

Risk analysis of production chain of ruminant fat and ruminant protein

1. Arrival of animals at slaughterhouse

HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Zoonoses	B	M	H	4	CCP	Diseases may only be noticed during ante mortem inspection of ruminants.	Reg. (EC) 853/2004 on specific hygienic rules for food of animal origin.	Ante mortem inspection by veterinarian.	
Feed related contaminants and residues									
Residues of organo chlor pesticides	C	L	H	3		The responsibility for controlling these hazards lies with operators in the feed chain. Potential accumulation in animal fat tissue.		Directives 79/117/EC and 91/414/EC regulate the use of pesticides in EU-agriculture. Monitoring of residue levels in animal products at member state level.	
PCB's, dioxins and dioxin-like PCBs	C	L	H	3		The responsibility for controlling these hazards lies with operators in the feed chain. Accumulation in animal fat tissue. Chance of contamination of feed chain through atmospheric deposition and improper drying techniques of feeding stuffs. Monitoring programmes of individual companies and of governments show levels of dioxins and PCBs in animal fats to be reassuring.		Directive 2002/32/EC limits dioxin levels in animal feeding stuffs. Monitoring of PCB and dioxin levels in animal products at member state level.	
Farming related residues									
Hormones	C	L	H	3		The responsibility for controlling these hazards lies with the farmers. Monitoring programmes at farm level show that levels of these substances in ruminants are normally in control.		EU-legislation prohibits the use of growth hormones. Monitoring of residue levels at member state level.	
Residues of medicines, including antibiotics	C	L	H	3		The responsibility for controlling these hazards lies with the farmers. Withdrawal times are respected which allow for medicines to break down.	Reg. (EEC) 2377/90 limits the content of residues of medicines in animal products.	EU-legislation regulates the use of medicines. Monitoring of residue levels at member state level.	

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			2. Slaughtering and cutting						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Zoonoses	B	M	H	4	CCP	Diseases may only be noticed during post mortem inspection of ruminants, for example BSE.	Reg. (EC) 853/2004 . Reg. (EC) 999/2001/EC on TSE's.	Post mortem inspection by veterinarian (Reg. (EC) 853/2004). Measures to control, prevent and eradicate TSE's (Reg. (EC) 999/2001).	
Cleaning and disinfection agents	C	M	M	3		It is not to be excluded that non-food cleaning and disinfection agents are used. Insufficient removal of cleaning and disinfection agents during cleaning.		Use of food compatible cleaning and disinfection agents. Cleaning instructions.	
Lubricants	C	M	M	3		Leakage of inner bearings.		Use of food compatible lubricants. Apply good maintenance.	
Foreign bodies	P	M	M	3		Foreign bodies such as knives may be found in slaughter by-products.		Working instructions in slaughterhouse.	
Zoonoses and contaminants as a result of contamination of category 3 material with category 1 and/or category 2 material	B	M	H	4	CCP	Mistakes during classification of raw materials.	Reg. (EC) 1774/2002 on animal by-products not intended for human consumption.	Working instructions on proper identification and separation, including a protocol on the control of BSE. Degradation of material as soon as contamination has been found. Inspection. Slaughtering of ruminants physically separated from slaughtering of pigs.	This risk includes the contamination of category 3 material with manure (which is category 2 material).
Zoonoses and contaminants as a result of contamination of slaughter by-products fit for human consumption with category 1 and 2 material	B	M	H	4	CCP	Raw materials are cut off from carcass separately. Mistakes during classification of raw materials.	Reg. (EC) 853/2004. Reg. (EC) 1774/2002.	Working instructions on proper identification and separation, including a protocol on the control of BSE. Degradation of material as soon as contamination has been found. Inspection. Slaughtering of ruminants physically separated from slaughtering of pigs.	Temperature is a CCP for zoonoses in slaughter by-products fit for human consumption. Zoonoses may be introduced when slaughter by-products fit for human consumption are contaminated with manure (which is category 2 material).

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2. Slaughtering and cutting (continued)

HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Pathogens as a result of microbiological decay during storage	B	L	H	3		Insufficient cleaning of containers. Storage period too long.	Reg. (EC) 853/2004.	According to Reg. (EC) 853/2004 slaughter by-products need to be stored and transported at a maximum temperature of 7°C, unless they are processed within 12 hours after the day that they are obtained. This is to be checked with each load. Category 3 slaughter by-products need to be cooled during storage unless they are picked up daily by a processing company. Good cleaning practices.	
Pathogens and viruses from pests	B	M	M	3		Pests entering the food chain during slaughter.		A pest control programme is in place that is certified for use in the food industry.	
Toxins from pest control	C	L	H	3		Toxins entering the food chain.		A pest control programme is in place that prevents toxins from entering the food chain during slaughter.	

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			3a. Transport and transfer of category 3 animal by-products						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Zoonoses and contaminants as a result of contamination with category 1 and/or category 2 material	B	L	H	3		Insufficient cleaning of bulk containers that are intermittently used for storing category 1, 2 and 3 slaughter by-products.	Reg. (EC) 1774/2002.	Good cleaning practices and inspection or the use of means of transport that are dedicated to the transport of category 3 animal by-products.	
	B	L	H	3		Loading category 1 and/or category 2 material instead of category 3 material.		Visual inspection. Document control. Proper identification.	
Pathogens as a result of microbiological decay during transport	B	L	H	3		Transport period too long.	Reg. (EC) 1774/2002.	According to Reg. (EC) 1774/2002 animal by-products need to be cooled during transport, unless they are processed within 24 hours after departing the slaughterhouse. This is to be checked with each load. Cleaning instructions.	

