Government of Western Australia
Department of Health

Food Act 2008 (WA) Fact Sheet 22

Australian Standard Alternative Equivalent Procedure: Risk-based Review of Post-mortem Inspection of Kidneys of Sheep and Goats

Version 1 – March 2019

Rationale and description of the alternative technique

From a public health perspective, the enucleation of kidneys poses an occupational zoonotic risk to meat workers and inspectors due to leptospirosis. However, from a food safety perspective, kidneys of sheep and goats have been demonstrated as not posing a risk to consumers.

The alternative procedure of presentation of unenucleated kidneys for inspection only applies when kidneys are not kept for human consumption. Otherwise there is no change; kidneys are enucleated for inspection when for human consumption.

This alternative procedure is assessed as having negligible adverse effect on determining final carcase disposition.

Current and approved alternative post-mortem inspection procedures for Schedule 2 AS4696 (Anon 2007) for sheep and goat kidneys.

Current (AS4696:2007 Schedule 2)	**Revised (AS4696:2007 Schedule 2 Guideine)**
Kidney (enucleated) - Observe	Kidney (unenucleated) – Observe. When not for human consumption.
	Kidney (enucleated) – Observe. When for human consumption.

No changes to Schedule 3 are recommended.

Background and supporting information

Sheep offal has been the attributed source of four of fifteen outbreaks (27%) attributable to sheep and goat meat between 1997-2014 in Australia, with *Salmonella* spp. being identified in all outbreaks. A desk-top assessment shows that gross abnormalities of kidneys of sheep and goats in Australia are unlikely to be caused by foodborne hazards. Infection with leptospirosis, an occupational zoonosis, however, is endemic in sheep in Australia.

The assessment aimed to quantify the effect on food safety and wholesomeness of changing from Observing enucleated to Observing unenucleated kidneys of sheep and goats, by

1. Determining the foodborne Hazard significance of gross abnormalities of kidneys;
2. Quantifying the industry prevalence of gross abnormalities of kidneys;

3. Determining the role of gross abnormalities of the kidneys in informing carcase disposition judgment;
4. Quantifying the effectiveness of the detection of gross abnormalities by Observing unenucleated kidneys by comparing with the rate detected by Observating enucleated kidneys;
5. Quantifying the effect on food safety of gross abnormalities undetected by Observing unenucleated kidneys;
6. Reviewing the potential benefits to worker safety from an occupational zoonosis;
7. Recommending alternative inspection arrangements for kidneys of sheep and goats that provide equivalent food safety and wholesomeness outcomes.

A total of 11,336 sheep and 8,160 goat carcases were inspected for gross abnormalities of the kidneys at 5 shhep and 3 goat abattoirs across the main production zones of Australia over 14 months.

The effect of observing unenucleated kidneys was also compared with observing enucleated kidneys on these carcases.

Key Findings

1. The most commonly detected gross abnormality for sheep were white spotted kidneys (WSK; indicative of leptospirosis) at 3.23%, scar tissue (0.51%), abscesses (0.19%) and cysts (0.13%). For goats white spotted kidneys (0.82%) followed by abscesses (0.05%) were the most prevalent gross abnormalities.
2. Observation of enucleated sheep kidneys resulted in approximately ten times the rate of detection of WSK than detected when observing unenucleated kidneys.
3. For abscessation, observing unenucleated kidneys resulted in an increased non-detection rate though the number of cases for this observation was very low i.e. 10 detected in unenucleated versus 21 in enucleated kidneys of 11,336 sheep. Similarly, for goats, rates of detection were higher when inspecting enucleated kidneys, but to a lesser degree than reported for sheep.
4. Five sheep carcases were totally condemned; two for emaciation; one for tumours (including kidneys), one contamination and one jaundice (kidney showed jaundice).
5. For the two goats condemned, one had septicaemia and one was contaminated with ingesta.

This report of the overall relatively low national prevalence of gross abnormalities of sheep and goat kidneys provides for the first-time quantitative data on which to judge the equivalence of alternative post-mortem inspection procedures.

The prevalence of gross abnormalities of foodborne significance is negligible. However, due to the prevalence of white spotted kidneys indicative of leptospirosis, examination of non-enucleated kidneys represents an opportunity to enhance worker protection from this occupational zoonosis.

The reasons for total carcase condemnation found in this assessment would apply irrespective of enucleation of the kidney capsule for inspection.

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

Consequently, when kidneys are kept for human consumption current procedures are followed (i.e. Observe enucleated). However, when not for human consumption, kidneys are to be left unenucleated for inspection.

Assessments of any adverse effects of the alternative technique

Post-mortem inspection and/or disposition

There are no changes recommended for inspection of kidneys intended for human consumption. Gross abnormalities detected in the kidney are of negligible significance for determining final carcase disposition judgement.

Food safety

As there is no change to Schedule 2 inspection procedures recommended for kidneys retained for human consumption there is no adverse effect on food safety.

Product wholesomeness (including non-detection rates)

As there is no change to Schedule 2 inspection procedures recommended for kidneys retained for human consumption there is no adverse effect on wholesomeness.

Product integrity Not applicable.

Animal health (including zoonoses) surveillance

As gross abnormalities of sheep and goat kidneys may be associated with flock infection with leptospirosis, alternative procedures may have relevance for surveillance of animal health and for an important occupational zoonosis. However, evidence from a comparable modern, but higher rainfall industry in New Zealand, indicates white spotted kidney are a poor indicator of flock infection with leptospirosis. On this basis, the alternative procedure of observing unenucleated kidneys when not retained for human consumption is likely of little significance for surveillance. In support of this observation it is noted that monitoring of white spotted kidneys is not a routine part of the National Sheep Health Monitoring Program.

Animal welfare surveillance

Gross abnormalities detected in the kidney do not inform animal welfare judgements.

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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