

Virgin Coconut Oil Hazard Analysis Critical Control Points (HACCP)

1) Hazard Identification

- Vegetative and Protozoan Enteric Pathogens
 - i. *Listeria monocytogenes*
 - ii. salmonella
 - iii. *E. coli*
 - iv. Yeast and Mold
- Metal Fragments
 - i. Metal fragments
- Pesticides
 - i. Residues from unapproved pesticides or residues in excess of pesticide tolerances in juice could pose a potential hazard if they occurred over an extended period of time at levels capable of causing health effects from chronic exposure, or if they occurred for only a brief period of time at levels capable of causing acute health effects.

2) Hazard Evaluation

- Vegetative and Protozoan Enteric Pathogens
 - i. Currently *Listeria monocytogenes* is not a direct source of disease and the reasons for the non association between this pathogen and fruit/juice disease outbreaks are not clear at this moment. But a log 5 reduction of any and all pathogens is critical to ensure.
 - ii. Salmonella is possible, but a log 5 reduction of any and all pathogens is critical to ensure.
 - iii. *E.coli* is possible, but a log 5 reduction of any and all pathogens is critical to ensure.
 - iv. Yeast and Mold is possible, , but a log 5 reduction of any and all pathogens is critical to ensure.
- Metal Fragments
 - i. If large enough, metal fragments in product can cause injury when ingested.
 - ii. Without controls, there is no means in the process by which metal fragments from grinding equipment would be removed.
- Pesticides
 - i. Acute or chronic exposure to unapproved pesticide residues can cause a variety of adverse health effects, some of which could be severe.

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3) Likelihood of Hazard Occurring

- Vegetative and Protozoan Enteric Pathogens
 - i. Because there are minimal natural levels of *Listeria monocytogenes* and exposure to air during processing can introduce other pathogens, there is a reasonable chance for a pathogen to be present in the product.
 - ii. There is a reasonable chance for *Salmonella* to occur.
 - iii. There is a reasonable chance for *E. coli* to occur.
 - iv. There is a reasonable change for Yeast and Mold to Occur
- Metal Fragments
 - i. Metal fragments are likely to occur with the chopping and granulator processes.
- Pesticides
 - i. Harmful pesticide residues in the juice are not likely because Philippines coconut farms are natural and do not normally use pesticides. Our suppliers of coconut have ensured that pesticides are not in use in the farms. Secondly, the majority of the coconuts are USDA/NOP certified organic. Third, the coconuts are deshelled, and cleaned prior to splitting, minimizing any pesticide residue. Overall, residues occur infrequently and the public health impact is typically not severe.

4)

Critical Control Points (CCP) from HACCP for Virgin Coconut Oil									
Critical Control Points (CCP)	Hazard(s)	Critical Limits	Monitoring				Corrective Action	Verification	Record Keeping
			What	How	Frequency	Who			
CCP1 Receiving	Pathogens	A supplier guarantee specifying that the shipment includes only coconut harvested to exclude fallen nuts	Ensure supplier guarantee exists for each incoming shipment of fruit	supplier guarantee is visually confirmed.	Each incoming shipment	Receiving Manager	reject coconuts if not accompanied by supplier guarantee	Review monitoring corrective action and verification of guarantees	supplier guarantee on file and receiving log
CCP 2 Drying	Pathogens	74 C for 15 minutes	Verify temperature and time duration	Records	Before pressing	Production Manager	Send back through drier	Temperature check of finished products.	Inspection Logs
CCP 3 Filtering	Pathogens & metal fragments	Filter through 1mm to remove any debris.	Ensure oil has been filtered	Visual	before packaging	Production employee	re filter product	Batch inspections per run of filter quality.	Record inspections

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Hazard Analysis Summary Table for Virgin Coconut Oil					
Ingredient/processing Step	Identify potential hazards introduced, controlled or enhanced at this step.	Are any potential food-safety hazard significant? (yes/no)	Justify your decision for Column 3	What preventative measure(s) can be applied to prevent/reduce/eliminate the hazard?	Is this step a critical control point? (yes/no)
1. Receiving/staging of coconuts	B - Pathogens Listeria monocytogenes, Salmonells, E. colit and others as petinent organisms in the coconut	yes	B - possible pathogens in the fruit itself	B - controlled at drying step	Yes
	C - Pesticides	no	C - Pesticides are not used, USDA/NOP Organic Standard, De-shelling and washing		Yes
	P - None				
2. Deshelling	B - None				
	C - None				
	P - None				
3. Cut opened & Peeled	B - None				
	C - Sanitizing Chemicals	no	not likely to occur because of SSOP for cleaning and sanitizing; residulas levels not reasonably likely to cause illness. Follow USDA/NOP Organic standards		
	P - Metal fragments	No	Using knives, not grinders.		
4. Washed	B - None				
	C - None				
	P - None				
5. Chopped	B - None				
	C - none				
	P - Metal fragments	Yes	Yes - from chopper	Filter	no
6. Granulated	B - None				
	C - None				
	P - Metal Fragments	Yes	Yes - from granulator	Filter	no
7. Dried	B - None				
	C - None				
	P - None				Yes
8. Expelled	B - None				
	C - None				
	P - None				
9. Settling Tanks	B - None				
	C - None				
	P - None				
10. Filtering	B - Growth of pathogens due to exposure during processing	Yes			Yes
	C - None				
	P - Metal fragments				
12. Packaging	B - None				
	C - None				
	P - None				
13. Case and Palletize	B - None				
	C - None				
	P - None				

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