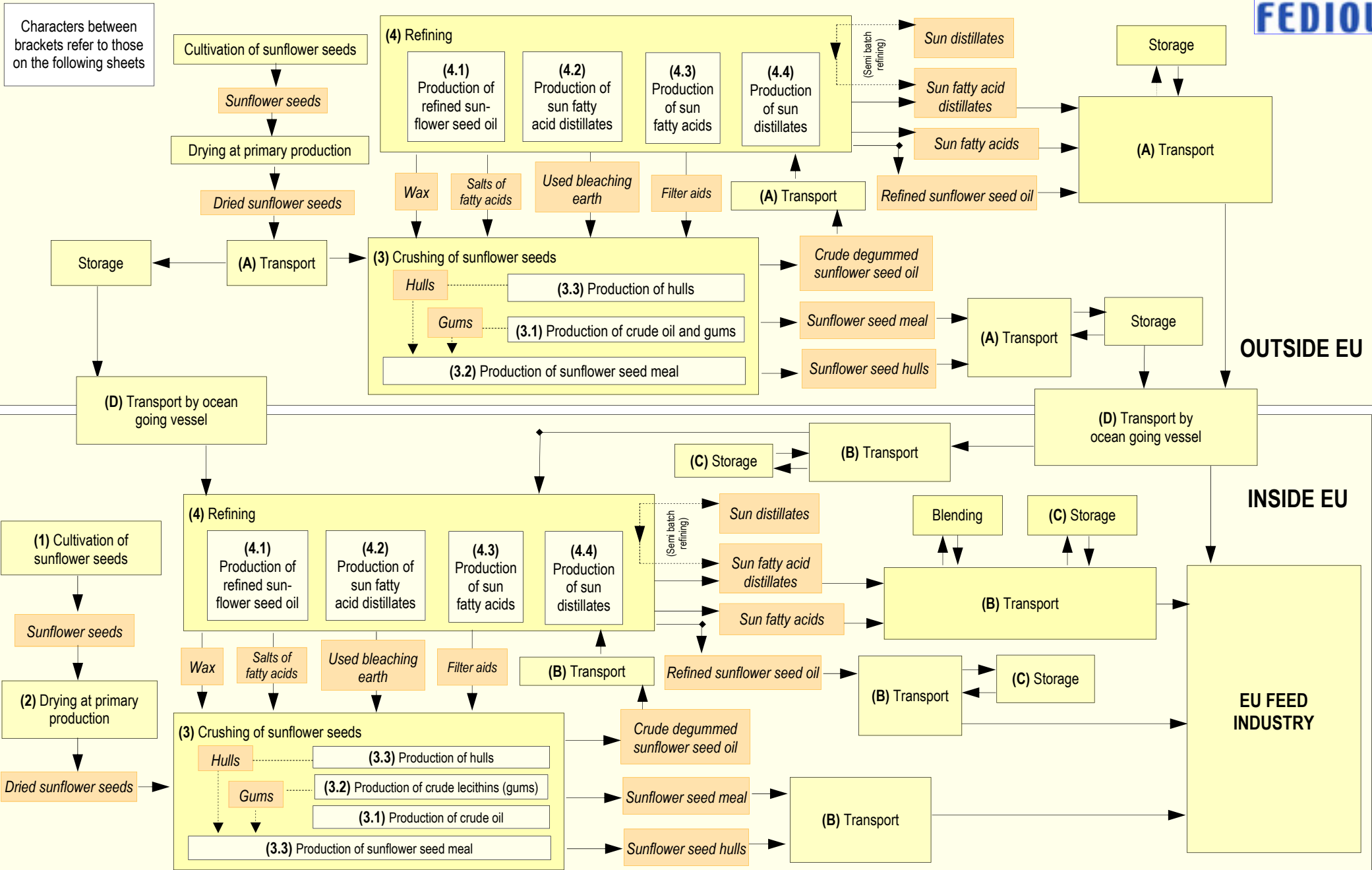


Flow chart of the production chain of sunflower seed oil products for feed application in the EU



