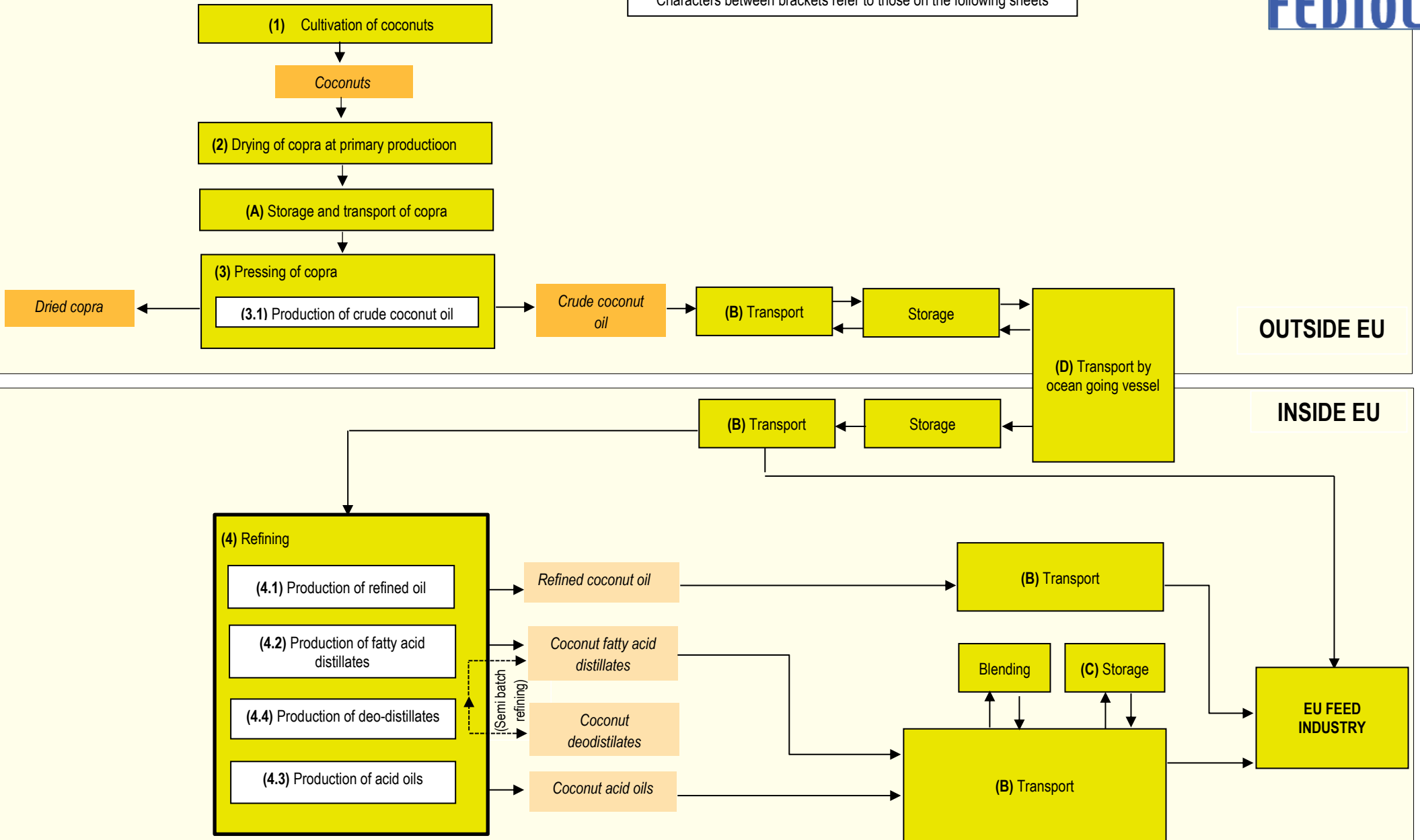


Flow chart of the production chain of coconut oil products for feed application in the EU



Characters between brackets refer to those on the following sheets



1. Risk assessment of the chain of coconut oil products

			1. Cultivation of coconuts*					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Pesticide residues above the EU MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the EU MRL.	C				The countries of export of coconut oil (Philippines, Indonesia and others) work with positive lists for the use of pesticides during cultivation which, for some substances, may conflict with European pesticide residue legislation. Hitherto no residues of pesticides have been detected in coconut oil.	EC Regulation No. 396/2005 prohibits putting into circulation commodities that do not comply with the MRLs set in the annexes. EC Regulation No. 178/2006 establishes Annex I that lists the food and feed products for which pesticide residue limits apply. Regulation 149/2008 establishes Annexes II, III and IV that sets the MRLs for the products listed in Annex I.		

