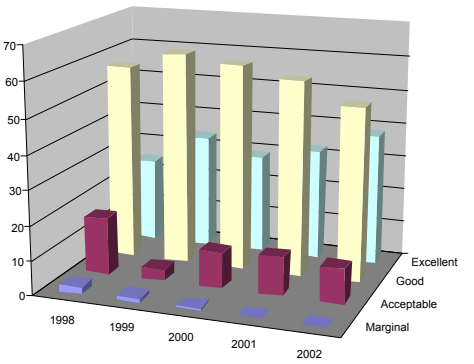
Hygiene of carcases is measured by conformance with the microbiological guidelines for Australian meat processing. Presented below are results for beef and sheep carcases at SA abattoirs for the period 1998-2002. Almost all TVCs were in the "Excellent" (<103/cm2) or "Good" (103-104/cm2) range as were E. coli prevalence (not detected) and <10/cm2, respectively.



Percentage distribution of TVCs (left) and E. coli (right) on beef carcases processed in South Australian abattoirs, 1998-2002



Percentage distribution of TVCs (left) and E. coli (right) on sheep carcases processed in South Australian abattoirs, 1998-2002



National, export and overseas comparison

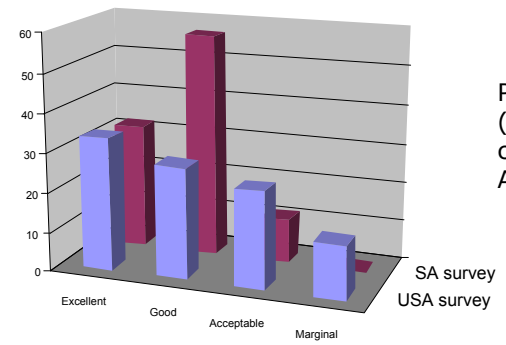
In national terms, the hygienic quality of red meat production is at least the equal of product surveyed in the national baseline study for abattoirs and VSPs in 1998 and it is emphasised that microbial levels have been reduced significantly over the ensuing period. International comparisons are harder to make because of methodological differences but a recent USA survey of sheep carcases had methodology identical with that used in Australia. The data indicates that South Australian production was of significantly better microbial quality

Carcase survey at Very Small Plants (VSP's) – How does South Australia measure up?

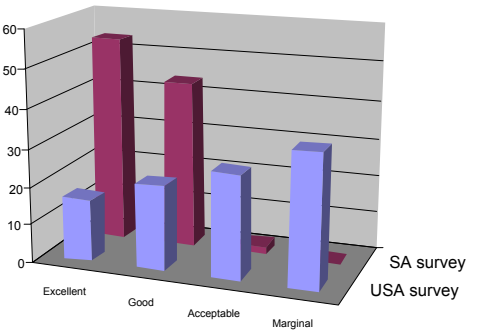
As with production from abattoirs the hygiene of beef and sheep carcases from VSP's in SA was assessed. Almost all beef and sheep carcases were in the Excellent or Good range for both TVCs and prevalence of E. coli.

While E. coli were isolated only rarely in both the 1998 and 2002 surveys, in 2002, TVCs were dramatically reduced with 89% of beef carcases and 76% of sheep carcases being in the Excellent category.

'The data indicates that South Australian production was of significantly better microbial quality.'



Percentage distribution of TVCs (right) and E. coli (left) on sheep carcases processed in South Australian and USA plants in 2001



Control of meat temperature – How does South Australia measure up?

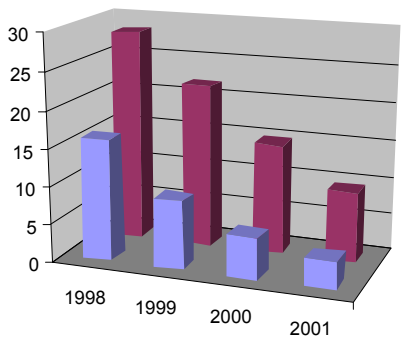
Since 1995, the Australian Standards (AS) for Hygienic Production of Meat for Human Consumption and for Transportation of Meat for Human Consumption have stipulated two cardinal temperatures for transport and distribution of meats:

- Carcases must be dry with a surface temperature not exceeding 7°C
- Portions of meat (smaller than quarter) must be no warmer than 5°C

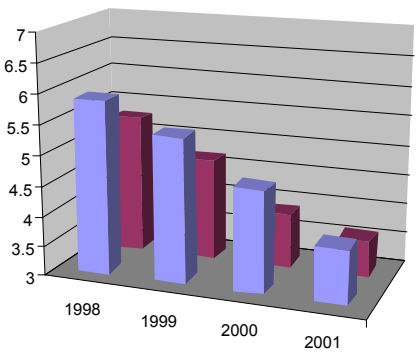
To assess the effectiveness of meat chilling during transport, load-in temperatures were obtained from 15 meat processors in South Australia. Over the period 1998-2001 carcase temperatures (n=13,010) and meat portion temperatures (n=13,490) were accessed from receival data sheets.

There has been improvement over the period 1998-2001 in mean temperature, and in the degree of conformance with the Australian Standard, of carcases and meat portions being transported in South Australia. In 2001, 96.3% of carcases and 90.6% of portions conformed with the AS and mean temperatures were 3.9°C for carcases and 3.6°C for portions indicating control of Gram-negative pathogens (the target organisms) during transport.

'There has been improvement over the period 1998-2001 in mean temperature, and in the degree of conformance with the Australian Standard, of carcases and meat portions being transported in South Australia.'



Percentage non-conformance of carcases (blue) and meat portions (red) at receival : 1998-2001)



Mean receival temperatures (°C) of carcases (blue) and meat portions (red) : 1998-2001

Opportunities for improvement identified by the study

The study required an assessment to be made of where the Meat Hygiene Program can more effectively contribute to improved meat hygiene and public health outcomes. The following are the 5 recommendations of the study:

1. Increase the rigor surrounding validation of Critical Control Points for listeriocidal processes in the HACCP plans of smallgoods plants.
2. Critically evaluate microbiological testing data to assess the relative effectiveness of Good Manufacturing Processes for control of L. monocytogenes of smallgoods operations.
3. Evaluate the scientific evidence for spin chilling being a CCP. The Codex definition requires that a CCP prevents, eliminates or reduces the hazard to an acceptable level.
4. There should be a co-operative approach to managing risks of Gram-negative pathogens in raw and cooked poultry between Departs of Human Services and Primary Industries.
5. PIRSA should undertake a comprehensive review of processes in the smallgoods industry centred on:
   - validation of all processes for uncooked and cooked fermented sausages.
   - A review of processes for spreadable sausages such as Teewurst.
   - Resolve the anomaly where regulation of smallgoods is the responsibility of DHS yet the audit of plants and processes is the responsibility of PIRSA.

The study also provided 4 recommendations to validate the ongoing effectiveness of the Program:

(i) establish a microbiological baseline for poultry and game

ii) establish effective indicators of Good Manufacturing Practices within poultry and game sectors

iii) rigorous review by auditors of microbiological results

(iv) annual audit of the microbiological status of each industry sector

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