Risk assessment of the chain of sunflower seed meal and oil products

			1. Cultivation of sunflower seeds*						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C					Third countries of export of sunflower seeds (Argentina, Hungary, etc) work with positive lists for the use of pesticides during cultivation which, for some substances, may conflict with European pesticide residue legislation. With sunflower seeds, post-harvest use of pesticides appears to be more critical than pre-harvest use of pesticides.	EC Regulation No. 396/2005 prohibits putting into circulation commodities that do not comply with the MRLs set in the annexes. EC Regulation No. 459/2010 amends the annexes II, III and IV listing all pesticide MRLs by products.		

* Assessment of risks outside the EU is out of the scope of this document. See Methodology document, paragraph 2.3 for more information.

Risk assessment of the chain of sunflower seed meal and oil products

2. Drying of sunflower seeds at primary production*

HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contaminants caused by drying									
- dioxin	C					Burning of waste may result in dioxin formation. Up to now the crushers have found dioxin levels in crude sunflower seed oil to be lower than detection limit.	Code of Practice for the prevention and reduction of dioxin and dioxin-like PCB contamination in foods and feeds (Codex CAC/RCP 62-2006).		<p>Good Manufacturing Practices recommend using fuels which are not generating dioxins and dioxin-like compounds and other harmful contaminants.</p> <p>In case of direct heating, proper burners should be used. Monitoring is regarded necessary to ensure that drying or heating processes do not result in elevated levels of dioxins and dioxin-like PCBs. No use of waste products as a fuel for direct drying.</p> <p>Feed materials derived from sunflower seeds have to comply with the limits for dioxin and dioxin-like PCBs of the Directive 2002/32/EC.</p>

* Assessment of risks outside the EU is out of the scope of this document. See Methodology document, paragraph 2.3 for more information.

Risk assessment of the chain of sunflower seed meal and oil products

Utilities: sunflower seeds crushing, oil refining and processing.

HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Hydraulic oils or lubricants from equipment	C	low	high	3	PRP	Hydraulic oils and lubricants may contain toxic compounds.		The prerequisite programme should assure that the contamination of product with non-food grade hydraulic oils or lubricants is avoided and that the risk of contamination of the product with food grade hydraulic oils and lubricants is minimised. The prerequisite programme could involve recording of the quantities used.	
Quality of water	C	low	high	3	PRP	Water is used in the crushing and refining process.	For manufacture of feed, according to Regulation 183/2005/EC water used during shall be of suitable quality.	Apply water of suitable quality.	
Cleaning agents and boiler chemicals	C	medium	medium	3	PRP	Cleaning agents and steam (using boiler chemicals) come into contact with the product.		Cleaning agents used in the production system should be flushed. Cleaning agents and boiler chemicals must be suitable for use in the food industry.	
Thermal heating fluids (THF) from equipment	C	medium	high	4	CCP	THF may still be used by non-FEDIOL members.	According to the FEDIOL Code of Practice on the Heating of Edible Oils during Processing, the use of THF is not allowed*.	Use hot water or steam heating. Otherwise, a control measure should assure that the contamination of product with thermal heating fluids is avoided.	

Risk assessment of the chain of sunflower seed meal and oil products

			3. Crushing of sunflower seeds						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Toxins from pest control materials	C	low	high	3	PRP	Poisoned grain from open boxes could end up in the food chain.		A pest control programme must be applied that is suitable for use in the food chain.	
Toxic compounds from hexane	C	low	high	3	PRP	Industrial hexane may contain toxic compounds.	Directive 2009/32/EC sets purity criteria for the use of hexane during the crush of oilseeds.	Food grade hexane must be used.	
Foreign material like glass, wood, metals, etc.	P	medium	medium	3	PRP	Foreign material may be present		A system should be in place that removes foreign material.	