* Assessment of risks outside the EU is out of the scope of this document. For more information, see section d) Methodology of the FEDIOL food and feed chain risk assessments of the Sector reference document on the manufacturing of safe feed materials from oilseed crushing and vegetable oil refining.

			2. Drying of copra at primary production*					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contaminants caused by drying								
- PAHs	C				Plantations dry copra on open fires, a source of PAH contamination for the copra.			<p>Sun drying or indirect drying with heat exchangers (avoiding contamination of the copra with off-gases) prevents PAH contamination.</p> <p>JECFA (Joint FAO/WHO Expert Committee on Food Additives) recommends replacing direct drying by indirect drying. In case of direct heating, Good Manufacturing Practices recommend not to use waste products as a fuel for direct drying. Temperature and time should be controlled to avoid PAH formation. The equipment has to be kept clean and well maintained.</p>
- dioxin	C				Plantations dry copra on open fires, a source of dioxin contamination for the copra.	Code of Practice for the prevention and reduction of dioxin and dioxin-like PCB contamination in foods and feeds (Codex CAC/RCP 62-2006).		Waste products must not be used as a fuel for direct drying.
- mineral oil	C				Copra being dried across roads may pick up spilled mineral oil.			

- Aflatoxins	C				Aflatoxins may be formed when copra is not sufficiently dried.	Directive 2002/32/EC limits aflatoxin B1 in copra and products derived to 0.02 mg/kg (based on a product with a moisture content of 12%).		FEDIOL advocates sun drying or (preferably) indirect drying of copra till a moisture content of max 6%.
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* Assessment of risks outside the EU is out of the scope of this document. See the footnote of the previous sheet.

			3. Pressing or extraction of copra*					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Toxic compounds from hexane	C				Some coconut oil mills use hexane as an extraction solvent for crude oil. Industrial hexane may contain toxic compounds.	Directive 88/344/EEC sets purity criteria for the use of hexane in the production of foodstuffs.		Hexane for oil extraction must be of food grade quality.
Hydraulic oils or lubricants from failing equipment	C				Hydraulic oils and lubricants may contain toxic compounds.			Contamination of the product with non-food grade hydraulic oils or lubricants have to be strictly avoided, for example by recording of the quantities used. The risk of contamination of the product with hydraulic oils and lubricants that are suitable for incidental contact with food should be minimised.
Foreign bodies	P				Foreign bodies may be present.			A system should be in place that removes any foreign material.
Recycling of contaminated fat from fat traps in effluent water	C				Effluent water may be chemically contaminated.			Fat from fat traps in effluent water must have a non-food, non-feed destination except in case of dedicated process water fat taps.

* Assessment of risks outside the EU is out of the scope of this document. See also the footnote of sheet 1. Cultivation of coconuts.

			3.1. Production of crude coconut oil*					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
PAHs	C				Concentration of PAHs in crude coconut oil during pressing of the copra.	FOSFA has an optional allowance scheme for crude coconut oil for BaP levels exceeding 50 µg/kg.		For coconut oil GMP+ International has a limit for the four PAHs benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene of 400 microgram/kg. OVOCOM (GMP) has a limit for BaP of 50 microgram/kg for feed fats.
Dioxin	C				A potential source of dioxin contamination is direct drying of the copra.			Monitoring data show that depending on origin crude coconut oil runs the risk of having dioxin levels exceeding the legal limits for this contaminant in feed materials.
Mineral oils	C				Copra being dried across roads may pick up spilled diesel, which will concentrate in the crude oil during the pressing of the oil.			The GMP+ International limits the content of MOSH C(10-40) in oils and fats to 400 mg/kg.
Aflatoxins	C				When improperly dried copra is stored for several days aflatoxin may be formed. Rainfall during storage and transport will accelerate the formation of aflatoxins. Some pick up by crude coconut oil during pressing of the copra.			

