

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 [#]			
			USA	EU	Australia	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	No	Yes	
	Hot water/steam pasteurisation	1-3	Yes	Yes	Yes	Most countries
	Irradiation (E-beam)	Up to 4 logs	Yes	No	No	
	Electrolysed water	1.5-3	Yes	No	No	Japan
	TSP	0.7-1.5	Yes	No	No	
	Rinse and Chill	0.2-2	Yes	No	Yes	Imminent for Japan, Korea
	UV/ozone	1-2	Yes	No	Yes	
	Activated lactoferrin		Yes	No	No	Japan, Korea
Chilling	ASC	Up to 4 logs	Yes	No	Yes	
	Organic acid spray	Up to 3 logs	Yes	No	Yes	
	UV/Ozone	Up to 2 logs	Yes	No	Yes	
	ASC	Up to 4 logs	Yes	No	Yes	
Packaging and retail	Natural antimicrobials					
	Nisin	Up to 3.5 logs	Yes	No	No	
	Oil extracts		Yes	Yes	Yes	
	Irradiation	Up to 4 logs	Yes	No	No	
	HPP	Up to 5 logs	Yes	Yes	Yes	
	Activated lactoferrin		Yes	No	No	
	Carbon Dioxide		Yes	Yes	Yes	

* where known

[#] Specific approvals may be required for individual operations eg. Use of a substance may be approved if equivalence is demonstrated, or approved as a processing aid.