Risk assessment of the chain of sunflower seed meal and oil products

			3.1 Production of crude oil						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contaminants from filter aids	C	low	high	3	PRP	The crude oil can potentially wash contaminants out of the filter aid.		Use of filter aids that are suitable for the food industry.	
Mineral oils from a failing recovery system	C	low	high	3	PRP	Mineral oils may contain toxic compounds. It is in the interest of the crusher to recover as much hexane as possible, and to thus maintain the recovery system well.		Mineral oil of the recovery system must be of food grade quality. The prerequisite programme should assure that the contamination of product with non-food grade oils is avoided and that the risk of contamination of the product with food grade oils is minimised. The prerequisite programme could involve recording of the quantities used.	The Dutch GMP standard limits the content of C(10-40) in sunflower seed oils and byproducts of refining to 1000 mg/kg.
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Regular monitoring of pesticide residues on sunflower seeds shows that residue levels remain within legal limits. MRL policy in third countries differs from EU MRL policy.	EC Regulation No. 396/2005 sets limits for residues of pesticides. This regulation allows using a transfer factor for authorised pesticides into processed products, providing food safety is assured. FEDIOL contract for purchasing sun seeds from the Black Sea area (contains a clause on compliance with EU MRL legislation).	Check incoming material (depending on the origin).	
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	very low	high	2		Some of the banned pesticides may be present in the environment. The chance of finding them in crude sunflower seed oil, however, is very low.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.		
Hexane that resides in the crude oil after recovery	C	high	little	3	PRP	After hexane extraction of the oil and subsequent hexane recovery from the oil, traces of hexane will reside in the crude oil.	FOSFA flash point limit at 121°C.	Follow transport regulation, which provides for stricter hexane residue limits than needed in relation to feed safety.	

Risk assessment of the chain of sunflower seed meal and oil products

			3.2 Production of crude lecithins (wet gums)						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Mineral oils from a failing recovery system	C	low	high	3	PRP	Mineral oils may contain toxic compounds. It is in the interest of the crusher to recover as much hexane as possible, and to thus maintain the recovery system well.		Mineral oil of the recovery system must be of food grade quality. The prerequisite programme should assure that the contamination of product with non-food grade oils is avoided and that the risk of contamination of the product with food grade oils is minimised. The prerequisite programme could involve recording of the quantities used.	The Dutch GMP standard limits the content of C(10-40) in sunflower seed oils and byproducts of refining to 1000 mg/kg.
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Regular monitoring of pesticide residues on sunflower seeds shows that residue levels remain within legal limits. MRL policy in third countries differs from EU MRL policy.	EC Regulation No. 396/2005 sets limits for residues of pesticides. This regulation allows using a transfer factor for authorised pesticides into processed products, providing food safety is assured. FEDIOL contract for purchasing sun seeds from the Black Sea area (contains a clause on compliance with EU MRL legislation).	Check incoming material (depending on the origin).	
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	very low	high	2		Some of the banned pesticides may be present in the environment. The chance of finding them in crude sunflower seed oil, however, is very low.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.		
Hexane that resides in the crude oil after recovery	C	high	little	3	PRP	After hexane extraction of the oil and subsequent hexane recovery from the oil, traces of hexane will reside in the crude oil.	FOSFA flash point limit at 121°C.	Follow transport regulation, which provides for stricter hexane residue limits than needed in relation to feed safety.	
Microbiological deterioration	B					Wet gums that are dried insufficiently may deteriorate.			