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			3b. Transport and transfer of slaughter by-products fit for human consumption						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Pathogens as a result of microbiological decay during transport	B	L	H	3		Duration of transport too long in combination with insufficient cleaning practices.	Reg. (EC) 853/2004.	<p>According to Reg. (EC) 853/2004 slaughter by-products need to be stored and transported at a maximum temperature of 7°C, unless they are processed within 12 hours after the day that they are obtained. This is to be checked with each load.</p> <p>Cleaning instructions.</p>	

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			4a. Processing of category 3 animal by-products						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Zoonoses and contaminants as a result of delivery of loads of not allowed material	B	M	H	4	CCP	Possible mix-up of the destination of loads	Reg. (EC) 853/2004.	Per delivery check of documents. Sourcing of slaughter by-products from companies that are officially approved.	
Zoonoses	B	M	H	4	CCP	Carry over of zoonoses from raw animal by-product due to insufficient heat treatment.	Reg. (EC) 1774/2002.	Heat treatment according to one of the heating methods 1 to 5 or 7 of Reg. (EC)1774/2002.	
Zoonoses as a result recontamination of protein	B	M	M	3		Recontamination of protein may occur.	Enterobacteriaceae: 5 samples < 300 CFU/gram of which 3 < 10 CFU/gram. Salmonella negative in 25 gram.	Hygiene management: process control and cleaning.	TSE Reg. (EC) 999/2001 and amendments prohibit the use of animal protein for feeding to farmed animals for the food chain.
Impurities	P	M	H	4	CCP	Legal limit.	Fat: insoluble impurities: max: 0.15% (Reg. (EC) 1774/2002).	Separation in combination with a positive release system.	
Lubricants	C	M	M	3		Leakage of bearings.		Use of food grade lubricants. Apply good maintenance.	
Foreign material: - plastic - metal objects	P	M	M	3		Metal objects from slaughterhouse may be present in raw material. Fat from former foodstuffs may contain package material.		Visual inspection. Metal detection. Analysis on polyethylene (PE).	The Dutch GMP standard limits the content of PE in animal fat to 500 mg/kg. GMP action limit is 250 mg/kg.
Cleaning and disinfection agents	C	L	M	2		Possible contamination of product with cleaning agent.		Use of food-compatible cleaning agents. Cleaning instructions.	
Pests and toxins from pest control programme	B/C	M	M	3		Pests or toxins fighting pests entering the food chain during the processing of category 3 animal by-products.		A pest control programme is in place that prevents pests and toxins from entering the food chain during the processing of category 3 animal by-products.	
Processing aids	C	M	M	3		Processing aids come into contact with the product.		Processing aids that directly come into contact with products are fit for the food chain.	
Additives	C	M	M	3		Additives may be added during processing.		Additives such as anti-oxidants are fit for the food chain.	

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			4b. Fat and protein processing						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Zoonoses and contaminants as a result of delivery of loads of not allowed material	B	M	H	4	CCP	Possible mix-up of the destination of loads.	Reg. (EC) 853/2004.	Per delivery check of documents. Sourcing of slaughter by-products from suppliers that are officially approved.	
Zoonoses	B	M	H	4	CCP	Carry over of zoonoses from raw animal by-product due to insufficient heating.	Reg. (EC) 853/2004.	Temperature treatment.	
Zoonoses as a result of recontamination by protein	B	M	M	3		Contamination with zoonoses after heating in combination with insufficient sedimentation and separation (water activity remains too high).	Meal: Enterobacteriaceae: 5 samples < 300 CFU/gram of which 3 < 10 CFU/gram. Meal: Salmonella negative in 25 gram.	Hygiene management: process control and cleaning.	TSE Reg. (EC) 999/2001 and amendments prohibit the use of animal protein for feeding to farmed animals for the food chain.
Decay caused by too high levels of moisture	B	M	L	2		Unsuccessful evaporation or separation.		Process control.	
Impurities	P	M	H	4	CCP		Fat: insoluble impurities: max: 0.15% (Reg. (EC) 1774/2002).	Separation, sedimentation instructions. Turbidity check of fat with electronic eye.	In practice moisture level is lower than 0.20% and insoluble impurities are lower than 0.02%.
Lubricants	C	M	M	3		Leakage of bearings.		Use of food compatible lubricants. Apply good maintenance.	
Foreign material: - plastic - metal objects	P	M	M	3		Metal objects from slaughterhouse may be present in raw material.		Visual inspection. Metal detection.	
Cleaning and disinfection agents	C	M	M	3		Possible contamination of product with cleaning agent.		Use of food-compatible cleaning agents. Cleaning instructions.	
Pests and toxins from pest control programme	B/C	M	M	3		Pests or toxins fighting pests entering the food chain during the processing of slaughter by-products.		A pest control programme is in place that prevents pests and the toxins fighting pests to enter the food chain during the processing of slaughter by-products.	
Processing aids	C	M	M	3		Processing aids come into contact with the product.	Reg. (EC) 853/2004.	Processing aids that directly come into contact with products are fit for the food chain.	
Additives	C	M	M	3		Additives may be added during processing.		Additives such as anti-oxidants are fit for the food chain.	

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5. Transport of ruminant fat and ruminant protein

HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	DECISION TREE	MOTIVATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS OR ACTIONS
Contamination due to previous cargoes	C	M	H	4	CCP	Insufficient cleaning in combination with an hazardous previous cargo.		Check of documents. Visual inspection, check log-book on three preceding cargoes or make use of tank cars that are dedicated to the transport of feeding stuffs.	In case of dedicated transport, the chance is low (no CCP).
Cleaning agents	C	M	M	3				Use of food compatible cleaning agents. Good cleaning instructions.	
Growth of pathogens as a result of residing moisture after cleaning	B	M	M	3				Good cleaning instructions.	