Residues of herbicides, insecticides, fungicides or rodenticides above the MRL	C				Pesticides residues have been detected in crude coconut oil.	EC Regulation No. 396/2005 prohibits putting into circulation commodities that do not comply with the MRLs set in the annexes. This regulation allows using a processing/concentration factor for pesticides into processed products, providing food safety is assured. The FEDIOL position (11SAF181) concludes that based on the average oil content in coconuts of 20 %, a processing factor of 5 should be used to establish the MRL in coconut oil.		Regulation (EC) 882/2004 allows for the processing of non-compliant agricultural commodities into compliant food or feed products under the control of the authorities.
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* Assessment of risks outside the EU is out of the scope of this document. See also the footnote of sheet 1. Cultivation of coconuts.

			Utilities: coconut oil refining and processing					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Hydraulic oils or lubricants from equipment	C	Low	High	3	Hydraulic oils and lubricants may contain toxic compounds.	FEDIOL code of practice for the management of mineral oil hydrocarbons presence in vegetable oils and fats intended for food uses (14COD341).	<p>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 hydraulic oils and lubricants that are suitable for incidental contact with food is minimised. The prerequisite programme could involve recording of the quantities used.</p> <p>Equipment requires proper lubrication to operate at optimum performance and reliability. In specific cases where no H1 lubricant could meet the particular lubrication requirements of the equipment, a specific assessment of the lubricant to be used should be performed, including consideration as regards the absence of mineral oil hydrocarbons (MOAH).</p>	
Contaminants in water such as PFOS and PFOA	C	Low	Medium	2	Water is used in the crushing and refining process.	Regulation 183/2005/EC is addressing water use.		

Cleaning agents and boiler chemicals	C	Medium	Medium	3	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	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.	

4. Refining

HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contaminants in processing aids such as mercury in caustic soda.	C	Low	High	3	Processing aids come into contact with the product.		Processing aids that directly come into contact with the oil must be of food grade quality or for food use.	

			4.1 Production of refined coconut oil					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
PAHs	C	High	Medium	4	Crude coconut oil may be heavily contaminated with PAHs due to bad drying practices.	EC Regulation No. 1881/2006 sets a 2.0 µg/kg limit for BaP in oils and fats intended for direct human consumption or use as an ingredient in foods.	The amount of active coal added and the intensity of the deodorisation process must be sufficient to remove both heavy and light PAHs.	For coconut oil GMP+ International has a limit for the four PAHs benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene of 400 microgram/kg. OVOCOM (GMP) has a limit for BaP of 50 microgram/kg for feed fats.
Dioxin and dioxin-like PCBs	C	Low	High	3	A potential source of dioxin contamination for the oil is drying of copra and bleaching earth. Crude coconut oil from Papua New Guinea is found to have a high risk of being contaminated with dioxin. The dosage level of bleaching earth during refining is only 1-3%. Dioxin partly evaporates during distillation.	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 (16COD137) , 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 EU MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides	C	Medium	Medium	3	Pesticides residues have been detected in coconut oil.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows using a reprocessing/concentration factor for pesticides into processed	Check incoming crude coconut oil or the refined oil.	Regulation (EC) 882/2004 allows for the processing of non-compliant agricultural commodities into

above the EU MRL.						products, providing feed safety is assured.		compliant food or feed products under the control of the authorities.
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 coconut oil, however, is very low.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.		
Aflatoxins	C	Very low	High	2	Crude coconut oil may be contaminated with traces of aflatoxin.	Directive 2002/32/EC limits aflatoxin B1 in copra and products derived to 0.02 mg/kg (based on a product with a moisture content of 12%).	Validate refining process for aflatoxin removal.	Aflatoxins will disappear under normal refining conditions.
Foreign materials	P	Medium	Medium	3	Foreign materials may be present.		Apply hygienic practices (eg closed systems) and filter before loading.	