Risk assessment of the chain of sunflower seed meal and oil products

			3.3 Production of sunflower seed meal						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Dioxin from anti-caking agent	C	low	high	3	PRP	Anti-caking agent is of mineral origin and may contain dioxin by nature. Dioxin is toxic to humans and animals.	Regulation 2439/1999/EC sets quality criteria for anti-caking agents.	Purchase anti-caking agent of feed grade quality.	
Salmonella	B	medium	medium	3	PRP	Salmonella is the major hazard for microbiological contamination of feed. Salmonella are widespread in the environment and each link in the food chain, from the producers up to and including the consumers has a role to play in reducing the risk of Salmonella harming animals or humans. Animal feed is acknowledged to be one possible route by which Salmonella can enter the food chain.	FEDIOL Code of Practice for the Control of Salmonellae in Oilseed Crushing Plants*.	Apply the PRPs of the FEDIOL Salmonella Code such as cleaning of dust collectors and coolers, condensation prevention in process lines and silos, training of personnel.	All links of the feed chain have to reduce to a minimum the occurrence of Salmonella in their products. The EU oilseed crushing industry has already made strenuous efforts, through voluntary measures, to reduce the contamination rates of their feed materials. Substantial progress has been made since the introduction of the FEDIOL GMP code for the seed crushing industry in 1993 (replaced by this Guide).
Dioxin from used bleaching earth	C	low	high	3	PRP	Bleaching clay is of mineral origin and may contain dioxin by nature. Dioxin is toxic to humans and animals.	Directive 2002/32/EC limits the dioxin content in feed material of vegetable origin to 0.75 ng/kg (WHO-PCDD/F-TEQ) and limits the sum of dioxin and dioxin-like PCBs to 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ). FEDIOL has developed a Code of Practice on the purchase conditions of fresh bleaching earth for oil refining*, which includes a maximum limit for dioxin and dioxin-like PCBs of 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ) as upperbound value.	Purchase fresh bleaching earth from suppliers that fulfil the FEDIOL specifications as listed in the FEDIOL Code of Practice on the purchase conditions of fresh bleaching earth for oil refining.	The risk only applies to integrated crushing/refining plants.
Mycotoxins	C	low	high	3	PRP	Result of insufficient drying of sunflower seeds		Control the mycotoxin level of the sunflower seed meal.	

Risk assessment of the chain of sunflower seed meal and oil products

Cadmium	C	medium	high	4	CCP	Cadmium concentrates into the meal during crushing. Depending on the geographical origin sunflower seeds run the risk of having cadmium levels leading to levels exceeding the limit in the meal.	Directive 2002/32/EC limits the presence of cadmium in feed materials of vegetable origin to 1 ppm.	Depending on the origin of the seeds, batch-wise control on incoming sunflower.	This risk is applying to certain geographical origins.
Hexane residue	C	high	little	3	PRP	Hexane residue is present in oilseed meals.	ADR 400 ppm.	Follow transport regulation, which provides for stricter hexane residue limits than needed in relation to feed safety.	

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

			3.4 Separation of sunflower seed hulls						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Salmonella	B	low	high	3	PRP	Salmonella is the major hazard for microbiological contamination of feed. Salmonella are widespread in the environment and each link in the food chain, from the producers up to and including the consumers has a role to play in reducing the risk of Salmonella harming animals or humans. Animal feed is acknowledged to be one possible route by which Salmonella can enter the food chain.	FEDIOL Code of Practice for the Control of Salmonellae in Oilseed Crushing Plants*.	Apply the preventive measures as listed in the FEDIOL Code of Practice for the Control of Salmonellae in Oilseed Crushing Plants.	

Risk assessment of the chain of sunflower seed meal and oil products

			4. Refining						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Processing aids (alkali solution, acids)	C	medium	medium	3	PRP	Processing aids come into contact with the product.		Processing aids that directly come into contact with the oil must be for food use or of food grade quality.	
Foreign materials like glass, wood, metals, etc.	P	medium	medium	3	PRP	Foreign materials may be present.		Filter before loading	

