



# Food Act 2008 (WA) Fact Sheet 21

## Australian Standard Alternative Equivalent Procedure: Risk-based Review of Post-mortem Inspection of Kidneys of pigs

Version 2 – March 2019

### Rationale and description of the alternative technique

The Pork Processor Referral Group (PPRG – comprised of representatives from all seven export pork processors) were advised in 2017 that the Australian Meat Regulators Group had approved the alternative of routine visual post-mortem inspection for all pigs, meaning there will be no requirement to routinely palpate enucleated pig kidneys at post-mortem inspection, irrespective of end-use.

Following that advice PPRG members requested that further work be undertaken to validate the equivalence of observing unenucleated kidneys as an alternative inspection procedure to inspecting enucleated kidneys.

While there was consensus at that time on a number of key issues, a robust quantitative comparison of the alternative procedure was required by the regulators. Current knowledge recognised:

- Gross abnormalities of kidneys are likely to be of limited food safety risk;
- Severe nephritis is indicative of leptospirosis as an occupational zoonotic risk to producers, transport drivers and abattoir personnel;
- Detection of gross abnormalities of kidneys is unlikely to inform carcass disposition that is not otherwise available;
- Current inspection procedures add opportunity for cross contamination with microbial pathogens due to handling of kidneys;
- Pig kidneys are not often kept for human consumption.

### Current and approved alternative post-mortem inspection procedures for Schedule 2 AS4696 (Anon 2007) Post-mortem Inspection procedures for pig kidneys

Current (AS4696: Schedule 2)	
Kidney (enucleated)	Palpate
Alternative post-mortem inspection procedures	
Kidney not for human consumption	Observe unenucleated kidneys
Kidney for human consumption	Observe enucleated kidneys

No changes to Schedule 3 are recommended.

## Background and supporting information

The objective of the assessment was to determine the effect of the alternative inspection procedure of observing unenucleated kidneys and assess whether these procedures provide equivalence with the standard (AS4696:2007).

The technical objectives of the project were to:

- Determine the foodborne hazard and zoonotic significance of gross abnormalities of pig kidneys;
- Quantify the industry prevalence of gross abnormalities of kidneys, including a breakdown of prevalence by type of gross abnormality;
- Quantify the role of gross abnormalities of kidneys in informing carcass disposition judgment;
- Predict the effect of inspecting unenucleated kidneys by observation on food safety and wholesomeness outcomes.

A national snapshot prevalence survey of one week's production (~85,000 pigs) through the seven export abattoirs was conducted to provide the prevalence rate for gross kidney abnormalities. Carcasses were examined over one week/abattoir to encompass pigs from all herd sizes, production systems and regions on a proportional basis. Inspection was by palpation of enucleated kidneys.

## Key Findings

1. The prevalence of gross abnormalities of kidneys was 6.43% of 84,047 pigs inspected.
2. Only 0.014% of 84,047 pigs had gross abnormalities of food safety significance (1.4/10,000 carcasses). Of the 5,403 pigs with gross abnormalities, 65.0% had cysts.
3. Nephritis was detected in 2.0% of 84,047 pigs with 0.49% of 84,047 pigs having Grade 2 nephritis. Grade 2 kidneys are easily detected by observation as they are characterised by a mottled whitish capsule, uneven surface and are often misshapen.
4. For pigs inspected by observation of unenucleated kidneys, the estimated increase in non-detection rates on a per 10,000 carcass-basis is substantial for Grade 1 nephritis and moderate for grade 2 nephritis and cysts.
5. In terms of significance for carcass disposition judgement, a total of 27 of 84,047 inspected pigs with kidney gross abnormalities were totally condemned (0.032%). Of these, five carcasses were condemned for food safety reasons, these being septicaemia (four) and pyaemia (one) (i.e. 0.6/10,000 carcasses). Another five carcasses were condemned for reasons unrelated to kidney lesions detected in that carcass, i.e. pigs condemned due to arthritis (four) and pyrexia (one) that had cysts.
6. All but one of the 27 pigs that were totally condemned with kidney lesions, had major evidence elsewhere in the carcass supporting total condemnation (e.g., uraemia, anaemia). The data supports that observing unenucleated kidneys has a negligible effect of on determining final carcass disposition.
7. Kidney lesions alone may have been a major reason in one of the 27 total carcass condemnations i.e. a tumour that may have signalled metastatic spread.

On an individual carcass basis at the point of post-mortem inspection, it is estimated that the specificity of nephritis Grade 2 gross abnormalities for leptospirosis infection is 95.7%.

Results of simulations based on these data using *FreeCalc* estimated the detection of positive Grade 2 lesions by observing unenucleated kidneys performs surprisingly well as a surveillance tool for herd leptospirosis infection despite a reduced sensitivity of detection.

In summary, while observing unenucleated kidneys would carry a negligible food safety risk due to the low prevalence of abscesses, there is a likely adverse effect on wholesomeness especially from non-detection of mild cases of white spotted kidneys.

Consequently, when kidneys are kept for human consumption the alternative recommended is to Observe enucleated. When not for human consumption leave unenucleated for inspection by Observation. These alternative procedures provide additional protection from an occupational zoonosis.

## Assessments of any adverse effects of the alternative technique

### Post-mortem inspection and/or disposition

It is evident that inspection of pig kidneys has negligible significance for determining final carcase disposition.

### Food safety

The prevalence of gross abnormalities of kidneys of food safety significance is negligible. Additionally, it is recommended that when retained for human consumption, that kidneys are enucleated for inspection as currently required in Schedule 2.

### Product wholesomeness (including non-detection rates)

Inspection of unenucleated kidneys may substantially increase non-detection of some gross abnormalities e.g. mild nephritis and cysts. However, when retained for human consumption, it is recommended that kidneys are enucleated for inspection as currently required in Schedule 2.

### Animal health (including zoonoses) surveillance

Kidneys with Grade 2 nephritis are commonly infected with leptospirosis. These are easily detected by observation of unenucleated kidneys.

Observing unenucleated kidneys will reduce zoonotic risk to abattoir personnel.

Observing unenucleated kidneys remains a useful surveillance tool for identifying herds likely to be infected with leptospirosis.

**Animal welfare** – Not applicable

## Useful Resources

Anon (2007) Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption. FRSC Technical Report 3, AS 4696:2007.

CAC (Codex Alimentarius Commission) (2005) Code of Hygienic Practice for Meat. CAC/RCP 58-2005.

Pointon, A.M., Hamilton, D.H and Kiermeier, A. (2018) Assessment of the post-mortem inspection of beef, sheep, goats and pigs in Australia: Approach and qualitative risk-based results. *Food Control* Volume 90, Pages 222-232 August 2018, <https://doi.org/10.1016/j.foodcont.2018.02.037> (including Supplementary Material)

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The information contained in this Fact Sheet was provided to the Australian Meat Regulators Group in support of this change to the meat inspection procedures content in the Australian Standard for the Hygienic Production and Transportation of Meat & Meat Products for Human Consumption (AS 4696:2007).

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