

Summary of Options Available at Different Stages of the Production Chain

Red meat supply chain	Food safety technology	Microbial Efficacy (log reduction)*	Regulatory Approval or acceptance [#]			
			US	EU	AUS	Other
On-farm	Diet modification		Yes	Yes	Yes	
Slaughter – before hide removal	Clipping or shearing		Yes	Yes	Yes	Most Countries
	Chemical dehairing		Site by site	No	No	
	Chemical hide wash		Yes	No	Yes	
	Plain water hide wash		Yes	Yes	Yes	Most countries
Slaughter – after hide removal	Acid wash (organic acid, peroxyacids etc.)	1-3	Yes	Some	Yes	
	Stream vacuum	1-4	Yes	Yes	Yes	
	Hot water or steam pasteurisation	1-3	Yes	Yes	Yes	Most countries
	Irradiation (Gamma rays)	2-6	Yes	No	No	
	Irradiation (E-beam)	Up to 4	Yes	No	No	
	Electrolysed oxidising water	1.5-3	Yes	No	No	Japan
	Trisodium Phosphate	1	Yes	No	No	
	Rinse and Chill™	0.2-2	Yes	No	Yes	Japan, Korea
	Ultraviolet light	Up to 4	Yes	No	Yes	
Ozonated water	1-2	Yes	No	Yes		

	Activated lactoferrin		Yes	No	No	Japan, Korea
	Acidified sodium chlorite	Up to 2	Yes	Yes	Yes	
	Chlorine dioxide	1	Yes	Yes	Yes	
Chilling	Organic acid spray	1-3	Yes	Yes	Yes	
	Ultraviolet light	Up to 4	Yes	No	Yes	
	Ozonated water	1-2	Yes	No	Yes	
	Acidified sodium chlorite	Up to 2	Yes	Yes	Yes	
	Chlorine dioxide	1	Yes	Yes	Yes	
Packaging and retail	Natural antimicrobial					
	Nisin	1.8-3.5	Yes	No	Yes	
	Oil extracts	Up to 3	Yes	Yes	Yes	

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	Irradiation (E-beam)	Up to 4	Yes	No	No	
	High pressure processing	Up to 4	Yes	Yes	Yes	
	Acidic calcium sulphate		Yes	Yes	Yes	
	Activated lactoferrin	Up to 5	Yes	No	No	Japan, Korea
	Carbon dioxide		Yes	Yes	Yes	

* where known

Specific approvals may be required for individual operations, e.g. use of a substance may be approved if equivalence is demonstrated, or approved as a processing aid.

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