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

			4.1 Production of refined sunflower seed oil						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Dioxin and dioxin-like PCBs	C	low	high	3	PRP	A potential source of dioxin contamination during the oil is drying of sunflower seeds and bleaching earth. However, the dosage level of bleaching earth during refining is only 1-3%.	Directive 2002/32/EC limits the dioxin content in feed material of vegetable origin to 0.75 ng/kg (WHO-PCDD/F-TEQ) and limits the sum of dioxin and dioxin-like PCBs to 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ). FEDIOL has developed a Code of Practice on the purchase conditions of fresh bleaching earth for oil refining*, which includes a maximum limit for dioxin and dioxin-like PCBs of 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ) as upperbound value.	Purchase fresh bleaching earth from suppliers that fulfil the FEDIOL specifications as listed in the FEDIOL Code of Practice on the purchase conditions of fresh bleaching earth for oil refining.	
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Regular monitoring of pesticide residues on sunflower seeds shows that residue levels remain within legal limits. However, post-harvest use of pesticides is critical, which can result in sunflower seeds and by-products of refining not respecting MRLs, unless residues are fully removed during refining of the crude oil.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows using a transfer factor for authorised pesticides into processed products, providing feed safety is assured.	In case of a pesticide residue level exceeding the limit, a feed safety assessment should be carried out.	
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	very low	high	2		Some of the banned pesticides may be present in the environment. The chance of finding them in crude sunflower seed oil, however, is very low.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.		
Microbiological contamination	B	low	medium	2		Moisture content (i.e. water activity) in refined oils is too low for bacteria to grow.			

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

			4.2 Physical refining: production of sun fatty acid distillates						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
General	C	low	high	3	PRP		Products intended for animal feed containing a level of undesirable substance that exceeds the legal limit may not be mixed for dilution purposes with the same, or other, products intended for animal feed (Directive 2002/32/EC).	No deliberate admixture of soybean distillates.	
Dioxin from bleaching earth	C	low	high	3	PRP	A potential source of dioxin contamination during refining of the oil is bleaching earth. However, the dosage level of bleaching earth during refining is only 1-3%.	Directive 2002/32/EC limits the dioxin content in feed material of vegetable origin to 0.75 ng/kg (WHO-PCDD/F-TEQ) and limits the sum of dioxin and dioxin-like PCBs to 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ). FEDIOL has developed a Code of Practice on the purchase conditions of fresh bleaching earth for oil refining*, which includes a maximum limit for dioxin and dioxin-like PCBs of 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ) as upperbound value.	Purchase fresh bleaching earth from suppliers that fulfil the FEDIOL specifications as listed in the FEDIOL Code of Practice on the purchase conditions of fresh bleaching earth for oil refining.	
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Regular monitoring of pesticide residues on sunflower seeds shows that residue levels remain within legal limits. However, post-harvest use of pesticides is critical, which can result in sunflower seeds and by-products of refining not respecting MRLs.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows to use a transfer factor for authorised pesticides into processed products, providing feed safety is assured.	In case of a pesticide residue level exceeding the limit, a feed safety assessment should be carried out.	
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	low	high	3	PRP	Some of the banned pesticides may be present in the environment. The chance of finding them in crude sunflower seed oil, however, is very low, but they will concentrate into the fatty acid distillates during refining.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.	Non-complying product should not be applied to feeding stuff.	

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

			4.3 Chemical refining: production of (salts of) sun fatty acids free from distillates						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Regular monitoring of pesticide residues on sunflower seeds shows that residue levels remain within legal limits. However, post-harvest use of pesticides is critical, which can result in sunflower seeds and by-products of refining not respecting MRLs.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows to use a transfer factor for authorised pesticides into processed products, providing feed safety is assured.	In case of a pesticide residue level exceeding the limit, a feed safety assessment should be carried out.	
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	very low	high	2		Some of the banned pesticides may be present in the environment. The chance of finding them in crude sunflower seed oil, however, is very low.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.	.	

