HAZARD ANALYSIS - HEAT TREATED, SHELF STABLE - Snack Sticks, Summer Sausage, Jerky

1. Process Step	2. Food Safety Hazard	3. Reasonably likely to occur?	4. Basis of decision for whether reasonably likely to occur	5. If Yes in Column 3, What Measures Could be Applied to Prevent, Eliminate, or Reduce the Hazard to an Acceptable Level?	6. Critical Control Point
1. Receiving Packaging Materials	Biological – Contamination with meat, other biological material	No	Visual inspection for container integrity, contamination, at receiving make hazard unlikely to occur.		
	Chemical - Non-food grade materials	No	Letter of guarantee for packaging materials		
	Physical - None	No			
2. Receiving Raw Meat/Poultry, Natural Casings	Biological - Presence of pathogens: Salmonella, Listeria monocytogenes, Staph. aureus; if beef E. coli 0157:H7; if poultry, Campylobacter	Yes (Pathogens)	Raw meat/poultry, natural casings are known sources of pathogens	Pathogens will be controlled at a subsequent step through heat treatment and drying (jerky & snack sticks) and/or fermentation or acidification and heating (summer sausage, snack stick)	
	Presence of BSE- causing prions in beef	No (Prions)	Letter of guarantee received from all		

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	casings		suppliers of natural beef casings to certify that casings are not obtained from SRM's.		
	Chemical - None	No			
	Physical - None	No			
3. Receiving and 6. Storage- Restricted and Unrestricted Non- meat\Non-poultry Food Ingredients(incl. collagen or synthetic casings)	Biological - None	No			
	Chemical – Ingredients containing undesirable substances	No	SOP for storage makes contamination unlikely. Letters of guarantee are received from all suppliers of food additives.		

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				Level?	
	Physical – None	No			
4. Storage (Cold – Frozen/Refrigerated) – Raw Meat/Poultry, Natural Casings	Biological: Presence or growth of pathogens (see list above)	Yes (Presence) No (growth)	Raw meat/poultry, natural casings are known sources of pathogens. Pathogens are not likely to grow if the product is maintained according to the SOP for storage.	Pathogens will be controlled at a subsequent step through heat treatment and drying (jerky & snack sticks) and/or fermentation or acidification and heating (summer sausage, snack stick)	
	Chemical - None	No	<b>Z</b>		
	Physical - None	No			
5. Tempering Frozen Meat/Poultry	Biological – Presence or growth of pathogens (see list above)	Yes (presence) No (growth)	Raw meat/poultry are known sources of pathogens. Tempering done according to SOP, therefore pathogen growth is unlikely.	Pathogens will be controlled at a subsequent step through heat treatment and drying (jerky & snack sticks) and/or fermentation or acidification and heating (summer sausage, snack stick)	
	Chemical - None	No			
	Physical - None	No			
7. Weighing Raw	Biological - Presence or	Yes	Raw meat/poultry	Pathogens will be controlled at a	

1. Process Step	2. Food Safety	3.	4. Basis of	5. If Yes in Column 3,	6. Critical
	Hazard	Reasonably	decision for	What Measures Could be	Control Point
		likely to	whether reasonably likely	Applied to Prevent, Eliminate on Deduce the	
			to occur	Hazard to an Acceptable	
				Level?	
Meat/Poultry	growth of pathogens (see list above)	(presence) No (growth)	are known sources of pathogens. Weighing done quickly enough to prevent growth. SSOP makes contamination via equipment and workers unlikely to occur.	subsequent step through heat treatment and drying (jerky & snack sticks) and/or fermentation or acidification and heating (summer sausage, snack stick). Spore-forming pathogens will not be able to grow on finished product (products are shelf-stable).	
	Chemical - None	No			
	Physical - None	No			
8.Weighing	Biological - None	No			
Restricted and Unrestricted Non- meat/Non-poultry Food Ingredients	Chemical - Excessive Level of Nitrite	No	Follow approved product formulation to prevent addition of too much nitrite. Ingredient addition involves pre-blended cure mixes added to standardized amounts of meat.		
	Physical - None	No			
9. Combining	Biological - Presence or	Yes	Raw meat/poultry,	Pathogens will be controlled at a	

1. Process Step	2. Food Safety Hazard	3. Reasonably likely to	4. Basis of decision for whether	5. If Yes in Column 3, What Measures Could be Applied to Prevent,	6. Critical Control Point
		occur?	reasonably likely	Eliminate, or Reduce the Hazand to an Acceptable	
				Level?	
Ingredients/ Processing (Includes one or more of the following; grinding, mixing, marinating, stuffing, forming, and slicing)	growth of pathogens (see list above)	(presence) No (growth)	natural casings are known sources of pathogens. Processing steps are done quickly enough to prevent growth. SSOP makes contamination via equipment and workers unlikely to occur.	subsequent step through heat treatment and drying (jerky & snack sticks) and/or fermentation or acidification and heating (summer sausage, snack stick). Spore-forming pathogens will not be able to grow on finished product (products are shelf-stable).	
	Chemical - Allergens; cleaning/sanitizing chemical residues	No	Application of correct label prevents inadvertent consumption of allergens by consumer. Operational SSOP prevents cross contamination of allergenic agents. Pre-op SSOP makes presence of chemical		

