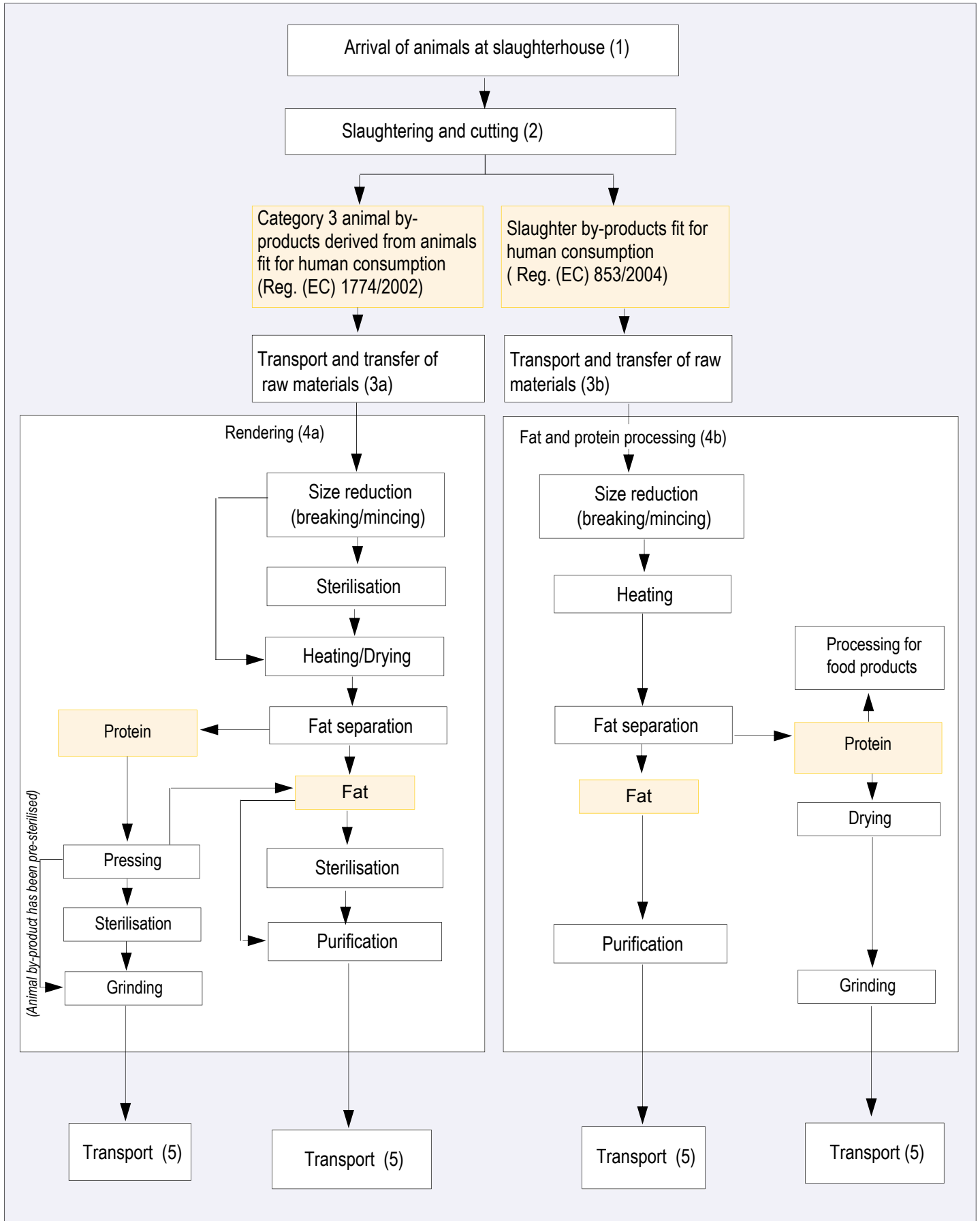


Flow chart of the production chain of animal fat and animal protein (ruminant, pig, poultry)



Risk analysis of production chain of Porcine fat and Porcine 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 pigs.	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. Pigs grow relatively fast. Growth hormones are usually not used.		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.	Regulation (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.	

Risk analysis of production chain of Porcine fat and Porcine protein

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 pigs.	Reg. (EC) 853/2004.	Post mortem inspection by veterinarian (Reg. (EC) 853/2004).	
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	L	H	3		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. Degradation of material as soon as contamination has been found. Inspection. Slaughtering of pigs physically separated from slaughtering of ruminants.	This risk includes the contamination of category 3 material with manure (which is category 2 material). Pigs do not contain category 1 material, unless they contain residue levels that exceed legal limits. Slaughterhouses may slaughter both pigs and ruminants.
Zoonoses and contaminants as a result of contamination of slaughter by-products fit for human consumption with category 1 and 2 material	B	L	H	3		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. Degradation of material as soon as contamination has been found. Inspection. Slaughtering of pigs physically separated from slaughtering of ruminants.	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). Pigs do not contain category 1 material, unless they contain residue levels that exceed legal limits. Slaughterhouses may slaughter both pigs and ruminants.

Risk analysis of production chain of Porcine fat and Porcine protein

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. 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.	

Risk analysis of production chain of Porcine fat and Porcine protein

			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.	Pigs do not contain category 1 material, unless they contain residue levels that exceed legal limits. Slaughterhouses may slaughter both pigs and ruminants.
	B	L	H	3		Loading category 1 and/or category 2 material instead of category 3 material.		Visual inspection. Document control. Proper identification.	Pigs do not contain category 1 material, unless they contain residue levels that exceed legal limits. Slaughterhouses may slaughter both pigs and ruminants.
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. Check each load organoleptically. Cleaning instructions.	

Risk analysis of production chain of Porcine fat and Porcine protein

			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.	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. Check each load organoleptically. Cleaning instructions.	

Risk analysis of production chain of Porcine fat and Porcine protein

			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	H	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.	Pigs do not contain category 1 material, unless they contain residue levels that exceed legal limits. Slaughterhouses may slaughter both pigs and ruminants.
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.
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 slaughter-house 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.	

Risk analysis of production chain of Porcine fat and Porcine protein

			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		Recontamination of protein may occur.	Enterobacteriaceae: 5 samples < 300 CFU/gram of which 3 < 10 CFU/gram. Proteins: Salmonella negative in 25 gram. Fat: maximum level of moisture and impurities: 0.5% (Reg. (EC) 853/2004).	Hygiene management: process control and cleaning. Separation, sedimentation instructions. Turbidity check of fat with electronic eye.	TSE Reg. (EC) 999/2001 and amendments prohibit the use of animal protein for feeding to farmed animals for the food chain. In practice moisture level is lower than 0.20% and insoluble impurities are lower than 0.02%.
Decay caused by too high levels of moisture	B	M	L	2		Uninsufficient evaporation or separation.		Process control.	
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	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 slaughter by-products.		A pest control programme is in place that prevents pests and toxins from entering 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.	

Risk analysis of production chain of Porcine fat and Porcine protein

5. Transport of pig fat and pig protein

			5. Transport of pig fat and pig 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).
Residues of 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.	