Risk assessment of the chain of sunflower seed meal and oil products

			4.4 Chemical refining: production of sun distillates						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
General	C	medium	high	4	CCP		Products intended for animal feed containing a level of undesirable substance that exceeds the legal limit may not be mixed for dilution purposes with the same, or other, products intended for animal feed (Directive 2002/32/EC).	According to FEDIOL, distillates from chemical refining may not be used for feed purposes. Fatty products obtained from batch refining processes combining physical and chemical refining steps in one and the same equipment may be used for feed purposes, provided that there is analytical proof showing that limits for dioxin and pesticide residues are respected.	
Dioxin from bleaching earth	C	medium	high	4	CCP	A potential source of dioxin contamination during refining of the oil is bleaching earth. During chemical refining, dioxins concentrate into the distillates.	<p>Directive 2002/32/EC limits the dioxin content in feed material of vegetable origin to 0.75 ng/kg (WHO-PCDD/F-TEQ) and limits the sum of dioxin and dioxin-like PCBs to 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ).</p> <p>FEDIOL has developed a Code of Practice on the purchase conditions of fresh bleaching earth for oil refining*, which includes a maximum limit for dioxin and dioxin-like PCBs of 1,5 ng/kg (WHO-PCDD/F-PCB-TEQ) as upperbound value.</p>	<p>Purchase fresh bleaching earth from suppliers that fulfil the FEDIOL specifications as listed in the FEDIOL Code of Practice on the purchase conditions of fresh bleaching earth for oil refining.</p> <p>According to FEDIOL, distillates from chemical refining may not be used for feed purposes.</p>	
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Regular monitoring of pesticide residues on sunflower seeds shows that residue levels remain within legal limits. However, during chemical refining, dioxins concentrate into the distillates.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows using a transfer factor for authorised pesticides into processed products, providing feed safety is assured.	See above under "general".	
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	medium	high	4	CCP	Some of the banned pesticides may be present in the environment. The chance of finding them in crude sunflower seed oil, however, is very low, but they will concentrate into the fatty acid distillates during refining..	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.	<p>See above under "general".</p> <p>According to FEDIOL, distillates from chemical refining may not be used for feed purposes.</p>	

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

			A. Storage and transport of oilseeds and oilseeds meal						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Toxins from pest control materials	C	low	high	3	PRP	Poisoned grain from open boxes could end up in the food chain.		A pest control programme must be applied that is suitable for use in the food chain.	
Pesticide residues above the MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the MRL.	C	medium	medium	3	PRP	Post-harvest use of pesticides on oilseeds is critical due to the limited time that is available for the pesticides to break down. The countries of export of oilseeds work with positive lists for the use of pesticides which, for some substances, may conflict with European legislation, particularly in the case of soft seeds such as those of sunflowers.	Regulation 396/2005 prohibits putting into circulation commodities that do not comply with the MRLs set in the annex of this regulation.	Transport and storage companies must use pesticides correctly and document this. Otherwise they must verify that the levels of the residues of the pesticides used during transport and storage comply with EU legislation.	
Contamination by the previous cargo during the transport by farm cart, truck or barge or ocean going vessel	C	low	high	3	PRP	Transport of oilseeds and oilseed meals usually does not take place in means of transport that are dedicated to the transport of food or feed.		Transport companies must clean farm carts, trucks, barges and ocean-going-vessels before loading. Inspection on cleanliness before loading.	
Contamination by the previous cargo during storage	C	low	high	3	PRP	Oilseeds and oilseed meals may be contaminated with mycotoxin containing previous loads.		Storage companies must clean sites before use and must inspect them on cleanliness before use.	
Adulteration with melamine	C	Low	High	3	PRP	Analytically, melamine mimics proteins		Make sure melamine is controlled when buying meal from areas with a known history for adulteration with melamine.	