			4.2 Physical refining: production of coconut fatty acid distillates					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
PAH	C	High	Medium	4	Light PAHs will concentrate into the fatty acid distillate during deodorisation. In case active coal have been added, heavy PAHs are removed.		Non-complying product should not be applied to feeding stuff.	For coconut oil GMP+ International has a limit for the four PAHs benzo(a)pyrene, benzo(a) anthracene, benzo(b) fluoranthene and chrysene of 400 microgram/kg. OVOCOM (GMP) has a limit for BaP of 50 microgram/kg for feed fats.
Dioxin	C	High	High	4	A potential source of dioxin contamination is drying of the copra and bleaching earth. Crude coconut oil from Papua New Guinea is found to have a high risk of being contaminated with dioxin. The dosage level of bleaching earth during refining is only 1-3%.	<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>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).</p> <p>According to Regulation 2015/1905 amending the Feed Hygiene Regulation 183/2005 100% of the batches of fatty acid distillates for feed shall be tested on the sum of dioxins and dioxin-like PCBs.</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-</p>	<p>Positive release of batches of deodistillates or active coal treatment to filter dioxin.</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>	

						PCB-TEQ) as upperbound value.		
Pesticide residues above the EU MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the EU MRL.	C	Medium	Medium	3	Pesticides residues (chlorpyrifos-ethyl, malathion) have been detected in crude coconut oil.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows using a processing/concentration factor for pesticides into processed products, providing feed safety is assured.	Check incoming crude coconut oil or the fatty acid distillate.	Footnote 1 of Annex I of Regulation EC No 396/2005 says that MRLs do not apply to products used exclusively as ingredients for animal feed, until separate MRLs will be applicable.
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	Low	High	3	Some of the banned pesticides may be present in the environment. The chance of finding them in crude coconut oil, however, is very low, but they will concentrate into the fatty acid distillates during physical refining.	Directive 2002/32/EC sets limits for a number of pesticides residues in feed stuff.	Non-complying product should not be applied to feed.	

			4.3. Chemical refining: production of coconut soap stocks and acid oils					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
PAHs	C	High	Medium	4	During chemical refining, the PAH content of the fatty acids is expected to be similar to that of the crude coconut oil.		Non-complying product should not be applied to feeding stuff.	For coconut oil GMP+ International has a limit for the four PAHs benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene of 400 microgram/kg. OVOCOM (GMP) has a limit for BaP of 50 microgram/kg for feed fats.
Pesticide residues above the EU MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the EU MRL.	C	Medium	Medium	3	Pesticides residues (chlorpyrifos-ethyl, malathion) have been detected in crude coconut oil.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows using a processing/concentration factor for pesticides into processed products, providing feed safety is assured.	Check incoming crude coconut oil or the refining by-product.	Footnote 1 of Annex I of Regulation EC No 396/2005 says that MRLs do not apply to products used exclusively as ingredients for animal feed, until separate MRLs will be applicable.
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 coconut oil, however, is very low.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.		
Aflatoxins	C	Low	High	3	Aflatoxins are removed through the treatment of the crude oil with used bleaching earth and activated carbon.	Directive 2002/32/EC limits aflatoxin B1 in copra and products derived to 0.02 mg/kg (based on a product		

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					Aflatoxins are water soluble. Otherwise during chemical refining they would move to the soap stock and they may stay with the acid oils.	with a moisture content of 12%.		
Dioxin	C	High	High	4	Presence of dioxin is depending on the origin of the crude coconut oil.		Positive release.	

			4.4 Chemical refining: production of coconut deodistillates					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
PAH	C	High	Medium	4	Light PAHs will concentrate into the distillates during deodorisation. In case active coal have been added, heavy PAHs are removed.		Non-complying product should not be applied to feeding stuff.	For coconut oil GMP+ International has a limit for the four PAHs benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene of 400 microgram/kg. OVOCOM (GMP) has a limit for BaP of 50 microgram/kg for feed fats.
Dioxin	C	Medium	High	4	A potential source of dioxin contamination during refining of the oil is bleaching earth. During chemical refining, dioxins concentrate into the deodistillates.	<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>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).</p> <p>According to Regulation 2015/1905 amending the Feed Hygiene Regulation 183/2005 100% of the batches of deodistillates for feed shall be tested on the sum of dioxins and dioxin-like PCBs.</p> <p>FEDIOL has developed a Code of Practice on the purchase conditions of fresh bleaching earth for oil refining (16COD137), which</p>	<p>Deodistillates from chemical refining are forbidden for use in feed unless they have been treated so as to ensure that dioxin levels are matching limits of the Undesirable Substances Directive 2002/32 (see also the FEDIOL factsheet on safe feed application of deodistillates Ref. 16SAF216).</p> <p>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.</p> <p>Purchase fresh bleaching earth from suppliers that fulfil the FEDIOL</p>	