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	Physical - Foreign materials	No	occur. No history of problem (must provide evidence). Visual observation for foreign materials during processing, inspection of equipment during cleaning make hazard unlikely.		
16. Storage of packaging materials, incl. collagen or synthetic casings	Biological – contamination from meat products Chemical – None Physical – None	No No No	SOP for receiving and storage makes hazard unlikely		
10. Racking/Hanging	Biological – Presence or growth of pathogens (see list above)	Yes (Presence) No (Growth)	Raw meat/poultry, natural casings are a known source of pathogens. Process is done rapidly enough to prevent	Pathogens will be controlled at a subsequent step through heat treatment and drying (jerky & snack sticks) and/or fermentation or acidification and heating (summer sausage, snack	

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			growth, and product is returned to cooler if not promptly fermented or heat- processed. SSOP makes contamination via equipment & workers unlikely to occur.	stick). Spore-forming pathogens will not be able to grow on finished product (products are shelf-stable).	
	Chemical - None	No			
	Physical - None	No			
11. Fermenting (Used for pH reduction of Snack Sticks, Summer Sausage, Landjaeger)	Biological – Presence or growth of pathogens (see list in step 2)	Yes (S. aureus) No (other pathogens)	Potential growth of Staphylococcus aureus and toxigenesis if fermentation process is too slow. Growth of other non-sporeforming pathogens may occur, but hazard is controlled by fermentation and/or	Fermentation within the degree- hour limit will achieve the pH needed to inhibit S. aureus. Spore-forming pathogens will not be able to grow on finished product (products are shelf- stable).	1 B

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			subsequent heat- processing.		
	Chemical - None Physical - None	No			
12. Heat Treatment (Cooking Step) & Drying	Biological - Pre-process contaminating pathogens: Listeria monocytogenes Salmonella, Staphylococcus aureus, E. coli 0157:H7	Yes	Potential survival and growth of pre- processing contaminating pathogens and toxin production by S. aureus due to inadequate process time/temperature/% relative humidity. Growth of spore- forming pathogens unlikely because finished products are shelf-stable.	Heat treatment using appropriate time/temperature/humidity to produce lethality/pasteurization.	2 B
	Post-process contaminating pathogens: Listeria	No	Post-processing contaminating pathogens: L.	Low water activity (a <sub>w</sub> ) precludes bacterial pathogen growth. The a <sub>w</sub> required to prevent growth of	

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	monocytogenes, Staphylococcus aureus, Post-process contaminating pathogens: toxin- producing molds	No	monocytogenes can grow if aw is above 0.92 and S. aureus can grow and form toxin if the aw is above 0.85 (packaged under air) or above 0.88 (oxygen-free packaging). SOP for oxygen-free packaging and/or discarding of moldy product makes hazard unlikely.	S. aureus (0.85) is lower than that for other pathogens.	
	Chemical - None	No			
	Physical - None	No			
13. Short-term storage	Biological – Growth of Listeria monocytogenes, Staphylococcus aureus, toxin-producing molds	No	Short duration of step and reduced water activity make growth unlikely to occur. Spore- forming pathogens		

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			will not grow because products are shelf- stable.		
	Chemical - None	No			
	Physical - None	No			
14. Slicing or cutting finished product	Biological – Contamination with pathogens via workers or equipment.	No	SSOP controls hygienic condition of equipment and practices of employees handling products in post- lethality environment.		
	Growth of Listeria monocytogenes, Staphylococcus aureus.	No	Post-processing contaminating pathogens: L. monocytogenes can grow if a <sub>w</sub> is above 0.92 and S. aureus can grow and form toxin if the a <sub>w</sub> is		

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	Growth of toxin- producing molds	No	above 0.85 (packaged under air) or above 0.88 (oxygen-free packaging). The drying process meets the criteria described in 9 CFR 430.4 for Alternative 2. SOP for oxygen-free packaging and/or discarding of moldy product makes mold growth unlikely.		
	Chemical - None	No			
	Physical - None	No			
15. Spraying w/	Biological - None	No			
potassium sorbate	Chemical - excessive potassium sorbate	No	Applying potassium sorbate according to approved formulation makes hazard unlikely to		

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	Physical - None	No			
17. Packaging/Labeling	Biological - Growth of Listeria monocytogenes, Staphylococcus aureus Growth of toxin-	No	Post-processing contaminating pathogens: L. monocytogenes can grow if a <sub>w</sub> is above 0.92 and S. aureus can grow and form toxin if the a <sub>w</sub> is above 0.85 (packaged under air) or above 0.88 (oxygen-free packaging). Listeria testing program. The drying process meets the criteria described in 9 CFR 430.4 for Alternative 2.		
	producing molds	No	SOP for oxygen-free		

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			packaging and/or discarding of moldy product makes hazard unlikely.		
	Chemical - None	No			
	Physical - None	No			
18. Finished Product Storage	Biological - None	No	Product is shelf- stable.		
	Chemical - None	No	Product is handled according to SOP for Finished Product Storage.		
	Physical - None	No	Product is handled according to SOP for Finished Product Storage.		
19. Shipping or Retail	Biological - None	No	Product is shelf- stable.		
	Chemical - None	No	Product is handled according to SOP for Finished Product Storage.		

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	Physical - None	No	Product is handled according to SOP for Finished Product Storage.		