Risk assessment of the chain of sunflower seed meal and oil products

B. Transport of tropical and seed oils and derived products for feed application according to EU food transport standards									
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contamination by previous cargo - Tank cars, rail tanks and barges - Tank coasters	C	low	high	3	PRP	Transport of oils is dedicated.	EC Regulation No. 852/2004 implies the transport of liquid food stuffs by tank cars, rail tanks and barges to be dedicated. FEDIOL code of working practice for bulk road and tank container transport of fats and oils for direct food use*.	Check previous cargoes via FEDIOL practical guide to previous cargo(es) for means of transport and tank lining.	
	C	low	high	3	PRP	Tank coasters carrying oils and fats during short sea voyages in the EU must have as an absolute minimum as the immediate previous cargoes a product that is either a foodstuff or a product appearing on the EU list of accepted immediate cargoes of Directive 96/3/EC.	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union*.	Check previous cargoes via FEDIOL practical guide to previous cargo(es) for means of transport and tank lining.	
Contamination by cleaning agents - Tank cars, rail tanks and barges - Tank coasters	C	low	medium	2		Increased risk at cleaning stations that clean both feed and chemical tanks on one site.	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union*.	Include safeguards to preclude contamination of the food or feed grade cargo tanks and equipment by steam, water and cleaning agents used in the cleaning of non-food grade cargo tanks.	FEDIOL code of working practice for bulk road and tank container transport of fats and oils for direct food use includes good practices for cleaning of tanks.
	C	low	medium	2		Increased risk in case coaster is not dedicated to feed- or foodstuff.		Selected cleaning stations must have an implemented HACCP-system. Demand a signed cleaning certificate before loading.	

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

			B. Transport of tropical and seed oils and derived products for feed application according to EU food transport standards (continued)						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Heating or cooling fluids from equipment	- Tank cars	C	low	high	3	PRP	Stainless steel tanks are used which are heated with cooling water from the motor through a system of double walls (and not coils).	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union*.	
	- Rail tanks, tank barges and coasters	C	low	high	3	PRP	Toxic thermal heating fluids may still be used. However, due to the relatively low heating temperatures applied during transport, the chance of leakage of thermal heating fluids into the product is low.	Heating coils of rail tanks must be of stainless steel (FEDIOL). If thermal heating fluids have been used, the transporter of the oil must provide for documentation on possible nett losses and analyse accordingly if necessary.	
Foreign bodies	P	low	high	3	PRP			A quality plan should require the loading of tank cars with refined oils under a roof.	
Adulteration	C/P/B	low	high	3	PRP	Adulteration can cause harm.		Application of minimum mandatory requirements in FEDIOL code of working practice for bulk road and tank container transport of fats and oils for direct food use.	

* <http://www.fediol.be/5/index2.php>

Risk assessment of the chain of sunflower seed meal and oil products

C. Transport of tropical and seed oils and derived products and by-products for feed application according not in compliance with EU food transport standards									
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contamination by previous cargo	C	low	high	3	PRP	Tank cars and barges may have been used for non food or non feed compatible products such as petrochemicals.		Tank cars and barges that are not dedicated tot the transport of foodstuff or feeding stuff should have undergone a validated cleaning procedure.	
Contamination by cleaning agents	C	medium	medium	3	PRP	Increased risk at cleaning stations that clean both feed and chemical tanks on one site.		Feed- or food-grade cleaning agents must have been used.	FEDIOL code of working practice for bulk road and tank container transport of fats and oils for direct food use includes good practices for cleaning of tanks.
Heating or cooling fluids from failing equipment									
- Tank cars	C	low	high	3	PRP	Tank cars that use coils for heat transfer are banned. The tanks are heated with cooling water from the motor through a system of double walls.			
- Barges	C	low	high	3	PRP	Toxic thermal heating fluids may still be used. However, due to relatively low heating temperatures applied during transport, the chance of leakage of thermal heating fluids into the product is low.		If thermal heating fluids have been used, the transporter of the oil must provide for documentation on possible nett losses and analyse accordingly if necessary.	The use of hot water or steam heating is recommended.
Foreign bodies	P	low	medium	2					
Misuse of additives	C	low	high	3	PRP	Additives allowed for food oil applied to oil going to feed –or vice versa- for which use they may not have been approved.		Agree on clear specifications as regards use of additives	Abuse of additives

Risk assessment of the chain of sunflower seed meal and oil products

Adulteration with mineral oil		low	high	3	PRP	Adulteration with mineral oils is still a problem with the transport of oils in the countries of origin. Since October 1999 control has been intensified and the chance of adulteration taking place has decreased.		Prevent adulteration.	
-------------------------------	--	-----	------	---	-----	---	--	-----------------------	--