						includes a maximum limit for dioxin and dioxin-like PCBs of 1.5 ng/kg (WHO-PCDD/F-PCB-TEQ) as upperbound value.	specifications as listed in the FEDIOL Code of Practice on the purchase conditions of fresh bleaching earth for oil refining (16COD137).	
Pesticide residues above the EU MRL, i.e. residues of herbicides, insecticides, fungicides or rodenticides above the EU MRL.	C	Medium	Medium	3	Hitherto residues of pesticides have been detected in crude coconut oil.	Regulation 396/2005 sets limits for residues of pesticides. This regulation allows using a processing/concentration factor for pesticides into processed products, providing feed safety is assured.	Check the crude coconut oil or the deodistillate.	Footnote 1 of Annex I of Regulation EC No 396/2005 says that MRLs do not apply to products used exclusively as ingredients for animal feed, until separate MRLs will be applicable.
Pesticides residues as listed in EU Directive 2002/32 for undesirable substances in feeding stuff	C	Medium	High	4	Some of the banned pesticides may be present in the environment. The chance of finding them in crude coconut oil, however, is very low, but they will concentrate into the distillates during refining.	Directive 2002/32/EC sets limits for a number of pesticides residues in feeding stuff.	Deodistillates from chemical refining are forbidden for use in feed unless they have been treated so as to ensure that pesticide residue levels are matching limits of the Undesirable Substances Directive 2002/32 (see also the FEDIOL factsheet on safe feed application of deodistillates Ref. 16SAF216).	

A. Storage of copra and transport of copra to the oil mill*								
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Aflatoxins	C				When improperly dried copra is stored for several days, aflatoxin may be formed.			Storage and transport companies must protect copra against rainfall and sea water. Aeration during storage.

					Rainfall during storage and transport will accelerate the formation of aflatoxins.			If copra is processed directly after harvesting, the risk at aflatoxin formation is low.
Foreign bodies	P				Foreign bodies such as stones from dirty trucks and glass particles, dead rodents and tree leaves can be present.			Oil mills must inspect incoming copra and must remove foreign bodies.

* Assessment of risks outside the EU is out of the scope of this document. See the footnote under sheet 1 Cultivation of coconuts.

			B. Transport of coconut oil and derived products for feed application by tank car, rail tank, barge or coaster (excluding ocean going vessel).					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contamination by previous cargo								
- Tank cars, rail tanks and barges	C	Medium	High	4	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 to the transport of foodstuff or feeding stuff should have undergone a validated cleaning procedure.	
- Tank cars, tank containers, rail tanks and barges following EU standards for the transport of food stuffs	C	Low	High	3	Transport of most of the vegetable oils is by means of transport that is dedicated to food stuffs.	The Food Hygiene Regulation No. EC/852/2004 requires the transport of liquid food stuffs by tank cars, rail tanks and barges to be dedicated to that of food stuffs. FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (Ref 14COD152 chapter A).	Make sure a means of transport is marked "for foodstuffs only".	
- Tank coasters following EU standards for the transport of food stuffs	C	Low	High	3	Tank coasters carrying oils and fats during short sea voyages in the EU must have as an absolute minimum as the immediate previous cargo a product that is either a foodstuff or a product appearing on the EU list of accepted	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (Ref 14COD152 chapter B) (including FOSFA operational	Check previous cargoes via FEDIOL practical guide to previous cargo(es) for means of transport and tank lining (Ref 14COD153). FOSFA certificate of compliance,	