Risk assessment of the chain of sunflower seed meal and oil products

			D. Storage						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contamination due to lack of segregation (contamination from previous cargoes, use of incorrect joining, shared equipment)	C	low	high	3	PRP	This risk classification applies to terminals that store both chemicals and vegetable oils. Less risk is involved when the tank terminal applies the EU list of acceptable previous cargoes during sea transport to the storage of vegetable oils. Least risk is involved when the vegetable oils are stored in tanks that are dedicated to the storage of foodstuffs.	Terminals in the EU that store oils and fats for food application are obliged to apply HACCP (EC Regulation No. 852/2004)	Food or feed dedication of storage tanks. Otherwise, storage tanks must at least adhere to the EU rules on previous cargoes that have been set up for sea transport in Directive 96/3/EC.	
Contamination by cleaning agents	C	low	high	3	PRP	This risk classification applies to terminals that store both chemicals and vegetable oils. They may abstain from using cleaning agents that are suitable for use in the food industry. For tank terminals in the EU that apply HACCP and that keep the storage of vegetable oils and chemicals separated, the chance of using the wrong cleaning agents is very low.		Cleaning agents must be suitable for use in the food industry.	
Solvent from coating	C	low	high	3	PRP	Solvents from virgin coatings migrating to the oil, which may end up in the fatty acid distillates during refining		Use stainless steel tanks or in case of use of tanks with virgin coating, do not feed the FAD	
Thermal heating fluids from failing equipment	C	low	high	3	PRP	Toxic thermal heating fluids may still be used. However, due to the relatively low heating temperatures applied during storage, the chance of leakage of thermal heating fluids into the product is low.		If thermal heating fluids have been used, the storage company must provide for documentation on net losses and analyse accordingly, if necessary.	The use of water and steam heating is recommended.
Misuse of additives	C	low	high	3	PRP	Additives allowed for food oil applied to oil going to feed –or vice versa– for which use they may not have been approved.		Agree on clear specifications as regards use of additives	Abuse of additives

Risk assessment of the chain of sunflower seed meal and oil products

			E. Transport by ocean going vessel						
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	PRP or CCP	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Transport contamination - Contamination by previous cargoes present in tanks or pipes	C	medium	medium	3	PRP	Ocean going vessels carrying oils and fats for edible use into the EU must have as an absolute minimum that the immediate previous cargoes is a product that is either a foodstuff or a product appearing on the EU list of accepted immediate cargoes of Directive 96/3/EC.	Directive 96/3/EC (Derogation to EC Regulation No. 852/2004) requires that previous loads have to be checked. FOSFA contracts oblige the seller to inform the buyer what the three preceding cargoes have been during the sea transport of oils and fats. FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union*. The EU has not regulated the sea transport of oils and fats for feed application.	Before loading, FOSFA recognised superintendents need to check whether tanks are sufficiently cleaned. Before unloading, FOSFA recognised superintendents need to check the ship's logbook on compliance with previous cargo lists. The use of dedicated pipe lines at loading and unloading.	
- Contamination by cleaning agents	C	low	high	3	PRP	Usually maritime business sticks to good practice.		Check ship log-book.	
Thermal heating fluids (THF) from equipment	C	low	high	3	PRP	Toxic thermal heating fluids may still be used. However, due to the relatively low heating temperatures applied during transport, the chance of leakage of thermal heating fluids into the product is low.		If thermal heating fluids have been used, the transporter of the oil must provide for documentation on possible net losses and analyse accordingly if necessary.	The use of water and steam heating is recommended.
Hydraulic oils from portable pumps	C	low	high	3	PRP	Hydraulic oils from portable pumps may be toxic.		The use of portable pumps with clear separation of hydraulic motor from pump. If not, hydraulic oils of food grade quality must be used.	Hydraulic motors that are directly linked to the pump allow for unwanted leakages of hydraulic oil into the vegetable oil in case of seal failure.

* <http://www.fediol.be/5/index2.php>