					immediate cargoes of Regulation EU no 579/2014.	procedures).	cleanliness and suitability of Ship's tanks issued by a FOSFA Member Superintendent. FOSFA combined Masters certificate signed by the Captain/First Officer or an equivalent statement signed by the ship's owner or authorised agent, applicable before any loading or cargo transfer.	
Contamination by cleaning agents								
- Tank cars, rail tanks and barges	C	Medium	Medium	3	Increased risk at cleaning stations that clean both feed and chemical tanks on one site.	FEDIOL code of working practice for bulk road and tank container transport of fats and oils for direct food use (Ref 07COD138 chapter A).	Apply good practices for cleaning of tanks.	
- Tank coasters	C	Medium	Medium	3	Increased risk in case coaster is not dedicated to feed- or foodstuff.	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (Ref 14COD152 chapter B) (including FOSFA operational procedures).	FOSFA certificate of compliance, cleanliness and suitability of Ship's tanks issued by a FOSFA Member Superintendent. FOSFA combined Masters certificate signed by the Captain/First Officer or an equivalent statement signed by the ship's owner or authorised agent, applicable before any loading or cargo transfer.	

Heating or cooling fluids from equipment								
- Tank cars	C	Low	High	3	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 (14COD152 chapter A).	Use of thermal heating fluids in direct heating systems is forbidden.	
- Rail tanks, tank barges	C	Low	High	3	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.	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (14COD152 chapter A).	Heating coils of rail tanks must be of stainless steel. 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 hot water or steam heating is recommended.
- Tank coasters	C	Low	High	3	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.	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (14COD152 chapter B) (including FOSFA operational procedures).	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.	
Foreign bodies	P	Medium	Medium	3			A quality plan should require the loading of tank cars with refined oils under a roof.	

			C. Storage of crude and refined coconut oil					
HAZARD	CAT.	CHANGE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Contamination due to lack of segregation (contamination from previous cargoes, use of incorrect joinings, shared equipment)	C	Low	High	3	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 Regulation 579/2014 as amended by Commission Regulation 2016/238.	
Contamination by cleaning agents	C	Low	High	3	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	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, or do not sell the fatty acid distillate as feed.	
Thermal heating fluids from failing equipment	C	Low	High	3	Toxic thermal heating fluids may still be used. However, due to the relatively low heating temperatures applied during storage, the chance of leakage of		If thermal heating fluids have been used, the storage company must provide for documentation on net losses	The use of water and steam heating is recommended.

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					thermal heating fluids into the product is low.		and analyse accordingly, if necessary.	
Misuse of additives	C	Low	Medium	2	Additives allowed for food oil applied to oil going to feed –or vice versa- for which use they may not have been approved.			

			D. Transport of coconut oil by ocean going vessel					
HAZARD	CAT.	CHANCE	SERIOUSNESS	RISK CLASS.	JUSTIFICATION	LEGISLATION, INDUSTRY STANDARDS AND/OR CONTRACT TERMS	CONTROL MEASURE	REMARKS
Transport contamination								
- Contamination by previous cargoes that is present in tanks or pipes	C	Medium	Medium	3	Ocean going vessels carrying oils and fats for edible use into 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.	<p>Regulation 579/2014 as amended by Commission Regulation 2016/238 (Derogation to EC Regulation No. 852/2004) requires that previous loads have to be checked.</p> <p>FOSFA contracts oblige the seller to inform the buyer what the three preceding cargoes have been during the sea transport of oils and fats.</p> <p>FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (Ref. 14COD152 chapter B) (including FOSFA operational procedures).</p>	<p>FOSFA certificate of compliance, cleanliness and suitability of Ship's tanks issued by a FOSFA Member Superintendent. FOSFA combined Masters certificate signed by the Captain/First Officer or an equivalent statement signed by the ship's owner or authorised agent, applicable before any loading or cargo transfer.</p> <p>The use of dedicated pipe lines at loading and unloading.</p>	
- Contamination by cleaning agents	C	Low	Little	1	Usually maritime business sticks to good practice and cleans tanks with sea water.			
Solvent from coating	C	Low	High	3	Solvents from virgin coatings migrating to the oil, which may end up in the fatty acid distillates during refining		Do proper analyses on maiden voyages oil before accepting and monitor refining or, or do not feed the fatty	

							acid distillate.	
Thermal heating fluids (THF) from failing equipment	C	Low	High	3	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.	FEDIOL Code of Practice for the transport in bulk of oils and fats into or within the European Union (Ref.14COD152 chapter B) (including FOSFA operational procedures).	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 failing portable pumps	C	Low	High	3	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.